

**UNISYS**

**BTOS  
Standard  
Software**

**Operations  
Guide**

Relative to Release  
Level 8.0

Priced Item

February 1987  
Distribution Code SA  
Printed in U S America  
5026222

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Detroit, Michigan 48232

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## About This Guide

This guide contains introductory, procedural, and reference information for using the standard features of BTOS, the Unisys workstation operating system. It includes software installation procedures, system configuration instructions, and explanations of standard Executive commands.

The information addresses several operator levels: the user who has little or no previous experience with operating systems, the system administrator who installs and sets up the system, and the programmer or system administrator who wants to use the more complex features of BTOS.

## Introductory and Installation Information

Section 1 contains an overview of the hardware and software. It also includes software installation information and procedures to install system and applications programs.

## Configuration Information

Sections 1, 2, and 4 contain configuration information for system administrators.

- Section 1 provides configuration and management procedures for master/cluster workstations.
- Section 2 provides information for adapting a system to user requirements, including instructions for creating and modifying user files, creating and managing application partitions, configuring the screen, and configuring the system to interface with devices.
- Section 4 includes procedures for configuring the system for printing.

## Operating Information

Sections 3, 4, 5, and 6 provide user operating information and procedures.

- Section 3 contains instructions for signing on and off the system, using Executive commands, and resolving system errors.
- Section 4 explains how to use the printer.
- Section 5 contains instructions for organizing and managing data in volumes, directories, and files.
- Section 6 explains how to protect your data.

## BTOS Features Modification Information

Section 7 and appendix C contain information and procedures for using the more complex Executive commands. This information can help system administrators and programmers to run programs and load software that is not standard.

## Conventions

The following conventions apply to all procedures:

- When two keys are used together for an operation, they are hyphenated. For example, `CODE-MARK` means that while you hold down `CODE`, you press `MARK`.
- `Character` refers to the alphanumeric symbols and the spaces (blanks) you enter by pressing the `Spacebar`.

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## Reference Information

Three appendixes, a glossary and an index provide reference information.

- Appendix A contains a table of the standard BTOS Executive commands. The table includes a brief explanation of each command, the command run file or code, and a reference to the section where you can find procedural information about the command.
- Appendix B contains a table of ASCII characters with their decimal and hexadecimal values.
- Appendix D lists the available product information.
- The glossary contains a listing of BTOS terms.

## Related Materials

The following BTOS documents are referenced in this guide and contain additional information about BTOS operations:

- *B 20 Cluster Workstations, Installation and Operations Guide*
- *BTOS Customizer Programming Reference Manual*
- *BTOS Debugger Programming Reference Manual*
- *BTOS Editor Operations Guide*
- *BTOS Linker/Librarian Programming Reference Manual*
- *BTOS Mail Manager Administration Guide*
- *BTOS Protected Mode Programming Guide*
- *BTOS Reference Manual*
- *BTOS Sort/Merge Operations Reference Manual*
- *BTOS Status Codes Reference Manual*
- *BTOS System Performance Accelerator (SPA) Installation Guide*



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## BTOS Overview and Software Installation

This section provides an overview of BTOS (Unisys workstation operating system) software and the hardware it runs on. It also includes procedures for installing system and application software.

### Hardware

Your workstation can be one of several types. There are differences between and within the types; however, each workstation is a single-operator computer consisting of a screen, processor, and keyboard.

A workstation can include one or more disk drives. Disk drives rotate the information storage media (called disks).

Depending upon your disk drives, you can use two types of data and software storage media with your workstation: hard disks and/or floppy diskettes. The hard disk is built into a workstation. You manually insert floppy diskettes into a floppy disk drive.

A workstation can have a hard disk drive only, a hard disk drive and a floppy disk drive, multiple hard disk drives, multiple floppy disk drives, or no drives, depending on its series and type.

There are six types of workstations: B 21, B 22, B 26, B 27, B 28, and B 38. Each type differs in appearance and/or components.

**Note:** In BTOS 8.0 and later, B 21 and B 22 workstations are supported only as cluster workstations, not as master or standalone workstations.

The following paragraphs describe the types of workstations. For more detailed information about hardware, refer to the hardware documentation that came with your workstation.

