TANDY®

TECHNICAL INFORMATION SERIES

3COM®

INFORMATION

0220 TECHNICAL SUPPORT SERVICES

3COM®
Installation, Diagnosis, and Use

10/09/87

Revision 1Ø/19/87 - TWF
Revision 12/3Ø/88 - RJB

Table Of Contents

INTRODUCTION AND HARDWARE REQUIREMENTS

INTRODUCTION

A Local Area Network is a high speed communications system used to share computer hardware resources, programs and data files. Generally the network is used within a single department, organization or geographic area with the intent on sharing printers, storage devices (hard drives, tape drives), communication devices (modems), word processors (so as to keep all documents stored in the same place with the same attributes for ease of modification or distribution), data bases (so the information may be accessed and used by all), etc..

This is usually accomplished by assigning to single or multiple processing units the task of controlling these devices/programs. These units are usually termed 'HOST' or 'SERVER' units and may be required to be dedicated to the task of control (dedicated servers), or may be allowed to run applications as the control processes are performed in the background with little or no user intervention (concurrent user servers). These 'SERVER' units can be looked upon as mass data storage and retreival systems with shared peripherals (printers, modems). A 'SERVER' unit does just what it's name suggests, it 'serves' the rest of the system.

In addition to the dedicated server unit with its printers, hard disks, modems, tape drives and its software resources, each user will be required to have a 'WORKSTATION' unit in order to connect to the server to share its resources. Most workstation units will run with minimal amount of required hardware, usually only needing memory for loading of the network drivers and programs, a boot device so that the machine may be initialized, and a network board so that communication with the server may be established.

All of the machines in the network must be connected together via a common communication scheme so that sharing of resources can be accomplished. This is done by installing a similar (one using the same network protocol) network board in each machine, and connecting the machines together with a type of cable specific to that network communication scheme.

Different network schemes use varied types of cabling layouts (topologies) including Bus, Star, and Ring type topologies. Each network also uses one of a couple different types of error prevention/detection schemes to keep more than one unit from attempting to send data over the network cable at a time. The two most common of these are collision detect and token passing.

After this all important Hardware Link of machines is accomplished and tested, software drivers and control modules must be run on each machine in order to initialize the hardware and initiate communication between machines.

The network we will discuss in this manual (3COM) is an Ethernet specification network. This is one of the oldest and most widely recognized local area network standards. It uses a bus type topology with data rates up to 1Ø megabits/sec.. The software for this system is divided into separate modules called 'services'. Certain of these services are required for network operation (name, file, print), while others are only needed for special purposes (such as route, for inter-network routing). Depending on the memory available and whether the server needs memory for concurrent users, these services may be installed on just one server or split between several.

Server Requirements

Dedicated Servers

A dedicated server is a server which is dedicated to the task of sharing the services on the network and is not available for use as a station on the network. In a 3COM network you will normally see a 3ØØØHD or a 3COM 3Server3 being used as a dedicated server, although this is not written in stone. A 3ØØØHL may be dedicated as a server and even in extreme instances a 1ØØØ. More often than not if you see one of these machines used as a server, it will be a concurrent server running only 1 service such as a remote service to enable PCs to dial up the network from a remote location. Conncurrent servers are servers which may be used to run as a workstation in the foreground while the tasks of the server are run in the background.

3ØØØHD Servers

To run as a dedicated server, depending on the services installed, at least 32ØK of memory is required although it is highly recommended that the 'PCServer' contain 64ØK (see figure 1 for memory requirements for specific services). This server must also have either an Etherlink or a Etherlink Plus Board installed to enable the network connection. The Plus board advantage is threefold. It enables the use of 16 bit DMA channels, has an on board 8Ø186 processor to control the board's functions, and it has a 128k (standard) network data buffer which is expandable to 512k. These extras add up to a faster network link, and a faster network. This Plus board can be used in a 3ØØØHL, but an 8bit DMA must be selected in the jumper configuration and it must be used in an 8 bit slot (the HL does not support 16bit DMA).

3Server3s

The 3server3 is a dedicated Ethernet Server product made by 3COM. Designed specifically for the task at hand, it can function as a lone server on a network or be used as the main server in conjunction with other dedicated or concurrent servers.

The 3server3 has 1 meg of on board memory, 896K of which is available for services. This memory is dual ported between the CPU (8Ø186) and the Ethernet controller (82586). With an add-on CacheCard you can add 2 meg more of RAM to the unit. This extra RAM will be used as a cache for data and FAT tables, a tape drive data buffer, and as a cache for CIOSYS (the concurrent input/output system).

This system comes standard with 1 serial and 1 parallel port and with the addition of an expansion board can be expanded to 5 serial and 2 parallel ports. These ports can be used for printers or modems as needed. In addition to these communication ports and the Etherlink port, the unit also contains an Appletalk com port and the capability of adding a Token Ring port.

The base unit contains a 7Ø meg hard drive. Up to 6 expansion units can be added with a capacity of two 7Ø meg hard drives each giving the system a capacity of 91Ø meg of hard disk space. The base unit also contains a tape drive for backup purposes and another can be added in an expansion unit for a capacity of two tape drives on the system. Both the Tape and Hard drives use separate SCSI buses and DMA transfers. The unit also contains a built in real time clock with battery backup.

Concurrent and DOS-only servers

A concurrent service can be run on nearly any station in the network, providing the concurrent user has enough memory left after the service is installed to run their application. The service, which is run in the background, will effect the speed of the station's operation as well as the amount of RAM available to the user. The drive which the service is run on will be write protected to the concurrent user. A concurrent service may be run in what is called DOS-only mode if desired. This will conserve memory in that CIOSYS (Concurrent I/O System which controls the servers network interface) is not loaded into RAM. Only the DOS files and 3COM drivers are loaded. Concurrent servers are typically used to run services like Mail, Route Remote, or Netconnect (all of the services are discussed in detail later on in this document).

Stations

A station in the 3COM network can also be configured a number of different ways. To run as a station, the unit must contain at least 32ØK of RAM, and in order to run anything of consequence, it must have 64K more RAM (384K). Of course the unit must have a boot device such as a floppy drive or hard drive. 3COM also gives us the capability of booting directly into the network through an Etherstart PROM which is installed on the Etherlink Board. This requires that the Etherstart software be installed on a server. Along with a Etherlink board this is the minimal configuration for a station. More memory will allow larger/more programs to be run.

3+ PC Server Memory Requirements
Version 1.1

Services	System Memory	Default Config	Available Concurrent	Minimal Config	Available Concurrent
File/Print(F/P)	640K	631K	9K	403K	237K
Name	640K	---	--	379K	261K
Mail	640K	---	--	358K	282K
Route/Remote	640K	---	--	279K	361K
Mail,Route	640K	---	--	396K	244K
Name,Route/Remote	640K	---	--	329K	311K
F/P,Name	640K	630K	10K	540K	100K
F/P,Route	640K	---	--	318K	222K
F/P,Mail	640K	---	--	519K	121K
F/P,Name,Route	640K	592K	48K	568K	72K
F/P,Name,Mail	640K	634K	6K	626K	14K
F/P,Name,Mail,Route	CONFIGURATION NOT POSSIBLE				

NOTE:The configurations for mail and file/print will change if N-user is installed.

The minimum configuration consists of:

1 - 32 meg disk partition
4 - disk buffers
1 - parallel printer
1 - commmunications port

Figure 1 - PCServer Memory Requirements

HARDWARE INSTALLATION

3Server3

The 3Server3 has jumper settings for the Hard Drive Controller (SCSI ID) and the Hard Drive itself (drive ID). It also has jumpers for the tape drive and Appletalk port.

Removing jumper plug WØØ9 on the main logic board will disable the Appletalk port. There is no reason this would need to be done.

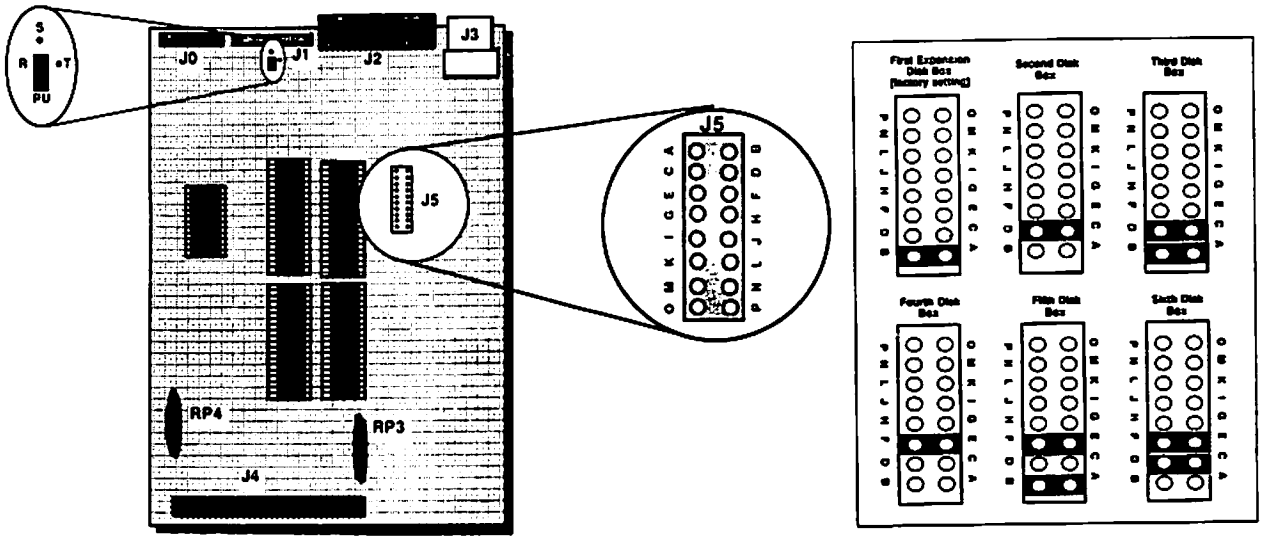
The Hard Drive controller board has a jumper for enabling write precompensation between PU and R. This should be installed on all controllers.

The controller also has a jumper block J5. This is used to select the SCSI bus address. The Base Unit's controller is always left empty to give it an address of Ø. Each subsequent controller will be jumpered in sequence (i.e. 1 for second controller). See figure 2.

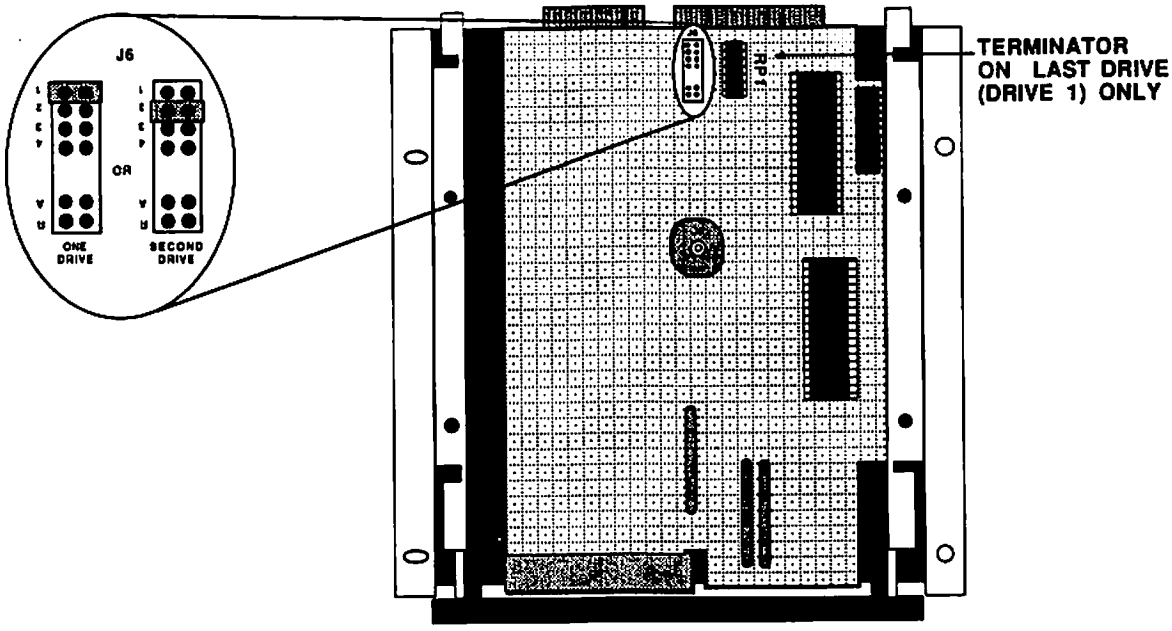
The hard drive logic board will have a drive select jumper relative to its location off of the controller. See figure 2 for this jumper's location.

The hard disk controller which is located last on the cable will also have terminating resistor packs in locations RP3 and RP4. These resistor packs MUST be removed from all other controllers on the SCSI bus. The LAST drive in each box will also have a terminator on the drive logic in location RP1.

The tape drive controller will always be jumpered to a SCSI bus ID of 7. To do this all of the jumpers A1, A2, and A4 will be on.



Hard Drive Controller



Hard Drive Logic

Figure 2 - 3Server3 Hard Drive Jumpers

Etherlink and Etherlink Plus Board

The jumpers on the Etherlink and the Etherlink Plus boards are silkscreened for easy location. The pictures in figures 3 and 4 show the jumper locations, their default settings, and the range their settings may be jumpered for. The settings used must be different from anything else in the machine, including another Etherlink board (two are used with the Netconnect Service). For example, if you were to install a RS-232 board into the machine, and set it up to use interrupt vector 3 (IRQ3), the Etherlink board will have to be jumpered for a different (and unused) interrupt vector.

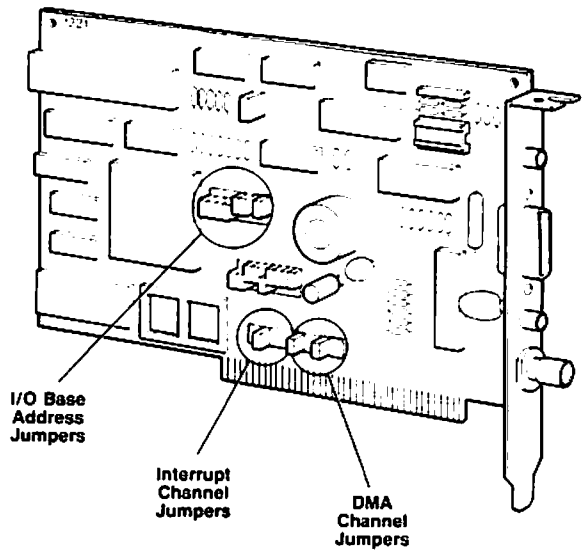
If a 16 bit DMA channel is jumpered (Etherlink Plus), the board must be installed in a 16 bit slot, and the unit must support 16 bit DMA (3ØØØ, not 3ØØØHL). If ANY of the jumpers are changed from the standard settings, both the command line used when running diagnostics (see diagnostic section) and the Etherlink driver in the config.sys (see the sample config.sys file in the software installation section) MUST be changed to reflect this.

The only block of jumpers not labeled in the picture are the memory address jumpers. These jumpers select the memory address for the Etherstart PROM if installed. The Etherstart PROM will not be used in the Etherlink PLUS board because this would not fully utilize the capabilities of this board, therefore these jumpers are not implemented on this board. On the standard Etherlink board these jumpers come configured for an address of ECØØ. In order to acomplish this the jumpers are configured as listed below. Note that the term 'DOWN' means towards IC location U6, 'UP' meaning away from U6.

12-DOWN
13-DOWN
14-UP
15-UP
16-DOWN
17-UP
18-UP
19-UP

This is the proper configuration to use in a Tandy 1ØØØ station. To use the Etherstart board in an AT type machine, move jumper 17 to the down position which gives the PROM an address of CCØØ. This address must be changed if it conflicts with any other BIOS ROMs installed. In order to enable the Etherstart PROM the memory enable jumper located next to the I/O address jumper block must be moved to the lower position.

