



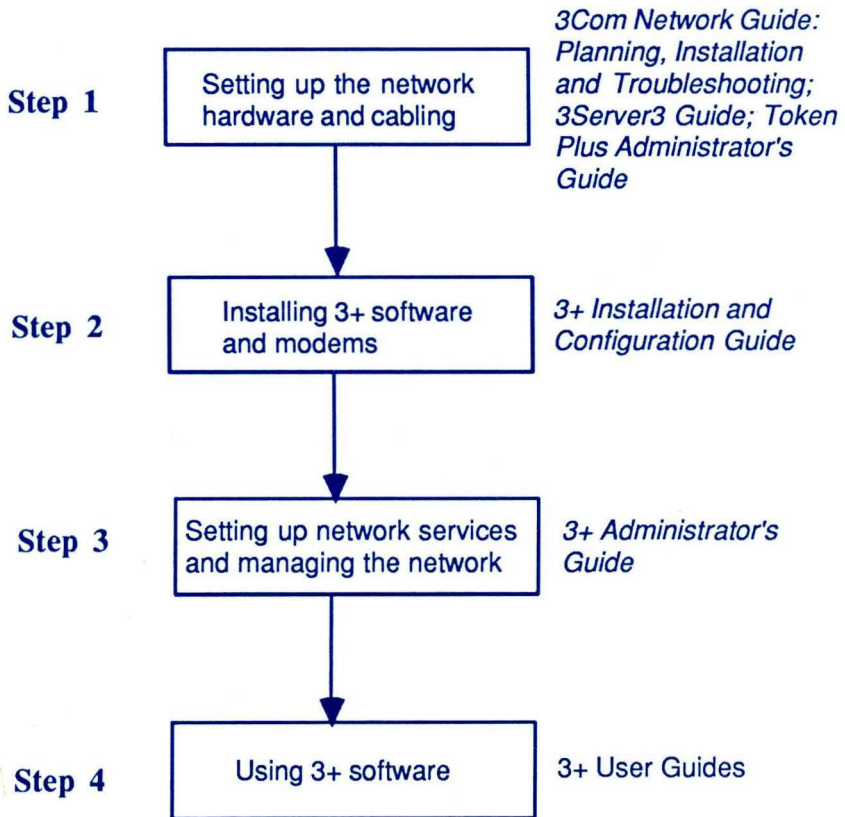
## *Installation and Configuration Guide*

2789-00

# **3Plus<sup>TM</sup>**

**3Com<sup>®</sup>**

# Where to find information



# **3+ Installation and Configuration Guide**

**A member of the 3+ family of products.  
For use with DOS 3.1 or DOS 3.2**

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## **Recognition**

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# **PART I: Installation**

These chapters guide the installer through procedures for loading software on workstations and servers. After installation, the installer can then boot up the server, and start using 3+ software. For certain services, some parameters cannot be preset. Chapter 4 provides pointers to the sections in Part II (Chapter 5) that provide the information needed to set these parameters.

## **Chapter 1: Introduction**

This guide describes how to install and configure 3+ software using the 3+ installation program. This easy-to-use program takes you through the installation with simple step-by-step instructions that appear on the screen. You insert the required diskette when prompted, press a key, and the files are automatically copied for you. During installation, you can choose to simply follow the screen prompts, or you can refer to the instructions in this guide.

Before you install 3+ software, you must first complete all network cabling and configure your hardware according to instructions in your network installation guide; for example, the *3Com Network Guide* or the *Token Plus Administrator's Guide*.

### **About this Guide**

This guide has two parts. Part I, Chapters 1-4, provides the basic information you need for installing 3+ software. Most installers will need to refer only to this part of the guide. Part II, Chapter 5, provides detailed information for configuring or fine tuning network performance. Appendices provide supplementary information.

## Overview

3+ software is installed both on network workstations and servers. A **workstation** is the personal computer from which the user accesses network services. A workstation located on the network is a **local** workstation; a workstation connected to a network by modem is a **remote** workstation. A **server** is a personal computer or a high-performance 3Com 3Server that manages network resources. In this guide, **3Server** refers to the family of servers that includes the 3Server and the 3Server3.

Workstation software allows the user to access network resources, such as data, application programs, disks, and printers. Server software allows the PC server or the 3Server to manage these network resources.

The installation diskettes contain 3+ user and system files and the 3INSTALL program. They also contain installation batch files that copy the required files to your workstation or server.

## Standard Server Configurations

You can install 3+ services on the server using standard configurations. These configurations accommodate different combinations of services that you might choose for your network. Preselected parameter settings ensure the best use of the high-performance features of 3+ software.

You can also choose your own configuration. Chapter 4 describes installation for both standard and non-standard configurations. Chapter 5 describes in detail how to use 3INSTALL to set service parameters for optimum performance in your specific application.

## 3+ Services

A 3+ network provides the ability to share applications, files, and printers, send and receive electronic mail, and to connect to other 3+ networks. It also allows remote users to access the network and to send or receive electronic mail. The following 3+ services are installed using the 3+ installation program:

- ▶ **3+Share:** consists of the File and Print services, their command interface, and the 3+Menus user interface. File and Print manage the sharing of disks, directories and files, and output devices.
- ▶ **3+ Name:** manages the names of users and servers on the network.
- ▶ **3+Mail:** allows network users to exchange messages and files on their network, and, using 3+Route or 3+NetConnect, on other networks.
- ▶ **3+Remote:** provides dial-in network support from stand-alone personal computers.
- ▶ **3+Route:** provides network-to-network communication and resource-sharing among 3+ networks in different geographic locations.
- ▶ **3+NetConnect:** supports network bridges between networks (for example, Ethernet and Token Ring networks) that are at the same physical location. For installation information, refer to your NetConnect documentation.
- ▶ **3+Start:** allows workstations with EtherStart PROMs to start up directly from the network without using a floppy diskette or a hard disk. Installation and setup of 3+Start is described in the *3+ Administrator's Guide*.

- ▶ **3+Backup:** copies network files from any 3+Share 3Server on the network to cartridge tape in the 3Server Tape Backup unit or the 3Server3 Tape Backup Option.
- ▶ **3+TurboShare:** allows 3+Share to use the additional memory on a Lotus-Intel-Microsoft Expanded Memory Specification (EMS) board, or compatible.

## **3+ Network Configurations**

The minimum network configuration is one workstation and one server. The minimum amount of 3+ software required for this configuration is the Name service and the Share (File and Print) services.

There is no specific limitation to the growth of a 3+ network. The capabilities of remote internetworking and internetwork bridging have made it possible to configure the network to accommodate most communication requirements. As your network grows, you can configure it with as many servers as needed, running the services described in the preceding section.

## **Configuration Factors**

The network configuration that best meets your needs will depend on the following factors:

- ▶ Number of users
- ▶ Services used
- ▶ Type of network activity
- ▶ Number of locations that need to be internetworked

More workstations require more network servers. To maintain good performance, add a new server when one of the following conditions occurs:

- ▶ The first server begins to receive more transaction requests than it can handle; that is, "Network retrying" messages begin to appear regularly.
- ▶ The server's disk space is 90% full.

The server's workload also increases as more services run on it and more users access it. To maintain good server performance, install services using the standard configurations recommended in Chapter 3.

## **Configuration Guidelines**

The following basic concepts serve as a guide for choosing both the hardware and software for a network configuration:

- ▶ There must be one, and only one, Name service on each independent network. The Name service manages all users, and server addresses.
- ▶ 3+Share services (File and Print) should be installed on as many servers as the workload requires.

- ▶ 3+Start can be installed on only one server per network.
- ▶ You can install as many 3+ services on a server as will fit in the server's memory.

## Hardware Requirements

- ▶ **Workstations:**  
A workstation on a 3+ network must be an IBM PC, XT, AT, or compatible. 320 KB of memory are required; 384 KB are recommended. Local workstations require a network adapter:
  - ▶ An EtherLink or EtherLink Plus board to connect with an Ethernet network
  - ▶ An IBM Token Ring or 3Com TokenLink Plus to access a Token Ring network (refer to your Token Ring documentation for detailed information)

Remote workstations require a modem to communicate with the network. Memory requirements for remote workstations are: 320 KB to run 3+Share; 384 KB to run 3+Mail. Running any application from a remote personal computer requires 25 KB more memory than running the application from a personal computer physically attached to the network. The above figures include this additional 25 KB of memory.

- ▶ **Servers:** 3Server or PC server  
The 3Server3 or the original 3Server with a 384 KB memory expansion board can operate as a network server for an Ethernet network or for a token ring network. These servers have a built-in Ethernet communication capability. Token Ring communication capability can be added through the optional Token connection.

PC servers must be an IBM PC, XT, AT, or compatible, with 640 KB of memory. 3Com recommends that you use an **AT-class PC** as a server. Each PC server on the network must have a network adapter that allows it to communicate with the network. On your PC server, you will have one of the following network adapters:

- ▶ An EtherLink or an EtherLink Plus board for use with an Ethernet network.
- ▶ An IBM Token Ring or a 3Com TokenLink Plus board for use with a Token Ring network (refer to your Token Ring documentation for detailed information).

If a server is to communicate with remote workstations and/or networks via 3+Route and 3+Remote, attach a modem to it.

## Optional Hardware

For an additional 2 megabytes of RAM on the 3Server3, you can install a 3Server3 CacheCard. Follow the instructions you received with the CacheCard to install it.

For additional RAM (2 to 8 megabytes) on the PC server, you can install an *Intel Aboveboard* or an *AST Rampage* compatible card that adheres to the Lotus-Intel-Microsoft Expanded Memory Specifications (EMS). Follow the instructions you received with the board to install the accompanying driver, and to edit the CONFIG.SYS file. To make use of the extra memory on the network, you must purchase and install 3+TurboShare.

When you start a 3Server after installation of 3+ software, you may want to connect a personal computer or a serial printer directly to the server in order to display startup messages. You will need Data Terminal Equipment (DTE) serial cable (null modem) for this connection.

## Software Requirements

- ▶ DOS version 3.1 or 3.2 for the brand of computer you are using. For example, if you have a WYSE computer, you must use a DOS intended for the WYSE computer. Errors can occur if DOS intended for another brand of personal computer is used, even if the two brands are "compatible".
- ▶ 3+ installation diskettes that you received with your 3+ version 1.1 software. Chapters 2, 3, and 4 specify the diskettes you need for specific installations.

## Installation Road Map

This guide explains 3+ software installation on workstations and servers. Before you install 3+ software, you should have completed all network cabling, hardware installation, and DOS formatting. Refer to the hardware and DOS documentation for instructions.

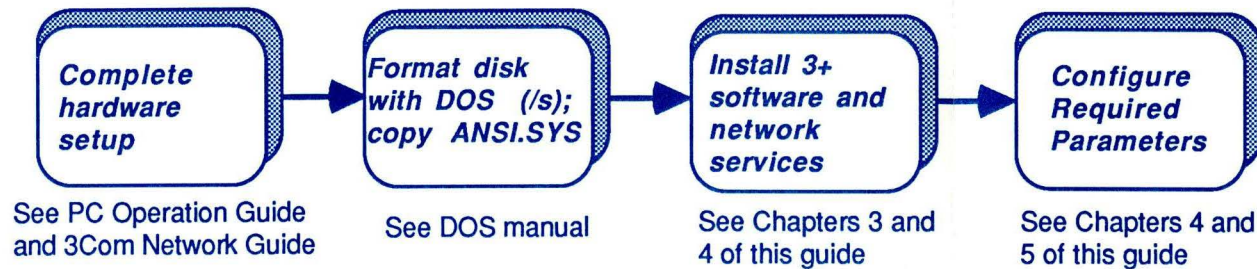
The procedure for installing software on a workstation is the same regardless of the kinds of servers the workstation will access. The procedure for installing software on a PC server differs slightly from that for the 3Server.

- ▶ For the PC server, start installation by inserting the first installation diskette. Then, run the installation program. It prompts you for the different diskettes you need to insert. The program copies the required files to the server.
- ▶ For the 3Server, you must create a workstation startup diskette before you install any software on the 3Server. Then follow the instructions in your 3Server guide for system software installation. After completing this step, continue with 3+ software installation.

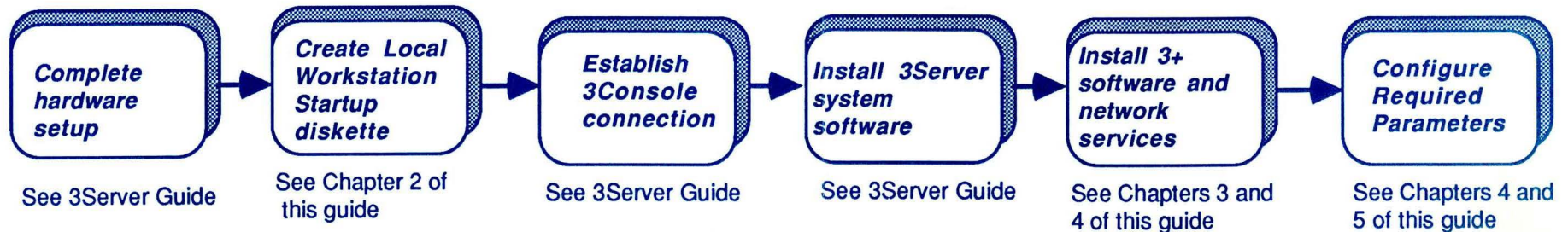
**The following chart shows the required installation procedures and the corresponding documentation that explains them.**

# 3+ Installation Road Map

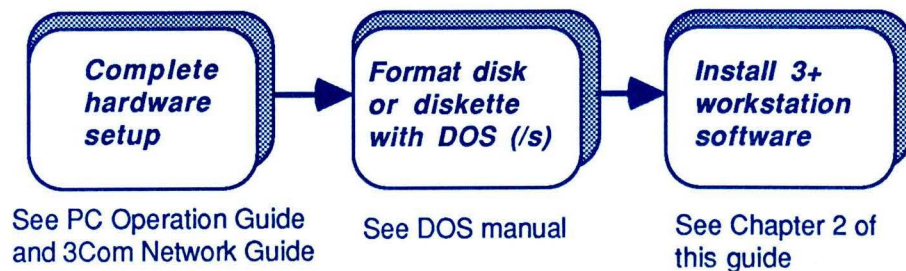
## PC Server



## 3Server



## Local & Remote Workstations



## **Chapter 2: 3+ Workstation Software Installation**

This chapter explains 3+ workstation software installation; specifically, the copying of files to hard disk or floppy diskette. These files allow you to start a workstation, local or remote, and use 3+ network resources from it. If you are going to install software on a 3Server, you must also start the personal computer that communicates with the 3Server with the same startup files that you use to start a local workstation.

### **Overview**

You can install software on a local or a remote workstation. The installation program copies one set of files for the local workstation and another set for the remote workstation.

This chapter explains software installation for three different workstation configurations. Instructions in this chapter start with a common "How You Begin" procedure, followed by a section for local workstations, and another for remote workstations. Chapter 3 explains server system software installation.

## Before You Begin

If you are preparing a startup disk for a local workstation, verify the type of network adapter -- EtherLink, EtherLink Plus, IBM Token Ring or TokenLink Plus -- in your workstation. Refer to Chapter 1, "Hardware Requirements" section, for information on network adapters and other hardware and software requirements.

To install workstation software, you will need the installation diskettes shown in Table 2-1. If you are installing on floppy diskette, you will need blank diskettes formatted with DOS 3.1 or higher. Diskettes for workstation startup must be formatted with the /S option. The second blank diskette for the remote workstation, shown in Table 2-1, is for 3+Share user files and should simply be formatted with DOS version 3.1 or higher. For information on formatting with DOS, refer to your DOS manual.



**NOTE:** If you are installing software on diskettes, use a workstation with a dual floppy diskette drive.

**Table 2-1. 3+ Workstation Installation Diskettes**

Diskettes required	Type of Workstation Installation			
	Local Hard Disk	Local Floppy Diskette	Remote Hard Disk	Remote Floppy Diskette
3+Installation #1	X	X	X	X
3+Share User #1	X	X	X	X
3+Share User #2	X	X	X	X
3+ Remote User			X	X
Blank diskette: DOS-formatted with /S		X		X
Blank diskette: DOS-formatted without /S				X



**CAUTION:** If you are creating workstation diskettes, use a dual floppy 360 KB IBM diskette drive. Diskettes created on a 1.2 MB diskette drive do not work reliably on a 360 KB diskette drive.

## How You Begin

1. Start the workstation with DOS version 3.1 or higher.
2. Insert the *3+ Installation #1 (Drivers)* diskette in drive A:.
3. If you are installing startup files on hard disk, make C: the default drive and type:

If you are creating workstation startup diskettes on a dual floppy diskette drive computer, make B: the default drive. Insert a blank disk, DOS-formatted with /S, in drive B:, and type:

This displays introductory text that reminds you where the files will be copied.



**NOTE:** If an error occurs, refer to Appendix A: Error Messages, for recovery procedures.

4. After reading the text, press any key to begin copying files. Two additional introductory screens appear while files are being copied.

5. When prompted, press any key to continue copying files. After these files are copied, a list of machine configurations appears. The first three are workstation configurations:

MACHINE CONFIGURATIONS MENU

1. Local Workstation Startup disk
2. Remote Workstation Startup disk
3. Local Workstation Startup disk with EPATH
4. 3+Start Master diskette
5. PC Server

- ▶ Select 1, **Local Workstation Startup disk**, if the workstation is located on the network and will access only servers with 3+ software.
- ▶ Select 2, **Remote Workstation Startup disk**, if the workstation connects to the network by modem.
- ▶ Select 3, **Local Workstation Startup disk with EPATH**, if the workstation is located on the network and will access both 3+ and EtherSeries servers. (EPATH is the workstation driver that allows the 3+ workstation to access EtherSeries.)
- ▶ For now, ignore numbers 4 and 5. They do not apply here. Selection number 4 creates a 3+Start Master diskette for use in creating 3+Start volumes. However, 3+Start will not be discussed in this guide. Refer to the *3+ Administrator's Guide* for instructions on creating the master diskette and the 3+Start volume to set up 3+Start service on your network. Selection number 5 installs server software. This is explained in Chapters 3 and 4.

Type the number that corresponds to your selection, then press **[Enter]** to start copying files.

If you are installing software for a local workstation, proceed to the following section. If you are installing on a remote workstation, proceed to the section entitled "Remote Workstations" on page 2-8.

## Local Workstations

This section continues the description of installation on both the 3+ Local Workstation and the 3+ Local Workstation with EPATH.

1. After files are copied, a menu similar to the following appears:

### NETWORK ADAPTER DRIVERS

1. EtherLink
2. EtherLink Plus
3. IBM Token Ring
4. TokenLink Plus

A workstation connected to an Ethernet network has either an EtherLink or an EtherLink Plus board installed. A workstation connected to a Token Ring network has either an IBM Token Ring or a TokenLink Plus board installed.

Select the network adapter that corresponds to the adapter installed in your workstation, then press **[Enter]**. The device drivers are copied to the startup disk.

2. When prompted, insert the 3+ *Share User (Drivers) #1* and press any key to copy files.
3. When prompted, insert the 3+ *Share User #2* diskette, then press any key to copy files. After copying the required files, the program will display a message indicating that the installation is complete. A DOS prompt then appears.

If you have installed the software on diskette, remove the diskette from drive B: and label it "3+Local Workstation Startup" or "3+Local Workstation Startup with EPATH." Use this diskette to start your local workstation or the personal computer that you use to communicate with a 3Server.

To make other copies of the workstation startup diskette you have just created, use the DOS DISKCOPY command.

Refer to Chapter 3 for instructions to install software on a PC server.

Refer to your 3Server guide to install software on a 3Server. Your 3Server guide details the preliminary steps you need to follow before installing 3+ server software and 3+ services.



**NOTE:** Refer to Appendix B for a list of files contained in the distribution diskettes and a list of files copied to your workstation disk during installation.

## Remote Workstations

To install software on a 3+Remote Workstation, start with the "How You Begin" section earlier in this chapter, then proceed with the steps below. If your workstation does not have a hard disk, you will need two DOS-formatted diskettes for this procedure.

Follow the on-screen prompts for each step:

1. When prompted, insert the *3+Share User #1* diskette. Press any key to copy the required files.
2. When prompted, insert the *3+Remote User* diskette. Press any key to copy the required files.
3. Insert the *3+Share User #2* diskette. Press any key to copy the required files.
4. If you are installing on diskette, when prompted, remove the diskette from drive B: and label it "3+Remote Workstation Startup." Then insert the second formatted diskette in drive B:. Press any key to copy the required files.
5. After copying the required files, the program will display a message indicating that installation is complete. A DOS prompt then appears.

If you have installed on diskette, remove the diskette from drive B: and label it "3+Share User."

To make other copies of the 3+Remote Workstation Startup and 3+Share user diskettes, use the DOS DISKCOPY command.



**NOTE:** Refer to Appendix B for a list of files contained in the distribution diskettes and a list of files copied to your workstation disk during installation.

## **Chapter 3: 3+ System Setup**

This chapter explains how you use the 3+ installation program to copy the required system files to your server's disk. The PC server and the 3Server are discussed separately in this chapter. Chapter 4 explains how to install the services themselves.

Installing system files involves copying network drivers, utilities, and the 3INSTALL program. The installation program prompts you through the installation steps. You insert the appropriate diskette, then press any key. The program automatically copies the required files.

You will be installing 3+ software using five diskettes:

- ▶ *3+ Installation #1 (Drivers)*: contains drivers and utilities
- ▶ *3+ Installation #2 (PC server) or (3Server)*: contains system files
- ▶ *3+ Installation #3 (3INSTALL)*: contains the 3INSTALL program
- ▶ *3+Share User #1*: contains 3+Share user files
- ▶ *3+Share User #2*: contains additional 3+Share user files

## Before You Begin

Refer to Chapter 1 for information on hardware requirements. Make sure that your server is connected to the network.

During installation, you will need to indicate the correct network adapter for your PC server or the correct network medium for your 3Server. Verify which adapter or network medium you are using. Instructions for PC server software installation start on page 3-3. Instructions for 3Server software installation start on page 3-9.

## The Server Name

During installation, you will give a name to the server. The 3+ network uses this name to keep track of information regarding each server.

A server's name consists of three parts, separated by colons, in the format, **Name:Domain:Organization**. **Organization** generally indicates company name. **Domain** is a category within the organization; it can be a geographic location or a department. **Name** is what you call the server to distinguish it from other servers on the network. A sample server name is **Finance:HQ:3Com**.

The character limits are 40:20:20, with a combined maximum of 58. 3Com recommends that the Name part be no longer than 15 characters, with no embedded blanks. Decide on the three-part-name for the server before starting system software installation. For further information, refer to the 3+ *Administrator's Guide*.

## How to Begin - PC Server

For a PC hard disk that you have previously formatted with DOS version 3.1 or higher, use a text editor to include the following statement in your CONFIG.SYS file in the root directory of your startup disk drive: **device=ansi.sys**. Make sure that you have the file ANSI.SYS in the root directory of the startup disk drive.

If you will be installing 3+TurboShare, first install the EMS-compatible memory expansion board in your server. Then follow the vendor's instructions to copy the Extended Memory Manager (EMM) driver to your server disk and reference it in a CONFIG.SYS statement.

For an unformatted PC server, you need to perform the following preparatory steps. Refer to your DOS manual for detailed instructions on formatting and partitioning a disk.

If you have a third party hard disk, refer to Appendix G for information on preparing the disk for installation.

1. Format the disk with DOS version 3.1 or higher using the /S option. If you are installing on a third party hard disk, refer to Appendix G: Installing on Third Party Hard Disks, for information.
2. Copy the DOS file, ANSI.SYS, to the root directory.

3. Create a CONFIG.SYS file with an ANSI.SYS statement by typing the following at the C> prompt:
4. Reboot the PC server.

## PC Server System Setup

Throughout the installation process, the installation program prompts you to insert diskettes and then press any key to start copying files. Use this section as a reference to follow the installation process, or simply follow the prompts that appear on the screen.

To install drivers and utilities:

1. Start the server with DOS version 3.1 or higher.
2. Insert the *Installation #1 (Drivers)* diskette in drive A:.
3. If you are not at the root directory of drive C:, type:
4. Start the installation program by typing:

This displays introductory text that reminds you where the files will be copied.

5. After reading the text, press any key to begin copying files. While files are copied, preliminary screens appear.

You will be prompted for the following steps to complete the installation:

6. Press any key to continue copying files. A list of machine configurations then appears on the screen:

MACHINE CONFIGURATIONS MENU

1. Local Workstation Startup disk
2. Remote Workstation Startup disk
3. Local Workstation Startup disk with EPATH
4. 3+Start Master diskette
5. PC Server

Select **PC Server** by typing **5** and pressing **[Enter]**.

7. A list of network adapters appears on the screen:

NETWORK ADAPTER DRIVERS

1. EtherLink
2. EtherLink Plus
3. IBM Token Ring
4. TokenLink Plus

Type the number corresponding to the network adapter installed on your server and press **[Enter]**. The installation program will copy the appropriate drivers. The copying takes about two minutes; a prompt then appears asking you for the next diskette.

8. Insert the *3+ Installation #2 (PC Server)* diskette and press any key to begin copying files from this diskette.
9. When prompted, enter a three-part name in the format, **Name:Domain:Organization**; for example, Personnel:SF:MyCompany. Press **[Enter]** to accept the server name. Refer to "The Server Name" section earlier in this chapter for information on selecting three-part names.
10. Passwords are optional. Enter a password if you want to limit access to the server. Passwords are 8 characters maximum with no blank spaces. Write down the server's three-part name and the password and keep the information in a safe place.
11. 3+Share user software is on two diskettes, *3+Share User #1* and *3+Share User #2*. When prompted, insert the diskettes and press any key to copy files.
12. When prompted, insert the *3+ Installation #3 (3INSTALL)* diskette. This diskette contains 3INSTALL, the program you use to install 3+ services and to configure service parameters. Press any key to copy 3INSTALL.

13. When prompted, reboot the server. Upon rebooting, a message appears asking whether you want to continue. To continue installation, type **Y** and press **[Enter]**.

The 3INSTALL program will run, displaying a screen with general instructions.

Read the instructions, then press any key to display a new menu that shows your server's disk drive configuration.

CIOSYS Configuration Ver. 1.1

NET/ DRIVE	PHYS LOCAL	PHYS DRIVE	NET/ DRIVE	PHYS LOCAL	PHYS DRIVE
A	L	**			
B	L	**			
C	N	1			

Concurrent user memory 0

This screen allows you to specify what server drives are to be accessible by network services and the amount of memory to be reserved for a concurrent user.

CIOSYS (Concurrent Input/Output System) is a file system extension to DOS that supports 3+'s multi-tasking environment.

In the server shown on the preceding page, drives A and B are local drives and C is a logical drive on physical drive number 1. If you had two partitions on this one drive, then both partitions, for example C and D, would show 1 under PHYS DRIVE. The menu's two columns are identical; they allow space for several drives with partitions.

Concurrent user memory is the amount of memory that you can designate for use by applications when you run a PC server concurrently as a workstation.



**CAUTION:** Do not designate diskette drives as network drives.

The menu shown on the preceding page lets you designate which drives are local and which drives are network drives. Accept the preset values by pressing **[Ctrl] + [A]**. Do not yet designate memory for a concurrent user (workstation). Modifying memory allocation is discussed after services installation.

Press any key to display 3INSTALL's main menu. You are now ready to install 3+ services. Proceed to Chapter 4.

## How to Begin - 3Server

Your 3Server guide provides detailed instructions on installing the system software that you received with the 3Server. The following steps summarize those described in the 3Server guide.

1. Establish a 3CONSOLE connection (Appendix F explains this procedure).
2. Ensure that the *3Server/3+ System Software* diskette is in drive A: and type:

A>>

A screen similar to the following appears:

```
Installing 3Server System Software into the 3Server  
DOS 3.1, 3server Version 1.1
```

The required files are copied to the server.

3. When prompted, insert the *3+ Installation #1 (Drivers)* diskette in drive A:, then follow the installation instructions in the next section.

## Installing Network Drivers and Utilities

This section assumes that you have just installed the *3Server/3+ System Software* diskette and are still running 3CONSOLE. You have also inserted the *3+ Installation #1 (Drivers)* diskette as the final step in the 3Server/3+ system software installation.

**NOTE:** Should the message "Connection not responding" appear during installation, you have lost the 3CONSOLE connection.



If the 3Server still displays the message **Remote Active**, type: **3CONSOLE /A**. If this does not re-establish the connection, refer to Appendix F for instructions on running 3CONSOLE.

Once you re-establish a 3CONSOLE connection, insert the *3+ Installation #1 (Drivers)* diskette in drive A:. At the C:>> prompt, type: **a:install**.

Follow the screen prompts for the steps described in this procedure.

1. When prompted, press any key to copy the files. A series of screens appears while files are copied to the server. The following menu then appears on the screen:

```
NETWORK MEDIA
1. Ethernet
2. Token Ring
```

Type the number corresponding to your network medium and press **[Enter]**. The installation program will copy the appropriate drivers. This process takes about a minute.

2. Insert the *3+ Installation #2 (3Server)* diskette and press any key to begin copying files from this diskette.
3. Enter a three-part server name in the format, **Name:Domain:Organization**; for example, **Eng:HQ:MyCompany**. Press **[Enter]** to accept the server name. Refer to "The Server Name" section earlier in this chapter for information on three-part names.
4. Passwords are optional. Enter a password if you want to limit access to the server. Passwords are 8 characters maximum, no blank spaces. Press **[Enter]** to accept the password.

Write down the server's three-part name and the password and keep the information in a safe place.

5. Insert the *3+ Installation #3 (3INSTALL)* diskette. This diskette contains the 3INSTALL program, which installs 3+ services on the server. Press any key to continue.

When installation is complete, the 3INSTALL program will start up.

6. A screen similar to the one shown below appears (only on first-time installation):

CIOSYS Configuration Program V1.1

	NET/ DRIVE LOCAL	PHYS DRIVE		NET/ DRIVE LOCAL	PHYS DRIVE
A	L	**			
B	L	**			
C	N	1			
D	N	1			
E	N	1			

This screen allows you to specify what server drives are to be accessible by network services.

CIOSYS is a file system similar to DOS, except that it supports 3+'s multi-tasking environment. Refer to Chapter 5 for more information about CIOSYS.

This screen lets you designate which drives are local and which drives are network drives. In the screen shown above, drives A and B are local drives and C, D, and E are network drives. Drives C, D, and E are partitions of the same physical drive, 1. The two columns of the menu are identical; they allow space for several drives with partitions.

If you have multiple drives, the physical drive number will be 1 for all drives. For optimal performance, correct the physical drive numbers to correspond to the actual physical drives. See page 5-28 for instructions.



**CAUTION:** Do not designate drive A: or drive B: as a network drive.

If you have only drives A - E, accept the values by pressing [Ctrl] + [A]. If you have additional drives, use the cursor keys to move around the screen, fill in the values, then press [Ctrl] + [A] to accept the new values.

A screen with general instructions appears.

Press any key to display 3INSTALL's main menu. You are now ready to install 3+ services using the 3INSTALL program. Refer to Chapter 4 for an explanation of 3+ services installation procedures.

## Chapter 4: Installing Services

This chapter explains how to use the 3INSTALL program to install 3+ services on a server. With 3INSTALL, you can install 3+ services in two ways:

- ▶ Choose a standard configuration that closely matches your desired configuration. (This is the preferred procedure.)
- ▶ Install individual services.

To obtain optimum performance, you can also use 3INSTALL to fine tune service parameters. Chapter 5 describes these procedures.



**CAUTION:** You must have successfully completed the necessary procedures described in Chapters 2 and 3 before performing the procedures described here.

## Overview

The procedures in Chapter 3 explained how to install network software and load the 3INSTALL program on a server. This chapter explains the procedure for **first-time installation** of 3+ software. You can also use this procedure to deinstall a service during initial installation. If you want to deinstall or add 3+ software on a server currently on the network, you must first shut down 3+ services on that server and then shut down the server itself. Refer to the *3+Administrator's Guide* for information on shutting down the services.

3INSTALL displays a series of menus that guide you as you install the services. "On-Line Help" messages briefly explain each choice and the ranges of the various parameters.

## Installation Guidelines

When installing services on a server, use the following general guidelines:

- ▶ Install a standard configuration when possible.
- ▶ If no standard configuration fits your requirements, install a standard configuration that has one less service than required, then install the remaining service individually.
- ▶ If no standard configuration meets your requirements, as qualified in the preceding paragraph, install services individually.

