Burroughs

Standard Software Operations Guide

B 20 Systems

(Relative to Release Level 4.0)

Priced Item
Printed in U.S.A.
June 1984

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INTRODUCTION

The *B 20 Systems Standard Operations Guide* introduces the beginning user to the B 20 system software. It begins by presenting an overview of operating systems in general, then details specific features of the B 20 Operating System (BTOS). It guides the beginner through operating procedures by explaining the B 20 commands and operations.

This manual assumes that the user has had no previous experience with, or knowledge of, operating systems. Where appropriate, this manual provides step-by-step tutorials, such as signing onto the system, initializing a disk, creating and manipulating a file, configuring a file, and establishing file security.

Experienced users should refer to the *B 20 Systems Custom Installation and Reference Manual*, which provides information on some of the more advanced features of BTOS.

For instructions on loading applications software, refer to the appropriate application reference manual. You will find procedures for your particular system configuration included in it.

This manual consists of an introduction, six sections, four appendixes, and an index.

Section 1, Components, provides an overview of the B 20 system software and explains organizing storage into volumes, directories, and files. This section also includes a description of the keyboard and how to use it.

Section 2, Starting Up the System, explains the procedures for signing onto the system, initializing a volume, and backing up and restoring a volume.

Section 3, Working with Files, describes conventions for naming files, including default volume and directory names, the wild card character, file prefixes, and subdirectories. This section explains the most frequently used commands for file manipulation.

Section 4, Using the Printer, describes the functions of the printer and the commands for using it. Included are descriptions of direct and spooled printing.

Section 5, Establishing Security Procedures, discusses file protection mechanisms that provide full security for your file. This section explains two mechanisms for protection: specifying a file or directory password, and specifying a file protection level.

Section 6, Commands, contains an alphabetic listing of the most frequently used system commands and a brief description of each. A complete listing of available B 20 system commands is in appendix D.

Appendix A is a Guide to Technical Documentation.

Appendix B contains an American Standard Code for Information Interchange (ASCII) chart showing the decimal and hexadecimal representation of information in the system.

Appendix C contains an annotated list of all available commands on the B 20 system.

Appendix D is a glossary of terms used in this manual.

An index follows the appendixes.

SECTION 1
COMPONENTS

INTRODUCTION

Operating Systems

An operating system is the part of the system's software, or programming, that supervises the running of individual programs. An operating system serves you by performing many important basic functions, including loading programs to be executed, enabling concurrent execution of two or more programs, scheduling different processes within the system, and providing management of information.

B 20 System Software

The B 20 system software is interactive; that is, you communicate with the system by entering commands. The system responds to each command by displaying a command form, which requests additional information.

The functions of the B 20 Operating System (BTOS) can be accessed by application programs, the B 20 Executive, or system utilities.

Application programs enable you to perform normal business or personal tasks quickly, easily, and efficiently. Programs can be written in any of the several higher level languages such as BASIC, COBOL, FORTRAN, or Pascal. Application programs include inventory control, marketing projection, word processing, and accounting programs.

The B 20 Executive is a special program that acts as an interface between you and the operating system or one of the applications programs installed on your system. It also performs tasks such as copying, renaming or deleting files, creating directories, setting security, and running programs.

Utilities are separate programs you activate through the Executive. They perform tasks such as file backup and restore, volume initialization, printing, application partition management, and cluster management. Utilities are treated throughout this manual as part of the Executive and are referred to as commands.

Programming development tools are also a part of the system software; they are of primary interest to system developers. In addition, a program known as the Batch Manager can control utilities, programming tools, and system services. The Batch facility allows repetitive functions to run under control of a Job Control Language (JCL) file.

Refer to figure 1-1 for an illustration of the B 20 System Software.

B 20 OVERVIEW

Your B 20 workstation is a single-operator desktop workstation consisting of a keyboard, a screen, and a processor module (the nerve center of the system, which coordinates and controls the activities of all the other components). It also has a power supply module, a small box that converts the incoming electric current from 110 volts AC to 36 volts DC, providing DC voltage for each module; the power supply is an external unit on some systems, and built-in on others. Your workstation also may include a Winchester disk, one or more floppy disk drives, and a printer.

Your workstation can be used in a standalone configuration. It can also be one of several (up to 16) workstations connected to a Burroughs B 22 (or B 21-4/5/6) master workstation or one of five workstations connected to a Burroughs B 26 master workstation. The master workstation provides file system and queue management resources for all workstations connected to it. The group of workstations and the master workstation together form a cluster configuration.

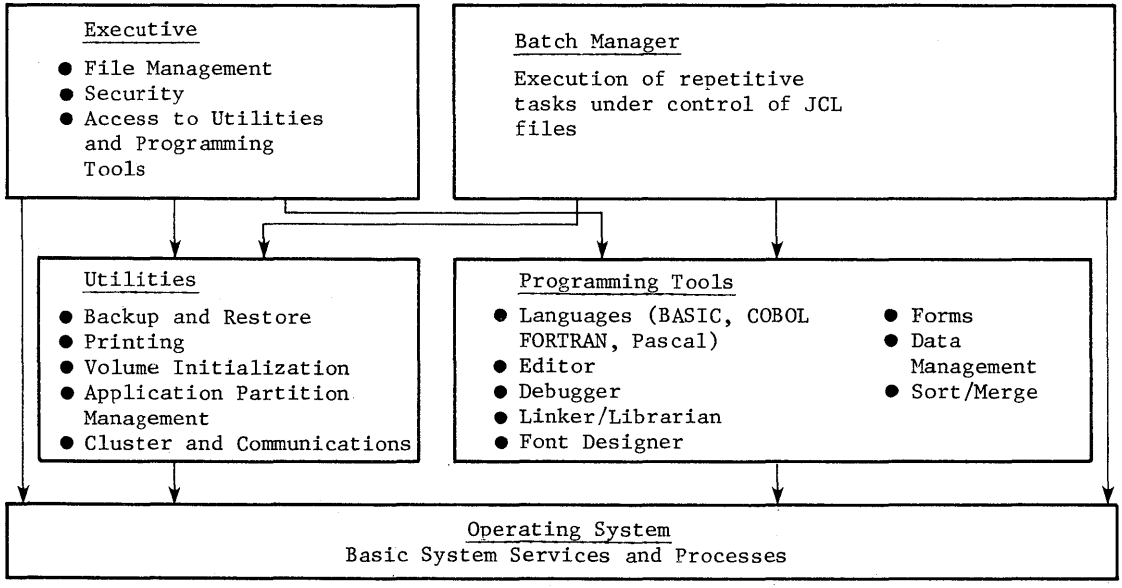


Figure 1-1. B 20 System Software

A cluster workstation can access its own data as well as data on the master workstation. A workstation maintains its own private data files, but can also contribute to and extract from the system's pool of information. The individual workstations in the cluster are connected to each other as well as to the master workstation. Other stations in the cluster cannot access your private data files, however, unless you have transmitted your data to the master workstation.

The master workstation and cluster workstations share the same operating system. All the workstations in the cluster share printers that are connected to the master. Figure 1-2 shows a typical cluster configuration.

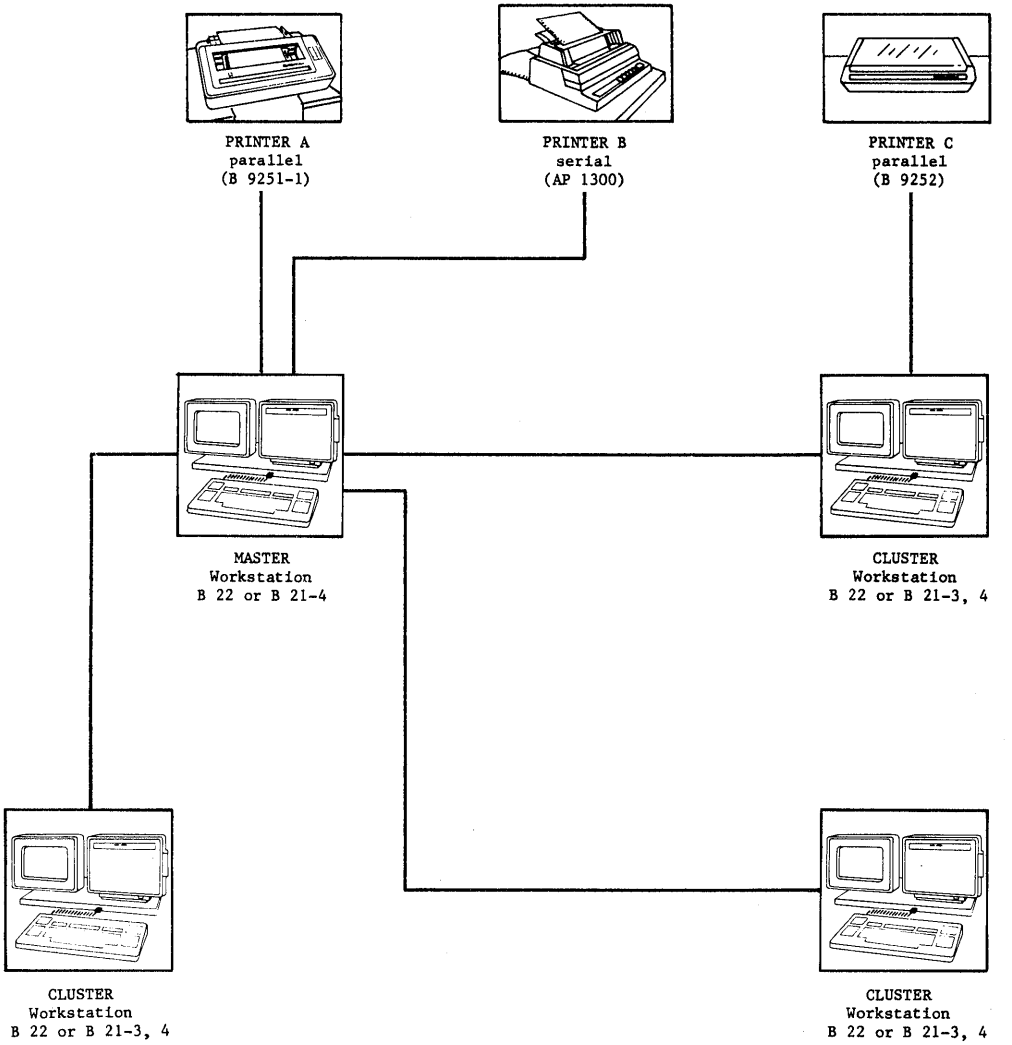


Figure 1-2. Typical Cluster Configuration

When the B 20 Workstation is connected to a mainframe, it operates as an I/O terminal. It also is capable of performing individual operations and programming functions. Each workstation can generate, modify, and execute its own utility or application programs independently of other workstations and simultaneously with them.

FILES, DIRECTORIES, AND VOLUMES

The B 20 organizes storage for data and programs into volumes, directories, and files. A volume is a floppy disk or Winchester disk (if your system has one) that has been formatted and initialized to store data or programs. (In some contexts, the disk drive is referred to as a volume.) You organize each of your volumes into units called directories. A directory is a group of related documents, programs, or other data stored on a volume. You organize directories into units called files. A file is a document, program, or other set of related data within a directory.

For example, you can have a volume called Plant Assets to record your company's business property. That volume can have a directory for Office Equipment, another for Manufacturing Equipment, another for Vehicles, etc. The Vehicles directory can have a file for information about company automobiles, another for trucks, etc.

You can think of your system as an office: each volume is like a file cabinet, the directories within each volume are like the drawers in that cabinet, and the files within each directory are like the file folders in each drawer.

Directories and files provide an index for a volume. You can list the directories contained within a volume by using the **Volume Status** command, and you can list the files within a directory by using the **Files** command.

Procedures for formatting and initializing volumes are explained in section 2; procedures for creating directories and files appear in section 3.

USING THE KEYBOARD

A typical B 20 keyboard is shown in figure 1-3.

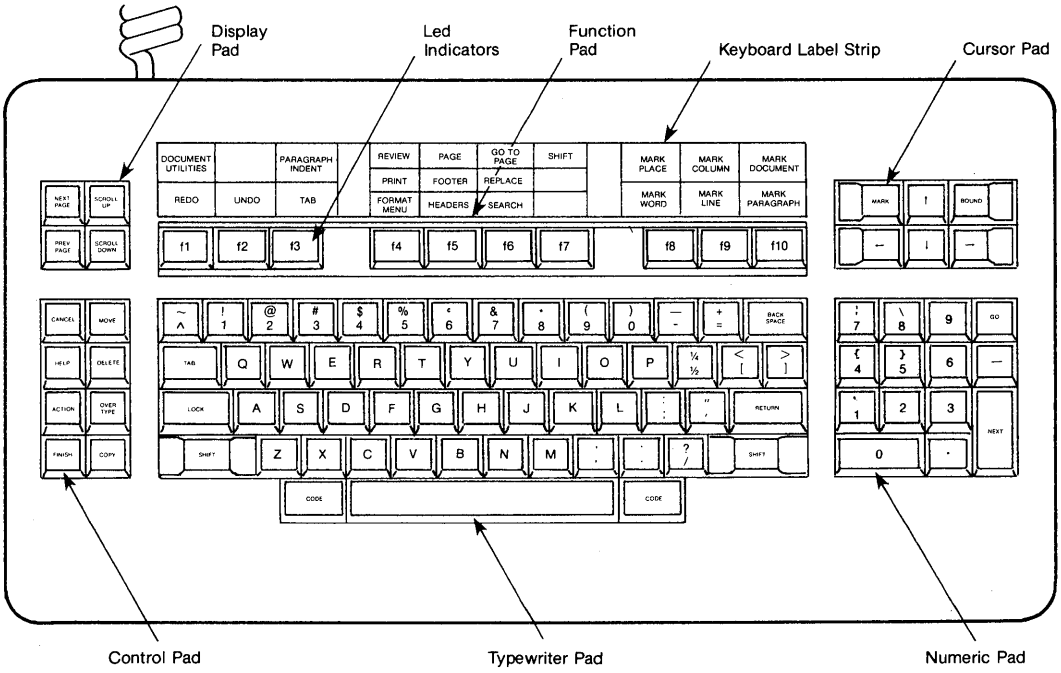


Figure 1-3. A Typical B 20 Keyboard

You can enter characters in either upper- or lowercase. Descriptions of special keys on the keyboard are as follows:

ACTION — The function of the **ACTION** key is specific to each application program. Refer to your application program manual.

ACTION/FINISH — Pressing and holding the **ACTION** key, then pressing the **FINISH** key terminates the application that is currently executing.

ACTION/DELETE — Pressing and holding the **ACTION** key, then pressing the **DELETE** key clears the type-ahead buffer.

ACTION/OVERTYPE — Pressing and holding the **ACTION** key, then pressing the **OVERTYPE** key turns off the video refresh. Press any key to restore the video display.

BACKSPACE — The **BACKSPACE** key has two functions: in the insert mode (**OVERTYPE** key not activated), it deletes the last character you enter. In the overtype mode (**OVERTYPE** key activated), it moves the cursor one space to the left.

CANCEL — The **CANCEL** key terminates the present command form and returns to a new command form without completing execution of the original command. The **CANCEL** key also terminates multipage displays initiated by **Type** and **Dump** commands.

CODE — The **CODE** key, is used in conjunction with the function keys (f1, f2, f3 ... f10). Pressing the **CODE** key and a function key at the same time, activates that function (displayed along the top line of the label strip).

CODE/DELETE — Pressing the **CODE** key and the **DELETE** key simultaneously blanks out the field currently being entered.

DELETE — The **DELETE** key blanks out the character currently being entered.

Down Arrow(↓) — The **Down Arrow** key has the same effect as the **RETURN** key, which moves the cursor to the next field when you enter fields on a command form.

F1 — The **F1** key replays the last command sequence of keystrokes.

FINISH — The **FINISH** key ends the execution of an application program or a command, and returns to the Executive.

GO — The GO key executes a command after you have entered the fields.

HELP — The **HELP** key provides a list of all the system commands. Press **HELP** once for a list of all commands and a second time for a description of each command.

If you press **HELP** after partially entering a command name, only those commands that exactly match the partially entered command name are listed and described.

If you press **HELP** when entering the parameter fields for a specific command form, a short description of the command in use appears, followed by a redisplay of the command form.

Left Arrow (←) — The **Left Arrow** key moves the cursor to the previous character position. By pressing the **CODE** key and the left arrow, you can move the cursor to the first character position on the line.

NEXT — The **NEXT** key has the same effect as the **RETURN** key, which moves the cursor to the next field when you enter parameter fields on a command form.

NEXT PAGE — The **NEXT PAGE** key displays the next page when the current command requests more than one display screen of information. The following message appears:

Press **NEXT PAGE** or **SCROLL UP** to continue

OVERTYPE — By pressing the **OVERTYPE** key, you enter the overtype mode. If you key other characters in to the system, the previous characters will be typed over as if they never existed. When this feature is activated, the indicator on the **OVERTYPE** key lights.

PREVIOUS PAGE — The **PREVIOUS PAGE** key displays the page previous to the text currently on the screen.

RETURN — The **RETURN** key ends a line of input.

Right Arrow (→) — The **Right Arrow** key moves the cursor to the next character position. By pressing the **CODE** key and the right arrow key, you can move the cursor to the right of the displayed text.

SCROLL UP — The **SCROLL UP** key rolls up one line at a time without moving the cursor. In effect, **SCROLL UP** displays one additional line of text at the bottom of your screen.

SCROLL DOWN — The **SCROLL DOWN** key rolls down one line at a time without moving the cursor. In effect, **SCROLL DOWN** displays one additional line of text at the top of your screen.

TAB — The **TAB** key has the same effect as the **RETURN** key, which moves the cursor to the next field when you enter parameter fields on a command form.

Up Arrow (↑) — The **Up Arrow** key moves the cursor to the preceding field when you enter parameter fields on a command form.

SECTION 2
STARTING UP THE SYSTEM

INTRODUCTION

If the system administrator or another user powers up and starts the system, you need only power up and boot your own B 20 workstation. When you must power up and start the system yourself, refer to your system's installation manual for complete instructions. Inform your system administrator if you have any difficulty with this procedure.

SIGNON PROCEDURE

A few seconds after the system is powered up, the Signon form appears on the screen. The Signon form controls access to system files. Enter your name, password, date, and time of the session.

To set the system date and time to Monday, December 3, 1983, 8:00 PM, you can enter one of the following:

1. 12/3/83Sa8:00PM
2. 3-Dec-83 20:00
3. 8:00 Saturday 3 December 1983 PM

After entering the time, check the accuracy of all entries and make any corrections.

To reset the system time to Monday, February 20, 1984, 8:00 AM, you can enter one of the following:

1. Mon February 20, 1984 8:00
2. Mo Feb 20, 84 8:00
3. 2/20/84Mo8:00

You can change the system time from 8:00 AM to 8:00 PM without changing the previously entered date and time by simply entering pm or PM.

After correctly filling in the form, press GO. Errors appear beneath the form as a status message appropriate to the error, such as, day and date disagree. The Signon form then reappears on the display.

Once you enter the Signon form, the current day, date, and time appear in the upper right of the display. The time updates continually, and appears as long as the system remains on.

USING THE EXECUTIVE

From this point on you will interact with the system through a series of commands and responses, using the Executive to activate the functions of the B 20 Operating System (BTOS). To enter an Executive command, specify the command name in the field next to the command prompt, which appears on the screen, as follows:

Command _____

Pressing the **HELP** key once displays a list of all available commands; pressing it twice displays a brief explanation of each command. Section 6 contains an annotated alphabetical list of commands.

Enter a command name (or an abbreviation of a command name) to complete the command prompt field. You need enter only as many characters of the command name as necessary to uniquely identify it.

Press **RETURN** to display the command form (you can also use the **Down Arrow**, **TAB**, or **NEXT** keys). Fill in the command form's parameter fields, then press **GO** to execute the command.

NOTE

Entries may not be required for each parameter field; items listed in square brackets are optional.

If you decide not to execute a command before completing the command form, simply press the **CANCEL** key; a new command prompt appears on the display. The original command does not execute.

To exit from the Executive, enter the **Logout** command, then press **GO**. In most cases, the Signon form then reappears.

Information Storage

Disks are the information storage media for the system. There are two types of disks: hard (Winchester) disks, and floppy (flexible) disks.

The Winchester disk is built into your workstation. Winchester disks may contain bad sectors that are not usable for data storage. A list of bad sectors identified at the factory accompanies each Winchester disk. This list must be entered manually when you first initialize the volume. The volume initialization process includes surface tests that may uncover additional bad spots. The location of all bad sectors on the disk is recorded in a file called BadBlk.Sys.

Floppy disks can be mounted and removed from your workstation's floppy disk drive. To use a floppy disk, you must first mount it according to the procedure found in your installation manual and initialize it using the IVolume command.

The mechanism that rotates the disk for reading and writing is the disk drive.

If you use a utility that has the word "floppy" in the command name (for example **Floppy Copy**), you must install the utility floppy in drive fl on the master workstation or in drive !f0 on your cluster workstation in order for the command to run.

Volume Initialization

The IVolume command prepares a floppy or a Winchester disk for use as a B 20 volume. IVolume formats the disk, performs write/read tests to identify surface defects, writes volume control structures onto the disk, and creates system files. When initializing a floppy disk, the system prompts you to mount the disk. It also recognizes whether the volume has already been formatted and requests confirmation before reinitializing a disk containing valid volume information. IVolume does not allow you to initialize a volume currently in use.

Avoiding Volume Fragmentation

B 20 volumes should be reinitialized periodically to avoid a problem known as volume fragmentation. Volume fragmentation occurs when you request the B 20 file system to create or extend a file; in response, the system attempts to allocate a single disk run. (A disk run is one or more contiguous disk sectors that comprise all or part of a file.) If this is not possible, it allocates two or more smaller disk runs whose total size satisfies the request.

If you have recently initialized or reinitialized a volume using the IVolume command, the system can easily find a single-disk extent large enough to satisfy the request. If you create and delete files many times after initializing a volume, however, the disk extents available for allocation may be scattered, making it impossible to allocate a single disk. In this case, the available storage of the volume is said to be fragmented.

Volume fragmentation degrades performance (that is, it causes the system to perform at a reduced level of efficiency) in several ways:

- It takes longer to create or extend a file because the system must access more sectors of the Allocation Bit Map to find enough disk extents to satisfy the request.

- It takes longer to process a file sequentially because disk sectors that are logically consecutive are not physically consecutive.

- It limits the number of files you can open concurrently because each open file requires allocation of a File Area Block in memory for each disk extent. In order for the system to accommodate a maximum number of concurrently open files, a sufficiently large number of File Area Blocks must be specified during the system build. Increasing the number of File Area Blocks, however, reduces the amount of memory available to the application system.

Volume Names

You can assign a volume name that is descriptive of the volume's contents. For example, a floppy disk containing accounting files can be designated Accounting, and one containing John Smith's files can be designated JohnSmith). You can assign the volume name when you initialize a volume, but you also can assign it with the **Change Volume Name** command.

Volume names can contain up to 12 alphanumeric characters, a period, and/or a hyphen. You can also use other symbols, including [, +, =, <, &, and @; however, it is not recommended.

In addition, you can refer to a volume by the default name of the drive in which it is mounted, regardless of its assigned name. Typically, the default volume name is one of the following:

[d0]	The first Winchester disk drive at the master workstation or a local file system.
[d1]	An additional Winchester disk drive on a B 20 system.
[!d0]	The Winchester disk drive at the master workstation when specified from a cluster workstation with local file storage.
[f0]	The first floppy disk drive of your local system.
[f1]	The second floppy disk drive on a system with two floppy disk drives or a dual floppy disk drive.
[!f0]	The first floppy disk drive of the master workstation when specified from a cluster workstation with local file storage.

When you backup a disk, you make an exact copy of it in case the original is damaged or lost. This is also known as archiving your files. Archiving the contents of a volume is critical for protection against disk hardware failure or inadvertent file deletion. In the event of such failure, you will have the backup copy from which to work.

The **IVArchive** command initializes a supply of floppy disks for use as archive volumes. Use the **IVArchive** command in conjunction with the **IVOLUME** command.

Before you begin archiving the contents of a volume, make sure you initialize enough floppy disks to hold all the files you want to back up. You can determine the approximate number of disks required by entering the **Files** command. If you specify y for YES in the [Details] parameter field, the system displays the number of sectors each file uses. For an 8-inch floppy, divide this number by 800 to arrive at the approximate number of floppy disks you need. You must start with enough disks; you cannot stop in the middle of a backup to initialize more disks. The procedures for backing up a disk are presented in the tutorials which follow.

You can copy an entire volume to an archive file with the **Backup Volume** command; the **Selective Backup** command duplicates individual files or directories. The **Restore** command restores volumes, directories, and files to a volume from an archive file. **Floppy Copy** duplicates the contents of a disk to one or more floppies.

TUTORIALS ON STARTING UP THE SYSTEM

The following tutorials provide step-by-step procedures for the following operations:

- System Signon
- Listing Available Commands
- Listing a Directory of Files
- Disk Backup

Signing onto the System

1. Power up your workstation according to the instructions given in your system's installation manual. In a few seconds, the following display appears:

```
Signon 4.0/USA

Burroughs B 20 Operating System BTOS 4.0
```

User Name	Enter an application name or leave this line blank to display a command form.
Password	Enter your assigned password (optional).
Day/Date/Time	Enter the current day, date, and time (if not already set).

```
User Name (e.g., Allen)
Password
Date/Time (e.g., Fri Sep 9, 1983 8:00 AM)
        Then press the GO key.
```

2. A light green band, called a highlight, appears next to the User Name prompt. In most cases, highlights appear on the screen when the workstation requires information from you. Enter a user name or application.

NOTE

If a .USER file is installed, this field is left blank.

3. Press **RETURN** twice to move the highlight to the prompt Date/Time (e.g., Fri Sep 9, 1983 8: AM).

4. Enter the current date and time. For example, at 9:00 A.M. on Monday July 22, 1985 you would enter: Mon 7/22/85 9:00 AM.

5. Press GO; the date and time now appear in the upper right corner of the screen. A new line, the Command prompt followed by the highlighted command field, also appears on the screen.

The following section explains how to proceed.

Listing Available Commands

You interact with your workstation in a conversational mode. When you enter a command, the system responds with a screen display. First, the workstation asks what you want to do by displaying the Command prompt. Then you supply a command that tells the workstation what to do.

1. Enter the word **Move** in the command field, then press **GO**. The following message appears:

   No such command

   Move is not a valid command.

2. To display a list of your system's commands, press the **HELP** key located in the leftmost column on your keyboard (refer to figure 1-3). Because the system cannot display all of its commands on one screen, the following message appears at the bottom of the display:

   Press **NEXT PAGE** or **SCROLL UP** to continue

3. To display the remaining commands, press the **NEXT PAGE** key located in the upper left corner of the keyboard (refer to figure 1-3). (Do not press **SCROLL UP** at this time.) After the system displays the rest of the commands, the Command prompt reappears.

4. Press **HELP** again. The system lists each of its commands again, but this time provides a brief explanation for each one. Because the system cannot display all of its commands on one screen, the following message appears at the bottom of the display:

   Press **HELP PAGE** or **SCROLL UP** to continue

5. Press **NEXT PAGE** or **SCROLL UP** to display the remaining commands. After the system displays the rest of the commands, the Command prompt reappears.

6. Familarize yourself with these commands and their explanations.

7. If you reach a command you would like to enter before finishing the last page of explanation, press the **CANCEL** key to display the Command prompt. Otherwise, when you reach the last page, the command prompt appears. You are now ready to enter commands.

Listing a Directory of Files

At times, you will probably find it useful to produce a listing of the files a disk contains. For example, you may forget the name of a document you wish to access. A directory of files gives you the names of all (or some) of the files on a disk. You also can request additional details about the files, such as document length and the most recent date of modification, which can help you identify the file you want.

To produce a directory listing, use the following procedure:

1. Enter the **Files** command; then press **RETURN**. The following display appears:

   Files
   [File list]
   [Details]
   [Print File]

   This display is called a command form. It requests information, called parameters, that the system needs to execute the command. When you enter a command from the Executive, then press **RETURN**, and a command form appears. The prompts under the word **Files** are called parameter prompts. You enter information in the parameter fields next to the prompts. Parameter prompts enclosed in square brackets are optional.

2. The parameter field next to the File list prompt is highlighted. The default for this field is an asterisk (*), which is a wild card character indicating that you want a list of all the files on your disk (refer to section 3). Either enter an asterisk in the File list parameter field, or simply leave it blank.

3. Press GO to execute the command. A list of all the files on the disk appears on the display. By pressing GO without making entries in the fields of the remaining optional parameters, you accept their default values (that is, the values they automatically have unless you change them). In some command forms, the default values appear along with the parameters; in others they do not. Refer to section 6 of this guide and section 3 of the *B 20 Systems Custom Installation and Reference Manual* for parameter default values.

To change the default values in the **Files** command form, use the following procedure:

1. Enter the **Files** command; then press **RETURN**. The **Files** command form reappears on the display, with the highlight located in the field next to the File list prompt.

2. Either enter an asterisk (*), or simply press **RETURN**. The default for this field is an asterisk. The highlight moves to the [Details] parameter field.

   The default value of this parameter is NO. If you change the value to YES, the system provides additional details about the files (refer to section 6 for details on the **Files** command).

3. To change the value to YES, enter the letter y; then press **RETURN**. The highlight moves to the [Print File] parameter field.

   The default value for this parameter is NO.

4. To accept the default value and execute the command, press **GO**. The File list with details appears on the screen only.

   If you change the default value to YES, the system prints the file directory. Change the value by entering the letter y in the [Print File] parameter; then press **GO**. (Refer to section 3 for details on using the **Print** command.

Backing Up a Disk

This section contains two procedures for backing up a disk; the first pertains to systems with two floppy disk drives; the second concerns systems with a hard disk (Winchester) drive. Follow the procedure applicable to your system.

Backing Up System with Floppy Disk Drives

Floppy disk backup is accomplished using two commands: **IVolume** (Initialize Volume) and **Copy**. The following procedure uses these commands to backup the Sysimage disk that comes with your system. Follow this procedure whenever you need to make a backup copy of a disk:

1. Turn on your system and insert your Sysimage disk in drive f0.

2. Insert a blank disk in drive f1.

3. Enter the **IVolume** command, then press **RETURN**. The following display appears:

```
IVolume
  Device Name
  [Device Password]
  Volume Name
  [Volume password]
  [System Image (default = 384)]
  [Log file (default = 2)]
  [Crash file (default = 0]
  [Max. directories]
  [Max. files on volume]
  [Primary file headers only?]
  [Max. files in Sys Directory]
  [Sys Directory password]
  [Write protect Sys Directory?]
  [Suppress format of medium?]
  [Surface tests]
  [Debug?]
  [Log file]
  [Extended floppy tracks?]
  [Single sided mini-floppy?]
  [Bad spots (See documentation)]
```

4. The highlight appears in the Device Name parameter field; you must specify the device containing the disk to be initialized. Because you need to initialize the disk in drive f1, enter f1; then press **RETURN**. The highlight moves to the [Device Password] parameter field.