## **B 21 Workstations (cluster workstations only)**

The B 21 series of workstations includes six models. All models have the following video capabilities: a 28-line, 80-column screen that can split horizontally into multiple frames, and a 256-character set that cannot be modified by software. On all models, a lectern to the right of the screen contains the processor module and disk drives (if any). Models that have floppy disk drives use 5-1/4-inch, double-sided, double-density, 96tpi (tracks per inch), soft-sectored diskettes.

The model numbers and components are:

- B 21-1 contains no disk drives
- B 21-2 contains one floppy disk drive, but no hard disk drives
- B 21-3 contains two floppy disk drives, but no hard disk drives
- B 21-4 contains one floppy disk drive and a 5MB hard disk drive
- B 21-5 contains one floppy disk drive and a 10MB hard disk drive
- B 21-6 contains one floppy disk drive and a 15MB hard disk drive

## **B 22 Workstations (cluster workstations only)**

The B 22 workstation has a lectern to the right of the screen, which holds the processor module only. A single 8-inch floppy disk drive and a hard disk drive are in a separate mass storage unit. The B 22 workstation has the following video capabilities: a 34-line, 80-column or 132-column screen that can be split horizontally and/or vertically into multiple, overlapping frames, and a 256-character set that you can modify with software.

## **B 26 Workstations**

The B 26 workstation has a table-top modular unit which holds a processor, hard disk drives, and one or more 5-1/4-inch floppy disk drives (depending on the number and type of its modules). You can add or remove modules from the unit to alter the workstation's capabilities. For example, you can increase data storage space by adding a 10MB, 20MB or 40MB hard disk expansion module. The video capabilities of the B 26 workstation are: a 29-line, 80-column screen that can be split horizontally and/or vertically into multiple, overlapping frames, and a 256-character set that you can modify with software.

## **B 27 Workstations**

The B 27 workstation has a table-top modular unit which holds a processor, hard disk drives, and one or more 5-1/4-inch floppy disk drives (depending on the number and type of its modules). You can add or remove modules from the unit to alter the workstation's capabilities. The B 27 workstation video capabilities include 30 or 34 lines per screen, 80 or 132 columns, and double-high, double-wide characters.

A Four-Port Communications Expander module is available for the B 27 workstation. This module provides four additional low speed RS-232C ports that allow you to connect additional serial printers and/or communications devices.

## **B 28 Workstations**

The B 28 workstation has the same appearance, modular expandability, and video capabilities as the B 26 workstation. Because it incorporates a different central processing unit (CPU), it can accommodate the BTOS System Performance Accelerator (SPA) and the BTOS Protected Mode Operating System (PMOS).

## **B 38 Workstations**

The B 38 workstation has the same appearance, modular expandability, and video capabilities as the B 28 workstation. Because it incorporates a different central processing unit (CPU), it can accommodate the BTOS System Performance Accelerator (SPA) and the BTOS Protected Mode Operating System (PMOS) and process data faster than the B 28.

### **Standalone Versus Master/Cluster Workstations**

A standalone system consists of an individual workstation that is not connected to any other workstations. It can include peripheral equipment, such as printers and communications devices. Standalone workstations can have one or more floppy disk drives and one or more hard disk drives.

A master/cluster system consists of a master workstation connected to one or more cluster workstations. Together the master and cluster workstations form a cluster configuration. You can use a workstation that has a hard disk drive as a standalone, master, or cluster connected to a master. However, a workstation with one or more floppy disk drives can only be a cluster.

Refer to *Managing Clusters*, in section 2, for further information about cluster operations.

---

## Master/Cluster Configurations

Master/cluster configurations can include any of the series of workstations; configurations do not require all the same type of workstations. Standard BTOS software supports the following cluster configurations:

- B 26 master with up to 5 cluster workstations
- B 27 master with up to 5 cluster workstations
- B 28 master with up to 11 cluster workstations
- B 38 master with up to 11 cluster workstations

**Note:** If an XE 520 system is the master (refer to the *XE 520 System Administrator's Guide*), you can include a maximum of 64 cluster workstations in a configuration.