## Installing N User Configurations

When installing 3+Share and 3+Mail on the PC server, and 3+Mail for the 3Server, you will install either a 5 User or an N User configuration. A 5 User configuration limits access to the service to five users. An N User configuration allows you to specify the number of users that can access the service.

Standard configuration for PC servers assumes a 5 User configuration. The recommended procedure for N User installation is to install a standard configuration that has one less service than required, then install the N User service individually.



**NOTE:** Take special care to mark the first diskette as a 5 User diskette. You will need to re-insert this diskette **first** during the N User installation.

## Installing on DOS-only PC Servers

If you are running only 3+Route or 3+Remote, you do not need CIOSYS or 3+Share. You can install these services on a hard disk or you can install them on diskette. Refer to the 3RTDOS.DOC or 3RMDOS.DOC file on the distribution diskette for installation instructions. Print out the file for easier reference.

## Installing 3+Mail User Software

For instructions on installing 3+Mail User software, refer to Appendix E.

## **Installing 3+NetConnect**

For information on installing 3+NetConnect, refer to the 3+NetConnect documentation.

## **Installing 3+Menus**

For information on installing 3+Menus, refer to the *3+Menus Reference Guide*.

The remainder of this chapter describes installation and deinstallation procedures and explains the considerations involved in making the various choices that are presented.

## **Before You Begin**

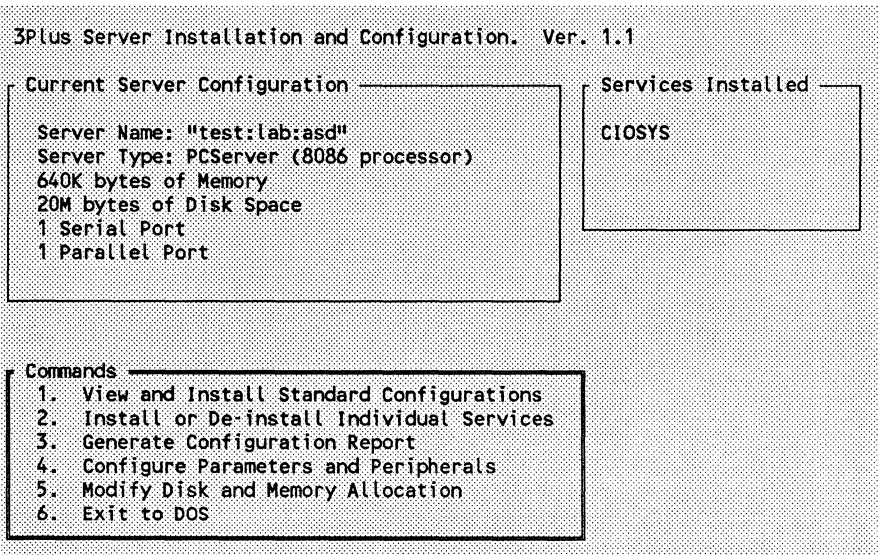
In addition to completing the procedures described in Chapters 2 and 3, you will need the appropriate diskettes from the list shown below in order to install the network services. If you are installing N User versions of the Share or Mail services on a PC server, you need to purchase two separate copies of the software. If you are installing an N User version of the Mail service on a 3Server, you need to purchase two separate copies of 3+Mail; however, a single copy of 3+Share for the 3Server supports N users.

### **3+ Software Diskettes:**

- 3+TurboShare PC Server
- 3+Share PC Server/File and Print
- 3+Share 3Server/File and Print
- 3+Share Server/Name
- 3+Mail Server
- 3+Route Server
- 3+Remote Server
- 3+Backup Server
- 3+Start Server

## How to Begin

After installing system software and the 3INSTALL program, as explained in Chapter 3, you should have the 3INSTALL program's main menu on your screen, which will appear similar to the following:



## Main Menu Selections

The 3INSTALL main menu presents Command selections. The first two selections, and the procedures for executing them, are explained in this chapter. Selections 3, 4, and 5 are explained in Chapter 5. Each selection is described briefly below.

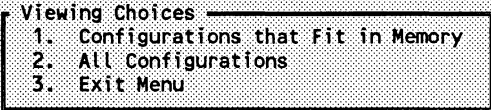
1. **View and Install Standard Configurations**  
Allows viewing of the standard configurations for 3+ services. Select and install one that suits your network needs.
2. **Install or Deinstall Individual Services**  
Allows installation or removal of individual 3+ services.
3. **Generate Configuration Report** (Chapter 5)  
Creates a detailed report showing the present network hardware and software configuration and stores it in a data file on disk for review.
4. **Configure Parameters and Peripherals** (Chapter 5)  
Displays parameter configurations used for each installed service and allows modification of parameter values.
5. **Modify Disk and Memory Allocation** (Chapter 5)  
Displays configurable disk and memory allocation parameters.
6. **Exit to DOS**  
Terminates the 3INSTALL program.

You can make a selection from the 3INSTALL main menu three different ways:

- ▶ Type the number of the desired selection.
- ▶ Type one of the highlighted letters of the desired selection.
- ▶ Highlight the selection using the Up/Down cursor keys and press [Enter].

## View and Install Standard Configurations

Selection #1 from the 3+INSTALL main menu, **View and Install Standard Configurations**, displays a menu similar to the following which presents three viewing choices. This section contains a brief description of each choice and a table of the available configurations.



```
Viewing Choices
1. Configurations that Fit in Memory
2. All Configurations
3. Exit Menu
```

- 1. Configurations that Fit in Memory**  
Displays only those standard configurations that will fit in the memory available on your server.  
  
This is the recommended selection. Select this viewing choice by pressing 1 or, when the cursor is on this viewing choice, **[Enter]**.
- 2. All Configurations**  
Displays all standard configurations.
- 3. Exit Menu**  
Returns you to the 3INSTALL main menu.

## Standard Configurations

When you select viewing choice #1, **Configurations that Fit in Memory**, a screen similar to the one shown below appears. The two lines below the command line will indicate the number of standard configurations that will fit in the memory available on your server. Table 4-1 shows the standard configuration for the PC server. Table 4-2 shows the standard configurations for the 3Server.

```
Instruct Forward Backward Choose Quit
Configurations that Fit in Memory
There are 10 such configurations.

Configuration #1. Configuration 1 of 10

Memory Required: 577K
Services: CIOSYS, 5 User Share

SERVICES: File and Print for up to 5 users. Very high-performance
configuration.
CONCURRENT USER: None
UNLIMITED USER VERSION: Mark N User Share for installation on the
Install/De-Install submenu. Adjust the number of users, links and
shares using the Configure Parameters submenu.
```

The command line displayed at the top of the screen lists the commands available:

**Instruct**            A "Command Help" window displays instructions on how to use the commands provided on this screen.

**Forward /  
Backward**            These commands (or the Up/Down cursor keys) allow you to scroll forward or backward through the configuration selections provided.

**Choose**              When you find a standard configuration that includes the services you want and fits in the memory available on your server, use this command to select and install the configuration displayed.

**Quit**                  Quits this screen. No installation is performed. You are returned to the 3INSTALL main menu.

## Standard PC Server Configurations

Table 4-1 shows the services installed for each PC server standard configuration. Configurations 6 - 13 are for a PC with 3+TurboShare. These configurations require a board compatible with the Lotus-Intel-Microsoft Expanded Memory Specification (EMS). The accompanying expanded memory (EMM) driver should be installed, and the CONFIG.SYS file edited to include the drivers. The EMS memory assumed is 2 megabytes.

All standard configurations that include 3+Share and/or 3+Mail are for five users. If more than five users need to access the server, you must purchase two copies of the service. One copy will be marked "5 User" and one "N User" during installation. The N in N user indicates that you can specify any number of users once you have installed the second copy of the service. The 3INSTALL program will prompt you to insert each of these two diskettes, in turn, during installation.

When you decide on the configuration from Table 4-1 that you want to install, press **C** to begin the installation procedure for the chosen configuration, or move the cursor to **Choose** and press **[Enter]**. Follow the prompts that appear on the screen to complete installation, accepting the preset parameter values of the standard configuration.

**Table 4-1. Standard PC Server Configurations**

Service	Configurations												
	1	2	3	4	5	6	7	8	9	10	11	12	13
5-User Share	X	X	X	X	X	X	X	X	X	X	X	X	X
Name		X	X	X	X			X	X	X	X	X	X
5-User Mail				X						X	X		
Route					X							X	
Remote													
NetConnect													
Start											X		
TurboShare						X	X	X	X	X	X	X	X
(Concurrent User)			X				X	X	X				X



**NOTE:** If you install a standard configuration and intend to add one more service that you will install individually, accept the preset parameter values. Proceed with the individual installation, then adjust the parameter for number of users (see Figure 4-2).

## Standard 3Server Configurations

Table 4-2 shows the services installed for each 3Server standard configuration. Your 3Server can be one of the following:

- ▶ 3Server with 384 KB memory expansion board
- ▶ 3Server3
- ▶ 3Server3 with CacheCard



**NOTE:** You must install an N User version of 3+Mail if more than five users need to access the Mail service. This requires that you purchase two copies of 3+Mail. 3INSTALL will prompt you to insert each of these two copies during installation.

Configuration 1 will only fit on a 3Server3. Configurations 2 - 10 will fit on a 3Server or 3Server3. If you are installing on a 3Server3, or a 3Server3 with a CacheCard, make sure that you assign the remaining memory to CIOSYS buffers. Refer to Figure 4-6.

When you decide on the configuration from Table 4-2 that you want to install, press **C** to begin the installation procedure for the chosen configuration, or move the cursor to **Choose** and press **[Enter]**. Follow the prompts that appear on the screen to complete installation, then accept the optimized parameters that have been preset for the standard configuration.

**Table 4-2. Standard 3Server Configurations**

Service	Configurations									
	1	2	3	4	5	6	7	8	9	10
Share	X	X	X	X	X	X	X	X	X	X
Name	X	X		X		X	X	X	X	
5-User Mail									X	
N-User Mail	X				X	X	X			X
Route	X						X			
Remote										X
NetConnect								X		
Start	X									
Backup	X		X	X	X				X	



**NOTE:** If you install a standard configuration and intend to add one more service that you will install individually, accept the preset parameter values. Proceed with the individual installation, then adjust the parameter for number of users (see Figure 4-2).



3. Repeat steps 1 and 2 for each service that you are installing or deinstalling. Then select the **Execute** command.

**Instruct** Provides a "Command Help" window that displays instructions on how to use the commands provided on this screen.

**Install** Marks a service to be installed on your server when you press the **Execute** command. During installation you will be asked to insert the appropriate distribution diskettes.



**CAUTION:** If you are installing N User Share or a Mail service after having installed a 5 User version of the same service, you will be asked twice to insert your service diskette. Make sure you insert first the diskette you marked as 5 User. After installation, adjust the number of users. See Figure 4-2.

**Deinstall** Marks a service to be removed from your server when you select the **Execute** command. This action will return your service diskette to its original unregistered state, allowing you to install the service on another server. If you are deinstalling an N User version of a service, when prompted, insert the diskette that you marked as N User.



**NOTE:** When you deinstall a service from a server, you may want to tune the parameters of the services that remain on the server. Refer to Chapter 5 for guidelines on tuning for optimum server performance.

If you have data files associated with a service that you want to deinstall, refer to deinstallation instructions in the *3+ Administrator's Guide*.

**Upgrade**

Marks a service to be upgraded from version 1.0 to version 1.1 when you select the **Execute** command. Before using this command to upgrade your service, refer to the Upgrade Instructions that you received with your version 1.1 Upgrade software.

**Migrate**

Marks a service so that it will be installed when you press the Execute command. You may use this command to convert your EtherSeries services to 3+ version 1.1 services. You must have your EtherSeries diskettes available to perform the migration. Before using this command to migrate to 3+ software, refer to the 3+Path documentation.

- Execute** Carries out all of the actions that have been marked. If your choices fit a standard configuration, it will be used to set your service parameters. The 3INSTALL program then gives you the option of accepting the pre-set parameter values or setting your own values.
- Quit** Quits this menu. No installation is performed. This returns you to the 3INSTALL main menu.

## Non-Standard Configurations

A message will display if your Install/Deinstall choices result in a configuration that does not match any of the standard configurations in the 3INSTALL program's library.

If you want to proceed with installation, press **Y** in response to the prompt that asks if you want to install it. Upon completion of the installation, you may need to configure parameters. Refer to Chapter 5 for information on configuring or fine tuning parameters.

## Required Parameter Configurations

After installing services, you will need to configure, or adjust, the parameters for certain services, in the situations listed on the following page. This section provides charts that guide you through different levels of the 3INSTALL program to the specific menu that allows you to adjust the parameter(s). Each chart directs you to specific pages in Chapter 5. Read the information in these pages before making any change.

Refer to the charts for the following parameter configurations:

- ▶ Fill in the network number and/or change the time zone parameter values that have been preset to Pacific Standard Time; these are Name service parameters (see Figure 4-1).
- ▶ Adjust for **Number of users** after installing N User Share on a PC server (see Figure 4-2).
- ▶ Configure network printers after installing 3+Share (see Figure 4-3).
- ▶ Configure network communication ports after installing 3+Route or 3+Remote (see Figure 4-4); for 3+Route, also configure network routes (see Figure 4-5).
- ▶ Reduce CIO SYS buffers if you installed services individually and if the 3INSTALL main menu displays memory usage as OVER USED (see Figure 4-6).

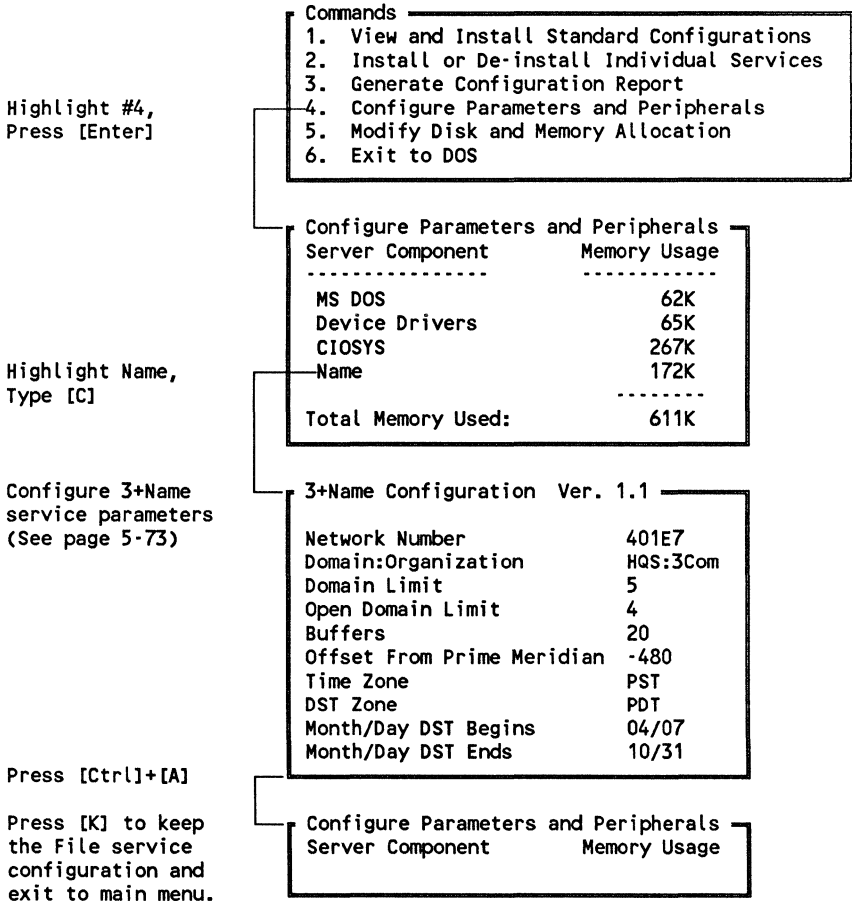


Figure 4-1. How to Adjust 3+Name Service Parameters

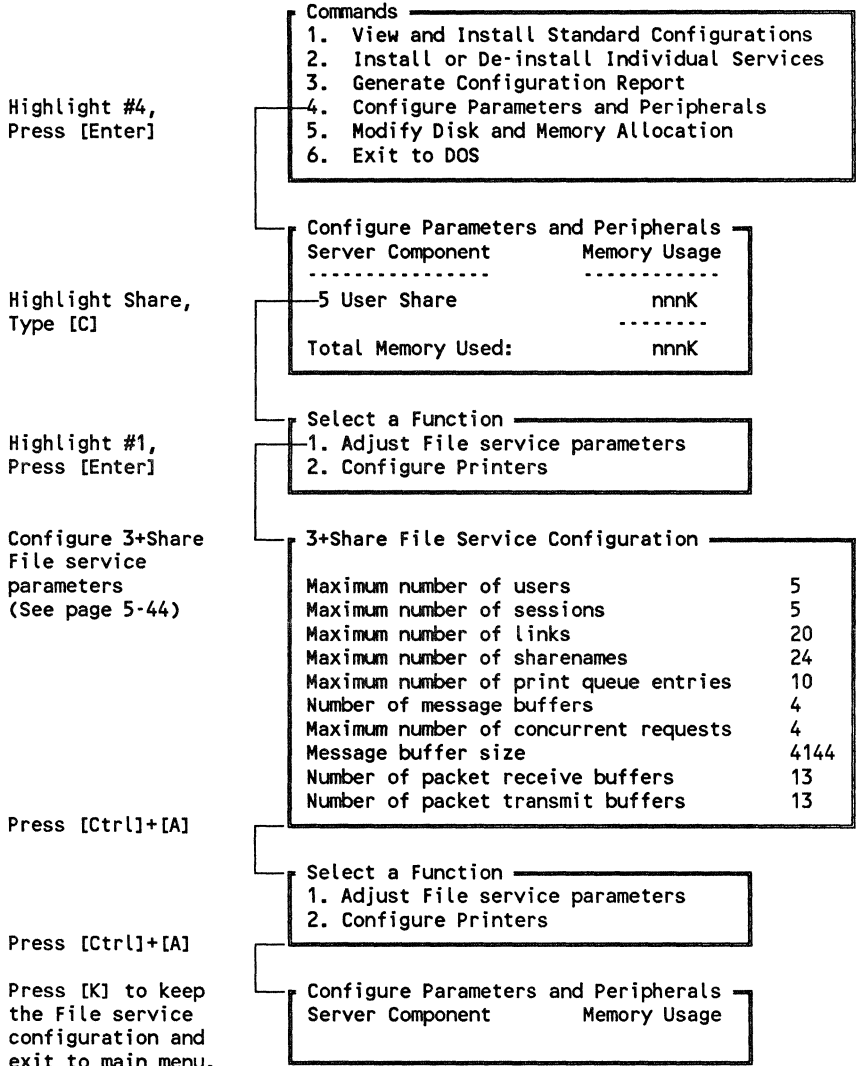


Figure 4-2. How to Adjust 3+Share File Service Parameters

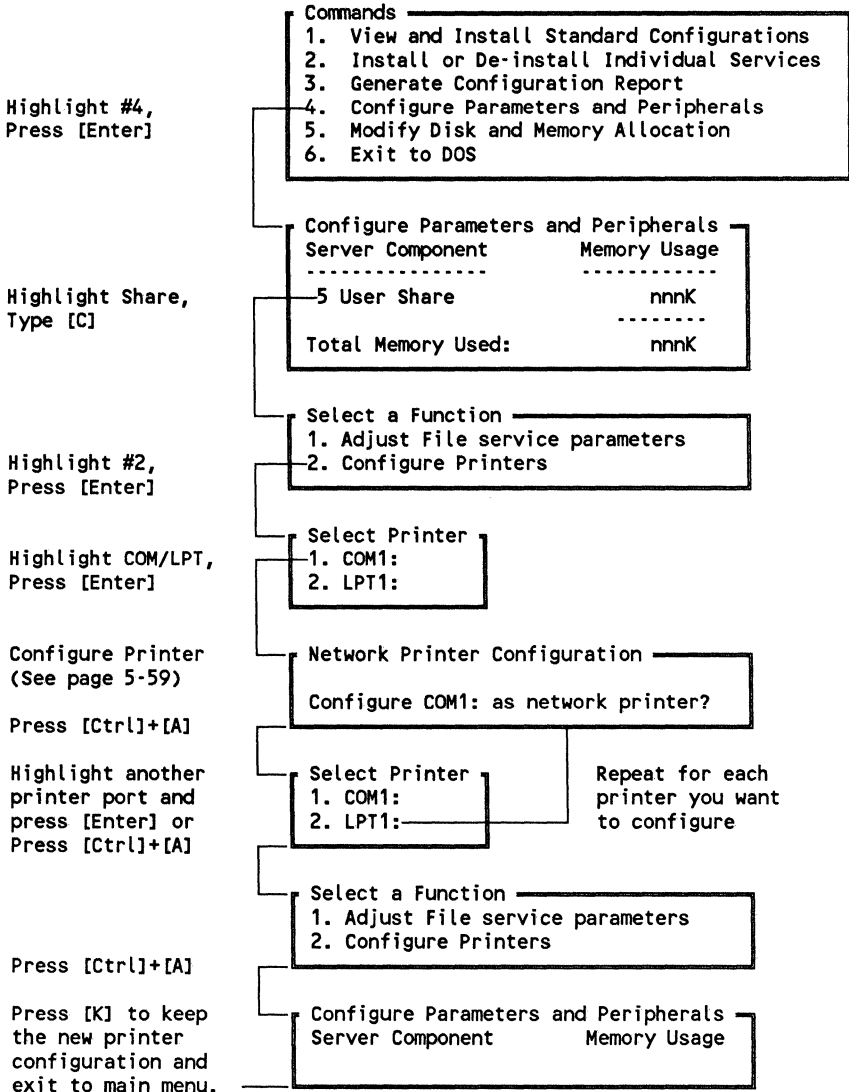


Figure 4-3. How to Configure Network Printers

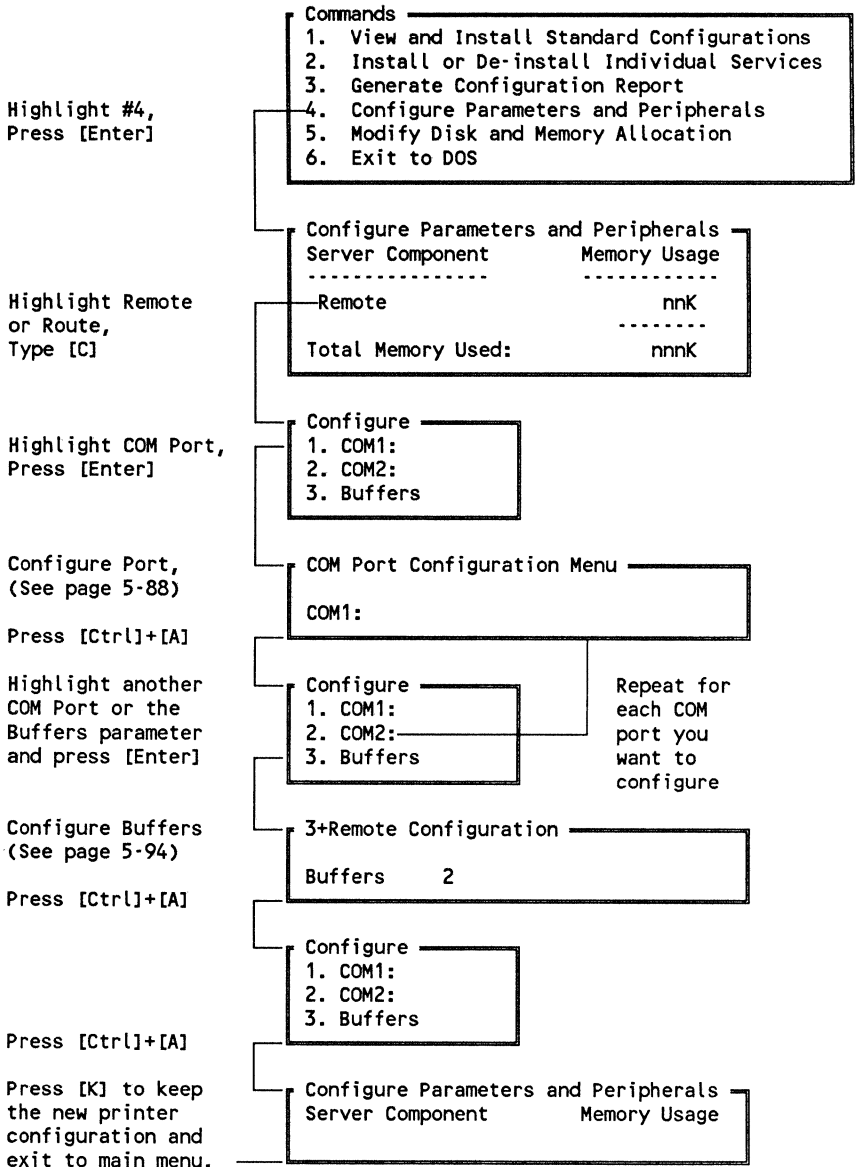
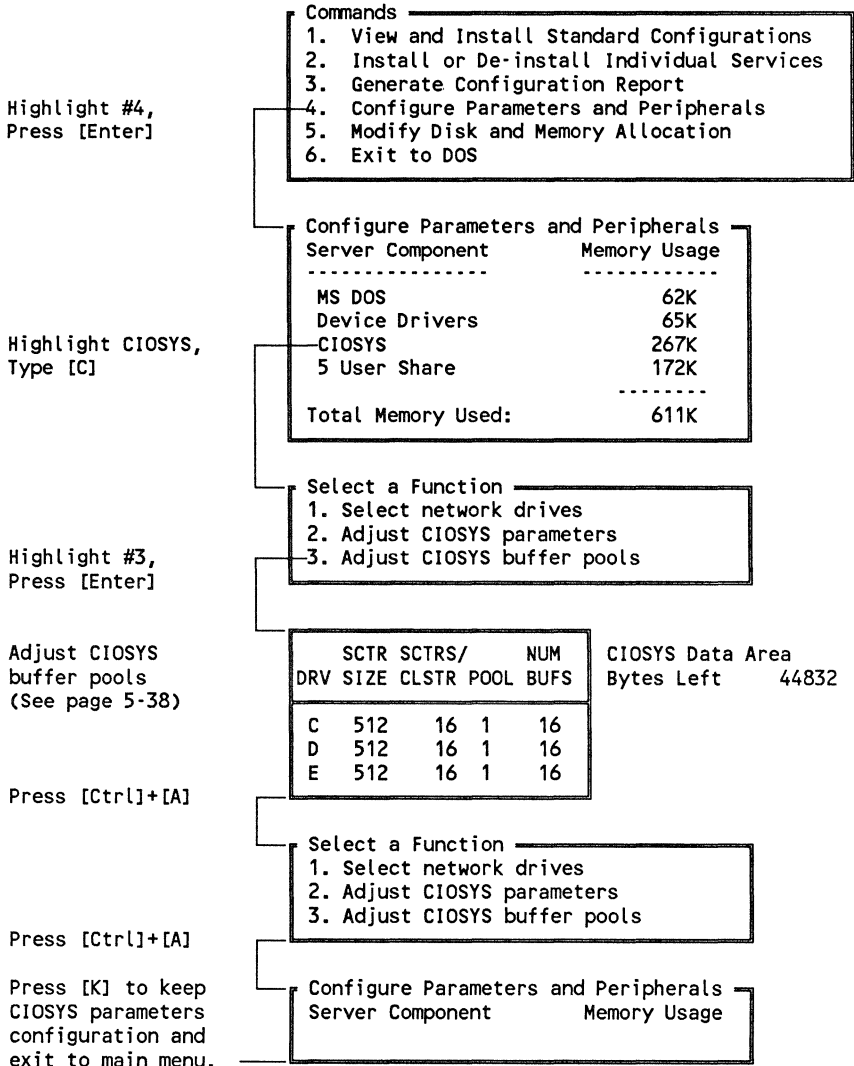


Figure 4-4. How to Configure Network COM Ports





**Figure 4-6. How to Adjust CIOSSYS Buffer Pools**

## Configuring for Optimal Performance

If you have installed a non-standard configuration of 3+ software, refer to Chapter 5 for information on configuring service parameters for optimal performance.

## Using 3+ Software

After installing 3+ software and completing the necessary configuration steps, reboot the server. The 3+ services will then be available for use. Consult the *3+ Administrator's Guide* for information on setting up the network services and managing the network.

When you reboot a PC server, the following screen will appear:

1. Start up in Concurrent Server Mode
2. Start up in Dedicated Server Mode
3. Start as a Workstation
4. Exit to DOS
5. Run the 3INSTALL program

Press the number that corresponds to your requirements.

Before you reboot a 3Server, you may want to connect a personal computer directly to the server. This will enable you to view the on-line messages that appear during the startup process. Refer to the "Attaching a Local Console" section of Appendix F for more information.

## Part II: Configuration

Selecting one of the standard configurations listed in Chapter 4 automatically sets most server parameters to standard default values. The default values should provide excellent server performance for most installations. However, certain server parameters *cannot* be preset and must be supplied after a particular service has been installed, such as printer and modem configurations. The charts at the end of Chapter 4 show the sequences required for the operations you will most often need to perform.

This part of the *Installation and Configuration Guide* includes information needed to configure the peripherals and tune various parameters used by network services. Much of the information included in this part is of a technical nature; however, we have tried to make it as easy to understand as possible. This does not mean you should attempt to tune server parameters as a routine matter.

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## Chapter 5: Optimizing Network Performance

The procedures in Chapter 4 explained how to use the 3INSTALL program to install services on the network. This chapter explains how to use 3INSTALL to set, or reset, various network parameters and configure peripherals. In addition, this chapter explains how to install services and optimize network performance for specific types of applications and data transfers.

Selecting one of the standard configurations listed in Chapter 4 automatically sets most server parameters to standard default values. However, certain server parameters *cannot* be preset and must be supplied after a particular service has been installed, such as printer and modem configurations.

Apart from the normal installation, some preset parameter values may need to be changed. The reasons for changing network parameters are:

- ▶ Increase/decrease the number of users.
- ▶ Add/delete services or network resources.
- ▶ Reallocate memory to improve performance.
- ▶ Change server capacities to improve performance.

## Overview

This chapter describes screens and parameters displayed as a result of installing various services or selecting Commands 3, 4, or 5 from the 3INSTALL main menu (Commands 1 and 2 from the on-line version; see page 5-10). Also, what you must consider when making required selections is explained so you can install or tune the network to meet your specific needs.

## Before You Begin

You should have successfully completed all the necessary procedures described in previous chapters *before* performing the procedures described here. In addition, you should know that parameters set on one screen may affect parameter settings on other screens. This chapter explains how these interactions can affect server performance.

The relationship of one server parameter to another is usually straightforward, but you must perform the operations required in order to keep these relationships in balance. For example, if you increase the number of users on a server, several other parameters must also be changed to allow the server to perform properly. These relationships are explicitly described in the sections on each service and in the individual server parameter descriptions.

The information contained in the parameter descriptions should be consulted *before* entering or changing any of the parameter settings in a particular section; otherwise, you may seriously impair or halt the operation of your server. To emphasize this point, a message to this effect is included at the beginning of each section.

## Parameter Types

The 3INSTALL program is designed to assist you to install the services you select. The parameters you must set for the different network services can be divided into three categories:

### 1. **Optional Parameters**

Parameters for optional capabilities that depend on your network's hardware/software configurations, such as printer and communications port configurations. The charts included in Chapter 4 show how to access these optional parameters without going through the entire tuning process.

### 2. **Capacity Parameters**

Parameters that affect server capacities. These set the size of the data tables used to store server operational data. Average values (defaults) are assigned for these parameters in the standard configurations; however, they may need to be changed if the number of users or type of applications varies from those anticipated by the default values.

### 3. **Performance/Memory Parameters**

Parameters automatically assigned optimal values for each of the standard configurations. Revising them is usually not advisable unless it becomes necessary to tune the network or an individual server for a specific application. Buffer sizes or the number of buffers may need to be changed to allow certain non-standard configurations to fit in available memory; usually a performance tradeoff is involved.

Table 5-11 (page 5-111) lists all 3INSTALL parameters for all 3+ services, their acceptable ranges, the amount of memory required by each increment (where applicable), and the guidelines for setting each parameter.

## **Tuning Guidelines**

The following are guidelines for tuning network and server parameters to obtain optimal performance. When it is necessary to adjust network or server parameters, they should be adjusted in the following sequence:

1. Determine the type(s) and amount(s) of hardware, services, and users that comprise the network.
2. Determine the type and volume of data that the network is expected to carry.
3. Distribute and install services among the servers on the network.
4. Adjust individual server parameters and memory allocations based on the number of users and the expected usage.
5. Adjust individual workstation parameters based on the number of sessions, links, and buffer sizes required.