5. The square brackets indicate that the [Device password] parameter is optional. Because you have not yet assigned a device password to drive f1, press **RETURN** to skip this line. The highlight moves to the Volume Name field.

6. You must specify a name that uniquely identifies the volume. Enter SysimageBackup, which identifies both the contents of the disk and its status as backup.

7. If your system uses eight-inch disks or double-sided 5-1/4 inch disks, go to step 8 and continue. If your system uses single-sided 5-1/4 inch disks, press **RETURN** until the [Single sided mini-floppy?] field is highlighted. Enter **y** (for Yes); then continue with step 8.

8. Press **GO** to execute the **IVolume** command. The following display appears:

```
Please insert disk to be initialized.
(Press GO to confirm, CANCEL to deny, or FINISH
to return to Executive)
```

9. Your blank disk should already be in drive f1; press GO. The following information then appears on your screen (where X indicates values specific to your system):

```
Maximum number of directories on volume:  X
Maximum number of files on volume:  X to X
Maximum number of files on directory SYS:  X

Initializing the disk on f1...all data on the disk is
lost!

Formatting Disk.
Surface test - Pass:  1
Writing volume structures on disk.

Disk contains 0 bad sectors.

Volume initialization complete.

Initialize another volume?
(Press GO to confirm, CANCEL to deny, or FINISH
to return to Executive)
```

10. Press **FINISH**; your screen now shows the command prompt. Now that the backup disk is initialized, the next part of the procedure uses the **Copy** command to transfer files on the disk in drive f0 to the disk drive f1.

11. Enter **Copy**; then press **RETURN**. The following display appears:

```
Copy
File from
File to
[Overwrite ok?]
[Confirm each?]
```

12. The highlight appears in the File from field. The only information you must provide is the names of the files you want to copy. Enter an asterisk (*) to indicate that you want to copy all the files from the disk in drive f0, then press **RETURN**. The highlight moves to the File to field.

13. To specify the names of the file copies and where you want the file copies to reside, enter [f1]<sys>*

    - [f1] - indicates the device where the copies will reside (in this case, disk drive f1).
    - <sys> - indicates the directory name where the files will reside.
    - * - indicates that you specified a wild card in the first parameter field of the command form. This causes the file copies to be assigned the same names as the original files.

14. Press GO. The following display appears:

    Copying X to [f1]<SYS>X...

    where X is the name of the file being copied. After each file is copied, the screen shows:

    Copying X to [f1]<SYS>X...Done

    After all files have been copied, the command prompt appears on your screen and you are ready to proceed.

15. Remove the backup disk from drive f1 and return it to its protective jacket. Using a felt-tip pen, label the disk SYSIMAGE BACKUP and write the current date on the label. It is always a good idea to include the date on all backup disks.

16. Repeat this procedure, beginning with step 2, until you have backup copies of all the disks that came with your system.

Backing Up a Hard Disk System

You can use three commands for hard disk backup: **Files**, **IVArchive**, and **Backup Volume** or **Selective Backup**. A summary of the backup procedure is as follows:

- Use the **Files** command to determine the number of floppy disks needed to contain all hard disk files.
- Use the **IVArchive** command to prepare floppy disks for backup purposes.
- Use the **Backup Volume** command to copy all files from the hard disk onto floppy disks,

  or

- Use the **Selective Backup** command to copy only selected files from your hard disk onto floppy disks.

The following procedure shows you how to backup your hard disk files. Use this procedure at least once a week or whenever you add a significant amount of data to your hard disk.

1. Turn on your system and insert a blank floppy disk into drive f0. Your system displays the command prompt.

2. Enter the **Files** command, then press **RETURN**. Your system displays the following command form:

```
Files
   [File list]
   [Details?]
   [Print file]
```

3. Enter the wild card symbol (*) to indicate that you want a list of all files, then press **RETURN**; the highlight moves to the next prompt, [Details?].

4. Enter **y** (for YES); then press **GO** to execute the **Files** command.

5. The bottom line of the screen should show:

```
Total sectors:  X
```

where X indicates the amount of space your files occupy on the hard disk. At this point, you do not need to know what a sector is; however, you do need to know how many floppy disks are required to backup your hard disk.

6. Use the following steps to determine the number of floppy disks you need:

   a. Jot down the total number of sectors currently occupying your hard disk; use the number obtained from the **Files** command.

   b. Divide the number of sectors by 800. The result of this division gives you the number of floppy disks needed to back up your hard disk. If there is a remainder in your division, allow an extra floppy disk for the remaining sectors. For example, a hard disk containing 2136 sectors requires 2136 divided by 800, or 2.67 floppy disks for backup. In this case, you would need to initialize three disks to backup your hard disk.

7. The command prompt appears on your display. Enter the **IVArchive** command, then press **RETURN**. The following display appears:

```
IVolume Archive
  [Volume name (default = Archive)]
```

8. Press GO to accept the default volume name Archive and execute the command. The following display appears:

```
Initialize Volume 4.0/USA

Please insert diskette to be initialized.
  (Press GO to confirm, CANCEL to deny, or FINISH
  to return to Executive.)
```

9. Press GO. This confirms that you already have inserted a blank disk (step 1). The following information then appears on your screen (where X represents values specific to your system.)

```
Maximum number of directories on volume:  X
Maximum number of files on volume:  X to X
Maximum number of files on directory SYS:  X

Initializing the disk on f0...all data on the disk is
lost!

Formatting Disk.
Surface test - Pass:  1
Writing volume structures on disk.

Disk contains 0 bad sectors.

Volume initialization complete.

Initialize another volume?
(Press GO to confirm, CANCEL to deny, or FINISH
to return to Executive.)
```

10. Press GO. Repeat this procedure as many times as required to initialize enough blank disks to contain all the files on your hard disks (step 6 explains how to determine this number).

11. After you have initialized enough disks, press **FINISH**. The command prompt appears on your display.

12. Enter the **Backup Volume** command, then press **RETURN**. The following display appears:

```
Backup Volume
  Volume or device name
  [Volume or device password]
  [Incremental from (e.g., Mon June 1 1981 8:00 pm)]
  [Suppress backup?]
  [Suppress verification?]
  [Archive file]
  [Delete existing archive file?]
  [Log file]
  [Display structures?]
```

13. The highlight appears in the Volume or device name field. Enter d0, then press GO. The following message appears on your screen:

    Please mount [Archive]<Sys>.01
    (Press **GO** to confirm, **CANCEL** to deny, or **FINISH** to return to Executive.)

14. Insert one of your blank initialized disks into drive f0; then press **GO**.

15. When the screen prompts you to insert another disk, remove the disk in drive f0, and return it to its protective jacket. Label this disk ArchiveSys #X, where X is 1 for the first disk, 2 for the second disk, and so forth. Be sure to write the current date on the label to prevent confusion between backup copies.

16. Repeat steps 14 and 15 until you have backed up the entire hard disk.

NOTE

The procedure for executing the **Selective Backup** command is similar to the procedure for the **Backup Volume** command except that you can specify which files to back up. **Selective Backup** may use fewer disks and save you considerable time in situations when an entire hard disk backup is not warranted.

SECTION 3
WORKING WITH FILES

FILE SPECIFICATION

File Name

B 20 programs and data are stored in files. A file is a set of related items stored as a unit in a directory on a single disk volume. You can create files in three ways:

- Use the Editor.
- Use the Copy command.
- Use an application program which creates a file.

Each file has a unique name, which should describe the contents of that file and be meaningful to you. A file name can contain up to 50 alphanumeric characters including upper- and lowercase letters, periods, hyphens, and right angle brackets (>).

NOTE

Although other special characters ([, +, =, <, &, @) are allowed in file names, their use is not recommended.

File Extension

You can add a file extension to each file name to further identify the type of file. A file extension consists of a period (.), followed by three or four alphabetic characters, appended to the end of the file name. Some commonly used file extensions are the following:

.Run	Run file
.Sub	Submit file
.Sys	System file
.Lst	List file
.Txt	Text file
.BAS	BASIC file
.User	User-signon file

Complete File Specification

The file specification is one of the most frequently used parameters in B 20 commands. A complete file specification uniquely defines a particular file within a specific directory and volume. It has the following form:

```
[volume name]<directory name>file name
```

The right square bracket (]) and the left and right angle bracket (<>) characters cannot have any spaces before or after them.

Use the complete file specification when you want to access a file in a different volume or directory than the one in which you are currently working.

Default Volume and Directory Specification

When you specify a file name only, the system assumes that the file is located in the current volume and directory. The [volumename] and <directoryname> default to those displayed in the status area of the Executive screen as follows:

```
Path:  [volumename]<directoryname>
```

The Path display shows the route that the operating system takes to access the file you are currently working with, showing the disk volume (hard or floppy) and the specific directory located on that volume.

To access a file in another directory, you must specify the directory as well as the file name; to access a file in another volume, you must provide the complete file specification, including volume, directory, and file name.

For example, if you are currently signed onto the directory <Manager> on the volume [Accounting], entering the file specification

```
Expenses
```

is equivalent to entering

```
[Accounting]<Manager>Expenses
```

To specify a file in another directory (for example, <User>) on the same volume, you must include the directory name; for example

```
<User>Expenses
```

is equivalent to

```
[Accounting]<User>Expenses
```

To specify a file in another volume (for example, [Purchasing]), you must enter the complete file specification:

```
[Purchasing]<User>Expenses
```

It is often convenient to refer to volumes by the device name of the disk drive on which they exist. For example, you can specify any floppy disk inserted in the system's first floppy drive by entering the device name [f0], instead of its individual [volumename].

THE WILD CARD CHARACTER

You can replace the file name or the directory name with an asterisk (*) in the complete file specification. The asterisk is a wild card which represents any character or group of characters. If you specify a wild card in the file name instead of a complete file name, the system expands the wild card into a list of file names which match the remainder of the file specification.

For example, if you enter the file name **E***, the system searches for all files in the current directory beginning with the letter E; if you specify the file name as **E*S**, the system searches for all files in the current directory beginning with E and ending with **S**, and so on.

You can use a question mark (?) as a wild card to represent a single character instead of a string of characters.

For example, if you enter the filename **E?.Lst**, the system searches for the files in the current directory that begin with the letter E, end with the suffix .Lst, and have only one character in between (for example, Ea.Lst, Eb.Lst, etc.).

When you enter a specification containing a wild card in a parameter field, the system replaces it with the list of matching files as soon as you press **RETURN**. Exceptions to this rule are the **Copy**, **Delete**, **Files**, and **Rename** commands, which do not expand the wild card characters until you press GO.

You can use the wild card as a shorthand method for entering long file names. Enter only enough letters to uniquely identify the file, followed by the wild card. For example, if you have a file with the full name Accounting, you can enter Acc* or A*, provided no other files on that directory begin with A or Acc.

The following file specifications suggest some of the ways you can use the wild card character to specify lists of files:

`[volname]<*>*`	specifies all the files in all the directories of the specified volume.

[volname]<*>*	specifies all the files in all the directories on the master workstation's mass storage unit (when entered on a cluster workstation with local files).
*	specifies all the files in the current directory.
<dirname>*	specifies all the files in the specified directory.
<*>filename	specifies all the files with that name in all directories.

If you use the wild card to represent a directory name, the system searches each directory on the volume you specify for the file names you request. For example, if you enter <*>Memo, the system searches all directories for files with the name Memo.

Parameters you enter in a command form can include a file specification with an asterisk (*). For example, you can enter the **Files** command with the following parameters:

Files

[Files list]	Test <*>Wp.Ts Personnel*
[Details?]	Y
[Print file]	

This produces a listing of the contents of the file Test, all files with the name Wp.Ts in all directories, and all files in the current directory with names matching Personnel*.

If you include an asterisk (*) in a file specification that you enter in a parameter field, and then move to another field using the **Up Arrow**, **Down Arrow**, **RETURN** or **NEXT** keys, the Executive automatically expands the asterisk to display the list of files that match.

NOTE

Use extreme caution when specifying wild cards with the **Delete**, **Copy** or **Rename** commands. Refer to section 6 for descriptions of these commands.

FILE PREFIXES AND SUBDIRECTORIES

You can often divide groups of files into categories or subdirectories that have some common feature or point of reference. You can classify these related files by attaching a common prefix, followed by a right angle bracket (>), to the beginning of the file name. For example, the file specifications

```
Personnel>Jones
Personnel>Smith
Expense>Trip
Expense>PettyCash
```

use file prefixes to distinguish between two major groupings, Personnel files and Expense files. You can use another level of file prefixes to further distinguish between individual personnel files, or between expenses for different trips:

```
Personnel>Jones>Appraisal
Personnel>Smith>Appraisal
Expense>10-24-79>Trip
Expense>10-17-79>Trip
Expense>10-17-79>PettyCash
```

If the files in this example are all within the directory <Manager> on the volume [Accounting], their complete file specifications are as follows:

```
[Accounting]<Manager>Personnel>Jones>Appraisal
[Accounting]<Manager>Personnel>Smith>Appraisal
[Accounting]<Manager>Expense>10-24-79>Trip
[Accounting]<Manager>Expense>10-17-79>Trip
[Accounting]<Manager>Expense>10-17-79>PettyCash
```

You can create a default file prefix with the **Set File Prefix** command. Once you create the file prefix, the system automatically adds it to the beginning of each file name. For example, if you add the default file prefix to Expense, entering the file names 10-24-79>Trip, 10-17-79>Trip, and 10-17-79>PettyCash results in all of these files belonging to the Expense subdirectory.

You can organize subdirectory groupings by using multiple file prefixes to provide files from a number of overlapping categories. For example, you can access all trip expenses by using the following file specification:

```
*>Trip
```

If you are currently signed on to the [Accounting]<Manager> directory, this is equivalent to:

```
[Accounting]<Manager>Expense>10-24-79>Trip
[Accounting]<Manager>Expense>10-17-79>Trip
```

Suppose, however, that you want to list all the expenses incurred on a particular date, whether from a trip or petty cash.

Specifying **Expense>10-17-79*** while signed on to [Accounting]<Manager> is equivalent to specifying

```
[Accounting]<Manager>Expense>10-17-79>Trip
[Accounting]<Manager>Expense>10-17-79>PettyCash
```

If you want all files in the Expense accounting subdirectory, you specify **Expense***, which is equivalent to

```
[Accounting]<Manager>Expense>10-24-79>Trip
[Accounting]<Manager>Expense>10-17-79>Trip
[Accounting]<Manager>Expense>10-17-79>PettyCash
```

COMMONLY USED FILE COMMANDS

The Executive provides a set of commands for using the system software, including a number of commands that allow you to create and work with files. This section briefly describes frequently used commands and presents examples of their use in the tutorials at the end. You are encouraged to work through these tutorials to become familiar with these commands. For further details on these and other commands, refer to section 6.

The **Edit** command activates the Editor utility, allowing you to create new files and revise the contents of existing files.

The **Files** command lists the files in a volume or directory you specify, and can provide other information, such as file length, access dates, and protection mode.

The **Type** command displays the contents of a single file, which appears on the display; you can access the entire file one screen at a time.

The **Copy** command makes one or more duplicate copies of a file.

The **Append** command merges one or more files into a single file. The first character of each file you append immediately follows the last character of the preceding file.

The **Rename** command allows you to change the name of a file.

The **Delete** command permanently erases the contents of a file.

The **Maintain File** command verifies file structure and removes malformed records.

The **Debug File** command activates the Debugger utility, which examines and modifies data in files and devices.

The **Dump** command displays the contents of a file in hexadecimal or ASCII characters, and displays the difference between two files.

TUTORIALS ON WORKING WITH FILES

The following tutorials show you how to manipulate files. Procedures covered include:

- Creating a file and displaying its contents
- Copying a file
- Renaming a file
- Deleting a file

Creating a File and Displaying Its Contents

This tutorial shows you one method for creating a file using the Editor. After creating the file, you will use the **Type** command to display the file contents.

1. Enter the **Edit** command; then press **RETURN**. The following display appears:

```
Edit
  File
  [Your name]
```

   The **Edit** utility is prompting you to supply the name of a file to edit or create.

2. Enter the file name **Practice.Txt**; then press **GO**. The screen goes blank for a few seconds; then the following display appears:

```
Editor 9.0  File Position:  0%
```

   In this program, a small square on the screen acts as the cursor. It indicates that the system is ready to accept input and shows you where your input will appear on the screen.

3. Enter the words BURROUGHS MAKES COMPUTING EASY!; then press **FINISH**. The following message appears at the bottom of the screen:

```
Finish
  Save?  :  <>
```

   The program is prompting you to specify whether you want to save the file.

4. Enter the letter **y** for YES, then press **GO**. The screen goes blank for a few seconds; then the Executive command prompt appears. If you need to examine the contents of a file at a later time, you can display a file with the **Type** command.

5. Enter the **Type** command; then press **RETURN**. The following display appears:

```
Type
  File list
  [Confirm each?]
```

   The program is prompting you to supply a file name.

6. Enter the file name **PRACTICE.TXT**; then press **GO**. The following display appears:

```
PRACTICE.TXT:
BURROUGHS MAKES COMPUTING EASY!
TYPED PRACTICE.TXT
```

   You now know how to create a file using the Editor, and how to display the contents of that file using the **Type** command.

The following tutorials show you other ways to manipulate files.

Copying a File

At times you may need to copy files. For example, suppose you create a document named MONTHLY.REPORT that contains all required topic headings and text for your company's monthly reports. In order to prepare the report each month, you need an unmarked copy from which to work. You want to copy MONTHLY.REPORT and rename the copy for the current month (for example, JANUARY84.REPORT). Use the following procedure:

1. Enter the **Copy** command, then press **Return**. The following display appears:

```
Copy
  File from
  File to
  [Overwrite ok?]
  [Confirm each?]
```

   The highlight appears in the File from parameter field.

2. Enter **MONTHLY.REPORT**; then press **RETURN**. The highlight moves to the File to parameter field.

3. Enter **JANUARY84.REPORT**; then press **GO**. The following message appears:

```
Copying MONTHLY.REPORT to JANUARY84.REPORT ...
```

The copy procedure takes a few seconds. When it is completed, the system displays the message:

```
Copying MONTHLY.REPORT to JANUARY84.REPORT ... Done
```

You now have two files with identical contents, MONTHLY.REPORT and JANUARY84.REPORT listed in your directory. Use the **Type** command if you want to display either of these files.

Renaming a File

The previous tutorial showed you how to copy a file to another file with a different name. This tutorial shows you how to rename the original file without producing a copy.

1. Enter the **Rename** command, then press **RETURN**. The following display appears:

```
Rename
  Old file name
  New file name
  [Overwrite ok?]
  [Confirm each?]
```

The highlight appears in the Old file name parameter field.

2. Enter PRACTICE.TXT, then press **RETURN**. The highlight moves to the New file name parameter field.

3. Enter **PRACTICE.MAKESPERFECT**, then press **GO**. After a few seconds, the following message appears:

```
Rename PRACTICE.TXT to PRACTICE.MAKESPERFECT
```

The file Practice.Txt no longer appears in your directory; Practice.Makesperfect has replaced it. You can verify this with the **Files** command.

Deleting a File

Deleting files allows you to use your disk space more efficiently by eliminating old files to make room for new files. Be careful when you delete files; you normally cannot recover information from a file once you delete it.

1. Enter the **Delete** command, then press **RETURN**. The following display appears:

```
Delete
  File list
  [Confirm each?]
```

The highlight appears in the File list parameter field.

2. Enter PRACTICE.MAKESPERFECT, then press **GO**. After a few seconds, the following message appears:

```
PRACTICE.MAKESPERFECT deleted.
```

The file PRACTICE.MAKESPERFECT no longer appears in your directory, and you now have more space on your disk for new files. You can use the **Files** command to verify that the file has been deleted.

SECTION 4
USING THE PRINTER

INTRODUCTION

This section describes the functions of the printer and the commands you use to operate it. Tutorials explain how to print a file, use the Printer Spooler, and initialize the printer. You are encouraged to read and work through these tutorials.

The system can perform direct and spooled printing with parallel (Centronics-compatible) and serial (RS-232C-compatible) printers. Spooled printing allows you to continue using your workstation while a document prints. With direct printing, however, you must wait until printing is completed before you can enter further commands.

DIRECT PRINTING

Direct printing transfers text directly from the file(s) with which you are working to your workstation's parallel or serial printer. The local printer attached to that workstation performs the printing. Unlike spooled printing, the local printer must be available before you can activate direct printing.

You use the **Copy**, **Append** or **Format** command to activate direct printing and specify one of the nonspooled device names listed in table 4-1 as the File destination.

Table 4-1 lists the device names you can use in command fields to display a file at your terminal, or the device name for the type of printer you are using, either direct (nonspooled) or spooled printing.

Direct printing requires a configuration file containing such features as the number of characters per line, baud rate, and line control mode. Your system administrator usually creates the configuration file for your printer. The tutorial at the end of this section explains how to create this file if it does not yet exist.

Table 4-1. Printer Device Names

Nonspooled	Spooled	Description
[Lpt]	[SPL]	Parallel Printer interface.
[Ptr]A		Serial printer (Channel A).
[Ptr]B	[SPLB]	Serial printer (Channel B).
[Vid]		Video display.

SPOOLED PRINTING

The Printer Spooler is a system program that you activate from the Executive. It transfers text from disk files to the printer interface on the workstation where the printer is installed. Spooled printing makes it easier for cluster workstations to share printers and allows concurrent interactive computing and printing. Direct printing requires that you wait until a printer is available before issuing a printing request; spooled printing allows you to issue a request for printing at any time, and then proceed to other activities.

The Queue Manager controls spooled printing. When you request that a file be printed on the spooled printer, the Printer Spooler enters the file name into a queue containing files that are currently printing or waiting to be printed.

When a printer becomes available, the Queue Manager selects the next file from the queue and assigns it to the available printer. This file is then printed.

The scheduling queue is a disk-based, priority-ordered set of specifications for files to be printed. It also contains information which controls the printing (such as the type of form to be used). Since the queue is disk-based, powering down your system will not delete information in the queue. When the spooler is reactivated, printing will continue where it left off.

TUTORIAL ON PRINTING A FILE

This tutorial provides a step-by-step procedure for printing a file. Direct printing uses the **Copy**, **Append**, or **Format** command. Spooled printing requires either the **Format** or **Print** command or the **Print Files** subcommand of the Spooler utility. This section includes a separate discussion of the **Print Files** subcommand for the Spooler utility.

Direct Printing

You can specify direct printing with any of the following commands:

- **Copy**
- **Append**
- **Format**

Copy Command

The **Copy** command duplicates the contents of one file to another file. By specifying the printer in the File to parameter field, you can use this command for direct printing. Use the following procedure:

1. Enter the **Copy** command, then press **RETURN**. The following display appears:

```
Copy
  File from
  File to
  [Overwrite OK?]
  [Confirm each?]
```

2. The highlight appears in the File from parameter field. Enter the name of the file you want to print, then press **RETURN**. The highlight moves to the File to field.

3. Enter **[LPT]** in this field, then press **RETURN**. The system sends a copy of the specified file to your printer.

4. Press **RETURN** twice to accept the default values for the optional parameters [Overwrite OK?] and [Confirm each?]. Press **GO** to execute the printing request.

Append Command

The **Append** command copies each file you specify in the File list from parameter field to the file you specify in the File to parameter field. The first character of each appended file immediately follows the last character of the preceding file. With direct printing, the system sends a copy of the desired file to your printer.

1. Enter the **Append** command ; then press **RETURN**. The following display appears:

```
Append
  File list from
  File to
  [Confirm each?]
```

2. The highlight appears in the File list from parameter field. Specify the name of the file you want to print, and then press **RETURN**. The highlight moves to the File to field.

3. Enter [LPT], then press **RETURN**. The system sends the file to your printer.

4. The highlight moves to the [Confirm each] parameter field. Press **RETURN** once if you want to accept the default (NO); otherwise, if you specify YES, the system prompts you for confirmation before printing each specified file. Press **GO** to confirm printing, **CANCEL** to skip a file, or **FINISH** to stop printing.

Format Command

The **Format** command formats the text in one or more files of a paginated document you print using either direct or spooled printing.

1. Enter **Format**; then press **RETURN**. The following display appears:

```
Format
  File list
  [Print to]
  [Confirm each?]
  [Title]
  [First page to format]
  [Last page to format]
  [Suppress page numbers?]
  [Suppress date?]
  [Suppress time?]
  [Double-space?]
  [Left margin (default 10 spaces)]
  [Text width (default 65 spaces)]
  [Page length (default 66 lines)]
  [Top margin (default 6 lines)]
  [Bottom margin (default 6 lines)]
  [Tab width (default 8 spaces)]
  [Suppress page ejects between files?]
```

2. The File list parameter field is highlighed. Enter the file name(s) you want to print, then press **RETURN**. The highlight moves to the [Print to] parameter field.

3. Enter the name of the printer ([PTR]A, [PTR]B, or [LPT]) enclosed in brackets for direct printing, then press **RETURN**.

4. The remaining parameters are optional. If you want to change the default value for any of them, press **RETURN** until the highlight moves to the parameter you want to change; then make your entry. (Refer to section 6 for more information on **Format** command fields.)

5. Press **GO** to execute the print request, **CANCEL** to deny, or **FINISH** to exit.

Spooled Printing

You can use the following commands to print your file on the spooled printer:

- **Format**
- **Print**

You use the **Spooler Status** command to determine the status of files in the print queue and to control the spooler; see **Spooler Utility** later in this section.

Format Command

Refer to the discussion of the **Format** command in **Direct Printing** earlier in this section. The procedure for using the **Format** command in spooled printing is the same as for direct printing (with the exception of step 3):

1-2. Same as the **Format** command in the direct printing tutorials.

3. In the [Print to] parameter field, enter the name of a scheduling queue enclosed in brackets. The name must match a queue name defined for the system.

4-5. Same as the **Format** command in the direct printing tutorial.

Format does not create a copy of your file; rather it queues the actual file for spooled printing. Therefore, do not delete or modify the file until the system finishes printing it.

Print Command

The **Print** command adds a file to the scheduling queue for spooled printing. **Print** does not create a copy of your file. Therefore, do not delete or modify the file until the system finishes printing it.

1. Enter the **Print** command, then press **RETURN**. The following display appears:

```
Print
  File list
  [Queue name (default = SPL)]
  [Number of copies]
  [Delete after printing?]
  [Special forms name]
  [Print wheel name]
  [Printing mode]
  [Align form?]
  [After date/time]
  [Security mode?]
  [Priority]
  [Confirm each?]
```

2. The File list parameter field is highlighted. Enter the name(s) of the files you want to print, and then press **RETURN**.

3. The remaining parameters are optional. If you do not want to accept the default value for any of them, press **RETURN** until you highlight the parameter you want to change; then make your entry. (Refer to section 6 for details on the **Print** command fields.)

4. Press **GO** to execute the print request, **CANCEL** to deny, or **FINISH** to exit.

SPOOLER UTILITY

The Spooler utility provides another method of printing a file and controlling the printer.

Main Spooler Status Display

The **Spooler Status** command activates the Spooler utility. When you enter the command, the system displays a brief status of every printer in the system (both standalone and cluster). The following example shows the Main Spooler Status Display:

```
Spooler X.XX                          User Name:  Joe
Path:  [Win] <Sys>                    Tues Nov 10, 1981 10:00 AM

Printer Name      Queue Name      Status

Parallel          Spl             Printing
                                  [Win]<Sys>New.Txt
Serial 1          SPLB            Paused
                                  Please change print wheel to A
                                  [Win2]<Current>Aws.Doc
Serial 2          SPLB            Paused
                                  Please enter the appropriate
                                  password
                                  [Win]<Private>Letter

Commands          <To invoke a command, enter the character shown.
                  To exit the program, press FINISH.>

N - New printer        Q - Select Queue        S - Select Printer
```

The example shows the status of the printers and their associated queues on Spooler X.XX. The Spooler controls three printers: one parallel printer and two serial printers. The display shows the queue corresponding to each printer and the current activity of each one. In this example, the parallel printer is printing a file, while both serial printers are indicating actions you must take in order to start printing. For Serial 1, the print wheel needs to be changed; Serial 2 is in security mode, and you must enter a password before printing will begin.

After checking the status of system printers and queues, you can choose a printer or queue by selecting one of the following three subcommands appearing at the bottom of the Main Spooler Status Display:

N **New Printer** places a specified printer under control of the Printer Spooler.

Q **Select Queue** displays detailed status information for the specified scheduling queue.

S **Select Printer** displays detailed status information for the specified printer and its associated scheduling queue.

Specifying a Printer

The **New Printer** subcommand (N) places a specified printer under control of the Printer Spooler, then redisplays the Main Spooler Status Display. When you enter **N**, the following command form appears:

```
New Printer
  Printer channel                  _____
  Printer name                     _____
  Queue name                       _____
  Printer configuration file       _____
  [Priority]                       _____
  [Suppress banner?]               _____

     Press GO to execute, CANCEL to deny, or FINISH to exit.
```

Parameters include the name of the printer and its associated scheduling queue, the printer configuration file, and the priority of the files to be printed. N also provides an option to suppress the banner page. Your system administrator provides the printer and queue names.

Checking the Queue Status

The **Select Queue** subcommand (**Q**) displays a detailed status of the files listed in the specified scheduling queue. When you enter **Q**, the following command form appears:

```
Select Queue
  Queue name                       _____

     Press GO to execute, CANCEL to deny, or FINISH to exit.
```

Enter the name of the scheduling queue for which you want to display status information, then press **GO**.

The following example shows the detailed status display of the files listed in the SPLB queue:

```
Spooler X.XX                                User Name:  Joe
Path:  [Win]<Sys>                           Tues Nov 10, 1981 10:00 AM

Queue:            SPLB
Served by:  Serial 1, Serial 2
Files Queued                                Priority
[Win]<Sys>Aws.Doc                              2
[Win]<Joe>A                                    2
[Win2]<File>File                               3
[Win1]<Sys>SplDoc                              4
[Win1]<Sys>SplDoc                              4
[Win1]<Mary>Memorandum101                      5
[Win2]<Frank>SalesOrder                        5

Press NEXT PAGE to continue, or CANCEL to stop listing

Commands:  <To invoke a command, enter the character shown.
           To exit the program, press FINISH.>

D - Delete print request                Q - Select queue
M - Main status display                 S - Select printer
P - Print file
```

After checking the queue status, you can choose from a list of five subcommands:

D **Delete Print Request**

M **Main Status Display**

P **Print File**

Q **Select Queue**

S **Select Printer**

Execution of the **Delete Print Request** or **Print File** subcommands restores the Main Spooler Status Display.