You can use the BTOS Customizer (refer to the *BTOS Customizer Programming Reference Manual*) to generate master operating systems for the following cluster configurations:

- B 26 master with up to 15 cluster workstations
- B 27 master with up to 15 cluster workstations
- B 28 master with up to 15 cluster workstations
- B 38 master with up to 15 cluster workstations



### **Accessing Files and Other Resources in Cluster Systems**

The master workstation provides file system and queue management resources for all cluster workstations connected to it. The master workstation and cluster workstations can share the same disk or file storage. If a cluster workstation has local file storage, it can have its own operating system.

You can access files on the master workstation from a cluster workstation. If your cluster workstation has local file storage, you can also access the files stored on its hard disk. However, you cannot access the files of another cluster workstation in the configuration unless a user first transmits the files to the master workstation. From the master workstation, you cannot access the files on any cluster workstation that has local file storage.

With proper installation of the Queue Manager and Spooler Management Utilities, all the workstations in a cluster configuration can share printers connected to any workstation in the cluster (refer to section 4, Using Your Printer).

### **Optional Utilities for Cluster Systems**

The following products are available to enhance the performance of cluster systems:

- The BTOS System Performance Accelerator (SPA), an optional software product, is available to speed up the performance of cluster systems consisting of B 28 and B 38 workstations (refer to the *BTOS System Performance Accelerator (SPA) Installation Guide*).
- The BTOS Hardware ID service and the optional Cluster Hardware Identification device are available to allow system services and applications to identify B 26, B 27, B 28, and B 38 workstations in a cluster (refer to Assigning Identification Numbers to Cluster Workstations, in section 2).

## Keyboards

You use the keyboard to enter data and control workstation operations. Four types of keyboards are available:

- K1 without ports (for B 21 and B 22 cluster workstations) shown in Figure 1-1
- K1 with dual ports (for B 26, B 27, B 28, and B 38 workstations) shown in Figure 1-1

**Note:** The keys on the K1 keyboard without ports or with dual ports are the same.

- K2 (for B 26, B 27, B 28, and B 38 workstations) shown in Figure 1-2
- K3 (for B 26, B 27, B 28, and B 38 workstations) shown in Figure 1-3
- K4 (for B 26, B 27, B 28, and B 38 workstations) shown in Figure 1-4

All keyboards are detached and connected to the rest of the workstation by a coiled wire. This feature allows you to move the keyboard to the position most comfortable for you.

The coiled wire is permanently attached to the K1 keyboard without ports. The K1 with dual ports, K2, and K3 have two ports located near the corners on the rear of the keyboard. You plug one end of the coiled wire into either of these ports. You can use the other port for attaching an optional device such as the mouse device.

The K1, K2, and K3 keyboards include a standard set of typewriter keys and special keys you use to perform functions and operations. The special keys differ in number, type, and location between the keyboards and can activate different operations, depending on the software you are using.

The K4 keyboard also has two ports located on the rear. You plug the coiled wire into the port on the right (with the ports toward you). You can use the other port for attaching an optional magnetic card reader device. The K4 keyboard does not accept the mouse device.

The K4 keyboard is specially designed for financial applications. It includes a numeric keypad and numerous special function keys.

An explanation of the keys used during the operation of the standard BTOS software appears in section 3 of this guide.

For keyboard capabilities when you use other software programs (for example, word processing), refer to the documentation supplied with the program.