Servers with fast disk access and high performance CPU's will always provide the best network performance. Performance can also be enhanced by distributing services and applications among servers; thus, each server can be optimally tuned to perform specific activities.

Tuning an individual server to accommodate different activities often involves compromises among divergent requirements, usually without achieving optimal performance for any application.

Sometimes the easiest way to optimize network performance is just to move services (e.g., Mail, Name) or network resources (e.g., printers, modems) to a server that has less workload.

## **Determine Network Composition**

All the network hardware should already have been selected and installed by the time you get to this point. If you selected a standard configuration of 3+ services, these services should also have been installed on the appropriate network server.

Before you begin tuning server parameters, you must know what kinds and types of servers and workstations are on the network, what services are installed, where they are installed, and their present configurations and parameter settings.

The Configuration Report described in the next section, "Generate Configuration Report", provides this information for each server. We recommended you have this information at hand for *all* servers on the network before you begin the tuning process.

Tuning the parameters on individual servers and workstations to optimize overall network performance requires that you first determine:

- ▶ The data transfer requirements of the various applications running on the network.
- ▶ The number of users to be accommodated by each server.
- ▶ The amount of memory available on the server and the workstations.

## Determine Input/Output Load

Before tuning a server, you must first determine its input/output load. Find out what kinds of applications are being run on the server and the types and volumes of data transfers required. Refer to the documentation that accompanied the applications software.

Optimal server performance requires that parameters be set to the values that best accommodate the data transfer rates, the file sizes, and the type of data handling (random or sequential) required by the applications that run on the server. Server workload can be characterized in three general categories:

1. **High density**

Frequent transfers of small amounts of random data in files, such as the I/O involved in many **database** applications. In this case server performance benefits from many smaller sized message buffers and many packet transmit/receive buffers. A server dedicated to this one type of activity can be tuned for optimal performance.

2. **Medium density**

Data transfer rates and file sizes may vary considerably. Random and sequential I/O are equally probable. Good server performance requires standard numbers and sizes of message and packet buffers. The standard server configurations are set to these values. Further tuning of server parameters depends on the type of applications being run on the server.

3. **Low density**

Frequent transfers of large sequential files, such as the I/O involved in **word processing** or **programming**. Server performance benefits from fewer, but larger sized message buffers and numerous packet buffers. A server dedicated to this type of activity can be tuned for optimal performance.

## Adjust for Number of Users

If the network services and resources are well distributed, and you know each server's data transfer requirements, you should then adjust the parameters on each server for the appropriate number of users.

Parameters that depend on the number of users, and the server components involved, are as follows:

- ▶ **CIOSYS/TurboShare** (page 5-25)
  - Byte range locks
  - File descriptors
  - File handles
  - File sharing processes
  
- ▶ **3+Share** (page 5-44)
  - Maximum number of sessions
  - Maximum number of links
  - Maximum number of sharenames
  - Maximum number of print queue entries
  - Number of message buffers
  - Number of packet receive buffers
  - Number of packet transmit buffers
  
- ▶ **3+Mail** (page 5-83)
  - Maximum number of mail server processes
  
- ▶ **3+Start** (page 5-104)
  - Maximum number of volumes
  - Maximum number of users

## Adjust Memory Allocations

After the servers are adjusted for the number of users, adjust the memory allocations for individual services. Almost all parameters require some storage space (see the table at the beginning of each section); however, the memory consumers are the buffers used in the different services, especially CIOSYS cache buffers. You can adjust these memory allocations by tuning parameters that affect memory usage in the following services:

- ▶ **CIOSYS** (page 5-25)
  - Cache buffer size
  - Number of cache buffers
  
- ▶ **3+Share** (page 5-44)
  - Message buffer size
  - Number of message buffers
  - Number of packet receive buffers
  - Number of packet transmit buffers
  - Print buffer size
  
- ▶ **3+Name** (page 5-73)
  - Buffers
  
- ▶ **3+Mail** (page 5-83)
  - Maximum number of mail server processes
  
- ▶ **3+Start** (page 5-104)
  - Number of receive buffers

## **CIOSYS Cache Buffers**

After the required buffers have been allocated, any remaining memory can be allocated to CIOSYS buffers, a concurrent user (on PC servers only), or left unused.

CIOSYS is the file data manager for 3+Share. It uses buffers to store (or "cache") data it reads from or writes to disk. When CIOSYS receives a request from an application to read data from a disk, it can read more data than requested and store it in the cache buffers. When this data is needed, it can be read from a CIOSYS cache buffer faster than from disk. When CIOSYS is required to write data back to disk, it also stores it in the cache buffers and performs write operations in a similar manner. The more cache buffers available for CIOSYS, the fewer disk accesses are required and the faster the server will operate.

## **Expanded Memory Usage**

If a PC server is equipped with a memory board compatible with the Lotus-Intel-Microsoft Expanded Memory Specification (EMS), you must install and configure 3+TurboShare in order to use the expanded memory for CIOSYS cache buffers.

3+TurboShare does not permit EMS memory on a PC server to be divided between a concurrent user application and CIOSYS cache buffers. The 3INSTALL program does allow you to switch EMS usage from CIOSYS cache buffers to a concurrent user application. If the EMS memory is used for applications, main memory must be used for CIOSYS cache buffers.

Without 3+TurboShare, EMS memory in a PC server can be used only for concurrent user applications, and main memory must be used for the CIOSYS cache buffers.

The 3Com CacheCard option that may be installed in a 3Server3 is dedicated exclusively to CIOSYS cache buffers.

## How to Begin

There are two ways to enter the configuration portion of the 3INSTALL program.

- ▶ If you are performing the initial installation of services on a new server, and the 3INSTALL main menu is displayed as shown below, you may begin the tuning process.
- ▶ If you need to tune server parameters on-line, you can start 3INSTALL by making the C:\3PLUS\3CONFIG directory a shared directory, linking to it, setting it as your default directory, typing 3INSTALL, and pressing **[Enter]**. (Refer to the *3+ Administrators Guide* for instructions.)

The menu displayed is slightly different than the one shown below. The **Commands** section displays only selections 3, 4, and 6 (which are renumbered 1, 2, and 3).

3Plus Server Installation and Configuration. Ver. 1.1

### Current Server Configuration

Server Name: "Server1:HQS:3Com"  
Server Type: PC Server (8086 processor)  
640K bytes of Memory  
20M bytes of Disk Space  
1 Serial Port  
1 Parallel Port

### Services Installed

CIOSYS  
5 User SHARE  
5 User MAIL  
Name  
Remote

### Commands

1. View and Install Standard Configurations
2. Install or De-install Individual Services
3. Generate Configuration Report
4. Configure Parameters and Peripherals
5. Modify Disk and Memory Allocation
6. Exit to DOS

## Main Menu Choices

The 3INSTALL main menu presents six selections. Procedures for viewing and installing standard configurations and installing or deinstalling individual services are explained in Chapter 4. Procedures for generating Configuration Reports, configuring parameters and peripherals, and modifying disk and memory allocations are explained in this chapter. Command selections 3, 4, and 5, described briefly below, are described in more detail starting at the page numbers shown.

3. **Generate Configuration Report** (page 5-12)  
This selection writes a profile of the currently installed server configuration to a disk file. This report, which can also provide a hard copy record of the server configuration, is useful for tuning or troubleshooting the network.
4. **Configure Parameters and Peripherals** (page 5-15)  
This selection displays a list of the components installed on this server. When a component is selected for change, its parameters are presented. These parameters can be changed to set server capacities, optimize server performance, or to configure attached peripherals, such as printers or modems.
5. **Modify Disk and Memory Allocation** (page 5-108)  
This selection displays a screen showing disk assignment and memory allocation parameters. These parameters can also be changed to optimize server and network performance.

You can select a Command from the 3INSTALL main menu three different ways:

- ▶ Highlight the Command selection using the Up/Down cursor keys and press **[Enter]**.
- ▶ Type the number of the desired Command selection.
- ▶ Type the highlighted first letter of the desired Command selection.

## Generate Configuration Report

Command selection 3 displays a message that tells you the *filename* of the file where the program will write information about this server's configuration. The message also lists the individual sections that are included in the Configuration Report. The Configuration Report reflects the services previously installed on the server.

```
Your Configuration Report will be located in C:\3PLUS\3CONFIG\CONFDUMP.001

Generating report for:
  CONFIG.SYS
  CIOSYS
  5 User Share
  Name

Report completed.
```



**CAUTION:** It is imperative that a Configuration Report be generated *before* attempting to change the current server configuration. This information is essential if it becomes necessary to restore the current server configuration. This report should be a required permanent system record.

You can view Configuration Reports on-line using the DOS command "**TYPE filename | MORE**", where *filename* is the name of the file in the message (C:\3PLUS\3CONFIG\CONFDUMP.001). The "**| MORE**" option presents one screen at a time. To print a hard copy of the Configuration Report, refer to the File and Print service setup procedures in the 3+ *Administrators Guide*.

## Configuration Report Format

The Configuration Report consists of a header followed by a number of individual sections. The first section shows the three-part name assigned to this server and the date and time the report was generated. The second section describes the server hardware. The third and fourth sections show memory used by CONFIG.SYS drivers and CIOSYS. Additional sections describe parameters associated with the other software components installed on the server.

The following paragraphs describe examples of the header and hardware sections.

## Configuration Report Header

The Configuration Report header shows the three-part name assigned to this server (Name:Domain:Organization), and the date and time the report was generated. The header will appear similar to the following:

```
*****  
***** Server Profile Report *****  
*****  
***** Name: AcctgServer *****  
***** Domain: HQ *****  
***** Organization: 3Com *****  
***** Date: 2/26/87 Time: 11:32:20 *****  
*****  
*****
```

## Hardware Configuration Section

The first section of the server Configuration Report is devoted to **Hardware Configuration**. This section shows the server type, the amount of physical memory available, the size of the hard disk(s), the number and type of I/O ports, and whether the server has a tape drive. This section will appear similar to the following:

```
*****  
O  
O  
O  
O  
O  
O  
O  
O  
O  
O  
O  
*****  
                                HARDWARE Configuration Report:  
Server Type:      PC Server (80286 processor)  
Physical Memory: 640K bytes  
Expanded Memory: 0K bytes  
Hard Disk Size:  28M bytes  
Serial Ports:    1  
Parallel Ports:  1  
*****
```

Examples of the Configuration Report sections describing individual network parameter settings are included at the beginning of each section.

## Configure Parameters and Peripherals

Command selection 4 on the 3+INSTALL main menu displays the **Configure Parameters and Peripherals** screen. This screen shows the approximate amount of memory used by server components presently installed on your server. The screen appears similar to the following:

Instruct	Change	Reset	Keep	Quit
Configure Parameters and Peripherals				
Server Component		Memory Usage		
-----		-----		
MS DOS				62K
Device Drivers				65K
CIOSYS				252K
5 User Share				172K
Route				45K
-----		-----		
Total Memory Used:		596K		

Usage Summary	
Available Memory:	632K
Dos/Drivers Used:	127K
Services Used:	469K
Concurrent User:	0K
-----	
Extra:	36K

To configure or reconfigure the parameters and/or peripherals for a specific server component, first highlight the component using the Up/Down cursor keys. Then highlight the desired command (Change, Reset, Keep, or Quit) using the Left/Right cursor keys. Press [Enter] to execute the command.

You can also accomplish the same function by highlighting the server component and entering the first letter of the command. The function performed by each command is explained on the next page.

At least 30 KB of extra memory should be left after all services are installed and all memory allocations are made. After the server is booted, access the above screen (see page 5-10) and verify that at least 30 KB of memory still remains unused.

## Configuration Commands

The commands shown on the first line of the **Configure Parameters and Peripherals** screen perform the following functions:

- |                 |   |
|-----------------|---|
| <b>Instruct</b> | Displays instructions for using this menu in a "Command Help" block at the bottom of the screen. The text in this block describes the function of each command. Use the Left/Right cursor keys to highlight the commands on the top row.  |
| <b>Change</b>   | Allows configuration parameters of the highlighted server component to be displayed and changed. Use the Up/Down cursor keys to highlight the service whose parameters you want to display or change.   |
| <b>Reset</b>    | Resets configuration parameters of the highlighted component to their original, or last "Kept" state. Some modifications, such as port configurations, <i>cannot</i> be reset with this command. Use the <b>Quit</b> command to undo <i>all</i> modifications made since the start of this reconfiguration session. |
| <b>Keep</b>     | Stores newly assigned parameter values in system files. When you are satisfied with all parameter settings and assignments, this command saves all changes in the appropriate data files. This command terminates the reconfiguration session and returns you to the 3INSTALL main menu.                            |
| <b>Quit</b>     | Terminates this tuning session and returns you to the 3INSTALL main menu. This command allows you to undo all changes you have made since beginning this tuning session. All parameter values are returned to their original state.   |

## Changing Parameters

The **Change** command displays a screen (or series of screens) for each server component. The information shown on these screens and the changes you make to them are written to a temporary "profile" for that component.

When a parameter value is changed and the cursor is moved to the next parameter, a "memory used" counter in the upper right-hand corner of most screens will immediately show the memory impact of the change.

After all parameters for a server component are set, press **[Ctrl] + [A]** to accept the changes. Press **[Ctrl] + [A]** at each screen until you are returned to the **Configure Parameters and Peripherals** screen. Otherwise, the temporary profile, including any changes that you made, is discarded.



**CAUTION:** Pressing **[Esc]** at *any* point in the configuration of a server component will cancel *all* changes. All values revert to the last set that were "accepted" or "kept" for the server component.

**[Ctrl] + [A]** returns you to the **Configure Parameters and Peripherals** screen, where the memory usage value for the changed component and the overall memory usage are updated to reflect the memory impact of the parameter settings in the temporary profile.

If the result is not acceptable (i.e., the changes require more system memory than is available), you can repeat the **Change** process and update the server's temporary profile as often as necessary.

## Retaining Parameter Changes

Only temporary profiles that were "accepted" using [Ctrl] + [A] as described above can be written to the permanent data files. Changes are written from the temporary profile to the permanent data files only when you execute the **Keep** command.

You cannot **Keep** a configuration that does not fit in the available system memory. You must revise the server parameters until the configuration fits in the available system memory.

After you execute the **Keep** command, most of the 3+ services require that you exit the 3INSTALL program and reboot the server in order to use the new parameter values. 3+Route is an exception; it checks its own parameter settings every few minutes and will use whatever values it finds there.

The only alternative to keeping the temporary profiles is using the **Quit** command. The **Quit** command discards *all* temporary profiles and effectively cancels *all* changes that have been made to all the server components during this reconfiguration session. All the parameter values revert to the last set of values that were **Kept**.

## Server Components

You may now proceed to the section describing the server component you have selected:

---

<b>Component</b>	<b>Page</b>
DOS	5-20
Device Drivers	5-23
CIOSYS/TurboShare	5-25
3+Share (File)	5-44
3+Share (Print)	5-59
3+Name	5-73
3+Mail	5-83
3+Remote	5-88
3+Route	5-95
3+Start	5-104

---

3+Backup has no parameters that can be tuned.

## DOS

The **Device Driver & DOS** section of your Configuration Report should appear similar to the following. The 3INSTALL program calculates the total amount of memory used by the installed device drivers and DOS. This memory usage depends, in part, on the settings of certain device driver parameters and other DOS parameters. The parameters displayed in this section of the report and their effect on network operation is described in the following section.

```
*****
Device Driver & DOS Configuration Report:
      (from C:\CONFIG.SYS)

Memory Used: 146320 (144K)

ansi.sys                1584 bytes
eth.sys                 5328 bytes
pro.sys 32 2 2          5120 bytes
buf.sys                5024 bytes
idp.sys                5120 bytes
spp.sys               23504 bytes
lgl.sys                5952 bytes
acp.sys               32016 bytes

BUFFERS = 6             3504 bytes
FILES = 20              1072 bytes
LAST DRIVE = g          560 bytes
FCBS = 4,x              224 bytes
SHELL = \COMMAND.COM   23216 bytes

*****
```

## DOS Configuration

Highlight the **DOS** server component on the **Configure Parameters and Peripherals** screen and execute the **Change** command to display a screen similar to the following:

```
Estimated DOS Memory Usage

C:\IBMBIO.COM                4832 bytes
C:\IBMDOS.COM                27504 bytes
-----
Basic DOS Memory Usage:    32336 bytes
--- Parameters are not Adjustable ---

  Buffers/Tables from C:\CONFIG.SYS Parameters:
Misc. Storage:              1760 bytes
BUFFERS = 6                 3504 bytes
FILES = 20                  1072 bytes
LAST DRIVE = g              560 bytes
FCBS = 4,x                  224 bytes
-----
  Buffers/Tables Memory Usage: 7120 bytes

SHELL = \COMMAND.COM        23200 bytes
-----
Total Memory Usage:        62656 bytes

--- To adjust parameters, edit CONFIG.SYS ---
```

To change these entries in the CONFIG.SYS file, refer to Appendix D for detailed instructions.

## DOS Parameters

The amount of system memory used by the two "hidden" DOS files, IBMBIO.COM and IBMDOS.COM, is fixed and cannot be changed. The actual file names and sizes depend on whose version of DOS you have installed on your server.

Other parameters that can be considered part of the operating system environment for a concurrent user on a PC server are set up by the following DOS commands in the CONFIG.SYS file; DOS reads and executes these as part of system startup. The only significance of these parameters to the server is that they increase the size of the resident part of DOS. Refer to your DOS manual for more detailed information.

- |                   |   |
|-------------------|---|
| <b>BUFFERS</b>    | Determines the number of disk buffers used by DOS to temporarily hold data being written to, or read from a disk. Each additional buffer usually requires 512 bytes of memory; however, the disk buffer must be as large as the largest sector on the disk. |
| <b>FILES</b>      | Determines the maximum number of file handles that DOS will allow to be open at the same time. Each file requires 48 bytes of memory.   |
| <b>LAST DRIVE</b> | Determines the maximum number of disk drive designations that DOS may access. Range is A-Z. Each requires 80 bytes of memory.   |
| <b>FCBS</b>       | Determines the maximum number of file control blocks that DOS will allow to be open at the same time. Each requires 56 bytes of memory. Refer to your DOS manual for an explanation of the purpose and use of file control blocks.                          |

## Device Drivers

Highlight the **Device Drivers** server component on the **Configure Parameters and Peripherals** screen and execute the **Change** command to display a screen similar to the following:

```
Device Driver Memory Usage
(from C:\CONFIG.SYS)

ansi.sys                2736 bytes
eth.sys -b53 -h2        5328 bytes
pro.sys 32 2 2          5120 bytes
buf.sys                 5024 bytes
idp.sys                 5120 bytes
spp.sys                 23504 bytes
lgl.sys                 5952 bytes
com.sys                 6256 bytes
ripsr.sys               8128 bytes
-----
Total Memory Usage:    66240 bytes

--- To adjust parameters, edit CONFIG.SYS ---
```



**NOTE:** The amount of memory used by the network device drivers shown here is only approximate. For most drivers this number is fixed and cannot be changed. The device drivers shown in the CONFIG.SYS file depend on the services installed.

### 3+ Device Drivers

Although the amount of memory used by most network device drivers is fixed and cannot be changed, the CONFIG.SYS file should contain only those drivers required by the services installed on this server.

Table 5-1 shows the file size of all 3+ drivers and the amount of RAM each requires after initialization.

**Table 5-1. 3+ Device Driver Memory Requirements**

Driver Filename	Release Version	Driver * Filesize	Memory * Required	Parameter Settings
3COM_EMM	1.1	2327	2112	
3LCD	1.1	2773	2560	
3STRDRV	2.9	7292	6112	
ACP	2.9	32640	32048	
ACP3	2.9	35984	35392	
BUF	2.9	5584	5024	
COM	2.10	6724	6160	320
EPATH	2.9	14258	13136	
ETH	2.9	6290	5312	
ETH3	2.9	11912	92416	-b53 -h2
ETH505	2.9	11864	7344	
IDP	2.9	5887	5120	
LGL	2.9	4106	5952	
PRO	2.9	6103	5040	32 2 2 (server)
			4128	8 20 2 (client)
RIP	2.9	5808	5232	
RIPSR	2.9	8720	8128	
RPC	2.9	32624	32048	
SPP	2.9	24720	24144	
TOK1060	2.8	8588	6848	
TOK605	2.8	9212	7456	
TOKIBM	2.9	6992	6000	
TDRIVE	1.0	3766	3776	

\*Driver Filesize and Memory Required are approximate and may vary.

To change entries in the AUTOEXEC.BAT or CONFIG.SYS files, refer to Appendix D for detailed instructions.

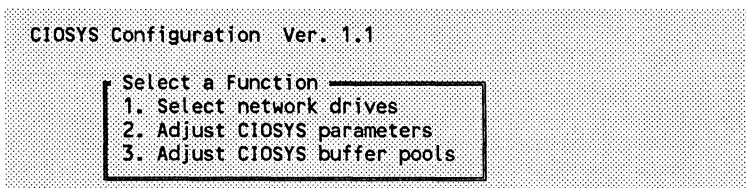
## CIOSYS/TurboShare

The CIOSYS/TurboShare section of your Configuration Report should appear similar to the following. The 3INSTALL program calculates the total amount of memory that CIOSYS uses. This memory usage depends on the parameter settings listed below. The parameters displayed on this section of the report and their effect on network operation are described in the following section.

```
*****
○ CIOSYS Configuration Report:
○ Memory Needed: 20704
○ Byte Range Locks:          32
○ File Descriptors:         95
○ File Handles:             60
○ Threads:                  4
○ File Sharing Processes:   20
○ I/O Request Blocks:       32
○ The following drive(s) share a buffer pool containing
  16 buffers: C:
○ The following drive(s) are part of the same physical
  disk drive: C:
*****
```

## CIOSYS/TurboShare Configuration

Highlight the **CIOSYS** or **CIOSYS TurboShare** server component on the **Configure Parameters and Peripherals** screen and execute the **Change** command to display a screen similar to the following:



**NOTE:** You should adjust the CIO SYS parameters *before* adjusting the CIO SYS buffer pools.

Use the Up/Down cursor keys to select the desired function, then press **[Enter]**.

You must press **[Ctrl] + [A]** to accept any adjustments that have been made and to return to the **Configure Parameters and Peripherals** screen.

To cancel adjustments, or to exit this screen without performing any of these functions, press **[Esc]**. The values will revert to their last "accepted" or "kept" configuration and you will be returned to the **Configure Parameters and Peripherals** screen.

The **CIOSYS Function Selection** screen presents three selections. Function selections 1, 2, and 3, described briefly below, are described in more detail starting at the page numbers shown:

1. **Select network drives** (page 5-28)  
This Function selection allows you to specify what server drives are to be accessible by the network services and the amount of memory to be reserved for a concurrent user.
2. **Adjust CIOSYS parameters** (page 5-31)  
This Function selection allows you to change any or all of the CIOSYS parameters listed in the Configuration Report.
3. **Adjust CIOSYS buffer pools** (page 5-38)  
This Function selection allows you to determine which network drives will share which CIOSYS buffer pools, and also the number of buffers in each pool.

## Select Network Drives

Highlight Function selection 1, **Select network drives**, on the **CIOSYS Configuration** screen and press **[Enter]** to display a screen similar to the following:

CIOSYS Configuration Program Ver. 1.1

DRIVE	NET/ LOCAL	PHYS DRIVE	DRIVE	NET/ LOCAL	PHYS DRIVE
A	L	**			
B	L	**			
C	N	1			
D	N	1			
E	N	1			
F	N	2			
G	N	2			
H	N	2			

EMS to be used by CIOSYS 1024  
Concurrent user memory 0

EMS available (in K) 2048

This screen allows you to specify what server drives are to be accessible by network services and the amount of memory to be reserved for a concurrent user.

Use the cursor keys to highlight the **NET/LOCAL** field next to the drive identifier you want to change. Type either an **N** or an **L** in this field. An **N** specifies that this disk drive should be used as a Network drive. An **L** specifies that this drive should be used as a Local (non-Network) drive. The drive that contains the 3+ software must be a network drive.

CIOSYS assumes that logical drives with the same number in the **PHYS DRIVE** field are, in fact, part of the same physical disk drive. CIOSYS uses this information to optimize movement of the disk drive's read/write heads. To change the physical drive assignments, use the cursor keys to highlight the logical drive you want to change and press the **[+]** (plus) key to give the drive a higher physical drive number (or create a new one if there are none higher). Pressing the **[-]** (minus) key will assign a logical drive an already existing lower physical drive number.

### **EMS Memory Used by CIOSYS/TurboShare**

The EMS option for a PC server consists of a memory board compatible with the Lotus-Intel-Microsoft Expanded Memory Specification (EMS), an EMM device driver, and 3+TurboShare software. To install the EMM device driver, consult the EMS board documentation.

If the EMS option is installed in this server, the EMS memory can be used by CIOSYS for cache buffers or by concurrent user applications, but not by both at the same time.

The first field in the upper right-hand corner of the **CIOSYS Configuration** screen (shown above) displays the amount of EMS memory allocated for CIOSYS cache buffers. If this field is set to any value other than zero (0), all EMS memory is reserved exclusively for use by CIOSYS cache buffers; however, only the amount displayed is actually used by CIOSYS. If this field is set to zero (0), all the EMS memory is available for concurrent user applications.

## Memory Allocated to a Concurrent User

The second field in the upper right-hand corner of the **CIOSYS Configuration** screen displays the amount of system memory, if any, allocated to a concurrent user. If this field is set to zero (0), no system memory is allocated for a concurrent user. A concurrent user can exist only on a PC server; therefore, this field will always be zero (0) for 3Servers.

In addition to system memory, EMS memory can also be used by concurrent user applications; however, the first field must be set to zero (0). If *any* EMS memory is allocated to CIOSYS, then *none* is available for concurrent user applications.

The third field in the upper right-hand corner of the **CIOSYS Configuration** screen shows the total amount of EMS memory available on the server. This field is not displayed if the EMS option is not installed.

Press **[Ctrl] + [A]** to accept the values displayed after you have made the desired adjustments. You will be returned to the **CIOSYS Function Selection** screen.

Press **[Esc]** to cancel all changes. The values revert to the last "accepted" or "kept" configuration and you are returned to the **Configure Parameters and Peripherals** screen.



**CAUTION:** Pressing **[Esc]** also causes all adjustments made to CIOSYS parameters *and* CIOSYS buffer pools to be cancelled. You may make and accept adjustments to each individually, but all are cancelled by **[Esc]**.

## Adjust CIOSYS Parameters

Highlight Function selection 2, **Adjust CIOSYS parameters**, on the **CIOSYS Configuration** screen and press [Enter] to display a screen similar to the following:

```
CIOSYS Configuration Ver. 1.1
CIOSYS Data Area Bytes Used 20704   CIOSYS Data Area Bytes Left 44832
Byte Range Locks           32
File Descriptors            95
File Handles                60
Threads                     4
File Sharing Processes      20
I/O Request Blocks         32

The "CIOSYS Data Area Bytes Used" number must not be larger than 65536.
```

Use the Up/Down cursor keys to position the cursor at each parameter you want to change, then type in the appropriate number(s). The next section provides detailed explanations and recommendations for setting these parameters.

Press [Ctrl] + [A] to accept the values displayed after you have made the desired adjustments. You will be returned to the **CIOSYS Function Selection** screen.

Press [Esc] to cancel any changes made. The values will revert to the last "accepted" or "kept" configuration. You will be returned to the **Configure Parameters and Peripherals** screen.



**CAUTION:** Pressing [Esc] also causes all adjustments made to network drives *and* CIOSYS buffer pools to be cancelled. You may make and accept adjustments to each individually, but all are cancelled by [Esc].

## CIOSYS/TurboShare Parameters

Table 5-2 shows the range of values and the amount of memory required for each parameter on the **CIOSYS Configuration** screen. The letter in parentheses ( ) is the 3+ version 1.0 designation for the parameter.

**Table 5-2. CIOSYS/TurboShare Configuration Parameters**

Parameter	Range	Bytes
Byte Range Locks (L)	1 to 3000	16
File Descriptors (F)	35 to 1000	46
File Handles (C)	20 to 1500	28
Threads (T)	1 to 10	1074
File Sharing Processes (P)	20 to 300	10
I/O Request Blocks (D)	32 to 200	40



**CAUTION:** It is essential that you read *and understand* the explanations provided for every parameter that you change; otherwise, you may seriously impair or halt the operation of the server.

The following paragraphs describe each of the parameters listed on the **CIOSYS Configuration** screen, the considerations involved in selecting the appropriate values, and the effect of those selections on network performance and memory usage.

## **Byte Range Locks**

Range: 1 to 3000

A **byte range lock** is a record lock invoked by an INT 21 function 5C call from a workstation running a multi-user application software package against files on the server. These record locks are passed to the server for management.

This parameter specifies the maximum number of byte range locks that can be active (asserted) at one time on this server. Each byte range lock requires 16 additional bytes of memory.

The number of byte range locks should be approximately four times the number of active users. This number may need to be increased if an application uses several locks per workstation, or if there are many workstations trying to set byte range locks on this server. Certain types of applications (notably databases) can require many locks per workstation. Other applications, such as word processors or spreadsheets, use no locks at all.

When all locks are in use, applications requiring locks must wait for them to be released. If the maximum number of byte range locks available is too small, network users may report slow system response when running these applications.

## File Descriptors

Range: 35 to 1000

A **file descriptor** is a data structure required by CIOSYS that contains information concerning a file. One file descriptor is required for each open file and one for each subdirectory in the path to the open file. A file that is opened more than once, or a subdirectory in the path to that file, does not require any additional file descriptors.

This parameter specifies the maximum number of file descriptors that can be in use at one time on this server. Each file descriptor requires 46 additional bytes of memory.

The number of file descriptors should be approximately seven times the number of active users. This number may need to be increased if applications used on the network open several files per workstation, or if many workstations try to open files at the same time on this server. Certain applications can require many open files per workstation.

If the maximum number of file descriptors available is too small, network users may report file open errors or unsatisfactory system response when running these applications. Complicated directory structures can also increase the required number of file descriptors.

In addition, certain 3+ services require additional file descriptors to support system usage. If any of the 3+ services listed below are installed, add the numbers specified to the number of file descriptors required by the applications software:

- 3+Share: 2 + number of network printers  
          + number of users simultaneously  
          spooling data to the printer.
- 3+Name: 1 + number of open domains.
- 3+Mail: 20 + 4 times the number of mail server processes.

## File Handles

Range: 20 to 1500

A **file handle** is a data structure used by CIOSYS to keep track of which workstation opened a particular file. A unique file handle is required for each file currently opened by a user or by a service. When different users or services open the same file more than once, each opening requires a unique file handle. If the same user or service opens a file more than once, only one file handle is required.

This parameter specifies the maximum number of file handles that can be in use at one time on this server. Each file handle requires 28 additional bytes of memory.

The number of file handles should be approximately five times the number of active users. Certain applications, notably databases and accounting packages, may need to open many files at once, and may require that this number be increased. If the maximum number of file handles available is too small, network users may report file open errors or slow system response when running these applications.

The 3+ system also uses file handles, which must be considered when setting this parameter. In addition to the number of file handles determined by the guidelines previously described, add additional file handles as specified below if any of these services are installed:

- 3+Share: 1 + number of network printers  
          + number of users simultaneously  
          spooling data to the printer.
- 3+Name: number equal to the open domain limit.
- 3+Mail: 5 + the number of mail server processes.

## Threads

Range: 1 to 10

A **thread** is a CIOSYS data structure containing information on the state of a file system call that a process has asked to be executed. One thread is required for each concurrent CIOSYS operation.

This parameter specifies the maximum number of simultaneous I/O requests that can be serviced by CIOSYS. The default value is set based upon the type of server hardware: 1 for a PC or XT, 4 for an AT (or other 286-based machine), and 7 for a 3Server (or a 386-based machine). Each thread requires 1074 additional bytes of memory.

I/O requests may come from workstations via 3+Share, 3+Mail, 3+Name, or 3+Start server activity. Multiple file requests (up to the maximum number of I/O request blocks) may be placed on CIOSYS's I/O queue at the same time. These requests remain queued until a thread is available to process them.

The 3Server incorporates a multitasking process manager that allows the CPU to process other network requests while the disk drive read/write head is seeking the desired track. An IBM PC-AT (or compatible) allows similar multiprocessing through INT 15 support in the disk driver. An IBM PC-XT cannot perform multiprocessing because it has no INT 15 support. Changing the number of threads to anything other than 1 on a PC-XT server will have no effect and provides no benefit.