Checking the Status of a Printer

The **Select Printer** subcommand (**S**) displays detailed status information for the specified printer and the files listed in its associated scheduling queue. When you enter **S**, the following command form appears:

```
Select Printer
  Printer name _____________________________

     Press GO to execute, CANCEL to deny, or FINISH to exit.
```

Enter the name of the printer for which status information is to be displayed, then press **GO**.

The following example shows the printer and scheduling queue status after you enter the **Select Printer** subcommand:

```
Spooler X.XX                          User Name:  Joe
Path:  [Win]<Sys>                     Tues Nov 10, 1981 10:00 AM

Printer:                              Serial 2
Status:                               Paused
                                      Please change print wheel to A
                                      [Win]<Sys>Aws.Doc
Printer Description:                  SerialB, Standard print wheel,
                                      standard forms
Configuration File:                   [Sys]<Sys>SplBConfig.Sys
Location:                             Cluster workstation

Queue:                                SPLB
Served by:                            Serial 1, Serial 2
Files Queued                          Priority
[Win]<Sys>Aws.Doc                        2
[Win]<Joe>A                              2
[Win2]<File>File                         3
[Win1]<Sys>SplDoc                        4
[Win1]<Sys>SplDoc                        4
[Win1]<Mary>Memorandum101                5
[Win2]<Frank>SalesOrder                  5

Press NEXT PAGE to continue, or CANCEL to stop listing

Commands:  <To invoke a command, enter the character shown.
           To exit the program, press FINISH.>

A - Align Form          F - Free Printer Channel     N - New Printer
C - Cancel Print        H - Halt Printer             P - Print File
D - Delete Print        M - Main Status Display      Q - Select Queue
    Request                                          R - Restart Printer
E - Enter Password                                   S - Select Printer
```

After checking the printer status, you can choose from a list of subcommands that control the printer and queue.

Subcommands to Control Printing

The **Spooler Status** command has a number of subcommands that control the operation and output of a printer. A brief description of each subcommand follows. (Refer to the **Spooler Status** command description in section 6, and the example in the tutorial for further details on the subcommands.)

Use the **Print Files** subcommand (**P**) to generate an entry on the scheduling queue for printing a specified list of files. Enter a file list along with other optional parameters, such as the number of copies to be printed, any special forms name, the print wheel name, printing mode (image, binary, or normal), the option to delete the file after printing, the option to align the form manually, the date and time after which the files can be printed, a password, a priority location on the scheduling queue, and an option to confirm each file before printing.

The **Cancel Print** subcommand (**C**) cancels the current printing request. A brief delay may occur before the printer stops.

The **Delete Print** Request subcommand (**D**) deletes the specified queue entry from the scheduling queue.

The **Halt Printer** subcommand (**H**) stops the printer. A brief delay may occur before the printer stops.

The **Restart Printer** subcommand (**R**) restarts the printer after it pauses.

The **Enter Password** subcommand (**E**) allows you to enter a password when the printer pauses in response to a security mode request given in the **Print** or **Spooler Status** commands. The file is not printed until you enter the password at the workstation connected to the printer.

Use the **Align Form** subcommand (**A**) after the printer pauses and you align the forms manually. This causes the printer to reprint the first page. The printer will pause again, allowing you to realign the form, if necessary.

The **Free Printer Channel** subcommand (**F**) frees a printer channel from the Printer Spooler's control. Use this subcommand to change the existing configuration to install a new printer, or to release RS 232 channel B for data communications operation.

Banner Page

The Printer Spooler continuously transfers text from disk files to printers, resulting in a single stack of paper that consists of text from many disk files. To indicate the beginning of each file, the Printer Spooler can print a distinctive banner page which identifies the file being printed. To specify whether the banner page is to be printed, enter a parameter in the Spooler Configuration file (refer to the tutorial on configuring the printer) or in the **Printer Spooler** subcommands (refer to the following tutorial).

Password Protection Files

The **Format**, **Print**, and **Spooler Status** commands expand a file specification, but do not append the Signon password before sending the file to the Queue Manager. To permit the Printer Spooler to read a protected file, you must either specify security mode or add an on-line password to the file specification. (Refer to section 5 for further information on the use of passwords and protection levels.)

Manual Intervention

A printer under control of the Printer Spooler can require manual intervention, either intentional or unintentional. Intentional intervention includes forms change, print wheel change, and generic printer pause. Unintentional intervention includes out-of-paper, off-line, and paper-jam conditions. Whenever a printer requires manual intervention, use the **Spooler Status** command to determine the cause. You can enter the **Spooler Status** command from any workstation in a cluster configuration. After you determine the cause of printer stoppage and correct it, restart printing by entering the **Restart Printer** subcommand.

You can control the Printer Spooler by embedding special character sequences, known as Printer Spooler escape sequences, which can cause intentional manual intervention, override the Printer Spooler page count, or switch to 132-column printing. Refer to the *B 20 Systems Custom Installation and Reference Manual* for more details on escape sequences.

Printing Modes

Any of three printing modes (normal, image, or binary) can be specified with the **Format**, **Print**, or **Spooler Status** commands. Normal mode prints the banner page, converts tabs into spaces, converts end-of-line characters into device-dependent codes, and recognizes the escape sequences for manual intervention. Image mode prints the banner page and recognizes the escape sequences, but performs no code conversion. Binary mode neither prints the banner page nor recognizes the escape sequences; instead it prints the contents of the file exactly as it appears.

TUTORIAL ON USING THE PRINTER SPOOLER

This tutorial shows you how to control the Printer Spooler by using the **Spooler Status** command. **Spooler Status** displays the status of printers and printer scheduling queues, and provides a variety of subcommands with which you can control the printing of your files. The subcommands are as follows:

A - Align Form
C - Cancel Print
D - Delete Print Request
E - Enter Password
F - Free Printer Channel
H - Halt Printer
M - Main Status Display
N - New Printer
P - Print File
Q - Select Queue
R - Restart Printer
S - Select Printer

(These subcommands are defined earlier in this section; more details on their characteristics appear in section 6.)

The following example gives the procedure for using the **Print Files** subcommand; other subcommands are similar.

1. Enter the **Spooler Status** command to access the spooler utility. The Main Spooler Status Display appears on your screen:

```
Spooler X.XX                                  User Name:  Joe
Path:  [Win]<Sys>                             Tues Nov 10, 1981 10:00 AM

Printer Name        Queue Name      Status

Parallel            Spl             Printing
                                    [Win]<Sys>New.Txt
Serial 1            SPLB            Paused
                                    Please change print wheel to A
                                    [Win2]<Current>Aws.Doc
Serial 2            SPLB            Paused
                                    Please enter the appropriate
                                    password
                                    [Win]<Private>Letter

Commands        <To invoke a command, enter the character shown.
                To exit the program, press FINISH.>

N - New printer      Q - Select Queue      S - Select printer
```

2. Select a printer and enter **S** for the **Select Printer** subcommand; the following display appears:

```
Select Printer
     Printer name

Press GO to execute, CANCEL to deny, or FINISH to exit.
```

3. The Printer name field is highlighted. Enter the name of your printer (for example, Serial 2) then press GO. For the purposes of this example, assume that the files queued actually exist. The following display then appears:

```
Spooler X.XX                                User Name:  Joe
Path:  [Win]<Sys>                           Tues Nov 10, 1981 10:00 AM

Printer:                                    Serial 2
Status:                                     Paused
                                            Please change print wheel to A
                                            [Win]<Sys>Aws.Doc
Printer Description:                        SerialB, Standard print wheel,
                                            standard forms
Configuration File:                         [Sys]<Sys>SplBConfig.Sys
Location:                                   Cluster workstation

Queue:                                      SPLB
Served by:                                  Serial 1, Serial 2
Files Queued                                Priority
[Win]<Sys>Aws.Doc                              2
[Win]<Joe>A                                    2
[Win2]<File>File                               3
[Win1]<Sys>SplDoc                              4
[Win1]<Sys>SplDoc                              4
[Win1]<Mary>Memorandum101                      5
[Win2]<Frank>SalesOrder                        5

Press NEXT PAGE to continue, or CANCEL to stop listing.

Commands:  To invoke a command, enter the character shown.
           To exit the program, press FINISH.

A - Align Form          F - Free Printer        N - New Printer
C - Cancel Print            Channel             P - Print File
D - Delete Print        H - Halt Printer        Q - Select Queue
    Request             M - Main Status         R - Restart Printer
E - Enter Password          Display             S - Select Printer
```

4. A wide choice of subcommands are available. Choose one to either redisplay the Main Spooler Status Display, select a different printer, select a queue, etc. (Refer to the previous discussion on subcommands for more details.) If you want to print a file, enter **P**; the following display appears:

```
Print Files
      File list
      [Number of copies]
      [Delete after printing?]
      [Special Forms Name]
      [Print wheel name]
      [Printing mode]
      [Align form?]
      [After date time]
      [Security mode?]
      [Priority]
      [Confirm each?]
```

5. The File list parameter field is highlighted; enter the name of the file(s) you want to print, then press **RETURN**.

6. The remaining parameter fields are optional. If you want to change the default value, press **RETURN** until the highlight moves to the parameter you want to change, then enter the new parameter. (Refer to section 6 for details on **Print Files** command fields.)

7. Press **GO** to execute the print request, **CANCEL** to deny, or **FINISH** to exit.

CONFIGURING THE SYSTEM FOR YOUR PRINTER

To install a new printer on the system, you must create a Device Configuration file for that printer. This file defines such characteristics as the printer's baud rate, line control mode, and the number of characters per line. The system provides a Default Configuration file for spooled printers, serial printers, and parallel printers, but if you change any printer characteristics, you must create a new configuration file. Figure 4-2 lists the Default Configuration files for each device, and figure 4-3 shows the Default Configuration file characteristics.

For more details on changing configuration file characteristics, refer to the *B 20 Systems Custom Installation and Reference Manual*.

Device Specification	Default Configuration File Specification
[Comm]A	[Sys]<Sys>CommAConfig.Sys
[Comm]B	[Sys]<Sys>CommBConfig.Sys
[Spl]	[Sys]<Sys>SplConfig.Sys
[SplB]	[Sys]<Sys>SplBConfig.Sys
[Ptr]A	[Sys]<Sys>PrtAConfig.Sys
[Ptr]B	[Sys]<Sys>PrtBConfig.Sys
[Lpt]	[Sys]<Sys>LptConfig.Sys

Figure 4-2. Default Configuration Files

	Device Specification		
Characteristics	[Comm]A/B	[SplB] [Lpt]	[Ptr]A/B
Data bits	7	na	7
Parity	0	na	even
Baud rate	9600	na	1200
Stop bits	1	na	1
Transmit time out		no time out	
Receive time out	no time out	na	na
CR/LF mapping mode	new line	na	na
New line mapping mode		B 20 RETURN (0Ah) to ASCII CR/LF	
Line control mode	XON/XOFF	na	XON/XOFF
EOF byte	04 (EOT)	na	na
Expand tab size	na	8	8
Number of characters per line	na	132	132
ACK delay	na	0	na

na = not applicable

Figure 4-3. Characteristics of Default Configuration Files

TUTORIAL ON CONFIGURING YOUR PRINTER

The following tutorial shows you how to create a configuration file to initialize a new printer and to print files on it.

1. Enter the **Create Configuration File** command, then press **RETURN**. The following display appears:

   Create Configuration File
   Configuration file name
   Device type (comm, parallel lpt, or serial ptr)

2. The Configuration file name parameter field is highlighted. Specify a name for the configuration file. Enter one of the default configuration file names given in figure 4-2, according to the type of printer you are using. For example, if you are using a serial printer, enter **[Sys]<Sys>SplBConfig.Sys**, then press **RETURN**. The highlight moves to the Device type field.

3. Enter either C for data communications, P for parallel printer, or S for serial printer. For example, if you are using a serial printer, enter S then press **GO**. The following subcommand form appears on the display:

```
Serial Line Printer Parameters
 [Data bits (5, 6, 7, or 8; default = 7)]
 [Parity (none, even, odd, 0, or 1; default = 0)]
 [Baud rate (up to 19200; default = 9600)]
 [Stop bits (1 or 2; default = 1)]
 [Transmit time out (number of seconds; default = no time out)]
 [New line mapping mode (binary, CR, or CR/LF; default = CR/LF)]
 [Line control (none, XON/XOFF, CTS, or both; default = XON/XOFF)]
 [Tab expansion size (default = 8)]
 [Number of characters per line (default = 132)]
 [Translation file (default = none)]
```

4. Press GO, since you are using the default parameters. Your printer is now configured and ready for use. (Refer to the B 20 Systems Custom Installation and Reference Manual if you want to change any of the parameters.)

Section 6 describes the subcommand forms for data communications and parallel printers in the **Create Configuration File** command subsection.

SECTION 5
ESTABLISHING SECURITY PROCEDURES

INTRODUCTION

You may be concerned about protecting your files against unauthorized or unintentional reading, or other users changing your data. To prevent such occurrences, two file protection specifications exist which, when used together, provide full security to your file: a file or directory password, and a file protection level. These security precautions can be important if your workstation shares common resources, such as a hard disk, with other workstations.

INSTALLING PASSWORDS

To gain access to a file, you must enter your user name and the correct password during the Signon procedure. When selecting a password, try to use a word that is easy to remember, unique to your system, and not obvious. Using your first or last name as a password does not provide much protection against unwanted intrusions. After entering the password, press GO; the system attempts to open the file for reading. If the file does not exist, or if a user supplies an improper password, the system displays an error message and requests a valid user name and password.

A valid password is a string of up to 12 characters; it can include any alphanumeric characters, periods (.), and/or hyphens (-). You can enter passwords as part of a volume, directory or file name using the caret (^). If the specified name includes a caret, then the characters between the caret and the end of the parameter make up the password. When you sign on to the system, each character of the password is echoed as a pound sign (#) on the display to ensure confidentiality.

Password protection is available at three levels: volume, directory, and file.

You must enter the volume password, which is assigned by the system administrator, when you initialize the volume using the **IVolume** command, or after initialization using the **Change Volume Name** command. The volume password protects the entire disk, or volume of data and programs. When you enter the correct volume password, you can gain access to all directories and files contained in the specified volume.

The directory password is specified when you create the directory using the **Create Directory** command. By entering the correct directory password, you can gain access to all files contained in the specified directory.

The file password is established when you create the file or use the **Set Protection** command. When you enter a correct file password, you can gain access only to the file specified. You can access a file if you know its volume, directory, or file password.

FILE AND DIRECTORY PROTECTION LEVELS

The protection level that you specify for a particular file controls the access that other users have to your files. This protection level limits access when others do not present a valid volume or directory password.

A default file protection level is automatically specified for the files of a directory when you enter the **Create Directory** command. The new file assumes the default file protection level of that directory.

With the **Set Protection** command, you can change the file protection level and, optionally, the file password to each file listed.

While eight file protection levels exist, you generally will use only three: the unprotected level, the modify password level, and the access password level. The unprotected level allows all users to have unlimited file access. A file in the unprotected level requires no password to read or modify the file. A file in the modify password level requires you to provide a password to change the file; no password is required to read the file. A file in the access password level requires a password to either read or modify the file. Table 5-1 presents the file protection levels, along with their decimal representation, used to define the protection level in the **Set Protection** command.

You must use your file protection level in conjunction with your password protection to provide full security. For example, you may use an appropriate file protection level to specify that your files cannot be changed; however, unless a password is also protecting your files, an unauthorized person could change the file protection level, then change your file.

TUTORIALS ON ESTABLISHING SECURITY

These tutorials tell you how to maintain control over access to your system; they only apply if your system includes a hard disk.

Security procedures for systems with floppy disks only, are much simpler. Keep your floppy disks in a safe place when you are not using them, and only distribute the disks to authorized people.

The procedures covered in this section include the following:

- Installing passwords
- Setting file and directory protection levels
- Protecting dangerous commands

Installing Passwords

Password protection is available at three levels: volume passwords, directory passwords, and file passwords. These three levels are discussed briefly in the introductory section of this chapter.

Volume Passwords

1) To install a volume password, enter **C V N** (an acronym for the **Change Volume Name** command); then press **RETURN**.

NOTE

You can execute any command by entering just enough letters to uniquely identify it. For example, to execute the **Create Configuration File** command, you need only enter **C C F** to identify it sufficiently.

The following display appears:

```
Change Volume Name
  Device name
  [Device password]
  [Old volume password]
  New volume name
  [New volume password]
```

2) The Device name field is highlighted. Enter **f0**; then press **RETURN** three times (ignore the [Device password] and [Old volume password] parameters). The highlight moves to the New volume name field.

3) Enter either the current volume name or a new volume name. You must make an entry in this field. Then press **RETURN**.

4) Now the [New Volume password] field is highlighted. Enter a password; then press GO. Be sure to remember your volume password. If your System administrator has created a volume password, you need to enter it into the Signon command form every time you use your workstation. For example, the following Signon command form has been filled out correctly to log into a directory named "Accounting" using the password "arrow" at 2:47 PM on Tuesday April 3, 1986.

Signon 4.0

BURROUGHS B-20 OPERATING SYSTEM BTOS 4.0

User Name	Enter an application name or leave this line blank to display a command form.
Password	Enter your assigned password (optional).
Day/Date/ Time	Enter the current day, date, and time (if not already set).

User Name accounting
Password arrow
Date/Time (e.g., Fri Sep 9, 1983 8:00 AM) Tue 4/24/84 2:47 PM

Then press the GO key.

Directory Passwords

1) To install a directory password, type C D (for **Create Directory**); then press **RETURN.** The **Create Directory** command form appears on the display:

Create Directory
New directory name
Default protection level (default 15)
[Maximum number of files (default 45)]
[Password for new directory]
[Volume password]

2) The New directory name field is highlighted. To create a new directory, enter a name, and press **RETURN.** The highlight moves to the Default protection level field.

3) Enter the appropriate numerical code for the protection level you want to assign to the directory. (A complete table of available protection levels and their numerical codes are listed in table 5-1.) Press **RETURN.** The highlight moves to the [Maximum number of Files] field.

Authorization to read and/or modify a file requiring a volume or directory password (such as modify protected, access protected, and read password) is restricted to a system administrator or directory manager.

Table 5-1. File and Directory Protection Levels

File Protection Levels			
Level	Password required to read	Password required to modify	Numerical code
Unprotected	none	none	15
Modify Password	none	volume directory or file	7
Access Password	volume, directory or file	volume directory or file	3
Nondirectory Modify Password	none	volume or file	23
Nondirectory Access Password	volume or directory	volume or file	19
Directory Protection Levels			
Level	Password required to read	Password required to modify	Numerical code
Modify Protected	none	volume or directory	5
Access Protected	volume or directory	volume or directory	0
Read Password	volume or directory	volume or directory	1

4) Enter the maximum number of files you want to allow in the directory, and then press **RETURN**. The highlight moves to the [Password for new directory] parameter field.

   The default value of 45 is recommended. Fewer files may result in an unwieldy number of directories; you will not be able to remember which directory contains the file you need. More files per directory make it difficult to look through a listing when trying to locate the file you need.

5) Enter the password for the new directory; then press **GO**. Future access to your new directory is now limited to those who know the directory password.

File Passwords

1) To install a file password, type **S P** (for **Set Protection**), then press **RETURN**. The following display appears:

```
Set Protection
  File list
  New Protection Level (e.g., 15)
  [New password]
  [Confirm each?]
```

2) Fill out the command form to your specifications. The following example is correct for a list of all files beginning with the letter A, a protection level of 3, and the password "Alphafiles."

```
Set Protection
  File list  A*
  New Protection Level (e.g., 15) 3
  [New password]    Alphafiles
  [Confirm each?]
```

3) Press **GO**; all files beginning with the letter A can be accessed with the password Alphafiles.

Protecting Potentially Harmful Commands

You may not want everyone who uses your workstation to have access to all the available commands. For example, you may not want to permit access to the **IVolume** command because it erases all information stored on a disk. The following procedure explains how to limit access to **IVolume**. You can use this general procedure to protect many commands.

1) Enter S P (for **Set Protection**), then press **RETURN**. The following display appears:

```
Set Protection
  File list
  New Protection Level (e.g., 15)
  [New password]
  [Confirm each?]
```

2) The File list field is highlighted. Enter **[Sys]<sys>IVolume.run**, then press **RETURN**. The highlight moves to the New Protection Level field. (IVolume.run is the name of the file that tells the workstation how to initialize a volume.) By assigning a protection level and password to this file, you can control who uses the **IVolume** command.

NOTE

You can use this procedure to protect any command that has a ".run" file extension listed in the system directory. To obtain a listing of commands that can be protected, enter the **Files** command and specify [Sys]<sys>*run for the File list.

3) Enter 0, then press **GO**. Level 0 ensures that other users must enter a specified password in order to access the **IVolume** command.

NOTE

If you want to change the password, press **RETURN** after entering the protection level. Enter the new password name in the [New Password] parameter field; then press **GO**.

SECTION 6
COMMANDS

INTRODUCTION

The B 20 Executive provides a powerful set of commands with which you can control the B 20 system software. The first section of this chapter defines the parameters you can use in the command form. The second section introduces the general command categories and provides a short description of the function each command performs. The final section is an annotated alphabetical list of commands, which displays the command form, defines fields, gives a brief example and, when appropriate, provides further remarks or references to additional documentation.

NOTE

Appendix C includes a listing of all B 20 commands.

Simple Parameters in Comand Form

A command form has fields which take parameters. Frequently-used parameters include file, directory or volume names, passwords, numeric values, or the letter y or n (Yes or No). However, a parameter can be any string of characters in a set of upper- and lower case letters, digits, and the following additional characters:

```
!"#$%>()*+,-./:;<=>?@
    _\}|{~
```

For example, Myfile is an acceptable parameter, as well as the string "$:009". The field definitions for each command specify the appropriate parameters.

You can include spaces in a parameter if they are enclosed in single quotes ('...'). For example, a file named Expense Account must be typed 'Expense Account'. If you want to include a single quote (') within a quoted simple parameter, then you must type it twice. For example, a file named Jim's file must be typed, 'Jim''s file'.

It is possible to include any character, including the special characters **DELETE**, **BACKSPACE**, etc., in a simple parameter by typing \ and then the character. When you enter the character, it overwrites the \ on the display.

NOTE

Command fields enclosed in brackets are optional. You do not need to specify a parameter(s).

Parameter Lists

Some command fields accept a list of parameters (that is, a list of file names) as well as a single parameter. Spaces separate the parameters in a list.

For example, the **Append** command accepts either a single parameter or a list in its File list from field, as in the following examples:

```
Append
  File list from        Detail
  File to               Master
  [Confirm each?]
```

```
Append
  File list from        Detail Detail2 Detail3
  File to               Master
  [Confirm each?]
```

The first invocation appends a single file named Detail to the file Master. The second invocation appends, in turn, each file (Detail, Detail2, Detail3) to the file Master.

Using Files as Parameters

Occasionally you may need to enter a parameter that does not fit into its command form, or one that you use frequently (such as a list of files to be backed up regularly). You can handle both cases by specifying a simple parameter to replace the contents of a file. The file itself must contain a simple parameter or a list of simple parameters. The file length is not limited. If a parameter begins with the character "@", the remaining characters are the file specification. The specified file's contents replaces the parameter.

For example, suppose that the file Printall in the currently signed on volume and directory contains the following parameter list:

```
Chapter1
Chapter2
Chapter3
Appendix
```

Entering the **Append** command with the following parameters copies the Printall files in the specified order into the file named Proof:

```
Append
  File list from        @Printall
  File to               Proof
  [Confirm each?]
```

Each command listed in this section may not be available on all B 20 systems. Pressing the **HELP** key displays a complete list of the commands available to your system.

OVERVIEW OF B 20 COMMANDS

Signing On and Off the B 20 System

You gain access to the facilities of the B 20 Operating System with the Signon form. Use **Logon** or **Path** to change the volume and directory, **Logout** to sign off the system, and **Set Time** to set the system clock.

File Directory and Management

A number of commands allow you to examine the status of files and volumes. **Volume Status** displays information about a given disk volume, such as the date the volume was created, the last modification date, number of free pages, number of free file headers, and a list of directories.

Files provides a list of file names plus other information, such as file length, access dates, and protection mode of each file in a specified list of files. **Type** displays the contents of a single file, one screen at a time.

The **Set File Prefix** command defines a subdirectory by establishing the default file prefix which you add to the file specifications when omitting the volume and directory names. **Set Protection** specifies the access allowed to a file when you do not present a valid volume or directory password.

Create Directory sets up a new directory on a disk volume. **Remove Directory** removes an empty directory from a disk volume.

File Manipulation

Copy makes one or more duplicate copies of a file. You can join one or more files into a single file with the **Append** command, rename a file with the **Rename** command, and erase the contents of files with the **Delete** command.

Volume Initialization

IVolume formats a floppy or Winchester disk for use as a B 20 volume. The **IVolume Archive** command used in conjunction with the **IVolume** command performs the same function for an archive volume. You can change the name and password of a volume with the **Change Volume Name** command.

Backup and Restore

You can copy an entire volume to an archive file with the **Backup Volume** command, and individual files or directories with the **Selective Backup** command. Use the **Restore** command to restore volumes, directories, and files onto a volume from an archive file. **Floppy Copy** duplicates the contents of a disk to one or more floppy disks.

Printing

The **Format** command formats and, (if you wish) prints a file by direct or spooled printing. You also can use the **Copy** command for direct printing. The **Print** command is for spooled printing alone. The **Spooler Status** command displays the status of the printers and scheduling queues. **Spooler Status** also provides subcommands for adding and deleting a queue entry, cancelling printing, pausing and restarting a printer, changing a printer spooler configuration, entering form alignment mode, and entering a password.

Command Management

You can add or modify commands by entering **New Command** and remove them from the B 20 Executive with **Remove Command** command.

To simplify complex or repetitive command sequences, you can define a sequence of command invocations, save it in a file, and activate it as a single operation with the **Record** command. To leave recording mode, use the **Stop Record** command. You can have these complex command sequences resubmitted for repetitive execution with the **Submit** command. In addition, the **Run File** command activates a user program by specifying the name of its run file.

Configuration

The **Create Configuration File** command creates a configuration file to which characteristics for configuring (initializing) a device are written. Four device types can be configured: communications lines, spooled printers, serial printers, and parallel printers.

The **Screen Setup** command changes one or more of the display attributes.

Cluster Management

The **Cluster Status** command reports the status of cluster system activity for a specified communications line.

Error Checking and File Maintenance

The **Debug File** command examines and modifies the data in files and devices. In addition, the B 20 provides two utilities which you can use to identify and recover from certain file system errors. **Dump** displays the contents of a file, including all control characters, in either ASCII or hexadecimal, or it compares two files. These features can be useful in looking for extraneous characters which are causing unexpected file behavior. **Maintain File** verifies the file structure of RSAM, DAM, or ISAM files, and removes malformed records.

The **Plog** command lists the content of the log file. The log always appears on the display and may optionally be printed or written to another file.

Miscellaneous

The **Diagnostic** command loads a specified diagnostic.

The **Sort** command sorts one or more Standard Access Method files of data records.

ALPHABETICAL ANNOTATED LIST OF COMMANDS

Append

The **Append** command copies each of the "File list from" files to the "File to" file. The first character of each appended file immediately follows the last character of the preceding file. It creates no artificial gaps.

Command Form

```
Append
  File list from      _____________________
  File to             _____________________
  [Confirm each?]     _____________________
```

Parameters

File list from

specifies the list of files you want to append. You can use the wild card character (*) in this field.

File to

specifies the appended file. The system creates the "File to" file if it does not exist. You also can enter a device specification in this parameter field (for example, [vid] or [lpt]), thereby displaying or printing the files in "File list from".

[Confirm each?]

If you enter **y** for YES, a prompt for confirmation of each file to be appended appears each time you press **GO**. Skip to the next file in "File list from" by pressing **CANCEL**, and stop appending files by pressing **FINISH**.

If you enter the letter **n** for No or accept the default by leaving the field blank, the system does not prompt for confirmation.

Example

```
Append
  File list from      Customers Suppliers Agents
  File to             Accounting
  [Confirm each?]
```

This example illustrates that 3 separate files-"Customers" "Suppliers" and "Agents"-join into a single file, "Accounting." Note that "Accounting" need not be a previously-existing file.

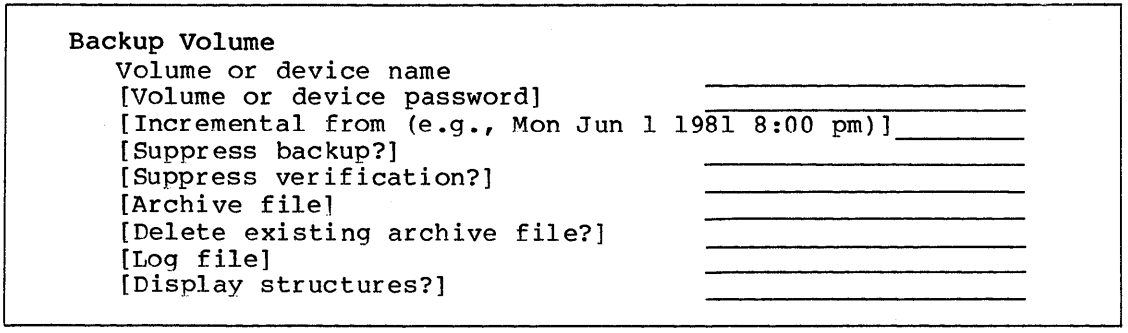
The **Append** command allows you to maintain separate files for certain classes of information, then to join these files into new files in a different order. For example, charts or figures that you may use with a number of different reports can be kept in a file which you can then append in each of those reports.

Append also allows a list of files to be sent directly to the printer, thus creating a composite-printed document containing a number of separate files.

Backup Volume

The **Backup Volume** command copies files from one volume to an archive file, verifies the integrity of the volume control structures, and identifies volumes which have been changed to the extent that the B 20 Operating System no longer recognizes them automatically.

Command Form



Parameters

Volume or device name

specifies the name of the volume or device to be backed up.

[Volume or device password]

specifies the password (if one exists) of the volume or device to be backed up.

[Incremental from (e.g., Mon Jun 1 1981 8:00 pm)]

specifies the beginning date from which files are to be backed up. The system backs up only those files modified on or after the specified date.

You can specify a time after the year if you wish.

If you do not specify a date, the system backs up all files. If you do not specify a time, the system backs up all files in the specified volume which you modified and/or created since 12:00 AM (midnight).

[Suppress backup?]