Figure 1-1 K1 Keyboard

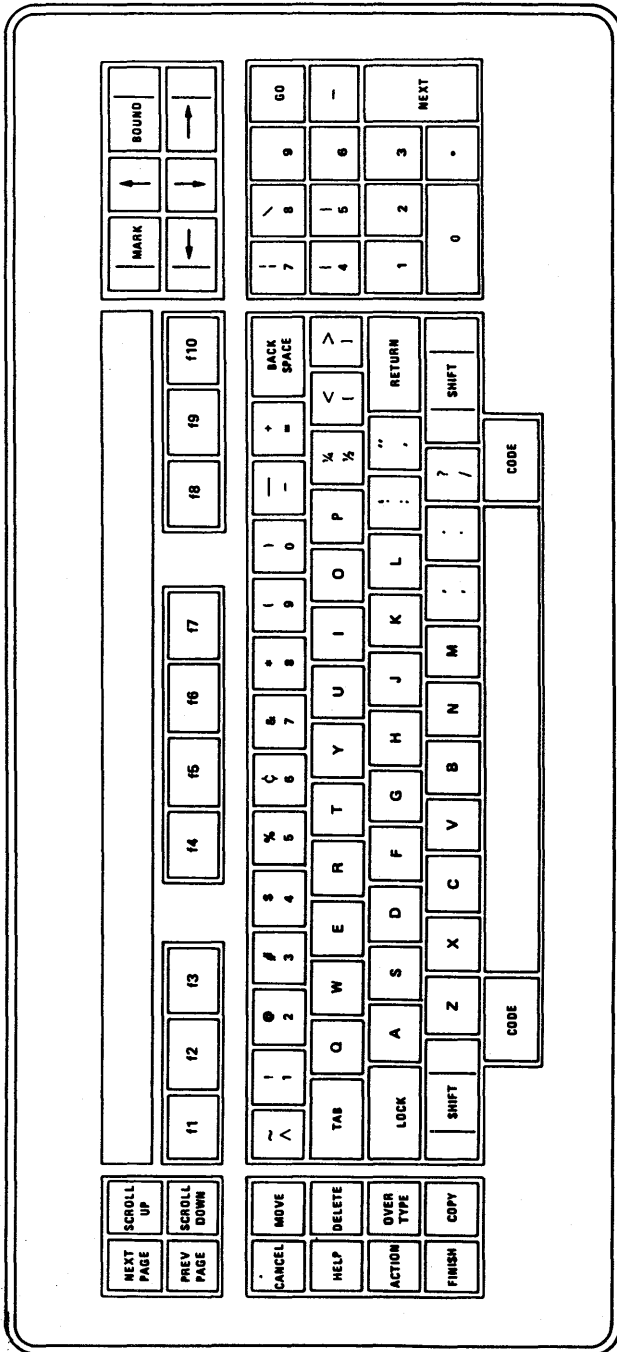


Figure 1-2 K2 Keyboard

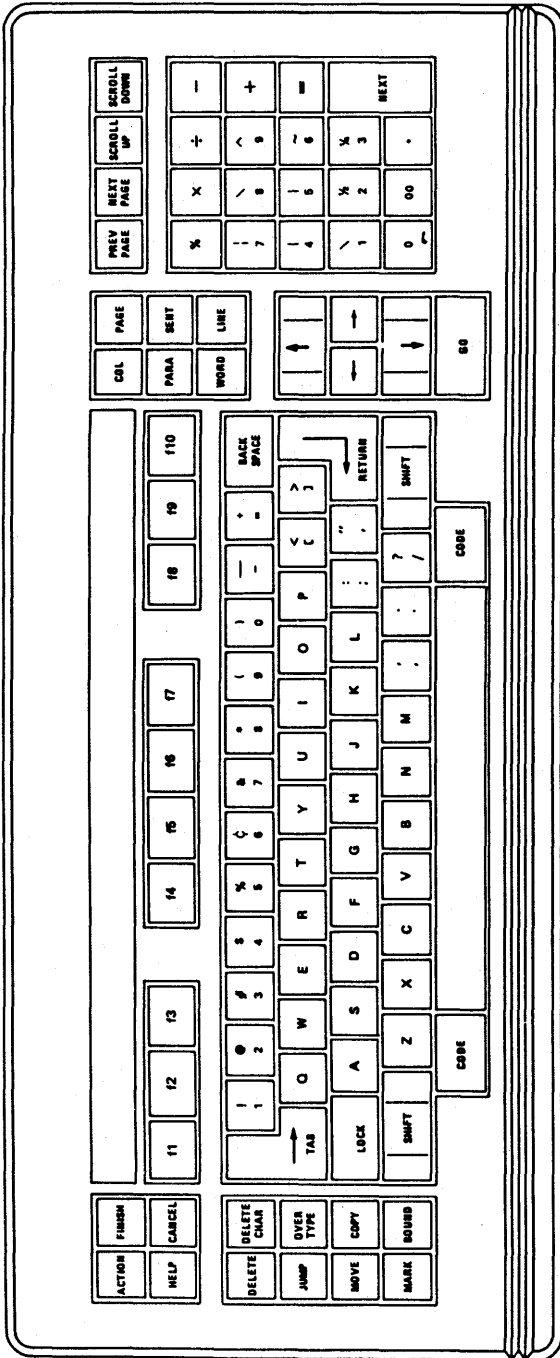