For an IBM PC-AT or a 3Server, increasing the number of threads increases the number of requests that can be handled at the same time. A larger value can improve server performance; however, increasing the number past 7 may actually degrade server performance.

## File Sharing Processes

Range: 20 to 300

A **file sharing process** is a logical connection between a workstation and a service, such as Mail or Name, or between a workstation and a device, such as a printer or a modem. Each file sharing process requires a unique CIOSYS data structure called a **file sharing process identifier** that contains information about the process.

This parameter specifies the maximum number of file sharing process identifiers that can exist on this server at one time. One process identifier is required for each user linked to the server (including printer links), plus one for each service installed on the server. You should also allow about ten extra process identifiers for other processes on the server. Each process identifier requires only 10 additional bytes of memory.

This number may need to be changed if the server must support a large number of 3+Share sessions. A server configured to support several shared printers and/or modems may also require more file sharing process identifiers.

## I/O Request Blocks

Range: 32 to 200

An **I/O request block** is a CIOSYS data structure used to manage the elevator queue for the server's disk drive(s). One I/O request block is required for each disk I/O request in the queue. Each thread can require several I/O request blocks.

This parameter specifies the maximum number of I/O request blocks that can exist on this server at one time. Each I/O request block requires 40 additional bytes of memory.

## CIOSYS/TurboShare Buffer Pools

Highlight Function selection 3, **Adjust CIOSYS buffer pools**, on the **CIOSYS Configuration** screen and press **[Enter]** to display a screen similar to the following:

CIOSYS Configuration Ver. 1.1

	SCTR	SCTRS/	NUM		SCTR	SCTRS/	NUM		
DRV	SIZE	CLSTR	POOL	BUFS	DRV	SIZE	CLSTR	POOL	BUFS
C	512	16	1	16					
D	512	16	1	16					
E	512	16	1	16					
F	1024	8	2	16					
G	1024	8	2	16					
H	1024	8	2	16					

CIOSYS Data Area  
Bytes Left 44832

EMS Left for CIOYS  
buffers (in K) 256



**NOTE:** Some of the information shown on this screen, such as the logical drive identifier (**DRV**), number of bytes per sector (**SCTR SIZE**), and number of sectors per cluster (**SCTRS/CLSTR**) reflects decisions made when the disk drive(s) were initially formatted/partitioned. These drive designations and values cannot be changed without reformatting or repartitioning the physical disk drive(s). For information, refer to the appropriate 3Server Guide, your DOS manual, or the instruction manual that came with the disk drive(s) on the server.

A **sector** is a fixed amount of disk space, usually 512 bytes on diskettes or hard disks formatted with DOS. Most diskettes and hard disks are sufficiently large that several sectors are grouped together in larger units called **clusters**. In the various versions of the DOS operating system, the cluster is the fundamental unit of disk I/O operations. A **file** consists of at least one cluster (usually several sectors).

A **pool** is a collection of memory buffers grouped together for the purpose of caching data from a disk (or disks). Caching of data improves system performance by reducing the volume of disk I/O's performed against the physical devices.

CIOSYS attempts to discern patterns of disk access and keep the most commonly accessed information in cache. Advance knowledge of disk access could produce superior results by permitting you to tune the CIOSYS buffer pools.

For example, if you know in advance that a particular disk will be used a great deal and another will not, then two pools could be created. The busy disk should have a pool with a large number of buffers. The relatively inactive disk should have a pool with a smaller number of buffers allocated to it.

This screen allows you to change a logical disk drive's (**DRV**) cache buffer pool assignment (**POOL**) and the number of cache buffers (**NUM BUFS**) in each pool. All logical disk drives that have the same sector size (**SCTR SIZE**), the same number of sectors per cluster (**SCTRS/CLSTR**), and reside on the same physical disk drive, should be assigned to the same buffer pool. Disks that have different sector or cluster sizes must be assigned to separate buffer pools.

Use the Up/Down cursor keys to highlight the **POOL** number field. Press the **[+]** (plus) key to increase the pool number (or to create a new pool number if there are none numbered higher). Press the **[-]** (minus) key to assign the logical drive (**DRV**) to an already existing, lower numbered CIOSYS buffer pool. The range of **POOL** numbers is 1 to 26, which allows a separate pool for each of the 26 possible drive identifiers (A-Z).

Use the Left/Right cursor keys to highlight the **NUM BUF**s field. Enter the number of buffers to be used for this CIOSYS buffer pool. The number of buffers in each pool can range from 2 to 1500; however, the primary limit is the amount of memory actually available. To update the memory counters, use the cursor keys to move the cursor back to the **POOL** field.

Press **[Ctrl] + [A]** to accept the values displayed after you have made the desired adjustments. You will be returned to the previous screen. Remember to press **[Ctrl] + [A]** until you are returned to the **Configure Parameters and Peripherals** screen.

Press **[Esc]** to cancel any changes you have made. The values revert to the last "accepted" or "kept" configuration and you are returned to the **Configure Parameters and Peripherals** screen.



**CAUTION:** Pressing **[Esc]** also causes *all* adjustments made to the network drives and CIOSYS parameters to be cancelled. You may make and accept adjustments to each individually, but all are cancelled by **[Esc]**.

If your PC server has an EMS option board installed and you have installed 3+TurboShare, or if your 3Server3 has the CacheCard option installed, the CIO SYS cache buffers (buffer pools) can be allocated from EMS memory instead of main memory. The amount of EMS memory to be used by CIO SYS is allocated on the network drive screen (page 5-28). The size of each CIO SYS buffer in a certain buffer pool is the same as the cluster size of the logical drives assigned to that buffer pool. EMS and CIO SYS counters on the right-hand side of the screen show the amount of CIO SYS data area and EMS memory remaining.

If your PC server does not have an EMS option installed, or if your 3Server3 does not have the CacheCard option installed, the CIO SYS cache buffers (buffer pools) are allocated from main memory. The EMS counter is not displayed, but the CIO SYS counter shows the amount of CIO SYS data area memory remaining. You must press **[Ctrl] + [A]** to return to the **Configure Parameters and Peripherals** screen to view the amount of main memory used by CIO SYS cache buffers.

In a system with the EMS option installed, CIO SYS will always attempt to use all the EMS memory it is instructed to use, regardless of the number of buffers specified for a pool. CIO SYS will also attempt to preserve buffer count relationships between pools. For example, if buffer pool #1 started with one buffer and buffer pool #2 started with four buffers, then for every additional buffer that CIO SYS added to pool #1, it would also attempt to add four buffers to pool #2 until all the available EMS memory was used.

## **Pool Number (POOL)**

Range: 1 to 26

Logical drives (**DRV**) that reside on the same physical disk drive (e.g., "C", "D", and "E" in the screen above) should be assigned to the same CLOSYS buffer pool (**POOL**). Only logical drives with the same sector size (**SCTR SIZE**) and the same number of sectors per cluster (**SCTRS/CLSTR**) can share a buffer pool.



**CAUTION:** Logical drives residing on the same physical drive in a 3Server or on hard disk drives from other vendors may not always have the same sector size and the same number of sectors per cluster. 3+ software must be installed on a partition (logical drive) formatted with 512-byte sectors. Refer to the documentation that came with your disk drive for additional information.

IBM PC-DOS formats hard disk drives with a standard sector size of 512 bytes. The number of sectors per cluster is determined by the size of the DOS partition and other operating system considerations. For example, in a standard 10 MB DOS partition each cluster has eight 512-byte sectors and in a standard 20 MB DOS partition each cluster has sixteen 512-byte sectors.

Hard disk drives in a 3Server are formatted with a program called 3DISK, which allows the user to specify the sector size and the number of sectors per cluster for each logical partition. Depending on the types of applications a 3Server is expected to handle, larger or smaller sector sizes and clusters can be used on individual disks to improve network performance.

## **Number of Buffers (NUM BUFS)**

Range: 2 to 1500

The number of CIOSYS cache buffers significantly affects server performance. Simply stated, the more cache buffers that are made available to CIOSYS, the fewer disk accesses will be required and the faster the server will operate. Any left over memory should be allocated to CIOSYS cache buffers.

The size of each CIOSYS cache buffer assigned to a buffer pool is equal to the cluster size for that partition. In the screen on page 5-38 each buffer in pool #1 requires 8,192 bytes (512 bytes/sector x 16 sectors/cluster = 8,192 bytes).

**Buffer size = (bytes/sector x sectors/cluster)**

The total memory allocated to a CIOSYS cache buffer pool is the size of the individual buffers times the number of buffers in the pool. In the screen on page 5-38 buffer pool #1 requires 131,072 bytes (8,192 bytes/buffer x 16 buffers = 131,072 bytes).

**Pool size = (buffer size x number of buffers)**

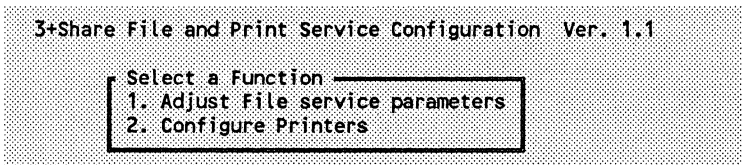
In addition to the memory allocated to the buffer, each buffer in a pool requires an additional 38 bytes of memory, which is part of the 64 KB CIOSYS data area. The CIOSYS data area memory consumed for buffer pool #1 is 608 bytes (38 bytes/buffer x 16 buffers = 608 bytes).

**CIOSYS data area = (38 bytes/buffer x number of buffers)**

The counter in the upper right-hand corner of the screen shows the amount of CIOSYS data area memory remaining. The second counter shown on the screen appears only if your server has an EMS option installed. It shows the amount of CIOSYS EMS buffer memory still available (in KB).

## 3+Share

Highlight the **5 User Share** (or **N User Share**) server component on the **Configure Parameters and Peripherals** screen and execute the **Change** command to display a screen similar to the following:



**NOTE:** You do not have to adjust the File service parameters in order to configure printers.

Use the Up/Down cursor keys to select the desired function, then press **[Enter]**.

You must press **[Ctrl] + [A]** to accept any adjustments that have been made and return to the **Configure Parameters and Peripherals** screen.

To cancel adjustments press **[Esc]**. The values will revert to their last "accepted" or "kept" configuration and you will be returned to the **Configure Parameters and Peripherals** screen.



**CAUTION:** Pressing **[Esc]** cancels *all* adjustments made to the File service parameters and all printer configurations. You may make and accept adjustments to each individually, but all are cancelled by **[Esc]**.

The **3+Share Function Selection** screen presents two selections. Function selections 1 and 2, described briefly below, are described in more detail starting at the page numbers shown.

- 1. Adjust File service parameters (this page)**  
This Function selection allows you to change any or all of the File service parameters listed in the Configuration Report.
- 2. Configure printers (page 5-59)**  
This Function selection allows you to configure serial and parallel printers on the server's COM and LPT ports.

### 3+Share File Service Configuration

The first part of the 3+Share section of your Configuration Report should appear similar to the following. The 3INSTALL program calculates the amount of memory that 3+Share uses; memory usage depends on the parameter settings listed below. The parameters displayed on this section of the report and their effect on network operation are described in the next section.

```
*****  
3+SHARE Configuration Report:  
Memory consumed: 134384 (134K)  
Maximum number of users: 5  
Maximum number of sessions: 5  
Maximum number of links: 20  
Maximum number of sharenames: 24  
Maximum number of print queue entries: 10  
Message buffers: 5  
Message buffer size: 4144  
Maximum number of concurrent requests: 5  
Number of packet receive buffers: 15  
Number of packet transmit buffers: 15  
*****
```

Highlight Function selection 1, **Adjust File service parameters**, on the **3+Share File and Print Service Configuration** screen and press **[Enter]** to display a screen similar to the following:

3+Share File Service Configuration Ver. 1.1.1		Memory Used: 164160
Maximum number of users		5
Maximum number of sessions		5
Maximum number of links		20
Maximum number of sharenames		24
Maximum number of print queue entries		10
Number of message buffers		4
	Suggested min:4, typ:5, max:38	
Maximum number of concurrent requests		4
Message buffer size		4144
Number of packet receive buffers		13
	Suggested min:5, typ:7, max:39	
Number of packet transmit buffers		13
	Suggested min:4, typ:43, max:43	

Use the Up/Down cursor keys to position the cursor at the parameter you want to change, then type in the appropriate number. The "Memory Used" counter in the upper right-hand corner of the screen will be updated to reflect the memory impact of your entry when you move the cursor to another field.

Note that the File service parameters for the number of message and packet buffers have *suggested* values and ranges that may differ from those listed in the individual parameter descriptions. These *suggested* values are derived by the 3INSTALL program from the actual values entered for other server parameters. The typical (**typ**) values provide an optimum compromise between server performance and memory usage. Specifying a number of buffers below the *suggested* minimum (**min**) or above the *suggested* maximum (**max**) may degrade server performance or may even cause the server not to boot.

You must press **[Ctrl] + [A]** to accept any adjustments that have been made to the parameter values on the **File Service Configuration** screen. You will be returned to the **3+Share Function Selection** screen.

To cancel any adjustments made on this screen press **[Esc]**. The values shown on this screen will revert to their last "accepted" or "kept" configuration and you will be returned to the **3+Share Function Selection** screen.



**CAUTION:** Pressing **[Esc]** cancels *all* adjustments made to the File service parameters and all printer configurations. You may make and accept adjustments to each individually, but all are cancelled by **[Esc]**.

### 3+Share File Service Parameters

Table 5-3 shows the range of values and the amount of memory required for each parameter on the **3+Share File Service Configuration** screen. The letter in parentheses ( ) is the 3+ version 1.0 designation for the parameter.

The following paragraphs describe each of the parameters listed on the **3+Share File Service Configuration** screen, considerations involved in selecting the appropriate values, and the effect of those selections on network performance and memory usage.

**Table 5-3. 3+Share File Service Parameters**

Parameter	Range	Bytes
Maximum number of users (U)	1 to (S)	64
Maximum number of sessions (N)	1 to 240	320
Maximum number of links (C)	1 to 999	48
Maximum number of sharenames (S)	(U)+1 to 520	128
Maximum number of print queue entries (E)	0 to 999	48
Number of message buffers (M)	2 to 6*	
Maximum number of concurrent requests (P)	1 to 9	4096
Message buffer size (B)	1072 to 8240	M(B+16)
Number of packet receive buffers (R)	4 to 66	1630
Number of packet transmit buffers (T)	2 to 66	144

\* plus 1 for each remote user



**CAUTION:** It is essential that you read *and understand* the explanations provided for each parameter that you change, otherwise you may seriously impair or halt the operation of the server.

## Maximum number of users

Range: 1 to number of **sharenames**

A **user** is any person who is assigned a home directory on this server.

This parameter specifies the maximum number of users, or home directories, that the File service will support on this server. Each home directory is associated with a unique sharename. On a **5 User** version of 3+Share, this number is fixed at 5. On an unlimited-user version of 3+Share, the default varies depending on the configuration selected.

The default value on an **N User** version of 3+Share File service may need to be increased when more than the default number of home directories (users) are required. Each user requires 64 additional bytes of memory.

The number of users must be smaller than the number of **sharenames**. Increasing the number of users to equal the number of sharenames prevents a sharename from being assigned to any other process or device.

## **Maximum number of sessions**

Range: 1 to 240

A **session** is a communications path between the server and a workstation. Each workstation linked to a server, or to a shared printer attached to the server, requires one session. Once established, a single session between a workstation and a server can support multiple printer and file links. Additional links between the two do not require additional sessions.

This parameter specifies the maximum number of simultaneous sessions the File and Print services can support on this server. Each session requires 320 additional bytes of memory.

**Sessions = maximum number of simultaneous users.**

The number of sessions should be equal to the maximum number of users that can be connected to the server at one time. The default value may need to be increased if more workstations will be linking to this server's directories or printers at the same time.

## **Maximum number of links**

Range: 1 to 999

A **link** is a logical connection (redirection) between a shared directory or shared printer on a server and either a drive identifier or a printer identifier on a workstation.

This parameter specifies the maximum number of links the File and Print services can support on this server at one time. This includes all links made with 3F LINK and 3P LINK commands. Data about each link is contained in a table whose size is established by this parameter. Each link requires 48 additional bytes of memory.

**Links = 4 times the maximum number of users.**

The number of links should be approximately 4 times the maximum number of users that can be connected to the server at one time. The default value may need to be increased for servers that have many users, or when users need to link several directories or printers at the same time.

## **Maximum number of sharenames**

Range: **(number of users + 1)** to 520

This is the **sharename** assigned in 3F and 3P SHARE commands to shared directories and printers.

This parameter specifies the maximum number of 3F and 3P sharenames that the File and Print services can support on this server. This maximum includes all users whose home directories reside on this server, all shared directories (each sharename counts as one "share"), plus one for each shared printer. Each printer sharename and directory sharename (even those pointing to the same directory, but allowing different access rights) counts as one.

Data about each sharename is kept in a table in memory for fast access, and is also kept in a disk file for reference when the server is restarted. Each sharename requires 128 additional bytes of memory.

**Sharenames = 4 times the number of users.**

The number of sharenames should be approximately 4 times the number of users. The default value may need to be increased to allow more sharenames if several users share directories, or if several different sharenames are used for the same directory to establish different access rights.

## **Maximum number of print queue entries**

Range: 0 to 999

A **print queue entry** is a file description in the spool file queue for one of the printers attached to this server.

This parameter specifies the maximum combined number of print queue entries, or spool files, for all shared printers on this server. Each spool file requires 48 additional bytes of memory.

A printer link automatically creates a print queue entry when the first character to be printed is received by the server. The print queue entry and spool file are deleted when the file has been completely printed on the selected printer.

### **Print queue entries = 3 times the number of users.**

The number of print queue entries should be approximately 3 times the number of users. The default value should be increased when the number of simultaneous printer users on this server approaches this number. The default value should also be increased when it is likely that users may have several print jobs in the queue, but not printing, because the printing of these files has been deferred or print jobs are waiting for a different form type to be specified.

Setting the number of print queue entries to zero (0) indicates that there are no printers attached to this server.

## Number of message buffers

Range: 2 to 64

A **message buffer** is a portion of main memory allocated for file or print server requests (or responses) that will not fit in one packet (1.5 KB). Message buffers are most commonly used when performing DOS file copies and program loads, or when programs read or write large blocks of data.

This parameter specifies the number of message buffers on this server. The amount of memory required by each message buffer depends on the setting of the **message buffer size** parameter.

The configuration screen displays a suggested value and range. The suggested value is derived by the 3INSTALL program from the values entered for other server parameters that affect the number of message buffers required. The typical (**typ**) value provides an optimum compromise between server performance and memory usage. Specifying a number of message buffers below the suggested minimum (**min**) or above the suggested maximum (**max**) may degrade server performance or may even cause the server not to boot.

**Message buffers = 1 + maximum number of concurrent requests.**

The number of message buffers must be at least one greater than the number of messages that the File and Print services can respond to concurrently, as specified in **maximum number of concurrent requests**. The number of message buffers should be set at a minimum of 5 for a 3Server or an IBM PC-AT server. The minimum number of message buffers is reduced to 2 for an IBM PC-XT server. In addition, the number of message buffers should be greater than the maximum number of remote and internetted users able to access this server, either through 3+Route or 3+NetConnect.

The number of message buffers affects server performance. The more message buffers, the more file or print server transactions can be queued at the same time. Increasing the *number* of message buffers may improve server response time in the case of frequent reads and writes of greater than 1.5 KB, but less than the message buffer size. Increasing the *size* of the message buffers would have an effect only if reads and writes greater than the current message buffer size occur frequently.

## **Maximum number of concurrent requests**

Range: 1 to 9

**Concurrent requests** ask for simultaneous file or print service operations. Several active processes may perform operations such as opening or closing files, data reads and writes, or spooling characters to a printer at the same time. Because of the elevator queue feature of CIOSYS, multiple workstations may also have disk data transfer requests queued at the same time. Network operations, such as establishing sessions or assembling messages, may also be performed concurrently.

This parameter specifies the maximum number of requests that this server can handle at one time. If the number of pending requests exceeds the maximum, one or more requests must wait for processing. Each requires 4096 bytes of additional memory.

**Concurrent requests = 1 + number of threads in CIOSYS.**

This number should typically be less than or equal to 1 plus the number of **threads** in CIOSYS; 2 for the IBM PC-XT server, 3 or 4 for the IBM PC-AT server, or 4 to 6 for the 3Server. In addition, the number of concurrent requests should be at least one less than the **number of message buffers**.

## **Message buffer size**

Range: 1072, 2608, 4144, 5680, 7216, or 8240 bytes.

This parameter specifies the **size** of the message buffers used by this server. This is the maximum number of bytes of data that the server can handle in a single read or write operation. Each of the message buffers specified in **number of message buffers** above requires this amount of main memory.

**Total memory = # of message buffers x message buffer size.**

The number of packet transmit and receive buffers also depends on the size and the number of message buffers specified.

Message buffers use moderate amounts of memory, but significantly affect server performance. When a server is used primarily for word processing and spreadsheets, file operations are characterized by reads and writes of large blocks of data, typically entire files. Network performance may be improved by increasing the size of the message buffers, which allows the data to be transferred over the network in larger chunks with less processing overhead.

If server usage is characterized by database, transaction processing, or accounting applications where requests are for reads and writes on small blocks of data (such as records or fields rather than entire files) smaller message buffers may be more useful. Network performance may be improved, in this case, by decreasing the size and increasing the number of message buffers.

The typical default value is 4144 bytes.

## Number of packet receive buffers

Range: 4 to 66

A **packet receive buffer** is a portion of main memory allocated to temporarily store data on its way *to* the server *from* other servers or workstations on the network.

This parameter specifies the maximum number of packet receive buffers that can exist on this server at one time. Each packet receive buffer requires 1630 additional bytes of memory.

File or Print service request messages are broken into one or more packets at a workstation for transmission on the network. If these messages arrive at the server as a sequence of packets, they are temporarily stored in the packet receive buffers, then reassembled into the original message in the message buffers. Each packet also contains header information that is separated from the data contained in the packet before the data is sent to a message buffer. Thus, the amount of data placed in the message buffer is less than the original packet size.

The configuration screen displays a suggested value and range. The suggested value is derived by the 3INSTALL program from the values entered for other server parameters that affect the number of packet receive buffers required. The typical (**typ**) value provides an optimum compromise between server performance and memory usage.

Because the server reuses packet receive buffers, there is no advantage in configuring more than the suggested maximum. Specifying a number of packet receive buffers below the suggested minimum (**min**) or above the suggested maximum (**max**) may degrade server performance or may even cause the server not to boot.

## Number of packet transmit buffers

Range: 2 to 66

A **packet transmit buffer** is a portion of main memory allocated to temporarily store header information used to route data on its way *from* the server to other servers or workstations on the network.

This parameter specifies the maximum number of packet transmit buffers that can exist on this server at one time. File or Print service response messages are split into one or more packets for transmission to the requesting workstation or server.

Packet header information, which is contained in the packet transmit buffer, is combined with data contained in the message buffers and the resulting packet is then routed to the proper workstation or server. Each packet transmit buffer requires 144 additional bytes of memory because these buffers contain only the packet header information, and not the response itself.

The configuration screen displays a suggested value and range. The suggested value is derived by the 3INSTALL program from the values entered for other server parameters that affect the number of packet transmit buffers required. The typical (**typ**) value provides an optimum compromise between server performance and memory usage. Decreasing the number of packet transmit buffers below the suggested typical (**typ**) value may slow server response.

Because the server reuses packet transmit buffers, there is no advantage in configuring more than the suggested maximum. Specifying a number of buffers below the suggested minimum (**min**) or above the suggested maximum (**max**) may degrade server performance or may even cause the server not to boot.

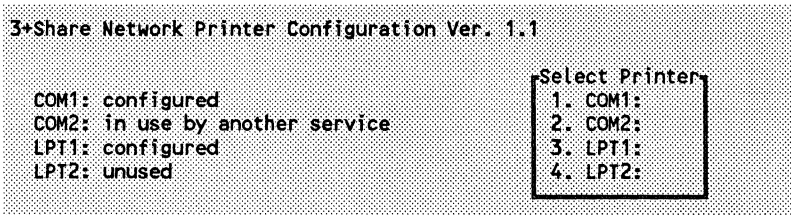
### 3+Share Print Service Configuration

The second section of the 3+SHARE Configuration Report will appear similar to the following. The report provides a separate section for each printer port configured on this server. The parameters displayed in this section of the report and their effect on network operation are described in the next section.

```
*****  
3+SHARE Configuration Report: (continued)  
  
Serial Ports:  
  Port:          COM1:  
  Description:   HP LaserJet+  
  Form Type:     1  
  Banners:       Y  
  Eject pages:   Y  
  Laserjet Form: 0  
  BaudRate:      9600  
  Parity:         5  
  Protocol:      1  
  Retries:       10  
  Buffer size:    512  
  Interrupt Level: 0  
  Reset Retries: 10  
  Reset Sequence: LaserJet  
  1B 45 1B 26 6C 31 34 63 31 65 37 2E 36 34 63 36 36 46  
  
Parallel Ports:  
  Port:          LPT1:  
  Description:   Diablo 630  
  Form Type:     1  
  Banners:       Y  
  Eject pages:   Y  
  Retries:       10  
  Buffer size:    512  
  Interrupt Driven: N  
  Reset Retries: 10  
  Reset Sequence: Diab 630  
  1B 0D 50  
*****
```

### 3+Share Network Printer Configuration

Highlight Function selection 2, **Configure printers**, on the **3+Share File and Print Service Configuration** screen and press **[Enter]** to display a menu similar to the following:



This menu reflects the status, type, and number of I/O ports available on this server. Ports labelled "COMn:" are RS-232C serial ports. Ports labelled "LPTn:" are Centronics-compatible parallel ports. Any or all of these ports may be configured as network printers; however, one or more RS-232C (COM) ports will be required for modems if you plan to install 3+Remote or 3+Route.

Use the Up/Down cursor keys to highlight the printer port you want to configure and press **[Enter]** or just type in the appropriate number. After each printer is configured you will be returned to this screen to allow you to select another port.

When you have configured all the necessary printers, or if you want to leave this screen without configuring any printers, press **[Ctrl] + [A]** to accept *all* the printer configurations and *all* the File service parameter changes entered and return to the **Configure Parameters and Peripherals** screen.

Press **[Esc]** to cancel *all* printer configuration changes (if any) and *all* the previously accepted File service changes (if any) and return to the **Configure Parameters and Peripherals** screen.

## Configuring Serial Ports

Highlight the desired serial port (COM) on the **Select Printer** screen and press **[Enter]** to display a screen similar to the following:

```
3+Share Network Printer Configuration Ver. 1.1.1 Memory Used: 188080
Configure COM1: as network printer? Y
Description HP LaserJet+
Eject a page between jobs? N
Translate IBM to Laserjet (Form Type) 15
Form Type 1 Print banners? Y
Baud rate N Parity 1
Protocol type 1 Retry count 10
Buffer size 512 Interrupt level 0
Change reset sequence? N Reset sequence name LaserJet
Reset retries 10
```

Use the Up/Down cursor keys to position the cursor at the parameter you want to change, then type in the appropriate number or response. The parameters displayed on this screen are described starting on page 5-63.

Press **[Ctrl] + [A]** to accept the values displayed and return to the **Select Printer** screen.

Press **[Esc]** to cancel the changes you have made and return to the **Configure Parameters and Peripherals** screen.



**CAUTION:** Pressing **[Esc]** causes the adjustments made to *all* printer configurations (if any) and *all* File service parameters to be cancelled. You must make and accept adjustments to each printer individually, but *all* changes to 3+Share are cancelled by pressing **[Esc]**.

## Configuring Parallel Ports

Highlight the desired parallel port (LPT) on the **3+Share Network Printer Configuration** menu and press **[Enter]** to display a screen similar to the following:

```
3+Share Network Printer Configuration Ver. 1.1.1      Memory Used: 188080
Configure LPT1: as network printer?  Y
Description                          Diablo 630
Form type                             1
Print banners?                       Y
Eject a page between jobs?          Y
Retry count                          10
Buffer size                          512
Interrupt driven?                   N
Change reset sequence?              N
Reset sequence name                 Diab 630
Reset retries                        10
```

Use the Up/Down cursor keys to position the cursor at the parameter you want to change, then type in the appropriate number or response. The parameters displayed on this screen are described starting on page 5-63.

After you have made the desired adjustments, press **[Ctrl] + [A]** to accept the values displayed and return to the **Select Printer** screen.

Press **[Esc]** to cancel the changes you have made and return to the **Configure Parameters and Peripherals** screen.



**CAUTION:** Pressing **[Esc]** causes the adjustments made to *all* printer configurations (if any) and *all* File service parameters to be cancelled. You must make and accept adjustments to each printer individually, but *all* changes to 3+Share are cancelled by pressing **[Esc]**.

### 3+Share Print Service Parameters

Table 5-4, shows the range of values for parameters on both **Network Printer Configuration** screens. The following paragraphs describe each parameter listed on the two **Network Printer Configuration** screens, the considerations involved in selecting the appropriate values, and the effect of those selections on network performance.

**Table 5-4. Network Printer Configuration Parameters**

Parameter	Range
Configure as network printer?	Y or N
Description	30 characters
Form type	1 to 99
Print banners?	Y or N
Eject pages between jobs?	Y or N
Translate IBM to LaserJet *	0 to 15
Baud rate *	50 to 9600
Parity *	see page 5-67
Protocol type *	see page 5-68
Retry count	10 to 99
Buffer size	512 to 8192
Interrupt driven?	Y or N
Interrupt level *	0, 2 to 5
Reset retries	10 to 99
Change reset sequence?	Y or N
Reset sequence	see page 5-70

\* These parameters used for serial printer ports only.



**CAUTION:** It is essential that you read *and understand* the explanations provided for each parameter that you change, otherwise you may seriously impair or halt the operation of your printer or Print server.

## **Configure <port> as network printer?**

Range: **Y** (yes) or **N** (no)

Your response (**Y/N**) determines if the printer connected to this port is to be a shared network printer or not.

Type **Y** if you want the printer attached to this port to be a shared network printer.

Type **N** if you want the printer to be used only by a local concurrent user, or if this port is designated to be used as a communications port, or if you do not want the port to be configured at all. A "no" response will return you to the **Select Printer** screen.

## **Description**

Range: 1 to 30 characters

Enter a unique description or other identifying information for this printer. You can enter a maximum of 30 characters, but a short name is recommended. The description you enter here is simply a comment for identification purposes. It is displayed as an output when the printer is listed with the 3P STAT command.

Acceptable, descriptive entries are, for example:

"LaserJet" or "Tech Pubs Printer"

## Form type

Range: 1 to 99

A **form type** is simply a number between 1 and 99 that you can associate with a specific type of form, paper, or process.

The prompt asks for the printer's *initial* form type. Whenever the server is booted, this will be the initial form type for this printer. Only print jobs (spool files) set to this form type can be printed on the printer until the form type is changed. The form type can be changed with the 3P RESUME command.

A print job's (spool file's) default form type is always 1 (one) unless the form type is explicitly set with the 3P SET command.

## Print banners?

Range: **Y** (yes) or **N** (no)

**Banner pages** separate the printer output of one user from the output of another. The banner page is imprinted with an abbreviated version of the user's name in large letters. The date and time the file was spooled to the printer and the date and time the file was printed also appear on the banner.

Each banner page requires one sheet of paper. Banner pages are very helpful for sorting the output of many users. On the other hand, banner pages are wasted if you are trying to print on invoices, preprinted forms, or company stationery.

Type **Y** if you want banner pages printed at the beginning of each print job. Otherwise, type **N**. The option you enter can be changed with the 3P RESUME command and /BANNER option. When the server is rebooted the option entered here takes effect.

## Eject pages between jobs?

Range: **Y** (yes) or **N** (no)

A **page eject** means that the print spooler automatically skips to the top of the next page between each print job.

Type **Y** to perform a page eject at the end of each file printed. Otherwise, type **N**. The option you enter here can be changed with the 3P RESUME command and /FF option. Whenever the server is rebooted, the option you enter here takes effect.

## Translate IBM to LaserJet (Form Type) (Serial Printers Only)

Range: 0 to 15

The IBM extended ASCII character set, which is used by IBM and compatible personal computers, contains characters used in foreign languages (e.g., French, Spanish). HP LaserJet printers can print these characters using the HP Roman-8 character set.

This option permits the 3+Share Print service to translate the IBM display codes for these characters into the corresponding HP LaserJet print codes used by the HP Roman-8 character set.

If the attached printer is an HP LaserJet, enter a Form Type number between 1 and 15 to enable translation of the ASCII character codes. The Form Type specified can be the same as the printer's initial Form Type. This option will then be in effect as part of the printer's initial default settings.