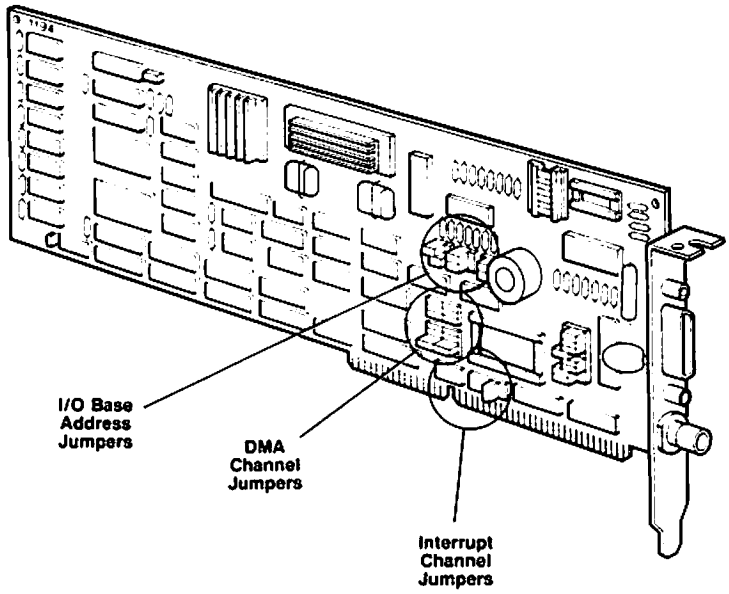
The CONFIG jumper on the Etherlink Plus must always be set to the off position. This jumper is used for factory testing only.



Jumpers	Possible Settings
DMA Channel	1, 2, or 3
INT Channel	2, 3, 4, 5, 6, or 7
I/O Base Address	O-3FFH

Jumper Settings	I/O Address Bit		
	9 8	7 6 5 4	3 2 1 0
Possible Values	1/0 1/0	1/0 1/0 1/0 1/0	0 0 0 0
Factory Settings	1 1	0 0 0 0	0 0 0 0
Hex Value	3	0	0

Figure 3 - Etherlink Jumpers



Jumper Settings	Personal Computer Types		
	PC, XT	AT 8 Bit Slot	AT 16 Bit Slot
DMA Channel	1,2,3	0,1,2,3	5,6,7
INT Channel	3,4,5,6,7,9	3,4,5,6,7,9,10,11,12,14,15	
I/O Base Address	0-3FFH		

Jumper Settings	I/O Address Bit									
	9	8	7	6	5	4	3	2	1	0
Possible Values	1/0	1/0	1/0	1/0	1/0	1/0	0	0	0	0
Factory Settings	1	1	0	0	0	0	0	0	0	0
Hex Value	3		0				0			

Figure 4 - Etherlink Plus Jumpers

DIAGNOSTICS

Etherlink and Etherlink Plus Boards

Diagnostic disks come with each Etherlink board sold. **These disks are copy protected and may become garbaged if an attempt is made to diskcopy them. The programs themselves, may be copied onto another disk.** The names used for the diagnostic programs are 3C5Ø1 for the Etherlink Board, and 3C5Ø5 for the Etherlink Plus.

The diagnostics should be run on each board individually before it is attached to the network. To run on each board individually, the loopback mode must be used and a loopback connector must be connected to the back of the network board. A loopback connector can be made by simply attaching a terminator to each end of the 'T' connector which comes with the board and then plugging this connector on to the back of the board. See figure 5. The machine must be booted from MS-DOS and NO drivers loaded in order for the diagnostic to run properly.

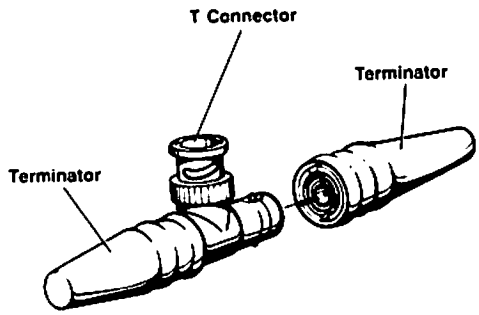


Figure 5 - Loopback Connector

A description of the tests the diagnostic will run is given below. The first four tests should be run on each individual machine before it is connected to the network. The remaining tests are run between two or more machines (i.e. one machine set up as a server by running test option 7, the other set up as a slave with option 5).

1.Preliminary Test - Tests to see that the diagnostic and the machine in which the board is installed can communicate with the Ethernet controller chip on the Ethernet Board.

2.DMA/Interrupt Test - Sends packets to and receives packets from the board using the DMA channel. Also tests the chosen interrupt channel.

3.Packet Test - Packets of different sizes are transmitted from the board and received back through the loopback plug. Do not run this test while the board is connected to an active network.

4.Recognizer Test - This test verifies that the board will receive packets intended for it and reject packets which are not intended for it.

5.Message Exchange Test - Sends packets back and forth between the computer and the server designated with option 7 - Echo Server Test.

6.Passive Receive Test - Counts the number of packets being transmitted over the network. This may be run on a functioning network.

7.Echo Server Test - Turns the computer into a simulated network server for other computers to communicate with during testing.

Diagnostic Parameters

The command line for the diagnostic is as follows:

3C5Ø1(or 3C5Ø5) [#] [A] [E] [L] [-I] [-D] [Ix] [Dx] [Bxxx]

It doesn't matter what order you give these parameters in as long as they are separated by a space. If no parameters are given, the first five tests are run. If just an 'L' parameter is given, only the first four tests will be run. The brackets indicate that the parameter is optional.

PARAMETER:	MEANING:
#	Selects the test corresponding to the number given. Numbers are the same as the numbers listed in the test descriptions above.
A	Reports all non-fatal errors that occur during the testing.
E	Used only on Xerox 8ØØØ networks that have echo servers.
L	Loopback mode. Performs the first 4 tests with a loopback connector connected.
-I	Skips the Interrupt test. **NOTE: You must use this parameter when testing a 1ØØØ as the interrupt test will fail. This is because the method used for testing interrupt on these boards will not work properly in a Tandy 1ØØØ.**
-D	Skips the DMA test.
Ix	Sets the interrupt to the number (x) you specify. Use this parameter if you change the interrupt from the default setting of 3 (this will normally be done if there is something else in the machine which uses interrupt 3).
Dx	Sets the DMA channel to the number you choose. This will be used when you change the DMA channel jumpers on the board in order to eliminate a conflict with another option which is installed in the machine.
Bxxx	Use this if the Base address on the board has been changed to eliminate a conflict with another option.

Examples:

3C5Ø1 L -I

This is the command line you would use to run the loopback test on a Tandy 1ØØØ. As you see interrupts are disabled.

3C5Ø5 L I1Ø D5 B31Ø

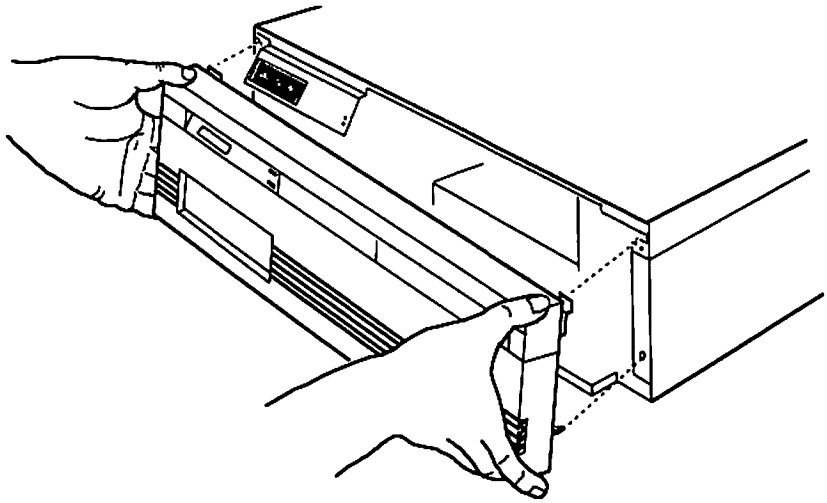
This command line will test an Etherlink Plus Board with the jumper settings changed to reflect a Interrupt of 1Ø, DMA of 5, and a Base Address of 31Ø.

3C5Ø1 L x x B31Ø

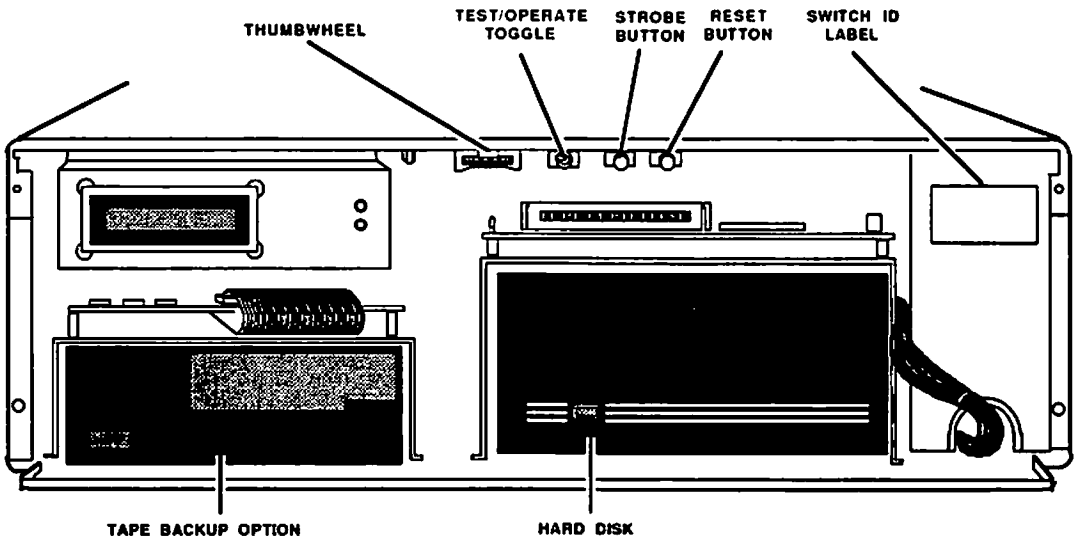
This command line would be used to test an Etherlink board which has had it's base address changed to 31Ø. Note the place marker x's used for the interrupt and DMA. The default values will be used for these options.

3Server3 Diagnostics

The 3Server3 Unit has a large array of built in diagnostics which may be called up through different settings of the thumbwheel switch underneath the front cover. To remove the front cover, carefully pull the bottom of the cover towards you until it pops off. Underneath you will find a thumbwheel switch, a operation/test switch, a strobe pushbutton, and a reset pushbutton. These switches are used to set the 3Server3 into various modes for initialization, operation, and testing purposes. See figure 6.



Removing The Front Panel



Front Panel Switches
Figure - 6 3Server3 Front Panel

Switch Descriptions

Operate/Test Switch - Put into operate position for all normal operations. Disables the Strobe and Reset switches.

Reset Button - Resets the 3Server3 when the operate/test switch is on test.

Strobe Button - Used in conjunction with thumbwheel on certain tests.

Thumbwheel Switch settings:

Setting	Description
Ø	Normal operation
1	Normal operation with a local terminal on serial port 1. This terminal will display more verbose 3Server3 messages than the LCD.
3	Installation/Maintenance. A local MS-DOS console is connected to serial port 1 for installation/de-installation of software or 3Server3 software maintenance.
4	Installation/Maintenance. Same as 3, but local console is connected via the ethernet cable (on the network).
6	Installation/Maintenance with a Network MS-DOS Apple Talk Console.
8	Installation/Maintenance with a Network Token Ring Console.

These settings call diagnostic tests which are discussed more fully below:

1Ø	Front Panel Test
11	Extended unit self test*
12	TDR test
13	Extended unit self test*
14	Special services

*** These tests require an external loopback on the Serial, Ethernet, and AppleTalk ports.**

Settings 2, 5, and 7 are reserved for factory use.

Front Panel Test 1Ø:

This test checks to see that all of the front panel controls and indicators are working properly. Switch the thumbwheel to 1Ø, switch the operate/test switch to test, and press reset. the normal power up self test will run and then the LCD will display 'Thumbwheel=A'. This tells you that the thumbwheel is set to position 1Ø. If you rotate the thumbwheel you should see this number/letter change to the corresponding switch setting.
The Strobe Button, when pressed, will cause both front panel LEDs to light. If you switch the operate/test switch to operate, the display will show 'Toggle To Test'. When switched back to test the thumbwheel numbers will again be displayed.

Extended Unit Self Test 11 & 13:

These two settings will run the Extended self tests on the 3Server3 when chosen. The Extended tests require a loopback plug on the Etherlink, Apple Talk, and Serial ports. The unit will run the normal self tests along with the tests listed as extended tests in the self test listing later in this document. The difference between choice 11 and 13 is that 13 will stop on errors where 11 will not.

TDR Test 12:

This is a Time Domain Reflectometry Test which may be run directly from the 3Server3 hooked into the network. This test will send signals out over the network and listen for any returning signals. If the network cable is properly connected and terminated, no signals will be reflected back and the test will pass. If there is a break in the cable, a bad terminator, a shorted cable, or other such problems the test will fail and report an error message which gives an estimate as to the problem and its distance from the server. Due to the relative inaccuracy of this test when compared to a true TDR test all errors should be verified using the Time Domain reflectometer sent to you from Technical Support.

To run the test, start the server with the thumbwheel in position 12. The results of the TDR test are reported to the LCD approximately 5 times per-second. Result messages and their meanings are shown below.

TDR Passed - The network is properly terminated and intact.
TDR Failed: 1nnn - The network may have a short somewhere. The approximate distance is indicated by the number nnn.
TDR Failed: 2nnn - The Network may have an open somewhere.

The distance units given relate to approximate lengths of ethernet cable. One unit translates to approximately 9.8 meters of Thin Ethernet Cable.

TDR Config Error - The TDR test could not start because the Ethernet controller could not initialize properly.
TDR CMD Error - An error was received from the Ethernet controller. It is not uncommon to get a few of these.

Special Services 14:

This particular setting, when called upon, will query you to select one of 3 functions. At this point you must reset the thumbwheel to one of the three selections listed below and press the Strobe button to execute.

Special Service Ø
This service clears the CMOS RAM error log. This error log contains logs of RAM errors which have occurred since the last clearing of the error log.

Special Service 1
This special service sets up the 3Server3 serial port to echo characters which it receives. A terminal may be connected to this port via null modem adapter and set for 96ØØ baud, 8 bit, even parity, 1 stop bit. All characters typed on the terminal should be echoed back to the screen.

Special Service 3
This service displays information about the size of RAM and the location of memory errors on the LCD. Each row of RAM is displayed on the LCD in turn and any RAM that had errors will be shown as a x.

Power On Self Tests and Extended Self Tests:
Whenever the unit is powered on or reset, the power on Self Test will be run. With the thumbwheel set to position 11 or 13, the Extended versions of the self tests will be run continuously. Remember that loopbacks must be installed to run the extended versions of the self tests. The tests run during the self tests are given below.

TEST	DESCRIPTION
LCD pixel test	A visual test of the LCD
Memory Test 1	Basic addressing uniqueness and stuck bit test. Word-wide access.
Memory Test 2	Memory refresh effectiveness test and real time clock test.
Memory Test 3	Addressing uniqueness and stuck bit. byte-wide access.
Memory Test 4*	Main Board memory moving inversions test. Data chips only.
Memory Test 4x*	Cache Card memory moving inversions test. Data chips.
Memory Test 5	Addressing uniqueness and stuck bit. Parity chips only.
Memory Test 6*	Main memory moving inversions. Data and Parity chips.
Memory Test 6x*	Cache memory moving inversions. Data and Parity chips.
CMOS RAM Test	Three tests, Corresponding to tests 1,2, and 4.
Sync ILoop Test	Synchronous port (Apple Talk) internal loopback test.
Sync Xloop Test*	Synchronous port external loopback test.
Async ILoop Test	Asynchronous port internal loopback test.
Async ELoop Test*	Asynchronous port external loopback test.
Print Port Test	Tests data lines to and from the printer port chip.
ENet Chip Test	Runs built in diagnostics on the 82586 Ethernet Chip.
ENet ILoop Test	Internal loopback test performed at the 82586.
ENet Xloop Test*	External loopback test
Disk Test	Basic test of the base units disk system.

*** These tests are Extended tests performed only when the thumbwheel is set to position 11 or 13.**

3DISK Utility

There is another utility available on the system software disk, which comes with the software installation set for the 3Server3. This utility is called 3DISK and allows checking of drive operation, logging of errors, and even formatting of the hard disk. NOTE: The hard disk comes formatted from the factory and should not need to be formatted except in extreme cases. This utility must be run from a 3console connection (A local network MS-DOS console - not a MS-DOS console hooked to the serial port). This is the same type of connection we will use for installation of the software on to the 3Server3 and is outlined in the next paragraph.

