

PLAN 4000™

File Server
IBM Personal Computer UCSD p-System
User's Guide

NESTAR

NESTAR SYSTEMS, INCORPORATED

PLAN 4000 (TM)

FILE SERVER

IBM PERSONAL COMPUTER UCSD p-System
USER'S GUIDE

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How to Use This Guide

This guide is designed to provide a description of those PLAN 4000 functions that are specific to the IBM Personal Computer UCSD p-System environment.

When familiarizing yourself with PLAN 4000, read first the PLAN 4000 General Information Manual.

For information pertaining to your network's file servers, which allow you to share hard disk memory with other network users, read the File Server User's Manual. A bibliography of PLAN 4000 system manuals and guides appears at the end of this guide.

The material in this document applies to Version 2.0 of the File Server software.

We welcome criticisms and suggestions. Forms for reporting program errors and documentation errors or inadequacies are provided at the back of this manual.

Contents

Disclaimer.....	ii
How to Use This Guide.....	iii
Contents.....	v
Chapter 1 Starting Up	
1.0 Introduction	1-1
1.1 Starting Up	1-1
1.2 Booting your IBM Personal Computer Workstation	1-1
1.3 Creating New Boot Diskettes for Network Use	1-5
Chapter 2 Using the Network	
2.0 Shared Disk Organization	2-1
2.1 Virtual Diskettes of Variable Size.....	2-1
2.2 Drives	2-2
2.3 Network File Server Commands: The NET Program	2-2
2.4 Creating Virtual Diskettes	2-5
2.5 Using Virtual Diskettes in the UCSD p-System.....	2-6
2.6 Local NET Commands	2-7
2.7 Other NET Inputs	2-9
Chapter 3 Programming	
3.0 Using File Server Commands Within a Pascal Program	3-1
3.1 CMDUNIT.....	3-2
3.2 NETUNIT.....	3-3
3.3 A Sample Program	3-6

CONTENTS

Chapter 4 Additional Utilities

4.1	SETPROF Utility Program	4-1
4.2	NETWORK.START Command Program	4-3

Appendices

A	Error Messages.....	A-1
B	File Server Commands.....	B-1

Index

Bibliography

Reader Comment Form

Chapter 1

Starting Up

1.0 Introduction

This guide assumes that you are familiar with the IBM Personal Computer, with UCSD p-System, and with the PLAN 4000 system as described in the User's General Information Manual and the File Server User's Manual.

1.1 Starting Up

IBM Personal Computer users boot by inserting a minidiskette in their built-in minidisk drive. The diskette is formatted for the UCSD p-System, and will load a bootstrap program which in turn loads the UCSD p-System.

1.2 Booting your IBM Personal Computer Workstation

To boot your IBM Personal Computer for use with virtual disks on the PLAN 4000 network, you need to have a boot diskette containing:

A modified first stage boot program (held in the first block on the diskette)

NETWORK.INSTALL program

NETWORK.COMMS file
(containing network access procedures)

NETWORK.DRIVERS file
(containing virtual device drivers).

STARTUP

It may also contain a NETWORK.PROFILE configuration file.

Boot diskettes are available from your system manager. Creating boot diskettes is described in the File Server Installation and Operation Manual.

Using this diskette, follow the "Powering up with the UCSD p-System" instructions in Chapter 2 of the IBM UCSD p-System Beginner's Manual.

The power up process operates as follows:

The modified first stage boot program calls NETWORK.INSTALL, which loads network access procedures from NETWORK.COMMS and virtual device drivers from NETWORK.DEVICES, then follows directions in NETWORK.PROFILE (if present) regarding the real/virtual status of the drives for the library and work volumes, which volumes are to be mounted on virtual drives, and whether the mounting of the work volume should be automatic or offered for the user's approval.

Note that subsequent stages of the boot are done from the library volume, whether real or virtual.

If the first stage boot and installation of network access procedures and virtual device drivers is successful, then:

- If NETWORK.PROFILE specified automatic mounting of a virtual work volume, a message

 'Mounting <pathname> as work volume'

will be displayed.

- If NETWORK.PROFILE did not specify automatic

mounting of a virtual work volume, a prompt

^Name of work volume to use: <pathname>^

will be displayed, where <pathname> is taken from the NETWORK.PROFILE work volume entry component and will be empty if the component was empty. You may then edit or replace the pathname displayed before pressing ENTER, whereupon the specified volume will be mounted and the boot will continue.

If the volume cannot be mounted, an error message will be displayed and you will be prompted again for a pathname.

If the pathname is null (empty), then the work drive will be set real and booting will continue.

- If NETWORK.PROFILE did not exist, all units are set real and booting will continue from the real diskette.

Error Messages:

1. ^There is no file NETWORK.COMMS present^

or

^Error while reading NETWORK.COMMS^

followed by

^Do you wish to use the Network? (Y/N): ^

The NETWORK.INSTALL program has been unable to load the network access procedures. If you answer ^Y^, it will prompt:

^Insert a system disk containing

STARTUP

NETWORK.COMMS into first drive
Press any key when ready

If you answer 'N', it will continue the boot as a standalone workstation.

2. 'There are no Interface Cards available'

or

'Error during network initialization'

followed by

'Do you wish to use the network? (Y/N):'

NETWORK.INSTALL has not found or has failed to initialize any Network Interface Cards. Answering 'N' will cause the boot to continue for standalone use.

3. 'There is no file NETWORK.DRIVERS present'

or

'The file NETWORK.DRIVERS is empty'

or

'Error while reading NETWORK.DRIVERS'

or

'Error while reading module VDISK'

followed by

'Do you wish to use virtual devices? (Y/N):'

or

'Do you wish to use virtual disk? (Y/N):'

NETWORK.INSTALL has been unable to load virtual disk drivers. If you answer 'N' you will be able to issue network commands from your workstation, but unable to use virtual disks. If you answer 'Y' you will be prompted to insert a diskette containing NETWORK.DRIVERS.

1.3 Creating New Boot Diskettes for Network Use

To prepare a blank diskette (or one whose contents are no longer required) for use as a Network Boot Diskette:

Format the disk using UCSD's DISKFORMAT utility program.

Use the File Transfer command to transfer all the contents of the original boot diskette to the blank diskette. Do this using the volume copy mode in Transfer, e.g. "#4,#5", rather than the file copy mode, e.g. "#4:=,#5:\$", to ensure that the first two blocks of the disk, containing the bootstrap code, are copied.