Enter the letter **y** for YES to verify the integrity of the volume control structures without performing a backup. The results appear on the display and, in the log file if specified. The default value is NO.

[Suppress verification?]

If you enter the letter **y** for YES, the system performs only the backup pass and suppresses the verification pass.

You should suppress the verification pass only when the system does a full backup, and only if you reinitialize the volume with the **IVolume** utility immediately following backup. Otherwise, you cannot ascertain the integrity of the volume. The default value is NO.

In any case, the display lists any errors encountered during the backup pass.

[Archive file]

designates the name of the archive file you want to create.

If you accept the default value by leaving this field blank, the system creates [Archive]<Sys>.nn as the default archive file name.

[Delete existing archive file?]

If you enter the letter **y** for YES the system overwrites automatically any existing archive file.

If you enter the letter **n** for NO, and the archive file already exists, the system displays the following prompt:

> File already exists. Delete? (Press **GO** to confirm, **CANCEL** to deny, or **FINISH** to return to the Executive.)

The default value is NO.

[Log file]

specifies the name of the file to which the system writes a report of the backup.

If the log file exists, the system automatically appends the log to it. If it does not exist, the system creates it.

If you accept the default value by leaving this field blank, the log appears only on the display.

[Display structures?]

Enter the letter **y** for YES for a detailed analysis of the volume control structures. Only system programmers should use this for file system error analysis. The default value is NO.

Example

```
Backup Volume
   Volume or device name                          d0
   [Volume or device password]                    WIN
   [Incremental from (e.g., Mon Jun 1 1981 8:00 PM)] August 3 1982
   [Suppress backup?]
   [Suppress verification?]
   [Archive file]
   [Delete existing archive file?]
   [Log file]
   [Display structures?]
```

This example illustrates an incremental backup of the Winchester disk. The system stores all files modified on or after August 3, 1982, in an archive file called [Archive]<Sys>.01 etc.

The **Backup Volume** command performs extensive checks for consistency on all volume control structures. The system reports irregularities such as Allocation Bit Map inconsistencies, File Header Blocks without directory entries or vice versa, and invalid FHBs. If when activating **Backup Volume** the system reports irregularities in volumes, you must determine the cause, reinitialize the volume with IVolume, and restore the files from the archive file.

The **Backup Volume** utility verifies the consistency of the specified parameters and opens the log file (if you have specified one). **Backup Volume** prompts you to mount the first volume in the archive file. For example, if [Archive file] is defaulted, the screen displays the message:

```
Please mount [Archive]<Sys>.01
(Press GO to confirm; CANCEL to deny,
or FINISH to return to the Executive.)
```

Mount the appropriate volume, and press **GO** to confirm. If the volume is in use (either as a system volume or by another user at a cluster workstation), the system displays the warning:

```
Device is currently in use.
(Press GO to confirm, CANCEL to deny,
or FINISH to return to the Executive.)
```

Even when the **Backup Volume** command is executing, users still can access the volume, since **Backup Volume** does not dismount it or take it offline.

During a backup it is best to restrict other users' access to the volume. Otherwise, you cannot be certain that other users' file modifications are included in the backup. Also, when access is not restricted, the verification pass may indicate non-existant consistency errors.

Unless you specify otherwise, the system first performs a backup pass, duplicating each file. It reports any errors found in the backup pass. It then performs a verification pass to confirm the integrity of all volume control structures. It reports any irregularities on the display, and in the log file (if specified).

After the system fills one disk, it prompts you to mount the next:

```
Please mount [Archive]<Sys>.02
(Press GO to confirm, CANCEL to deny,
or FINISH to return to the Executive.)
```

If an archive file of the same name already exists (most likely from a prior backup), and you did not specify YES in [Delete existing archive file?], the system asks if the file is to be overwritten. If you press **CANCEL** or **FINISH**, the system terminates the **Backup Volume** operation and returns to the Executive. When you overwrite archive files, it is important that they be overwritten in sequence. Otherwise, the system does not recognize that the archive file on the floppy disk can be overwritten during a **Backup Volume** operation.

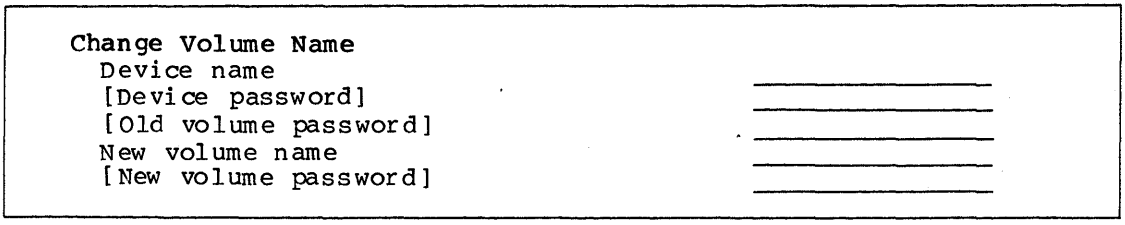
NOTE

Do not specify a log file when initializing a Winchester disk. For more information on the complete backup and restore process, see section 2.

Change Volume Name

The **Change Volume Name** command changes a volume's name and/or password. You also can use it to add or delete a volume password.

Command Form



Parameters

Device name

specifies the name (up to 12 characters long) of the device that contains the volume you want to rename.

[Device password]

specifies the password (up to 12 characters long) for the device containing the volume you want to rename.

[Old volume password]

specifies a password (up to 12 characters long) assigned to the volume you want to rename.

New volume name

specifies the new volume name (up to 12 characters long).

[New volume password]

specifies a password (up to 12 characters long) for the new volume name.

Example

```
Change Volume Name
  Device name                    f0
  [Device password]
  [Old volume password]          Xyz
  New volume name                Source
  [New volume password]
```

This form shows how you assign the new volume name, Source, to the volume in the f0 device. Because you did not enter a new volume password, access to this volume is not restricted.

Cluster Status

The Cluster Status command displays status information about the activity on a cluster system for a specified communications line. The information includes the total number of workstations configured for the line, the number currently active, the time elapsed since the cluster system began operation, line activity (percent of time busy), and the number of the various types of errors the system has encountered.

For each active workstation, the command also displays the total number of requests the system receives since becoming active, and the number of requests currently outstanding.

Command Form

```
Cluster Status
  [Line number (default = 0)]          _____________________
  [One time display?]                  _____________________
```

Parameter

[Line number (default = 0)]

Specifies one communication line. You can request status information for lines 0 through 4 identified as follows:

Line Number	Communications Line
0	standard channel
1	CommIOP1,Channel A
2	CommIOP1,Channel B
3	CommIOP2,Channel A
4	CommIOP2,Channel B

[One time display?]

If you enter the letter **y** for YES, the operating system returns to the Executive after displaying the status information.

If you enter the letter **n** for NO, the status display remains on the screen, and the system updates it every second. You can return to the Executive at any time by pressing **FINISH**. The default value is NO.

Example

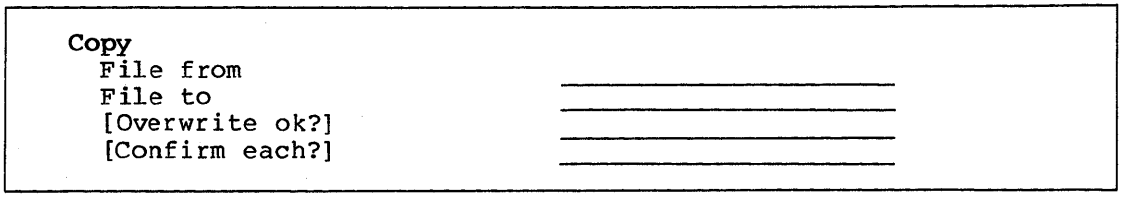
To determine the status of the communications line, CommIOP2, Channel A, fill in the following:

```
Cluster Status
  [Line number (default = 0)]          3
  [One time display?]                  Y
```

Copy

The **Copy** command duplicates the contents of an existing file to a new file.

Command Form



Parameters

File from

specifies the name of the file you want to copy. If you fill this parameter with a wild card character (*) you must also use it in the "File to" parameter. You can use the wild card character to replace the directory name or file name part of the file specification, but not both.

File to

specifies the name of the copied file. The system creates the "File to" file if it does not exist. You can use the wild card character (*) in this parameter, only if you also use it in the "File from" parameter.

[Overwrite ok?]

Enter the letter **y** for YES to permit the system to overwrite the existing **File to** file. Otherwise, enter the letter **n** for NO or accept NO as the default value by leaving this field blank.

If a **File to** file already exists and you enter the letter n for NO or leave the field blank, then the system displays the following prompt to confirm the **Copy** operation (which erases the existing contents of the **File to** file):

File: File name already exists. Overwrite? (Press **GO** to confirm, **CANCEL** to deny, or **FINISH** to stop command).

[Confirm each?]

Enter the letter **y** for YES for confirmation before the system copies each file. Press **GO** to confirm, **CANCEL** to deny (and continue the **COPY** command), or **FINISH** to stop copying files.

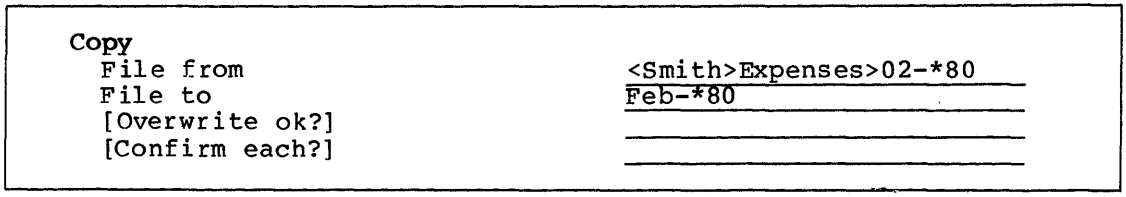
If you enter the letter **n** for NO or accept NO as the default by leaving the field blank, the system does not prompt you for confirmation.

Example

If the directory contains the files

```
Expenses>02-16-80
Expenses>02-30-80
Expenses>05-02-80
```

then execution of the form



copies the files <Smith>Expenses>02-16-80 and <Smith>Expenses>02-30-80 to the files Feb-16-80 and Feb-30-80, respectively, on the signed-on volume and directory (using the signed-on default file prefix, Expenses).

Refer to section 3 for instruction on using the wild card character (*).

Create Configuration File

The **Create Configuration File** command creates a configuration file to which you can write characteristics for configuring (initializing) a device.

Command Form

```
Create Configuration File
  Configuration file name
  Device type (comm, parallel lpt, or serial ptr) _____
```

Parameters

Configuration file name

specifies the name of the file to which you can write the characteristics that configure (initialize) a device.

Device type (comm, parallel lpt, or serial ptr)

Enter the letter **C** for communications, **P** for a parallel printer, or **S** for a serial printer.

When the system performs the preceding process, it displays the appropriate subcommand form (Communications Characteristics, Parallel Printer Characteristics, or Serial Printer Characteristics).

A form for each subcommand follows, including definitions of their respective fields.

Subform

```
Communications Parameters
  [Data bits (5, 6, 7, or 8; default = 7)]
  [Parity (none, even, odd, 0, or 1; default = 0)]
  [Baud rate (up to 19200; default = 9600)]
  [Stop bits (1 or 2; default = 1)]
  [Transmit time out (number of seconds; default = no time out)]
  [Receive time out (number of seconds); default = no time out)]
  [CR/LF mapping mode (binary or new line; default = new line)]
  [New line mapping mode (binary, CR, or CR/LF; default = CR/LF)]
  [Line control (none, XON/XOFF, CTS, or both; default = XON/XOFF)]
  [EOF byte (hex value or none; default = 04)]
```

Parameters

[(Data bits (5, 6, 7, or 8; default = 7)]

specifies the number of data bits per character. Data bits does not include the parity bit if parity is even, odd, 0, or 1.

[Parity (none, even, odd, 0, or 1; default = 0)]

specifies the state of the parity bit, which is a check on the data bits. When you specify **none**, increase the number of data bits (refer to above field) to make up for the absence of a parity bit.

[Baud rate (up to 19200; default = 9600)]

designates a transmission speed from 20 to 19200. Common baud rates are 110, 150, 300, 1200, 2400, 4800, and 9600.

[Stop bits (1 or 2; default = 1)]

specifies the number of stop bits per character.

[Transmit time out (number of seconds; default = no time out)]

specifies the number of seconds a Write operation waits to begin transmitting a character before returning status code 300 (Device not ready).

[Receive time out (number of seconds; default = no time out)]

specifies the number of seconds a Read operation waits to receive a character before it returns status code 602 (No character available).

If you enter 0 and no character is currently available, status code 602 (No character available) is immediately returned from a Read operation.

If you accept the default by leaving this parameter blank, the Read operation does not return status code 602 (No character available).

[CR/LF mapping mode (binary or new line; default = new line)]

determines the mapping of incoming carriage returns (CR) and linefeeds (LF). Binary does not map any incoming CRs or LFs.

New line maps an incoming single CR, single LF, or CR/LF combination into a B 20 System return (0Ah).

[New line mapping mode (binary, CR, or CR/LF; default = CR/LF)]

determines the mapping of outgoing B 20 returns (0Ah). Binary does not map any outgoing B 20 returns. CR maps an outgoing B 20 return into an ASCII CR (0Dh). CR/LF maps an outgoing B 20 return into an ASCII CR/LF (0Dh/0Ah).

[Line control (none, XON/XOFF, CTS, or both; default = XON/XOFF)]

determines the line control mode that the receiving device uses to control the data flow.

When you leave this parameter blank, the receiving device has no line control.

XON/XOFF selects suspension of transmission from the time it receives an XOFF control character (13h) until it receives an XON control character (11h).

Clear to Send (CTS) selects suspension of transmission when the the system does not receive the CTS signal.

[EOF byte (hex value or none; default = 04)]

specifies the value the system uses to detect the byte that signals the end of the input file. For example, 04 is the ASCII code for the End of Transmission (EOT) character.

If you do not enter a value, a communications byte stream never returns status code 1 ("End of file") .

Subform

```
Parallel Printer Parameters
  [New line mapping mode (binary, CR, or CR/LF; default = CR/LF)]___
  [Tab expansion size (default = 8)]                              ___
  [Number of characters per line (default = 132)]                 ___
  [Transmit time out (number of seconds; default = no time out)]  ___
  [Additional ACK delay (units of 100 microseconds; default = 0)]___
  [Translation file (default = none)]                             ___
```

Parameters

[New line mapping mode (binary, CR, or CR/LF; default = CR/LF)]

determines the mapping of outgoing B 20 returns (0Ah).
Binary does not map any outgoing B 20 returns.
CR maps an outgoing B 20 return into an ASCII CR (0Dh).
CR/LF maps an outgoing B 20 return into an ASCII CR/LF (0Dh/0Ah).

[Tab expansion size (default = 8)]

specifies the number of blanks in which the system maps the B 20 **TAB** character.

[Number of characters per line (default = 132)]

specifies the maximum number of characters in a print line.

[Transmit time out (number of seconds; default = no time out)]

specifies the number of seconds a Write operation waits to begin transmitting a character before returning status code 300 (Device not ready).

[Additional ACK delay (units of 100 microseconds; default = 0)]

specifies an additional delay beyond 10-20 microseconds (for example, 200) for printers that use a longer ACK (acknowledgment) signal. The system normally sends a character to the printer approximately 10-20 microseconds after receiving the falling edge of the ACK signal from it.

[Translation file (default = none)]

specifies the file created by the **Make Translation File** command, which is used to translate characters when printing.

```
Serial Line Printer Parameters
  [Data bits (5, 6, 7, or 8; default = 7)]                              ___
  [Parity (none, even, odd, 0, or 1; default = 0)]                      ___
  [Baud rate (up to 19200; default = 9600)]                             ___
  [Stop bits (1 or 2; default = 1)]                                     ___
  [Transmit time out (number of seconds; default = no time out)]        ___
  [New line mapping mode (binary, CR, or CR/LF; default = CR/LF)]       ___
  [Line control (none, XON/XOFF, CTS, or both; default = XON/XOFF)]
  [Tab expansion size (default = 8)]                                    ___
  [Number of characters per line (default = 132)]                       ___
  [Translation file (default = none)]                                   ___
```

Parameters

[Data bits (5, 6, 7, or 8; default = 7)]

specifies the number of data bits per character. Data bits do not include the parity bit if parity is even, odd, 0, or 1.

[Parity (none, even, odd, 0, or 1; default = even)]

designates the state of the parity bit, which functions as a check on the data bits. When you respond with **none**, increase the number of data bits to make up for the absence of a parity bit.

[Baud rate (up to 19200; default = 1200)]

is a transmission speed from 20 to 19200. Common baud rates are 110, 150, 300, 1200, 2400, 4800, and 9600.

[Stop bits (1 or 2; default = 1)]

specifies the number of stop bits per character.

[Transmit time out (number of seconds; default = no time out)]

specifies the number of seconds a Write operation waits to begin transmitting a character before returning status code 300 (Device not ready).

[New line mapping mode (binary, CR, or CR/LF; default = CR/LF)]

determines the mapping of outgoing B 20 returns (0Ah). Binary does not map any outgoing B 20 returns. CR maps an outgoing B 20 return into an ASCII CR (0Dh). CR/LF maps an outgoing B 20 return into an ASCII CR/LF (0Dh/0Ah).

[Line control mode (none, XON/XOFF, CTS, or both; default = XON/XOFF)]

determines the line control mode the receiving device uses to control the data flow.

When you select **none**, the receiving device uses no line control.

XON/XOFF selects suspension of transmission from the time it receives of an XOFF control character (13h) until it receives an XON control character (11h).

CTS selects suspension of transmission when the system does not receive the Clear to Send signal.

[Tab expansion size (default = 8)]

specifies the number of blanks in which the system maps a B 20 **TAB** character.

[Number of characters per line (default = 132)]

specifies the maximum number of characters in a print line.

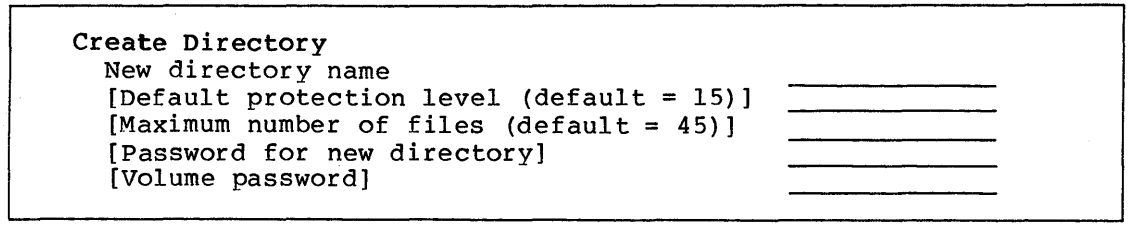
[Translation file (default = none)]

specifies the file created by the **Make Translation File** command, which is used to translate characters when printing.

Create Directory

The **Create Directory** command creates a new directory with a user-specified name on a disk volume.

Command Form



Parameters

New directory name

specifies the name of the directory you want to create. If you do not create the directory on the logged-in volume, then "New directory name" must be a directory specification of the form [volname]dirname or [volname]<dirname>.

[Default protection level (default = 15)]

assigns the protection level for all files created in the directory. Only the protection levels unprotected (15), modify protected (5), and access protected (0) are valid.

[Maximum number of files (default = 45)]

specifies the maximum number of files for the directory.

[Password for new directory]

specifies a password for the new directory. If you accept the default value by leaving the field blank, no password is assigned.

[Volume password]

specifies the password for the volume on which you create the directory. If you accept the default by leaving the field blank, no volume password is assigned.

Example

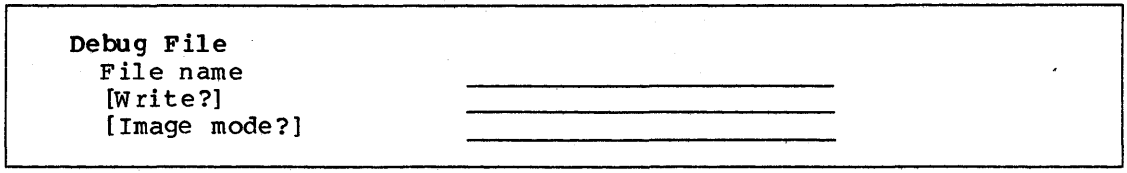
To create a directory named "Accounting," and to protect it from being modified, fill in the form as follows:

```
Create Directory
  New directory name                                  Accounting
  Default protection level (e.g., 15)                 5
  [Maximum number of files (default = 45)]
  [Password for new directory]
  [Volume password]
```

Debug File

The **Debug File** command activates the Debugger to examine and modify the data in files and devices.

Command Form



Parameters

File name

specifies the name of the file you want the Debugger to examine.

[Write?]

If you enter the letter **y** for YES, the system allows you to modify data. The default value is NO.

[Image mode?]

If you enter the letter **y** for YES, the debugger interprets the data exactly as it appears in the run file. Normally, the system interprets the data as it appears when loaded in memory. The default value is NO.

CAUTION

You can use all Debugger commands, except those relating to breaking and proceeding, to examine and modify the data in a file or device.

Be very careful not to destroy the B 20 file system when using the **Debug File** command to modify a disk device (for example, d0).

For more information, refer to the B 20 Systems Debugger Reference Manual.

Delete

The **Delete** command removes each file you specify in the File list parameter field, permanently erasing the contents of those files.

Command Form

```
Delete
  File list
  [Confirm each?]
```

Parameters

File list

specifies the list of files containing the file(s) you want to delete. You can use the wild card character (*) in this field.

[Confirm each?]

Enter the letter **y** for YES for the system to prompt you to confirm each file you want to delete. Skip to the next file specified in the File list parameter field by pressing **CANCEL**. Terminate the **Delete** operation by pressing **FINISH**.

When you specify NO or accept the default by leaving the field blank, a confirmation prompt does not appear.

Example

This example deletes all the files in the Payroll directory from the B 20 System.

```
Delete
  File list          <Payroll>*
  [Confirm each?]
```

*	deletes all files on the signed-on directory
[volname]<*>*	deletes all files on another volume
[volname]<*>*	deletes all files of the master file system
<*>*	deletes all files in the signed-on volume
<dirname>*	deletes all files in the specified directory
prefix *	deletes all files in a subdirectory indicated by a prefix

Assume directories dirname, dirname1, dirname2 . . . dirnameN.

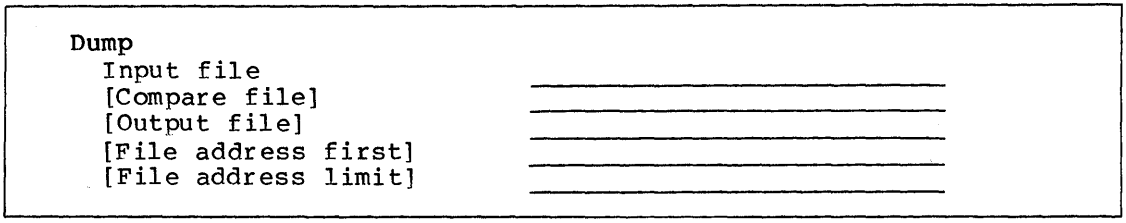
?	deletes all files that exactly match one character
<dirname?>*	deletes all files in the directories dirname, dirname1, dirname2 . . . dirnameN

Refer to section 3 for a discussion of the wild card character (*).

Dump

The Dump command displays the contents of a file in hexadecimal and ASCII characters, and shows the differences between two files.

Command Form



Parameters

Input file

specifies the file you want to display.

[Compare file]

specifies the file the system is to compare with the input file. The comparison (or display) is limited to the range of file addresses specified in the [File address first] parameter field and the [File address limit] fields.

[Output file]

specifies the file to which the system writes the comparison.

If you do not name an output file, the comparison only appears on the screen.

If [Output file] exists, the system discards its prior contents. If it does not exist, the system creates it.

[File address first]

specifies a hexadecimal number indicating the file address where the comparison or display begins.

If you do not name [File address first], or if you enter an invalid value, the comparison or display begins at file address.

The final h of the hexadecimal number (for example, 1F2Eh) is optional.

[File address limit]

specifies a hexadecimal number indicating the file address at which the comparison or display ends (for example, 1F2Eh). The comparison or display goes up to, but does not include, this address.

If [File address limit] is greater than the address of the end of the file, the comparison or display stops at the end of the file.

If you do not name [File address limit], or if you specify an invalid value, the comparison or display ends at file address FFFFFFFFh.

The final **h** of the hexadecimal number, (for example, 1F2Eh) is optional.

Example

The following example shows a comparison of two similar files:

```
0001  71  72  73  74  75  76  77  78  79  7A  61  62  63  64  71  20  qrstuvwxyzabcdq
0001  71  72  73  74  75  76  77  78  79  7A  61  62  63  74  65  20  qrstuvwxyzabcde
0002  65  66  67  68  6A  6B  6C  6D  6E  6F  70  71  72  73  74  75  efghjklmnopqustu
0002  71  72  73  74  75  76  77  78  79  7A  61  62  63  64  65  75  fghijklmnopqrstu
0005  61  62  63  64  65  66  67  68  69  77  6A  6B  6C  6D  6E  20  abcdefghiwjklmn
0005  61  62  63  64  65  66  67  68  69  6A  6B  6C  6D  6E  6F  20  abcdefghijklmno
0006  6F  71  72  73  74  75  76  77  78  79  7A  61  62  63  64  20  oqrstuvwxyzabcd
0006  70  71  72  73  74  75  76  77  78  79  7A  61  62  63  64  20  pqrstuvwxyzabcd
0009  6A  6B  6C  6D  6E  6F  70  65  72  71  72  73  74  77  78  79  jklmnoperqrstwxy
0009  6A  6B  6C  6D  6E  6F  70  71  72  73  74  75  76  77  78  79  jklmnopqrstuvwxy
```

The following example shows the display of a single file:

```
0000  61  62  63  64  65  66  67  68  69  6A  6B  6C  6D  6E  6F  70  abcdefghijklmnop
0001  71  72  73  74  75  76  77  78  79  7A  61  62  63  64  71  20  qrstuvwxyzabcdq
0002  65  66  67  68  6A  6B  6C  6D  6E  6F  70  71  72  73  74  75  efghjklmnopqustu
0003  76.77  78  79  7A  61  62  63  64  65  66  67  68  69  6A  20  vwxyzabcdefghij
0004  6B  6C  6D  6E  6F  70  71  72  73  74  75  76  77  78  79  7A  klmnopqrstuvwxyz
0005  61  62  63  64  65  66  67  68  69  77  6A  6B  6C  6D  6E  20  abcdefghiwjklmn
0006  6F  71  72  73  74  75  76  77  78  79  7A  61  62  63  64  20  oqrstuvwxyzabcd
0007  65  66  67  68  69  6A  6B  6C  6D  6E  6F  70  71  72  73  74  efghijklmnopqrst
0008  75  76  77  78  79  7A  61  62  63  64  65  66  67  68  69  20  uvwxyzabcdefghi
0009  6A  6B  6C  6D  6E  6F  70  65  72  71  72  73  74  77  78  79  jklmnoperqrstwxy
000A  7A                                                            z
```

Edit

The **Edit** command allows you to edit information in a file. Like most modern text editors, it shows the text as it appears on a typewritten page. The screen acts as a window for viewing the text file.

Command Form

```
Edit
  File                    _____________________
  [Your name]             _____________________
```

Parameters

File

specifies the file you want to edit.

[Your name]

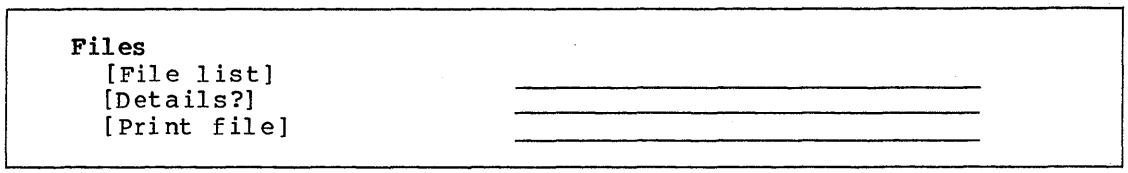
is your user name. Use this parameter when you are logging onto a directory currently in edit mode. More than one user may edit files in the directory.

For more information on the use of the Editor, refer to the *B 20 Systems Editor Reference Manual*.

Files

The **Files** command displays information about each of the files named in the File list parameter field.

Command Form



Parameters

[File list]

specifies the list of file names you want to display. You may use the wild card character (*) in this field. If you leave the field blank, the * is the default.

[Details]

Enter the letter **y** for YES to display access dates, protection mode, etc. of each file. Enter the letter **n** for NO to display only the names of the files. The default value is NO.

[Print file]

specifies the name of the disk file or the device that receives the information.

When you enter a disk file name, the specified disk file contains the files information for each file in the File list field.

Enter a device name enclosed with brackets ([device]) to send the print file to a device, for example, a printer.

The default is not to print or store the information generated by the **Files** command. The information appears on the display, whether or not you enter a response in the [Print file] parameter.

Example

IF you enter **Toc Pref Chl** in the File list field and Yes in the Details field, the system displays access dates, protection level, etc., for each file listed as follows:

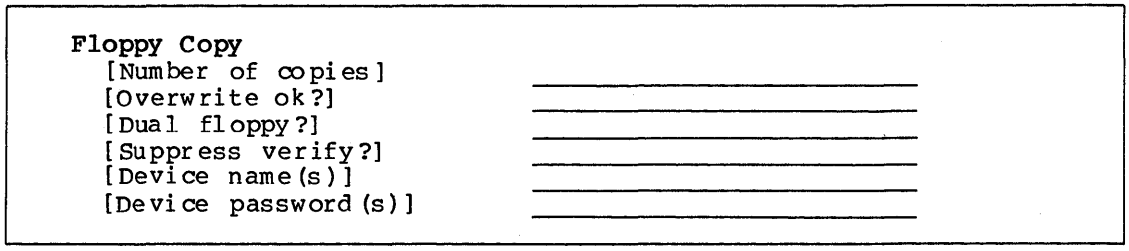
	Length	Sectors	Last Modified	Protection
[Win]<Jones>Toc	73	1	May 10, 1982 1:10PM	15
[Win]<Jones>Pref	463	1	May 10, 1982 3:00PM	15
[Win]<Jones>Chl	3581	7	May 12, 1982 9:30AM	15

Refer to section 3 for a discussion of the wild card character (*).

Floppy Copy

The **Floppy Copy** command duplicates the contents of a floppy disk to another floppy disk. It sets up a temporary file ([SCR]<$>FloppyCopy.Tmp) on the Winchester disk, which stores information from the master floppy disk that you want to copy to the floppy disk. **Floppy Copy** allows you to make multiple copies.

Command Form



Parameters

[Number of copies]

specifies the number of copies you want to make from each master disk.

[Overwrite ok?]