Figure 1-3 K3 Keyboard

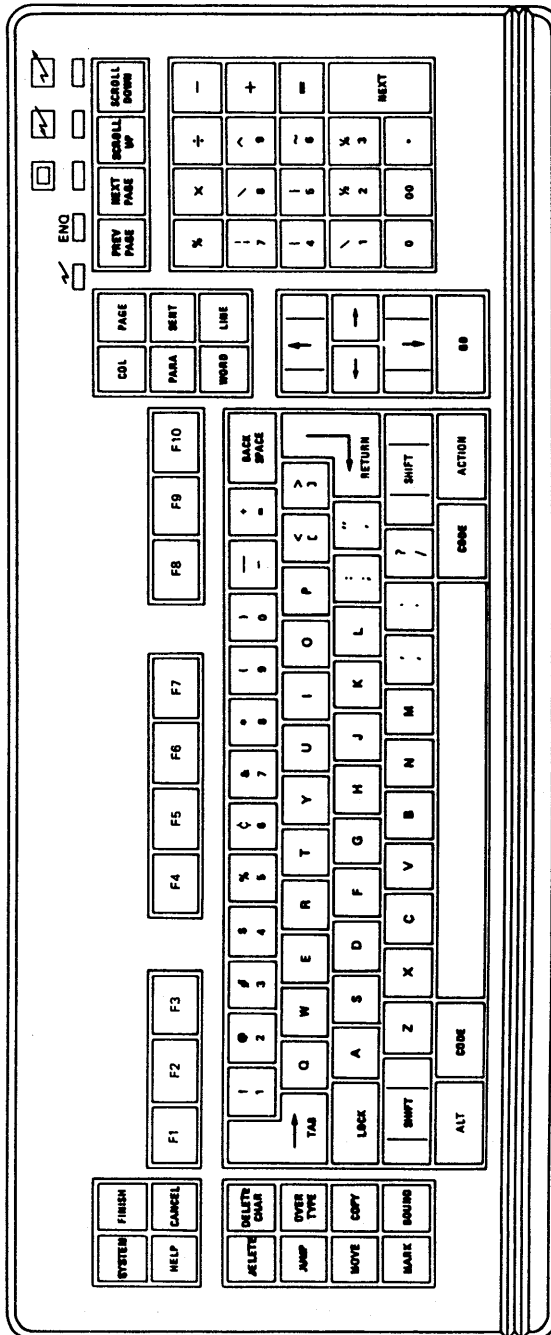
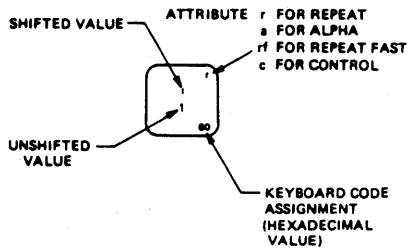
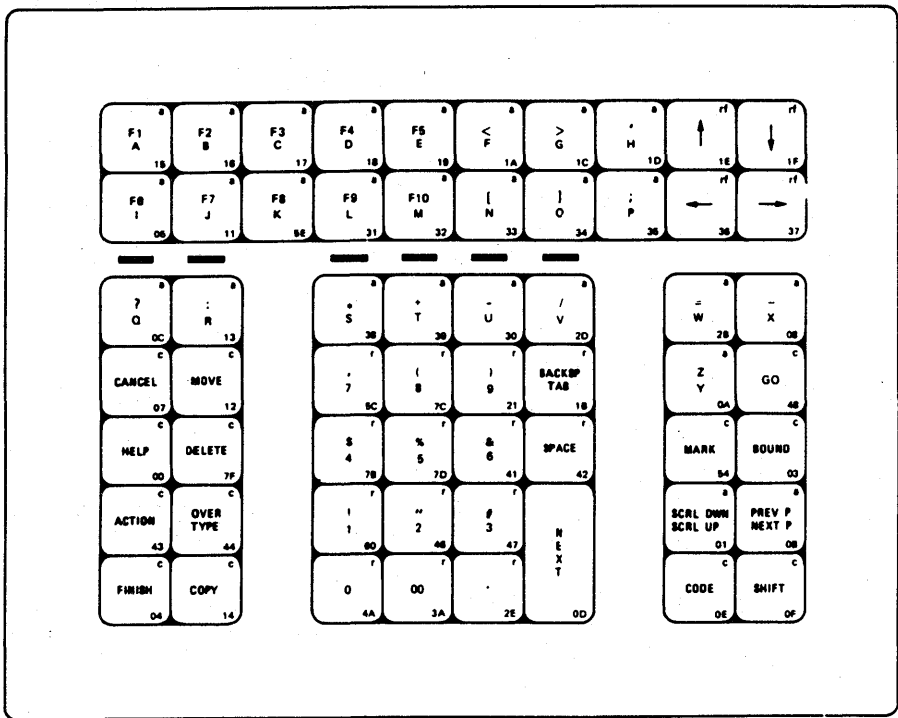