3Console Connection

To establish a 3Console connection, a workstation correctly connected to a properly terminated network must be booted with a workstation boot disk. To make a workstation boot disk see the software installation section of this manual.

After the workstation diskette is booted and the 3COM drivers are loaded without errors, exchange the workstation boot disk with a copy of the system software diskette. Next, the 3server3 must be booted in installation/maintenance mode (thumbwheel in position 4). The server will run through it's self tests and display an address (i.e. ADDRESS=35ØØ89).

At this point you will need to run the 3console program at the station. Do this by typing **'3CONSOLE /START'** at the A:\> prompt. The station will display a message that it is waiting for a request. When it receives a request, it will display the address of the server it received the request from and a question as to whether this is OK or not. If this is the server with which we want to connect, type a **'Y'**, if not, type a **'N'** and wait for the correct address.

When the server is recognized by the station and we accept the address shown on the station by answering 'Y' to the 'Request From' prompt, it will proceed to load DOS from the station. When it has finished the station will display a 3console prompt which is the same as the normal prompt with an extra >, i.e. A:\>>. If you change drives by typing **'C:'**, you will be located on the first partition of the 3Server3.

3DISK

To run the 3DISK program from this point, make sure you are at the A:\>> prompt and type '**3DISK**'. When this is loaded, a menu like this one will appear.

1. Choose Disk
2. Show Configuration and Tables
3. Diagnose Hardware
4. Recover Without Format
5. Format

Choose Disk

This option will prompt you for the SCSI ID and the Drive ID of the drive you wish to work with. This must be done before any other menu options can be run. These are the ID's to which the drives were jumpered in the hardware setup. The SCSI ID is the SCSI address the controller was jumpered to. The base unit will have a SCSI ID of Ø. The drive ID is the drive number in that particular unit (always drive Ø or drive 1). The base unit's Drive ID is Ø.

Show Configuration and Tables

This option will give you these choices:

1. Show DOS Configuration - This will give you the partition information for the drive.

2. Show Error Log - This option will show you a log of all the disk errors, hard or soft, that have occurred since the last format.

3. Show Defect Map - This will give you a list of all the disk defects that were locked out when the drive was last formatted.

Diagnose Hardware

This option allows you to diagnose problems in the hard drive hardware. A menu is displayed which looks like this:

1. Check Cabling and Controller - Performs read/write tests to the hard disk controller only.
2. Read Only Disk Test - Allows you to select a number of passes and performs a read only test of the hard drive. Any new errors found are logged into a CMOS RAM defect map.
3. Read/Write Disk Test - Performs a selectable number of passes of write/read test on hard drive. Logs new errors into defect map. This test overwrites any data on the hard drive.

Recover Without Format

Allows you to recover any hard errors which have occurred on the hard drive, save the files if possible, and lock out the tracks where these errors occurred. A menu will be displayed.

1. Confirm Logged Defects - Compares the defects listed in the error log with the actual disk surface to insure that the defects listed can indeed be found.
2. Locate Logged Defects - This option will find out what files the new defects in the defect log are located in and give you an idea as to whether the repair option can repair them.
3. Repair Logged Defects - Prompts you as to whether you would like to attempt repair on each individual defect. Repairing defects in this manner consumes large amounts of disk space and may slow the system down. If an excessively large amount of defects are found, reformatting may be the best option.

Format

This option will reformat the disk. Precautions MUST be taken to insure that the customer has a recent backup and that all possible steps towards salvaging the disk have been taken. You will be prompted for a number of parameters and except for special cases, all of the default values should be taken.

CABLING

Cabling

Type - RG58 C/U Coax (thin cable) will be used in our installations. 3COM's Etherlink boards also allow for the connection of an external transceiver to allow the optional connection of thick Ethernet cable. This is done by moving the DIP Shunt on the top right hand corner of the board. The external transceiver connects to the 15 pin 'D' type connector on the back of the board.

Length - The Minimum length between machines is 3 feet with thin cable, Ø feet with thick cable. Maximum length is limited to 1ØØØ feet with thin cable, 1ØØØ meters with thick cable. If you are combining two types of cable, the total feet of thin cable plus the total meters of thick cable must not exceed 1ØØØ. For example, if you were installing a system using 535 feet of thin cable, the maximum number of meters of thick cable you could connect on the same network segment would be 465.

The maximum number of connections on this cable is 1ØØ. Xerox T-28 repeaters may be used to extend the cable length to 1.5 kilometers between any 2 terminators with a maximum of two repeaters in any data path. Tandy does not at this time sell external transceivers, thick cable or repeaters.

Termination - Termination is 5Ø ohms at the end of each network segment. Only one terminator on each network will be grounded to a good earth ground. A terminator is a BNC connector with a 5Ø ohm resistor between the conductor and ground.

Computer Connections - Connections to the Etherlink Board in the computer must be made with the 'T' connectors supplied with the board. Any other method of connection will cause a change in the characteristics the board sees and cause network operation problems. The 'T' connectors are designed so that a machine may be disconnected easily without disturbing the rest of the network by unplugging the connector from the board and maintaining the cable connections.

Cable Testing - The cable resistance may be measured at any 'T' connector and should measure 24-27 ohms between center conductor and shield on a properly terminated network. Further cable testing may be done with a Time Domain Reflectometer.

Signal - The signal transmitted over the network cable is Manchester encoded data which was encoded from NRZ data by a 8Ø23 IC on the Etherlink board. This signal is composed of negative going pulses of approximately 2V which aids the collision detect circuitry. This signal propagates at approximately 1Ø megabaud and is very susceptible to noise, bad cable, and improperly terminated networks. The on board transceiver can only handle up to 2.5V transients.

SOFTWARE OVERVIEW

Services And Their Uses

As mentioned before, the 3COM network software is based on several services designed to handle certain functions installed on either dedicated or concurrent servers in the network. The Share and Name services MUST be installed on the network. The other services are installed depending on the specific needs of that network.

The Share and the Mail services are designed for a 5 user system and allow the network only 5 users unless a second copy of the package is installed. This second copy must be a different package than the first as installing the same package twice will not give you any more than 5 users.

********** NOTE **********

When the services are installed, they are registered to an Ethernet Address PROM on the Ethernet board of the server they are installed on. This service, once installed, may not be reinstalled on another machine unless the other machine has the very same address PROM (i.e. servers hard drive failed and the Etherlink board was moved to a new server), or the service has been deinstalled from the original server (this is an option which allows the moving of services from one server to another). This PROM can be easily recognized by its 6-digit code which is printed on a sticker attached to the PROM.

****

Share Service

This service is a combination of both the File and Print services. These services are grouped together because they must be installed on the same server. Only 5 users can access this service unless 2 copies of the service are installed. This service performs the management of the multi-user file system and manages the hard disk space use and access. It also manages the spooled print service which controls the sharing and spooling of up to 7 printers.

Name Service

This service is basically a database of name information to control levels of access to the network. It includes the following types of names:

Users - Names of users which may access the network
Domains - Names of groups of users usually allowed the same access rights.
Organizations - A grouping of one or more domains to form an even more general group.

These three types of names are grouped together in order to give each user a three part name which will specifically identify him/her (Name:Domain:Organization)

Aliases - These are alternate names for each user, which that user may use to perform all the functions they could with their normal user name such as login and receive mail.
Groups - These are groupings of users for mail purposes.
Members - Members for a specific group.

Mail Service

This is the other of the 5 user packages of which 2 must be installed in order to get unlimited user access. The service provides mail service for local and remote network users. This package also provides you with a Mail Minder program which will poll the server for your mail at a specified rate, and report to you, via a screen message, beep, or both if you receive mail.

Route Service

This service allows users on one network to communicate with users on another network through a modem. Also provided with this service is the Remote server package.

Remote Service

This service will allow PC stations without an Etherlink board to login to the network over the phone and use the services. This requires that the server have either route or remote server software installed and that the station have remote PC software.

Start Service

This service will allow a drive-less workstation to boot over the network. It requires that the service be installed on the server and a Etherstart PROM be installed on the station's network board in the empty socket provided. Software volumes which look like a boot disk to the workstation are created on the server. The workstation boots off of these volumes which are then linked to its C: drive.

Netconnect Service

This service allows 2 networks to connect together and appear as though they are the same network. The advantage to this is that if one network is shut down, it will have no effect on the other network's operation. To implement this service, you are required to have 2 Ethernet boards in one PCserver. The boards must be jumpered differently.

Backup Service

This service allows the use of the tape drive in the 3Server3 which permits backup of a running network.

SOFTWARE INSTALLATION AND CONFIGURATION

Initial Installation

Workstation Startup Diskettes

To make workstation startup diskettes for the local workstations the following procedures must be used.

1. Boot up a workstation with MS-DOS 3.2 or higher.
2. Put the '3+ Installation #1' diskette into drive A.
3. If you are installing the startup files on hard drive, make C: the current drive by typing **'C:'**, and type **'A:INSTALL'**. If you wish to make a floppy workstation startup diskette, put a floppy formatted with the /s option into drive B, make B the default drive by typing **'B:'**, and type **'A:INSTALL B:'**.
4. When the menu appears asking you what type of disk you are making, choose option 1, Local Workstation Startup Disk.
5. A menu will appear asking you which type of adapter board is installed in the machine. Choose either Etherlink or Etherlink Plus, as necessary.
6. The Machine will then prompt you to insert the '3+Share User #1' and '3+Share User #2' diskettes when it is ready for them.
7. You will then need to copy, to the workstation diskette, ansi.sys from a current DOS disk. This ansi.sys MUST be dated 1-21-87 or later. You must also insert the line 'DEVICE=ANSI.SYS' into the config.sys file on the workstation diskette. To do this, follow the steps below (instructions given are for a two floppy drive machine).

   With the MS-DOS Supplemental disk in drive A, and your workstation disk in drive B, type the following at the A:\> prompt.

   EDLIN B:CONFIG.SYS <enter> (Enter the editor)

   The computer will respond with an asterik (*)

   i <enter> (Enter insert mode)

   The computer will repond with a line number which corresponds to the line you are inserting.

   device=ansi.sys <enter> (Put the driver in)
   ^C (That's control-c to exit insert mode)
   e <enter> (Exit and write the new file)

8. If more workstation diskettes are needed, DOS DISKCOPY may be used to copy this diskette. With a blank diskette in drive B and the workstation disk in drive A, the syntax for copying the workstation disk onto the blank is:

   DISKCOPY A: B: <enter>

CONFIG.SYS

The config.sys file on the Workstation Boot, and on the Server Boot disk contain the drivers needed to run the 3COM Network. These drivers are loaded into memory when the machine is booted. If the Ethernet board was reconfigured, the driver for that board will need to have its parameters reconfigured to match, otherwise the machine will lockup when trying to load this driver. Below is a listing of some of the drivers you may see in the config.sys file and what their parameters are. This is a reference only. Do not attempt to change a config.sys file unless you are sure about the changes you are making.

DEVICE=ANSI.SYS - Ansi.sys driver - Check date of driver in root directory.

DEVICE=ETH.SYS x x x x - This is the Etherlink driver for the standard Etherlink board. the driver for the Plus board is Eth5Ø5.sys. The four parameters listed (x x x x) are interrupt, I/O Base address, DMA Channel, and DMA Type. If a parameter is left out (default is used), an x must be used in it's place only if the flanking parameters are to be changed (i.e. device=eth5Ø5.sys 1Ø x 5 for a interrupt of 1Ø and a DMA Channel of 5).

DEVICE=PRO.SYS x x x - This driver controls the process time between user and background processes. The parameters are always set. They are:

1. # of processes the system can manage.
2. # of ticks of time used for user processes used before switching to background processes.
3. # of tick spent on background processes before switching back to user processes.

DEVICE=BUF.SYS - Buffer Manager.
DEVICE=IDP.SYS - Internet Datagram Protocol Driver.
DEVICE=SPP.SYS - Sequenced Packet Protocol Driver.
DEVICE=LGL.SYS - Login Library Manager.
DEVICE=RIP.SYS - Along with RIPSR.SYS drivers for Route or Remote.
DEVICE=COM.SYS - Device Driver for com or printer port on 3Server3.
Buffers=6
Files=2Ø
Lastdrive=g

Installing on the 3Server3

To install the network software on the 3Server3, first a 3console connection must be made. The full procedure is discussed in the diagnostic section of this manual. The steps are given here as a reference.

3console connection

1. Boot the 3Server3 in thumbwheel position 4. Wait until the server's address is displayed on the LCD.
2. Boot the machine to be used as a local workstation with a workstation startup diskette. When the station has finished booting, remove the workstation boot disk and insert the system software disk.
3. At the local console type '**3CONSOLE /START**'. When the correct address is displayed type '**Y**'.
4. When 'REMOTE ACTIVE' is displayed on the 3Server3, press <ENTER>. When you receive the A:\>> prompt, the remote console connection is made.

If software installation is to be done from scratch, proceed with the steps below. If services are being installed or deinstalled there is no need to go through the complete installation. If this is the case, go to the 3INSTALL section later in this chapter.

To Install Complete Software - 3Server3

1. After the 3console connection is active, with the system software disk in drive A:\>> type '**INSTALL**'.
2. The software will prompt you to install the following diskettes.

   Installation #1
   Installation #2
   Installation #3

3. Along the way you will be prompted for the network media type. Choose Ethernet. You will also be prompted for a 3 part server name in the format name:domain:organization and a password. choose these names and write them down so that they won't be forgotten.
4. After you install the third installation diskette, the 3INSTALL program menu will appear. Refer to that section for information concerning using this program.

To Install Complete Software - PCServer

1. This assumes that the server software is to be installed on the hard drive of the PCServer. Only DOS only or Concurrent servers are likely to be run off of floppy. If an installation is to be done on one of these types of machines, see 3COM's Installation and Configuration Guide for further information.

2. Boot the PCServer off of the hard drive which has previously been formatted with 3.2 or later MS-DOS and has had the proper (3.2.2) ansi.sys driver loaded from it's config.sys.

3. Make the hard drive the current drive. The prompt should be C:\>. Type **'A:INSTALL'** at this prompt with the Installation #1 disk in drive A:. You will be asked for a choice of machine configuration. Choose PCServer. You will be asked which type of network adapter the machine has installed. Choose the appropriate adapter (Etherlink or Etherlink Plus).

4. You will then be prompted to insert the Installation #2 disk into drive A:. While this disk is installing, the software will prompt you for a 3 part server name in the "name:domain:organization" format. Write down the name and password you give the server so that they will not be forgotten.

5. You will then be prompted to insert the following disks:

   User #1
   User #2
   Installation #3

6. When the installation #3 disk is installed, the 3INSTALL menu will appear. See the next section for information on running this program.

3INSTALL

The 3Install program is designed to aid in the installation, deinstallation, and maintenance of services. It is run automatically from the Installation #3 disk during a software installation. It may also be run while a server is in operation from the \3plus\3config directory of the server. You will be limited in your options if running the program while the server is in operation. For service de-installation or major system maintenance, shutdown the server prior to running the 3INSTALL program. This program is very user friendly and is menu driven and should supply you with all of the information needed for software installation. The program gives you these options:

1) VIEW AND INSTALL STANDARD CONFIGURATIONS

This option will allow you to view all of the service configurations which are commonly found in 3COM systems or only the ones that will fit in your server's memory. You may then choose one of these configurations to install or proceed to the section for installation of individual services in order to install a configuration different from the standard. If you use this option, variables within the services will be automatically set to the optimum values. See figure 7 for parameter list for individual services.

2) INSTALL OR DE-INSTALL INDIVIDUAL SERVICES

This option allows you to install or de-install services as needed. For services such as Share and Mail, which have 5 user or unlimited user capabilities, you will be prompted for each of the two disks in turn. If you use this option to install your services, you will be required to adjust the parameters for each service as needed. This includes such things as maximum number of users and maximum domains.

3) GENERATE CONFIGURATION REPORT

This option will create a text file on your hard disk which contains all the information as to how your service parameters are set on that server. It is very important that you use this option after setting all of your parameters. After generating the report, print it out so that it may be referenced in case of system failure. This report is also very important to have for a 3Server3, as it will be needed in order to properly restore a full system tape backup.

4) CONFIGURE PARAMETERS OR PERIPHERALS

This will allow you to set individual parameters within each service in order to fine tune the network. You will use this for things such as setting the maximum number of users, configuring printers, setting time zones, setting up communication ports, and setting up dial out routes for the route network.