Remove any files that you do not want on the new boot disk. The minimum files necessary are

```
SYSTEM.INTERP
SYSTEM.PASCAL
SYSTEM.MISCINFO
NETWORK.INSTALL
NETWORK.COMMS
NETWORK.DRIVERS
NETWORK.PROFILE (if required)
```

If necessary, use the SETPROFILE utility (Chapter 4) to specify the desired NETWORK.PROFILE options.

Chapter 2

Using the Network

2.0 Shared Disk Organization

PLAN 4000 users share mass storage by using "virtual diskettes" that are portions of network shared disks. These virtual diskettes are formatted for use in various operating systems.

PLAN 4000 names refer to shared network disks and to the shared virtual volumes in them.

2.1 Virtual Diskettes of Variable Size

As described in the File Server User's Manual, when virtual volumes are "mounted" on a "virtual drive" for use, they appear to be UCSD p-System minidiskettes of (possibly) different sizes, with directories and files arranged according to UCSD p-System naming conventions.

Shared disk storage on the network is implemented by the use of "virtual volumes". You, as a network user, have the option of creating volumes that, at your workstation, appear to be real diskettes of (optionally) different sizes, formatted for use in the UCSD p-System environment. These volumes are in reality portions of your network's shared disks.

IBM Personal Computer UCSD p-System users create diskettes of type U.

Virtual disks may be any size up to 32,766 blocks. (A "block" in UCSD contains 512 bytes.) Access and usage protection for virtual disks is

described in the File Server User's Manual.

To create a virtual volume from the UCSD p-System environment, see Section 2.4.

2.2 Drives

Each user station operating under the UCSD p-System can use unit numbers #4, #5, #9, #10, #11 and #12 as real or virtual diskette drives. The installed Network Drivers contain the status of these real and virtual devices, as well as that of file server commands and station to station message channels.

Real drives are local, private diskette drives attached directly to the user station; virtual drives allow access to volumes that reside on a system disk connected to a (shared) file server station.

It is possible to manipulate drives for your station directly at the file server. If you do this, you should be aware that the units 4, 5, 9, 10, 11 and 12 that you see at your station map onto drives 0, 1, 2, 3, 4 and 5 respectively at the file server. (This mapping is caused by the way the IBM hardware, i.e. the ROM BIOS, addresses physical drives. It does this independently of the operating system being run on the PC).

2.3 Network File Server Commands: the NET Program

Virtual disks are created, "mounted", renamed, deleted, and otherwise manipulated using the network NET program.

The NET program is an interactive command

program that allows a user to enter file server commands at the keyboard. NET is generally made available as an executable file in the default library volume, which should be mounted at startup on unit #4 as specified in the NETWORK.PROFILE file on your boot diskette. If NET is not found there, the system manager will know where it is installed.

Commands handled by the NET program are either local commands (displaying or changing system information within the workstation), or file server commands, which are passed to the file server for execution. If a file server command produces an error message or other information, this is passed back to the workstation for display. A complete list of error messages is found in Appendix A.

After displaying any response, NET redisplay its prompt (:) for another file server command to be entered. The cycle repeats until Q <return> or <esc><return> is entered; then control returns to the UCSD p-System command level.

The following printout shows a sample session. User responses are shown in lower case to distinguish them from information displayed by the UCSD p-System and NET.

NETWORK

```
Command: E(dit, R(un, F(ile, C(omp, ...x
```

```
EXECUTE WHICH FILE?: net
```

```
ENTER NETWORK COMMAND
```

```
: create lunch,t=u
```

```
109,ROOT DIR NOT SPECIFIED; NO DEFAULT
```

```
: set dir /main/users/abc
```

[No message in response to a command indicates that the command was successfully executed.]

```
: show dir
```

```
/MAIN/USERS/ABC
```

```
:create lunch,t=u
```

```
:q
```

(Actually, commands can be entered in either upper or lower case.)

In this example, a user executes the NET program, which allows him (or her) to send commands to the file server. The user wishes to create a virtual volume for use on the network. This volume, a portion of one of the network's shared hard disks, will be of type "U", formatted to resemble a real IBM UCSD p-System diskette (and since no size is given, by default the same size as a real diskette of 640 blocks).

The user does not enter the volume's full pathname, perhaps assuming that a part of the pathname will be added by default, having been set at startup by a "SET DIR" command.

No such default "partial" pathname has been set,

however, and an error message is returned. The user then sets a default partial pathname, /MAIN/USERS/ABC, for future convenience, and asks that it be displayed ("SHOW DIR"). The user then creates the desired volume and quits the NET program. File server commands are discussed in detail in the File Server User's Manual; local commands are discussed in Section 2.6.

2.4 Creating Virtual Diskettes

Size is an optional parameter when CREATING a UCSD p-System virtual diskette. If no size is specified, each UCSD p-System virtual diskette is the size of a real doublesided minidisk, i.e., 640 blocks (each 512 bytes long).

Size may be specified with the CREATE command using the parameter:

[,SIZE=Nb]

where N is the number of 512 byte blocks. The maximum size is limited by the space available on the disk unit on which the virtual diskette will be stored or by limitations in the UCSD p-System. The number of blocks for a UCSD p-System virtual diskette must be:

>=6 (minimum:space used by directory)
<=32,766 (maximum for any virtual volume)

NOTE: The system also allows size to be specified in units of:

C (characters-----1 byte each)
B (blocks-----512 bytes each)
blank (blocks-----512 bytes each)
K (kilo bytes--1024 bytes each)

NETWORK

To create a 1000 block UCSD p-System disk and mount it on unit #9, do the following :

```
CREATE /MAIN/DOE/UCSDDISK,T=U,SIZE=1000B,D9,RW
```

To initialize the directory of the volume, you must now use the Filer Zero command.

2.5 Using Virtual Diskettes in the UCSD p-System

Suppose that, as a brand new user, you want to write new programs or run existing ones on the PLAN 4000.

To get started, you (or the system manager) must:

Boot an existing UCSD p-System diskette that gives you access to the NET program.

CREATE a UCSD p-System virtual disk.

MOUNT it on unit #5, #9, #10, #11 or #12 for RW access.

SET it for virtual access by SET DRIVE x VIRTUAL (Section 2.6.3).

Initialize its directory using the Filer Zero command. (Note that you do not need to use the DISKFORMAT utility to format virtual volumes.)

If desired, add a NET command to your boot diskette STARTCMD.TEXT, to mount the new volume at each startup.