Enter the letter **y** for YES to overwrite existing data on the floppy disk on which you want to copy information. If you specify the letter **n** for NO or accept the default value by leaving the field blank the B 20 prompts to confirm the overwrite.

[Dual floppy?]

Enter the letter **y** for YES if the system has dual floppy drives on the workstation. Specify the letter **n** for NO or leave the field blank if the system has a single floppy drive. The default value is NO.

[Suppress verify?]

Enter the letter **y** for YES to suppress verification. Otherwise enter the letter **n** for NO to reread the information on the floppy disk so you can verify it after it is written. The default value is NO.

[Device name(s)]

specifies the name(s) of the device(s) from which you copy a floppy disk.

[Device password(s)]

specifies the password(s) for the device from which you copy the floppy disk.

Format

The **Format** command formats the text contained in one or more files and prints a paginated document by direct or spooled printing.

Command Form

```
Format
  File list                                    _____
  [Print to]                                   _____
  [Confirm each?]                              _____
  [Title]                                      _____
  [First page to format]                       _____
  [Last page to format]                        _____
  [Suppress page numbers?]                     _____
  [Suppress date?]                             _____
  [Suppress time?]                             _____
  [Double-space?]                              _____
  [Left margin (default 10 spaces)]            _____
  [Text width (default 65 spaces)]             _____
  [Page length (default 66 lines)]             _____
  [Top margin (default 6 lines)]               _____
  [Bottom margin (default 6 lines)]            _____
  [Tab width (default 8 spaces)]               _____
  [Suppress page ejects between files?]        _____
```

Parameters

File list

designates the file(s) to be formatted.

[Print to]

specifies one of the following:

- The name of a local printer ([Ptr]A, [Ptr]B, or [Lpt]), enclosed in brackets for direct-printing files.
- The name of a scheduling queue, enclosed in brackets for spooled-printing files. (The name must match a queue name defined for the system.)
- The name of the file, not enclosed in brackets, into which the formatted image of the input file is written.

The default is the default system printer.

[Confirm each?]

If you enter the letter **y** for Yes, the system prompts you for confirmation before formatting the file.

If you enter the letter **n** for No, then **Format** proceeds without your interaction. The default value is NO.

[Title]

specifies the title to insert at the top of each page of the file. If the title includes spaces, you must enclose them in single quotes.

The default is the current name of the file.

[File page to format]
[Last page to format]

specifies the numbers of the first and last pages (inclusive) to be formatted, respectively.

If you do not specify page numbers, the entire file is formatted.

[Suppress page numbers?]
[Suppress date?]
[Suppress time?]

If you enter the letter **y** for Yes, then the page numbers, date, and time, respectively, are not inserted at the top of each page of the file.

If you enter the letter **n** for No, then the page numbers, date, and time, respectively, are inserted at the top of each page of the file. The default value is NO.

[Double-space?]

If you enter the letter **y** for Yes, the lines are double-spaced. If you enter the letter **n** for NO, the lines are single-spaced. The default value is NO.

[Left margin (default = 10 spaces)]

specifies the number of spaces the text of the file is to occupy. Lines longer than the specified length are split into two or more lines. Split lines do not wrap into succeeding lines.

[Text width (default = 65 spaces)]

specifies the number of spaces the text of the file is to occupy. Lines longer than the length you specify are split into two or more lines. Split lines do not wrap into succeeding lines.

[Page length (default = 66 lines)]

specifies the number of lines per page, including the top and bottom margins.

[Top margin (default = 6 lines)]
[Bottom margin (default = 6 lines)]

specifies the number of lines the system is to allow for the top and bottom margins, respectively.

[Tab width (default = 8 spaces)]

specifies the number of spaces between tab stops.

[Suppress page ejects between files?]

Enter the letter **y** for YES, or the letter **n** for NO. The default value is NO.

Example:

```
Format
     File list                                  Preface
     [Print to]                                 [SPLB
     [Confirm each?]
     [Title]                                    Preface
     [First page to format]
     [Last page to format]
     [Suppress page numbers?]
     [Suppress date?]
     [Suppress time?]
     [Double-space?]
     [Left margin (default 10 spaces)]          Yes
     [Text width (default 65 spaces)]
     [Page length (default 66 lines)]
     [Top margin (default 6 lines)]
     [Bottom margin (default 6 lines)]
     [Tab width (default 8 spaces)]
     [Suppress page ejects between files?]
```

The parameters in this example format the file Preface into a paginated document to be printed, double-spaced, with standard margins. The heading Preface appears on each page. When formatting is complete, you can print the document on the printer associated with the queue SPLB.

The **IVArchive** command initializes a floppy disk for use as an archive volume. Use the following procedure:

1. Enter the IV **Archive** command; then press **RETURN**. The line under the command becomes highlighted.

2. Enter the **IVolume** command; then press **GO**. The **IVolume** command form appears on the display with several parameters entered by the system.

Command Form

The command form is the same as the **IVolume** command form, except that the system enters the following parameters:

Device name	f0
[Device password]	##
Volume name	Archive
[Max. directories]	2
[Max. files on volume]	30
[Max. files in Sys Directories	9

Refer to the following discussion of the **IVolume** command in section 6 of this guide.

IVolume

The **IVolume** command prepares a floppy or Winchester disk for use as a B 20 volume. **IVolume** formats the disk, performs write/read tests to identify surface defects, writes volume control structures onto the disk, and creates system files. Use the **IVolume** command in conjunction with the **IVArchive** command to initialize a floppy disk for use as an archive volume.

Command Form

```
IVolume
    Device name                                  _____
    [Device password]                            _____
    Volume name                                  _____
    [Volume password]                            _____
    [System Image (default = 384)]               _____
    [Log file (default = 2)]                     _____
    [Crash file (default = 0)]                   _____
    [Max. directories]                           _____
    [Max. files on volume]                       _____
    [Sys Directory password]                     _____
    [Write protect Sys Directory?]               _____
    [Suppress format of medium?]                 _____
    [Surface tests]                              _____
    [Debug?]                                     _____
    [Log file]                                   _____
    [Extended floppy tracks?]                    _____
    [Single-sided, mini-floppy?]                 _____
    [Bad spots (See Documentation)]              _____
```

CAUTION

IVolume performs a surface test to identify bad spots on the medium. However, certain spots may be marginal, and the surface test can not find them. Marginal bad spots do not always fail, but failure is possible; thus, they are not appropriate areas in which to store data. Each Winchester disk drive comes with a report of bad spots. This report includes all bad spots at the time of the factory test, including marginal ones. Enter this list manually whenever you initialize a new Winchester disk.

Parameters

Device name

specifies the device that contains the disk you want to format. For a standard system, the names of the floppy disk drives are f0 and f1; the Winchester disk drives are d0, d1, and d2. Alternate names may have been assigned at system build. See your system administrator if you have a question.

[Device password]

specifies the device password for the device that contains the disk you want to initialize. Your system administrator provides passwords for system devices.

Volume name

specifies the user-assigned volume name (up to 12 characters long). It cannot duplicate any other volume or device name. Invalid volume names are:

Commanything	Lptanything
d0, d1, d2	Nul
f0, f1	Splanything
Kbd	Tapeanything
	Vidanything

To avoid accidentally erasing a volume that contains valuable data, IVolume checks to see if the volume contains a valid Volume Home Block (VHB). (If one exists, the volume has been formatted previously.) Upon finding a valid VHB, IVolume displays the information contained in it, and asks for confirmation of the volume's reinitialization. The following message appears (with the information filled in):

Medium contains valid volume information.

Volume name:
Creation date/time:
Last modification date/time:
Number of free sectors:
Number of free file headers:

Do you wish to DESTROY this volume?
(Press GO to confirm, CANCEL to deny, or FINISH to return to the Executive.)

If you press GO, and the volume has a password, **IVolume** requires that you supply the old password as added confirmation with the prompt:

Password?

IVolume echoes the pound sign (#) for each password character you type. Press the **RETURN** key to terminate the password entry mode.

[Volume password]

specifies the password (up to 12 characters long) that you assign to this volume. Use it when you create files or directories, or when you open files on this volume.

If you accept the default by not specifying a password, the volume is unprotected. No directories or files can have passwords, and overwriting of the volume can occur at any time.

You can specify volume protection later with the **Change Volume Name** command.

[System Image (default = 384)]

specifies the number of sectors required for the system run file.

To initialize a system disk with the standard System Image, leave this field blank. Otherwise, use the **Files** command entering the letter **y** for Yes in the [Details?] parameter prompt to get the number of sectors.

To initialize a system disk with a non-standard system image, enter the size of the run file which the Linker prints at system build.

To initialize a non-system disk, enter 0.

[Log file (default = 2)]

specifies the number of sectors required for the Log file.

If the Log file tends to fill before printing is convenient, specify a larger number, such as 4.

The system writes log entries only to system disks. If this volume does not contain a System Image, enter 0.

[Crash file (default = 0)]

specifies the number of sectors required for the Crash Dump file.

Allocate two sectors for each 1K bytes of memory to be dumped. If you do not specify a number, the system does not write a Crash Dump file when BTOS is bootstrapped.

[Max. directories]

specifies the maximum number of directories you can create on this volume.

[Max. files on volume]

specifies the maximum number of files that you can create on this volume. Allow a sufficient number for future expansion. You cannot expand this number at a later date without reinitializing the volume.

[Primary file headers only?]

Enter the letter **y** for YES to allocate space for only a primary File Header Block for each file, rather than primary and secondary File Header Blocks. Specifying primary headers only conserves disk space.

Enter the letter **n** for NO to allocate space for primary and secondary File Header Blocks. The default value is NO.

[Max. files in Sys Directory]

specifies the maximum number of files that you can create in the <Sys> Directory.

[Sys Directory password]

specifies the password (up to 12 characters long) that you assign the <Sys> Directory. Leave this field blank if files in the <Sys> Directory are not to be password protected. If you specify a password, a user must present this password before a file can be created in this directory.

[Write protect Sys Directory?]

Enter the letter **y** for YES to set the default file protection level of the files in the <Sys> Directory to **modify protected.** You must already have specified a volume and <Sys> Directory password. The default value is NO.

[Suppress format of medium?]

Enter the letter **y** for YES to reduce the time required to reinitialize a medium that was previously a formatted volume. The default value is NO.

Leave this field blank when you initialize a new disk.

[Surface tests]

specifies the number of surface tests **IVolume** performs on each disk.

The surface test writes and reads each sector on the disk to ensure that it is defect-free. It logs any errors and makes an entry for that sector in BadBlk.Sys. Surface tests use random data. Therefore, the more passes you specify, the more reliable the tests.

You should run surface tests the first time you initialize floppy disks. You should not use any floppy disks for which **IVolume** reports surface errors.

Specifying 0 reduces the time to reinitialize a floppy disk.

The default values are 1 for floppy disks, 1 for initialized Winchester disks, and 8 for uninitialized Winchester disks.

[Debug?]

Enter the letter **y** for YES to display debugging information for system programmers. The default value is NO.

[Log file]

specifies the name of the file which receives a written report of the **IVolume** operation.

If you want to keep a log of the volume initialization, enter a file name on this parameter.

If the log file exists, the sytem automatically appends the log to it. If it does not exist, the system creates it. If there is no log file name, the log appears only on the screen.

[Extended floppy tracks?]

Enter the letter **y** for YES to use the innermost (extended) six tracks of the floppy disks for storage.

Selecting this option degrades floppy disk reliability but results in an 8% increase in the storage capacity of the floppy disk. This option is not recommended.

Entering the letter **n** for NO or accepting NO as the default by leaving the field blank allows **IVolume** to create a system diagnostic file to occupy these tracks.

[Single-sided mini-floppy?]

Enter the letter **y** for YES to use only one side of the 5 1/4-inch mini-floppy.

Enter the letter **n** for NO to use both sides of the 5 1/4-inch mini-floppy. The default value is NO.

This parameter does not apply to an 8-inch floppy disk.

[Bad spots (See Documentation)]

is a list of bad spots with the form

t/h or t/h/sb/bc, or t/h/#sector

The bad spots on the medium are as follows:

t	is the track number,
h	is the head number,
sb	is the starting byte number,
bc	is the number of bytes, and
#sector	is the sector number.

The form t/h declares all sectors on track t and head h as bad. For example, 3/0 declares all sectors on track 3, head 0 as bad.

The form t/h/sb/bc declares the sectors on track t, head h, starting at byte sb, and continuing for bc bytes, as bad. For example, 3/0/101,26 declares the sectors on track 3, head 0, containing bytes 101-126 as bad. This form is compatible with the "bad spot" report that is shipped with the Winchester disk drives.

The form t/h/#sector declares sector number #sector on track 3, head 0, as bad. For example, 3/0 #2 declares sector 2 on track 3, head 0, as bad. This form is compatible with the information displayed by the Winchester disk diagnostic.

Separate the list of bad spots with blanks; for example,

3/0/101/26 7/1 16/2/#2

The form accommodates up to three lines of bad spot information. The description of each bad spot must be contained on a single line. If you need more than three lines, enter the first three lines. Then enter the **IVolume** command again to enter the additional bad spots.

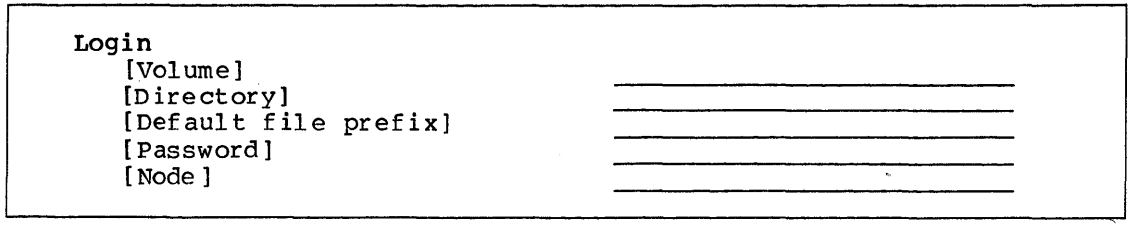
When you use the **IVolume** command to reinitialize a disk, it reads the old BadBlk.Sys file to find the current list of bad spots.

The Winchester or floppy disk diagnostic destroys the contents of all the files. Before executing the Winchester diagnostic, locate the bad spot report that came with the system. If you cannot locate the report, reinitialize the volume. Fill in the form and specify YES in the [Suppress format of medium] parameter, and 0 in the [Surface tests] parameter. Copy the bad spot information displayed and, on the next use of **IVolume**, reenter the list of bad spots.

Login

The **Login** command changes the path (the volume name, directory name, file prefix, and password) to which you are signed on.

Command Form



Parameters

[Volume]

specifies the volume name. If you accept the default by leaving this field blank, the system uses the currently logged on volume as your volume name.

[Directory]

specifies the directory name. If you accept the default, by leaving the field blank, the system uses the currently logged on directory as the default value.

[Default file prefix]

specifies the default file prefix name which you add to file specifications when the volume and directory names are omitted in calling up a file. Use the double quotation marks (" ") convention with the file prefix.

If you accept the default by leaving this field blank, there is no assignment of a default file prefix.

[Password]

specifies the password required for the specified volume or directory. If you accept the default by leaving the field blank no password is assigned.

[Node]

specifies your system's node name if it is part of a BNET communications network. If you accept the default by leaving this field blank, no node name is assigned.

Example

Assume that you are signed on to the System Volume and directory [Sys]<sys>. Executing **Login** with the following parameters signs you on to the "Accounting" directory on the "Data" volume, with the default file prefix mgr>. Assuming that the directory is password protected, you can gain access to the directory with either a directory password (for example, AC) or the volume password (for example, f0).

```
Login
   [Volume]                    Data
   [Directory]                 Accounting
   [Default file prefix]       mgr>
   [Password]                  AC
   [Node]
```

Logout

The **Logout** command terminates the current session, removes any information specified on the current Signon form or with the **Path** or **Login** commands, and reinitializes the display. No command form exists for this command.

To activate the **Logout** command, enter the Executive command **Logout**, then press **GO**. A new Signon form appears on the display which you must fill in before activating any other commands.

Maintain File

The **Maintain File** command modifies and reads data files including Record Sequential Access Method (RSAM) files, Direct Access Method (DAM) files, and the data store files of Indexed Sequential Access Method (ISAM) data sets. **Maintain File** can verify the file structure, remove malformed records, remove deleted records, and (optionally) write a log showing verification of the file structure to a file. (The log always appears on the screen.)

Command Form

```
Maintain File
  Input files
  [Output file]
  [Log file]
  [Remove deleted records?]
  [Suppress confirmation?]
```

Parameters

Input files

lists the names of one or more data files (RSAM, DAM, or ISAM data store) you want to maintain. If this is the only parameter filled in, then the system verifies file structure and displays a report of the verification. (The contents of this report appear under [Log file] which follows.)

[Output file]

specifies the file to which the system copies well-formed input records.

If all the input files are readable using DAM, the output file is a DAM file; otherwise, the output file is an RSAM file.

If [Output file] exists, the system discards its prior contents or, if the file does not exist, creates one.

[Log file]

specifies the file to which the system writes a report of the structure verification. The log file lists the number of records processed, the number of data bytes processed, the logical file address, and the length of any malformed records.

If you do not enter a log file name, the report appears only on the display; this is the default value.

[Remove deleted records?]

If the output file is a DAM file and you enter the letter y for YES, then the system skips deleted and malformed records and does not create corresponding ones in the output file.

If the output file is a DAM file and you enter the letter n for NO, then deleted records in the input file cause corresponding deleted records in the same positions in the output file. The system treats malformed records as deleted records in the output file. The default value is NO.

If the output file is an RSAM file, the system skips deleted and malformed records.

[Suppress confirmation?]

When a malformed record appears in the input file, a display message specifies its file address and its length.

If you enter the letter **y** for YES, the system proceeds without user interaction.

If you enter the letter **n** for NO, the system asks you how to proceed. The options are either to skip the malformed record and keep processing the input file, or to terminate processing. The default value is NO.

Example

To merge the two ISAM data sets <Jones>Order-Line.Isam and <Smith>OrderLine.Isam into the ISAM data set <Mstr>Temp, and to write a log of the verification report, enter the following:

```
Maintain File
 Input files              <Jones>OrderLine.Isam <Smith>Orderline.Isam
 [Output file]            <Mstr>Temp
 [Log file]               <Mstr>Temp.Log
 [Remove deleted records?] Y
 [Suppress confirmation?]
```

Maintain File causes the system to scan the data store files of the two data sets, verifying the file structures and reclaiming the space occupied by deleted records, and merges the well-formed records into <Mstr>Temp.

The following is an example of a log file:

```
Malformed input record in input file 0 at Lfa 512

189 bytes skipped before properly-formed record was found.

85 records read.

2835 bytes read.
```

Make Translation File

The **Make Translation File** command generates a custom translation file for the serial printer. This translation file provides the facility to translate a single character into a series of characters.

Command Form

```
Make Translation File
    Source file name          _____________________________
    Translation file name     _____________________________
```

Parameters

Source file name

specifies an Editor file that contains a list of characters you want to translate.

Translation file name

specifies the output file.

New Command

The **New Command** command adds a new command to those that the Executive already can perform.

Command Form

```
New Command
     Command name          _____________________________
     Run file              _____________________________
     Field names           _____________________________
     Description           _____________________________
     [Overwrite ok?]       _____________________________
     [Case (default = '00']_____________________________
     [Command file]        _____________________________
```

Parameters

Command name

specifies the new command name that activates the subsystem you specify in the Run file field. Enclose the command name in single quotes if it contains more than one word.

Run file

is the subsystem or run file that the new command specified in the Command name field activates.

The commands which follow are implemented within the Executive, rather than in a separate run file. For these commands, you must fill in the Run file field with the appropriate symbol.

Command Name	Executive Commands Run File Field
Append	!1
Copy	!2
Create Directory	!14
Delete	!3
Path	!7
Record	!19
Remove Directory	!15
Rename	!4
Run File	!16
Screen Setup	!17
Set File Prefix	!9
Set Protection	!10
Stop Record	!20
Type	!6

Field names

specify simple parameter prompts that appear in the command form for the new command. Each simple parameter labels one line. You must enclose field names in single quotes.

Description

is a simple parameter displayed as the **HELP** description for the new command. You must enclose the Description in single quotes.

[Overwrite ok?]

If you enter the letter **y** for YES, the system performs the **New Command** operation (which erases the existing command and replaces it with the new command).

If the command already exists and you enter the letter n for NO or leave the field blank, then the system prompts you to confirm the **New Command.** Press **GO** to confirm, **CANCEL** to deny, or **FINISH** to return to the Executive's command form. The default value is NO.

[Case (default = '00')]

Allows a user to select the same run file for different functions.

[Command file]

allows modification of command files other than the one currently in use.

Example

For example, the **New Command** form used to create **Path** is

```
New Command
    Command name            Path
    Run File                !7
    Field Names             '[Volume]' '[Directory]'
                            '[Default file prefix]'
                            '[Password] '
    Description             'Set the . . .'
    [Overwrite ok?]
    [Case default = '00']
    [Command file]
```

The last parameter, [Password] , is a password parameter.

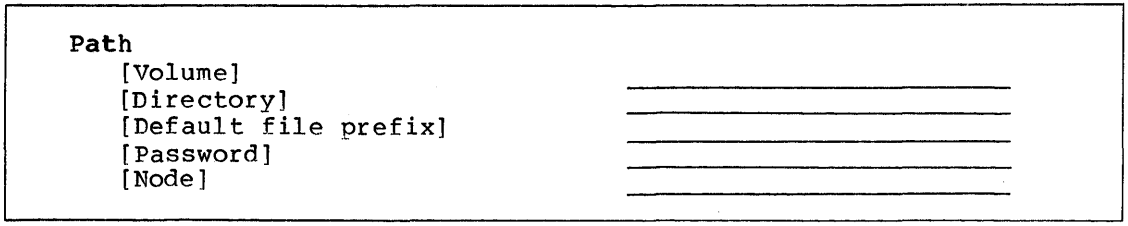
A command form can include a password parameter which does not display the password on the screen. Instead, the characters you enter are echoed as the pound sign (#).

The last character of a password parameter must be a period (.). It does not appear in the command form, but the Executive recognizes it.

Path

The **Path** command changes the currently logged on path (the volume, directory, file prefix, and password).

Command Form



Parameters

[Volume]

specifies the volume name. If you accept the default by leaving the field blank, the system uses the volume currently logged on as the default volume name.

[Directory]

specifies the directory name. If you accept the default by leaving the field blank the system uses the directory currently logged on as the default directory name.

[Default file prefix]

specifies the default file prefix name which you add to file specifications when the system calls up a file where the volume and directory names are omitted. Your entry should end with a right angle bracket (>).

The default is no default file prefix.

[Password]

specifies the password required for the specified volume or directory. The default is no password.

[Node]

refer to *B 20 Systems BNET Reference Manual*.

Example

Assume that you are signed on to the System Volume and directory, [Sys]<sys>. If you enter the **Path** command with the following parameters, you sign on to the Accounting directory on the Data volume, with the default file prefix mgr>. Assuming that the directory is password protected, you can gain access to the directory with either a directory password (for example, AC) or the volume password, (for example, f0).

```
Path
    [Volume]                    Data
    [Directory]                 Accounting
    [Default file prefix]       mgr>
    [Password]                  AC
    [Node]
```

PLog

The **PLog** command lists the contents of the log file, which is an error-logging file on the display. At your option, **PLog** can also write the log to a file or printer.

Command Form

```
PLog
  [Error type (Cr,B,In,D,Cl,Is)]  _____________________
  [Print to]                      _____________________
  [Volume name]                   _____________________
  [After date/time]               _____________________
```

Parameters

[Error type (Cr,B,In,D,Cl,Is)]

specifies the error type(s) in the log to be printed, where

Cr = System Crash
B = System Boot
In = System initialization errors
D = Disk errors
Cl = Cluster communication errors
Is = ISAM errors

If you accept the default by leaving the field blank, the system shows all errors.

[Print to]

specifies the name of the file or printer to which the system writes the log file. If you accept the default by leaving the field blank, the system writes the log file to [VID].

[Volume name].

specifies the name of the volume which contains the log file information. The default is [Sys]. BTOS maintains a log file only on the [Sys] volume, and only if you specify it using the **IVolume** command. Refer to section 2 for additional information.

[After date/time]

specifies the starting date/time of entries to be printed; the system does not print entries older than this. Enter the date/time with the **Set Time** command or in the Signon form.

Print

The **Print** command adds a file to the scheduling queue for spooled printing. Unlike **Format**, **Print** does not create a temporary file. Rather, the system queues the actual file for spooled printing. Therefore, do not delete or modify it until printing is complete.

Command Form

```
Print
  File list                                  _____________________
  [Queue name (default = SPL)]               _____________________
  [Number of copies]                         _____________________
  [Delete after printing?]                   _____________________
  [Special forms name]                       _____________________
  [Print wheel name]                         _____________________
  [Printing mode]                            _____________________
  [Align form?]                              _____________________
  [After date/time]                          _____________________
  [Security mode?]                           _____________________
  [Priority]                                 _____________________
  [Confirm each?]                            _____________________
```

Parameters

File list

specifies the names of all files to be printed.

[Queue name]

specifies the name of the scheduling queue that contains the queue entry generated by this print request. The name must match a queue name defined for the system. If you accept the default by leaving the field blank, the system uses Spl as the Scheduling queue.

[Number of copies]

specifies the number of copies of the file you want to print. If you leave this field blank the system, by default creates one copy.

[Delete after printing?]

If you enter the letter **y** for YES, the file is deleted after printing. If you accept the default by leaving the field blank, or if you enter the letter **n** for NO, the file remains.

[Special forms name]

specifies the name (up to 12 characters long) of the special paper on which the printer transcribes a file. If you specify a name, the printer pauses before printing so that you can load the paper.

[Print wheel name]

specifies the name (up to 12 characters long) of the print wheel you want to use. If you specify a name, the printer pauses before printing so that you can install the print wheel.

To restart the printer, enter the **Spooler Status** command and use the **Restart Printer** subcommand.

[Printing mode]

is N for normal mode, I for image mode, or B for binary mode. The default value is N normal mode.

[Align form?]

If you enter the letter **y** for YES, the printer pauses after transcribing the first page so you can align the paper. To restart the printer, enter the **Spooler Status** command and use the **Restart Printer** subcommand.

If you enter the letter **n** for NO, the printer does not pause for forms alignment. The default value is NO.

[After date time]

specifies the earliest date and time the printer will print the file. The format is as follows:

Mon Jun 1 1981 8:00 pm

The default is to print as soon as possible.

[Security mode?]

If you enter the letter **y** for YES, the printer pauses before printing the file. You must enter a password at the workstation connected to the printer before the file is printed.

If you enter the letter **n** for NO, the printer does not pause for a password before printing the file. The default value is NO.

[Priority]

specifies a priority (0-9, with 0 the highest) that determines the file's placement in the scheduling queue. The default value is 5.

[Confirm each?]

If you specify y for YES, the system prompts you for confirmation before printing each file.

If you specify **n** for NO, printing proceeds without user interaction. The default value is NO.

Example

```
Print
  File list                          Manual
  [Queue name]                       [SPLB]
  [Delete after printing?]
  [Number of copies]                 4
  [Special forms name]
  [Print wheel name]                 Courier
  [Priority]
  [Printing mode]
  [Align form?]
  [After date time]
  [Security mode?]
  [Confirm each?]
```

The queue SPL uses a dot-matrix printer, and the queue SPLB uses a letter-quality printer. These parameter entries indicate that you want four copies of the file Manual to be printed on the letter-quality printer. The printer pauses before printing this file to allow installation of the Courier print wheel.

Record

The **Record** command copies a sequence of commands into one file, which you then can enter as a single operation.

Command Form

```
Record
  File to record on _____________________
```

Parameters

File to record on

specifies the name of the file containing the commands being recorded.

Example

```
Record
  File to record on              Example.sub
```

The commands you enter in this example are recorded (until **Stop Record** is executed in the file Example.Sub).

When you call up a command file with the **Submit** command, parameters entered for Executive forms in 132-column mode may not fit in 80-column mode.

Remove Command

The **Remove Command** operation deletes a command name from the Executive. The Executive will no longer recognize the command nor include it in the listing when you press **HELP**.

Command Form

```
Remove Command
  Command name          _____________________________
  [Command file]        _____________________________
```

Parameters

command name

specifies the name of the command you want to remove.

Do not abbreviate command names. Enclose the command name in single quotes ('...') if it includes spaces.

[Command file]

allows modification of command files other than the one currently in use.

Example

To remove the **Delete** command, enter the following:

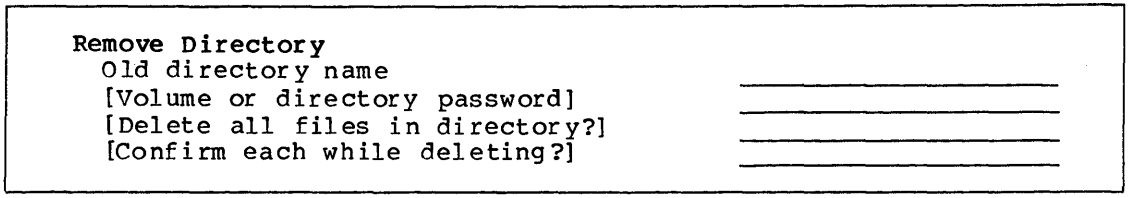
```
Remove Command
  Command name          Delete_______________________
  [Command file]        _____________________________
```

The Executive no longer recognizes the **Delete** command.

Remove Directory

The **Remove Directory** command deletes an empty directory from a disk volume. You must elminate all the files from the directory before removing it.

Command Form



Parameters

Old directory name

specifies the name of the directory you want to remove. If the directory is not on the signed-on volume, then you must enter a directory specification in the form [volname]<dirname>.

[Volume or directory password]

specifies the password for the volume or the directory. The default is none.

[Delete all files in directory]

specifies the files in the directory which you want to delete.

[Confirm each while deleting?]

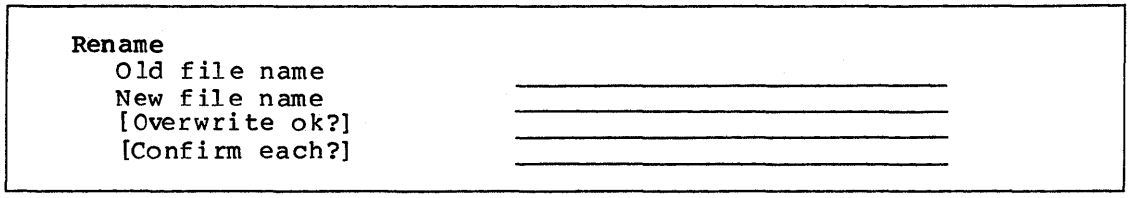
Enter the letter y for YES to confirm the deletion of any files remaining in the directory before it is removed.