If the attached printer is not an HP LaserJet, enter a 0 (zero).



**CAUTION:** Graphics and other applications that may use the extended ASCII character codes differently than the HP LaserJet should not be sent to the printer when this character translation is in effect.

### **Baud rate** (Serial Printers Only)

Range: **a** (50 baud) to **n** (9600 baud)

Select a **baud rate** from the menu displayed at the bottom of the screen. The baud rate is the speed at which characters are transmitted from the server to the printer. The rate selected should be the fastest rate at which the printer can communicate with the server with the fewest retransmissions. The baud rate selected here must agree with the baud rate set at the printer. Refer to the printer documentation for information on setting the printer's baud rate.

The baud rates available are:

- |             |              |              |
|-------------|--------------|--------------|
| a. 50 Baud  | f. 600 Baud  | k. 3600 Baud |
| b. 75 Baud  | g. 1200 Baud | l. 4800 Baud |
| c. 110 Baud | h. 1800 Baud | m. 7200 Baud |
| d. 150 Baud | i. 2000 Baud | n. 9600 Baud |
| e. 300 Baud | j. 2400 Baud |              |

### **Parity** (Serial Printers Only)

Range: 1 to 5

Select a **parity** checking method from the menu displayed at the bottom of the screen. The method selected must match the parity checking method set at the printer. Refer to the documentation supplied with the printer for information on setting the parity checking method on the printer. Generally, Choice 3, No parity, may be selected.

The parity checking options available are:

1. Even parity
2. Odd parity
3. No parity
4. Parity always on (Parity bit = 1)
5. Parity always off (Parity bit = 0)

## **Protocol type** (Serial Printers Only)

Range: 1 to 4

Select a handshaking **protocol** that the printer supports. The printer must be set to the same protocol you select here. Refer to the printer documentation for information on which protocols the printer supports and how to set protocols on the printer.

The protocol options available are:

1. XON/XOFF
2. ETX/ACK
3. Hardware
4. Hardware and XON/XOFF combination



**NOTE:** If you select the ETX/ACK protocol, you must specify a buffer size equal to or less than the printer's internal buffer size. Refer to the printer's manual to determine the size of the printer's internal buffer.

## **Retry count**

Range: 10 to 99

The **retry count** is the number of attempts that will be made to print a character before the server assumes the printer is busy and gives control to another process.

A larger retry count may improve printer performance, but will tend to reduce file service performance.

## Buffer size

Range: 512 to 8192 bytes

The print spooler buffer temporarily stores output on its way to the printer.

Enter the size of the print spooler buffer to be used with the printer. The print spooler buffer size should be at least equal to, and preferably larger than, the size of the printer's internal buffer. The larger this buffer is, the fewer number of times the Print service will have to read the spool file. The print spooler buffer size should be some multiple of 512 bytes.



**CAUTION:** If you select the ETX/ACK protocol, you must select a print spooler buffer size *no larger* than the size of the printer's internal buffer.

## Interrupt driven? (Parallel Printers Only)

Range: **Y** (yes) or **N** (no)

One, and only one, parallel printer attached to a PC server may be interrupt driven by the Print service. This feature uses hardware interrupt 7. If you activate this feature by responding to this prompt with a **Y** (yes), no other device can use this hardware interrupt.

The default value is **N** (no), which indicates the printer is not to be interrupt driven. Refer to the instruction manual that came with the computer or parallel port hardware for more information on using interrupt driven I/O.

### **Interrupt level** (Serial Printers Only)

Range: 0, 2 through 5

Two serial printers attached to a PC server may be interrupt driven by the Print service. To use this feature, enter the number of the hardware interrupt to be used. Use interrupt 4 for the COM1: port and interrupt 3 for the COM2: port. The interrupt level chosen must match the jumper setting for the interrupt on the COM board.

Interrupts 2 and 5 are normally used for other devices. If you can set a serial card (COM board) to use these interrupts, and they are not used for another device, they can be used in place of interrupts 3 and 4.

The default value is zero (0), which indicates the printer is not to be interrupt driven. Refer to the instruction manual that came with the computer or the serial port hardware for more information on using interrupt driven I/O.

### **Change reset sequence?**

Range: Y (yes) or N (no)

Both printer configuration screens display the name of the printer whose reset sequence is currently being used (if any). You can change this reset sequence by responding Y (yes) to this prompt. A screen similar to the following is displayed.

3+Share Network Printer Configuration Ver. 1.1.1  
Reset Sequence Definition

No reset sequence	Create	Display	Erase	
1- Diab 630	2- Epson MX	3- LaserJet	4- NEC 7710	5- Oki 98

Most printers must be reset before each print job. Refer to the documentation that came with your printer to determine what reset sequence, if any, is required.

Five reset sequence options are available:

1. To select one of the reset sequences listed, enter the corresponding number and press **[Enter]**.
2. To reset the printer reset sequence selection to "<none>", type the letter **N** (No reset sequence) and press **[Enter]**.
3. If your printer type is not among those listed, type the letter **C** (Create) and press **[Enter]** to create a new printer reset sequence.

The screen will prompt you for the name of the reset sequence to be created:

Enter a 1-9 character descriptive label for this reset sequence

Enter the name you want to assign to the reset sequence.

The screen will prompt you to enter the reset sequence in hexadecimal:

Enter 1 to 100 hex numbers between 00 and FF separated by spaces

Enter the appropriate reset sequence in hexadecimal and press **[Enter]**. The reset sequence you enter is selected and you are returned to the **Network Printer Configuration** screen.

4. To display an existing printer reset sequence, type the letter **D** (Display) and press **[Enter]**.

The screen will prompt you for the number of the reset sequence to be displayed:

Display which reset sequence?

Enter the number of the corresponding reset sequence.

The screen will display the reset sequence name and the reset sequence in hexadecimal:

Sequence Diab 630 is: 1B 0D 50

5. To delete an existing printer reset sequence, type the letter **E** (Erase) and press **[Enter]**.

The screen will prompt you for the number of the reset sequence to be erased:

Erase which reset sequence?

Enter the number of the reset sequence you want to delete and press **[Enter]**. The reset sequence is deleted.

## **Reset retries**

Range: 10 to 99

**Reset retries** is the number of times the server will attempt to write the reset sequence to the printer before it assumes the printer is busy and gives control to another process.

### 3+Name Service

The 3+Name section of your Configuration Report should appear similar to the following. The parameters displayed on this section of the report and their effect on network operation are described in the next section.

```
*****
3+NAME Configuration Report
Memory Used:                153024
Network number:             401E7
Default domain:             HQS
Default organization:       3Com
Domain limit:               5
Open domain limit:         4
Buffers:                    20
Offset from prime meridian: -480
Time zone:                  PST
DST zone:                   PDT
Month/day DST begins:      4/ 7
Month/day DST ends:        10/31
*****
```



**CAUTION:** Every network must have one, and only one, operational Name service. Do not attempt to install the Name service on more than one server per network.

### 3+Name Configuration

Highlight the **Name** server component on the **Configure Parameters and Peripherals** screen and execute the **Change** command to display a screen similar to the following:

```
3+Name Configuration Ver. 1.1.1      Memory Used: 131232
Network number           401E7
Domain:Organization      HGS           :3Com
Domain limit             5
Open domain limit        4
Buffers                  20
Offset from prime meridian -480
Time zone                 PST
DST zone                  PDT
Month/day DST begins     04/07
Month/day DST ends       10/31
```

Use the Up/Down cursor keys to position the cursor at the parameter(s) you want to change, then type in the appropriate number.

After you have made the desired adjustments, you must press **[Ctrl] + [A]** to accept the values displayed and return to the **Configure Parameters and Peripherals** screen.

Press **[Esc]** to cancel the changes you have made and return to the **Configure Parameters and Peripherals** screen.

### 3+Name Parameters/Options

Table 5-5 shows the range of values and the amount of memory required for each parameter on the **3+Name Configuration** screen. The following paragraphs describe each of the parameters listed on the **3+Name Configuration** screen, the considerations involved in selecting the appropriate values, and the effect of those selections on network performance and memory usage.

**Table 5-5. 3+Name Configuration Parameters**

Parameter	Range	Bytes
Network Number	8 characters	8
Domain	20 characters	20
Organization	20 characters	20
Domain Limit	5 to 500	112
Open Domain Limit	4 to 100	32
Buffers	20 to 125	544
Offset From Prime Meridian	-720 to 720	
Time Zone	*	
DST Zone	*	
Month/Day DST Begins	01/01-12/31	
Month/Day DST Ends	01/01-12/31	

\* The possible values are listed in Table 5-6 on page 5-80.



**CAUTION:** It is essential that you read *and understand* the explanations provided for each parameter that you change, otherwise you may seriously impair or halt the operation of the Name service on your network.

## Network Number

Range: Up to 8 hexadecimal digits (0-9, A-F)

A **network number** is a unique sequence of hexadecimal digits (0-9, A-F) that identifies each network. Every 3+Share server package has a unique five-character network number that is printed on the label of the *3+Share Server/Name* diskette, for example "4E123". The network number printed on the label of the diskette should be the one shown on this screen.

## Domain

Range: 1 to 20 characters

**Domain** is the middle part of the 3+ three-part network name that was entered during the original installation procedure described in Chapter 3.

This entry specifies the *default* domain name that is used whenever a domain is required, but not specified by the user. For example, if the default domain is "HQ", the names "Joe Kent:HQ" and "Joe Kent" specify the same person. A domain usually corresponds to a geographic location.

The domain name can be from 1 to 20 characters long. The allowed characters are: letters (A-Z and a-z), digits (0-9), periods (.), underscores ( \_ ), dashes (-), apostrophes ( ' ), and blanks ( ). You can also use any of the international characters as defined in the IBM extended ASCII character set. (Refer to the IBM *Technical Reference* manual for detailed information.)



**CAUTION:** Do not change the default domain name after the initial installation has been completed unless the new default already exists on the Name service.

## Organization

Range: 1 to 20 characters

**Organization** is the last part of the three-part 3+ network name that was entered during the original installation procedure described in Chapter 3.

This entry specifies the default organization name, that is used whenever an organization is required, but not specified by the user. For example, if the default organization is "3Com", then "Joe Kent:HQ:3Com" and "Joe Kent:HQ" specify the same person. If the default domain name is "HQ", the name "Joe Kent" may also be used.

The organization can also be from 1 to 20 characters long. The allowed characters are: letters (A-Z and a-z), digits (0-9), periods (.), underscores ( \_ ), dashes (-), apostrophes ( ' ), and blanks ( ). You can also use any of the international characters as defined in the IBM extended ASCII character set. (Refer to the IBM *Technical Reference* manual for detailed information.)



**CAUTION:** Do not change the default organization after the initial installation has been completed unless the new default already exists on the Name service.

## Domain Limit

Range: 5 to 500

The **domain limit** is the maximum number of domains this Name service will support. In addition to the domain name of the local network, the Name service must have information available about other domains (networks) with which it may communicate. This additional domain information is required by other 3+ services, such as Mail and Route.

The minimum value of the domain limit is 5. You can increase this number if your network requires more domains. Each additional domain requires 116 bytes of memory.

## Open Domain Limit

Range: 4 to 100

The **open domain limit** is the maximum number of domains that can have operations being performed at the same time on this Name service.

**Open domain limit > domain limit/5, but < domain limit**

This value should not be less than one fifth, or greater than, the **domain limit** specified above. The minimum value of the open domain limit is 4. Each open domain requires 64 bytes of memory.

Specifying a larger number here may require adjusting the **CIOSYS File Handles** and **File Descriptors** parameters to larger values. Each open domain requires one **CIOSYS File Handle** and one **CIOSYS File Descriptor**. See **CIOSYS Parameters** in this chapter for additional information.

## **Buffers**

Range: 20 to 125

This parameter specifies the number of 512-byte buffers that the Name service will use to hold data in memory. The larger this number, the better the performance.

### **Buffers > 5 times the open domain limit, or = 125**

The number should be at least 5 times the value of the "open domain limit", or the maximum of 125, whichever is smaller. The minimum value is 20. Each buffer requires an additional 512 bytes of memory.

## **Offset From Prime Meridian**

Range: -720 to 720

**Offset From Prime Meridian** is the number of minutes the time zone in which you are located is offset from Greenwich Mean Time (GMT). This value is negative for time zones west of the Greenwich Mean Time zone (which is in England at 0-15 degrees west longitude), and positive for time zones east of the GMT zone. San Francisco is at a GMT offset of -480 (-8 x 60) and Chicago is at a GMT offset of -360 (-6 x 60). Chicago time is two hours (120 minutes) ahead of San Francisco time.

Table 5-6 on the following page provides the offsets from Greenwich Mean Time and the abbreviations for standard time zones and daylight savings time zones in the United States, Canada, and Europe.

**Table 5-6. Time Zone Abbreviations and Offsets**

Standard Time Zone Designation	Greenwich MT Offset (Minutes)	Standard Time Zone Abbreviation	Daylight Savings Time Abbreviation
Frankfurt	+120	GMT+2	GMT+3
Paris	+ 60	GMT+1	GMT+2
London	0	GMT	GMT+1
Iceland	- 60	GMT-1	GMT
Greenland	-120	GMT-2	GMT-1
Newfoundland	-180	NST	NDT
Atlantic	-240	AST	ADT
Eastern	-300	EST	EDT
Central	-360	CST	CDT
Mountain	-420	MST	MDT
Pacific	-480	PST	PDT
Yukon	-540	YST	YDT
Alaska/Hawaii	-600	HST	HDT
Bering	-660	BST	BDT

### Time Zone

Range: GMT+12 to GMT-12

Enter the abbreviation for the name of the local **Standard Time Zone**, if any. "GMT+N" or "GMT-N" is acceptable.

### DST Zone

Range: see Table 5-6

Enter an abbreviation for the name of the local **Daylight Savings Time Zone**, if any. See the Daylight Savings Time column in Table 5-6 for abbreviations for daylight savings time zones.

If daylight savings time is not observed in your area, enter blanks for this parameter and set both the month and day of the DST begin and end dates to zero (0).

## **Month DST Begins**

Range: 1 to 12

Enter a number from 1-12 corresponding to a month of the year in which Daylight Savings Time begins in your area. (January=1, December=12).

For example, if Daylight Savings Time begins on the first Sunday of April, enter 4. In the United States, the month entered here should be 4. If your area does not observe daylight savings time, enter zero (0).

## **Day DST Begins**

Range: 1 to 31

Enter a number from 1-31 corresponding to the last day of the month on which daylight savings time *can* begin.

For example, if Daylight Savings Time begins in your area on the first Sunday of April, enter 7. In the United States, this number should always be 7. If your area does not observe daylight savings time, enter zero (0).

## **Month DST Ends**

Range: 1 to 12

Enter a number from 1-12 corresponding to a month of the year Daylight Savings Time ends in your area. (January=1, December=12).

For example, if Daylight Savings Time ends on the last Sunday of October, enter 10. In the United States, the month entered here should be 10. If your area does not observe daylight savings time, enter zero (0).

## **Day DST Ends**

Range: 1 to 31

Enter a number from 1-31 corresponding to the last day of the month Daylight Savings Time *can* end in your area.

For example, if Daylight Savings Time ends in your area on the last Sunday of October, enter 31. In the United States, this number should always be 31. If your area does not observe Daylight Savings Time, enter zero (0).



### 3+Mail Configuration

Highlight the **5 User Mail** (or **N User Mail**) server component on the **Configure Parameters and Peripherals** screen and execute the **Change** command to display a screen similar to the following:

3+Mail Configuration Ver. 1.1	Memory Used: 126970
Number of mail server processes (MSPROCS)	2
Number of processes for remote users (MSREMOTE)	1
Number of hours before forwarding time-out (MSFDEAD)	24
Maximum number of seconds before forwarding (MSFSLEEP)	60
Maximum number of users (MSMBXLIM)	64
Maximum sleep cycles for remote servers (MSFRSLEEP)	5

Use the Up/Down cursor keys to position the cursor at the parameter you want to change, then type in the appropriate number.

Press **[Ctrl] + [A]** to accept the values displayed and return to the **Configure Parameters and Peripherals** screen.

Press **[Esc]** to cancel the changes you have made and return to the **Configure Parameters and Peripherals** screen.

### 3+Mail Parameters

Table 5-7, shows the range of values and the amount of memory required for each parameter on the **3+Mail Configuration** screen. The following paragraphs describe each of the parameters listed on the **3+Mail Configuration** screen, the considerations involved in selecting the appropriate values, and the effect of those selections on network performance and memory usage.

**Table 5-7. 3+Mail Configuration Parameters**

Parameter	Range	Bytes
Number of mail server processes (MSPROCS)	1 to 10	12000*
Number of processes for remote users (MSREMOTE)	0 to MSPROCS-1	
Number of hours before forwarding time-out (MSFDEAD)	1 to 32767	
Maximum number of seconds before forwarding (MSFSLEEP)	1 to 32767	
Maximum number of users (MSMBXLIM)	1 to 32767	0 or 65
Maximum sleep cycles for remote servers (MSFRSLEEP)	1 to 32767	

\* Each MSPROC requires 8762 bytes on an Ethernet 3Server.



**CAUTION:** It is essential that you read *and understand* the explanations provided for each parameter that you change, otherwise you may seriously impair or halt the operation of your Mail service.

## **Number of mail server processes (MSPROCS)**

Range: 1 to 10

An **MSPROC** is a Mail server process. Each process supports a single user either sending mail to, or retrieving mail from, the server.

This parameter specifies the maximum number of simultaneous Mail server processes that can be handled by this server. A Mail server process is activated only while a user is actually sending or receiving mail messages. Each Mail server process requires 12000 bytes of memory on a PC server or a Token Ring 3Server. An Ethernet 3Server requires 8762 bytes per Mail server process.

The number of Mail server processes may need to be increased if there are a large number of Mail service users on this server, or if your network environment is especially mail intensive. As a rule, 20 to 40 users can be accommodated by each mail server process.

## **Number of processes for remote users (MSREMOTE)**

Range: 0 to the number of MSPROCS-1

**MSREMOTE** is the maximum number of Mail server processes that can be used to support remote users.

A remote user takes longer to send or receive mail than a user connected directly to the network. Therefore, the **MSREMOTE** value should be less than the value of **MSPROCS**, so that there are at least a few Mail service processes that can be used on the network. If *all* mail users on this server are remote users, then these two values may be the same.

## **Number of hours before forwarding time-out (MSFDEAD)**

Range: 1 to 32767

**MSFDEAD** is the number of *hours* that the server will try to forward mail to other servers (local and remote) before the mail is considered dead (undeliverable). Undelivered mail is returned to the sender with a message indicating that it was not delivered after forwarding failed for this amount of time.

## **Maximum number of seconds before forwarding (MSFSLEEP)**

Range: 1 to 32767

**MSFSLEEP** is the number of *seconds* that the Mail server will wait (sleep) before forwarding any mail it has collected for other Mail servers on the same network. This number approximates the maximum time delay that a user may experience when sending mail to a user on another server on the same network.

## **Maximum number of users (MSMBXLIM)**

Range: 1 to 32767

**MSMBXLIM** is the **Mail Service Mail BoX LIMit**, or the maximum number of users that can be assigned to the Mail service on this server. Each mail box requires 65 bytes of memory.

This parameter is ignored if you are running the 5 User version of 3+Mail. That version automatically defaults to 5 users.

## **Maximum sleep cycles for remote servers (MSFRSLEEP)**

Range: 1 to 32767

**MSFRSLEEP** is the number of cycles that the Mail server will wait (sleep) before forwarding any mail it has for remote servers (i.e., other networks). For example, if MSFSLEEP is set to 60 seconds and MSFRSLEEP is set to 5, the server forwards mail to remote servers on every fifth cycle, or every 5 minutes (60 seconds x 5 cycles).

## 3+Remote

The 3+Remote section of your Configuration Report should appear similar to the following. The parameters displayed on this section of the report and their effect on network operation is described in the next section.

```
*****  
3+Remote Configuration Report:  
Memory Used: 49888 (49K)  
Buffers : 2  
COM1: Modem HAYES, BaudRate 2400, TimeOut 5  
*****
```



**NOTE:** If you plan to install 3+Route on the server, do not install 3+Remote (the dial-in remote service). 3+Route provides all the capabilities of the dial-in remote service, and also supports communications between networks.

### 3+Remote Configuration

Highlight the **3+Remote** server component on the **Configure Parameters and Peripherals** screen and execute the **Change** command to display a screen similar to the following:

```
3+Remote Configuration Ver. 1.1.1      Memory Used: 57637

COM1 HAYES 1200 0
COM2 HAYES 2400 5
COM3 unused
COM4 unused
COM5 unused

Configure
1. COM1:
2. COM2:
3. COM3:
4. COM4:
5. COM5:
6. Buffers
```

The status of the server's RS-232C serial ports is displayed on the left. A menu for selecting ports and the buffers parameter is displayed on the right. All of these ports can be configured as remote communications ports unless they are used for serial printers. Each configured modem requires 4352 bytes of memory.

Use the Up/Down cursor keys to highlight the port you want to configure, or parameter you want to set, and press **[Enter]** or just type in the appropriate number. The COM ports should be configured before the buffers parameter.

As each port is configured you will be returned to this screen to allow you to select another port. Press **[Ctrl] + [A]** to accept the configurations entered and return to the **Configure Parameters and Peripherals** screen. You can reset a port's parameters by selecting the port and pressing **[Del]** (delete) or **[<-]** (backspace).

If you select a COM port, the next screen displayed is the **COM Port Configuration Menu** on the next page. If you select the **Buffers** parameter, the next screen displayed is on page 5-94.

## 3+Remote Port Configuration

Highlight a port on the **3+Remote Configuration** screen and press **[Enter]** to display a screen similar to the following:

```
3+Remote Configuration Ver. 1.1.1           Memory Used: 57637
COM Port Configuration Menu

COM1:
Modem Type           HAYES
Baud Rate            1200
Timeout              5
```

The **COMn:** line displays the designation of the port selected from the previous screen. If the selected port has previously been configured, the remaining three lines display the current configuration. Otherwise these lines will display the default values shown above (i.e., HAYES, 1200, 5).

Use the Up/Down cursor keys to position the cursor at the parameter you want to configure or change, then type in the appropriate entry.

Press **[Ctrl] + [A]** to accept the values displayed and return to the **3+Remote Configuration** screen.

Press **[Esc]** to cancel all the configurations you have made and return to the **Configure Parameters and Peripherals** screen.



**CAUTION:** Pressing **[Esc]** causes the adjustments made to *all* COM port configurations (if any) to be cancelled. You must make and accept adjustments to each COM port individually, but *all* changes to 3+Remote are cancelled by pressing **[Esc]**.

### 3+Remote Parameters

Table 5-8 shows the range of values for each parameter on the **COM Port Configuration Menu**. The following paragraphs describe each of the parameters listed on the **COM Port Configuration Menu**, the considerations involved in selecting the appropriate values, and the effect of those selections on network performance.

**Table 5-8. COM Port Configuration Parameters**

Parameter	Range
Modem Type	Hayes, Fastlink, Trailblazer, MicroCom, Other, or Null
Baud Rate	300 to 9600 baud
Timeout	0 to 90 minutes



**CAUTION:** It is essential that you read *and understand* the explanations provided for each parameter that you change, otherwise you may seriously impair or halt remote communications with your network.

## Modem Type

Range: HAYES, MICROCOM, FASTLINK,  
TRAILBLAZER, OTHER, NULL .

When you highlight the **Modem Type** parameter on the **Port Configuration Menu**, the box at the bottom of the screen displays a list of modem types. Enter a modem type from the list displayed.

The **HAYES** modem designation includes the Hayes SmartModem 1200, 1200B, 2400, 2400B, and Hayes-compatible modems.

The **FASTLINK** and **TRAILBLAZER** modems may be operated only at 9600 baud. See the release notes for additional information on performance optimization techniques for these modems.

The **MICROCOM** modem designation includes the MicroCom SX/1200 or SX/2400.

The **OTHER** modem designation is used for modems that employ different dialing conventions than the Hayes or MicroCom modems.

You may need to initialize the **OTHER** modem using a terminal emulator program so that the modem hangs up when the personal computer drops the DTR (data terminal ready) signal. The modem should return a high Carrier Detect signal when a connection is established and a low when the connection is dropped. (Refer to the manual that came with your modem for more detailed information.)

Use the **NULL** modem selection for manual dial modems or for any serial port connected to another serial port by a direct RS-232C null modem cable.

## **Baud Rate**

Range: 300, 1200, 2400, 4800 or 9600 baud

When you highlight the **Baud Rate** parameter on the **COM Port Configuration Menu**, the box at the bottom of the screen displays a list of acceptable baud rates. Enter a baud rate selection from the list displayed.

The baud rate is the speed at which data is transmitted over the line. Use the maximum speed allowed by the modem that gives the fewest errors (retransmissions).

When using a NULL modem connection, you may set the baud rate to 19200 baud when connecting two 80286-based machines, two 3Servers, or any other two machines with faster clock rates. This rate may be used only for the type of NULL modem connections described. There may be some serial overruns at 19200 baud if the server handles a lot of disk I/O and network traffic. Check your status log to see if overruns are occurring. If overruns become a problem, change the rate to 9600 baud.

## **Timeout**

Range: 0 to 90 (minutes)

When you highlight the **Timeout** parameter on the **COM Port Configuration Menu**, the box at the bottom of the screen displays an explanation of this parameter.

Timeout is the time (in minutes) the modem will wait before hanging up. It is measured from the last activity on the line. Specifying zero (0) tells the modem not to hang up (disconnect) due to inactivity on the line.

## 3+Remote Buffers Configuration

Highlight the **Buffers** parameter on the **3+Remote Configuration** screen and press **[Enter]** to display a screen similar to the following:

```
3+Remote Configuration Ver. 1.1.1      Memory Used: 57637
Number of receive buffers      2
```

This parameter specifies the number of receive buffers used by 3+Remote. Each receive buffer uses 1600 bytes of memory. The number of receive buffers can affect the performance of your network. Additional receive buffers will usually improve the performance of the communications link.

### Receive buffers = 1 + number of configured ports

The number of receive buffers should be at least one more than the number of configured ports. Enter a number from 2-8.

Press **[Ctrl] + [A]** to accept the value displayed and return to the **3+Remote Configuration** screen.

Pressing **[Esc]** will cancel all configurations you have made and return you to the **Configure Parameters and Peripherals** screen.



**CAUTION:** Pressing **[Esc]** causes the adjustments made to *all* COM port configurations (if any) to be cancelled. You must make and accept adjustments to each COM port individually, but *all* changes to 3+Remote are cancelled by pressing **[Esc]**.

### 3+Route

The 3+Route section of your Configuration Report should appear similar to the following. The parameters displayed on this section of the report and their effect on network operation are described in the following section.

```
*****
                                     3+Route Configuration Report:
Memory Consumed:  57K
Buffers:          3
COM 1:   Modem HAYES, Baud Rate 1200, TimeOut 5

Route 1: Network 000401E1, Phone (9),-970-1895
TimeOut 3, COM Port 1
Comment
[00:00 - 00:59 MTWTFSS]  [00:00 - 00:00 MTWTFSS]
[00:00 - 00:00 MTWTFSS]  [00:00 - 00:00 MTWTFSS]
[00:00 - 08:08 MTWTFSS]  [00:00 - 00:00 MTWTFSS]
[00:00 - 00:00 MTWTFSS]  [00:00 - 00:00 MTWTFSS]

Route 2: Network 000401E1, Phone (9),-970-1895
TimeOut 3, COM Port 2
Comment
[01:00 - 01:59 MTWTFSS]  [00:00 - 00:00 MTWTFSS]
[00:00 - 00:00 MTWTFSS]  [00:00 - 00:00 MTWTFSS]
[00:00 - 08:08 MTWTFSS]  [00:00 - 00:00 MTWTFSS]
[00:00 - 00:00 MTWTFSS]  [00:00 - 00:00 MTWTFSS]
*****
```



**NOTE:** If you install 3+Route on the server, do not install 3+Remote (the dial-in remote service). 3+Route provides all the capabilities of the dial-in remote service and also supports communications between networks.

## 3+Route Configuration

Highlight the **3+Route** server component on the **Configure Parameters and Peripherals** screen and execute the **Change** command to display a screen similar to the following:

```
3+Route Configuration Ver. 1.1.1           Memory Used: 57637

COM1 HAYES 1200 5
COM2 HAYES 2400 5
COM3 unused
COM4 unused
COM5 unused

Configure
1. COM1:
2. COM2:
3. COM3:
4. COM4:
5. COM5:
6. Buffers
7. Dial-Out Routes
```

This menu displays the status of the server's serial ports (RS-232C) on the left. A menu for selecting ports, the buffers parameter, and dial-out routes is displayed on the right. All of these ports can be configured as network communications ports.

Use the Up/Down cursor keys to highlight the port you want to configure or parameter you want to set and press **[Enter]** or just type in the appropriate number.

As each port is configured you will be returned to this screen to allow you to select another port. When you have configured all the necessary ports, press **[Ctrl] + [A]** to accept the configurations entered and return to the **Configure Parameters and Peripherals** screen.

Press **[Esc]** to cancel all the changes you have made (if any) and return to the **Configure Parameters and Peripherals** screen. You can reset a port's parameters or deconfigure a route entry by selecting the port or route and pressing **[Del]** (delete) or **[<-]** (backspace).

If you select a COM port to examine or configure, the next screen displayed is the **COM Port Configuration Menu**. Refer to the **3+Remote** section (page 5-90) for detailed instructions.

If you select the **Buffers** parameter, refer to the **3+Remote** section (page 5-94) for detailed instructions on setting the buffers parameter.

If you select **Dial-Out Routes**, the next screen is shown below.

### 3+Route Route Configuration

Highlight the **Dial-out Routes** parameter on the **3+Route Configuration** screen and press **[Enter]** to display a screen similar to the following:

```
3+Route Configuration Ver. 1.1.1           Memory Used: 57637

Route 1  40E41  408-555-5555
Route 2  unused
Route 3  unused
Route 4  unused
Route 5  unused

Configure
1. Route 1
2. Route 2
3. Route 3
4. Route 4
5. Route 5
6. Previous
7. Next
```

This screen displays the status of the first five possible communications routes on the left and a window for selecting the route to be configured on the right. As many as 50 different routes may be specified. Use the "Previous" and "Next" selections to display the other routes.

Use the Up/Down cursor keys to highlight the route you want to configure and press **[Enter]** or just type in the appropriate number. When you select a route to configure, the **Route Configuration Menu** shown on the next page is displayed.

When you have configured the necessary routes, press **[Ctrl] + [A]** to accept the route configurations entered and return to the **3+Route Configuration** screen.

Pressing **[Esc]** will cancel all the COM port, buffer, and route configurations you have made to this point and return you to the **Configure Parameters and Peripherals** screen.

Highlight a route on the previous screen and press **[Enter]** to display a **Route Configuration** screen similar to the following:

```
3+Route Configuration Ver. 1.1.1 Memory Used: 57637
Route Configuration

Route 1:
Comment      Route to Headquarters
Network Number 40E41
Phone Number 408-555-5555
COM Port     ANY
Timeout      3
Schedules    00:00 - 23:59 MTWTFSS    00:00 - 00:00 MTWTFSS
              00:00 - 00:00 MTWTFSS    00:00 - 00:00 MTWTFSS
              00:00 - 08:08 MTWTFSS    00:00 - 00:00 MTWTFSS
              00:00 - 00:00 MTWTFSS    00:00 - 00:00 MTWTFSS
```

The **Route n:** line displays the designation of the route selected from the previous screen. If this route has previously been configured, the remaining lines display the current configuration. Otherwise these lines will contain the defaults.

Use the Up/Down cursor keys to position the cursor at the parameter you want to change, then type in the appropriate entry. As you highlight each parameter, a box at the bottom of the screen displays an explanation of that parameter.

Press **[Ctrl] + [A]** to accept the values displayed. As each route is configured you will be returned to the previous screen to allow you to select another route to configure.

Pressing **[Esc]** will cancel all the COM port, buffer, and route configurations you have made to this point and return you to the **Configure Parameters and Peripherals** screen.



**CAUTION:** Pressing **[Esc]** causes the configurations made for *all* COM ports and *all* routes to be cancelled. You must make and accept configurations for each COM port and each route individually, but *all* changes to 3+Route are cancelled by pressing **[Esc]**.

### 3+Route Parameters

Table 5-9 shows the range of values and the amount of memory required for each parameter on the **Route Configuration** screen. The following paragraphs describe each of the parameters listed on the **Route Configuration** screen, the considerations involved in selecting the appropriate values, and the effect of those selections on network performance and memory usage.