Use the Filer Transfer command to copy files from a real disk inserted in one of the user station diskette drives to the new virtual

volume if desired.

Use the Editor, Compiler, and Linker to create, compile, and link programs, just as on a standalone IBM Personal Computer.

For example, say that an educator has a set of arithmetic courses which he previously ran on a standalone IBM Personal Computer. Now he wants to present these same courses on the PLAN 4000 network.

Let's assume that he is authorized to allocate space on the shared disk /MAIN, in the directory COURSES. He wants to CREATE a virtual disk called ARITHMETIC on it. He would give the CREATE command:

```
CREATE /MAIN/COURSES/ARITHMETIC,T=U,D9,RW
```

Then using the Filer Zero and Transfer commands, he would initialize the directory on the virtual disk, and transfer files from the real disk to his virtual one.

2.6 Local NET Commands

In addition to the commands that it sends to the file server, the command program NET responds to a number of local commands that it executes itself. These commands are concerned with changing and displaying the status (real or virtual) of each available device.

2.6.1 SHOW DRIVES [NOCHECK]

This command displays the status of all the UCSD p-System units. The information displayed consists of the following:

NETWORK

- the unit ("DRV") number.
- a "#" character if the unit is a disk (as in the Filer's "V" command)
- volume name
- number of blocks on device (disks only)
- REAL or VIRTUAL indication. If VIRTUAL then the station number of the file server is displayed. Slot number is shown as zero, to maintain compatibility with the network.

The SHOW DRIVES display has the following format:

DRV	T	NAME	BLKS	STATUS
4	#	UCSD:	640	VIRTUAL: SLOT=0,STN=\$FE
5	#	WORK:	640	REAL
9	#	-----		VIRTUAL: SLOT=0,STN=\$FE
10	#	COURSES:	1000	VIRTUAL: SLOT=0,STN=\$FE
11	#	-----		VIRTUAL: SLOT=0,STN=\$FE
12	#	-----		VIRTUAL: SLOT=0,STN=\$FE

In this example, all available drives have been set virtual. The user has a virtual library volume UCSD mounted on unit 4, a real work diskette on unit #5, and a virtual volume COURSES mounted on unit #10. The file server station number is \$FE. Normally SHOW DRIVES will read in all the volume names to make sure the information is current. This will not be done if the NOCHECK option is specified.

2.6.2 SHOW FS

This command displays the default station number to which file server commands are currently

being sent. A slot number of zero is also shown, to be compatible with the network.

FS COMMAND CHANNEL IS:
SLOT=0,STN=\$FE

2.6.3 SET DRIVE[S] n[,n]...[REAL|,VIRTUAL] [,STN \$nn]

This command can be used to allow access to virtual volumes mounted at more than one file server, or more than one network.

The "REAL" keyword makes your machine look for the specified drives attached directly to your station; the virtual keyword makes your machine look for the drives at the file server. The "STN \$nn" makes your machine look for the specified drives, when they are virtual, on the file server at station "\$nn". If you use the "STN \$nn" feature, make sure there is a file server active on station "\$nn", otherwise your machine will hang when it tries to access data on one of the specified drives.

2.6.4 SET FS STN \$nn

Sets the default file server station address for file server commands issued by NET or by subsequently run programs to \$nn.

2.7 Other NET Inputs

The NET program also accepts the following inputs:

; <anystring> Ignored as a comment.

NETWORK

PRINT <anystring> Displays the text on the console.

command;command;.. Multiple NET commands are allowed on the same input line if they are separated by a semi-colon.

%filename Causes commands to be read in from the text filename specified.

NOECHO command Commands from a file (initiated by %filename) are usually displayed when they are executed; NOECHO suppresses this.

Chapter 3

Programming

3.0 Using File Server Commands Within A Pascal Program

Nestar provides library "units" that allow the Pascal user to write programs that issue commands to the file server. The unit library distributed is called

NETWORK.LIBRARY

and it includes the following units:

CMDUNIT - a Pascal regular unit that allows programs to issue file server or local commands (i.e., any command accepted by the NET utility program). In fact, this is the unit that the NET utility program uses. This unit requires the unit NETUNIT, also contained in NETWORK.LIBRARY.

NETUNIT - a Pascal regular unit that allows programs to issue commands to the file server (local commands are NOT accepted here) and optionally gets responses back for processing by the program. In addition, NETUNIT contains routines that allow direct station-to-station communication.

The contents of NETWORK.LIBRARY may be installed in SYSTEM.LIBRARY at your local installation. If not, the Pascal program must use the \$U option to specify the location of the unit library to the compiler. During linking the same library name must be given.

PROGRAMMING

A program using CMDUNIT must have the following "USES" declaration:

```
USES (*$U network-library-name*)NETUNIT,CMDUNIT;
```

Note the order: NETUNIT must come before CMDUNIT for the declarations to compile without errors. This "USES" declaration also allows use of the NETUNIT entry points.

If the program uses only NETUNIT, then the "USES" declaration can be simplified to:

```
USES (*$U network-library-name*) NETUNIT;
```

3.1 CMDUNIT

If the user wants to execute file server or local commands (just as the NET utility program does), then the Pascal procedure CMD or CMDLOOP in CMDUNIT should be used.

The CMD procedure has the form:

```
CMD (COMMAND, OPTIONS)
```

where:

COMMAND is a string variable whose value is the file server command or local command to be executed.

OPTIONS is an integer variable which must be set to:

- 0 - don't echo command if error.
- 1 - do echo command if error.

Examples:

```
CMD(ˆshow mountsˆ,0);
CMD(ˆshow drivesˆ,0);
CMD(ˆmount /MAIN/A,D10; MOUNT /MAIN/B,D11ˆ,1);
```

For programs in which the user enters file server or local commands from the keyboard until the user types Q, QUIT or <escape>, the CMDLOOP procedure is provided. It has the form:

```
CMDLOOP (PROMPT);
```

where:

PROMPT is the string variable whose value is the prompt to be issued to the user.

Examples:

```
CMDLOOP(ˆ: ˆ);
CMDLOOP(ˆFS command or QUIT: ˆ);
```

The following program, COMMAND, demonstrates the use of CMDLOOP to execute file server commands.

```
PROGRAM COMMAND;ˆ
USES (*$U LIB:NETWORK.LIBRARY*)NETUNIT,CMDUNIT;

BEGIN
  CMDLOOP(ˆ: ˆ)
END.
```

3.2 NETUNIT

To execute a file server command and get the return code back for evaluation by the program, use the FSCMD procedure. The procedure has the

PROGRAMMING

form:

```
RC := NFSCMD (NIL,COMMAND,RESPONSE);
```

where:

RC is an integer representing the "return code" sent back by the file server (see Appendix A for a list of return codes and their meanings). A return code of 0 means no errors.