Figure 1-4 K4 Keyboard



**Diacritic Escape Keys (Non-USA Systems)**

On non-USA systems, diacritic escape keys are available to provide a method for producing special characters found in some languages. This type of character is usually a vowel with one of the following diacritical marks directly above it:

- umlaut (¨)
- grave (˘)
- acute (´)
- circumflex (ˆ)

For example, ä , è , û .

**Use the following procedure to produce a diacritical character:**

- 1 Press the diacritic escape key.

This key varies, depending on the type of keyboard you have (for example, on a French keyboard, you press the 1/2 key).

- 2 Press the vowel key.

The resulting character is a single special character; for example, e.

If the second key you press is one that does not produce a diacritical character, or is the diacritic escape key, the system displays the character shown on the keycap.



## Mouse Device

A mouse is a desk-top hand-held device you use to point the cursor to text or graphics on a screen, select items from a menu, and with interactive graphics applications, do free-form drawing (you must have BTOS 7.0 or higher installed.)

You can use either a 2-button or 3-button mouse. You use the 2-button mouse with the K2 (revision I or later) or K3 keyboards. You can use the 3-button mouse with the K1, K2, or K3 keyboards.

If you develop applications using the mouse functions, you should be aware of the following:

- The 2-button mouse and 3-button mouse return the same values for the left and right buttons.
- The 3-button mouse uses all three buttons to generate input; however, it returns a unique value for the middle button.

Any application written to use the mouse should use the right and left buttons for valid input and have a case value to handle the middle button.

There are no default actions for the mouse device. The mouse device is dependent upon the specific application software that you use; for example, word processing or spreadsheet analysis.

The mouse software is packaged on the Language Development distribution diskette. You must install the Mouse Server (refer to section 2) so that the mouse software can interface with the operating system and application programs. (Refer to the *BTOS Reference Manual*.)

## BTOS System Software

BTOS is the operating system for Unisys workstations.

An operating system is the part of the system software that manages your system's operations; for example, it supervises the running of individual programs. It performs many functions, including:

- loading programs for operation
- allowing concurrent operation of two or more programs
- scheduling processes within the system
- providing management of information

The standard BTOS software that comes with your workstation includes:

- the Executive
- system utilities
- programming development tools

You can access the functions of BTOS through these and also through installed application programs.

### The Executive

The Executive is a BTOS program that acts as an interface between you and BTOS or an installed application. It also performs tasks such as copying, renaming, or deleting files; creating directories; setting security; and running programs.

The BTOS Executive is interactive—you communicate with the system by entering commands. The system responds to each command and, if necessary, displays a command form requesting additional information. Refer to section 3 for more information about the Executive.

## **System Utilities**

System utilities are separate BTOS programs you activate through the Executive. They perform tasks such as file backup and restore, volume initialization, printing, application partition management, and cluster management. This guide treats utilities as part of the Executive and refers to them as commands.

## **Programming Development Tools**

BTOS programming development tools are of primary interest to system developers. The Editor and Sort/Merge programs are a part of the standard system software. Other programming tools packaged on the Language Development distribution diskette include language development, debugging, linking, and forms development. The Debugger is packaged with the Standard Utilities.