**Table 5-9. Route Configuration Parameters**

Parameter	Range	Bytes
Comment	80 characters	80
Network Number	8 hex characters	8
Phone Number	49 digits	49
COM Port	ANY, COM1-5	
Timeout	0 to 90 (min)	
Schedules	0 to 23 (hrs)	
	0 to 59 (min)	
	MTWTFSS (day)	



**CAUTION:** It is essential that you read *and understand* the explanations provided for each parameter that you change, otherwise you may seriously impair or halt internetwork communications.

## Comment

Range: 80 characters

Enter a comment line describing this route. The comment may be up to 80 characters long, for example: "Route to NY office".

## Network Number

Range: Up to 8 hexadecimal digits (0-9, A-F)

A **network number** is a unique sequence of hexadecimal digits (0-9, A-F) that identifies each network. Every network has a unique network number that is printed on the label of the *3+Share Server/Name* diskette.

The network number specified in this parameter is the number of the network with which you want to communicate, *not* your network number. Consult the remote network's Administrator to obtain the correct number for that network.

## Phone Number

Range: 49 digits

Enter the **phone number** the Route service must dial to reach the other network. Special characters like dashes (-) or spaces are generally supported by modems. A comma (,) indicates a pause for Hayes and Hayes-compatible modems. Other special command characters may also be inserted, such as P to designate pulse dialing instead of tone (DTMF) dialing.

In specifying the phone number in a Route entry where an OTHER modem is used, the dial command should be combined with the phone number. The modem should also be initialized to auto-answer mode to allow incoming phone calls. Check your modem manual for specific instructions.

## COM Port

Range: ANY, COM1, COM2, COM3, COM4, COM5

If this route is to use a specific modem attached to one of the previously configured server communications ports, enter the **COM Port** number of that port. If this route can use any configured communications port, use the default value, ANY.

When using a manual dial modem for 3+Route, you must dedicate that modem to only one network at a time for dial-out use. The **COM Port** to which the manual dial modem is assigned must have been configured as a NULL modem type.

Refer to the *3+ Administrator's Guide* for instructions on manually dialing the modem when you want to communicate with the dedicated remote network. After dialing manually, you should use the link promptly; an inactivity timeout may occur after the specified time period elapses.

Remember to specify the baud rate as the effective rate of the connection, since no baud rate detection is done for a NULL modem. Also, manually configure your modem to enable the auto-answer capability.

## Timeout

Range: 0 to 90 minutes

**Timeout** is the period of inactivity that the modem will wait before hanging up (disconnecting the line). It is measured from the last data transmission on the line. Specifying zero (0) tells the modem not to hang up (disconnect) due to inactivity.

## Schedules

Range: 0 to 23, 0 to 59, MTWTFSS

The **schedule** allows you to enter up to eight time periods, or "windows", during which this route can be activated. You can also specify which day (or days) of the week each of the eight windows is valid.

To specify the beginning and ending times and the effective days for each window, use the **[PgUp]** and **[PgDn]** keys to position the cursor at the desired schedule. The times and days are entered from left to right as described below.

1. Enter a number from 0-23 for the starting hour.
2. Enter a number from 0-59 for the starting minute.
3. Enter a number from 0-23 for the ending hour.
4. Enter a number from 0-59 for the ending minute.
5. Enter 7 letters or spaces

The last field is a "mask" that indicates which days of the week the preceding time period is valid. If you want the time period to be valid for every day of the week, the mask should read "MTWTFSS". If you want the time period to be valid only on normal working days, the mask should read "MTWTF\_\_" (the last two spaces must be blank). If you want the time period to be valid only on Monday, Wednesday, and Friday, the mask should read "M\_W\_F\_\_". You can use X instead of the actual letters. A space means not valid for that day, anything else means valid for that day.

## 3+Start

The 3+Start section of your Configuration Report should appear similar to the following. The parameters displayed in this section of the report and their effect on network operation are described in the next section.

```
*****  
3+Start Configuration Report:  
Maximum number of start volumes:      8  
Maximum number of start users:        8  
Maximum number of receive buffers:    6  
*****
```

Installing 3+Start and setting up a 3+Start volume on the server is described in the *3+ Administrator's Guide*.

### 3+Start Configuration

Highlight 3+Start on the **Configure Parameters and Peripherals** screen and execute the **Change** command to display a screen similar to the following:

3+Start Configuration Ver. 1.1	Memory Used: 51920
Maximum number of start volumes	8
Maximum number of start users	8
Maximum number of receive buffers	6

Use the Up/Down cursor keys to position the cursor at the parameter you want to configure or change, then type in the appropriate entry.

Press **[Ctrl] + [A]** to accept the values displayed and return to the **Configure Parameters and Peripherals** screen.

Press **[Esc]** to cancel the changes you have made (if any) and return to the **Configure Parameters and Peripherals** screen.

### 3+Start Parameters

Table 5-10 shows the range of values and the amount of memory required for each parameter on the **3+Start Configuration** screen. The following paragraphs describe each of the parameters listed on the **3+Start Configuration** screen, the considerations involved in selecting the appropriate values, and the effect of those selections on network performance and memory usage.

**Table 5-10. 3+Start Configuration Parameters**

Parameter	Range	Bytes
Maximum number of start volumes	1 to 128	134
Maximum number of start users	1 to 128	20
Maximum number of receive buffers	1 to 100	2560



**CAUTION:** It is essential that you read *and understand* the explanations provided for each parameter that you change, otherwise you may seriously impair or halt the operation of your workstation.

## Maximum Number of Start Volumes

Range: 1 to 128

A 3+Start **volume** is a disk file that is an image of a 360 KB floppy diskette. This floppy diskette image contains the startup configuration for a particular workstation (or set of workstations).

This parameter specifies the maximum number of 3+Start volumes allowed on this server. Each 3+Start volume designation requires 134 bytes of memory.

## Maximum Number of Start Users

Range: 1 to 128

A 3+Start **user** is a workstation with an EtherStart chip installed. The EtherStart chip allows the workstation to boot from the file(s) contained in a selected start volume.

This parameter specifies the maximum number of 3+Start users allowed on this server. Each user requires 20 additional bytes of memory.

## Maximum Number of Receive Buffers

Range: 1 to 100

This parameter specifies the number of **receive buffers** used by 3+Start. Each receive buffer uses 2560 bytes of memory. The number of 3+Start receive buffers can affect the performance of your network. Additional buffers can improve performance if multiple users start their workstations simultaneously.

The more receive buffers allocated, the more backlog requests the 3+Start server can service. The default value of 6 receive buffers is enough to handle about 10-14 users. There is no formula to calculate the optimum number of buffers, but generally, one buffer should be allocated for each 2 or 3 users.

## Modify Disk and Memory Allocation

Selection 5 on the 3INSTALL main menu, **Modify Disk and Memory Allocation**, displays a screen similar to the one shown below. This screen shows the logical-to-physical disk drive assignments, the EMS CIOSYS memory allocation if the EMS option is installed on this server, and the concurrent user memory allocation if this is a PC server.

The CIOSYS section of the Configuration Report (see page 5-25) displays which physical disk drive each logical disk drive (partition) is a part of, as well as the EMS and concurrent user memory allocations. Parameters displayed on this screen and their effect on network operation are described in the following section.

CIOSYS Configuration Program Ver. 1.1.1

	NET/ DRIVE	PHYS LOCAL	PHYS DRIVE		NET/ DRIVE	PHYS LOCAL	PHYS DRIVE
A	L	**					
B	L	**					
C	N	1					
D	N	1					
E	N	1					
F	N	2					
G	N	2					
H	N	2					

EMS to be used by CIOSYS 1024  
Concurrent user memory 0

EMS available (in K) 2048

This screen allows you to specify what server drives are to be accessible by network services and the amount of memory to be reserved for a concurrent user.

Use the cursor keys to highlight the **NET/LOCAL** field next to the drive identifier you want to change. Type either an **N** or an **L** in this field. An **N** specifies that this disk drive should be used as a Network drive. An **L** specifies that this drive should be used as a Local (non-Network) drive. The drive that contains the 3+ software must be a network drive.

CIOSYS assumes that logical drives with the same number in the **PHYS DRIVE** field are part of the same physical disk drive. CIOSYS uses this information to optimize movement of the disk drive's read/write heads. To change the physical drive assignments, use the cursor keys to highlight the logical drive you want to change and press **[+]** (plus) to give the logical drive a higher physical drive number (or create a new one if there are none higher). Pressing **[-]** (minus) will assign a logical drive an already existing lower physical drive number.

### **EMS Memory Used by CIOSYS/TurboShare**

The EMS option for a PC server consists of a memory board compatible with the Lotus-Intel-Microsoft Expanded Memory Specification (EMS), an EMM device driver, and 3+TurboShare software. To install the EMM device driver, consult the EMS board documentation.

If the EMS option is installed in this server, the EMS memory can be used by CIOSYS for cache buffers or by concurrent user applications, but not by both at the same time.

The first field in the upper right-hand corner of the **CIOSYS Configuration** screen (shown on page 5-108) displays the amount of EMS memory allocated for CIOSYS cache buffers. If this field is set to any value other than zero (0), all EMS memory is reserved exclusively for use by CIOSYS cache buffers; however, only the amount displayed is actually used by CIOSYS. A value of zero (0) in this field indicates that all the EMS memory is available for concurrent user applications.

## **Memory Allocated to a Concurrent User**

The second field displays the amount of system memory, if any, allocated to a concurrent user (in KB). A value of zero (0) in this field indicates that no system memory is allocated for a concurrent user. A concurrent user can exist only on a PC server; therefore, this field will always be zero (0) for 3Servers.

In addition to system memory, EMS memory can also be used by concurrent user applications; however, the first field must be set to zero (0). If *any* EMS memory is allocated to CIOSYS, then *none* is available for concurrent user applications.

The third field shows the total amount of EMS memory available on the server (in KB). This field is not displayed if the EMS option is not installed.

Press **[Ctrl] + [A]** to accept the values displayed. You will be returned to the **CIOSYS Function Selection** screen.

Press **[Esc]** to cancel all changes. The values revert to the last "accepted" or "kept" configuration and you are returned to the **Configure Parameters and Peripherals** screen.

**Table 5-11. 3+Install Configuration Parameters**

Parameter	Range	Bytes	Guidelines
<b>CIOSYS</b>			
Maximum number of byte range locks (L)	1 to 3000	16	≥ 4 times the number of users
Maximum number of file descriptors (F)	35 to 1000	46	≥ 7 times the number of users
Maximum number of file handles (C)	20 to 1500	28	≥ 5 times the number of users
Maximum number of threads (T)	1 to 10	1074	PC-XT=1, PC-AT=4, 3Server=7
Maximum number of file sharing procs (P)	20 to 300	10	≥ 1 (users) + 1 (services) + 10
Maximum number of I/O request blocks (D)	32 to 200	40	
<b>3+SHARE - FILE</b>			
Maximum number of users (U)	1 to sharenames	64	< the number of "sharenames"
Maximum number of sessions (N)	1 to 240	320	≥ Max # of simultaneous users
Maximum number of links (C)	1 to 999	48	≥ 4 times # simultaneous users
Maximum number of sharenames (S)	(U)+1 to 520	128	≥ 4 times the number of users
Maximum number of print queue entries (E)	0 to 999	48	≥ 3 times the number of users
Number of message buffers (M)	2 to 6*		≥ 1 + Max Concurrent Requests
Maximum number of concurrent requests (P)	1 to 9	4096	< Number of Message Buffers
Message buffer size (B)	1072 to 8240	M(B+16)	
Number of packet receive buffers (R)	4 to 66	1630	use suggested "typical" value
Number of packet transmit buffers (T)	2 to 66	144	use suggested "typical" value

\* Refer to parameter description.

continued

**Table 5-11. 3+Install Configuration Parameters**

continued

Parameter	Range	Bytes	Guidelines
<b>3+SHARE - PRINT</b> Configure as network printer? Description Form type Print banners? Eject pages between jobs? Translate IBM to LaserJet * Baud rate * Parity * Protocol type * Retry count Buffer size Interrupt driven? Interrupt level * Reset retries Change reset sequence? Reset sequence	Y or N 30 characters 1 to 99 Y or N Y or N 0 to 15 50 to 9600 see page 5-67 see page 5-68 10 to 99 512 to 8192 Y or N 0, 2 to 5 10 to 99 Y or N see page 5-70		Y = shared printer.
<b>3+NAME</b> Network Number Domain Organization Domain Limit Open Domain Limit Buffers Offset From Prime Meridian Time Zone DST Zone Month/Day DST Begins Month/Day DST Ends	8 characters 20 characters 20 characters 5 to 500 4 to 100 20 to 125 720 to -720 see Table 5-6 see Table 5-6 01/01 to 12/31 01/01 to 12/31	8 20 20 112 32 544	from 3+Name Service Diskette User defined value User defined value default value is 5 $\geq (\text{Domain Limit}/5)$ $> 5$ times Open Domain Limit

\* Refer to parameter description.

contin

**Table 5-11. 3+Install Configuration Parameters**

continued

Parameter	Range	Bytes	Guidelines
<b>3+MAIL</b> Number of mail server processes (MSPROCS) Number of processes for remote users Number of hours before forwarding timeout Maximum number of seconds before frwrding Maximum number of users Maximum sleep cycles for remote servers	1 to 10 0 to MSPROCS-1 1 to 32767 1 to 32767 1 to 32767 1 to 32767	12000*    0 or 65	(* 8762 on an Ethernet 3Server) < MSPROCS   = number of users number of cycles of MSFSLEEP
<b>3+REMOTE (Port Configuration)</b> Modem Type (Hayes, Fastlink, Trailblazer, MicroCom) Baud Rate Timeout Buffers	(Type listed) Other, Null 300 to 9600 0 to 90 2 to 8	1600	
<b>3+ROUTE</b> Comment Network Number Phone Number COM Port Timeout Schedules	80 characters 8 characters 49 digits ANY, COM1-COM5 0 to 90 (min) 0 to 23 (hrs) 0 to 59 (min) MTWTFSS (day)	80 8 49	
<b>3+START</b> Maximum number of start volumes Maximum number of start users Maximum number of receive buffers	0 to 128 0 to 128 0 to 100		

\* Refer to parameter description.

## **Appendix A: Error Messages**

The following error messages are returned from the 3+ Installation and Configuration programs to the PC server terminal and/or the 3Server LCD display.

If you receive an error message that does not appear in this Appendix, or in the *3+ Administrator's Guide*, contact your 3Com network supplier.

Note that if the Action to an error suggests that you adjust or reconfigure any of the service parameters, please refer to Chapter 5 of this guide for detailed information.

**ACP: not enough memory.**

Meaning	There isn't enough memory to run the current Route and/or Remote configuration.
Action	Reconfigure the Route/Remote server parameters to enable the Route/Remote configuration to work within your current memory restrictions. You can also adjust other parameters to allow more memory for the present Route/Remote configuration. See Chapter 5 of this guide for more information.

**Cannot DE-INSTALL non-existent service.**

Meaning	You are trying to deinstall a service that is not recognized as being installed.
Action	Check the 3INSTALL program's menu of installed services to review which services are actually installed on the server.

**Cannot start up in concurrent server mode.**

**Meaning**            The files that allow the PC server to be used as a concurrent workstation are missing.

**Action**            Copy the following files from the *3+Share User #1* diskette to the \3ROOT directory on the server's hard disk:

NB.COM  
MINSES.EXE  
MSREDIR.EXE  
SETNAME.EXE  
PRTSC.EXE

When the files have been successfully copied to the \3ROOT directory, copy the following files from the *3+Share User #2* diskette to the \3ROOT directory on the server's hard disk:

3F.EXE  
3N.EXE  
3P.EXE

When all files have been successfully copied to the \3ROOT directory, reboot the server.

If the problem persists, reinstall the 3+ software using the INSTALL program described in Chapter 2 of this guide.

### **CIOSYS Failure!**

Meaning	An LCD message specifying that a fatal error occurred during initialization.
Action	<p>Since there are several error conditions that could cause this message to be displayed, it is important to look up the specific error message that displays <i>before</i> this message and follow the actions given.</p> <p>If you are using a 3Server or 3Server3 and do not have a Local console (LCONSOLE) connected, refer to Appendix F of this guide, or your 3Server guide, for instructions on connecting one. A Local console will allow you to view messages on the screen display.</p>

### **Cluster mismatch.**

Meaning	All drives specified in the same buffer pool must have the same number of sectors per cluster. This message indicates that a drive has a different number of sectors per cluster than the rest of the drives in the pool.
Action	Run 3INSTALL and reconfigure your system hardware and CIOSYS. See Chapter 5 of this guide for more information.

**Component does not allow parameter tuning.**

- Meaning        You have attempted to tune a service that does not exist in the SERVICES.DAT file.
- Action         There are no parameters to tune with this service. No action required.

**Copy protection failure.**

- Meaning        You have attempted to run a 3+ service on a server other than the one on which it was installed, or you have incorrectly installed a 3+ service.
- Action         Run 3+ services only on the server on which they were installed. If this error occurred during installation, install the service again according to the instructions in this guide.

**Couldn't back up PORT File.**

- Meaning        The server's disk is full; therefore, 3INSTALL could not make a copy of the data file SYSTEM.CFG.
- Action         Make more disk space available by deleting any unnecessary files (be careful you do not delete any necessary files). See Appendix B of this guide for listings of required files.

**Couldn't find data file: '<file>'.**

**Meaning**            3INSTALL could not find the specified data file.

**Action**            If the specified file is SERVICES.DAT, you can copy the file back to the server using one of the methods below, depending on which server you are using. If the specified file is not SERVICES.DAT, contact your 3Com network supplier.

**If you are using a 3Server**, copy and rename the file SRV3S.DAT from the *3+ Installation #3 (3INSTALL)* diskette to  
\\3PLUS\3CONFIG\SERVICES.DAT.

**If you are using a PC server**, copy and rename the file SRVPC.DAT from the *3+ Installation #3 (3INSTALL)* diskette to  
\\3PLUS\3CONFIG\SERVICES.DAT.

**Couldn't open <filename>.**

- |         |  |
|---------|--|
| Meaning | The program could not open the specified file. This error can occur if DOS attempts to open a file that does not exist, if too many files were already open, or if the file simply could not be opened. This error will exit the program and return you to DOS.  |
| Action  | <ol style="list-style-type: none"><li>1. Check the <b>FILES=x</b> line in the CONFIG.SYS file. Increase the x parameter to allow more files to be open concurrently. See Chapter 5 of this guide for more information.</li><li>2. Verify that the specified file exists. If it does, retry the operation; if you get the same error message, contact your 3Com network supplier.</li></ol> |

**Couldn't Write to CONFIG data file.**

- |         |   |
|---------|---|
| Meaning | An attempt to write to the data file used to hold CONFIG.SYS information failed, possibly because the disk is full.   |
| Action  | You can verify whether or not the disk is full by using the DOS DIR command and checking how many bytes are left. Make more disk space available by deleting any unnecessary files (be careful you do not delete any necessary files). See Appendix B of this guide for listings of required files. |

**Couldn't Open Configuration Library: <filename>.**

**Meaning**            The configuration library specified in the SERVICES.DAT file could not be found.

**Action**            If <filename> is 3INSTALL.LIB you can copy the file from the 3+ *Installation #3 (3INSTALL)* diskette back to the server; however, if <filename> is not 3INSTALL.LIB, reinstall the software. Follow one of the methods below to copy 3INSTALL.LIB to the server.

**If you are using a 3Server**, copy the file 3INS3S.LIB from the diskette to the file  
\\3PLUS\3CONFIG\3INSTALL.LIB.

**If you are using a PC server**, copy the file 3INSPC.LIB from the diskette to the file  
\\3PLUS\3CONFIG\3INSTALL.LIB

If the problem persists, contact your 3Com network supplier.

**Directory <name> does not exist, err=<number>.**

**Meaning**            Either the specified directory does not exist or there is something wrong with CIOSYS.

**Action**            Verify whether or not the specified directory exists. If the directory does not exist, create it using the DOS MKDIR command.

If the directory does exist, check the network disk using the DOS CHKDSK command. If no problems are found, reinstall and try again; otherwise, contact your 3Com network supplier.

**DISK ERROR FROM: "<command>".**

**Meaning**            A disk I/O error was returned by the service indicating that the disk is full.

**Action**            Make more disk space available by deleting any unnecessary files (be careful you do not delete any necessary files). See Appendix B of this guide for listings of required files.

**Entry in share list file adds one too many users.**

**Meaning**            You have exceeded the allowable number of users specified for the 3SHARE Number of Users parameter.

**Action**            There are two versions of 3+Share: **5 User**, which allows up to 5 users on the server, and **N User**, which allows an unlimited number of users on the server. If you have not already done so, install the N User version of 3+Share. Use 3INSTALL to reconfigure the 3SHARE parameters to allow more users. See Chapter 5 of this guide for more information.

**Entry in share list names nonconfigured printer <printername>.**

**Meaning**            The 3SHARE parameters referenced a nonconfigured printer.

**Action**            Use 3INSTALL to reconfigure the 3SHARE parameter to recognize the printer; then reboot the server. See Chapter 5 of this guide for more information. If you do not want to use the printer, unshare it using the 3P program and then unconfigure the printer with 3INSTALL.

**ERROR in creating <filename>.**

- |         |  |
|---------|--|
| Meaning | The program could not create the specified service file. This error will exit the program and return you to DOS.                       |
| Action  | Verify that there is enough file space available and restart the operation. If the error persists, contact your 3Com network supplier. |

**ERROR in open <filename>.**

- |         |  |
|---------|--|
| Meaning | An error was encountered while opening the specified service file. This error will exit the program and return you to DOS. |
| Action  | Restart the operation; if the error persists, contact your 3Com network supplier.  |

**ERROR in reopening a file.**

- |         |  |
|---------|--|
| Meaning | An error was encountered when trying to reopen a file. This error will exit the program and return you to DOS. |
| Action  | Restart the operation; if the error persists, contact your 3Com network supplier.                              |

**Error <number> attempting to terminate and remain resident.**

Meaning            This message indicates an internal DOS error.

Action             Restart the server; if the error persists, contact your 3Com network supplier.

**Error while seeking to EOF on: "<filename>".**

Meaning            An error occurred when DOS attempted to seek (or find) the end of the specified file (EOF).

Action             Contact your 3Com network supplier.

**ETH Needs More-B**

Meaning            An LCD error message indicating that the ETH3 driver ran out of buffers on the 3Server.

Action             Increase the Number of buffers (-B) parameter in CONFIG.SYS for the ETH3 driver using 3CONSOLE (or LCONSOLE) and 3EDLIN. See Appendix F in this guide for using 3CONSOLE or LCONSOLE. See Appendix D in this guide for more information on the ETH3 parameters.

**FAT read error.**

Meaning	Errors were encountered while reading the file allocation table (FAT) for the network drive.
Action	The most common occurrence of this error is a drive that has not been turned on. Verify that all of the network drives are on-line when the server is started. If you have taken (or need to take) a drive off-line, please contact your 3Com network supplier for instructions.

**FORK: ERR(*n*): "<command>".**

Meaning	<ol style="list-style-type: none"><li>1. If '<i>n</i>' equals -1, this is a DOS error specifying that not enough memory exists or the specified service file is missing.</li><li>2. If '<i>n</i>' does not equal -1, this is an internal error returned from the service.</li></ol>
Action	<ol style="list-style-type: none"><li>1. Verify that the service specified in &lt;command&gt; exists; if not, reinstall the service. If the service does exist, allocate more memory, retry the operation, and see if the error persists.</li><li>2. Contact your 3Com network supplier.</li></ol>

**Forking Off the IRS Process.**

- |         |   |
|---------|---|
| Meaning | The Internet Routing service is terminating and staying resident. |
| Action  | None required. The 3+Route server is now in operation.            |

**Init of serial printer, which is entry <number> in configuration file, failed.**

- |         |   |
|---------|---|
| Meaning | The printer is not configured properly for the 3SHARE parameter.  |
| Action  | Verify that the hardware specifications match the printer configuration information in the 3SHARE parameter. Use the 3INSTALL program to verify and correct any discrepancies. If the problem persists, check the printer itself. |

**I/O error reading block xxx.**

- |         |  |
|---------|--|
| Meaning | During installation or deinstallation of the 3+ services, you have taken the diskette out of the drive before the batch file has completed processing. |
| Action  | Insert the diskette back into the drive and continue when the next prompt is displayed.  |

**Installation program does NOT exist!**

- Meaning**            The 3INSTALL program does not exist.
- Action**             Copy 3INSTALL.EXE from the 3+ *Installation #3* (3INSTALL) diskette to the \3PLUS\3CONFIG directory and retry the operation. If this procedure does not work, reinstall the software.

**Insuff memory.**

- Meaning**            An LCD message indicating that there is not enough memory to support the specified configuration.
- Action**             Refer to the list of standard configurations and memory requirements in this guide; then run 3INSTALL and reconfigure the service(s). If the error persists, you may need to reconfigure the system to support the specified network configuration.

**IRS: not enough memory for xmit buffer.**

- Meaning**            You do not have enough memory for 3+Route, 3+NetConnect, and/or 3+Remote.
- Action**             Reconfigure the services using 3INSTALL.

**IRS: not enough memory for receive buffers.**

Meaning        You do not have enough memory for 3+Route,  
3+NetConnect, and/or 3+Remote.

Action         Reconfigure the services using 3INSTALL.

**MINDS drivers could not be initialized.**

Meaning        The MINDS drivers have not been initialized.

Action         Make a list of the driver files (\*.SYS) in the ROOT  
directory by using the DOS DIR command. Compare  
this list to the CONFIG.SYS file (see Appendix B  
for a complete list of drivers).

Verify that the CONFIG.SYS file has included all  
the drivers. Reboot the server. If the problem  
persists, reinstall the software.

**MINDS error.**

Meaning        An error was encountered while calling the MINDS  
process manager.

Action         Verify that PRO.SYS exists in the CONFIG.SYS file  
using the DOS TYPE command (TYPE CONFIG.SYS),  
and that RUNMINDS has been executed in the  
3PLUS\_ON.BAT file. Reboot the server. If the  
problem persists, contact your 3Com network  
supplier.

**No memory for buffers.**

Meaning	The number of data buffers specified, in conjunction with the size of the File Allocation Table (FAT) needed to support the drives specified, uses more memory than the server has.
Action	Run 3INSTALL and reduce the number of CIOSYS buffers. Reboot the server .

**Not enough memory for ACP process stack.**

Meaning	There is not enough memory for the current configuration.
Action	Use 3INSTALL to reconfigure the 3+Route, 3+NetConnect, or 3+Remote service. Reboot the server.

**Not enough memory for 3Share data.**

Meaning	The 3+Share server does not have enough memory for the program data.
Action	Use 3INSTALL to review current memory usage. You can decrease the number of CIOSYS buffers to free up memory. Then reboot the server.

**Not enough memory for printer buffer of entry <number> in configuration file.**

- |         |   |
|---------|---|
| Meaning | 3+Share does not have enough memory for the specified printer.  |
| Action  | Use 3INSTALL to review current memory usage. You can decrease the number of CIOSYS buffers to free up memory, then reboot the server. |

**Not enough memory for printer queue with (*number*) entries.**

- |         |   |
|---------|---|
| Meaning | 3+Share does not have enough memory for the number of files in the printer queue.   |
| Action  | Use 3INSTALL to review current memory usage. You can decrease the number of CIOSYS buffers to free up memory, then reboot the server. |

**Not enough memory for (*number*) printers.**

- |         |   |
|---------|---|
| Meaning | 3+Share does not have enough memory for the specified number of printers.   |
| Action  | Use 3INSTALL to review current memory usage. You can decrease the number of CIOSYS buffers to free up memory, then reboot the server. |

**Not enough memory for printing.**

- Meaning        3+Share does not have enough memory for the specified number of printers.
- Action         Use 3INSTALL to review current memory usage. You can decrease the number of CIOSYS buffers to free up memory, then reboot the server.

**Not enough memory for process stacks.**

- Meaning        3+Share does not have enough memory to allocate process stacks.
- Action         Use 3INSTALL to review current memory usage. You can decrease the number of CIOSYS buffers to free up memory, then reboot the server.

**Not enough memory for user list with <number> entries.**

- Meaning        3+Share does not have enough memory to allocate the specified number of user entries.
- Action         Use 3INSTALL to review current memory usage. You can decrease the number of CIOSYS buffers to free up memory, then reboot the server.

**Not enough memory for volume list with <number> entries.**

**Meaning** 3+Share does not have enough memory to allocate the specified number of volumes.

**Action** Use 3INSTALL to review current memory usage. You can decrease the number of CIOSYS buffers to free up memory, then reboot the server.

**Not enough space for buffers.**

**Meaning** 3+Share does not have enough memory to allocate buffers.

**Action** Use 3INSTALL to review current memory usage. You can decrease the number of CIOSYS buffers to free up memory, then reboot the server.

**Nothing to Reset.**

**Meaning** You have attempted to reset the configuration parameters of a service that did not have any changed parameters.

**Action** Verify the service that does have changed parameters and reset that service.

If you changed parameters for a service and used the **Keep** command instead of the **Reset** command, you need to go back to the service(s) that you modified and manually reset them to the previous values.

**Number of share list entries, <number>, in share list file, <filename>, greater than table size <number>.**

**Meaning**            The number of shares parameter has been set too low for the number of shares on the server.

**Action**            Use 3INSTALL to increase the number of shares and reboot the server.

**Number of spooled files greater than print queue size of <number>.**

**Meaning**            Spooled print files existed when the server was shutdown and the maximum number of spooled files was reconfigured too low.

**Action**            Use 3INSTALL to increase the number of spooled files parameter and reboot the server. If the problem persists, delete all spooled files in the \3PLUS\3SHARE directory using the DOS command DEL SP\*.P\*.

### **Out of Memory!**

**Meaning**            There was not enough memory available for dynamic allocation of the service information. 3INSTALL keeps all service information in dynamic memory and allocates it as needed. This usually happens while reading the data file SERVICES.DAT at initialization, but can also happen when a service is installed.

**Action**            Allocate more memory. If you are a concurrent user, bring the server down, make more memory available for the concurrent user by using 3INSTALL to decrease the services, or install more memory if you are currently under what is specified in the requirements list in this guide.

If you are using a workstation, eliminate any resident programs, such as SideKick, and/or add more memory.

### **Parameters set too high for available memory.**

**Meaning**            This message is displayed if you have tuned parameters in such a way that too much memory is required to use the configuration and you tried to keep the parameter settings.

**Action**            You cannot keep such a configuration. The parameters must be decreased to free memory.

**pn=** (*pathname*), **sn=** (*shortname*).

**Meaning**            The share list file has conflicts or has become corrupted.

**Action**            Try recreating the specified directory using the DOS MKDIR command or contact your 3Com network supplier for assistance.

**Problem allocating stacks for processes.**

**Meaning**            3+Share does not have enough memory to allocate process stacks.

**Action**            Use 3INSTALL to review current memory usage. You can decrease the number of CIOSYS buffers or reconfigure other 3SHARE parameters to free up memory, then reboot the server.

**Problem initializing data variables.**

**Meaning**            3+Share does not have enough memory to initialize the data variables.

**Action**            Use 3INSTALL to review current memory usage. You can decrease the number of CIOSYS buffers to free up memory, then reboot the server.

**Problem initializing network interface.**

- Meaning            Either 3+Share does not have enough memory to load and initialize MINDS, or there is a problem with the MINDS drivers.
- Action             Run 3INSTALL to reconfigure the 3SHARE parameters. Use the DOS TYPE command to display the CONFIG.SYS file and make sure it contains all the MINDS drivers (see Appendix D of this guide). If the problem persists, reinstall the software.

**Read error attempting to access software on network drive.  
Error [xxx] Please verify your installation procedures.**

- Meaning            A file (or files) on the server's disk was not registered properly or does not exist.
- Action             Reinstall the software. If the problem persists, contact your 3Com network supplier.

**Return value (value) terminating program.**

- Meaning            This message indicates a serious problem with DOS.
- Action             Check your network disk (using the DOS CHKDSK command) and the DOS system files. Try recopying DOS from the master DOS distribution disk. If the problem persists, write down the value and contact your 3Com network supplier.

**RUNMINDS: driver <x> cannot be opened. Check CONFIG.SYS.**

- Meaning           DOS cannot find the specified driver x; see Appendix D for a complete list of drivers.
- Action            The service drivers may need to be reinstalled. Insert the 3+ *Installation #1 (Drivers)* diskette into drive A: and enter the command COPY A:\3DRIVERS\\*.SYS x:, where x: is the server drive.