NIL is a "virtual channel" pointer. Specify NIL for the default file server.

COMMAND is a string variable whose value is the file server command to be executed.

RESPONSE is a string "VAR" variable whose value is set to the last response line sent back by the file server. If the command has been executed successfully, then the last response is usually "OK". Otherwise, the last response contains the error message text.

All intermediate response lines are written to the screen.

To execute a file server command and get all the responses back for evaluation, (including those usually displayed on the screen without program intervention), use the NFSCMD1 procedure. The procedure has the form:

```
RC := NFSCMD1 (NIL,COMMAND,RESPONSE,NEWCMDFLAG,  
              DONEFLAG);
```

where:

- RC is an integer representing the "return code" sent back by the file server. RC is only significant when DONEFLAG is TRUE.
- NIL is a "virtual channel" pointer. Specify NIL for the default file server.
- COMMAND is a string variable whose value is the file server command to be executed when NEWCMDFLAG is set to TRUE. When NEWCMDFLAG is set to false it is ignored.
- RESPONSE is a string "VAR" variable whose value is set to the next (or first) response line sent back by the file server.
- NEWCMDFLAG is a boolean variable whose value is TRUE when a command is initially sent to the file server. It is FALSE on successive calls which get the next response lines.
- DONEFLAG is a boolean "VAR" variable. Its initial value is ignored and it is set to TRUE if this is the last response line and FALSE if there are more response lines.

PROGRAMMING

For example, a program fragment might contain:

```
CMD := 'file server command';
RC := NFSCMD1 (NIL,CMD,RSP,TRUE,DONE);
WHILE NOT DONE DO BEGIN
...process RSP (RC not valid until DONE=TRUE)
  RC := NFSCMD1(NIL,CMD,RSP,FALSE,DONE);
END;
...process final RSP and RC
```

3.3 A Sample Program

The following program, MININET, demonstrates the use of NFSCMD to send commands to the file server with a Pascal program. The MININET program will get an input line from the user and send it to the file server for execution.

MININET differs from NET in the following ways:

1. Both the code number and reply returned by the file server are displayed on the console.
2. The local commands of NET, as described in Section 2.6, are not available in MININET. They are executed by the NET program, using CMDUNIT, not by the file server.

```

PROGRAM MININET;

USES (*$U LIB:NETWORK.LIBRARY *) NETUNIT;

VAR
  RC: INTEGER;
  CMD,REPLY: STRING;

BEGIN
  Writeln ('Mini Command Program');
  REPEAT
    Write ('FS COMMAND? '); Readln (CMD);
    IF LENGTH (CMD) <> 0 THEN BEGIN
      RC := NFSCMD (NIL,CMD,REPLY);
      (* Send command to default file server *)
      Writeln (RC,',',',',REPLY)
    END
  UNTIL LENGTH (CMD) = 0;
  (*All done if nothing typed *)
  Writeln ('Ciao.')
END.

```

A sample execution of the MININET program :

```

Mini Command Program
FS COMMAND? show date
DATE IS 03/10/81
FS COMMAND? foo
1,ILLEGAL COMMAND
FS COMMAND?
Ciao.

```


Chapter 4

Additional Utilities

4.1 SETPROF Utility Program

The SETPROF (set profile) program allows you to create a PROFILE.NET virtual volume that will mount library and work volumes for you at boot time. This program asks you four questions:

- "Library volume name" Here you should specify the full pathname of the library volume you want to use. If you wish to have no library volume mounted, type <space> <Return>. The library volume is mounted on drive L:.
- "Work volume name" Here you should specify the full pathname of the library volume you want to use. If you wish to have no work volume mounted, type <space> <Return>. The work volume is mounted on drive E:. The following two questions also apply to the work volume.
- "Work volume usage" Here you should specify the way you want to use the work volume. Usage of volumes is described in the File Server User's Manual in Section 3.10. The normal usage you will want to apply is "RW", which will allow you to write to the volume after booting it and other users to read it. If you type <space> <Return> here, the volume will be mounted with "RO,SHR" (Read only, Shared) usage.
- "Auto Mount (Y/N)". If you respond "Y" to this question, the work volume will be automatically mounted at boot time. If you respond "N", the boot process will display the work volume name and ask you to press <Return> to accept the work volume or to enter another work volume pathname to mount.

SETPROF

For more information on the boot process and the mounting of library and work volumes, see Section 1.2.

4.2 NETWORK.START Command Program

NETWORK.START is the program that automatically runs in the user station when the boot volume is mounted. NETWORK.START first checks the disk on unit #5 (or on unit #4, if #5:STARTCMD.TEXT is not present). for a file named SYSTEM.STARTUP. If present, it is chained to. Otherwise, NETWORK.START reads a file called STARTCMD.TEXT from the disk on unit #5 and interprets each line as a command.

The format of each command is (typed on one line):

```
<command> ::= <verb> <one-or-more-blanks>
              <optional-operand>
```

The legal <verb> <operand> sequences are as follows:

; <anystring> Ignored as a comment.

PRINT <anystring> Print the string on the screen.

CLEAR Clears the screen.

NET<fileserver command> Executes file server or local command (e.g., MOUNT or SET DRIVE).

NOECHO <command> Executes <command> but doesn't print it.

START

ASK <command> Asks whether to execute
 <command>.

ASK=Y <command> Same as ASK, except that a
 carriage return (only)
 response means yes.

ASK=N <command> Same as ASK, except that a
 carriage return (only)
 response means no.

ASK...PROMPT text The PROMPT option on ASK
 allows you to use your own
 prompt text. The prompt is
 NOT quoted and consists of
 whatever follows the word
 "PROMPT".

CONTINUE Asks if it is ok to
 continue. A reply of no
 means QUIT.

CONTINUE=Y Same as CONTINUE, except
 that a carriage return
 (only) response means yes.
 The prompt on screen will be

CONTINUE (Y/N)?

and any typed response will
replace the default Y.

CONTINUE=N Same as CONTINUE, except
 that a carriage return
 (only) response means no.

SET USER id Sets a file server lock with the id specified. The convention is that "id" are your initials and the lock name generated is USER.id. This allows a user to issue the file server command "SHOW ALL LOCKS" to determine the initials of the users currently using the network.