5) MODIFY DISK OR MEMORY ALLOCATION

In this option you may determine if your hard drive partitions are to be available for network use, or if they are for local use only. The EMS (Expanded Memory Specification, memory beyond standard 64ØK which meets EMS standard, such as the CacheCard in the 3Server3). memory is set aside here for use with CIOSYS. You also set aside memory for use as concurrent user memory with this option.

6) EXIT TO DOS

I think we all know what this one does.

For more information on what these options allow you to do and how to use them, see the 3COM Installation and Configuration guide, and Administrators Guide. While in this section, be sure and set up the printers, time zones, and communication ports. This is done by using the menu driven, **Configure Parameters and Peripherals** option.

After all of the parameters have been set, the server will need to be rebooted in order to start the services. Before re-booting, make sure that the current ansi.sys is in the root directory and 'DEVICE=ANSI.SYS' is in the config.sys file. Also, if the jumper configurations were changed on the Etherlink/Plus board, be sure that the driver's parameters were also changed in the config.sys.

PARAMETER	RANGE	BYTES	GUIDELINES
CIOSYS			
Byte Range Locks	**1 - 3000**	**16**	**≥ 4 x number of users**
File Descriptors	**35 - 1000**	**46**	**≥ 7 x number of users**
File Handles	**20 - 1500**	**16**	**≥ 5 x number of users**
Threads	1 - 10	1074	PCXT = 1, 3000 = 4, 3Server = 7
File Sharing Process	**20 - 300**	**10**	**≥ 1/user + 1/service + 10**
I/O Request Blocks	32	40	
3+SHARE - FILE			
Message Buffers	1 - 64		≥ 1 + Max Concurrent Requests
Max Concurrent Req.	1 - 9		< number of Message Buffers
Packet Receive Buf.	1 - 42	1500	≥ 2*(Msg Buff Size/1500)
Message Buf. Size	512 - 32737		
Max # Sessions	**1 - 240**	**114**	**≥ Max # Simultaneous Users**
Max # of Links	**1 - 999**	**44**	**≥ 4 x number of users**
Max # of Shares	**1 - 520**	**126**	**≥ 4 x number of users**
Print Queue Entries	**0 - 999**	**50**	**≥ 3 x number of users**
Max # of Users	**1 - #shares**	**66**	**< number of "Shares"**
3+NAME			
Network Number	8 characters	8	from 3+Name Diskette
Domain	20 characters	20	User defined value
Organization	20 characters	20	User defined value
Domain Limit	5 - 500	116	Default = 5
Open Domain Limit	4 - 100	64	≥ (Domain Limit/5)
Buffers	20 - 15	512	> (5 x Open Domain)
3+MAIL			
MSPROCS	1 - 10	12000	
MSREMOTE	1 - MSPROCS		< MSPROCS
MSFDEAD	1 - 32767		
MSFSLEEP	1 - 32767		
MSMBXLIM	1 - 32767	65	= number of users
MSFRSLEEP	1 - 32767		Number of cycles MSFSLEEP
3+ROUTE			
Comment	80 characters	80	
Network Number	8 characters	8	
Phone Number	49 digits	49	

NOTE: Whenever the number of users are changed on the server, all of the parameters in bold face must also be changed.

FIGURE 7 - Service Parameters

Setting Up The System

Each of the 3+services has a 'shell' which is entered in order to use commands from that service. Shells are named 3f (file shell), 3p (print shell), 3n (name shell), 3m (mail shell), 3r (remote shell), and 3b (backup shell). Once the service is entered, the commands may be used as shown in the command reference guide in Appendix A. Certain commands require that you are logged in as the Server-User (login using the server name and password) or that you are logged in as a user with administration capabilities (such as the user 'admin' provided automatically on the system).

Each particular service will require some setup to be done before the users will be able to utilize the services you make available.

Name Service Setup

In order to setup the name service you must be logged in as a user with administrative capabilities. A user with this capability is automatically made available upon name service installation. To login as this user (or any user) use the login command.

login admin <enter>

You will notice that you were not prompted for a password. Before proceeding further, assign a password for the admin user.

3n mod <enter>

This command will prompt you for specific information on the user you are logged in as. One thing it will ask you for is a password. Assign it one now. Another thing you will be prompted for is the user's home directory name. The admin user does not really need a home directory and if you assign one on a five user system, admin will use a user entry in your name service and leave you with only four actual users. For this reason it is recommended that you hit <enter> to skip this parameter. You will be asked if the user will have user (U) or admin (A) capabilities. All users should have user capabilities except a backup administrator assigned in case of damage to the normal admin user.

In order to set up the name service you must now add all of your users, aliases, domains, and organizations (domains and organizations will not need to be added if the users use the same ones as the server. This is recommended). In order to add these things, use the 3n add command.

3n add user <enter>
3n add alias <enter>
3n add domain <enter>
3n add organization <enter>

This is all of the name service entries you will need to add unless you are setting up inter-network communications with 3+Route.

File Service Setup

For the setup of this service you will need to log in as the server user using the servername and the password you assigned at initialization. After logging in you will use the 3f shell and the share command to share directories for the users on the system. Put another way, you will assign directories on the server to a sharename that the users can link to a drive identifier and access programs on that directory through that drive identifier.

For example assume the server user shared the server directory '\apps\testdir' with the sharename 'test'. you could then link the sharename 'test' to the drive identifier F: on your station. After doing this you could perform a directory command on your drive F, and you would get a listing of the files and subdirectories in the servers directory '\apps\testdir'. You may then load and execute (if the permissions have been set to allow this) files and programs in this directory as if they were actually on drive F of your station. This allows all of the users to access programs shared by the administrator at a level assigned by the administrator. Although this may seem confusing at this point, it should become more clear as we proceed.

The first directory we want to share is an application directory. We will call this directory apps and put it on the C drive of the server (you may place your directories on any server drive which is network available and has enough space).

3f share ? <enter>

The question mark in this command line will cause the service to prompt you for all applicable parameters. The parameters it will ask for are sharename; a name which will be used to describe the directory such as 'apps', the pathname; in this case c:\apps, the privileges; in this instance we will use /r and a password. The prompts will appear as they do in this example:

Sharename? **apps**
Path? **c:\apps**
Password? ****
Access(/RWC)? **/r**

The privilege levels are described below.

```
/pub  = read only
/r    = read only
/w    = write only
/rw   = read/write only
/rwc  = read, write, create, or delete
/wc   = write, create, or delete
/shar = rwc + the ability to share the directory
```

After apps has been shared with read only permission, we will need to create a sharename for the same directory which allows /rwc permissions. This sharename will be assigned a password and will be used for administration functions to the directory, such as making sub-directories and copying files into the directory. A good name for this directory would be appsadmn.

Once the appsadmn directory has been created you may link to it and copy some of the necessary user files to it.

3f link e: \\sys\appsadmn

This command line will link the drive identifier E: (on the station we are using) to the sharename appsadmn (which we know represents the directory C:\apps on our server). Since you are linked to appsadmn, you now have /rwc permission to this directory. The first thing that must be done is to copy the User #1 and #2 disks into this directory. This can be accomplished by putting those disks in turn into drive A: and typing '**xcopy A:\ E:\ /s**'. This is done to allow each of the users access to the user software simply by linking one of their drive identifiers to the \\sys\apps sharename.

The next thing that should be done to this directory is to make a sub-directory named 'dos' and copy all of the MS-DOS commands and utilities to this directory. Directories should also be made for all of the applications the user will be accessing and these should be given their own sharenames. There are a couple of system directories which should be shared with passwords for administration use. These are \3plus\3config (which contains the 3install program), and \3plus\3backup (which contains the tape backup service).

You should remain logged in as the server user and proceed with setting up the print services.

Print Service Setup

All that will need to be done to this service is that the printer(s) will need to be shared for the users access. This share command will simply ask for a sharename and printer location (i.e. lpt1:). A password may also be assigned.

3p share ?

After typing this command the system will prompt you for the following three parameters:

Printer Sharename?	(name used to link the printer)
Printer ID? (i.e. PRN:, LPT1:)	(which port on the server is attached to this printer)
Password?	(password of your choice, if any)

This will complete the minimum setup needed for the 3 basic services. For setup information on other services consult the 3+ Administrators Guide.

USING THE SYSTEM

Using 3COM

In order for the user to access and use the system, the minimum he will need to do will be to first boot from a workstation startup disk. This will load the needed drivers through his config.sys and run the startup programs from the autoexec.bat program. He will then need to log in and it is recommended that at this time he modify his password.

3n mod password <enter>

This command will allow you to modify your password. The next thing that will need to be done is the linking of sharenames to drive identifiers so that services on the server may be accessed. One way to do this would be with a batch file. An example of a batch file which does this as well as logs the user in is shown and explained below.

```
login username            *log in the user and prompt for a password.
3f link d:                *this links D: to the users home directory.
3f link e: \\sys\apps     *links e: to the apps directory
3f link f: \\sys\desk     *links f: to the shared deskmate directory.
3f link g: \\sys\games    *links g: to the shared games directory.
path=d:;e:;e:\dos         *sets the path to common command directories.
3p link lpt1: \\sys\prl   *links the stations printer port to the servers f:
                           shared printer 'prl'
desk                      *runs Deskmate®
```

The user applications, mail and menus, are very useful services. To get complete information on their use reference the individual user's manuals. Some basic information on each is provided below.

3+Mail

This service provides mail communication between all users on the network as well as users on other networks connected via route or netconnect. To use this service the mail server software must be installed on the a server and the mail user software must be copied to a shared directory such as \\sys\apps. If the user software was in the apps directory and the user linked apps to D: and their home directory to E:, a possible way to load the mail program would be:

D:\> mail e:\inbox /displaytype=b <enter>

This command line will load mail and create a mailbox in the user's home directory. The displaytype parameter is optional and will give the user a color screen. Once mail is loaded the user may send, receive, forward, reply to, and attach programs to mail messages. The 3+Mail program also provides a Mail Minder program that allows you to set parameters for a service which will check the server for mail and report to you through a pop up window and/or a beep. 3+mail may even be called from the 3+menus program.

3+Menus

The menus software should also be copied to the apps directory by the administrator. In order to properly use the software, the user should make a menus directory in their home directory, and copy all of the menus software to that directory. They would then call menus from that directory. Menus will allow you to create your own menus and sub menus. It will allow you to execute programs and tasks from the menu directly and return there after finishing. Parameters for the tasks may be set automatically or be prompted for by the menus program.

SAVES AND RESTORES

3Server Saves

The tape drive built into the 3Server3 makes for fairly easy full system saves of the 3Server3's hard drives. Of course, the 3+Backup service must be installed in order access the tape unit.

The information provided below is just one means of making a full system save. There are other methods of making a full system backup as well as individual file backups which may prove to be more advantageous to the particular system you are working with. Also, as the software changes, procedures may also change. Refer to the 3+Backup documentation for further information on this subject.

Some important files must be duplicated in a different location on the hard drive before the backup is done. The backup procedure will not back these files up because they are accessed when the backup program is run. In order to copy these files to another directory, you must access the server through a 3console connection. The best place to copy them to may be the E: drive since in most systems this is the least used drive. An example of the command line which would be used to copy these files to the E: drive is given below.

```
copy c:\3plus\3name\ns_dom.* e:   (this is the name service entries)
copy c:\3plus\3share\shrlst e:    (this is the list of sharenames)
```

The procedure for performing a full system backup is given below.

1. Login as the server user. Individual backups may be done from a user level. See the 3+Backup documentation for further information on how to do this.

2. Create a sharename for the backup utilities directory.

```
3f share tapeback=c:\3plus\3backup
```

3. Link up this newly shared directory.

```
3f link d: \\sys\tapeback
```

4. Make D: the current drive and enter the backup service.

```
D:
3b
```

5. Execute the backup command.

```
backup ?
```

This command will prompt you for all of the parameters it needs. Hitting <enter> to use the defaults will give you a full backup of the current server. Only a serveruser (logged in under the server name) can do a full system save. Individual direcories may be saved by the users who own them as long as the tape in the tape drive is not a server user tape (any tape which the server user has used for a previous backup).

There are two other useful commands which will aid in operation of the backup service.

Stat -- This command, executed from the 3b shell, will give a status of the current operation in progress.
Log -- After the backup has finished, this command will show you whether the backup was successful and a directory of the files that were backed up.

3Server3 Restores

In order to restore a full system save to an empty 3Server3 hard drive, you must first reinstall the name, share, and backup services (if these services were originally on this server). These services must then be configured exactly as they were prior to the save. To do this you must use the configuration report generated with the 3install program when the services were originally installed. The procedure is the same as with a backup except that the command line used will be:

3b restore ?

After a full system restore is done, you will need to copy the **NS_DOM.*** and **SHRLST** files back over from where they were copied to before the save. This must be done in order to maintain all of the name service listing from the previous hard drive. After the restore has been completed, the services will need to be reinstalled once again. This must be done due to the method of software protection used on the services.

PCServer Saves and Restores

Before performing a full save of a PCServer, all of the services installed on that server must be deinstalled. After this has been done, a tape or floppy, mirror image or file by file backup may be done. The services are deinstalled due to the method of software protection used on the services which takes into account the location of services on the hard drive. The only possible way to do a full system save without first de-installing would be a mirror image tape backup. This method would work as long as the media error map on the hard drive to which the software is reinstalled matches the one from which the save was made.

Shutting Down The Services

Before turning off the server, the services must first be shut down. When doing this, the 3+Name service must always be shut down last. Use the procedures below depending on the service you are shutting down.

3+Mail Service

1. Login as admin

    login admin

2. Link the apps directory to a drive

    3f link d: \\sys\apps

3. Make that drive the current drive and type:

    D:
    3M SHUTDOWN <enter>

3+Share Service

Make sure that no users are logged on or linked before proceeding.

1. Login as admin

    login admin

2. Link the apps directory to a drive

    3f link d: \\sys\apps

3. Make that drive the current drive and type:

    D:
    3F SHUTDOWN <enter>

3+Name Service

1. Login as admin

   login admin

2. insert the 3+Share User Software diskette into drive A: and make A: the current drive.

   A:

3. Type:

   3N SHUTDOWN <enter>

Appendix A

COMMAND REFERENCE

The Commands listed here are separated into their different service 'shells'. The command 'shells' are organized in the order listed below.

SHELL	SERVICE
3F	3+Share File
3M	3+Mail
3N	3+Name
3P	3+Print
3R	3+Remote
3S	3+Start

Each of the commands are listed in the syntax shown below.

COMMAND SYNTAX [optional parameters] Command Description User Type

The user type column is a letter value, either blank, A, SU, A/SU, which indicates the level of user capabilities required to execute this commands. The letters represent:

blank = User
A = Admin
SU = Server User
A/SU = Admin or Server User

COMMAND	DESCRIPTION	USER TYPE
LOGIN [[\\]username][/PASS=password]	Checks to see if you are a valid user and allows you access to network.	
LOGOUT	Disconnects you from the network.	