Enter the letter n for NO to suppress confirmation before deletion. The default value is NO.

Rename

The **Rename** command is used to change the name of a file.

Command Form



Parameters

Old file name

specifies the file name you want to change. You can use the wild card character (*) in one part of the file specification (either the file name or the directory name, but not both).

New file name

specifies the new name for the file. You can use the wild card character (*) in this field.

[Overwrite ok?]

If you enter the letter **y** for YES, the system assigns the new file name to the old file; however, if the new file name already exists, the system deletes that file and assigns the new file name to the old file.

If you enter the letter **n** for NO the screen displays the following prompt:

File: File name already exists Overwrite?
(Press **GO** to confirm, **CANCEL** to deny, or **FINISH** to stop command.)

The default value is NO.

[Confirm each?]

If you enter the letter y for YES, then the system prompts you to confirm each rename operation. Confirm it by pressing **GO**, deny it by pressing **CANCEL**, or stop renaming files by pressing **FINISH**.

By entering n for NO, the system does not prompt you for confirmation. The default value is NO.

Example

To rename a file form "Letters" to "Correspondence", make the following entries in the command form:

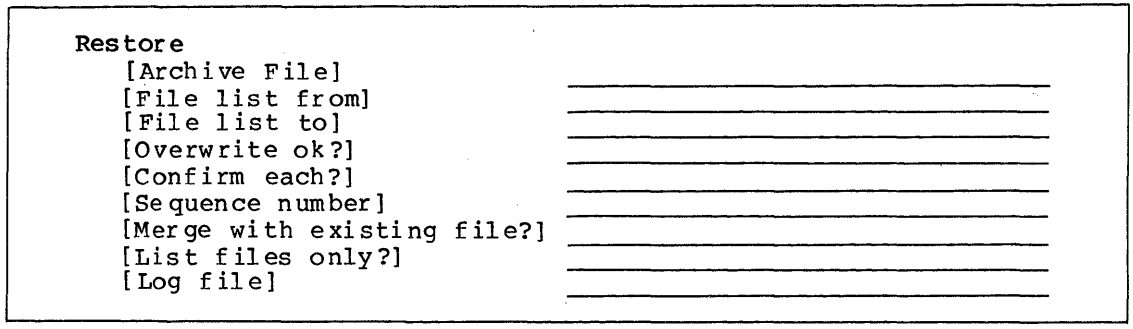
Rename	
Old file name	Letters
New file name	Correspondence
[Overwrite ok?]	
[Confirm eacn?]	

Refer to section 3 for a discussion of the wild card character (*).

Restore

The **Restore** command moves files from an archive file onto a volume.

Command Form



Parameters

[Archive file]

specifies the name of an archive file which the **Backup Volume** or **Selective Backup** utilities create. The default file name is [Archive]<Sys>.

An archive file can extend across more than one volume. When it does, it splits into files named

[Archive]<Sys>.01,[Archive]<Sys>.02, etc.

[File list from]

specifies the files you want to restore. The file specifications are in the form

<dirname>filename

No volume name is permitted. If you accept the default by leaving the field blank, the system restores all the files on the archive file. You can use the wild card character (*) for the directory name and the file name. To restore an entire directory, enter

<dirname>*

[File list to]

specifies the files which receive the restored files. The file specifications are in the form

[volname]<dirname>filename

The volume name and directory name are optional. If you enter only a file name, the system restores the files to the currently signed on volume and directory.

If you accept the default by leaving the field blank, the system restores the files to the same directory and file as when they were archived; however, they are restored to the currently signed on volume.

You can use the wild card character (*) for the directory name and the file name; the wild card character follows the same conventions as in the Executive mode.

[Overwrite ok?]

If you enter the letter **y** for YES, the system automatically deletes any existing file of the same name before restoring a new one.

If you enter the letter **n** for NO, the system prompts you for confirmation before it deletes any existing file.

[Confirm each?]

If you enter the letter **y** for YES, the system prompts you for confirmation before restoring the file.

If you enter the letter **n** for NO, the **Restore** operation proceeds without user interaction.

[Sequence number]

specifies the volume with which you begin the **Restore** operation. The default value is 1, (the first volume of the archive file).

If the **Restore** operation does not begin with the first volume, the system creates any required directories 10 sectors in size, which are unprotected.

[Merge with existing file?]

Enter the letter **y** for YES to bypass overwriting the sectors of the target file, if you cannot read the corresponding sectors of the archive file.

If you enter the letter **n** for NO, the system overwrites the sectors of the target file with zeros if it detects any input/output error on the archive file.

[List files only?]

Enter the letter **y** for Yes to list the files on the archive file; it does not restore them. The default value is NO.

[Log file]

specifies the name of the file to which the system writes a report of the **Restore** operation (for example, Errors).

If a log file currently exists, the system appends the log to it. If a log file does not exist, the system creates one.

If you do not specify a log file, the log appears on the display only.

Examples

Example 1: Volume Restore

To restore all the files from the default archive file to the default volume (the currently signed on volume), leave all the fields blank.

Restore

[Archive File]	_____
[File list from]	_____
[File list to]	_____
[Overwrite ok?]	_____
[Confirm each?]	_____
[Sequence number]	_____
[Merge with existing file?]	_____
[List files only?]	_____
[Log file]	_____

The system prompts you to mount volume 1:

```
Please mount [Archive]<Sys>.01
(Press GO to confirm, CANCEL to deny, or FINISH to
return to the Executive.)
```

If you mount the wrong volume, the system repeats the prompt. The **Restore** operation creates all required directories on the default volume if they do not already exist. It then restores all the files from [Archive]<Sys> to the default volume. As the system restores each volume of [Archive]<Sys>, it prompts you to mount the next volume:

```
Please mount [Archive]<Sys>.02
(Press GO to confirm, CANCEL to deny, or FINISH to
return to the Executive.)
```

Example 2: Selective Restore to Old Specifications

To restore all files from the Work1 and Work2 directories of the archive file [060181]<Sys> to the same specifications they had when backed up, fill in the command form as follows:

```
Restore
   [Archive File]                  [060181]<Sys>
   [File list from]                <Work1>* <Work2>*
   [File list to]
   [Overwrite ok?]
   [Confirm each?]
   [Sequence number]
   [Merge with existing file?]
   [List files only?]
   [Log file]
```

The system prompts you to mount volume 1:

```
Please mount [060181]<Sys>.01
(Press GO to confirm, CANCEL to deny, or FINISH to
return to the Executive.)
```

If you mount the wrong volume, the system repeats the prompt. The **Restore** operation creates the directories Work1 and Work2 on the default volume, if they do not already exist. It then restores all the files from Work1 and Work2 directories of the default volume. As the system restores each volume of [060181]<Sys>, the system prompts you to mount the next volume:

```
Please mount [060181]<Sys>.02
(Press GO to confirm, CANCEL to deny, or FINISH to
return to the Executive.)
```

Example 3: Selective Restore to New Specifications

To restore all the files from the Work1 directory to the X directory of the Win2 volume and all files from the Work2 directory to the Util directory of the default volume, enter

```
Restore
   [Archive File]
   [File list from]              <Work1>* <Work2>*
   [File list to]                [Win2]<X>* <Util>*
   [Overwrite ok?]
   [Confirm each?]               Yes
   [Sequence number]             3
   [Merge with existing file?]
   [List files only?]
   [Log file]                    [Spl]
```

The **Restore** operation starts from the third volume of the default archive file, confirms each file before restoring it, and sends the log to the Printer Spooler.

The system prompts you to mount volume 3:

> Please mount [Archive]<Sys>.03
> (Press GO to confirm, **CANCEL** to deny, or **FINISH** to return to the Executive.)

If you mount the wrong volume, the system repeats the prompt. The **Restore** operation then creates the directories X (on the Win2 volume) and Util (on the default volume), 10 sectors in size and unprotected, if they do not already exist. It then restores the files from the Work1 directory to the [Win2]<X> directory and the files from the Work2 directory to the Util directory on the default volume. Before restoring each file, the system displays the following prompt:

> Restore x?
> (Press GO to confirm, **CANCEL** to deny, or **FINISH** to return to the Executive.)
>
> where x is the file specification of the file to be restored.

As the system restores each volume of [Archive]<Sys>, the system prompts you to mount the next volume:

> Please mount [Archive]<Sys>.04
> (Press GO to confirm, **CANCEL** to deny, or **FINISH** to return to the Executive.)

Example 4: Restoring from Two Archive Disks

To restore all the files from two sets of archive files (with the default name Archive) to the default volume, use the first archive file and leave all the fields blank (as in Example 1).

If the system restores the first archive file without error, further restoration is unnecessary. If the system detects errors, however, use the second archive file and execute **Restore** again. For this example, assume that the system reported errors in the files Mon1 and Mon2 in the Work directory. Also assume that these files begin on the third volume of the archive file.

Mount the second archive file, enter the **Restore** command, and fill in the command form as follows:

```
Restore
   [Archive File]
   [File list from]              <Work>1Mon1  <Work>Mon2
   [File list to]
   [Overwrite ok?]               Yes
   [Confirm each?]
   [Sequence number]
   [Merge with existing file?]
   [List files only?]
   [Log file]
```

The **IVolume** utility already may have been used to reinitialize the volume onto which the system restores the files, or the volume already may have files on it. If the volume already contains a file with the same file specification as one on the archive file, the **Restore** operation deletes and replaces it at your option.

In the volume restore mode, the system restores an entire archive file to a volume. If you accept the defaults by leaving the fields blank on the system command form, the system copies all files to the currently signed on volume. It restores each file with the same characteristics (creation date, protection level, etc.) it had when backed up.

In the selective restore mode, the system restores individual files or directories. Specify the list of files in the [File list from] parameter field in the **Restore** command form. Specifying a list of files in the [File list to] field restores the files to a new destination. Accepting the default in [File list to] field restores the files to the same directory and file names as when they were archived; however, it restores them to the currently signed on volume. Files specified in the [File list from] field must match in number the files specified in the [File list to] field.

NOTE

Because [volname] is not permitted in the [List file from] parameter field on the cluster workstation with a local floppy disk, restoration can take place only from the local floppy.

For example, you can restore the files from directory Work1 to a new directory, Work2. Specify <Work1>* in the [File list from] field and <Work2>* in "[File list to]."

The system usually reads each volume of the archive file in sequence starting with the first. When restoring selected files, however, it is possible to begin with the sequence number of the first volume of the archive file that contains one of the files to be restored. Although the restoration can start out of sequence, each volume of the archive file must be loaded in sequence after that (for example: 3, 4, 5, or 7, 8, 9).

CAUTION

Only the first volume of the archive file maintains directory information. Thus, when the operation begins from a volume other than the first, the system creates any required directory 10 sectors in size and unprotected. If 10 sectors are insufficient, create a directory of the proper size before activating the **Restore** command.

The system reports the following statistics at the end of the **Restore** operation:

- Number of files processed:
  indicates the number of files read.

- Number of files successfully backed up:
  indicates the number of files that the system successfully retrieved from the archive file and placed on the destination volume without errors.

- Number of files with input/output errors in data:
  indicates the number of restored files, but contains input/output errors in the data portion of the file.

- Number of files with missing header information:
  indicates the numbr of files that had unrecoverable header information. Unless you enter the letter y for YES in the [List of files only?] field, the system restores all such files to temporary files named &Restore.n (where n represents a system-assigned number).

- Number of files not successfully restored:
  indicates the number of files that the system could not correctly restore to destination volume. The causes include invalid files specification, nonexistent volume, etc.

- Number of files not recoverable:
  indicates the number of files that the system could not recover. Input/output errors on the archive file rendered the entire header and data portion of the file unreadable.

Note that some files can belong in multiple categories. For example, a file with missing file header information also can have input/output errors in the data portion.

Refer to section 3 for a discussion of the wild card character (*).

Run File

The **Run File** command activates the user program specified in the command form. You use this command to run programs that cannot be implemented using the **New Command** operation. The Executive passes the optional parameters to the program.

Command Form

```
Run File
   File name          _____________________
   [Parameters]       _____________________
```

Parameters

File name

specifies the name of the file containing the program you want to run.

[Parameters]

specifies the parameters for the program you want to run. The default is no parameters.

Example

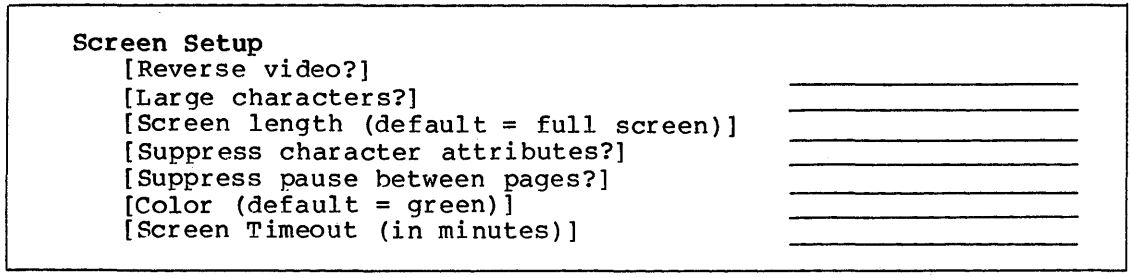
```
Run File
   File name          WP.Run
   [Parameters]       Datafile  Output
```

This example runs the FORTRAN program named WP.run. This program requires two parameters: the name of a file containing data, and a file to contain the program output. Data appears in the file Datafile, while the file named Output stores the output of the program.

Screen Setup

The **Screen Setup** command changes one or more display attributes.

Command Form



Parameters

[Reverse video?]

Enter the letter **y** for YES to display dark characters on a light background.

Enter the letter **n** for NO to display light characters on a dark background. The default value is NO.

[Large characters?]

Enter the letter **y** for YES if you want the screen 80 columns wide. The default value is NO (that is, 132 columns wide).

[Screen length (default = 34 lines)]

specifies the number of lines on the screen. If you specify a screen length of less than 34 lines, the amount of memory used by the display is reduced.

[Suppress character attributes?]

If you enter the letter **y** for YES, the display has a reduced amount of memory. The command form field does not have a reversed video highlight.

If you enter the letter **n** for NO, the system does not suppress character attributes. The default value is NO.

[Suppress pause between pages?]

If you enter the letter **y** for YES, the system does not pause between pages.

If you enter the letter **n** for NO, the system prompts you to press the **NEXT PAGE** key before scrolling any information off the screen. The default value is NO.

[Color (default = green)]

Allows you to select a default color for the display on color workstations.

[Screen Timeout (in minutes)]

Sets a time limit when the screen will automatically turn off if no keys are pressed.

If you accept the default by leaving the parameter field blank, the screen will not automatically turn off.

Example

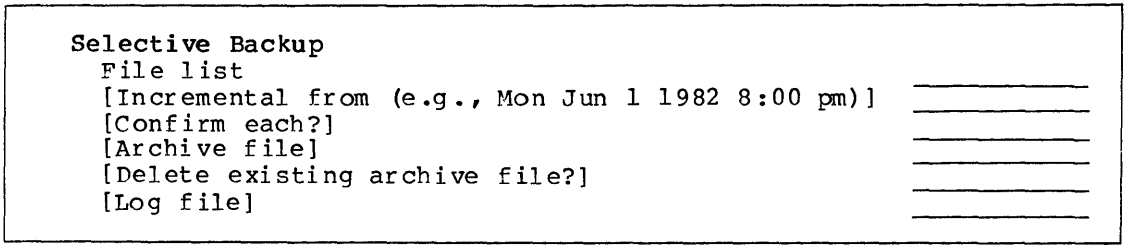
```
Screen Setup
     [Reverse video?]
     [Large characters?]
     [Screen length (default 34 lines)]      27
     [Suppress character attributes?]
     [Suppress pause between pages?]
```

This example specifies a change in the number of lines on the screen from 34 (the default) to 27. The system assigns the default values to all other parameters.

Selective Backup

The **Selective Backup** command copies individual files or directories from one volume to an archive file, thus allowing archiving of personal files and requiring only read access to these files.

Command Form



Parameters

File List

specifies a list of the files you want to back up. The list can include single files, directories, or sets of files (using wild card characters).

You can include a password to any file specification by appending a password to that file specification. For example,

<Work1>* ABC

uses ABC as the password to access all the files in the Work1 directory. ABC appears as ### on the screen.

[Incremental from (for example, Mon Jun 1 1982 8:00 pm)]

specifies the date and time from which you want to back up files. The system backs up only files modified on or after the specified date. The time is optional.

If you accept the default by not specifying a date, the system backs up all files. If you do not specify a time, the system backs up all files from 12:00am (midnight) of the specified day.

[Confirm each?]

If you enter the letter **y** for YES, the system prompts you for confirmation before prompting you to supply each file.

If you enter the letter **n** for NO, the system backs up the files without individual file confirmation. The default value is NO.

[Archive file]

is the name of the archive file you want to create.

If you do not specify a file, **Selective Backup** creates one named [Archive]<Sys>.nn, where nn represents a number supplied by the system. This is the default.

If you specify a volume name other than Archive, you must also specify a directory name so that adding a sequence number produces a valid file specification.

For example, specify [Xyz]<Sys> to get [Xyz]<Sys>.01
[Xyz]<Sys>.02, etc.

or [Xyz]<Sys>Abc to get [Xyz]<Sys>Abc.01
[Xyz]<Sys>Abc.02, etc.

[Delete existing archive file?]

Enter the letter **y** for YES to automatically overwrite any existing archive file.

If you enter the letter **n** for NO, the screen displays the following prompt if the archive file already exists:

> File already exists. Delete? (Press GO to confirm, **CANCEL** to deny, or **FINISH** to return to the Executive.)

[Log file]

specifies the name of the file to which the system writes a report of the backup (for example, BackupLog).

If a log file currently exists, the system automatically appends the log to it. If not, the system creates one.

If you do not name a log file, the log appears only on the display.

Example

Archiving an Entire Disk

This example shows how to archive all the files on volume ABC to an archive file. This is similar to **Backup Volume** with no verification.

```
Selective Backup
  File list                                                  [Abc]<*>8
  [Incremental from (e.g., Mon Jun 1 1981 8:00 pm)]
  [Confirm each?]
  [Archive file]
  [Delete existing archive file?]
  [Log file]
```

Archiving User Directories

This example shows how to archive the user directory Work2.

```
Selective Backup
  File list                                                  [Win]<Work2>*
  [Incremental from (e.g., Mon Jun 1 1981 8:00 pm)]
  [Confirm each?]
  [Archive file]
  [Delete existing archive file?]
  [Log file]
```

Archiving A List of Files

This example shows how to archive a list of files to an archive file. You create a file containing the list of files to be archived. In this example, the list is contained in the file Myfile.

```
Selective Backup
  File list                                                  @Myfile
  [Incremental from (e.g., Mon Jun 1 1982 8:00 pm)]
  [Confirm each?]
  [Archive file]
  [Delete existing archive file?]
  [Log file]
```

After you fill in all the necessary fields in the command form, the system verifies the consistency of the specified parameters and opens the log file (if you specify one). It prompts you to mount the first volume of the archive file.

Mount the appropriate volume, then press GO. The system creates the archive file. If the file already exists and you specify YES in the [Delete existing archive file?] parameter field, the system overwrites it. Otherwise, it requests verification before overwriting the file.

The system opens each file to be archived and copies it to the archive file, then lists each file as it is archived. If any sectors of a file are unreadable, the system writes status information to the archive file. When the **Restore** utility encounters this information, it reports that it cannot restore the specific sectors and continues operation.

Activating the **Selective Backup** command does not archive system files such as FileHeaders.Sys and Mfd.Sys.

CAUTION

> The **Selective Backup** operation does not copy directory information to the archive file. When the system restores the archive file, it creates any needed directories with a default size of 10 sectors and a default protection level of 15. If it needs larger directories or a different protection level, you must create the directories before the restore operation begins.

Set File Prefix

The **Set File Prefix** command sets the default file prefix the system adds to file specifications when you omit the volume and directory.

Command Form

```
Set File Prefix
   Default file prefix _____________________
```

Parameters

Default File Prefix

specifies the default file prefix name.

Example

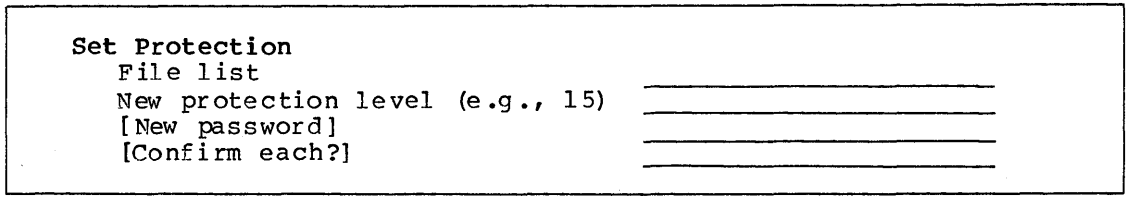
To set the default file prefix to "Expenses", enter it as follows:

```
Set File Prefix
   Default file prefix Expenses>_____________
```

Set Protection

The **Set Protection** command assigns a new protection level and, at your option, a file password to each file you specify in the File list field.

Command Form



Parameters

File list

specifies the list of files you want to protect.

New protection level (e.g., 15)

allows a choice of eight different levels of protection:

Decimal Value	Level
15	Unprotected
5	Modify protected
0	Access protected
7	Modify password
3	Access password
1	Read password
23	Nondirectory modify password
19	Nondirectory access password

[New password]

specifies a new password assignment (required if you choose one of the following new protection levels: 7, 3, 1, 23, or 19).

If you accept the default by leaving the field blank, no password is assigned.

[Confirm each?]

If you enter the letter y for YES, the system prompts you for confirmation before setting the protection level of each file.

Press GO to begin the operation. Skip to the next file by pressing **CANCEL**, or stop setting file protection levels by pressing **FINISH**.

If you specify NO or accept NO as the default value by leaving the field blank, the system will not prompt you for confirmation.

Example

```
Set Protection
   File list                          Jones*
   New protection level (e.g., 15)    7
   [New password]                     PR
   [Confirm each?]
```

By setting the protection level at 7 for all files containing the file name Jones, only a user who knows the proper password (PR) can modify these files.

Set Time

The **Set Time** command sets the system clock. In a cluster workstation, this sets the system clock for the entire cluster configuration.

Command Form

```
Set Time
     Date/Time (e.g., Mon Jun 1, 1981 8:00 pm)  _____________
```

Parameters

Day of Week

specifies the current day. Enter only enough of the name to identify it. For example, **mo** specifies Monday.

Month

specifies the current month. Enter only enough of the name to identify it. **Ja** specifies January.

Day of Month

specifies the current date. Enter a number between 1 and 31.

Year

specifies the current year. You can enter either two or four digits (19 is optional).

Abbreviated Month, Date, and Year

specifies the current month, date (day of month), and year, combined into an abbreviated form (for example, 6/1/82 for June 1, 1982).

Time

specifies the current hour, minute, and optional time qualifier (AM, PM, Noon, or Midnight).

If you omit the optional qualifier, the system interprets a time between 7:00 and 11:59 as AM, while a time between 12:00 and 6:59 becomes PM. To specify a time before 7:00 AM or after 7:00 PM, include AM or PM.

You may use the 24-hour notation of two digits to specify the hour. For example, 09:21 is 9:21 AM, and 14:22 is 2:22 PM.

Signon

Signon allows you to enter your name, password, and the date and time of the session. You must successfully sign on to the system before executing any other commands.

Command Form

```
            BURROUGHS B 20 OPERATING SYSTEM BTOS X.X

User name                                          _____________
Password                                           _____________
Day/Date/Time (e.g., Fri Sep 9, 1983 8:00 am)      _____________
```

Parameters

User name

specifies the user's name, as the system administrator preconfigured it.

Password

specifies the user's password, as the system administrator preconfigures it. When you enter the password, the system displays each character as a pound sign (#).

Day/Date/Time (e.g., Fri Sep 9, 1983 8:00 am)

specifies the current day, date and time. If the system clock is not set, enter a valid date and time in this field.

Day of Week

specifies the current day. Enter only enough of the name to identify it. For example, **mo** uniquely specifies Monday.

Month

specifies the current month. Enter only enough of the name to identify it. For example, **Ja** uniquely specifies January.

Day of Month

specifies the current date. Enter a number between 1 and 31.

Year

specifies the current year. You can enter either two or four digits (19 is optional).

Abbreviated Month, Date, and Year

specifies the current month, date (day of month), and year, combined into an abbreviated form (for example, 6/1/82 for June 1, 1982).

Time

is the current hour and minute and an optional time qualifier (AM, PM, Noon, or Midnight).

If you omit the optional qualifier, the system interprets a time between 7:00 and 11:59 as AM, while a time between 12:00 and 6:59 becomes PM. To specify a time before 7:00 AM or after 7:00 PM, include AM or PM.

You may use the 24-hour notation of two digits to specify the hour. For example, 09:21 is 9:21 AM, and 14:22 is 2:22 PM.

Example

A user named Jack, whose password is sword, signs on as follows:

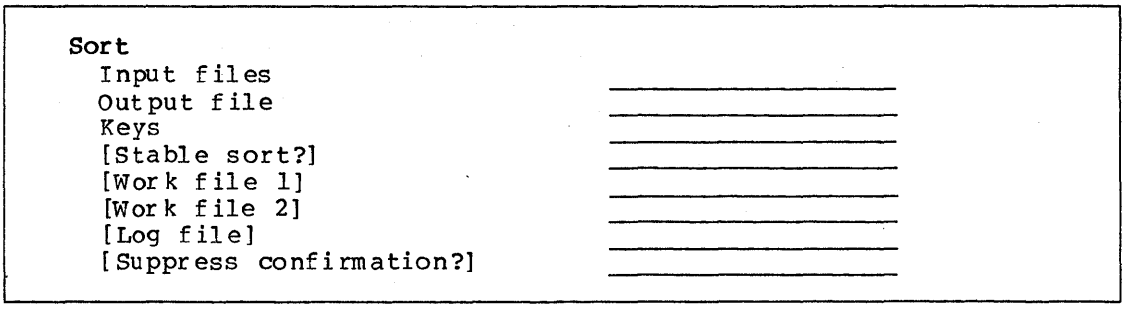
```
User name                                  Jack
Password                                   sword
Day/Date/Time (e.g., Wed 5/5/82 8:00 am)   Wed Jun 9 1982 7:00 AM
```

Once the system executes the Signon, the day, date, and time appear in the upper right corner of the display as long as the display remains on. The system updates the time continuously.

Sort

The **Sort** command separates preexisting files of data records according to sort keys embedded within those data records. The files can be any files readable using RSAM. RSAM or DAM may have created the files, or they may be the data store file of an ISAM data set. In the latter, the result of the sort is a file accessible with RSAM or DAM but not a new ISAM data set. The **Sort** command has special features for handling files containing malformed records.

Command Form



Parameters

Input files

specifies a list of one or more files to be sorted. Separate the file names with spaces; do not use commas. Each one must be an RSAM file, a DAM file, or an ISAM data store file. The system sorts all valid records in these files, but skips deleted records.

Output File

specifies the name of a file to which the system writes the sorted output using RSAM. If all of the input records have the same size, however, the output file is accessible with either DAM or RSAM.

specifies how sort keys are embedded within each data record. Although the input records may be of varying lengths, the records must all have a prefix of a common, fixed length containing the sort keys. If the sort is a multilevel sort, there are several specifications in this field. Each specifies one component of the sort key. Separate the specifications with spaces; do not use commas. If more than one specification exists, the earlier ones are more significant than the later ones in determining sort order. Each key component specification has the following form:

```
TypeName:Length.Offset.AorD
```

where TypeName specifies the internal representation of the key component. TypeName is a Binary, Byte, Character, Decimal, LongReal, or ShortReal string. Upper- or lowercase letters are not significant (for example, ShortReal and Shortreal are equivalent). Also, you may use any unique abbreviation in place of a fully spelled TypeName (for example, C or Char for Character). The meanings of these types are as follows:

- Binary: the key component is a 16-bit unsigned number. You must omit the colon and Length following this TypeName.

- Byte: the key component is a sequence of binary bytes of length specified by Length.

- Character: the key component is a sequence of text characters of a length specified by Length. For purposes of sorting, lowercase alphabetical characters (61h through 7Ah) are mapped to the corresponding uppercase alphabetical character (41h through 5Ah). Thus "a" is equivalent to "A".

- Decimal: the key component is a packed decimal number. The number of digits in the packed decimal number is specified by Length and must be in the range 1 through 18.

- LongReal: the key component is an 8-byte real number. You must omit the colon and Length following this TypeName.

- ShortReal: the key component is a 4-byte real number. You must omit the colon and Length following this TypeName.

Length specifies the length of the key component as a positive decimal number. The system interprets this number according to the TypeName it modifies (as described earlier).

Offset is a decimal number that specifies the relative byte position of the key component within a data record. For example, an offset of 0 specifies that the key component starts at the beginning of the record.

A or D specifies one of the following:

- A requests that the records be arranged so that this key component is in ascending order.
- D requests that the records be arranged so that this key component is in descending order.

The system determines sort order according to the type of key component. Thus, negative real numbers are understood to be smaller than positive real numbers, and negative-packed decimal numbers are understood to be smaller than positive-packed decimal numbers.

For example, suppose the records to be sorted have the following form:

Offset	Field	Length	Type
0	Name	18 bytes	Character
18	Address	80 bytes	Character
98	Category	2 bytes	Binary
100	Identification Number	8 digits	Decimal

To sort these records in ascending order by Name and descending order by Identification Number, fill in the field Keys with

```
Character:18.0.A      Decimal:8.100.D
```

To sort these records in descending order by Identification Number, ascending order by Category, and ascending order by Name, fill in the field Keys with:

```
Decimal:8.100.D  Binary.98.A  Character:18.0.A
```

[Stable sort?]

specifies whether a sort is to be stable. A sort is stable if input records whose sort keys are equal always appear in the output in the same order as they appear in the input. If you enter the letter n for NO or accept NO as the default by leaving the field blank, a stable sort is not required. Specify a stable sort only if necessary, since the sort takes longer as a result.

[Work file 1] and [Work file 2]

are the names of files that the Sort/Merge facility uses as work files. The default is no specification of work files; that is, if you do not enter parameters in these optional fields, the work files are placed on the currently logged-in volume and directory and named SortWorkfile1.dat currently and SortWorkfile2.dat.

Activating the **Sort** command requires a pair of work files, each approximately the same size as the input data. If you specify files that currently exist, the Sort/Merge facility opens these files. If you specify files that do not exist, the system temporarily creates them for the **Sort** operation.