SHOW FORMDATE Displays the date on the screen. The format is:
Day dd-Mon-Year hh:mm:ss

NEWS Displays general system information (contents of UCSD: NEWS.TEXT).

CHAIN<program name> Passes control to the program named. Note that control is never returned to the startup program so commands following this command are not processed.

SET DATE Sets the Pascal system date to the current date (from the file server), as if the user had used the D(ate) command in the Pascal Filer.

START

SET PREFIX Sets the Pascal system default volume prefix as if the P(refix command in the Pascal filer had been used. Do not append ":" to the prefix. Examples:

```
SET PREFIX #5
SET PREFIX WORK
```

QUIT Exits the NETWORK.START program.

Example

```
; this is abcl:startcmd.text
PRINT
PRINT  ----> THIS IS /MAIN/USERS/ABC/1
PRINT
continue=y
noecho set user abc
noecho net set drive 4,5,9,10 virtual
net SET DIR /MAIN/USERS, PRVPW=xxx
net MOUNT ABC/TEMP,D9,RW,SHR
PRINT
ask=n news prompt display current news
```

This list of program commands begins with a comment ignored by the startup program ("this is startcmd.text"). When the volume is booted, "THIS IS /MAIN/USERS/ABC/1" is printed on the user station screen. The user is then asked whether the startup program should continue or not. Typing "n" <return> quits the program and the UCSD p-System command line comes up. Typing <return> causes the startup to continue.

A user id is then set in the system and drives 4, 5, 9 and 10 are set to virtual. A default

START

partial pathname is set, as well as a private password that may be required to access directories or virtual volumes

The virtual volume /MAIN/USERS/ABC/TEMP is mounted on drive 9 for shared, read/write use.

Finally, the user is prompted to display the system's news. Pressing <return>, however, is equivalent here to "no".

Appendix A

Error and Information Messages

When the file server receives a file server command from a user station, it executes the command, if possible, and, in any case, returns two variables:

- return code - an integer between 0 and 200
- return message, such as OK, ILLEGAL COMMAND, or TYPE=IBM PC PASCAL

Messages are of several types:

- information, such as OK, IN USE, TYPE=BINARY.
- user errors such as syntax errors or attempting to access a Network file without the necessary access rights
- system errors such as memory full or disk full; these should be reported to the system manager.

In this list, messages are classified as:

general syntax

pertaining to a specific command

system errors

file system errors.

ERRORS

General Syntax (0-19)

0,OK

(Not an error.) The command was syntactically correct and was executed without error.

1,ILLEGAL COMMAND

The command verb cannot be recognized, or cannot be executed from this user station operating system environment. The command verb is the first word of the command, and must be separated from the rest of the command with one or more blanks.

2,NAME PARAMETER REQUIRED

The first parameter of the command must be a non-null pathname.

3,UNRECOGNIZED PARAMETER

A keyword parameter was not recognized. Check the spelling carefully, and make sure that it is properly separated from the previous and following items with commas.

4,ILLEGAL DRIVE NUMBER

A drive number must be specified with "D" followed by the integer 4,5,9,10,11, or 12. Example: "D4".

5,ILLEGAL STATION NUMBER

A station number must be specified as a two-digit hexadecimal number preceded with \$, in the range \$1 to \$FE. Example: "\$2D".

7,PARAMETER APPEARS TWICE

A keyword parameter appears more than once in a single command. There can only be one occurrence of a keyword parameter, even if multiple occurrences have the same value.

8,ILLEGAL TYPE PARAMETER

The "T=" value is not one of the legal volume types. It must be one of the following:

P (Apple // Pascal)	B (binary)
D (Apple // DOS),	S (system)
C (Apple // CP/M)	Y (directory)
3 (Apple /// SOS)	T (text)
U (IBM PC p-SYSTEM PASCAL)	I (IBM PC DOS)

Example: T=U

9,COMMAND TOO LONG

A file server command must be no longer than 80 characters. In unusual cases where this is a problem, long commands can often be shortened by using a default directory, or by assigning access rights in a subsequent PROTECT command.

10,PARAMETER TOO LONG

The new name given as the second parameter of the RENAME command must be no more than 15 characters long. Remember that RENAME changes only the last name in the sequence of names which constitute a pathname. If you wish to change the name of a directory, give the pathname of the directory itself as the first parameter of RENAME.

ERRORS

11, ILLEGAL PROTECTION PARAMETER

The value of the PUBACC, GRPACC, or PRVACC protection item is incorrect. The value must be some combination of the letters RWECD (read, write, erase, create, and delete), or may be null. For example, "GRPACC=RW" or "PUBACC=".

12, NO STATION CMD; USE \$NN PREFIX

The "station" command has been removed. Use "\$nn <command>" where nn is the station number on whose behalf you wish to issue the command. (file server console only.)

13, ILLEGAL NUMBER (NEGATIVE OR TOO BIG)

The number was less than 0 or bigger than 32767. Number may be specified in decimal, or in hexadecimal preceded by \$. Examples: "42", "\$1A3".

19, HELP FILE NOT FOUND

There is no HELP file for the word used as an operand of the HELP command. Use the HELP command with any parameters to see what the possible HELP parameters are. (The system manager has the option of removing all HELP files to save space.)

Create (20-25)

20, TYPE PARAMETER REQUIRED (T=?)

The type parameter was missing. Example: "T=D".

21,SIZE OUT OF RANGE (<OB OR >32752B)

The value of the SIZE parameter was negative or greater than 32752 blocks. Each block is 512 bytes. Other units that can be specified are C (characters), and K (1024 bytes). If the units are omitted, B (512-byte blocks) is assumed. Examples: "SIZE=280", "SIZE=2000S".

23,SIZE PARAMETER REQUIRED WITH T=B, =T

The SIZE parameter must be specified to create a binary volume. The size may be an overestimate of the size of the data to be BSAVED into the volume, but it must not be less.

24,SIZE OUT OF RANGE (<1C OR >48K)

The limits on the size of a binary (T=B) file are between 1C (one byte) and 48K (49152 bytes) regardless of the units used in the specification.

Delete (25-29)

29,CURRENTLY MOUNTED OR DEFAULT DIR

You cannot delete a volume which is currently mounted by any station, or which is the default directory (see the SET DIR command) of any station.

Mount (30-34)

30,DRIVE REQUIRED

You must specify what drive the volume is to be mounted on. Example: "D4".