## **Access Through Applications**

BTOS can activate applications such as inventory control, marketing projection, word processing, and accounting programs. Once BTOS activates an application, the application can then access the BTOS functions.

Applications written in any of the following high level languages are compatible with the current release of BTOS:

- BASIC
- COBOL
- FORTRAN
- Pascal

## **Single Partitions and Multipartitions**

Your system's memory includes areas called partitions. During software installation, the system displays a prompt offering you the option of installing a single-partition or multipartition system.

Two types of partitions are possible: system partitions and application partitions. In addition, application partitions are of two types: primary application partitions and secondary application partitions.

After software installation on a single-partition system, automatically installed system programs load into the system partition when you turn on your workstation. All remaining memory in the partition becomes a single application partition, called the primary application partition. This primary application partition supports only interactive programs that use the keyboard and screen to interact with the user. Only one application can operate at a time.

A multipartition system supports the Application Partition Management facility, which allows you to create and control secondary application memory partitions. Secondary partitions support noninteractive applications such as the Spooler. The Application Partition Management facility permits the simultaneous execution of several applications, each in its own secondary partition.

The memory requirements for single and multipartition operating systems differ. Refer to Memory Requirements, in this section, and Managing Application Partitions, in section 2.

## Memory Requirements

Table 1-1 lists the memory and disk space requirements for BTOS configurations. These sizes are approximate values.

Table 1-1 BTOS Memory and Disk Space Requirements

Configuration	Single Partition (KB)	Multi-Partition (KB)	Disk Space (Sectors)
B 21-1 Cluster	65	—	—
B 21-4 Cluster with local file storage	100	125	—
B 22 Cluster	85	100	—
B 22 Cluster with local file storage	110	150	—
B 26 Standalone	115	140	1400/2900*
B 26 Master	175	195	700**
B 26 Cluster	100	115	—
B 26 Cluster with local file storage	120	155	—
B 27 Standalone	140	150	1400/2900*
B 27 Master	220	230	700**
B 27 Cluster	140	145	—
B 27 Cluster with local file storage	160	190	—
B 28 Standalone	110	135	1400/2900*
B 28 Master	190	210	700**
B 28 Cluster	95	110	—
B 28 Cluster with local file storage	115	150	—
B 38 Standalone	110	135	1400/2900*
B 38 Master	190	210	700**
B 38 Cluster	95	110	—
B 38 Cluster with local file storage	115	150	—

\* Minimum/Optional requirements (including standard software)

\*\* Cluster operating systems require 170 to 300 additional sectors each.

**Note:** Customized operating systems will be approximately 22k larger, due to protected mode support.

---

## File Requirements

BTOS requires special files called run files to function successfully on all workstations. Table 1-2 lists the run file names. If an Executive command activates the run file, the command name is also listed (refer to section 3 for more information about Executive commands).

If your system includes the Editor, one of the following files is also present:

- B 21 systems: AWSEditor.run
- B 22 systems: IWSEditor.run
- B 26 systems: t1Editor.run
- B 27 systems: BAWSEditor.run
- B 28 systems: t1Editor.run
- B 38 systems: t1Editor.run

Table 1-2 BTOS Run Files

Run File	Command Name (if any)
BackupVolume.run	BACKUP VOLUME
BootStrap.run	BOOTSTRAP
ChgVolName.run	CHANGE VOLUME NAME
ClusterStatus.run	CLUSTER STATUS
CmdFileEditor.run	COMMAND FILE EDITOR
Command.run	NEW COMMAND, REMOVE COMMAND
CreateConfig.run	CREATE CONFIGURATION FILE
CreatePartition.run	CREATE PARTITION
DebugFile.run	DEBUG FILE
DisableCluster.run	DISABLE CLUSTER
Dump.run	DUMP
DcxServer.run	INSTALL DATACOMM SERVER
Editor.run	REPLAY, EDIT
Exec.run	—
Files.run	FILES
FloppyCopy.run	FLOPPY COPY
Format.run	FORMAT
HwID.run	INSTALL HARDWARE ID

Table 1-2 BTOS Run Files (continued)