3F COMMANDS

COMMAND	DESCRIPTION	USER TYPE
3F	Starts the file service shell.	
3F DIR [\\username:\\servername] [sharename][/LINK]	Displays information about shared directories.	
3F HELP [command name]	Displays information about 3F commands	
3F LINK driveid: [\\username:\\servername[\]] [sharename][\PASS=password][/NP]	Links a drive identifier on your workstation to a shared directory on a servers disk.	
3F LOGIN [[\\]username][/PASS=password]	Allows you access to the network.	
3F LOGOUT	Disconnects you from the network.	
3F MOD[IFY] sharename [/PASS=newpass][/newaccess][/NP]	Changes the password and access rights for the sharename of a shared directory.	
3F MOD[IFY] sharename:path [/PASS=password][/access]	Modifies the password and access rights of a first level directory's sharename.	SU
3F SHARE sharename=path [/PASS=password][/access]	Makes a directory on a server available to users.	
3F SHARE [sharename=] path [/PASS=pass][/access]	Creates a first level directory and shares it.	SU
3F SHUTDOWN [\\server][/NEW][/NP]	Shuts down the 3+Share File and Print services on the specified server.	A

3F STAT[US] [\\servername]	Displays status information for shared disks on a server.	
3F UNLINK driveid:	Ends a link between a drive identifier on your workstation and a shared directory on a server's disk.	
3f UNLINK \\user [\\server][/NP]	Unlinks a user from shared directories and printers on the specified server.	A
3F UNSHARE sharename	Deletes a sharename.	
3F UNSHARE sharename¦path	Deletes a sharename	SU

3M COMMANDS

COMMAND	DESCRIPTION	USER TYPE
3M	Starts the 3M shell.	A
3M DELM user [/NP]	Deletes a users unretrieved mail.	A
3M DEL1M user	Deletes the first message in the queue waiting to be delivered to the specified user.	A
3M DEL0 network:server [/NP]	Deletes outgoing mail waiting to be relayed to another server.	A
3M DEL1O network:server [/NP]	Deletes the oldest outging message waiting to be relayed to another server.	A
3M DIRM [/NP]	Lists users who have mail to retrieve and the number of those messages.	A
3M DIRO [/NP]	Lists the addresses of servers to which outgoing mail is addressed and the number of messages.	A
3M HELP¦? [command]	Lists 3+Mail commands and their functions.	A

3M SERVER=[server][/NP]	Specifies the mail server with which you want to work.	A
3M SHUTDOWN [/NP]	Shuts down the 3+Mail service on a server.	A
3M STATUS [/NP]	Displays configuratiuon and current status information for the 3+Mail service.	A

3N COMMANDS

COMMANDS	DESCRIPTION	USER TYPE
3N	Starts the 3N shell.	
3N ADD ALIAS [\\]name[:domain[:organization]]	Creates an alias for an entry in in the name service.	A
3N ADD DOMAIN domain[:organization]	Adds a domain to the name service.	A
3N ADD GROUP [\\]name[:domain[:organization]]	Adds a group to the name service.	A
3N ADD MEMBER [\\]name[:domain[:organization]]	Adds a member to a group.	A
3N ADD PROP propnum	Adds a new property, or feild to the record definition for a class of entry in the name service.	A
3N ADD SERVER [\\]name[:domain[:organization]]	Adds a server to the name service.	A
3N ADD USER name[:domain[:organization]]	Adds a user to the name service.	A
3N ASSIGN IBMname=[\\]name	Assigns an IBM compatible name to represent the three part name of the server.	A
3N DEL[ETE] [\\]name[:domain[:organization]][/NP]	Deletes a user group or server from the name service.	A
3N DEL[ETE] ALIAS [\\]name[:domain[:organization]][/NP]	Deletes an alias from the name service.	A

3N DEL[ETE] DOMAIN domain[:organization][/NP]	Deletes a domain and all associated entries from the name service.	A
3N DEL[ETE] MEMBER [\\]name[:domain[:organization]][/NP]	Deletes a member from a group in the name service.	A
3N DEL PROP propname¦propnum [/NP]	Deletes an existing property, or field, from an entry's record in the name service.	A
3N DIR [itemtype][[\\]name]	Lists names of items on the network aliases, domains, groups, members, organizations, servers or users- or displays detailed information on a specific item.	
3N DIR PROP [propnum¦propname]	Displays the properties that have been added to the name service.	A
3N HELP [commandname]	Displays information on 3N commands	
3N LOGIN [[\\]username] [/PASS=password]	Allows you access to the network as a user.	
3N LOGOUT	Disconnects you from the network.	
3N MOD[IFY] /PASS=password	adds, changes or removes your login password.	
3N MOD[IFY] [\\]name[:domain[:organization]]	Modifies a user, group or server entry in the name service.	A
3N MOD[IFY] DOMAIN domain[:organization]	Modifies a domain in the name service.	A
3N MOD PROP propnum¦propname	Modifies a property in the name service.	A
3N SET [/SERVER=\\server] [DOMAIN=domain][/ORG=organization]	Temporarily resets 3N's default server, domain, or organization.	
3N SET [/TIME=hh:mm[:ss]][/DATE=mm-dd-yy]	Sets the name service's time and date.	A

3N STAT[US]	Displays detailed information about your user name.
3N SHUTDOWN [/NP]	Shuts down the name service.

3P COMMANDS

COMMAND	DESCRIPTION	USER TYPE
3P	Starts the 3P shell	
3P DEL[ETE] [prnid:]/SPOOL=spoolid[/NP]	Deletes a spool file from a print queue.	
3P DEL[ETE] [prnid] /SPOOL=spoolid¦*¦all [/NP]	Deletes one or more spooled files from a print queue.	A
3P DIR [\\servername] [[\]printersharename][/LINK]	Lists shared printers or links to shared printers and directories.	
3P HELP [commandname]	Displays information about 3P commands.	
3P LINK [prnid:] [\\servername\]printersharename [/PASS=password][/NP]	Establishes a link between a printer identifier at your workstation and a shared printer on a server.	
3P LOGIN [[\\]username] [PASS=password]	Identifies you as a valid user and allows you to access the network.	
3P LOGOUT	Disconnects you from the network.	
3P MOD[IFY] printername[/PASS=pass]	Modifies a printer's password.	SU
3P MOVQ prnid1 [prnid2]	Moves one printer's queue to the end of another printer's queue.	A
3P QSTAT [prnid:¦[\\servername\]printersharename] [/SPOOL=#]	Lists the files in a printer's queue.	
3P RESUME [prnid¦printername][/NEW] [/FORM=formnum][/FF[=OFF]] [/BANNER[=OFF]]	Resumes printing on the specified printer.	A/SU

3P SET [prnid:][/HOLD[=OFF]] [COPIES=#][/PRI=#][/DEFER[=OFF]] [/RELEASE][/FORM=#][SPOOL=#]	Sets special printing options for a printer.	
3P SET [prnid]/SPOOL=spoolid¦*¦ALL [/HOLD[=OFF]][/COPIES=copies] [/PRI=priority][/DEFER[=OFF]] [/RELEASE][/FORM=formnum]	Sets spool file options.	A
3P SHARE printername=portid [/PASS=pass]	Assigns a name to a printer and shares it on the network.	SU
3P SHUTDOWN [\\server][/NEW][/NP]	Shuts down the File and Print services on a specified server.	A
3P STAT[US] [\\servername]¦ [\\servername\printername]¦[prnid:]	Displays status information of the specified printer.	
3P STOP [prnid][/LINK][/NEW]	Stops any printing on the specified printer.	A
3P UNLINK [prnid:]	Disconnects a printer linked to your workstation.	
3P UNLINK \\user [\\server]	Unlinks a user from the shared directories and printers on a server.	A
3P UNSHARE printername	Makes the printer unavailable for shared use.	SU

3R COMMANDS

COMMAND	DESCRIPTION	USER TYPE
3R DIAL [/TIMEOUT=timeout] [PHONENUMBER=phonenumber]	Causes a remote station to dial a phone number.	
3R HANGUP	Forces a remote workstation to hang up the phone and disconnect from the network.	
3R SET [/COM1:¦COM2:] [/MICROCOM¦/HAYES¦/TRAILBLAZER¦ /FASTLINK¦/OTHER][/BAUDRATE=baud] [/SPEED=speed]	Sets option values other than those specified in the PROFILE.SYS file on a remote workstation.	

3R STATUS	Displays remotes internal counters for monitoring line activity and transmit errors.

3S COMMANDS

COMMAND	DESCRIPTION	USER TYPE
3S CREATE volname [/access] [/PASS=pass][/FROM=parameter] [/TO=parameter2][/DESC="description]	Creates a Start volume.	A
3S DEL[ETE] volname [/NP]	Deletes a Start volume.	A
3S DIR [volname][/LINK]	Lists information about a Start volumes.	A
3S LINK volname [/PASS=pass][/NP]	Links a start volume to drive C:.	A
3S MOD[[IFY] startvol[/PASS=pass] [/access][/DESC="description"]	Modifies a start volume's password access type, and/or description.	A
3S UNLINK	Unlinks a Start volume from drive C:.	
3S UNLINK [volname] [addr=netaddress|*]	Unlinks a user from a start volume by specifying the users netaddress.	A

ETHERLINK II

Etherlink II Jumper Options:

The Etherlink II is the second generation Etherlink board. With this board you are allowed to configure the same options as on the original Etherlink board. The difference is in that only the memory and I/O addresses are configurable through hardware jumpers. Other options such as interrupt and DMA channels are configured in software by adding options after the driver in the computer's config.sys file.

You have the ability to set a number of I/O and memory addresses (memory addresses are for the Etherstart PROM option if it is enabled). If the addresses are changed from the default values, this must also be noted when loading the driver. The default values for these two options are memory disabled and I/O address 3ØØ. Locations for these jumpers are shown in figure 1.

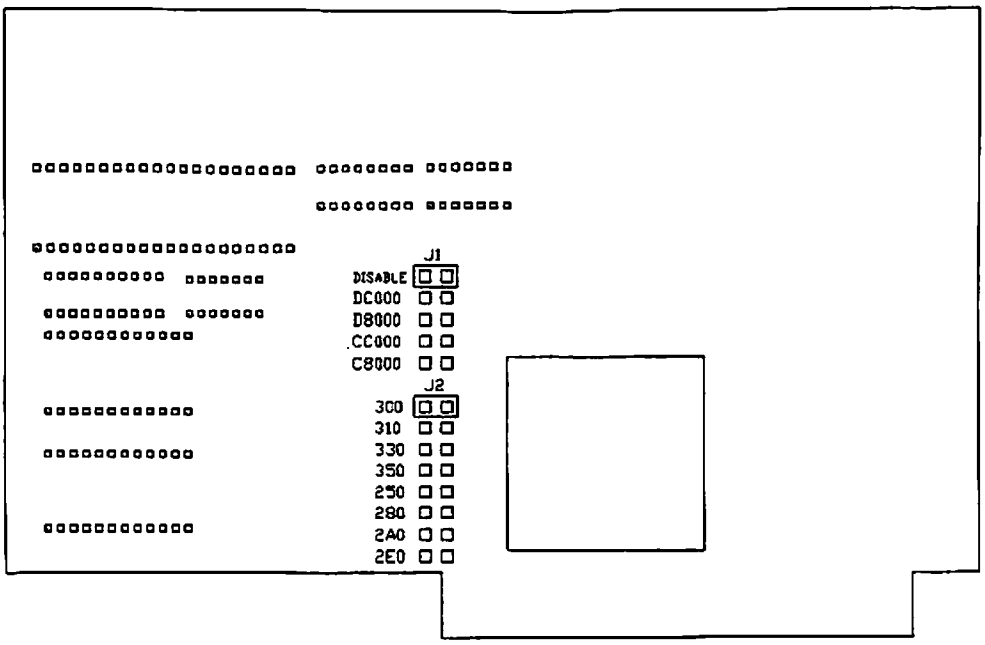


Figure 1 - Jumper Locations Etherlink II

Software Setup

To boot and run a station using this board, the standard workstation startup disk created on page 35 of this manual will work fine with modifications to the drivers. The disk that comes with the Etherlink II board contains both the diagnostics and a driver (eth5Ø3.sys) for use with this board.

In order to use this board you will need to copy the driver (eth5Ø3.sys) from the diagnostic disk onto your workstation startup disk. For example, if you have your workstation boot disk in drive A: and the diagnostic disk in drive B:, you would type:

COPY B:eth5Ø3.sys A: <enter>

You will then need to put this driver in your config.sys file in place of the network driver previously found there. You may find one of these command lines in your config.sys file:

DEVICE=eth.sys
or
DEVICE=eth5Ø5.sys

This line must be changed to read:

DEVICE=eth5Ø3.sys [/parameter:value] ...

Parameters which may be appended to this command line are listed below. Remember that if you change the jumper for I/O address on the board, you must add that parameter's value to this command line. Default parameters are assumed and therefore need not be entered on this command line.

Parameter	Function
A	Sets the value of the I/O base address. Default is 3ØØH. You may use 3ØØH, 31ØH, 33ØH, 35ØH, 25ØH, 28ØH, 2AØH, and 2EØH. This setting must match the hardware jumper.
D	Sets the DMA channel to use. Default is 1. You may use 1, 2, or 3.
I	Sets the Interrupt channel. Default is 3. Choices are 2, 3, 4, and 5.
M	Determines the type of data transfer to be used. Default is 3 on a PC or PC XT type computer, 4 on a PC AT type. Values are described below. 1 - DMA single byte mode 2 - Programmed I/O loop 3 - DMA demand mode 4 - Programmed I/O using REP instruction. Can only be used in Intel 8Ø186, 8Ø286, 8Ø386 class machines.
T	Determines the transceiver type used. Default value is 1 (on board transceiver). Choose 2 for use with an external transceiver.

Example:

```
DEVICE=eth5Ø3.sys /I:5 /A:31Ø /D:3 /T:2
```

This line in your config.sys file will set your Etherlink II board up to use interrupt level 5, I/O base address 31Ø, DMA channel 3, and an external transceiver.

Diagnostics

Diagnostics for this board are very similar to the diagnostics for the Etherlink and Etherlink Plus boards. However, the diagnostics for this board are presented in a menu format. This makes the diagnostic much easier to use. Menu items may be accessed by using the arrow keys to make a selection and the <enter> key to execute that selection. To start the diagnostic, place a copy of the disk which comes with the Etherlink II board into drive A and type:

A:3C5Ø3 <enter>

The program will display a main menu which provides you with two selections, Diagnostic Tests and Echo User Setup.

The Echo User Setup selection allows you to set up a single machine on a cabled and terminated network as an echo server for the testing of other boards in the network. When you choose this option your parameter value selections set in software will be displayed and you will be asked if you want to change any of them. After you accept these values your echo server will complete its setup.

If you choose the Diagnostics Tests selection on the main menu, you will again be asked to verify your software parameter values, and then you will be taken to a sub-menu. This sub-menu allows you to select from one of three groups of tests.

Group one tests only require that the adapter be installed in your machine. This selection will run tests which check internal functions of the controller as well as its ability to communicate with the host machine.

Group two tests require a loopback connector as described on page 17 of this manual, to be installed. Group one's tests will be run as well as tests to verify the board's ability to communicate over the network.

Group three tests require that an echo server is setup on a functional network. Tests will be run from groups one and two as well as tests to verify the board's ability to send and receive data over the network.

3Station™

The 3Station™

The 3Com® 3Station™ is a dedicated diskless workstation designed for use on an Ethernet® network. The 3Station™ comes ready to be connected to a compatible keyboard, monitor and other compatible peripherals and then connected to the network via a built in Ethernet® controller and transceiver. The station may then be booted from a network with 3+Start™ installed which has a start volume created and enabled for use with the 3Station™.

The station has a keyboard interface which may be connected to almost any PC-AT compatible keyboard. A keyboard is provided with the unit. A PC-XT style keyboard cannot be used. The 3Station™ has the capability of interfacing with three different display types in four different possible modes. These are monochrome display in monochrome or Hercules Monochrome mode, color display in CGA mode, and enhanced graphics display in EGA mode.

Also provided are a 25-pin Centronics compatible printer port and 2 RS-232C compatible serial ports (9 and 25 pin) for connection to printers, modems, mice, and other peripherals.

Figure 1 shows a front and rear view of the unit showing the indicators, controls and connectors.

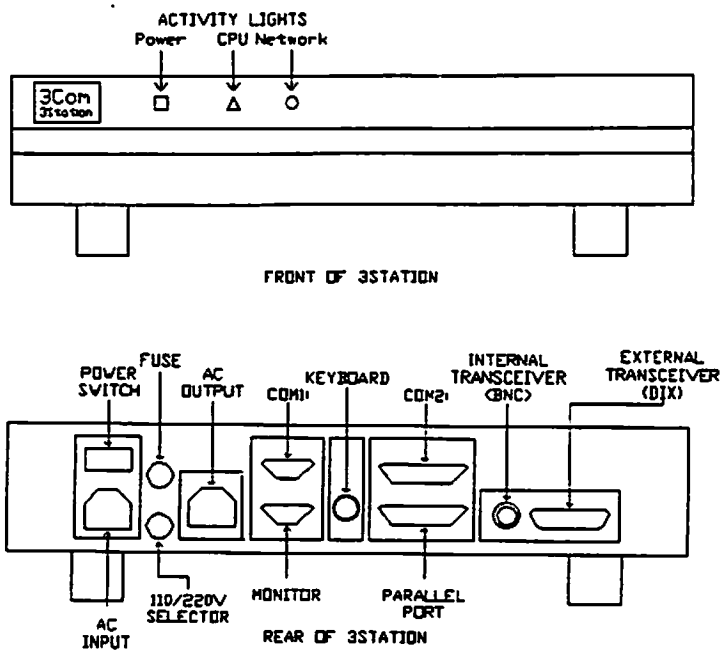


Figure 1

Disassembly

To remove the unit's outer cover and gain access to the logic board and power supply inside, three screws must be removed. First remove the two black square screw covers in the rear corners of the unit. Remove the two screws which were covered by these inserts. The front panel will now slide forward and come off of the unit.