ERRORS

31,IN USE

The volume you asked to mount is in use by another station. You are therefore denied exclusive use of that volume.

32,IN EXC USE

The volume you asked to mount is in exclusive use by another station. You are therefore denied any use of the volume.

34,RW NOT ALLOWED ON DIRECTORIES

You are not allowed to mount a directory (T=Y) volume for write access.

Unmount (35-39)

35,DRIVE OR "ALL" REQUIRED

You must specify a drive number or "ALL" on the UNMOUNT command. Examples: "UNMOUNT D1", "UNMOUNT ALL".

36,NOT CURRENTLY MOUNTED

The drive number specified in the UNMOUNT command does not have any virtual volume mounted on it by the file server.

Lock (40-44)

40,ILLEGAL LOCK NAME

A lock name must be 1 to 15 characters long.

41, IN USE

The lock name specified is in use by another station. You are therefore denied exclusive use of the lock.

42, IN EXC USE

The lock name specified is in exclusive use by another station. You are therefore denied any use of the lock.

Unlock (45-49)

45, NOT HELD

The lock name specified is not currently held by your station.

BSAVE, BRUN, BLOAD (50-55)

50, CMD NOT ALLOWED FROM THIS STATION

The BSAVE/BLOAD/BRUN/OFF commands can only be executed from an Apple // user station.

51, NOT BINARY

The pathname identifies a volume which is not binary (T=B). Only binary volumes can be used for BSAVE, BLOAD, or BRUN commands.

52, NOT PREVIOUSLY SAVED

The binary volume was created but has never had any data written into it using the BSAVE command. It can not not be used with BLOAD or BRUN until it has been BSAVED into.

ERRORS

53, FROM PARAMETER REQUIRED

For BSAVE, the FROM parameter, which specifies the memory area from which data is to be taken, must be provided. Example: "FROM=\$1000".

54, SIZE PARAMETER REQUIRED

For BSAVE, you must provide the SIZE parameter on the BSAVE command to indicate how much data is to be saved. This value must be less than or equal to the size of the volume specified on the original CREATE command. Example: "SIZE=256.C".

55, FILE WAS THERE; REP NOT SPECIFIED

Data has already been saved in the binary volume. To replace that data, you must specify "REPLACE" as a parameter in the BSAVE command.

Set/List (57-58)

57, FILE IS NOT A DIRECTORY

The pathname given in a SET DIR command identifies a volume which is not a directory (T=Y).

58, USE: SET TIME [YYMMDD] [,HH[MM]]

If the date parameter was supplied, it was incomplete or contained invalid fields. If the time of day parameter was supplied, it contained invalid fields.

Show (59-69)

59,TYPE=SYSTEM

(Not an error.) The volume mounted on the drive for which you did a "SHOW TYPE" is a system volume (T=S).

60,SHOW OPTION NOT RECOGNIZED

The operand of a "SHOW" command was not recognized. Check the spelling and make sure there are no extraneous items in the command.

61,DRIVE REQUIRED

For the "SHOW TYPE" command you must specify the drive number on which the volume is mounted. Example: "SHOW TYPE D12".

62,NOT CURRENTLY MOUNTED

The drive number specified has no volume mounted on it by the file server.

63,TYPE=APPLE // CP/M

(Not an error.) The volume mounted on the drive for which you did a "SHOW TYPE" is an Apple // CP/M volume. (T=C).

64,NO DEFAULT DIRECTORY SET

(Not necessarily an error.) This response to the "SHOW DIR" command indicates that there is no default directory established for this station by the file server.

ERRORS

65,TYPE=APPLE // PASCAL

(Not an error.) The volume mounted on the drive for which you did a "SHOW TYPE" is an Apple // Pascal volume (T=P).

66,TYPE=APPLE // DOS

(Not an error.) The volume mounted on the drive for which you did a "SHOW TYPE" is an Apple // DOS volume (T=D).

67,TYPE=BINARY

(Not an error.) The volume mounted on the drive for which you did a "SHOW TYPE" is a binary volume (T=B).

68,TYPE=DIRECTORY

(Not an error.) The volume mounted on the drive for which you did a "SHOW TYPE" is a directory (T=Y).

69,UNKNOWN TYPE

The volume mounted on the drive for which you did a "SHOW TYPE" is not a standard volume type.

70,yyymmddhhmmssw

(Not an error.) Returns date and time information in encoded form. For example, the FS command `TIMESTAMP` returns the current year, month, day, hour, minute, second, and day of the week in the form 70,8104301859381 (that is, 6:59 P.M., Sunday, April 30, 1981).

71,--t--tt--t-t----

(Not an error.) Returns types of virtual disks currently mounted on drives 1-16 (Y,P,D,B,S,C,3,I,U,T). The system responds to the FS command SHOW TYPES using this format.

72,TODAY IS DD-MON-YYYY HH:MM:SS

(Not an error.) This is the response to the SHOW TIME command.

73,TYPE=TEXT

(Not an error.) The volume mounted on the drive for which you did the SHOW TYPE is a text volume (T=T).

74,TYPE=APPLE /// SOS

(Not an error.) The volume mounted on the drive for which you did the SHOW TYPE is an Apple /// SOS volume (T=3).

75,TYPE=IBM PC DOS

(Not an error.) The volume mounted on the drive for which you did the SHOW TYPE is an IBM PC DOS volume (T=I).

76,TYPE=IBM PC P-SYSTEM PASCAL

(Not an error.) The volume mounted on the drive for which you did a "SHOW TYPE" is an IBM PC Pascal p-System volume (T=U).

ERRORS

Local Commands (90-92)

90,DRIVE(S) REQUIRED (LOCAL COMMAND)

A drive number, or list of drive numbers, is required for this command. Example: "SET DRIVES 9,10 VIRTUAL".

91,DRIVE NUMBER CANNOT BE USED

There are 12 drives (also called "volumes") in the UCSD p-System, but only drives 4,5,9,10,11, & 12 can be made virtual with the SET DRIVE local command, in order to be used as virtual disks.

System Errors (94-99)

94,NOT CONNECTED

This is a network error that indicates that the connection to another station has been terminated prematurely.

95,UNRECOGNIZABLE NETWORK RESPONSE

The last response message from file server did not contain a numeric error code, as expected. This may indicate incorrect logic in the use of NETUNIT procedures from within Pascal programs.

97,FILE SERVER MEMORY FULL

The file server has no space left for tables needed to complete your request. This does NOT refer to memory space in the user station.