**RUNMINDS: driver <x> is not responding appropriately.**

- Meaning           RUNMINDS cannot get an appropriate response from "get bind list".
- Action            The service drivers may need to be reinstalled. Insert the 3+ *Installation #1 (Drivers)* diskette into drive A: and enter the command COPY A:\3DRIVERS\\*.SYS x:, where x: is the server drive.

**Service cannot be INSTALLED.**

- Meaning           The service you want to install does not have a batch file specified in the SERVICES.DAT data file to install it.
- Action            Verify that you have selected the correct service to be installed for the server, or that you are using the correct command (**Install** instead of **Deinstall**, for example).

**Service cannot be DE-INSTALLED.**

**Meaning**            The service you want to deinstall does not have a batch file specified in the SERVICES.DAT data file to deinstall it.

**Action**            Verify that you have selected the correct service to be deinstalled for the server, or that you are using the correct command (**Deinstall** instead of **Install**, for example).

**Service cannot be UPGRADED.**

**Meaning**            The service you want to upgrade does not have a batch file specified in the SERVICES.DAT data file to upgrade it.

**Action**            Verify that you have selected the correct service to be upgraded for the server, or that you are using the correct command (**Upgrade** instead of **Install**, for example).

**Service cannot MIGRATE to 3Plus 1.1.**

**Meaning**            The service you want to migrate does not have a batch file specified in the SERVICES.DAT data file to enable the migration.

**Action**            Verify that you have selected the correct service to migrate for the server, or that you are using the correct command (**Migrate** instead of **Upgrade**, for example).

**Software version mismatch, error <number>.**

**Meaning**            The version numbers of the programs do not match.

**Action**             Check that the correct versions of all 3+ programs are being used. If the error persists, contact your 3Com network supplier for assistance.

**ST: No Name Svr.**

**Meaning**            An LCD error message specifying that communications to the Name service could not be made, or no Name service is available. This error could also appear if the Ethernet cable is not attached to the 3Server.

**Action**             Establish that you do have the Name service installed and the Ethernet cable has been attached correctly. If the Name service is installed, and the Ethernet cable is attached properly, you may need to use a local console to display the exact error condition that caused this message.

If you do not have a local console connected to the server, refer to Appendix F of this guide for instructions. A local console allows you to see the messages on the screen display.

**Start Server: multiple 3+Start servers not allowed.**

- |         |   |
|---------|---|
| Meaning | A 3+Start server already exists on the network.   |
| Action  | Only one 3+Start server can be used on the network. Shut down one of the 3+Start servers and deinstall it using 3INSTALL. |

**Terminated abnormally.**

- |         |  |
|---------|--|
| Meaning | A serious problem was encountered when booting the server.                                     |
| Action  | Reboot the server. If the problem persists, contact your 3Com network supplier for assistance. |

**This diskette was not installed using the EtherLink card present in this PC.**

**Error [xxx] Please verify your installation procedures.**

- |         |   |
|---------|---|
| Meaning | The diskette was installed on a different computer.   |
| Action  | Use the diskette in the correct computer or use the correct diskette in the current computer. |

**3+<service> Failure** (LCD display)  
**3+<service> startup failure.** (Console display)

**Meaning**            These messages will display after an initial error message displays on the terminal, specifying a service startup failure.

**Action**            Since there are several error conditions that could cause these messages to be displayed, it is important to look up the specific error message that displays *before* the 3+ failure message and follow the actions given.

If you are using a 3Server or 3Server3 and do not have a Local console (LCONSOLE) connected, refer to Appendix F of this guide, or your 3Server guide, for instructions on connecting one. A Local console will allow you to view messages on the screen display.

**3Start Server copy protection detection failed.**

**Meaning**            You have attempted to run a 3+ service on a server on which it was not installed, or you have incorrectly installed a 3+ service.

**Action**            You can run 3+ services only on the server on which they were installed. If it is an installation error, reinstall the service according to the instructions in this guide.

**3SRVGO.EXE Error**

Meaning	A 3Server LCD error specifying that the 3SRVGO.EXE program does not have enough memory to run (2 KB of memory are required), or there are not enough MINDS processes available.
Action	Decrease your configuration parameters; we recommend reducing the CIOSYS buffers parameter by two. Or try increasing the number of processes on the "device=pro.sys" line in the CONFIG.SYS file. See Chapter 5 of this guide for more information.

**Unable to create dir.**

Meaning	During the reinstallation process, after a service has been deinstalled, the installation batch file is trying to create a directory that already exists. The deinstallation process removes the .EXE files for the particular service; however, it does not remove the directory.
Action	No action is required. The installation batch file will skip to the next instruction and begin the copy process of files to the appropriate directory.

**Unable to locate Name service.**

Meaning	Either the Name server is not started on the network or the network cable connection has been interrupted, making it impossible for the server(s) to communicate.
Action	Verify that the Name server is connected to the network and running properly. Check the network cable for loose connections or improper configuration.

**You cannot overwrite that version of 3+ <service name> software.**

**Error [xxx] Please verify your installation procedures.**

Meaning	You are trying to overwrite a different version of the software.
Action	Verify the version number of the 3+ diskette for the service you are attempting to install.

**You did not insert a valid 3+ <service name> diskette.**

**Error [xxx] Please verify your installation procedures.**

Meaning	You did not insert the correct diskette as specified in the prompt.
Action	Insert the correct 3+ service diskette. If the problem persists, contact your 3Com network supplier.

## **Appendix B: Diskette and Directory Contents**

This appendix provides tables containing the following information:

- ▶ Diskette file listings
- ▶ Server directory contents

### **Diskette File Listings**

This portion of the appendix lists each of the diskettes in the 3+ product family and their contents. Files are grouped by directory and listed in alphabetical order.

Diskette and  
Directory  
Contents

B-2

**Table B-1. PC Server Running CIOSYS**

Directory	Source Diskette	Files
Root (\)	1 1 1 1 1 1 1 1 1 1	ACP.SYS AUTOEXEC.BAT (1) BUF.SYS CONFIG.SYS (1) ETH.SYS   TOK605.SYS   ETH 505.SYS   TOKIBM.SYS IDP.SYS LGL.SYS PRO.SYS RIPSR.SYS RUNMINDS.COM SPP.SYS
\3ROOT	13 13 13 12 12 12 12 12	3F.EXE COMMAND.COM LOGIN.EXE LOGOUT.EXE MINSES.EXE MSREDIR.EXE NB.COM PRTSC.EXE SETNAME.EXE
\3PLUS	2a 2a 2a	CIOSYS.EXE S_NAME STARTUP.EXE SYNC.COM
\3PLUS\3CONFIG	2a 3 2a 2a 2a 2a 2a 2a 2a 2a 1 2a 1 1	3CISCK.EXE 3INSTALL.EXE 3INSTALL.LIB 3PLUS_ON.BAT 3SPONGE.COM CIOSYS.NSD COMP.F.EXE CONFDUMP.000 DRIVEOFF.EXE ENVIRON.DAT ENVIRON2.DAT ENVIRON3.DAT HWINFO.CFG HWINFO.EXE MEMSZE.COM S_PROMPT.EXE SERVICES.EXE SYSTAT.EXE YNPROMPT.COM

**Table B-2. 3+ Local Workstation Startup**

Directory	Source Diskette	Files
Root (\)	13	3F.EXE
	1	AUTOEXEC.BAT (3)
	1	BUF.SYS
	1	CONFIG.SYS (3)
	1	ETH.SYS   TOK605.SYS   ETH 505.SYS   TOKIBM.SYS
	1	IDP.SYS
	1	LGL.SYS
	13	LOGIN.EXE
	13	LOGOUT.EXE
	12	MSREDIR.EXE
	12	NB.COM
	1	PRO.SYS
	12	PRTSC.EXE
	1	RIP.SYS
	1	RUNMINDS.COM
12	SETNAME.EXE	
1	SPP.SYS	
1	SYSTAT.EXE	

**Table B-3. 3+Remote Workstation Startup**

Directory	Source Diskette	Files
Root (\)	15	3R.EXE
		AUTOEXEC.BAT (4)
	1	BUF.SYS
		CONFIG.SYS (4)
	1	IDP.SYS
	1	LGL.SYS
	12	MINSES.EXE
	13	MSREDIR.EXE
	12	NB.COM
	1	PRO.SYS
	15	PROFILE.SYS
	12	PRTSC.EXE
	1	RIP.SYS
	1	RPC.SYS
	1	RUNMINDS.COM
12	SETNAME.EXE	
1	SPP.SYS	
1	SYSTAT.EXE	

**Table B-4. 3+Share User**

(used with 3+Remote Workstation Startup)

Directory	Source Diskette	Files
Root (\)	13	3F.EXE
	13	3N.EXE
	13	3P.EXE
	13	LOGIN.EXE
	13	LOGOUT.EXE

**Table B-5. 3+Start Master**

Directory	Source Diskette	Files
Root (\)	13	3F.EXE
		AUTOEXEC.BAT (5)
	1	BUF.SYS
		CONFIG.SYS (5)
	1	ETH.SYS
	1	IDP.SYS
	1	LGL.SYS
	13	LOGIN.EXE
	13	LOGOUT.EXE
	12	MSREDIR.EXE
	12	NB.COM
	1	PRO.SYS
	12	PRTSC.EXE
	1	RUNMINDS.COM
	12	SETNAME.EXE
1	SPP.SYS	
	STRDRV.SYS	

**Table B-6. 3+ Local workstation Startup  
(with EPATH)**

Directory	Source Diskette	Files
Root (\)	13	3F.EXE
	1	AUTOEXEC.BAT (6)
	1	BUF.SYS
	1	CONFIG.SYS (6)
	1	EPATH.SYS
	1	ETH.SYS   TOK605.SYS   ETH505.SYS   TOKIBM.SYS
	1	IDP.SYS
	1	LGL.SYS
	13	LOGIN.EXE
	13	LOGOUT.EXE
	12	MINSES.EXE
	12	MSREDIR.EXE
	12	NB.COM
	1	PRO.SYS
	12	PRTSC.EXE
	1	RIP.SYS
	1	RUNMINDS.COM
12	SETNAME.EXE	
1	SPP.SYS	
1	SYSTAT.EXE	

**Table B-7. 3Server**

Directory	Source Diskette	Files
Root (\)	4	3BIO.COM
	4	3DEBUG.EXE
	4	3DOS.COM
	4	3EDLIN.EXE
	4	3EMM.SYS
	4	3HERALD.TXT
	4	3LCD.SYS
	4	3SRVGO.EXE
	4	3START.COM
	4	3SWITCH.EXE
	1	ACP3.SYS
		AUTOEXEC.BAT (1)
	1	BUF.SYS
	4	CHKDSK.EXE
	4	COM.SYS
	4	COMMAND.COM
		CONFIG.SYS (7)
	1	ETH3.SYS   TOK1060.SYS
		GROWTH.SPC
	1	IDP.SYS
4	LOADER.COM	
1	PRO.SYS	
1	RIPSR.SYS	
1	RUNMINDS.COM	
1	SPP.SYS	

(continued)

**Table B-7. 3Server (Continued)**

Directory	Source Diskette	Files
\3PLUS	2b 2b 2b	CIOSYS.EXE STARTUP.EXE SYNC.COM S_NAME
\3PLUS\3CONFIG	2b 3  2b 4  2b  2b 1 2b  4 1	3CISCK.EXE 3INSTALL.EXE 3INSTALL.LIB 3PLUS_ON.BAT 3SRVGO.COM CIOSYS.NSD CIOSYS.NSP COMPF.EXE ENVIRON.DAT ENVIRON2.DAT ENVIRON3.DAT HWINFO.CFG HWINFO.EXE MEMORY.REQ MEMSZE.COM S_PROMPT.EXE SERVICES.EXE SYSTAT.EXE SYSTEM.CFG YNPROMPT.COM

**Table B-8. 3+Share Service**

Directory	Source Diskette	Files
\3PLUS	6/7	3SHARE.EXE
\3PLUS\3CONFIG	6/7 6/7 6/7	3SHARE5.NSD   3SHAREN.NSD 3SHRCK.EXE 3SHRCK.LIB

**Table B-9. 3+Name Service**

Directory	Source Diskette	Files
\3PLUS	8	3NAME.EXE
\3PLUS\3CONFIG	8	3NAMCK.EXE 3NAME.NSD
\3PLUS\3NAME	8 8	NS_DEF.DOM NS_PROP.DIR

**Table B-10. 3+Mail Service**

Directory	Source Diskette	Files
\3PLUS	9	3MAIL.EXE
\3PLUS\3CONFIG	9 9	3MAICK.EXE 3MAIL.NSD 3MAIL.NSM
\3PLUS\3MAIL	9 9	3MAIL.MSG MSUP0001.COM

**Table B-11. 3+Route Service**

Directory	Source Diskette	Files
\3PLUS	10	3ROUTE.EXE
\3PLUS\3CONFIG	10 10	3ROUCK.EXE 3ROUTE.NSD 3ROUTE.NSM

**Table B-12. 3+Remote Service**

Directory	Source Diskette	Files
\3PLUS	11	3REMOTE.EXE
\3PLUS\3CONFIG	11 11	3REMCK.EXE 3REMOTE.NSD 3REMOTE.NSM

**Table B-13. 3+Start Service**

Directory	Source Diskette	Files
\3PLUS	17	3START.EXE
\3PLUS\3CONFIG	17	3START.NSD 3STRCK.EXE
\3PLUS\3START	17 17 17	BANNER.ASC BOOTPC.COM PRMPT.ASC
\3PLUS\3START\3STARTVOL	17 17	3S.EXE BRDOS31

**Table B-14. 3+Backup Service**

Directory	Source Diskette	Files
\3PLUS	16	BACKUP.EXE
\3PLUS\3CONFIG	16	3BCKCK.EXE BACKUP.NSD
\3PLUS\3BACKUP	16 16	3B.EXE AUTOTIMS
\3UTIL	16 16	CRDIR.EXE CSED.EXE

**Table B-15. 3+TurboShare Service**

Directory	Source Diskette	Files
\3PLUS	5	CIOSYS.EXE
\3PLUS\3CONFIG	5	3CISCK.EXE EMS.NSD

## Server Directory Contents

This portion of the appendix presents tables with the following information:

- ▶ Directories that are created during installation on either the server or a floppy disk, depending on the configuration being installed.
- ▶ Files copied into the directories.
- ▶ Numbers corresponding to the diskettes where the original files are located. A Diskette Key lists the diskette names represented by the numbers in the tables.

In addition to the tables, CONFIG.SYS and AUTOEXEC.BAT file variations are presented at the end of the appendix. In the tables, reference to a particular CONFIG.SYS or AUTOEXEC.BAT file is presented as:

CONFIG.SYS (1)  
or  
AUTOEXEC.BAT (1)

where (1) represents the corresponding numbered file at the end of the appendix.

A line (|) separating file names or source diskette numbers indicates a choice. The file or disk used may vary depending on your hardware configuration.

## Diskette Key

<b>Source Diskette Number</b>	<b>Diskette Label</b>
1	3+ Installation #1 (Drivers)
2a	3+ Installation #2 (PC Server)
2b	3+ Installation #2 (3Server)
3	3+ Installation #3 (3INSTALL)
4	3Server/3+System
5	3+TurboShare Server
6	3+Share PC Server/File and Print
7	3+Share 3Server/File and Print
8	3+Share Server/Name
9	3+Mail Server
10	3+Route Server
11	3+Remote Server
12	3+Share User #1
13	3+Share User #2
14	3+Mail User
15	3+Remote User
16	3+Backup Server
17	3+Start Server
18	3+Menus Server

A complete list of all files contained on each of these diskettes can be found at the beginning of this appendix.

Some file names are changed during the installation process and therefore do not have the same name in the server directory as on the diskette itself. Files shown in the tables with no source diskette reference are created during the installation process.

Diskette and  
Directory  
Contents

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**Table B-16. Diskette No. 1**

<b>Installation #1 (Drivers)</b>	
<b>Directory</b>	<b>Files</b>
Root (\)	INSTALL.BAT PARTNO
3UTIL	3INSBAT.BAT 3SRVINS.BAT BOTPC.BAT BOTPCF.BAT CINSTL.BAT CNGDV.EXE CRDIR.EXE CSED.EXE FLEXEC.BAT INSBOOT.BAT INSNDV.BAT INSPC.BAT INSTL1.BAT MEMSZE.COM NOINS.BAT QUERY.EXE RENEXEC.BAT RENEXECF.BAT SYSTAT.EXE YES YNPROMPT.COM
3DRIVERS	3STRTDV.SYS ACP.SYS ACP3.SYS BUF.SYS EPATH.SYS ETH.SYS ETH3.SYS ETH505.SYS IDP.SYS LGL.SYS PRO.SYS RIP.SYS RIPSR.SYS RPC.SYS RUNMINDS.COM SPP.SYS TOK1060.SYS TOK605.SYS TOKIBM.SYS

**Table B-17. Diskette No. 2a**

<b>Installation #2 (PC Server)</b>	
<b>Directory</b>	<b>Files</b>
Root (\)	AUTOEXEC.BAT PARTNO
3CONFIG	3CISCK.EXE 3PLUS_ON.BAT 3SPONGE.COM COMP.F.EXE DRIVEOFF.EXE HWINFO.EXE RMVPORTS.EXE S_PROMPT.EXE STATUS.EXE
3 PLUS	CIOSYS.EXE STARTUP.EXE SYNC.COM

**Table B-18. Diskette No. 2b**

<b>Installation #2 (3Server)</b>	
<b>Directory</b>	<b>Files</b>
Root (\)	AUTOEXEC.BAT PARTNO
3CONFIG	3CISCK.EXE 3PLUS_ON.BAT 3SPONGE.COM COMP.F.EXE DRIVEOFF.EXE HWINFO.EXE RMVPORTS.EXE S_PROMPT.EXE STATUS.EXE
3PLUS	3CIOSYS.EXE STARTUP.EXE SYNC.COM

**Table B-19. Diskette No. 3**

<b>Installation #3 (3INSTALL)</b>	
<b>Directory</b>	<b>Files</b>
Root (\)	3INS3S.LIB 3INSPC.LIB 3INSTALL.EXE PARTNO SRV3S.DAT SRVPC.DAT

**Table B-20. Diskette No. 4**

<b>3Server/3+System</b>	
<b>Directory</b>	<b>Files</b>
Root (\)	3BIO.COM 3COMBIO.COM 3CONSOLE.EXE 3DEBUG.EXE 3DISK.COM 3DOS.COM 3EDLIN.EXE 3EMM.SYS 3HERALD.TXT 3LCD.SYS 3SAUTOEX.BAT 3SCONFIG.SYS 3SRVGO.EXE 3START.COM 3STATUS.EXE 3SWITCH.EXE AUTOEXEC.BAT BOOT.RCD CHKDSK.EXE COM.SYS COMMAND.COM CONFIG.SYS DISKSET0.COM DOSINIT.COM GLUE.BAT INSTALL.BAT LCONSOLE.EXE LOADER.COM PARTNO RHERALD.TXT SYSTAT.EXE UPGRADE.TXT

**Table B-21. Diskette No. 5**

<b>3+TurboShare PC Server</b>	
<b>Directory</b>	<b>Files</b>
Root (\)	3CISDE.BAT 3CISDR.EXE 3CISIN.BAT 3CISRG.EXE CIOSYS.EXE ECIOSYS.EXE PARTNO
3CONFIG	3CISCK.EXE

**Table B-22. Diskette No. 6**

<b>3+Share PC Server/File and Print</b>	
<b>Directory</b>	<b>Files</b>
Root (\)	3SHARE5.EXE 3SHAREN.EXE 3SH5IN.BAT 3SHNIN.BAT 3SHRDE.BAT 3SHRDR.EXE 3SHRMG.EXE 3SHRMI.BAT 3SHRRG.EXE PARTNO
3CONFIG	3SHRCK.EXE 3SHRCK.LIB

**Table B-23. Diskette No. 7**

<b>3+Share 3Server/File and Print</b>	
<b>Directory</b>	<b>Files</b>
Root (\)	3SHAREN.EXE 3SHRDE.BAT 3SHRDR.EXE 3SHRIN.BAT 3SHRRG.EXE PARTNO
3CONFIG	3SHRCK.EXE 3SHRCK.LIB

**Table B-24. Diskette No. 8**

<b>3+Share Server/Name</b>	
<b>Directory</b>	<b>Files</b>
Root (\)	3NAMDE.BAT 3NAMIN.BAT 3NAME.EXE PARTNO
3NAME	NS_DEF.DOM NS_PROP.DIR
3CONFIG	3NAMCK.EXE

**Table B-25. Diskette No. 9**

<b>3+Mail Server</b>	
<b>Directory</b>	<b>Files</b>
Root (\)	3MA5IN.BAT 3MAIDE.BAT 3MAIDR.EXE 3MAIL5.EXE 3MAILN.EXE 3MAIMG.EXE 3MAIMI.BAT 3MAIRG.EXE 3MANIN.BAT PARTNO
3MAIL	3MAIL.MSG MSUP0001.COM
3CONFIG	3MAICK.EXE 3MAIL.NSM

**Table B-26. Diskette No. 10**

<b>3+Route Server</b>	
<b>Directory</b>	<b>Files</b>
Root (\)	3CNXSRV.NSP 3ROUDE.BAT 3ROUDR.EXE 3ROUIN.BAT 3ROURG.EXE 3RTCIO.EXE 3RTDOS.DOC 3RTDOS.EXE AUTOEXEC.DOS CSED.EXE DOS_ON.BAT PARTNO RTDOS.BAT RTDOS2.BAT
3CONFIG	3ROUCK.EXE 3ROUTE.NSM

Table B-27. Diskette No. 11

<b>3+Remote Server</b>	
<b>Directory</b>	<b>Files</b>
Root (\)	3CNXSRV.NSP 3REMDE.BAT 3REMDR.EXE 3REMIN.BAT 3REMRG.EXE 3RMCIO.EXE 3RMDOS.DOC 3RMDOS.EXE AUTOEXEC.DOS CSED.BAT DOS_ON.BAT PARTNO RMDOS.BAT RMDOS2.BAT
3CONFIG	3REMCK.EXE 3REMOTE.NSM

**Table B-28. Diskette No. 12**

<b>3+Share User #1</b>	
<b>Directory</b>	<b>Files</b>
Root (\)	CNEXEC.BAT CREXEC.BAT EPEXEC.BAT MINSES.EXE MSREDIR.EXE NB.COM PARTNO PRTSC.EXE SETNAME.EXE STEXEC.BAT
COMPAT	APPEND.COM MSNET.INI NET.EXE USE.EXE
UTIL	3COPY.EXE CPRINT.EXE MED.EXE

**Table B-29. Diskette No. 13**

<b>3+Share User #2</b>	
<b>Directory</b>	<b>Files</b>
Root (\)	3F.EXE 3N.EXE 3P.EXE CINSTL1.BAT LOGIN.EXE LOGOUT.EXE PARTNO

**Table B-30. Diskette No. 14**

<b>3+Mail User</b>	
<b>Directory</b>	<b>Files</b>
Root (\)	3M.EXE 3MLOGIN.BAT ATT6300.COM MAIL.EXE MED.EXE MMINDER.EXE MUIINSTAL.BAT PARTNO RENUM.EXE RUNMAIL.BAT

**Table B-31. Diskette No. 15**

<b>3+Remote User</b>	
<b>Directory</b>	<b>Files</b>
Root (\)	3R.EXE PARTNO PROFILE.SYS

**Table B-32. Diskette No. 16**

<b>3+Backup Server</b>	
<b>Directory</b>	<b>Files</b>
Root (\)	3BCKDE.BAT 3BCKIN.BAT BACKUP.EXE PARTNO TDRIVE.SYS
3BACKUP	3B.EXE AUTOTIMS
3CONFIG	3BCKCK.EXE
3UTIL	CRDIR.EXE CSED.EXE

**Table B-33. Diskette No. 17**

<b>3+Start Server</b>	
<b>Directory</b>	<b>Files</b>
Root (\)	3START.EXE 3STRDE.BAT STRDR.EXE 3STRIN.BAT 3STRRG.EXE PARTNO
3CONFIG	3STRCK.EXE
3START	BANNER.ASC BOOTPC.COM PRMPT.ASC
3START/STARTVOL	3S.EXE BRDOS31

**Table B-34. Diskette No. 18**

<b>3+Menus Server</b>	
<b>Directory</b>	<b>Files</b>
Root (\)	ADMIN.MNI ADMIN1.MNI ADMIN2.MNI ADMIN3.MNI ADMIN4.MNI ADMIN5.MNI ADMIN6.MNI EM.EXE INSTALL.BAT MACH.DIR MAINMENU.MNI MENUS.EXE NETWORK.MNI PARTNO PROFILE.SYS UTILITY.MNI

## CONFIG.SYS Files

1. device=eth.sys | eth505.sys | tokibm.sys | tok605.sys  
device=pro.sys 32 2 2  
device=buf.sys  
device=idp.sys  
device=spp.sys  
device=lgf.sys  
device=ripsr.sys  
buffers=6  
files=20  
lastdrive=g
2. device=eth.sys | eth505.sys | tokibm.sys | tok605.sys  
device=pro.sys 32 2 2  
device=buf.sys  
device=idp.sys  
device=spp.sys  
device=lgf.sys  
device=acp.sys  
buffers=6  
files=20  
lastdrive=g
3. device=eth.sys | eth505.sys | tokibm.sys | tok605.sys  
device=pro.sys 8 20 2  
device=buf.sys  
device=idp.sys  
device=spp.sys  
device=lgf.sys  
device=rip.sys  
buffers=6  
files=20  
lastdrive=g

4. device=rpc  
device=pro.sys 8 2 2  
device=buf.sys  
device=idp.sys  
device=spp.sys  
device=lgl.sys  
device=rip.sys  
buffers=8  
files=16  
lastdrive=g
  
5. device=eth.sys | eth505.sys | tokibm.sys | tok605.sys  
device=pro.sys 8 20 2  
device=buf.sys  
device=idp.sys  
device=spp.sys  
device=lgl.sys  
device=rip.sys  
device=strtdrv.sys  
buffers=6  
files=20  
lastdrive=g
  
6. device=eth.sys | eth505.sys | tokibm.sys | tok605.sys  
device=pro.sys 8 20 2  
device=buf.sys  
device=idp.sys  
device=spp.sys  
device=lgl.sys  
device=rip.sys  
device=epath.sys  
buffers=6  
files=20  
lastdrive=g

7. `device=eth.sys -b50 -h2 | tok1060.sys`  
`device=lcd.sys`  
`device=tdrive.sys`  
`device=pro.sys 28 0 0`  
`device=buf.sys`  
`device=idp.sys`  
`device=spp.sys`  
`device=com.sys`  
`device=ripsr.sys`  
`buffers=2`  
`files=10`

## AUTOEXEC.BAT FILES

1. `echo off`  
`echo 3+ Server Boot Up batch file - version 1.1`  
`\3config\3plus_on.bat`
2. `echo off`  
  
`echo 3+ Server Boot Up batch file from a floppy - version 1.1`  
`b:`  
`cd \`  
`\3plus\3config\3plus_on.bat`
3. `echo off`  
`echo 3+ Workstation Startup batch file - version 1.1`  
`runminds mindspro mindsbuf mindseth mindsidp mindsspp`  
`mindslgl mindsrip`  
`nb`  
`minses`  
`msredir /z:4096`  
`setname $$3com$$`  
`prtsc`

4. echo off  
echo 3+ Remote PC Startup batch file - version 1.1  
3r  
runminds mindspro mindsbuf mindseth mindsidp mindsspp  
    mindslgl mindsrip  
nb 2 1 1  
minses  
msredir /z:4096  
setname \$\$3com\$\$  
prtsc
  
5. echo off  
echo 3+Start Workstation Startup batch file - version 1.1  
runminds mindspro mindsbuf mindseth mindsidp mindsspp  
    mindslgl mindsrip  
nb  
minses  
msredir /z:4096  
setname \$\$3com\$\$  
prtsc  
login  
3f link d: \\sys\sys; link e:  
e:  
path=d:;\e\  
if not exist autouser.bat goto end  
autouser  
:end

6. echo off  
echo 3+Workstation with EPATH Startup batch file - version  
1.0  
runminds mindspro mindsbuf mindseth, mindsidp mindsspp  
mindslgl mindsrip 4mindsdrv  
nb  
minses  
msredir /z:4096  
setname \$\$3com\$\$  
prtsc

## **Appendix C: Modem Specifications**

This appendix tells you what kinds of modems you can use with 3+Route and 3+Remote and how to configure and install your modem for use with 3+Route/3+Remote. For detailed instructions on installing and configuring your modem, see the documentation supplied with the modem.

### **Compatible Modems**

3+Remote and 3+Route allow you to use any asynchronous modem that conforms to the specifications under "General Configuration Requirements" given below. 3Com recommends the following modems:

- ▶ Hayes Smartmodem 1200
- ▶ Hayes Smartmodem 1200B
- ▶ Hayes Smartmodem 2400
- ▶ Hayes Smartmodem 2400B
- ▶ Microcom SX/1200
- ▶ Microcom SX/2400
- ▶ DCA FastLink
- ▶ TrailBlazer

3+Remote and 3+Route also allow the use of a null modem to connect two computers that are physically located close to each other. In addition, you can configure a non-supported modem for use with 3+Remote and 3+Route by following the general configuration requirements at the end of this appendix.

## Hayes Smartmodems

Use the following information and the documentation supplied with the modem to install and configure a Hayes modem.

### Smartmodem 1200

Connect the modem to a serial port on your personal computer (either COM1: or COM2:) with an RS-232C modem cable.

Use Table C-1 to set switches 1, 6, 7, 8, 9, and 10. The other switches are handled by the 3+Remote software. If your Smartmodem does not have switches 9 and 10, ignore the information for them.

**Table C-1. Switch settings for Hayes 1200**

	Switch Number					
	1	6	7	8	9	10
Switch Setting	Up	Up	See Below	Down	See Below	Up

When the Hayes 1200 modem's switches are configured as shown in Table C-2, the Modem Ready (MR) light should glow when you turn the modem on.

- Switch 1:** Setting switch 1 UP allows software to hang up the modem. The switch is not required to be up but if it is not set, the software will be unable to disconnect the modem.
- Switch 6:** Setting switch 6 UP enables the Carrier Detect lead.
- Switch 7:** Set as appropriate for your telephone configuration: UP for a single line or DOWN for multiple line drops.
- Switch 8:** Setting switch 8 DOWN allows the modem to recognize commands.
- Switch 9:** Set the protocol that is appropriate for the other modem to which you will be communicating.
- Switch 10:** Setting Switch 10 UP returns the modem to the command state on DTR transition.

## Smartmodem 1200B

There are two different versions of the SmartModem 1200B: one with three switches and one with six switches. Switches 1 - 3 are the same for both versions of the modem. Set switches 1 - 3 as required.

- Switch 1:** Set for either COM1: or COM2:.
- Switch 2:** Set as appropriate for your telephone configuration.
- Switch 3:** Set to ON

Set Switch 1 to ON, to identify the modem as IBM communications device COM1:.

Set Switch 2 to OFF for a single line, and ON for multiple line drops.

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Set Switch 3 to ON, so that the software can monitor the carrier signal from the modem.

For the six-switch version of the SmartModem 1200B, set switches 4 - 6 as required:

- Switch 4:** Set to OFF
- Switch 5:** Set the protocol that is appropriate for the other modem to which you will be communicating.
- Switch 6:** Set as appropriate for your telephone system.

Install the board as described in the Smartmodem 1200B guide. If any other board or device already installed in your personal computer is configured as COM1:, you will have to remove that device first, or reconfigure it as COM2:. (The IBM PC XT comes with an asynchronous board configured as COM1:.) If you use the Smartmodem 1200B, you do not need an asynchronous adapter board or an RS-232C cable.

### **Smartmodem 2400**

Configure the dumb strap mode so that it is in smart position. This is the factory setting, so it may be that no adjustment is necessary.

### **Smartmodem 2400B**

Smartmodem 2400B has no switches.

### **Microcom Modems**

Use the following information and the guide that is supplied with the modem to install and set the switches on a Microcom modem.

Microcom switches are at the rear of the modem.

Set switches 1 - 5 as follows:

**Table C-2. Microcom Switch Settings 1-5**

	Switch Number				
	1	2	3	4	5
<b>Switch Setting</b>	Up	Up	Up	Up	Up

Switches 6, 7, and 8 determine the baud rate. The baud rate should match the baud rate you specify in the PROFILE.SYS file. 3Com recommends you set baud rates at the highest setting for which your modem can transmit data. The serial and modem port baud rates must have the same setting. A list of switch settings for switches 6, 7, and 8 at baud rates of 300, 1200 and 2400 is shown in Table C-3.