Inside the unit, on the right front side, there is another screw which holds the board mount to the chassis of the station. Remove this screw. The PC board power supply and board mount will now slide out the rear of the unit along with the rear panel.

NOTE: The 3Station™ may come set for 220V AC input. Before plugging the station into the power outlet, be sure to set the 110/220V selector on the rear of the unit to the proper voltage.

3station™ Setup

When a new 3Station™ is connected to the network and powered on, it will attempt to boot from a 3+start volume called 3Station™. If this start volume has not been created by the system administrator, or if there is a problem with the station, network, or network connection, the station will boot to the 3Station™ Setup & Diagnostic Program screen. This screen is used to set up the station's configuration and/or test the station. We will discuss this later.

If you power the station up you should receive one of the aforementioned screens. If what you see on you monitor is information which seems to be out of sync, or if your display shows nothing at all, it could be because the monitor type in the system configuration is not set properly for the type of monitor you have connected. Follow this procedure to correctly set the monitor type.

1.) Press and hold the following keys: <CTRL>, <SHIFT>, <ALT>, and <DEL>.
2.) When the left (power) and center (CPU) indicators on the front of the unit are BOTH lit, release the keys. This will place the machine into setup mode.
3.) Press the following key combination which pertains to the type of monitor you are using:

    <ALT><M> = Monochrome
    <ALT><C> = Color
    <ALT><E> = Enhanced Color

    This will setup the station to the display type selected and reboot the station.

Setup and Diagnostics Program

As mentioned before, if the station has any problem during startup, it will enter the 3Station™ Setup & Diagnostic Program. This program can also be entered by pressing and holding the <SHIFT> key during startup, or at anytime by pressing the following key sequence: <CTRL>, <SHIFT>, <ALT>, <DEL>. The later method of entering the setup program will terminate any applications which are running on the station. The following menu will be displayed.

```
                3Station™ Setup & Diagnostics Program

                          Version 1.Ø
              © 1987 3Com® Corp. All rights reserved.

   Select the desired function:
   1. Set up system configuration
   2. Run user diagnostics
   3. Exit and reboot system

   Enter selection number:

   Setup entered due to: user request
```

Note that the reason setup was entered is listed underneath the menu. Press the number of the selection wanted. If <1> is selected from this main menu the following sub-menu will be displayed.

```
                3Station™ Setup & Diagnostic Program

                          SETUP MENU

   Select the desired function:        Current values are:

   1. Select display type              Enhanced Color
   2. Select memory size               1 MB
   3. Select Ethernet connection       Internal Transceiver (BNC)
   4. Set Start volume name            3Station
   5. Set time                         Ø2:57:25
   6. Set date                         Ø9/Ø2/1988
   7. Return to main menu

   Enter selection number:
```

To change one of the listed values, press the number associated with that function. The choices are described here.

1. Select display type - This option allows you to select the display type connected to your station. The choices are Enhanced Color, Color, or Monochrome.

2. Select Memory size - This option allows you to select the amount of memory you have in your station. Stations come with 1MB of RAM installed and can be upgraded to either 2.5MB or 4MB. This is done by replacing the SIMMs at locations U32, U33, U34, and U35 on the main PCB with 1MB SIMMs. To upgrade to 2.5MB replace U33 and U35. To upgrade to 4MB replace all four of the SIMMs. Jumpers MCJØ, MCJ1, and MCJ2 must also be cut or left shorted depending on the memory configuration. See the truth table below for the proper jumpering. These three jumpers are located next to the SIMMs, along the edge of the board.

MEM SIZE	MCJØ	MCJ1	MCJ2
1MB	SHORT	SHORT	SHORT
2.5MB	CUT	SHORT	CUT
4MB	SHORT	CUT	CUT

3. Select Ethernet® connection - This option allows you to select the type of Ethernet® connection you will use for the station. The choices are either Internal Transceiver using a BNC connector to attach the station to thin Ethernet® cable or an External transceiver connected to the DIX connector generally used to connect to Thick Ethernet® cable.

4. Set Start volume name - This option allows you to select the name of the 3+Start™ volume you would like the station to boot from. If this option is left blank, you will be prompted for a volume name when you boot the station. The default volume name is 3Station™.

5. Set time - This option is used to set the internal CMOS clock in the station.

6. Set date - This selection is used to set the correct date in the internal CMOS real time clock.

7. Return to main menu - This option exits you from the Setup menu and returns you to the main menu.

If you choose selection 2 from the main menu, the diagnostics menu will be displayed. The menu seen will be similar to the one displayed below.

3Station™ Setup & Diagnostic Program

DIAGNOSTICS MENU

Select the desired function:

1. **Keyboard test**
2. **Lights test**
3. **Speaker test**
4. **Memory test**
5. **Video test**
6. **Server link test**
7. **Ethernet hardware tests**
8. **Return to main menu**

To execute any of the tests, press the corresponding number key. A description of each test follows.

1. Keyboard test - This test will allow you to press a key or key combination and have it displayed on the screen. Use this test to verify proper operation of the keyboard.

2. Lights test - This test will turn the three front panel lights in specific sequences. The light status is also displayed on the screen to aid in verification.

3. Speaker test - When this test is run a tone will be emitted from the speaker which starts out high, gradually moves to a low tone, and the rises to its original tone.

4. Memory test - This test will test the memory in the station and display the address, and data written and read values for any errors encountered.

5. Video test - This test will first allow you to select a character to fill the screen with for adjustment purposes. At this point you should check to be sure that your screen alignment is straight and symmetrical. After you check this alignment and press any key to continue, the screen will display the ASCII characters for ASCII 32 to 165. Verify that these characters are correct.

6. Server Link test - For this test the station must be connected to the network. The Start server on the network must also be operational. The test will continuously attempt to transmit to and receive messages from a Start server on the network. Each complete attempt will take about 1Ø to 15 seconds so wait at least that long before exiting the test by pressing any key.

7. Ethernet® Hardware tests - Selecting this item from the diagnostics menu will display a sub-menu which includes the following tests. A loopback connector must be connected to the Ethernet® port on the back of the unit prior to running these tests or the unit will fail.

    1. Write/read Ethernet® address - Reads your stations Ethernet® address from the hardware registers and writes it back.

    2. Write/read registers - Writes data to the Ethernet® hardware registers and reads it back to verify the registers accessibility from the station's CPU.

    3. Write/read local RAM - Writes to and reads from the local RAM in the Ethernet® transceiver section.

    4. Loopback tests - Loops data through the major portions of the Ethernet® hardware.

    5. Interrupt test - Transmits a packet and checks to make sure that the proper interrupt occurs upon transmission completion.

    6. All tests in sequence - Runs each of the above tests in sequence.

    7. Return to diagnostic menu - Returns to the diagnostics menu.

For information on installing 3+Start™ or other services on a server refer to the 3Com® Installation and Configuration Guide and the Administrator's Guide. Once the Start service is setup on the server, the 3Station™ can boot and operate like any other station.

Appendix D-3Server386®/3S4ØØ

Table Of Contents

3Server386®

The 3Server386® is a highly efficient dedicated Ethernet® network server. Features of this server are as follows.

-16Mhz 80386 processor
-2MB of on board RAM, expandable to 14MB
-150MB Hard Drive with built in SCSI Controller
-3+ Networking Software
-One parallel port
-One asynchronous serial port
-One AppleTalk™M Port
-Two syncchronous RS-232C serial ports
-BNC and DIX type Ethernet® connectors for use with either thick or thin Ethernet® cable
-Four 16 bit AT expansion slots
-A two-line 32 character LCD and 6 server status lights.

This server has the capability of operating as a server in three different network environments, either through the built in Ethernet® or AppleTalk™M ports, or through the addition of a TokenLink™M expansion board.

The 3S400 or 3S401 is a name given to a complete 3Com® system including a 3Server386® and the 3+ network software. The 3S400 system is the system described above. The 3S401 system also includes a 150MB Tape Drive installed in the 3Server386® and appropriate 3+Backup software needed to access this drive. A tape drive may be added to the 3S400 unit.

Another option the customer may choose is to purchase a 3S400 system and instead of adding a tape drive to the base unit, they may add another 150MB Hard Drive. The 3Server386® will support up to 6 hard drives (including the one in the base unit). The base unit can have a maximum of 2 hard drives installed and then an 150MB Disk Expansion Unit may be added. This unit comes with one hard drive installed and can be upgraded with the same 150MB disk which was installed in the base unit so that it contains its maximum of two hard drives. Another Disk Expansion Unit and Disk may be added to bring the total to 6 hard drives or approximately 900MB of disk storage (only 5 drives may be added if a Tape Backup is installed).

The standard built-in 1 parallel, 1 asynchronous serial, and 2 synchronous serial port configuration may be upgraded by adding up to two additional communication boards.

The built in ports on the server will use COM1: and LPT1:. One of Tandy's Serial/Parallel boards for the 3000/4000 may be used to expand the server's ports if it is configured for COM2: and LPT2:.

3Com® also supports the AST® Four-Port Serial Board. One or both of these boards may be added to the server and if the board is configured correctly, the server will recognize it and automatically configure it into the system. The software must then be configured to use these ports through the 3INS (3Install) program.

Figure 1 is a picture of the front control panel of the 3Server386®. The controls and indicators are described below.

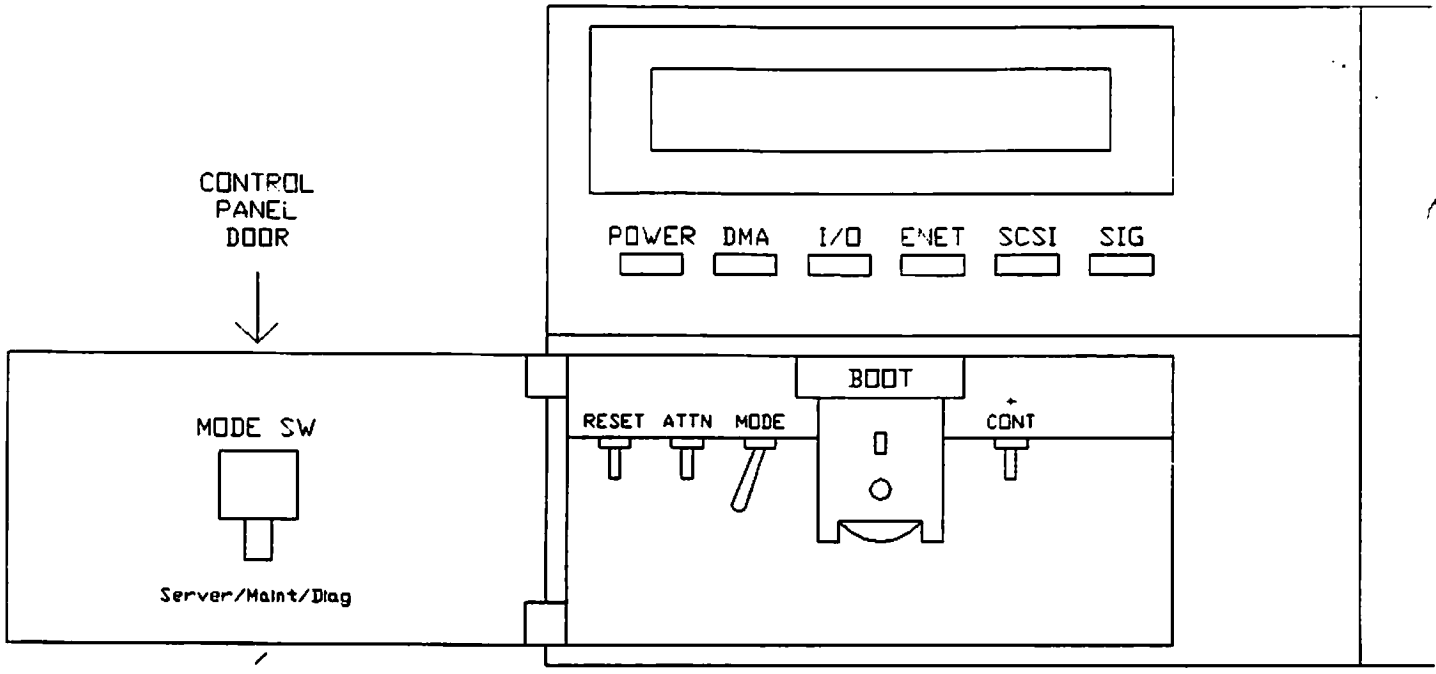


Figure 1

Indicators:

LCD - Displays the server status and any error messages. The power on self test information will be shown on boot up. After boot and during normal operation the current date and time and the server name will be displayed.

POWER - Turns on when power is applied to the unit.

DMA - Lights upon access of the memory by the DMA controller.

I/O - Indicates activity by the CPU in I/O space.

ENET - Indicates activity on the Ethernet® network.

SCSI - Indicates activity on either the server's tape or hard drives.

SIG - Indicates the need for operator attention except during power on self tests when it flickers during each phase of the test.

Controls:

Reset Button:

When the MODE switch is set for either maintenance or diagnostics, this switch will reset the server. There are some operations in these modes which will require the server to be reset on completion. **NOTE: Make sure that all of the users are logged off of the server and the services are shut down before reseting the server. Refer to the software section of this guide for further information on shutting down the services.**

Mode Switch:

This switch may be set to one of the three positions described below.

Server (left)	This setting is used for normal server operations. When the switch is set in this position, the reset switch is disabled.
Maintenance (center)	This mode setting is used to run programs and utilities on the server that require it is operating in a DOS only mode (not running as a server) i.e. 3Console for installations; diagnostics, 3disk386 for drive testing.
Diagnostics (right)	Used for running the built in diagnostics on the server.

Boot Switch:

This is a thumbwheel switch with 16 possible settings. In combination with the Mode Switch, this switch is used to select the server's mode of operation. For each setting of the mode switch, the effects of the boot switch settings are listed. Make special note of the MODE = DIAGNOSTIC settings as these will aid you in troubleshooting the server unit.

MODE=SERVER

Boot Switch Setting:

Ø - With the boot switch in this position, the server will boot from its own hard drive. If the network software has been loaded on the hard drive, the software will be run and the network services will be run as configured. If there are no errors, the server will then be accessable by the users.

1-15 - These settings are reserved.

MODE=Maintenance

Boot Switch Setting:

Ø - Local boot position. This setting causes the server to boot exactly as it would if the MODE Switch were set to server. Use this setting to reboot the server after running diagnostics or maintenance functions. Once reset is pushed, set the MODE switch back to SERVER.

1 - Ethernet® boot position. This setting will allow the server to boot and load DOS through the Ethernet® cable connection from a station on the network. This is done by establishing a 3Console connection in much the same way it was done with the 3Server3®. For instructions on establishing this connection, Refer to the instructions on page 85.

2 - Token Ring boot position - This setting will allow the server to boot and load the operating system from a station through the Token Ring connection.

3-15 - These settings are reserved.

MODE=Diagnostics

Boot Switch Setting:

Ø - Front Panel Test. This setting monitors the controls on the front panel and displays any change. For example, if you change the BOOT switch to setting 1, the LCD will display 'BOOT switch = 1'. To end this test you must change the setting of either the MODE or BOOT switch and reset the server.

1 - All Diagnostic Tests. This setting will run diagnostics on all portions of the server. External loopback tests will be run on the Ethernet® port, and all of the serial ports. Loopback connectors must therfore be connected to these ports. If they are not connected, the test for that particular port will fail and the CONT button must be pressed in order to continue the tests. The printer must also be attached since a printer test will also be run to verify proper operation of this port.

2 - Reserved

3 - Serial Port External Loopback. This test will run an external loopback test (requires loopback connectors) on both the asynchronous serial and AppleTalk™M ports.

4 - Ethernet® External Loopback. This test will do a continuous external loopback on the Ethernet® port. A loopback connector must be installed.

5 - Parallel Port Extended Test. This test will print a line of 8Ø characters to a printer connected to the parallel port 5 times and also print a line containing the server's Ethernet® address.

6 - Reserved

7 - Extended Memory Setup. This setting allows you to specify the amount of extended memory you have added to the server. The server has 1MB of extended memory already installed on the main logic board. This is the optimum amount. To install any more memory requires the installation of a 3Server386® Memory Expansion Board. For installation instructions, refer to the memory upgrade section of this document.

8 - RS-232C Synchronous Port External Loopback. This setting tests the synchronous RS-232 loopback capability. You must install external loopback cables to the RS-232 ports for this test.