98, NETWORK ERROR

The network routines were unable to complete the transaction. The error may be transient; see the description of NETUNIT for more information. This error does not occur from most user level programs, such as NET.

99, USER ABORT

The network abort key <escape> was pressed while a network transaction was queued up or in progress. The transaction was aborted.

File System Errors (100-140)

101, END OF FILE OR RECORD OUT OF RANGE

An attempt was made to read a block or sector of a volume which is outside the legal range for that volume.

102, FILE NOT FOUND

The volume specified by the pathname was not found, or one of the directories in the pathname was not found. Check the spelling of each filename in the pathname. If the name does not begin with a slash, check that the current default directory is the correct one.

103, BAD DELIMITER IN PATHNAME

A delimiter other than "/" or ":" was found in a pathname. Make sure that you have not omitted a comma separating the pathname from other operands in the command.

ERRORS

104, FILE NAME OR PASSWORD TOO BIG

A single filename (the part between slashes in a pathname), or password (the part after a colon in a pathname) is longer than the maximum of 15 characters.

105, NO ACCESS FOR READ TO DIRECTORY

You have been denied read access to a directory which is part of the specified pathname.

106, NON DIRECTORY FOUND IN PATHNAME

One of the names in the pathname (other than the last name) identifies a volume which is not a directory (T=Y). Only the last thing in a pathname can be other than a directory.

107, END OF PATHNAME IS A DIRECTORY

The pathname specifies a directory (T=Y) in a context where a non-directory volume is required.

109, ROOT DIR NOT SPECIFIED NO DEFAULT

The specified pathname does not begin with a slash, and there is no default directory recorded for this station by the file server. If you wish to completely specify the pathname, begin with a slash and the name or number of the disk unit. If you wish to use the current default directory, do not begin the pathname with a slash. You may use the "SHOW DIR" command to find out the current default directory, and the "SET DIR" command to establish one.

110,NO ACCESS FOR READ

You have been denied read access to the volume specified by the pathname, or to a directory along the path.

111,NO ACCESS FOR WRITE

You have been denied write access to the volume specified by the pathname.

112,NO ACCESS FOR APPEND (not yet implemented)

You have been denied append access to the volume specified by the pathname.

113,NO ACCESS FOR ERASE

You have been denied erase access to the volume specified by the pathname. Erase access is necessary to delete the file.

114,NO ACCESS FOR CREATE

You have been denied access to create or rename an entry in one of the directories specified in the pathname.

115,NO ACCESS FOR DELETE

You have been denied access to delete or rename an entry in one of the directories specified in the pathname.

ERRORS

116,CANT DELETE NON-EMPTY DIRECTORY

The pathname specified in a DELETE command identifies a directory, and that directory is not empty, that is, it still points to other volumes. Only empty directories can be deleted by a single file server DELETE command.

117,FILE SERVER MEMORY FULL

The file server has no space left for tables needed to complete your request. This does NOT refer to memory space in the user station.

118,DISK FULL

There is not enough contiguous space left on the disk unit to create the volume. The LIST command when used to display the root directory will give information about the space available on a disk unit. Example: "LIST /MAIN".

119,DIRECTORY FULL

There is not enough space left to create more entries in the directory, and the directory cannot be expanded. Directories are automatically expanded as necessary to accomodate new entries.

120,INTERNAL ERROR

An internal error has been detected by the file server. Additional information is written on the console of the file server. That information and the circumstances surrounding the error should be transmitted to your support organization for diagnosis. The file server should be restarted as soon as practical.

121, UNINITIALIZED DISK

The disk unit has not been initialized. All disks must be formatted and initialized using the file server FORMAT DISK utility; see the File Server Installation and Operation Manual.

122, WRONG SOFTWARE VERSION

The disk format is not compatible with version of the file server currently running. (This error cannot occur with any file servers so far released.)

123, FILE ALREADY EXISTS

The file you have asked to create, or the new name used in a RENAME command, already exists in the directory.

124, DISK I/O ERROR, SUBCODES x,y

A hardware I/O error was detected. The details of the error are described in the subcodes; for more information see the table of I/O errors in Appendix A of the File Server Installation and Operation Manual.

125, VERIFY FAILED (BAD MEMORY)

All disk write operations are verified by reading back the recorded data and comparing it to the data stored in memory. This error indicates that the disk data did not compare correctly. It sometimes indicates a memory error in the file server, and not a disk error.

128, BAD UNIT NUMBER IN PATHNAME

The first item after the initial slash in a pathname is a number, but it is not in the legal range for unit numbers (1 to 4).

ERRORS

130,NEED PRIVATE PASSWORD FOR PROTECT

In order to execute the PROTECT command for any volume, the private password must be specified in the pathname or as a default private password. The password must be specified whenever the volume has a non-null private password, regardless of the access rights currently assigned to the volume.

131,UNIT NAME NOT FOUND

The name after the initial slash of a pathname is not the name of a disk unit currently recognized by the file server. You can also use the unit number in place of a name, if you wish.

133,DISK NOT READY

The disk unit specified is not ready. The one minute warmup period after initial power up may not have elapsed. It may also indicate a controller or disk drive failure.

COMMAND LIST

- modifies passwords or access rights for a virtual disk or directory

RENAME oldpathname, newname

- renames specified NFS file

SET DIR pathname

- sets default directory

SET [GRPPW=password] [PRVPW=password]

- sets default group or private password

SHOW DIR

- displays name of current default directory

SHOW ID

- displays file server identification number

SHOW INFO

- displays information on opened virtual volume

SHOW LOCK [lockname]

- lists all stations using specified lockname

COMMAND LIST

SHOW [ALL] LOCKS

- displays all locks set at own station or held in file server

SHOW [ALL] MOUNTS [pathname]

- gives information on virtual disks mounted on the file server

SHOW PROTECTION [pathname]

- displays group, private and public access rights for virtual disk or directory addressed by pathname

SHOW STATION

- displays own station number

SHOW TIME

- displays current date, time, and day of week

SHOW TYPE Dd

- displays type of virtual disk mounted on drive d

SHOW TYPES

- displays types of virtual disks mounted on drives 1-16

SHOW VOLLS

COMMAND LIST

- displays names of system disk units currently operational

TIMESTAMP

- returns encoded form of the current date and time

UNLOCK lockname or UNLOCK ALL

- releases locked usage on a lockname or on all locknames currently held

UNMOUNT Dd or UNMOUNT ALL

- cancels previous mount(s)