**Table C-3. Microcom Switch Settings 6-8**

Baud Rate Setting	Switch Number		
	6	7	8
300 baud	Up	Down	Up
1200 baud	Down	Up	Up
2400 baud	Down	Up	Down

## FastLink and TrailBlazer

Cables for FastLink and TrailBlazer modems require pin 4 (Request to Send) and pin 5 (Clear to Send).

## Null Modem Cable Specifications

If you are using a direct RS-232C communications link, you need a null modem cable. The specifications for the required null modem cable are given below in Table C-4. The null modem cable directly connects an RS-232C serial communications port on your server to an RS-232C serial communications port on another server.

**Table C-4. Null Modem Pin Assignments**

Description	Pin Assignment
Ground (GRD)	1 ● ————— ● 1
Transmit Data (TD)	2 ● ————— ● 2
Receive Data (RD)	3 ● ————— ● 3
Request to Send (RTS)	4 ● ————— ● 4
Clear to Send (CTS)	5 ● ————— ● 5
Data Set Ready (DSR)	6 ● ————— ● 6
Signal Ground (GRD)	7 ● ————— ● 7
Carrier Detect (CD)	8 ● ————— ● 8
Data Terminal Ready (DTR)	20 ● ————— ● 20
Ring Indicator (RI)	22 ● ————— ● 22



**NOTE:** The null modem cable is symmetrical; it does not matter which end is connected to your server.

## General Configuration Requirements

Refer to the documentation supplied with your modem for specific instructions on installing and configuring your modem. Listed below are the requirements for installing and configuring your modem for use with 3+Remote/3+Route.

1. You must connect the modem to a data communications port (either COM1: or COM2:) on your personal computer with an RS-232C modem cable. (The cable must be suitable for use with your personal computer unless the computer has an internal modem.)

If you are building your own cable, use the pin assignments listed in Table C-5.

**Table C-5. Pin Assignments**

Pin Number	Circuit	Description	Direction	Required
1	AA	Protective Ground		yes
2	BA	Transmit Data	To modem	yes
3	BB	Receive Data	To PC	yes
4	CA	Request to send	To modem	TrailBlazer and FastLink
5	CB	Clear to send	To PC	TrailBlazer and FastLink
6	CC	Data Set Ready	To PC	Yes
7	AB	Signal Ground (common return)		Yes
8	CF	Carrier Detect	To PC	Yes
20	CD	Data Terminal Ready	To modem	Yes
22	CE	Ring Indicator	To PC	Microcom

2. Your personal computer must operate as Data Terminal Equipment (DTE) as defined by the RS-232C standard.
3. If your modem is not compatible with the 3Com recommended modems, use the following guidelines to configure it. When specifying the modem type, use the OTHER modem designation.

You must configure your modem so that it will perform the following operations:

- a. Monitor the Data Terminal Ready (DTR) signal (pin 20) from your personal computer. This lets the modem hang up when you use the 3R HANGUP command or when the timeout elapses.
- b. Enable the modem to return the true state of the carrier signal (pin 8). This allows the software to determine if a connection is in progress.
- c. Match your type of phone line--single or multiple line.
- d. Enable command recognition.
- e. Enable auto answer for the modem to be placed on the Route or Remote server.
- f. When using this modem on a Route server to dial out, specify the dial command as part of the phone number.

## Appendix D: AUTOEXEC.BAT and CONFIG.SYS Files

This appendix shows a sample of AUTOEXEC.BAT and CONFIG.SYS files used with 3+ software and explains each component.



**NOTE:** The AUTOEXEC.BAT and CONFIG.SYS files on your server or workstation will vary depending on your particular configuration. Appendix B lists the different versions of the files created during the installation process.

AUTOEXEC.BAT  
and CONFIG.SYS  
Files

---

D-2

The AUTOEXEC.BAT and CONFIG.SYS files are used by DOS when you first start your PC or 3Server. Each file contains information that is stored in the machine's memory for use during normal operation. In addition to this information, the AUTOEXEC.BAT file can contain 3+ or DOS commands (LOGIN, PATH=C:\, etc.) which are executed during the machine's startup.

Parameters explained in this section apply **only** to workstations and concurrent users. 3Server and dedicated PC server operation are not affected by these parameters.



**CAUTION:** When you change the parameters described in this appendix, memory usage on the workstation or server is affected. If you make changes to the parameters on a server, you should run the 3INSTALL program and check the memory allocations before bringing the server back into operation.

If you had an existing AUTOEXEC.BAT file, the installation program (3INSTALL) renamed it to AUTOEXEC.OLD. You can use the DOS DIR command to see if AUTOEXEC.OLD exists by typing:

If it exists, use a text editor to add the contents of AUTOEXEC.OLD to the AUTOEXEC.BAT file. You can use your text editor or the DOS TYPE command to view the contents of both AUTOEXEC files. Both files are in the root directory of the current drive.

Add any statements required to initialize the workstation to the beginning of the AUTOEXEC.BAT files. 3+ commands (LOGIN, 3F LINK, 3P LINK, etc.) can be added to the end of the file.

## The AUTOEXEC.BAT File

When you install 3+ workstation or server software, the installation program creates an AUTOEXEC.BAT file similar to the following:

```
echo off
echo 3+ Workstation Startup batch file -
      version 1.1
runminds mindspro mindsbuf mindseth
      mindsidp mindsspp minds1gl mindsrip
nb
minses
msredir /z:4096
setname $$3com$$
prtsc
```

Each line in the file has a specific function. These functions are explained below, along with any parameters that can be changed to support your particular workstation configuration.

**echo off**            Prevents commands from printing on the screen while the batch file is being executed.

**echo 3+ Workstation ...**  
                     Prints the title of the batch file on the screen.

**runminds**            RUNMINDS binds MINDS (MS-DOS Internal Network Driver Scheme) drivers together so that they can call one another. The names of the individual MINDS drivers are listed after RUNMINDS and must be on the same line.

AUTOEXEC.BAT  
and CONFIG.SYS  
Files

---

D-4

**nb** Loads the 3Com NETBIOS emulator. Parameters may be set to indicate the maximum number of sessions, packet transmit buffers, and packet receive buffers supported on your machine. Additional parameters allow you to specify the retry display mode, local timeout and remote timeout values. Each of these parameters are explained below.

Normally, no parameters are specified, causing the default values to be used. The NB parameters interact with those specified for MSREDIR (see below).

The format of the NB command is:

**nb** *sessions transbuf recbuf retdisp lcltime rmttime*

Parameters are identified by their location. Using the letter x in place of a parameter's value will cause the default value to be accepted. Default values will also be accepted for parameters omitted at the end of the line. For example, if you want to change only the number of sessions and the retry display mode parameters, the line will read:

**nb** 4 x x 1

The transmit and receive buffers, and local and remote timeout values all remain at the default values.

*sessions* The number of sessions that can be initiated at one time. A session is a communications path between the workstation and a server. When a user links to a shared directory or printer, a session is established with the server. Once established, a single session can support multiple shared directory and printer links. The value should agree with the /S (session) value in the MSREDIR command. Each session requires 1688 bytes of memory. The range is 1 to 32. The default is 2.

*transbuf* The number of transmit buffers. Each buffer requires 320 bytes of memory. The range is 1 to the number of links (/L) in the MSREDIR command times 2. The default is 4.

*recbuf* The number of receive buffers. Each buffer requires 1688 bytes of memory. The range is 1 to the number of links (/L) in the MSREDIR command times 2. The default is 4.

*retdisp* The retry display mode. When set to 1, the workstation will "beep" instead of displaying a retry message at the bottom of the screen should a network timeout occur. If no setting is specified, a message will appear at the bottom of the screen. The default has no specified setting.

*lcltime* The local timeout value. It specifies the time, in seconds, that the network will retry an operation without operator intervention for a local workstation (one connected to the server via network cable). Setting this option higher makes retrying easy on the operator, but can give the impression the network is slow. The default is 15 seconds.

*rmttime* The remote timeout. It specifies the time, in seconds, that the network will retry an operation without operator intervention for a remote workstation (one connected to the server via a modem). This setting should be higher than *lcltime* to ensure reliable communications. The default is 90 seconds.

**minses** Loads the interrupt interface for the redirector. There are no parameters for this line.

**msredir** Loads the **MicroSoft Redirector**. The format of the MSREDIR command is:

```
msredir [/parameter:value] [... /parameter:value]
```

where the expression */parameter:value* can be repeated as often as required. Each group, */parameter:value*, must be separated from the next group by one space and cannot include any blanks.

Parameters omitted from the MSREDIR command assume their default values.

*parameter* A letter that identifies the parameter. Valid entries are: S, L, Px, B, and Z.

*value* One or more integers specifying the value of the parameter.

**S** The number of sessions that can be supported at one time. A session is a communications path between a server and a workstation. When a user links to a shared directory or printer, a session is established with the server. Once established, a single session can support multiple shared directory and printer links. The value should agree with the **sessions** value in the NB command. Each session requires 70 bytes of memory. The range is 1 to 32. The default is 2.

- L** The number of links that can be supported at one time. A "link" is a logical connection (redirection) between a shared directory or printer on a server, and a drive or printer identifier on a workstation. The value specified for this parameter governs the number of shared directory and printer links the user can establish at one time. Each link requires 90 bytes of memory. The range is 1 to 32. The default is 5.
- Px** The local printer buffer size, in bytes, and printer number. The *x* specifies the printer for which you are setting buffers. This determines the maximum amount of information that will be buffered at the workstation before the job is sent to the server to be placed in the print queue. The value of *x* can be: 1 for a printer linked to LPT1: (or PRN:), 2 for LPT2:, or 3 for LPT3:. For example, /P1:256 sets a buffer size of 256 bytes for the printer linked to LPT1:. The range is 80 to 10240 bytes. The default is 128 bytes.
- B** The number of redirector buffers allocated to the workstation. The setting of this parameter should be based on the typical type of transaction to be performed on the workstation. If the average transaction consists of large file transfers, setting this parameter to a larger value may improve performance. The range is 1 to 15. The default is 3.

- Z** The size of redirector buffers. This value should be the same as the Share server's message buffer size less 48 bytes. For example, if the Share server has a message buffer size of 5680 bytes, this parameter should be set at 5632 (5680 - 48). The value can be 1024, 2560, 4096, 5632, 7168, or 8192 bytes. The default is 4096 bytes.

**setname \$\$3com\$\$**

Loads the IBM machine name. 3+ does not require you to set the name on the SETNAME line to a value other than the default \$\$3com\$\$\$. However, this "IBM Machine Name" is used by certain multi-user applications, such as dBASE III Plus, for licensing or logged-in user reporting. 3Com recommends that you set this name to the first name, last initial alias (spaces cannot be used) for each user.

**prtsc**

Loads the program that allows the combination of [Ctrl]+[Alt]+[Prtsc] to close spool files. Some applications do not send a DOS CLOSE call when a job has finished spooling. In order for the Print service to recognize that the job is ready to print, you must use [Ctrl]+[Alt]+[Prtsc] to close the spool file. There are no parameters for this line.



**NOTE:** On newer IBM AT keyboards, use the combination [Ctrl]+[Alt]+[\*] (where the \* is the key located directly above the 9 on the numeric keypad) instead of [Ctrl]+[Alt]+[Prtsc].

## The CONFIG.SYS File

When you install 3+ workstation or server software, the installation program creates a CONFIG.SYS file designed for the type of system you are installing. Samples of CONFIG.SYS files are shown below:

### 3Server

```
device=eth3.sys
device=lcd.sys
device=tdrive.sys
device=pro.sys 28 0 0
device=buf.sys
device=idp.sys
device=spp.sys
device=com.sys
device=ripsr.sys
buffers=2
files=10
```

### Workstation

```
device=eth.sys
device=pro.sys 8 20 2
device=buf.sys
device=idp.sys
device=spp.sys
device=lgl.sys
device=rip.sys
buffers=6
files=20
lastdrive=g
```

Each line in the file has a specific function. These functions are explained below, along with any parameters that can be changed to support your particular configuration.

**device=eth.sys**

Loads the device driver for the network adapter installed in your computer. The exact wording of the line depends on the type of network adapter or medium being used. Listed below are the various types of network adapters and the device driver used for each.

<b>Network Adapter/Medium</b>	<b>Device Driver</b>
EtherLink	eth.sys
EtherLink Plus	eth505.sys
Ethernet (3Server)	eth3.sys
IBM Token Ring	tokibm.sys
TokenLink Plus (PC)	tok605.sys
Token Ring (3Server)	tok1060.sys

The parameters that can be specified for ETH.SYS vary depending on whether your server is a PC or 3Server.

**PC Server**

If you are using a PC and your network adapter is an EtherLink or EtherLink Plus, parameters can be specified in the following format:

**device=eth.sys** *int i/obase dmachan dmatype*  
**device=eth505.sys** *int i/obase dmachan*

Normally, no parameters are specified, causing default values to be used.

Parameters are identified by their location. Using the letter *x* in place of a parameter's value will cause the default value to be accepted. Default values will also be accepted for parameters omitted at the end of the line. For example, if your EtherLink board has been changed to have an interrupt level of 7, and DMA is set to channel 2, the line should be changed to:

```
device=eth.sys 7 x 2
```

The I/O base address and DMA type would remain at the default values. If an EtherLink Plus network adapter is used, the line would read:

```
device=eth505.sys 7 x 2
```



**CAUTION:** Any one or all of these parameters can be changed from the default values; however, the jumpers on the network adapter board **must** correspond to the parameter settings specified. If the specified parameters do not match the settings on the network adapter, the system will not function properly.

*int*        The interrupt level number of the network adapter. On an EtherLink board, the range is 2 through 7. On an EtherLink Plus board, the range is 2 through 15. The default value for both boards is 3, corresponding to the factory switch setting.

- i/obase* The I/O (Input/Output) base address. It is a three-digit hexadecimal number with a range of 0 to 3F0. The last digit must always be zero. The default is 300 hex, corresponding to the factory switch setting on the board.
- dmachan* The DMA (Direct Memory Access) channel number. On an EtherLink board, the range is 1 through 3. On an EtherLink Plus board, the range is 0 through 3 when the board is used in an 8-bit slot; 4 through 7 when the board is used in a 16-bit slot. The default for both boards is 1, corresponding to the factory switch setting.
- dmatype* Specifies the type of DMA and programmed I/O used by your computer. The value can be 1, 2, 3, or 4, where the numbers reflect the settings outlined below. The default value is 3 on an IBM XT or compatible, and 4 on an IBM AT or compatible. Consult the documentation for your computer to determine the correct setting.
- 1 DMA byte mode transfer – gives control back to the CPU after each byte is transferred. The CPU gives control back to the DMA device after each full machine cycle.
  - 2 Programmed I/O loop – performs input and output to ports and loops until the packet has been received or sent.

- 3 DMA block mode transfer -- the DMA channel is active continuously until the entire transfer has completed. Accelerated refresh ensures no loss of data integrity.
- 4 Programmed I/O using REP instruction -- substitutes this instruction instead of loop. This can only be used with Intel 80186- or 80286-class machines.

Set the value for 2 or 4 when there is no DMA channel installed or when memory problems are suspected.

Set this parameter appropriately for the CPU used in your workstation or server. Some accelerator cards substitute a faster CPU for the one originally installed. The ROM on your system board may indicate the original CPU type.

### **3Server**

If you are using a 3Server and your network medium is Ethernet, parameters can be specified in the following format:

**device=eth3.sys -bx -hx**

- bx** Sets the maximum number of buffers, which determines the amount of memory available for packet buffers. These buffers are used for Ethernet and interprocess communications on the 3Server. Each buffer specified requires 1608 bytes of memory. The range is one plus the number of buffers reserved by the **-hx** parameter (explained below), to the memory limit of the machine. The default is 53, which sets aside 85224 bytes of memory.
  
- hx** Sets the maximum number of ETH reserved buffers. These reserved buffers are used only for interprocess communications, such as 3+Mail, 3+Route, and 3+Backup. The range is 0 to the number of packet buffers specified by the **-bx** parameter. Generally, this parameter should be 1.5 times the number of modems, plus 2. The default is 2.

**device=pro.sys**

Allocates the processor time between user (DOS) and background processes. Parameters are always specified for this driver. Each parameter must be separated from the next by a space.



**CAUTION:** If incorrect parameter values are specified, the system will not function properly.

The format for these parameters is:

**device=pro.sys** *processes user services*

- processes*      The maximum number of separate processes that the system can manage at once. Each process requires 38 bytes of memory. The range is from 4 to 64. Normally, there is no need to change the value from the default of 8 on a workstation, 32 on a server.
- user*            The amount of time (measured in timer clock ticks) spent performing tasks for the user before switching to background processes. Each timer clock tick lasts .055 seconds. The range is from 0 to 255. For normal operation of a workstation, 0 should never be specified; setting this parameter to 0 impairs keyboard input. The default is 20 on a PC workstation, 0 on a 3Server, and 2 on a PC server.
- services*        The amount of time (measured in timer clock ticks) spent performing tasks for the background processes before switching to user processes. Each timer clock tick lasts .055 seconds. The range is from 0 to 255. For normal operation of a workstation, 0 should never be specified; setting this parameter to 0 impairs keyboard input. The default is 2 on a PC workstation or server, 0 on a 3Server.

**device=buf.sys**

The Buffer manager used internally by 3+. There are no parameters for this driver.

**device=idp.sys**

The Internet Datagram Protocol driver used internally by 3+. There are no parameters for this driver.

**device=spp.sys**

The Sequenced Packet Protocol driver used internally by 3+. There are no parameters for this driver.

**device=lgl.sys**

The Login Library manager used internally by 3+. There are no parameters for this driver.

**device=rip.sys**

**device=ripsr.sys**

The drivers used with 3+Route or 3+Remote. On a workstation, RIP.SYS is used; on a server, RIPSr.SYS is used. There are no parameters for these drivers.

**device=com.sys**

Loads the device driver that controls the communication/printer ports on a 3Server. It is not used on a PC server or a workstation.

For this driver, you can specify a parameter that will determine the number of characters per second (cps) to be sent to the parallel printers.



**NOTE:** This parameter setting applies ONLY to parallel printers. It has no effect on serial printers.

The format for this parameter is:

**device=com.sys** *cps*

*cps* The number of characters per second to be sent to your printer. The value can be 160, 320, 640, or 800. If no setting is specified, the default of 320 will be used. Consult your printer's documentation to determine which setting is appropriate.

**buffers=6**

The number of disk buffers used by DOS to temporarily hold data being written to, or read from a disk. Each additional buffer requires 512 bytes of memory. The default setting depends upon the type of workstation or server used. Refer to your DOS manual for more information.

**files=20**

The maximum number of file handles that DOS will allow to be open at the same time. Each file requires 48 bytes of memory. The default setting depends upon the type of workstation or server used. Refer to your DOS manual for more information.


**lastdrive=g**

A DOS command limiting the number of drive identifiers available to the user.

The format of this command line is:

**lastdrive=***letter*

*letter* This is the last drive identifier that can be accessed. For example, if G: is assigned as the last drive, the user can access the drive identifiers A: through G:, but not H: or higher. This parameter applies only to workstations and concurrent users. The range is A: through Z:. The default is G:.



**NOTE:** Increasing the number of available drive identifiers may necessitate editing the AUTOEXEC.BAT file. If the error message "Too many redirections" is returned, increase the /L parameter (number of links) on the MSREDIR line of AUTOEXEC.BAT.

## Appendix E: Installing 3+ Mail User Software

This appendix explains how to install 3+Mail user software.

3+Mail user software program files are listed below:

<b>File Name</b>	<b>Description</b>
MAIL.EXE	The 3+Mail program
RENUM.EXE	The program used to renumber messages
MED.EXE	The message editor program
MUINSTAL.BAT	The installation batch file
3MLOGIN.BAT	The login batch file
RUNMAIL.BAT	The program execution batch file
MMINDER.EXE	The Mail Minder program
ATT6300.COM	The program used with 3+Mail Minder on AT&T 6300 computers
3M.EXE	The 3+Mail administrator commands program.

There are three ways to install 3+Mail user software. Choose an installation method based on your network software configuration:

1. If 3+Share is running on your network, install 3+Mail user software in a shared directory; for example, the APPS directory which can be accessed by any user on the network.
2. If 3+Share is not running for remote users, install 3+Mail user software at each workstation. This way, 3+Mail need not be downloaded over telephone lines to remote workstations.
3. If 3+Share is not running and you are using the mail server as a concurrent server, install 3+Mail user software on a diskette.

## Installing on a Workstation's Hard Dis

1. Make sure the hard disk has been formatted using the DOS 3.1 FORMAT command. If the workstation is to start from the hard disk, you must use the /S option.



**CAUTION:** If you have been using the hard disk with an earlier version of DOS, be sure to copy the files on the hard disk to diskette or tape before you reformat the hard disk. **The FORMAT command erases the entire hard disk.**

2. Start the workstation.
3. Make the hard disk the current drive.
4. Insert the 3+Mail User Software diskette in drive A:.
5. Start the user software installation program by typing:  
  
A>
6. When the DOS prompt returns, the 3+Mail user software is installed. Remove the *3+Mail User* diskette from drive A: and store it in a safe place.

## Installing on a Diskette

To install 3+Mail user software on a diskette, use a personal computer that has two diskette drives.

1. Start the personal computer with DOS 3.1.
2. Place a blank diskette, formatted with DOS version 3.1 or higher, in drive B:.
3. Insert the *3+Mail User* diskette in drive A:.
4. Make B: the current drive.
5. Start the user software installation program by typing:  
  
B>
6. When the DOS prompt returns, the 3+Mail user software is installed. Remove the *3+Mail User* diskette from drive A: and store it in a safe place.

## **Appendix F: 3Server Consoles**

This appendix explains how to run the 3CONSOLE Program. 3CONSOLE, run from a workstation, can be used as the keyboard and display monitor of the 3Server. This appendix also explains how to connect a local console to the 3Server.

Before installing software, you must first run 3CONSOLE to create a direct connection between a personal computer on the network and the 3Server. Optionally, you can attach a local console directly to the 3Server to see the complete error messages that might appear during installation.

## Running the 3CONSOLE Program

1. If your workstation on the network starts from diskette, insert the 3+ *Local Workstation Startup* diskette in drive A: and start the computer.



**NOTE:** Only diskettes that are formatted as 360 KB can be read using 3CONSOLE.

If your workstation starts from a hard disk that contains the 3+ workstation startup software, just start the computer.

2. Remove the 3Server's front panel. Turn the thumbwheel switch to the maintenance setting (4 for Ethernet or 8 for token ring).
3. Set the TEST/OPERATE switch to the TEST position.
4. Press the RESET button.

A series of startup messages now appears on the LCD, followed by part of the 3Server's network station address, displayed in this format:

EStart nnnnnn (a six-digit number)

5. Remove the *3+ Local Workstation Startup* diskette, if used, and insert the *3Server/3+ System Software* diskette in drive A:. Type:

A>

A message similar to the following appears:

```
3Console Version 1.1
Copyright (c) 3Com Corporation, 1986.
All rights reserved

Waiting for a request...

Start request from nnnnnn, OK (y or n)?
```

**nnnnnn** is the 3Server network station address.

6. Check the network address (write it down after starting the 3Server) against the network address on the screen. If a different address appears, type **N** and wait for another address to be displayed. As each new address is displayed, type **N** if it is not the address you want. When the correct address appears, type **Y**.

**NOTE:** If the correct network address does not appear, verify that the cables are properly connected (see the "General Hardware Problems" section of your 3Server guide for instructions on checking cabling). If necessary, adjust the cables and then restart the server. If the cables are properly connected and the correct network address still does not appear on your screen, call an authorized service technician for assistance.



7. Wait while DOS is loaded on the 3Server. When the 3Server LCD displays "Remote Active," press **[Return]**.
8. When you see the message

```
Remote Console Connected
```

on your screen, followed by the 3Server's DOS prompt, A:\>>, you are connected to the 3Server.

When 3CONSOLE is running, the keyboard and screen responses might be slower than usual since they are operating over the network. Unless you see a message on your screen indicating the network console connection has been dropped, 3CONSOLE is still active.

The 3CONSOLE prompt (A:\>>) shows that you are connected to DOS running on the 3Server. When you run 3CONSOLE, you can use diskette drive A: on the personal computer as though it were attached directly to the 3Server. The 3Server cannot access disk drive B:, so be sure to put the diskette you want to access in drive A:.

## Connecting a Local Console

You can connect a personal computer directly to the 3Server to act as a local console by using LCONSOLE. The LCONSOLE connection directs DOS console messages through the 3Server's SERIAL 1 port to the serial port on an attached personal computer or ANSI standard display terminal. This allows you to see these messages on a screen display.

You need a Data Terminal Equipment (DTE) serial cable (null modem) to connect an ANSI standard display terminal, personal computer, or serial printer to the 3Server serial port. The 3Server end of the serial cable must be a female DB25 connector. The other end of the cable can be a female or male DB25 connector, depending on the type of device you are connecting to the 3Server. The Inmac part, #1966, for the DB25 female/female null modem cable, enables LCONSOLE to be run on a personal computer.

The minimum signal connections are as follows:

<b>3Server Cable End</b>		<b>Male/Female Cable End</b>
TXD pin 2	connects to	RXD pin 3
RXD pin 3	connects to	TXD pin 2
GND pin 7	connects to	GND pin 7

Alternatively, you can use a standard RS-232C cable and a null modem adapter to make the serial connection. The null modem crosses TXD and RXD signals, and usually connects additional control signals. This equipment is available from your network supplier.

The 3Server also supports these RS-232C signals in case the attached personal computer (or terminal) requires them:

Output Signals	Input Signals
DTR pin 20	DCD pin 8

## Installation

Installing a local console connection does not affect network operation. You must, however, restart the 3Server before you can use the local console.

1. Connect one end of the terminal cable (or personal computer serial cable) to the terminal or personal computer's serial port. Connect the other end to the 3Server SERIAL 1 port.
2. If you connected a display terminal, turn on the terminal's power.

If you connected a personal computer that starts from diskette, insert your 3+ Local Workstation Startup diskette in drive A: and turn on the power. If you connected a personal computer that starts from a hard disk containing 3+ workstation startup software, just turn on the power.



**CAUTION:** Before proceeding, warn all network users to save their work and log off the network.

3. Remove the 3Server front panel.
4. Set the thumbwheel switch to 1 or 3 to boot the server in the local console state.
5. Make sure the 3Server power is on, set the TEST/OPERATE to TEST, and press the RESET button to restart the 3Server.
6. If you connected a display terminal, it is now ready for use as a local console.

If you connected a personal computer, continue as follows:

- a. Remove the 3+ Workstation Startup diskette from drive A:, if necessary, and insert the *3Server/3+ System Software* diskette.
- b. To start the personal computer as a local console, type:

## **Appendix G: Installing on Third Party Hard Disks**

This appendix provides information on installing 3+ software on a PC server that has a third party hard disk. These instructions apply to third party disks that have their own software device drivers.

### **Preparing the Hard Disk**

Prepare your hard disk according to the instructions supplied with the disk. Use the following guidelines:

1. Format the partition to which you will copy 3+ software with 512 byte sectors; you can use sector sizes other than 512 bytes for the rest of the partitions.
2. Add the hard disk's device driver as the first line of the CONFIG.SYS file.

3. Copy the DOS file **ANSI.SYS** on your boot disk and add the statement **device=ansi.sys** to the CONFIG.SYS file.
4. If your boot disk is different from the disk to which you will copy 3+ software (destination disk), copy CONFIG.SYS from the boot disk to the destination disk.

Your boot disk will be different from your destination disk if any of these conditions apply:

- ▶ You boot from a small boot partition and install to another partition of the hard disk.
- ▶ You boot from an internal hard disk and install to a third party disk.
- ▶ You boot from diskette.

## Installation Guidelines

If you are booting from a hard disk that is also the destination disk for 3+ software, follow the regular installation steps in Chapters 3 and 4.

If your boot disk is different from your destination disk, you should be a DOS expert. Complete installation Steps 1 -12 in Chapter 3. After copying 3INSTALL (Step 12), continue with the following steps:

1. Reboot the server, then exit to DOS by typing **N** in response to the onscreen prompt to continue with installation.
2. Copy CONFIG.SYS back to the boot disk.

3. Edit the boot disk's CONFIG.SYS file, adding the drive designator of the destination disk (for example, C:), before the 3+ drivers; this drive designator may be different if you have more than one partition on the disk or have multiple hard disks.

```
device = c:eth.sys  
device = c:pro.sys 32 2 2  
device = c:buf.sys  
device = c:idp.sys  
device = c:spp.sys  
device = c:lgl.sys  
device = c:ripsr.sys
```

4. Using a text editor, create an AUTOEXEC.BAT file containing the statement **C: AUTOEXEC**; if you are using another drive designator, substitute it for C:.
5. Reboot. From the menu that appears, run 3INSTALL. Install the 3+ services by using the 3INSTALL program and by following the instructions in Chapter 4.

## **Appendix H: Concurrent User Considerations**

If you use a server in concurrent mode as your workstation, keep the following considerations in mind.

- ▶ If the server is under a heavy load, you may occasionally have problems with programs that use INT13 calls. These programs include DISKCOPY, DISKCOMP, FORMAT, certain low-level disk utilities, and others. The problems are typically reported as read or write errors by the programs. If you suspect you are encountering one of these problems, run the program on another machine or wait until the server load is reduced.

- ▶ You **must not** reboot the machine without making sure that the services installed on it have been properly shut down. A concurrent user is a very special case, as the network services provided by the server are directly affected by actions such as power-off and [CTRL]+[ALT]+[DEL]. If you need to reboot the machine, be sure to follow the instructions in the *3+ Administrator's Guide*.
- ▶ Under certain situations, performance for the concurrent user may slow down noticeably. This can occur when spooled print files exist on the server. If normal (i.e., non-interrupt) printing is being used, the effect will be minor. If interrupt-driven printing is in use on the server, the degradation will be more noticeable until the files have been printed. See Chapter 5, "3+Share Print Service Configuration," for information on interrupt versus non-interrupt-driven printers.
- ▶ When you start the concurrent server and respond with a user name to the "Login" prompt, the \3ROOT directory is automatically linked by the 3PLUS\_ON.BAT file to C:. This establishes access for the local user to a "fake C:" rather than the true hard disk drive C:.

If you log out or log in as a different user, a warning message will appear saying that drive C: will be unlinked by your actions. If you acknowledge the warning and instruct 3+ to continue with the process, you will no longer be able to access the C: drive to load 3F and regain access to the system.

There are three ways to circumvent this situation:

1. Never log out. Instead, log in as a different user and establish a new link to \3ROOT at the same time. Follow these steps:

- a. Enter the 3F program:

```
C>  
3F>
```

- b. Log in as a different user.

```
3F>  
Login 1.0 - Copyright (c) 3Com  
Corporation 1985.  
All rights reserved.
```

```
John Doe:HQ:3Com logged in.  
3F>
```

- c. Link \3ROOT to C:.

```
3F>  
C: linked to \\Market:HQ:3Com\3ROOT  
3F>
```

- d. Exit the 3F program.

```
3F>  
C>
```

The new user now can function normally.

Concurrent  
User  
Considerations

---

H-4

2. Keep a floppy disk containing LOGIN.EXE and 3F.EXE at the concurrent workstation. When you want to log in as a different user, follow these steps:

- a. Make the default drive A:.

```
C>  
A>
```

- b. Login as a different user.

```
A>  
Login 1.0 - Copyright (c)  
3Com Corporation 1985.  
All rights reserved.
```

```
John Doe:HQ:3Com logged in.  
A>
```

- c. Link \3ROOT to C:.

```
A>  
C: linked to \\Market:HQ:3Com\3ROOT  
A>
```

- d. Change the default drive to C: and continue working.

```
A>  
C>
```

3. Use EDLIN, MED or another text editor and modify the 3PLUS\_ON.BAT file. Delete the statement DRIVEOFF. This will allow the entire REAL drive C: to be accessed in READ ONLY mode by anyone sitting at the machine whether or not they are logged in to the network. It is possible to WRITE to drive C: only if you issue a 3F LINK command first.



**CAUTION:** This method leaves everything on the server open for anyone to inspect and copy. If you have concerns regarding security of data, use method 1 or 2 above.

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**NOTE:** The "3" and "3+" preceding some terms have been ignored for alphabetizing purposes.

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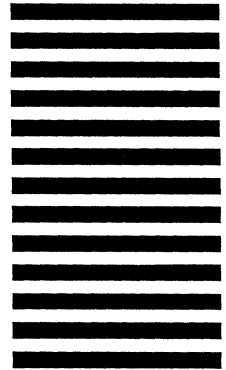
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