9 - View/Clear Error Log. This setting will allow you to display or clear the CMOS error log. You may push the CONT button to scroll through the error log. The LCD will also tell you to set the thumbwheel to position Ø to clear the error log. **DO NOT clear the error log without specific instructions to do so. Always write all of the errors listed down on paper before clearing the log.** If you set the thumbwheel to this setting and press the CONT button, you be prompted with the question 'are you sure?'. If you are sure this is what you wish, press the CONT button again to clear the error log.

1Ø- Reserved

11- Reserved

12- CMOS test. This will do a read/write test of the CMOS RAM.

13- Reserved

14- Reserved

15- Continuous POST. This will run the power on self test continuously until the BOOT switch setting is changed.

CONT Button:

This button is used to display the second part of a message when the first part is followed by a plus (+) sign. It is also used in some diagnostic tests.

ATTN Button:

This button is not currently being used.

Figure 2 is a picture of the rear of the 3Server386®. Please note that synchronous port B and the AppleTalk™M port share some circuitry and only one of these may be used at a time.

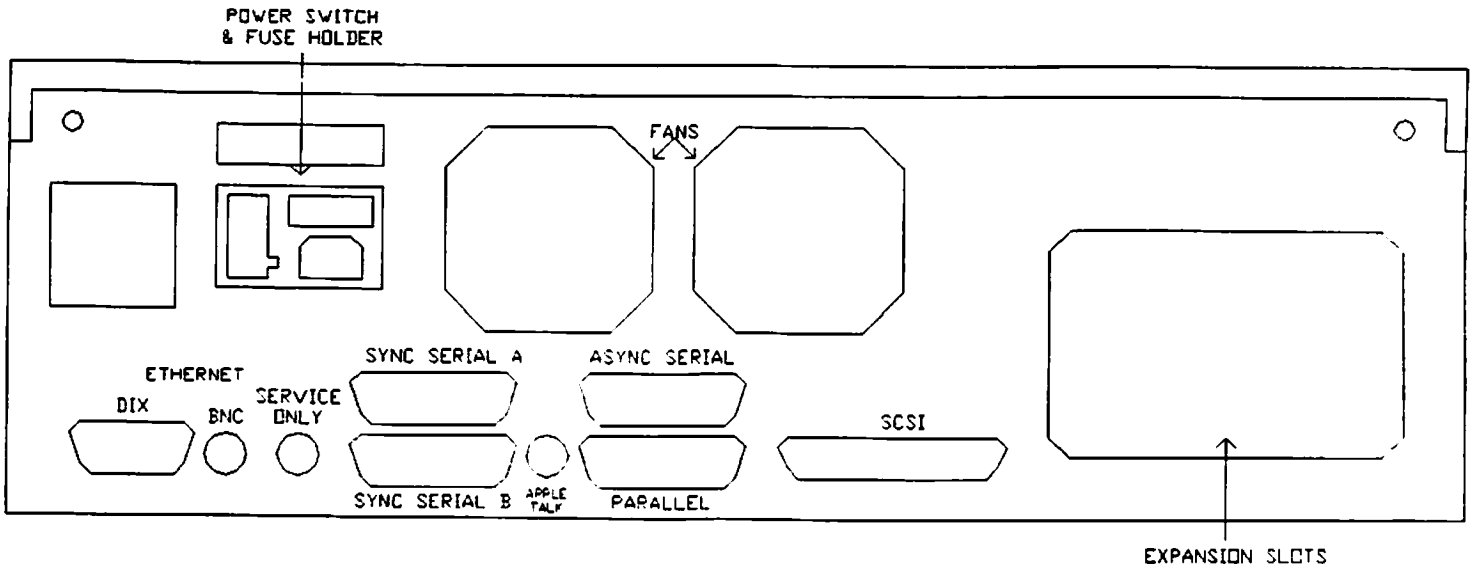


Figure 2

Memory Upgrade

As stated earlier, the 2MB (1MB base, 1MB expansion) that comes with the 3Server386® may be upgraded to a total of 14MB in 2MB increments. This is done by plugging in up to 2 expansion RAM boards populated to up to 6MB each into the two 96 pin DIN connectors at the rear right hand corner of the main logic board.

This board comes with 2MB of RAM installed as well as the parity chips for another 4MB. There are sockets on the board for two more rows of RAM chips (4MB). The lowest row is the populated row, the first 2MB. The middle row may be populated with 16 256Kx4 bit RAM chips (minimum 1ØØns access time) to bring the board's total to 4MB. The top row on the card (15 sockets), along with the empty socket along the bottom edge of the board, may be populated with 256Kx4 bit RAMs to bring the board total to 6MB.

The first expansion RAM board installed into the server is installed into the inside connector (J5ØØ, closest to the power supply). If it is installed into the other connector, it will not be recognized by the system. The first board must be fully populated to 6MB before a second card is installed. If it is not, the second card will not be recognized by the system.

After the card is installed, the CMOS RAM must be updated to reflect the memory installed. To do this, follow the steps below.

1.) Set the BOOT switch to 7 and the MODE switch to diagnostics (right position). Then turn on the server.

2.) The server's power-on self-test should recognize that the memory size has changed and should display the following message.

Invalid Config. Info...Run Setup +

Press the CONT button to continue. The LCD will display the amount of usable memory it found during the POST.

BASE Mem 896K Extended Mem 3Ø72K +

The extended memory number should match the amount of RAM you have installed via the expansion board, plus the 1MB of expansion RAM that comes with the system installed on the Main Logic board of the server. If these numbers do not match, recheck to make sure that all of the RAM chips have been installed correctly and do not have any bent pins, then retry the procedure. If the count is still not correct, either the memory board or the memory chips may be damaged.

3.) Press the CONT button once the memory count displayed is correct. The following message is displayed.

CMOS Config for Memory Invalid +

Press the CONT button again. This message is displayed.

Update CMOS Wheel=Ø +

This message tells you that if you wish to update the CMOS, you must turn the thumbwheel to Ø (BOOT switch) and press CONT. After this is done the CMOS will have been updated and a final message will appear telling you to reset the server. The server may now be booted in any mode you wish to run. Use the 3OPT program to put this memory to use.

Jumpers:

On the 3Server386® main logic board, the following jumpers are configured as stated.

JP2ØØ - This jumper is installed in order to put the server in the workstation mode of operation. This jumper should normally be OFF.

JP2Ø1 - This jumper is installed when an external transceiver is to be connected to the DIX connector rather than using the internal transceiver. This jumper is normally OFF.

JP2Ø2 - The two jumper positions, A and B are jumpered.

JP275 - Jumpered

JP526 - Only one jumper is installed on the two pins closest to the expansion ports.

JP6ØØ - This position should be left open.

On the hard drive controller, the SCSI ID of the drive is set. The base unit's original drive is always set to an ID of 2. See the table below for proper jumpering of the drives in your system.

SCSI ID	Drive Used For	Jumpers Installed
2	Base unit's original drive	M-N, C-D
3	Second hard drive	M-N, C-D, A-B
4	Third hard drive	M-N, E-F
5	Fourth hard drive	M-N, E-F, A-B
6	Fifth hard drive	M-N, E-F, C-D
7	Motherboard	N/A
1	Sixth hard drive	M-N, A-B
Ø	Tape drive	N/A

In addition, the controller boards all have terminating resistors installed at locations RN3 and RN4. These resistors must only be installed on the controller board of the last drive in a daisy chain. These terminators are to be removed from the controller board of the second drive installed into a unit.

On the hard drive itself, there will be a jumper installed on the far outside two pins of the jumper block above the 2Ø-pin data cable. This selects the drive as drive Ø. All drives will be selected this way since they each have their own controller board. All of the drives will also have a terminator installed.

The tape drive will have a jumper installed on the third set of pins to the right of the power connector when looking at the rear of the drive. This jumper is used to enable parity. The drive's SCSI address is set to Ø by leaving the three drive select jumpers (DSØ-DS2) disconnected.

Adjusting the CMOS Clock

If the CMOS clock is inaccurate and the battery is good, the oscillator frequency may be off somewhat. There is a trimmer capacitor available to adjust this frequency. To perform this adjustment, attach a frequency counter to TP375 and adjust C377 for a frequency of 32.7678 to 32.7682 Khz (period of 3Ø.51776439 to 3Ø.51739186 uSec).

Establishing A 3Console Connection

As with the original 3Server3®, a 3Console or 3C connection must be established between a workstation and the server for the purpose of maintenance and software installation. The procedure for this on the 3Server386® is slightly different than it was on the 3Server3®. The procedure is given below.

1.) Boot the server with the MODE switch in the maintenance setting and the BOOT switch in position 1 for Ethernet® or 2 for Token Ring. The 3Server386®'s LCD should display the servers address. If it does not and an error message is displayed followed by a '+' symbol, press the CONT button until the address is displayed.

2.) Boot the workstation to be used with the workstation software. The station can be anywhere on the network and can be initialized from either floppy or hard drive.

3.) Insert the **3+ System Software #1** diskette (1.3 or later) into drive A: of the workstation. At the A> prompt, type '**3C START <enter>**'. This will initiate the console connection.

4.) The station should display the message :

Start request from: <server address>
OK (Y/N)?

If this is the correct address displayed on the server, type a '**Y**' to proceed. The message:

Start in progress...

will be displayed, and if all goes well eventually the station's prompt will be returned with an additional > attached indicating an active console connection (i.e. A>>).

5.) You now have an active console connection to the server at your workstation which will enable you to run the other diagnostic utilities discussed in the next section or to initialize your server's software as discussed in the section after that. To end the console connection at any time, press the key combination **<CTRL><Q>**.

Some of the errors which may occur when trying to establish this connection are listed and explained below.

Error:	Explanation:
File 3START.COM missing	This file is not on the disk you are using to start the server with. Make sure you have the System Software #1 disk in your A Drive.
Floppy disk I/O error	Indicates a possible problem with either the netstation's floppy drive system or the system software diskette.
MINDS driver not loaded	The disk used to boot the workstation did not contain one of the necessary drivers in the config.sys (pro.sys, buf.sys, eth.sys (or eth5Ø3.sys or eth5Ø5.sys), idp.sys, spp.sys, or lgl.sys) or the RUNMINDS command in the autoexec.bat file did not contain that MINDS driver (MINDSPRO, MINDSBUF, MINDSETH, MINDSIDP, MINDSSPP, MINDSLGL).
Must use DOS 3.x	The workstation was booted with a DOS version other than the required 3.x.
Server not responding	Indicates an error in one of a number of possible places such as the station's network board, the cabling, termination, the server's Etherlink™M connection, etc..

Other Diagnostic Utilities

There are three other utility programs which can be run on the 3Server386®. These are LASTBOOT, SETUP, and 3DISK386. LASTBOOT and SETUP are programs which are run from the servers hard drive and therefore require that the information on the drive be intact. The 3DISK386 program is a program much like 3DISK on the 3Server3® which is used for testing and formatting the server's hard drive. This test is run from the System Software #1 diskette.

All 3 of these programs first require a 3C connection be established as described in the previous section.

LASTBOOT

This program is used to display the DOS console messages that were generated during the previous boot of the server. The usefulness of this program is that messages will be displayed which will indicate such things as the inability to load certain drivers or the inability of the software to initialize certain pieces of hardware. To initiate this program, first establish a 3C connection as discussed earlier, then type the two lines shown below.

C:<enter>

LASTBOOT<enter>

SETUP

This program is used to update or store system configuration information in the server's CMOS RAM in much the same manner as our MS-DOS machines. This should not need to be done unless the server's LCD displays a message indicating an invalid configuration or the unit's battery has been replaced. Once again a 3C connection must be made prior to running this program.

To run the program follow the procedure below.

First make the C drive the current drive by typing:

C:<enter>

To view the configuration type:

setup<enter>

This will display the system memory and port configuration. To change this configuration, or the system date and time, type:

setup -f<enter>

The system's date and time or memory configuration can be changed at this time. The date and time may also be changed on an operating system with the 3N SET DATE and 3N SET TIME commands. The serial and parallel ports should default to the primary addresses and should be left that way. If any additional ports are added, they will use the secondary addresses. When you are through running this program, you will be prompted to reset the server's MODE and BOOT switches and press <enter> to reset the server.

3DISK386

This program may be used to run various tests on the server's hard drives, as well as to format these drives and manage their defects. Like the previous programs, a 3C connection must first be established. To initiate the program type the following with the System Software #1 disk in drive A of the console connected workstation.

3disk386<enter>

When this command is entered, a menu which looks like the one below will be displayed. To choose an option from a menu, type that option's number or letter followed by <enter>. To redisplay the current menu, just type <enter>. To go back to the next higher level menu, press <esc>. If you hit <esc> at the main menu screen, you will be taken back to DOS.

3Server386 Disk Utility
Copyright © 3Com Corporation, 1987
All rights reserved.

Main Menu
1. Choose disk
2. Configuration
3. Diagnose hardware
4. Manage defects
5. Format disk
6. Write new DOS volumes (soft format)
<esc> Exit program

Each of these selections and their sub-menus are discussed here.

Choose Disk

This option is used to choose the disk which we currently want the program to work with. You will be prompted for the following information.

Controller type?
1. Adaptec ACB-452ØA
2. CDC embedded controller :<1>

The <1> to the right hand portion of the screen indicates the default selection which in this case is the Adaptec controller. At the time of this writing only this controller is being used.

Enter SCSI ID [1-6]

Enter the SCSI address of the drive you are testing. Remember the base unit's first drive is always 2.

Will this be a bootable drive?

The only drive to which 'yes' should be selected is the base unit's first drive (SCSI ID 2). This must be selected as yes for this drive in order for the boot information to be installed on this drive during a format.

You will then be prompted for the cylinders, heads, and sectors per track for this drive. Use the default values unless you have specific reasons not to.

Configuration

This option is used to modify or view the server's disk configuration. This must be done whenever a drive is added to or removed from the server's system. The 3OPT program must also be run after this in order to properly configure the system's drive information. This is discussed later in this document on page 93 A sub-menu will be displayed for this option.

2. Configuration
- **a. Display configuration**
- **b. Add drive**
- **c. Remove drive**
- **d. Choose boot disk**
- **e. Show DOS volumes**
- **f. Remove all drives**

Choose an item or press <esc> to go to previous menu.

3D>>

Display configuration

This option will display specific information about the drive selected and the boot drive (cylinders, heads, sectors, size, controller type, address) as well as the controller types installed at the other SCSI addresses.

Add drive

This choice will allow you to add a new drive to the system's configuration. You will be prompted for the unit's SCSI address and controller type.

Remove drive

Choose this selection to remove a drive from the system. You will be prompted for the SCSI address of the drive to remove. Be sure to run the 3OPT program and remove the drive from the CIOSYS configuration.

Choose boot disk

To perform this function, which is used to select the drive to be booted from, you must first clear the CMOS record of all the SCSI IDs. The boot disk must always be the first drive defined in the CMOS RAM. Choose option **'f'** at the menu. You will be prompted to continue. Choose **'y(es)'**.

Next you must choose the **'Add drive'** option in order to put the SCSI ID of the drive you want to be your boot drive in the CMOS. This must be the first drive entered. When this drive was formatted it must have been selected as being a bootable drive. You will not need to run the 3OPT program at this time because you are just redefining the drive in CMOS RAM, not adding it for the first time.

Then you will select the **'Choose boot disk'** option from the menu. This option will display the drive you added in the last step and prompt you to enter the cylinder, head, and track information for the drive. Accept the default values.

Finally all of the other drives attached to the system must be added to the CMOS configuration.

Show DOS volumes

This option will display the SCSI IDs, logical drive letters, and the drives' size in megabytes for all of the drives attached to the server.

Remove all drives

This will clear all of the SCSI ID records from the CMOS RAM.

Diagnose Hardware

This menu choice is used for testing of the hard drive hardware. When this option is called upon, a sub-menu is displayed much like the one below.

3. Diagnose hardware
- **a. Check cabling and controller**
- **b. Check disk**
- **c. Verify disk**
- **d. Run write-read test**

Choose an item or press <esc> to go to previous menu.

3D>>

Each of these options are discussed here.

Check cabling and controller

This test will check the read/write electronics between the 3Server386® and the controller. It will not alter the data on the drive. The test will run for about five seconds and then display a pass/fail status. If the test fails, check all of your cables and connections and try again. This should be the first test you run when you encounter hard drive problems.

Check disk

This is a test to see if the server can access the hard drive therefore testing the full data path from the server to the disk. This test will not destroy data on the hard drive.

Verify disk

This is a read-only test of the drive. It may be used to check the disk for new defects without altering the data on the drive. Any defects found will be automatically be added to the defect log and be replaced with spare sectors on the drive.