Parameters

access rights: set of letters from RWECD
(read, write, erase, create, and delete)

drive: Dd, where d=number or letter as appropriate

filepath: name[:password] [/filepath]

lockname: name of lock (same restrictions as name)

name: name of disk unit, directory, or virtual disk. (1-15 characters; no commas, control characters, slashes, colons, returns or unprintable characters; imbedded blanks ok; first character any ok character)

COMMAND LIST

number: if decimal: between -32768 and 32767,
inclusive if hex: between \$0 and \$FFFF,
inclusive

password: a secret word used to gain access
to protected volumes. Same restrictions as
name. except control characters allowed.

pathname: /unitname/filepath or filepath
(80 characters max. An initial slash
indicates first field is a unit name; no
initial slash indicates current default
directory is to be prefixed to pathname.

protection: protect item [,protection]

protect item: ,GRPPW=password
,PRVPW=password ,PUBACC=access rights
(Default: R) ,GRPACC=access rights
(Default: PUBACC) ,PRVACC=access rights
(Default: varies)

size: SIZE=number [.size-unit]

size-unit:

C: character----(1 byte)
S: sector---- (256 bytes)
B: block---- (512 bytes)
blank: block---(512 bytes)
K: -----(1024 bytes)

type:

T=B (binary)	T=C (Apple II CP/M)
T=D (Apple II DOS)	T=3 (Apple III SOS)
T=P (Apple II UCSD Pascal)	T=U (IBM PC p-Sys)
T=Y (directory)	T=I (IBM PC DOS)
T=S (system)	T=T (textfile)

COMMAND LIST

unitname: 1, 2, 3 or 4 [:password]
 or name [:password]

usage: EXC(exclusive), SHR(shared),
 or UPD(update)
 RO(read only) or RW(read/write)

Local NET Commands

SHOW DRIVES [NOCHECK]
SHOW FS
SET DRIVE[S] n[,n,...] REAL|VIRTUAL
 [STN \$nn]
SET FS [STN \$nn]

Other NET Inputs

drive: 4,5,9,10,11,12
drive-status: R, REAL, or V, VIRTUAL

A

<anystring> 2-9
ASK 4-4

B

bibliography BB-1
block 2-1
booting 1-1
boot diskettes 1-1, 1-5ff

C

CHAIN 4-5
CLEAR 4-3
CMD 3-2
CMDLOOP 3-3
CMDUNIT 3-1, 3-2
COMMAND 3-2, 3-4
command;command 2-10
commands, network 3-7
configuration file 1-2
CONTINUE 4-4
CREATE 2-5
creating boot diskettes 1-5ff
 virtual diskettes 2-5

INDEX

D

default pathname 2-4
disclaimer ii
disk organization 2-1
diskette size 2-1, 2-5
DONEFLAG 3-5
drives 2-2

E

error messages A-1
 while booting 1-3ff

F

file server commands 2-2, B-1
files, installation 1-5

L

library volume 4-1
local commands 2-7

M

manuals,
 list of BB-1
MININET 3-6

N

NET program 2-2, 2-7, 4-3
 network 2-lff
 network commands 2-2, B-1
 local 2-7
 NETWORK.COMS 1-1
 NETWORK.DRIVERS 1-1
 network drives 2-2
 NETWORK.INSTALL 1-1
 NETWORK.LIBRARY 3-1
 NETWORK.PROFILE 1-2, 2-3
 NETWORK.START command program 4-3
 network utilities 4-1
 NETUNIT 3-1, 3-3
 NEWCMD FLAG 3-5
 NEWS 4-5
 NIL 3-4
 NOECHO 2-10, 4-3

O

OPTIONS 3-2

P

power up process 1-2
 PRINT 2-10, 4-3
 programming 3-1

Q

QUIT 4-6

INDEX

REF: I

R

RC 3-4
REAL 2-9
RESPONSE 3-4

S

SET DATE
SET DRIVES 2-9
SET FS 2-9
SET PREFIX 4-6
SETPROF utility 4-1
shared disk organization 2-1
 library volume 4-1
SET USER 4-5
SHOW DRIVES 2-7
SHOW FORMDATE 4-5
SHOW FS 2-8
SIZE 2-5
size, diskette 2-1, 2-5
STARTCMD.TEXT 2-6
starting up 1-1, 4-3
status of drives 2-8
STN 2-9
SYSTEM.LIBRARY 3-1

T

type 2-1

INDEX

8

U

- unit numbers 2-2
- USES declaration 3-2
- using network commands within a program 3-1
- utilities, network 4-1

V

- variable size diskettes 2-1
- version number iii
- VIRTUAL 2-9
- virtual diskettes 2-1, 2-5, 2-6
- virtual drives 2-2
- volume size 2-1

Other

- ; <anystring> 2-9, 4-3
- % filename 2-10

SECRET - (S) REFERENCE

0000-0100	SECRET - (S) REFERENCE
0000-0101	SECRET - (S) REFERENCE
0000-0102	SECRET - (S) REFERENCE
0000-0103	SECRET - (S) REFERENCE
0000-0104	SECRET - (S) REFERENCE
0000-0105	SECRET - (S) REFERENCE
0000-0106	SECRET - (S) REFERENCE
0000-0107	SECRET - (S) REFERENCE
0000-0108	SECRET - (S) REFERENCE
0000-0109	SECRET - (S) REFERENCE
0000-0110	SECRET - (S) REFERENCE
0000-0111	SECRET - (S) REFERENCE
0000-0112	SECRET - (S) REFERENCE
0000-0113	SECRET - (S) REFERENCE
0000-0114	SECRET - (S) REFERENCE
0000-0115	SECRET - (S) REFERENCE
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0000-0118	SECRET - (S) REFERENCE
0000-0119	SECRET - (S) REFERENCE
0000-0120	SECRET - (S) REFERENCE

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Print Server User's Manual	SC40-0201
Print Server Installation and Operation Manual	SC40-0301
Messenger User's Manual	SH40-0204
Messenger Installation and Operation Manual	SH40-0304

enclosed is one in a series that describe
the various types of...

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Reader Comment Form

This manual is one in a series that describes the use of the PLAN 4000 system.

You are encouraged to use this form to communicate to Nestar any problems or suggestions associated with the system. We would like your comments on improving the system itself, as well as on this documentation. Possible topics for comment are: clarity, accuracy, completeness, organization, coding, retrieval and legibility.

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Address of Recipient (mirrored text)

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