To enhance the sort's efficiency, make the records in each work file physically contiguous, and place them on different physical volumes. To make a file's records physically contiguous, either create the file when the disk is not very full, or after the file exists and has its maximum length, use the **Backup**, **Initialize Volume**, and **Restore** utilities.

[Log file]

specifies the name of a file which receives sort statistics and status codes. If you accept the default by leaving the field blank, no log file will be produced. (All sort statistics and status codes appear in any case.)

The system computes the following statistics and writes them in the log file: number of records, number of bytes of data, number of merge passes, and elapsed time.

[Suppress confirmation?]

Enter the letter **y** for YES to proceed automatically from the detection of malformed input records. By entering the letter **n** for NO you gain control each time malformed input occurs. The default value is NO.

For more information, refer to the *B 20 Systems Sort/Merge Reference Manual*.

Spooler Status

The **Spooler Status** command displays the status of printers and printer scheduling queues, and provides a variety of subcommands from which you select and control a printer and queue. The subcommands are as follows:

A - Align Form
C - Cancel Print
D - Delete Print Request
E - Enter Password
F - Free Printer Channel
H - Halt Printer
M - Main Status Display
N - New Printer
P - Print File
Q - Select Queue
R - Restart Printer
S - Select Printer

The **Spooler Status** command displays a listing of applicable subcommands.

Command Form

There is no form or parameters for the **Spooler Status** command.

Example

Enter **Spooler Status** in the command prompt. The following status report appears:

```
Spooler X.XX                                  User Name:  Joe
Path:  [Win]<Sys>                             Tues Nov 10, 1981 10:00 AM

Printer Name    Queue Name    Status

Parallel        Spl           Printing
                              [Win]<Sys>New.Txt
Serial 1        SPLB          Paused
                              Please change print wheel to A
                              [Win2]<Current>Aws.Doc
Serial 2        SPLB          Paused
                              Please enter the appropriate
                              password
                              [Win]<Private>Letter

Commands        <To invoke a command, enter the character shown.
                To exit the program, press FINISH.>

N - New Printer        Q - Select Queue        S - Select Printer
```

New Printer, Select Queue, and Select Printer are the only subcommands you can select from this menu. Other subcommands for the **Spooler Status** command can be used when you have selected the Select Queue or Select Printer subcommand.

Example

The following is an example of the Printer and Scheduling Queue status after you activate the Select Printer subcommand and enter a printer name in the Select Printer: Printer Name command form.

```
Spooler X.XX                          User Name:  Joe
Path:  [Win]<Sys>                     Tues Nov 10, 1981 10:00 AM

Printer:                              B9252
Status:                               Paused
                                      Please change print wheel to A
                                      [Win]<Sys>Aws.Doc
Printer Description:                  SerialB, Standard print wheel,
                                      standard forms
Configuration File:                   [Sys]<Sys>SplBConfig.Sys
Location:                             Cluster workstation

Queue:                                SPL
Served by:                            B9251-1, B9252
Files Queue                           Priority
[Win]<Sys>Aws.Doc                        2
[Win]<Joe>A                              2
[Win2]<File>File                         3
[Win1]<Sys>SplDoc                        4
[Win1]<Sys>SplDoc                        4
[Win1]<Mary>Memorandum101                5
[Win2]<Frank>SalesOrder                  5

Press NEXT PAGE to continue, or CANCEL to stop listing.

Commands:  To invoke a command, enter the character shown.  To
           exit the program, press FINISH.

A - Align form          F - Free printer        N - New printer
C - Cancel print            channel             P - Print file
D - Delete print        H - Halt printer        Q - Select queue
    request             M - Main status         R - Restart printer
E - Enter password          display             S - Select printer
```

The subcommands listed on the Printer and Scheduling Queue status menu are explained in the following paragraphs. For clarity, the New Printer, Select Printer, and Select Queue subcommands are included in this list.

Subcommands

A - Align Form Subcommand

You can use Align Form to check form alignment. Align the form while the printer pauses automatically and then activate the Align Form subcommand. The printer reprints the first page and pauses again, allowing you to align the form if necessary.

To restart the printer, activate the Restart Printer subcommand (see Restart Printer later in this section).

```
Align Form
     Press GO to execute, CANCEL to deny, or FINISH to exit.
```

C - Cancel Print Subcommand

Cancel Print cancels the current printing request.

```
Cancel Print
     Press GO to Execute, CANCEL to deny, or FINISH to exit.
```

D - Delete Print Request Subcommand

Delete Print Request deletes the queue entry for the specified print request from the scheduling queue.

```
Delete Print Request
     File list
          Press GO to execute, CANCEL to deny, or FINISH to
          exit.
```

File list is the list of file specifications previously specified in the print request..

E - Enter Password Subcommand

Enter Password allows you to enter a password when the printer pauses in response to the security mode request given in the **Print** command or the Print Files subcommand of the **Spooler Status** command. The file is not printed until you enter the password at the workstation connected to the printer.

Enter Password
Password
Press GO to execute, **CANCEL** to deny, or **FINISH** to exit.

F - Free Printer Channel Subcommand

Free Printer Channel frees a printer channel from the printer spooler's control. Enter the channel code that specifies the printer channel connected to the printer. ("0" is the parallel channel, "A" is channel A, and "B" is channel B.)

Free Printer Channel
Press GO to execute, **CANCEL** to deny, or **FINISH** to exit.

H - Halt Printer Subcommand

Halt Printer halts the printer.

Halt Printer
Press GO to execute, **CANCEL** to deny, or **FINISH** to exit.

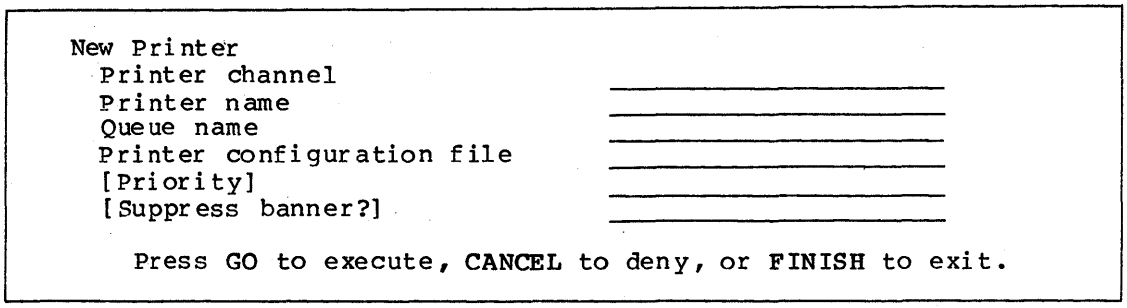
M - Main Status Display Subcommand

Main Status Display redisplays the main status display.

N - New Printer Subcommand

New Printer places a specified printer under control of a printer spooler and redisplays the main status.

Subform



Parameters

Printer channel

is a single-character code that specifies the printer channel connected to the printer.

0	is the parallel printer
A	is channel A
B	is channel B

Printer name

specifies the new printer.

Queue name

specifies the scheduling queue associated with the printer.

Printer configuration file

is the file created by the **Create Configuration File** command and describes the printer parameters.

[Priority]

is the priority (10-254, with 10 the highest) of the printer spooler process. The default is 10. A priority lower than 128 (the default priority of the interactive application system) ensures that the printer spooler does not impact the interactive application system.

[Suppress banner?]

If you enter the letter **y** for YES, the printer does not transcribe the banner page at the beginning of the file.

If you enter the letter **n** for NO, the printer transcribes the banner page at the beginning of the file. The default is NO.

P - Print Files Subcommand

Print Files generates a queue entry for printing a specified list of files and adds it to the scheduling queue.

Subform

```
Print Files
      File list                          _____________________
      [Number of copies]                 _____________________
      [Delete after printing?]           _____________________
      [Special Forms Name]               _____________________
      [Print wheel name]                 _____________________
      [Printing mode]                    _____________________
      [Align form?]                      _____________________
      [After date time]                  _____________________
      [Security mode?]                   _____________________
      [Priority]                         _____________________
      [Confirm each?]                    _____________________

     Press GO to execute, CANCEL to deny, or FINISH to exit.
```

Parameters

File list

specifies a list of file specifications you want to print.

[Number of copies]

specifies the number of copies made of each file. The default value is 1.

[Delete after printing?]

Enter the letter **y** for YES to delete the file after printing. The default value is NO.

[Special forms name]

specifies the name (up to 12 characters long) of the special paper on which you want the file to be printed. If you enter a name, the printer pauses before printing so that you can load the special paper.

To restart the printer, use the Restart Printer subcommand.

[Print wheel name]

is the name (up to 12 characters long) of the print wheel you want to use to print the file. If you specify a name, the printer pauses before printing so that you can change the print wheel.

To restart the printer, use the Restart Printer subcommand.

[Printing mode]

is N for normal mode, I for image mode, or B for binary mode. The default value is normal mode.

[Align form?]

If you enter the letter y for YES, the printer pauses after printing the first page so that you can align the paper. To restart the printer, use the Restart Printer subcommand.

If you enter the letter n for NO, the printer does not pause for forms alignment.

[After date time]

is the date and time after which you want the file to be printed. A sample format is "Mon Jun 1 1981 8:00 pm". The default is to print as soon as possible.

[Security mode?]

If you enter the letter y for YES, the printer pauses before printing the file. The file is not printed until you enter a password at the workstation connected to the printer.

If you enter the letter n for NO, or accept NO as the default by leaving the field blank, the printer does not pause for a password before printing the file.

[Priority]

specifies the priority (0-9, with 0 the highest) at which the scheduling queue places the file for printing. The default is 5.

[Confirm each?]

Enter the letter **y** for YES to have the system prompt you for confirmation before it formats the file.

Enter the letter **n** for NO to format without user interaction. The default value is NO.

Q - Select Queue Subcommand

Select Queue displays a detailed status of the files listed in the specified scheduling queue.

To scroll to the end of a list that is longer than one screen, press the **NEXT PAGE** key. To stop the listing, press the **CANCEL** key. To redisplay the queue status, press the **PREV PAGE** key.

Select Queue provides five subcommands. When you enter the Delete Print Request or Print File subcommands, the system restores the previous display.

Subform

```
Select Queue
      Queue name                    _____________________

    Press GO to execute, CANCEL to deny, or FINISH to exit.
```

Parameter

Queue name

specifies the name of the scheduling queue for which you want to display status information.

Example

The following is a detailed status display of the files listed in the specified scheduling queue:

```
Spooler X.XX                          User Name:  Joe
Path:  [Win]<Sys>                     Tues Nov 10, 1981 10:00 AM

Queue:  SPL
Served by:  B9251-1, B9252
 Files Queued                                    Priority
[Win]<Sys>Aws.Doc                                   2
[Win]<Joe>A                                         2
[Win2]<File>File                                    3
[Win1]<Sys>SplDoc                                   4
[Win1]<Sys>SplDoc                                   4
[Win1]<Mary>Memorandum101                           5
[Win2]<Frank>SalesOrder                             5

Press NEXT PAGE to continue, or CANCEL to stop listing.

Commands:        To invoke a command, enter the character shown.
                 To exit the program, press FINISH.

D - Delete print request          Q - Select queue
M - Main status display           S - Select printer
P - Print file
```

R - Restart Printer Subcommand

Restart Printer restarts the printer after it has paused.

Subform

```
Restart Printer
     [Restart from page number]  _____________________

     Press GO to execute, CANCEL to deny, or FINISH to exit.
```

Parameter

[Restart from page number]

is the page number from which the printer is to restart printing. If you accept the default by leaving the field blank, the system restarts printing where the printer stopped. "0" means to restart the printer from the beginning of the current page.

S - Select Printer Subcommand

Select Printer displays a detailed status of the specified printer and of the files listed in the associated scheduling queue.

To scroll to the end of a list that is longer than one screen, press the **NEXT PAGE** key. To stop the listing, press the **CANCEL** key. To redisplay the printer status, press the **PREV PAGE** key.

Select Printer provides a list of subcommands that allows you to enter printer and queue control instructions. Execution of a subcommand (except for Free Printer channel, Main Status Display, New Printer, Select Queue, and Select Printer), restores the previous display.

Subform

```
Select Printer
     Printer name                    _____________________

 Press GO to execute, CANCEL to deny, or FINISH to exit.
```

Parameter

Printer name

specifies the name of the printer for which you want to display status information.

Stop Record

The **Stop Record** command stops recording keystrokes into a command file.

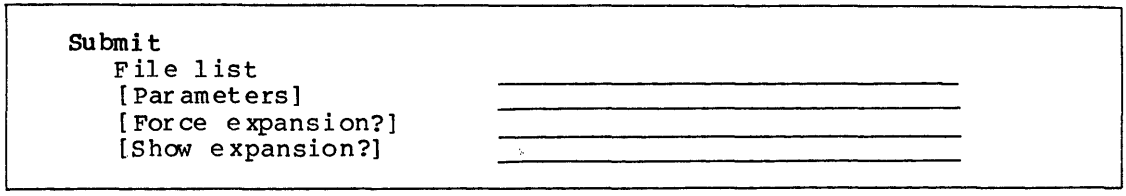
This command has no parameters.

For more information on recording files, refer to the Advanced Command Features Section in the *B 20 Systems Custom Installation and Reference Manual*.

Submit

The **Submit** command reads characters from a command file or submit file rather than from the keyboard. You can include a call to another submit file.

Command Form



Parameters

File list

specifies the name of the command or submit file(s) from which characters are read. The files are read sequentially. The **Record** command or the Editor can create files.

[Parameters]

specifies parameters (up to 10) that replace escape sequences in the form %n in the file(s) specified in the File list parameter field. The first parameter replaces all instances of %0, the second %1, and so on through %9.

[Force expansion?]

If you enter the letter **y** for YES, the system forces the expansion of submit escape sequences in a file even though you are not passing parameters. This may be necessary for nested conditional expansions. The default value is NO.

[Show expansion?]

Enter the letter **y** for YES in this parameter field to cause the file expansion to appear on the display. This is useful for debugging complicated conditional expansions. The default value is NO.

CAUTION

Parameters in a submit file that work properly when the screen is in 132-column mode may not fit if the screen is in 80-column mode.

For detailed information on how to use the **Submit** command, refer to the *B 20 Systems Custom Installation and Reference Manual*.

Type

The **Type** command displays each of the specified files on the display, one screen at a time.

Command Form

```
Type
   File list                    _____________________
   [Confirm each?]              _____________________
```

Parameters

File list

specifies the list of files you want to display.

You may use the wild card character (*) in this field.

[Confirm each?]

If you enter the letter **y** for YES, the system prompts you for confirmation before displaying each file. Skip to the next file you entered in the File list parameter field by pressing **CANCEL**, or stop displaying files by pressing **FINISH**.

If you enter the letter **n** for NO or accept NO as the default value by leaving the field blank, the system does not prompt you for confirmation.

Example

To display the file "Letters", enter the file name in the File list parameter field, as follows:

```
Type
   File list                    Letters_____________
   [Confirm each?]              _____________________
```

You cannot modify a file in this mode.

Refer to section 3, for a discussion of the wild card character (*).

Volume Status

The **Volume Status** command displays the status of the specified disk volume or of the volume mounted on the specified disk device.

Command Form

```
Volume Status
   [Volume or device name (e.g., Accounting)]
```

Parameters

[Volume or device name (e.g., Accounting)]

specifies the name of the disk volume or the disk device whose status you want.

The default is the currently signed-on volume.

Example

Enter the volume name (for example, Accounting) to display that volume's status, as follows:

```
Volume Status
   [Volume or device name (e.g., Accounting)] Accounting
```

The following is a sample **Volume Status** display:

Status of volume Win

Created	Dec 27, 1982 11:40 AM
Last modified	Jan 13, 1983 10:56 AM
Number of free pages	9638
Number of free file headers	213

Directory Name	Pages	Default Protection
$000	3	15
$001	3	15
$002	3	15
$003	3	15
SYS	7	5
SPL	3	15
wp	3	15
MyDirectory	3	15

This example indicates the volume name (Win), the date and time last modified (Jan 13, 1983 10:56 AM), the number of free pages (9638), the number of free file headers (213), and a list of all the directories on the volume Win.

A page is defined as one sector of 512 bytes.

APPENDIX A
GUIDE TO TECHNICAL DOCUMENTATION

This manual is one of a set that documents the B 20 family of information processing systems. The set can be grouped as follows:

Introductory and Planning

Burroughs B 20
Your *B 20 Installation Planning Guide*

Hardware Installation

B 20 Hardware Installation Instructions
AP 1302 Printer, Installation, Operation, and Maintenance Guide
B 9251-1 Printer, Installation, Operation, and Maintenance Guide
B 9252 Printer, Installation, Operation, and Maintenance Guide
B 20 Cluster Workstation Installation and Operations Guide
B 20 Mass Storage Unit Installation Instructions for Qualified Service Personnel

Operations Training

B 20 Operations - Learning To Use the System
B 20 Operations, Quick Reference Guide

BASIC Language

B 20 Systems BASIC Language - An Overview
B 20 BASIC Quick Reference Guide

Reference Manuals

B 20 Systems Standard Operations Guide
B 20 Systems Custom Installation and Reference Manual
B 20 Systems COBOL II Reference Manual
B 20 Systems Pascal Reference Manual
B 20 Systems FORTRAN Reference Manual
B 20 Systems Operating System (BTOS) Reference Manual Volume 1 and 2
B 20 Systems Debugger Reference Manual
B 20 Systems Editor Reference Manual
B 20 Systems Linker/Librarian Reference Manual

Reference Manuals

B 20 Systems System Programmer's Guide (Part 1-4.0)
B 20 Systems System Programmer's Guide (Part 2-3.0)
B 20 Systems Font Reference Manual
B 20 Systems Forms Reference Manual
B 20 Systems Indexed Sequential Access Method (ISAM) Reference Manual
B 20 Systems 2780/3780 RJE Terminal Emulator Reference Manual
B 20 Systems 3270 Terminal Emulator Reference Manual
B 20 Systems Asynchronous Terminal Emulator (ATE) Reference Manual
B 20 Systems Sort/Merge Reference Manual
B 20 Systems Batch Reference Manual

Following is a brief description of each B 20 manual:

Introduction and Planning

Burroughs B 20 provides a general description of the B 20 system.

Your *B 20 Installation Planning Guide* offers suggestions to the new B 20 system owners about how to prepare for B 20 installation.

Hardware Installation

B 20 Hardware Installation Instructions provides step-by-step procedures on unpacking and installing the B 20 system.

AP 1302 Printer, Installation, Operation, and Maintenance Guide, provides instructions for unpacking, assembling, and using the B 20 AP1302 printer.

B 9251-1 Printer, Installation, Operation, and Maintenance Guide, provides instructions for unpacking, assembling, and using the B 20 B9251-1 printer.

B 9252 Printer, Installation, Operation, and Maintenance Guide, provides instructions for unpacking, assembling, and using the B 20 B9252 printer.

B 20 Cluster Workstation Installation and Operations Guide, describes how to install and operate the B 20 cluster workstation.

B 20 Mass Storage Unit Installation Instructions for Qualified Service Personnel, provides complete instructions for unpacking and assembling the B 20 mass storage unit.

Operations Training

B 20 Operations - Learning To Use the System provides comprehensive, step-by-step guidance in learning to use the B 20 system.

B 20 Operations, Quick Reference Guide provides quick reference to questions that come up during B 20 operation.

BASIC Language

B 20 Systems BASIC Language - An Overview describes BASIC programming language and its uses on the B 20 system.

B 20 BASIC Quick Reference Guide provides a summary and examples of all BASIC commands and functions.

Reference

The *B 20 Systems Standard Operations Guide* describes the B 20 Executive, the program that first interacts with you, as the user, when you turn on the system. It specifies commands for managing files and invoking other programs such as the Editor, the programming language compilers, and communications interfaces.

The *B 20 Systems Custom Installation and Reference Manual* offers a comprehensive understanding of the B 20 system, including its advanced features. The reference manual builds upon basic concepts provided by the *B 20 Systems Standard Operations Guide*.

The *B 20 Systems COBOL, FORTRAN, BASIC, and Pascal Language Reference Manuals* describe the system's programming languages. Each manual specifies both the language itself and operating instructions for that language.

The *B 20 Systems Operating System (BTOS) Reference Manual* describes the Operating System. It specifies services for managing processes, messages, memory, exchanges, tasks, video, disk, keyboard, printer, timer, communications, and files. In particular, it specifies the standard file access methods: SAM, the Sequential Access Method; RSAM, the Record Sequential Access Method; and DAM, the Direct Access Method.

The *B 20 Systems Debugger Reference Manual* describes the Debugger, which is designed for use at the symbolic instruction level. Together with appropriate interlistings, you can use it for debugging FORTRAN, Pascal, and Assembly language programs. (COBOL and BASIC, in contrast, are more conveniently debugged using special facilities described in their respective manuals.)

The *B 20 Systems Editor Reference Manual* describes the text editor.

The *B 20 Systems Linker/Librarian Reference Manual* describes the Linker, which links together separately compiled object files, and the Librarian, which builds and manages libraries of object modules.

B 20 Systems System Programmer's Guide (Part 1 and 2) provides the system programmer or system manager with detailed information on Operating System structure and system operation. It describes cluster architecture and operation, procedures for building a customized Operating System, and diagnostics. It also describes the Assembly programming language.

The *B 20 Systems Font Reference Manual* describes the interactive utility for designing new fonts (character sets) for the video display.

The *B 20 Systems Forms Reference Manual* describes the Forms facility that includes (1) the Forms Editor, which is used to interactively design and edit forms, and (2) the Forms run time, which is called from an application program to display forms and accept user input.

The *B 20 Systems Indexed Sequential Access Method (ISAM) Reference Manual* describes the multikey Indexed Sequential Access Method. It specifies the procedural interfaces and shows how these interfaces are called from the various languages.

The *B 20 Systems 2780/3780 RJE Terminal Emulator Reference Manual* describes the 2780/3780 emulator package.

The *B 20 Systems 3270 Terminal Emulator Reference Manual* describes the 3270 emulator package.

The *B 20 Systems Asynchronous Terminal Emulator (ATE) Reference Manual* describes the asynchronous terminal emulator.

The *B 20 Systems Sort/Merge Reference Manual* describes the Sort and Merge utilities that run as a subsystem activated at the Executive command level, and the Sort/Merge object modules that can be called from an application program.

The *B 20 Systems Batch Reference Manual* describes the format of JCL files for invoking programs via the B 20 Batch Manager.

APPENDIX B
ASCII CHART

Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex
NUL	000	00	,	044	2C	X	088	58
SOH	001	01	-	045	2D	Y	089	59
STX	002	02	.	046	2E	Z	090	5A
ETX	003	03	/	047	2F	[	091	5B
EOT	004	04	0	048	30	\	092	5C
ENQ	005	05	1	049	31	]	093	5D
ACK	006	06	2	050	32		094	5E
BEL	007	07	3	051	33	_	095	5F
BS	008	08	4	052	34	`	096	60
HT	009	09	5	053	35	a	097	61
LF	010	0A	6	054	36	b	098	62
VT	011	0B	7	055	37	c	099	63
FF	012	0C	8	056	38	d	100	64
CR	013	0D	9	057	39	e	101	65
SO	014	0E	:	058	3A	f	102	66
SI	015	0F	;	059	3B	g	103	67
DLE	016	10	<	060	3C	h	104	68
DC1	017	11	=	061	3D	i	105	69
DC2	018	12	>	063	3E	j	106	6A
DC3	019	13	?	064	40	k	107	6B
DC4	020	14	@	064	40	l	108	6C
NAK	021	15	A	065	41	m	109	6D
SYN	022	16	B	066	42	n	110	6E
ETB	023	17	C	067	43	o	111	6F
CAN	024	18	D	068	44	p	112	70
EM	025	19	E	069	45	q	113	71
SUB	026	1A	F	070	46	r	114	72
ESC	027	1B	G	071	47	s	115	73
FS	028	1C	H	072	48	t	116	74
GS	029	1D	I	073	49	u	117	75
RS	030	1E	J	074	4A	v	118	76
US	031	1F	K	075	4B	w	119	77
SP	032	20	L	076	4C	x	120	78
!	033	21	M	077	4D	y	121	79
"	034	22	N	078	4E	z	122	7A
#	035	23	O	079	4F	{	123	7B
$	036	24	P	080	50	|	124	7C
%	037	25	Q	081	51	}	125	7D
&	038	26	R	082	52	~	126	7E
'	039	27	S	083	53	DEL	127	7F
(	040	28	T	084	54			
)	041	29	U	085	55			
*	042	2A	V	086	56			
+	043	2B	W	087	57			

1. Abbreviations used in the column headings:

   Char - Character
   Dec - Decimal
   Hex - Hexadecimal

2. Abbreviations and acronyms used for control characters:

   NUL - Null string; all zeros
   SOH - Start of heading
   STX - Start of text
   ETX - End of transmission
   ENQ - Enquiry
   ACK - Acknowledge
   BEL - Bell
   BS - Backspace
   HT - Horizontal tab
   LF - Line feed
   VT - Vertical tab
   FF - Form feed
   CR - Carriage return
   SO - Shift out
   SI - Shift in
   DLE - Data link escape
   DC1 - Device control 1
   DC2 - Device control 2
   DC3 - Device control 3
   DC4 - Device control 4
   NAK - Negative acknowledge
   SYN - Synchronous idle
   ETB - End transmission block
   CAN - Cancel
   EM - End of medium
   SUB - Substitute
   ESC - Escape
   FS - File separator
   GS - Group separator
   RS - Record separator
   US - Unit separator
   SP - Space
   DEL- Delete

APPENDIX C
ANNOTATED LIST OF COMMANDS

INTRODUCTION

This appendix contains an inclusive listing of all commands available on the B 20 Operating System. An asterisk (*) following a command explanation indicates that there is further explanation of that command in the B 20 Systems Custom Installation and Reference Manual.

Append	(AP)	The **Append** command copies each of the "File list from" files to the "File to" file. The first character of each appended file immediately follows the last character of the preceding file. The command creates no artificial gaps.
Assemble	(ASSEM)	The programmer uses the **Assemble** command to invoke the ASM-86 Assembler.*
Asynchronous Terminal Emulator	(A T E)	The **Asynchronous Terminal Emulator** (ATE) utility allows a B 20 workstation to emulate an asynchronous character-oriented ASCII terminal (glass TTY). It also provides file transfer capabilities.*
Backup Volume	(B V)	The **Backup Volume** command copies files from one volume to an archive file and verifies the integrity of the volume control structures.*
Basic	(BAS)	The **Basic** command is used to invoke the Basic Language interpreter.*
Batch	(BAT)	The **Batch** command activates the Batch Manager in the primary application partition.*

Bootstrap	(BOOT)	The **Bootstrap** command allows you to run a diagnostic from a workstation by loading it into memory and logically disconnecting the workstation from the cluster, or it allows the system programmer to load a new version of the operating system.*
Change Volume Name	(C V N)	The **Change Volume Name** command changes a volume's name and/or password. You also can use it to add or delete a volume password.
Cluster Status	(C S)	The **Cluster Status** command displays status information about the activity on a cluster system for a specified communications line. The information includes the total number of workstations configured for the line, the number currently active, the time elapsed since the cluster system began operation, line activity (percent of time busy), and the number of the various types of errors encountered. For each active workstation, the command also displays the total number of requests received since it became active, and the number of requests currently outstanding.
COBOL	(COB)	The **COBOL** command activates the COBOL compiler.*
Configure RJE	(C RJE)	The **Configure RJE** command creates or modifies an RJE configuration file.*
Copy		The **Copy** command duplicates the contents of an existing file to a new file.
Create Configuration File	(C C F)	The **Create Configuration File** command creates a configuration file to which characteristics for configuring (initializing) a device are written.
Create File	(C F)	The **Create File** command creates a new file without defining its contents.

Create Directory	(C D)	The **Create Directory** command creates a new directory of a specified name on a disk volume.
Create Partition	(C P)	The **Create Partition** utility creates a vacant secondary application partition.*
CRun		The **CRun** command runs a compiled COBOL program.*
Debug File	(D F)	The **Debug File** command invokes the Debugger to examine and modify the data in files and devices.
Delete	(DEL)	The **Delete** command removes each file named in "File list," permanently destroying the contents of those files.
Diagnostic	(DI)	The **Diagnostic** (Floppy) command loads a diagnostic program from a floppy disk into memory, replacing BTOS and transferring control of the workstation to the diagnostic.
Disable Cluster	(D C)	The **Disable Cluster** command disables cluster operations. It stops communication between the operating system in the master workstation and cluster workstations, and closes all files. **Disable Cluster** can be run from the master workstation only.*
Dump	(DU)	The **Dump** command displays the contents of a file in hexadecimal and ASCII characters and displays the differences between two files.
Edit	(ED)	The **Edit** command allows the operator to edit information in a file. Like most modern text editors, it shows the text as it appears on a typewritten page. The screen acts as a window for viewing the text file.*
Files	(FI)	The **Files** command displays information about each of the files named in "File list".

Floppy Copy	(F C)	The **Floppy Copy** command copies the contents of a floppy disk to another floppy disk. This command sets up a temporary file ([SCR]<$>FloppyCopy.Tmp) on the Winchester disk. The temporary file stores information from the master floppy disk that is to be copied to the floppy disk. **Floppy Copy** allows you to make multiple copies.
Font Designer	(F D)	The **Font Designer** command interactively designs a character set (Font).*
Format	(FOR)	The **Format** command formats the text contained in one or more files into a paginated document that is printed by direct or spooled printing.*
Forms Editor	(F E)	The **Forms Editor** command designs a form.*
FORTRAN		The **FORTRAN** command activates the FORTRAN compiler.*
Forms Reporter	(F R)	The **Forms Reporter** command produces a report describing a format and its fields. This report can be shown on the display and can be written to a disk file or printer.*
IVolume Archive Volume	(IV A)	The **IVolume Archive** used in conjunction with the **IVolume** command prepares a floppy disk for use as a B 20 archive volume. It formats the disk, performs write/read tests to identify surface defects, writes volume control structures onto the disk, and creates system files.
Install Batch	(I B)	The **Install Batch** utility creates a secondary application partition and installs a Batch Manager in it.*

Install 3270		The **Install 3270** command installs the Binary Synchronous Communications (BSC) protocol handler in the master workstation.*
Install Queue Manager	(IQM)	The **Install Queue Manager** command installs the Queue Manager at the master workstation.*
Install RJE	(I RJE)	The **Install RJE** command installs the RJE system service permanently in memory and, if the designated (or default) RJE configuration file contains a sign-on record, transmits the record to the host computer. **Install RJE** must be activated on the workstation (standalone, master, or cluster) connected to the communications line.*
Install Spooler	(IS)	The **Install Spooler** command installs the Printer Spooler, in a master, cluster, or standalone workstation.*
ISAM Copy	(ISAM CO)	The **ISAM Copy** command copies a data set file, producing a new data set. The passwords of the new data set are identical to those of the existing one.*
ISAM Create	(ISAM CR)	The **ISAM Create** command creates an empty data set with the specified record size and index fields.*
ISAM Delete	(ISAM D)	The **ISAM Delete** command deletes both files of a data set, destroying all data in the data set.*
ISAM Install	(ISAM I)	The **ISAM Install** command permanently installs the ISAM multiuser package in memory in the workstation, after which ISAM requests can be serviced.*
ISAM Rename	(ISAM REN)	The **ISAM Rename** command renames the files of a data set. The passwords for the data set are unchanged.*

ISAM Reorganize	(ISAM REO)	The **ISAM Reorganize** command builds a data set from any Standard Access Method file of fixed-length records, including the data store file of a data set.*
ISAM Set Protection	(ISAM S P)	The **ISAM Set Protection** command changes the passwords used to gain access to an existing data set.*
ISAM Status	(ISAM S)	The **ISAM Status** command displays information about a data set. The information can optionally be printed or written to a disk file as well as displayed.*
IVolume	(IV)	The **IVolume** command prepares a floppy or Winchester disk for use as a B 20 volume. **IVolume** formats the disk, performs write/read tests to identify surface defects, writes volume control structures onto the disk, and creates system files.
LCopy	(LC)	**LCopy** copies files and differs from the **Copy** command by the parameters you pass.*
Librarian	(LIB)	The **Librarian** command allows you to create and maintain libraries of object modules.*
Link	(LIN)	The **Link** command combines object modules (files produced by compilers and assemblers) into run files.*
Login		The **Login** command changes the path (the volume name, directory name, file prefix, and password) you signed in on.
Logout		The **Logout** command terminates the current user session. **Logout** removes any information previously specified with the Signon form or with the **Path** or **Login** commands from the workstation and reinitializes the display.