Run write-read test

When you choose this option you will test the disk by writing to the disk and then reading the written information back and checking for integrity. This test will also log any defects into the defect log. This test will take several hours to run and requires that the drive be reformated with either the soft format (write new DOS volumes) or format routines in the 3DISK386 program. Any data on the disk will be erased when this test is run.

Manage defects

This selection from the main menu will allow you to view and modify defects on any hard drive connected to the server. A submenu is displayed.

4. Manage defects
- **a. Display manufacturers defect list**
- **b. Display cumulative defect list**
- **c. Modify defect log**
- **d. Repair logged defects in software**

Choose an item or press <esc> to go to previous menu

3D>>

These options are discussed here.

Display manufacturers defect list
Display cumulative defect list

Both of these options display defects on the hard drive. The manufacturers defect list existed when the drive was first installed and the cumulative list is a listing of defects that have been added since that time.

Modify defect log

This option will display a sub-menu.

Modify defect log
- **a. Show log**
- **b. Add defect to log**
- **c. Delete log entry**

3D>>>

This defect log is to be used only by users that have a system based diagnostic (a diagnostic independent of the operating system) which is capable of logging disk errors by sector addresses. The errors, in order to be locked out of the system must first be entered into a defect log with this option, and then repaired in the software with the ' **'Repair logged defect in software'** option. Defects found by the operating system or 3DISK386 are automatically logged into the cumulative defect list and repaired in software.

Repair logged defect in software

This will cause the defects you added to the defect log to be added to the cumulative defect list and to be replaced by spare sectors in software.

Format disk
Write new DOS volumes (soft format)

These two selections from the main menu are used for formatting the drive choosen with the **'Choose disk'** option. **'Format disk'** is a hard format which will erase all of the data on the drive. **'Write new DOS volumes'** will do a soft format and rewrite the DOS volumes on the drive. With both of these options you will be prompted for drive information and default values should be used unless you have reason to do otherwise. This program will automatically lock out the bad tracks written into the manufacturers and cumulative defect lists.

3OPT program

The 3OPT program is a very intricate program used for the tuning of nearly all of the network services. Discussing all of the options of this program would result in a very large mass of information which is already covered very thouroughly in the 3Com® Network Tuning Guide which comes with every 3S4Ø1 system. We will only touch on the portion of that document needed for our purposes here. For further information on this program refer to the Network Tuning Guide.

When new drives are added to the system, this program must be run in order to make the CIOSYS configuration aware of their presence. Once a 3C connection is made and the server's C drive prompt is displayed, type **'3OPT'**.

From the main screen you will use the arrow keys to highlight the CIOSYS usage line. With this line highlighted, hit the <c> key to instigate the change. The CIOSYS configuration menu will then be displayed. Choose **'Select network drives'** from this menu.

The logical drives present on your system will all be listed as to drive letter and physical drive number. The new drive's physical drive number will be indicated with an asterisk as it has not yet been assigned. The drives will also have a 'L' or a 'N' displayed next to them which indicates that they are either available for network use or are reserved for local use. On a server such as this, all of the drives will most likely be set for network use.

The newly added drive will display a 'L' for local drive. Use the arrow keys to position your cursor above these 'L's and type a 'N' to configure them as network drives. Then position your cursor over the asterisk (*) representing the physical drive and type a '+' to change this to the next physical drive location.

After this is done, the configuration must be saved. To do this type <CTRL><A>. This will save your configuration and take you back to the main menu. At the main menu type a 'S' to save and a 'Q' to quit and exit back to DOS.

Quick Software Installation

Since the 3S4Ø1 system comes with the software installed, all that need be done is to configure the services for your particular situation. This installation can only be done on a newly purchased system. If the quick install has already been run or the software changed, run the 3INS program to set up or modify the services. If the hard drive has been replaced or reformatted you must reinstall the system as discussed later in this document.

The quick installation can be run from either a 3Station or a PC workstation connected to thhe network. For both types of installations the server must be booted normally. To do this, the server's MODE switch is set to server (left position) and the BOOT switch is set to Ø. The server should then be powered up. An address matching the server will be displayed on the LCD along with the message **'Do Quick Install'**.

To Install from a 3Station:

1.) Power up the 3Station and press <CTRL><ALT><SHFT><DEL> to bring up the setup and diagnostic menu. Choose the **'Setup system configuration'** option.

2.) Select option 4, set Start volume name. Press <esc> to leave the Start volume name blank.

3.) Select option 7, return to the main menu. From the main menu select option 3, exit and reboot system.

4.) When the station is rebooted you will be prompted for a Start Volume name. If the server has been powered up as discussed previously, type **'qinstall'** as the start volume name on the 3Station.

5.) You will be prompted as to whether you want to perform the quick install. Respond with a Y(es).

6.) The station display should display the message:

```
Searching for a new server...
New server found at address Ø26Ø8Cxxxxxx
Do you want to initialize this server?(Y/N)
```

The address given should match the server you are installing to. If it does, enter a 'Y' to continue. If it does not, enter a 'N' and wait for the correct address to be displayed.

7.) Next you will be asked to supply a name for the server in the format Name:Domain:Organization. This three part name is to be used to identify your server. It can be a maximum of 4Ø:2Ø:2Ø characters with a combined maximum of 58 characters. Name usually represents the server name, domain is a category within the organization (generally a department name), and organization is generally a company name.

8.) You will then be prompted to enter a password for the server. Enter a maximum of 12 characters.

9.) The 3+Name configuration will then be displayed. On this form you will enter specific information on the name service. The one item which must be entered here is the network number. The network number is a five digit number listed on the label of the Name Service diskette. Enter this number exactly as shown. You should not have to change anything else on the form except for possibly the time zone information. Do Not change the Domain or Organization on this form. The form will look something like this.

3+Name Configuration

Network Number	**Ø**	
Domain:Organization	**HQ**	**:Tandy**
Domain limit	**5**	
Open domain limit	**4**	
Buffers	**2Ø**	
Offset from prime meridian	**-36Ø**	
Time zone	**CST**	
DST zone	**CDT**	
Month/day DST begins	**4/7**	
Month/day DST ends	**1Ø/31**	

When you are through entering your Name Service information, press <CTRL><A> to save the name service information.

1Ø.) The program will check to see if there is a server on the network running the 3+Share service. If there is a server already running this service, the program will disable that service on this server. If there is not a share service running on the network, the programm will enable that service on this server. You will be informed as to whether this service has been enabled or not.

11.) The program will then check to see if the locator has been installed and is running on a server in the network. If not, it is enabled on this server. If it is running on this network already, it will be disabled on this server. You will be told whether it was enabled or not.

12.) The server will then automatically reboot. The LCD should eventually (after POST is run) display the name of the server and the current date and time. Reset the station at this time by pressing <CTRL><ALT><DEL>. When prompted for the start volume name type 'qinstall<enter>'. When you are asked if you wish to run the quick install, type 'N<enter>'. The installation is then complete and you will need to set up the users. This is discussed in brief in the next section.

Setting up With a Workstation

If you wish to do the quick install from a workstation other than a 3Station you will use the Quick Install Workstation (QIW) diskette supplied with the server's software.

This procedure assumes that the server is powered up and is displaying the message 'Do Quick Install' on the LCD.

1.) Boot the station using the QIW disk. The program will prompt you for the type of Etherlink™M adapter you are using.

    If you are not using the default values of INT3, DMA channel 1, and Base I/O address of 3ØØH for your adapter, you will need to use EDLIN to edit the QIW disk's CONFIG.SYS driver so that it contains the proper parameters. For information on doing this, refer to the section of this manual which corresponds to the type of adapter you are using.

2.) The Workstation display should display the message:

```
Searching for a new server...
New server found at address Ø26Ø8Cxxxxxx
Do you want to initialize this server?(Y/N)
```

    The address given should match the server you are installing to. If it does, enter a 'Y' to continue. If it does not, enter a 'N' and wait for the correct address to be displayed.

3.) Next you will be asked to supply a name for the server in the format Name:Domain:Organization. This three part name is to be used to identify your server. It can be a maximum of 4Ø:2Ø:2Ø characters with a combined maximum of 58 characters. Name usually represents the server name, domain is a category within the organization (generally a department name), and organization is generally a company name.

4.) You will then be prompted to enter a password for the server. Enter a maximum of 12 characters.

5.) The 3+Name configuration will then be displayed. On this form you will enter specific information on the name service. The one item which must be entered here is the network number. The network number is a five digit number listed on the label of the Name Service diskette. Enter this number exactly as shown. You should not have to change anything else on the form except for possibly the time zone information. DO NOT change the Domain or Organization on this form. The form will look something like this.

3+Name Configuration

Network Number	**Ø**	
Domain:Organization	**HQ**	**:Tandy**
Domain limit	**5**	
Open domain limit	**4**	
Buffers	**2Ø**	
Offset from prime meridian	**-36Ø**	
Time zone	**CST**	
DST zone	**CDT**	
Month/day DST begins	**4/7**	
Month/day DST ends	**1Ø/31**	

When you are through entering your Name Service information, press <CTRL><A> to save the name service information.

6.) The program will check to see if there is a server on the network running the 3+Share service. If there is a server already running this service, the program will disable that service on this server. If there is not a share service running on the network, the programm will enable that service on this server. You will be informed as to whether this service has been enabled or not.

7.) The program will then check to see if the locator has been installed and is running on a server in the network. If not, it is enabled on this server. If it is running on this network already, it will be disabled on this server. You will be told whether it was enabled or not.

8.) The server will then automatically reboot. The LCD should eventually (after POST is run) display the name of the server and the current date and time. The installation is then complete and you will need to set up the users. This is discussed in brief below.

Creating Users

The 3S4Ø1 system allows you an easy method of setting up and adding users to your system through the menus program. This will be discussed briefly here. This section goes under the assumption that you have done the quick install to set up your system as discussed in the previous section.

1.) First you must log in as the administrator user.

Login Admin<enter>

2.) Link to the apps directory.

3f link d: \\sys\apps<enter>

If you receive a 'No Share Server' message you will need to assign a share server to your admin user. To do this, insert the User #2 disk into drive a of your station. Make the A drive the working drive by typing:

A:<enter>

Then modify the Admin user by typing:

3N mod admin<enter>

Press return until the screen displays '**3ShareServer?**' is displayed. Here you must specify the server which is running the 3+Share service on the network. You will then be prompted for a Home Directory name and a file server drive to use. After this command is complete, attempt to link the apps directory to drive D: again.

3.) Set up your path by typing the following command.

set path=d:\;d:\dos;d:\menus

4.) Now enter the menus program by typing:

MENUS<enter>

This will take you to a main menu display somewhat like this one.

Main Menu
Directory and Files
Printer Connections
Shared Resources
Log Out
Network Administration
Tape Backup

Use the arrow keys to highlight the '**Network Administration**' selection and press <enter>. This will display the network administrator sub-menu. One selection under this sub-menu is User and Alias names. We will use this selection to set up our user names. Select this option and call up the user and alias names sub-menu.

5.) Select the option for Add A User. The 3N add user command will be called upon by the menus program and you will be prompted for the following responses.

User Name?	(1 to 4Ø characters)
Comment?	(1 to 1ØØ characters describing the user)
Capability Class?	(U or A, user or administrator)
3+Mail Server?	(Server on the network running 3+Mail, if any)
3+Share Server?	(Server on the network running 3+Share)
HomeDir?	(Name for the user's home directory, 1-8 characters)
Server Drive?	(drive on the server to contain the home directory)

6.) You will be prompted to press any key to return to the menus program. Repeat step 5 for each user you wish to add to the name service.

Software Reinstallation -Installation From Scratch

If the server's hard drive has been replaced and or reformatted, the services will have to be installed from scratch. The services can be reinstalled from either a recent tape backup or from the original diskettes. Some late model 3s4Ø1s will have an installation tape instead of diskettes. Installation from this tape is also discussed in this section.

Before reinstallation is started, a 3C connection must be acheived between the server and a workstation.

If you are reinstalling the server from scratch and do not have a tape backup of a previous installation, you will need to install from the service diskettes. This method is outlined here.

Installation From Diskettes

1.) Establish a console connection with the server. With the System Software #1 diskette in drive A:, type:

A:<enter>
install<enter>

2.) You will be prompted to install a number of the diskettes from the install set. After a number of diskettes are installed, the 3INS program will start automatically. On the Install Services screen, select the services to be installed and when all selections have been made, type 'A' to accept. You will be prompted to insert the service disks as required.

If 3+Route, 3+Remote, or 3+Netconnect were installed the modems and routes will need to be configured. If 3+Share was installed, printers installed on the server must be configured. These may both be done from the Configure Peripherals and Services selection from the 3INS main menu.

3.) After the services have been installed, exit to DOS. Insert the **'Re-Installation and Support'** diskette into drive A: and type:

install<enter>

This will automatically create and share an apps directory on the server, share the 3plus\3config directory (where the 3INS program is located), and set up default parameters for the services installed.

When asked if you want to restore the server to Quick Install mode, type 'N'. You may now restart the server for normal operation.

4.) If you have installed 3+Start and have stations which are using this service, you must reinstall start volumes for these users at this time.

Installing From an Installation Tape (later model systems)

1.) Establish a 3C connection with the server. Insert the Service Installation tape into the tape drive of the server.

2.) Insert the 1.3.1 **'3+Backup #2'** diskette in the station's drive A:. Type:

tapeins<enter>

3.) After the procedure is completed, boot the server on thumbwheel position Ø and do the Quick Install.

Re-installing from a Tape Backup

If you are re-installing the services to a server with a tape backup unit installed, you may use an off-line restore. If another server other than the one being restored contains the tape backup unit, an on-line restore must be used.

Off-Line Restore

1.) Establish a 3C connection with the server. Insert the **'Backup #2'** diskette into drive A: and type:

3BMENDOS<enter>

2.) Insert the first tape of the backup set into the tape drive and select Restore Partitions from the menu. You will be asked to select the source server and specify the server's name. Be sure to enter the 3-part name EXACTLY as it was when the services were originally installed. You will be prompted for any additional tapes if required.

3.) If any incremental backups have been made since the last full backup, install these now. The server may then be restarted.

On-Line Restore

1.) Establish a 3C connection with the server. When you receive the A>> prompt, type:

install<enter>

You will be prompted to install a number of disks in the install set before the 3INS program is automatically started. When the 3INS main menu is displayed, choose 'Install Services'. From the Install Services screen, mark the Share service for installation. Press 'A' to accept and install this service. You will be prompted to insert the 3+Share disk in drive A:. There is no need to install any additional services as they will be installed when the tape backup is restored.

2.) When you return to the 3INS menu, choose the option to exit to DOS. Insert the **'Re-Installation Support'** diskette into drive A: and type:

install<enter>

Insert the diskettes as you are asked for them. When the program is complete, restart the server as if proceeding with normal operations.

3.) Start up a station and log in as the Admin user. Type:

```
3f link e: \\servername\apps<enter>
e:<enter>
3BMEN<enter>
```

4.) This will bring up the backup menu. Select the option to 'Set Backup Server' and enter the name of the server that has the tape unit installed.

5.) Insert the first tape of the last full backup into the tape drive. Select the 'Restore Partitions' option. Enter the name of the server you are restoring in the Source Server field. Do not change any of the default values given for the partitions and dates. The Destination Server field must also contain the name of the server you are restoring. Insert the next tape, if required, when you are prompted. When the restore is completed the server may be restarted for normal operations.

Shutting Down The Services

3+Mail Service

1. Login as admin

```
login admin
```

2. Link the apps directory to a drive

```
3f link d: \\sys\apps
```

3. Make that drive the current drive and type:

```
D:
3M SHUTDOWN <enter>
```

3+Share Service

Make sure that no users are logged on or linked before proceeding.

1. Login as admin

```
login admin
```

2. Link the apps directory to a drive

```
3f link d: \\sys\apps
```

3. Make that drive the current drive and type:

    D:
    3F SHUTDOWN <enter>

3+Name Service

1. Login as admin

    login admin

2. Insert the '3+Share User Software' diskette into drive A: and make A: the current drive.

    A:

3. Type:

    3N SHUTDOWN <enter>

SERVICE POLICY

Radio Shack's nationwide network of service facilities provides quick, convenient, and reliable repair services for all of its computer products, in most instances. Warranty service will be performed in accordance with Radio Shack's Limited Warranty. Non-warranty service will be provided at reasonable parts and labor costs.

RADIO SHACK
A Division of Tandy Corporation
Fort Worth, Texas 76102