M3270		The B 20 **3270** Terminal Emulator (**M3270**) allows a B 20 system to emulate an IBM 3270 terminal, so that it can communicate with an IBM 3270 computer, or any other host computer able to support the IBM 3270 family of terminals.*
Maintain File	(M F)	The **Maintain File** command modifies and reads data files (Record Sequential Access Method (RSAM) files, Direct Access Method (DAM) files, and the data store files of Indexed Sequential Access Method (ISAM) data sets. **Maintain File** can verify the file structures, remove malformed records, remove deleted records, and (optionally) write a verification log of of the file structure to a file. (The log always appears on the video display.)
Make Translation File	(M T F)	The **Make Translation File** command generates a custom translation file for the serial printer. This translation file provides the facility to translate a single character into a series of characters.
Merge	(ME)	The **Merge** command merges several existing files of sorted data records according to sort keys embedded within those data records.*
New Command	(N C)	**New Command** adds a new command to those commands recognized by the Executive.
Partition Status	(P S)	The **Partition Status** command displays status information for all the application partitions, including its size, memory boundaries, and the name of the run file currently executing it.*
Pascal	(PAS)	The **Pascal** command activates the Pascal compiler.*

Path		The **Path** command changes the Path (the volume, directory, file prefix, and password) to which the user is signed on.
PLog	(PL)	The **PLog** command lists the contents of the log file, which is an error logging file. **PLOG** (optionally) can write the log to a file or printer. The log always appears on the screen.
Print	(PR)	The **Print** command adds a line to the scheduling queue for spooled printing.
Purge RJE	(P RJE)	The **Purge RJE** command removes one or more entries from the transmit or receive queue. The command first searches the transmit queue and then the receive queue for each entry. It removes the entry from the first queue in which it exists.*
Queue RJE	(Q RJE)	**Queue RJE** creates an entry containing specified information about a transmit file and places it in the transmit queue.*
Record	(REC)	The **Record** command records a sequence of commands into one file, which then can be activated as a single operation.
Remove Command	(REM)	**Remove Command** eliminates a command name from the list of commands from the Executive.
Remove Directory	(R D)	The **Remove Directory** command removes an empty directory from a disk volume.
Rename	(REN)	The **Rename** command renames the file named in "Old file name" to the name in "New file name."
Replay	(REP)	The **Replay** command replays an editing session.*
Restore	(REST)	The **Restore** command restores files onto a volume from an archive file.

Resume Cluster	(RES C)	The **Resume Cluster** command reenables normal cluster operations, with the exception of files that were open on the cluster workstations before cluster communications were disabled. The application system must reopen these files.*
Run	(Ru)	The **Run** command activates a user program.
Run File	(R F)	The **Run File** command activates the user program specified in the parameter "File name." This command primarily invokes programs not registered by means of **New Command**.
Screen Setup	(S S)	The **Screen Setup** command changes one or more display attribute(s).
Selective Backup	(S B)	The **Selective Backup** command copies individual files or directories from one volume to an archive file, thus allowing archiving of personal files and requiring only read access to the files being archived.
Set File Prefix	(S F P)	The **Set File Prefix** command sets the default file prefix to be added to file specifications when the volume and directory names are omitted.
Set Directory Protection	(S D P)	The **Set Directory Protection** command allows you to add, change or remove a directory password, and/or to change the default file protection level for files in that directory.
Set Protection	(S P)	The **Set Protection** command assigns a new protection level and, optionally, a file password to each file in "File list."
Set Time	(S T)	The **Set Time** command sets the system clock. In a cluster workstation, this sets the system clock for the entire cluster configuration.

Signoff RJE		The **Signoff RJE** command signs off from the host computer by transmitting the sign off record (/*Signoff), and optionally disconnects the communications line.*
Signon		The **Signon** form provides for the user's name, password, and the date and time of the session. You must successfully sign on to the system before executing any other commands.
Signon RJE		The **Signon RJE** command signs on to the host computer by transmitting the signon record. For systems that do not require a signon, the signon record can be omitted altogether.*
Software Installation	(S I)	The **Software Installation** command allows you to install additional software programs after initial system installation.
Sort		The **Sort** command separates preexisting files of data records according to sort keys embedded within those data records.
Spooler Status	(SP)	The **Spooler Status** command displays the status of printers and printer scheduling queues, and provides a variety of subcommands from which you can select and control a printer and queue.
Status RJE	(STA RJE)	The **Status RJE** command reports the status of the file the RJE system service currently manages, or of all files with entries in either queue.*
Stop Record	(S RE)	The **Stop Record** command stops recording keystrokes into a command file.

Submit	(SU)	The **Submit** command reads characters from a command file or submit file rather than from the keyboard. You can include a call to another submit file within a submit file.
Terminate Partition Tasks	(T P T)	The **Terminate Partition Tasks** command terminates all tasks in the specified application partition, and loads and activates the partition's exit run file.*
Type	(TY)	The **Type** command displays each of the specified files on the display, one screen at a time.
User File Editor	(U F E)	The **User File Editor** command creates and modifies user configuration files.
Vacate Partition	(V P)	The **Vacate Partition** command terminates all tasks in the specified application partition but does not load and activate the partition's exit run file. The partition becomes vacant.*
Volume Status	(VO S)	The **Volume Status** command displays the status of the specified disk volume or of the volume mounted on the specified disk device.

APPENDIX D
GLOSSARY

$ Directories	The $ directories are special directories required for the B 20 software to operate correctly. When a request with the directory name of $ is given as part of a file specification to BTOS, the directory name is expanded to the form $ nnn , where nnn is the user number of the application system.
Application Partition	An application partition is a section of user memory reserved for the execution of an application system. A workstation can have any number of application partitions, with an application system executing concurrently in each. (Also refer to Primary Application Partition, Secondary Application Partition, and System Partition.)
Application Partition Management	The application partition management facility permits concurrent execution of multiple application systems, each in its own partition. It provides operations for creating, managing, and removing secondary application partitions. (Also refer to Application Partition, Primary Application Partition, and Secondary Application Partition.)
Application Process	An application process executes code in the application system. It is not a system service process. (Also refer to System Service Process.)
Application System	An application system is the collection of all tasks currently in an application partition. The tasks in an application system access a common set of files and implement a single application. The tasks execute asynchronously. (Also refer to Application Partition and Task.)
Archive File	Archive file is a generic term for multivolume data set. It consists of 99 floppy disks with the same volume name and numeric suffixes and is used only with the **Selective Backup, Backup Volume** and **Restore** utilities.

B 21 Workstation

A B 21 workstation provides basic video capabilities and no Multibus slots. The B 21 family offers four models: one with no floppy drives; one with a single 5 1/4-inch floppy; one with double 5 1/4-inch floppies; and one with a 5 1/4-inch Winchester disk with one 5 1/4-inch floppy for backup. The first two models can be used only as cluster workstations. The second two can be used either as cluster or standalone workstations. (Also refer to Basic Video Capability and Master Workstation.)

B 22 Workstation

A B 22 workstation is a B 20 workstation that has standard (or optionally advanced) video capabilities and two (or optionally five) Multibus slots. (Also refer to Advanced Video Capability and Standard Video Capability.)

Backup copy

A backup copy is a duplicate copy of a volume, directory or file which is preserved in an archive file.

Bad Sector File

The Bad Sector File contains an entry for each unusable sector of a disk. The Bad Sector File is 1 sector in size.

Banner Page

By the user's direction, the Printer Spooler prints a banner page before it prints each file. The banner page is visually distinctive and also identifies the file being printed. The banner page can contain the text of a notice file. (Also refer to Notice File and Printer Spooler.)

Basic Video Capability

Basic video capabilities are provided by the B 21 workstation. These capabilities include an 80-character by 28-line screen, one cursor on the screen, a 256-character set that cannot be modified by software, and a screen split horizontally into multiple frames. Standard Video Capability and Video Capability.

Batch Job Control File

See Batch Job Stream, and the *B 20 Systems Batch Reference Manual*.

Batch Job Stream	A batch job stream is a file containing batch control statements used by the Batch Manager to direct the execution of noninteractive application systems. (Refer to the *B 20 Systems Batch Reference Manual*.)
Batch Manager	The Batch Manager is a system service that uses the batch control statements of a batch job stream to direct the loading and execution of noninteractive application systems. (Also refer to the *B 20 Systems Batch Reference Manual.*)
Batch Partition	A batch partition is an application partition that the Batch Manager controls. (Also refer to Batch Manager, Batch Job Stream, and the *B 20 Systems Batch Reference Manual*.)
Binary Mode	Binary mode is one of three printing mode options in the printer, Printer Spooler, and communications byte streams. Binary mode does not print the banner page before each file, send extra code not in the file to the printer, nor recognize the escape sequence. (Also refer to Image Mode and Normal Mode.)
Bootstrap	To bootstrap (or boot) the system is to start it by reloading the Operating System from disk. On other systems, this is often known as Initial Program Load (IPL).
Character Attribute	A character attribute controls the presentation of a single character. The standard character attributes are reverse video, blinking, half-bright, and underlining. (Also refer to Line Attribute, Screen Attribute, and Video Attributes.)
Client Process	A client process makes a request of a system service. Any process, even a B 20 process, can be a client process, since any process can request system services. (Also refer to System Service Process.)

Cluster Configuration	A cluster configuration is a local resource-sharing network consisting of a master workstation and up to 16 cluster workstations. A cluster is connected by one to four high-speed multidrop half-duplex data links using a variant of the ADCCP/HDLC bit-oriented synchronous protocol. The operating system executes in each cluster workstation and in the master workstation. (Also refer to Cluster Workstation, CommIOP, Master Workstation, and Minicluster.)
Cluster Workstation	A cluster workstation is connected to a master workstation within a cluster configuration. A cluster workstation can be either a B 22 or B 21. (Also refer to Cluster and Master Workstation.)
Command	A command is a specifically-configured direction which you give to the Executive.
Command Form	The command form is a format which appears on the display in the Executive mode, used to issue directions (or commands) to the B 20 system.
Command Frame	The command frame is the lower portion of the split screen in the Executive mode. The command frame displays a sequence of user-issued commands alternating with Executive and subsystem response to commands.
CommIOP	The CommIOP is an intelligent communications processor based on the Intel 8085 microprocessor. The CommIOP serves up to four cluster workstations on each of its two high-speed serial input/output channels. The CommIOP is installed in the Multibus slot to master workstations. CommIOP software consists of the 8085 bootstrap-ROM program, the main CommIOP program, and the CommIOP handler.
Compact System	A compact system is a version of the Operating System that provides no concurrent execution of multiple application systems. A compact system has a primary application partition and can execute application systems one at a time. An Operating System is specified to be compact during system build.

Configuration File	A configuration file specifies the characteristics of either the parallel printer, the serial printer, or other device attached to a communications channel. Examples of characteristics are number of characters per line, baud rate, and line control mode (XON/XOFF, CTS). The Create Configuration File utility creates a configuration file, which is used by printer, Printer Spooler, and communications byte streams.
Crash Dump Area	The Crash Dump Area (the file [Sys]<Sys>CrashDump.Sys) contains a binary memory dump in the event of a system failure.
Cursor	The cursor is a blinking light on the display which identifies the point where you are entering information.
DAM	See Direct Access Method.
Date/Time Format	The B-20 date/time format provides a compact representation of the date and the time of day. It precludes invalid dates and allows simple subtraction to compute the interval between two dates. The date/time format is represented in 32 bits to an accuracy of one second.
Device	A device is a physical hardware entity, such as printers, tape, floppy disks, and Winchester disks.
Device Control Block	A Device Control Block (DCB) exists for each physical device. The DCB contains information generated at system build about the device. For a disk, the information includes how many tracks are on a disk, the number of sectors per track, etc. The DCB points to a chain of I/O Blocks. The DCB is memory-resident.
Device Password	A device password protects a device.
Device Specification	A device specification consists of a devname (device name).
Direct Access Method (DAM)	DAM provides random access to disk file records identified by record number. The record size is specified when the DAM file is created. DAM supports COBOL Relative I-O, but also can be called directly from any of the B-20 languages.

Direct Printing	Direct printing transfers text directly, from application system partition memory to the specified parallel or serial printer interface of the workstation on which the application system is executing. Direct printing is always accessed through the Sequential Access Method (printer byte streams). (Also refer to Spooled Printing.)
Directory	A directory is a collection of related files on one volume. A directory is protected by a directory password.
Directory Password	A directory password protects a directory on a volume.
Directory Specification	A directory specification consists of a node (node name), volname (volume name), and a dirname (directory name).
Dirname (Directory name)	A dirname is the third element of a directory specification or a full file specification.
Disk Extent	A disk extent is one or more contiguous disk sectors that compose all or part of a file.
Escape Sequence	An escape sequence is a special sequence of characters that invokes special functions. (Also refer to Printer Spooler Escape Sequence, and Submit File Escape Sequence).
Executive	An Executive is an interactive application program that can be executed in the primary application partition. It accepts commands from the workstation operator and requests the operating system to load tasks to execute those commands. The standard B 20 Executive or a user-written Executive can perform this function. The Executive is loaded from the file [Sys]<Sys>Exec.Run if specified in the SignOnExitFile. (Refer to the Release Notice for the current version.)
Exit Run File	An exit run file is a user-specified file that is loaded and activated when an application system exits. Each application partition has its own exit run file.

Expansion	See File Expansion.
Field	An area in a command or data entry form used to enter specified parameters.
File	A file is a set of related records (on disk) treated as a unit.
File Area Block (FAB)	There is a File Area Block for each Disk Extent in an open file. The FAB specifies where the sectors are and how many there are in the Disk Extent. The FAB is pointed to by a File Control Block or another FAB. The FAB is memory-resident. (Also see Disk Extent.)
File Expansion	File expansion is the expansion of escape sequences in a submit file. Parameters passed to the file are substituted for the escapes, and nested calls to other submit files are invoked.
File name	A file name is the fourth element of a full file specification.
File Password	A file password protects a file in a directory on a volume.
File Prefix	A portion of a file name (indicated by a string followed by the character>) which defines subdirectory.
File Protection Level	A file protection level specifies the access allowed to a file when the accessing process does not present a valid volume or directory password.
File Specification	A complete file specification has the form [volume name]<directory name>filename (and optionally, [volname]<dirname>prefix>filename).
Floppy Disk	A floppy disk is a mass storage device using a flexible mylar disk to record information. Use of the floppy disk is with the Winchester disk in the B 20 system.
Font	A font is a bit array for each of the 256 characters in the character set that defines the representation of each character when shown on the display. User-defined fonts can be designed and loaded on the B 22 workstation.

Form	See Command Form.
Frame	A frame is a separate, rectangular area of the screen. A frame can have any desired width and height (up to the entire screen).
Image Mode	Image mode is one of three printing options in printer, Printer Spooler, and communications byte streams. Image mode prints the banner page before each file and recognizes escape sequences but performs no code conversions. (Also refer to Normal Mode and Binary Mode.)
Incremental Backup	Process or archiving files created or modified on or after a specified date and time. The system archives entire file(s), not just the modified portion.
Indexed Sequential Access Method (ISAM)	The Indexed Sequential Access Method provides efficient, yet flexible, random access to fixed-length records identified by multiple keys stored in disk file. (See the *B 20 Systems Indexed Sequential Access Method (ISAM) Reference Manual.*)
Initialization	A process performed at the beginning of a program to ensure that all indicators and constants are set to prescribed conditions and values before the routine is obeyed.
ISAM	See Indexed Sequential Access Method.
Line Attribute	A line attribute controls the presentation of a single line. The standard line attribute is cursor position. (Also refer to character Attribute, Screen Attribute, and Video Attributes.)
Linker	The Linker utility links one or more object files into a task image stored in a run file. (Refer to the *B 20 Systems Linker/Librarian Reference Manual*.)
Local File System	The Local File System allows a cluster workstation to access files on local mass storage as well as files on mass storage at the master workstation. The filter process of the local file system intercepts each file access request and directs it to the local file system or to the master workstation.

Log File

The Log File (the file [Sys]<sys>Log.Sys) is an error-logging file. An entry is placed in the Log File for each recoverable and nonrecoverable device error. Use of this file, can be, for example, a general-purpose logging file to write entries for accounting information for system services.

Master Workstation

A master workstation is the hub of a cluster or minicluster configuration. The master workstation provides file system, queue management facility, and other services to all the cluster workstations. In addition, it supports its own interactive and batch application systems. (Also refer to Cluster Workstation.)

Minicluster

A minicluster configuration consists of a master workstation and up to four cluster workstations. The master workstation uses its SIO Channel A rather than a CommIOP to connect to the cluster workstations. (Also refer to Cluster, Cluster Workstation, and CommIOP.)

Multiprogramming

BTOS supports multiprogramming at three levels. First, any number of application systems can coexist, each in its own partition. Second, any number of tasks can be loaded into the memory of the partition and independently executed. Third, any number of processes independently can execute the code of each task. (Also refer to Application System, Process, and Task.)

Normal Mode

Normal Mode is one of three printing options in printer, Printer Spooler, and communications byte streams. Normal mode prints the banner page before each file, converts tabs into spaces and end-of-line characters to device-dependent codes, and recognizes the escape sequences for manual intervention. (Also refer to Binary Mode and Image Mode.)

Notice File	The notice file contains text the system is to print on banner pages. The notice file is a convenient way to convey operational information, such as the version of the software currently in use to a later version of the printed output. The notice file [Sys]<Sys>Spooler.Notice) is an ordinary text file that you can create and modify with the Editor or Word Processor. (Also refer to Banner Page.)
Operation	An operation is a B 20 Operating System primitive, service, or procedure.
Operating System	A program that controls the basic system services and processes for device control, program scheduling, etc.
Parameter	A string of characters or words you use to fill in a command form.
Parameter List	Multiple strings of characters you use to fill in the field(s) of a form.
Partition	A section of B 20 memory containing running system or application programs.
Password	A string of character(s) which provides a security measure. A password can be assigned to user, device, volume, directory or file. Once assigned, you need the password to gain access to the designated levels of the B 20 system.
Primary Application Partition	The primary application partition is for interactive programs that use the keyboard and display to interact with you. You can choose the interactive programs which are loaded on these partitions, such as the Editor, word processor, or terminal emulators. (Also refer to Secondary Application Partition.)
Primary Task	The primary task is the first task loaded into an application partition. The Load Primary Task utility loads a task by a process in the primary application partition, or by a process in its own partition which executes a Chain, Exit, or Error Exit operation. The primary tasks, in turn can load additional tasks, called secondary tasks, in its own partition.

Printer Spooler	The Printer Spooler is a dynamically-installed system service that transfers text from disk files to the printer interfaces of the workstation. It can simultaneously control the operation of several printers. A disk-based priority-ordered queue, controlled by the queue manager contains the file specifications of the files to be printed and the parameters (such as the number of copies and whether to delete the file after printing) that control the printing. This allows the printer spooler to resume printing automatically when reinstalled after a B 20 reload. (Also refer to Direct Printing and Spooled Printing.)
Printer Spooler Escape Sequence	Printer Spooler escape sequences are special character sequences embedded in text files. They cause the printer to pause when processed by the Printer Spooler. Escape sequences are available to request a forms change, a print wheel change, and a generic printer pause. The reason for the printer pause (including a text string that is included in the escape sequence) can be ascertained by the **Spooler Status** utility. (Also refer to Escape Sequence.)
Process	A program in execution is a process. The program begins by competing for access to the processor: it is assigned a priority so that BTOS can schedule its execution appropriately. Associated with the program is the address (CS:IP) which points to its next executable instruction.
Queue Manager	The Queue Manager controls the named, priority-ordered, disk-based queues contained in queue entry files. It must be installed in the master workstation, either as a system service in the system partition, or in a secondary application partition.

Recording File	A recording file is created in active recording mode and contains a copy of all characters typed at the keyboard. Later, you can use a recording file as a submit file to repeat the same sequence of input characters. By entering the **Submit File** command while recording, the Recording Mode is terminated. (Also refer to Recording Mode and Submit File.)
Recording Mode	When recording mode is active, the system writes all characters typed at the keyboard and read in character mode to a recording file, in addition to returning them to the client process. (Also refer to Recording File.)
Record Sequential Access Method (RSAM)	The Record Sequential Access Method provides blocked, spanned, overlapped input and output. An RSAM file is a sequence of fixed- or variable-length records. Files can be opened for read, write, or append operations.
Reverse Video	Reverse video displays a light characters on a solid green screen.
RSAM	See Record Sequential Access Method.
Run File	A run file is created by the Linker and contains a task image. (Also refer to Task Image.)
SAM	Refer to Sequential Access Method.
Scroll	The capability to move the contents displayed on the screen up or down by one or more lines.
Secondary Application Partition	A secondary application partition is a memory section that is created and controlled by using operations provided by the application partition management facility. Such partitions are used for noninteractive applications, such as user applications, the Batch manager, or system services including the Printer Spooler, ISAM, and remote job entry. (Also refer to Application Partition, Application Partition Management, and Primary Application Partition.)

Security Mode	Security mode is a printer security feature which causes the printer spooler to pause before printing a file and wait for you to enter a password.
Selective Backup	Selective backup is the process of copying a file to an archive file.
Sequential Access Method	The Sequential Access Method provides device-independent access to devices (such as the video display, printer, files, and keyboard) by emulating a conceptual, sequential character-oriented device known as a byte stream.
Simple Parameter	Refer to Parameter.
Size	Size always refers to the number of bytes a data item or structure contains.
Spooled Printing	Spooled printing transfers text to a disk file for temporary storage. It queues a request for the transfer to the first available printer interface under of the Printer Spooler's control. This facilitates unclogged communications in a shared-printer (cluster workstation) environment, as well as concurrent interactive computing and printing. Spooled printing can be accessed through the Sequential Access Method (spooler byte streams) and the printer spooler utilities. (Also refer to Direct Printing.)
Standard Video Capability	Master work-stations provide standard video capabilities. These capabilities include a 34-line screen, a software selectable 80-character line, one cursor per line, a 256 character set, and a screen split horizontally and/or vertically into multiple frames that can overlap each other. The B 22 also features a 132-character line, and software can modify dynamically the 256-character set. (Also refer to Basic Video Capability and Video Capability.)
Status Code	A status code reports the success or failure of the requested operation. The system service process stores a status code in a request block, and the client process examines it.

Status Frame	The status frame is the top two lines on the screen in Executive mode, which provides continuously updated information on basic system status (that is, system identification, user name, default volume, directory and file prefix, date and time.)
Status Message	The status message appears on the screen, citing an error in the file management system or a subsystem.
Subdirectory	A subdirectory is a collection of related files within a directory.
Submit Facility	The submit facility permits a sequence of characters from a file to be substituted for characters typed at the keyboard. The use of submit files allows the convenient repetition of command sequences. (Also refer to Submit File.)
Submit File	A submit file, used in the submit facility, contains the same sequence of characters that you would type to the desired programs. When an application process or a command to the Executive requests a character from the keyboard, the Submit file is activated and a character from the file is returned to the application process. Calling a submit file while recording terminates Recording Mode. (Also refer to Recording File and Submit Facility.)
Submit File Escape Sequence	A submit file escape sequence consists of two or three characters. The first character is either % or >, which indicates the presence of an escape sequence; the second character is a code to identify the special function; the third character, if present, is an argument to the function. (Also refer to Escape Sequence and Submit File.)
Sys.Cmds	The system uses the Executive's Command File (Sys.Cmds) which contains information about each command known to the Executive. [Sys]<Sys> Sys.Cmds if there is no SysCmds file in the Application System Control Block. Use the **New Command** command to enter additional commands into Sys.Cmds.

Sys.Font	The [Sys]<Sys>Sys.Font file contains the font for the standard character set.
System Administrator	The system administrator is the person responsible for planning, generating, extending, and controlling the use of the operating system to improve the overall productivity of the installation.
System Build	System build is the collective name for the sequence of actions necessary to construct a customized B 20 System Image. System build allows the specification of installation-specific parameters and the inclusion of user-written system services. (Refer to the *B 20 Systems Programmer's Guide/Assembler* for more details.)
System Common Procedure	A system common procedure performs a common system function, such as returning the current date and time. The code of the system common procedure is included in the System Image and is executed in the same context and at the same priority as the invoking process. The Video Access Method, for example, is a system common procedure.
System Directory	The System Directory (<Sys>) of each volume contains entries for system files, including the Bad Sector File, the File Header Blocks, the Master File Directory, the System Image, the Crash Dump Area, the Log File, and the Executive. Create the <Sys> Directory by entering the **IVolume** command rather than the **Create Directory** command. (Also refer to System Volume.)
System Image	The System Image (the file [Sys]>Sys>SysImage.Sys) contains a run-file copy of the B 20 Operating System.
System Manager	See System Administrator.
System Partition	A system partition contains the B 20 Operating System or dynamically installed system services. (Also refer to Application Partition.)
System Service	A system service is an operation performed by a system service process.

System Service Process

A system service process is an operating system process that services and responds to requests from client processes. Both B 20 and user-written system service processes can be dynamically installed or linked to the System Image at system build. A system service process is scheduled for execution in the same manner that an application process is scheduled. (Also refer to Application Process and Client Process.)

System Volume

The operating system is bootstrapped from the System Volume ([Sys]). The <Sys> Directory of the Sys Volume contains entries for system files that are not necessary in the <Sys>Directories of other volumes. You must place these additional entries in [Sys]<Sys> when you initialize the volume. SysImage.Sys, CrashDump.Sys, and Log.Sys are created (but not initialized) by the IVolume utility. The other file entries are created using the **Create Directory** command. These system files are the System Images, the Crash Dump Areas, the Log File, the Debugger, the Executive, the Executive's command file, and the standard character font. (Also refer to Crash Dump Area, Log File, System Directory, and System Image.)

Task

A task consists of executable code, data, and one or more processes. The code and data can be unique to the task or shared with other tasks. To create the system a task translates source programs into object modules, and then links them together, resulting in a task image that is stored on disk in a run file. When requested by a currently active task, such as the B 20 Executive, the operating system reads the task image from the run file into the application partition, relocates intersegment references, and schedules it for execution. The new task can coexist with, or replace, other application tasks. (Also refer to Application System, Run File, and Task Image.)

Task Image

A task image is a program stored in a run file that contains code segments and/or static data segments. (Also refer to Run File and Task.)

Text File	A text file contains bytes that represent printable characters, or control characters such as tab (09h), new line (0Ah), or form feed (0Ch).
Type-Ahead Buffer	The type-ahead buffer stores keyboard characters (no keyboard codes, if in unencoded mode) that a client process has not yet read. If the workstation operator types too many characters in advance of processing, the system discards the excess characters. When the client process reads beyond those characters that were buffered successfully, it receives a special status code. The size of the type-ahead buffer is usually 128 characters, but can be changed at system build.
User Control Block (UCB)	There is a User Control Block (UCB) for each user number. The UCB contains the default volume, default directory, default password, and default file prefix set by the last SetPath and SetPrefix operation. The UCB is memory-resident.
Utility	A utility is a program designed to perform a common task such as comparing the contents of two files. **IVolume, Backup Volume, Restore, Dump,** and **Maintain File** are a few examples of utilities.
Video Attributes	Video attributes control the visual presentation of characters on the screen. There are three kinds of video attributes: screen, line, and character. (Also refer to Character Attribute, Line Attribute, and Screen Attribute.)
Video Capability	The several models of workstations have varying levels of video capability: basic, standard, or advanced. (Also refer to Basic Video Capability and Standard Video Capability.)
Volname (Volume name)	A volume name is the second element of a full file specification.

Volume	A volume is the medium of a disk drive formatted and initialized with a volume name, a password, and volume control structures such as the Volume Home Block, File Header Blocks, Master File Directory, etc. A floppy disk and the medium sealed inside a Winchester disk are examples of volumes.
Volume Backup	Volume backup is the process of duplicating a copy of the files in a volume to an archive file.
Volume Control Structures	Volume control structures allow the file management system to manage (allocate, deallocate, locate, avoid duplication of) the space on the volume not already allocated to the volume control structures themselves. A volume contains a number of volume control structures: the Volume Home Block, the File Header Blocks, the Master File Directory, and the Allocation Bit Map, etc.
Volume Home Block (VHB)	A Volume Home Block exists for each volume. The VHB is the root structure (that is, the starting point for the tree structure) of information on a disk volume. The VHB contains information about the volume such as its name and the date it was created. The VHB also contains pointers to the Log File, the System Image, the Crash Dump Areas, the Allocation Bit Map, the Master File Directory, and the File Header Blocks. The VHB is disk-resident and 1 sector in size.
Volume Password	A volume password protects a volume.
Wildcard	The wild card character is a shorthand method of specifying a list of files by substituting an asterisk (*) for a string of characters in the file specification. The volume is searched for all file names which match the remainder of the file specification.
Winchester Disk	The Winchester disk is a hard disk system characterized by very light Read/Write heads, low head-to-disk clearance, and complete enclosure of the magnetic media in a dust-free environment to achieve high information density and fast access time. It is used with floppy disks in the B 20 system.

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