<b>Run File</b>	<b>Command Name (if any)</b>
InstallQMgr.run	INSTALL QUEUE MANAGER
InstallSpl.run	INSTALL SPOOLER
IVolume.run	IVOLUME
LCopy.run	LCOPY
MaintainFile.run	MAINTAIN FILE
MakeTxlFile.run	MAKE TRANSLATION FILE
Merge.run	MERGE
PartitionStatus.run	PARTITION STATUS
PLog.run	PLOG
Print.run	PRINT
Restore.run	RESTORE
ResumeCluster.run	RESUME CLUSTER
rHwID.run	READ HARDWARE ID
SelectiveBackup.run	SELECTIVE BACKUP
SetDirectoryProtection.run	SET DIRECTORY PROTECTION
SetTime.run	SET TIME
SetMouse.run	SET MOUSE CONTROLS
SignOn.run	LOGOUT
Sort.run	SORT
Spooler.run	SPOOLER STATUS
SubCmd.run	IVARCHIVE, SOFTWARE INSTALLATION, XESOFTWARE INSTALLATION
Submit.run	SUBMIT
SysInIt.run	—
UserFileEditor.run	USER FILE EDITOR
VolumeStatus.run	VOLUME STATUS
wHwID.run	WRITE HARDWARE ID



## BTOS Software Installation

Procedures for installing the BTOS software vary for standalone and cluster systems. In addition, the type of disk storage your workstation has affects software installation.

- If you have a standalone system with hard disk storage, you install the standalone system software on your hard disk.
- If your workstation is the master in a cluster system, you install the standalone system software; then you install the cluster utilities software; and finally you install the MultiUser software.
- If your workstation is part of a cluster system and does not have a hard disk for local file storage, it uses the software installed on the master's hard disk.
- If your workstation is part of a cluster system and has a hard disk for local file storage, you install the standalone system software on the hard disk. Next, you copy the appropriate cluster operating system (for example, B26ClstrLfsMp.Run) over the resident file, SysImage.Sys. This allows you to boot locally (you use the operating system stored on your hard disk instead of the one on the master); however, you can install the software on the master.

### Installing BTOS on Standalone Hard Disk Workstations

The system software for standalone workstations with hard disks includes the following packages:

- the Standalone Software package (two diskettes)
- the Standalone Utilities package (four diskettes)

The system software diskettes include the single-partition and multipartition versions of BTOS. During installation, the system displays a prompt offering you the option of installing the single-partition or the multipartition version (refer to Single-Partitions and Multipartitions, in this section).

## Installing the Standalone Software Package

When you install the system software, you use the install option to initialize your hard disk, or the update option to update your existing operating system. You select one option from the Software Installation/Update form (refer to figure 1-5). Initializing the disk erases all data and software on the disk, including your files. Updating revises the earlier operating system, but retains your files.

**Note:** You can update only systems that currently have BTOS release level 4.0 or higher.

You must use the operating system provided with the Standalone Software package. To do this, you must boot the system from the first diskette (that is, insert the first diskette in the left-most drive, then restart or reset the system).

**To install the Standalone Software package, use the following procedure:**

- 1 Insert the first Standalone Software package diskette in your workstation's floppy disk drive (drive [f0]).
- 2 Restart or reset the system to boot the system from the diskette.
  - To restart the system, press the **POWER** switch once to turn the system off; then press it again.
  - To reset the system, press the **RESET** button located on the back panel of your workstation. (On B 27 workstations, you reset by turning the power off and then on again.)

The Software Installation/Update form appears on the screen (refer to figure 1-5). The **User name** field is highlighted.

- 3 Enter *INSTALL* to initialize the disk; or enter *UPDATE* to update your current operating system (BTOS release level 4.0 or higher).
- 4 If your system is currently password-protected or if you want to initialize your system with a password, you must enter a password in the [Password] field.

- 5 If the date and time are not currently displayed, press RETURN twice to move the highlight to the Date/Time field. Enter the current date and time (refer to SignOn Form, in section 3).  
If the date and time are currently entered, skip this step and proceed to step 6.
- 6 Press GO.
- 7 Watch the screen and respond to the prompts the system displays during the rest of the installation.

Figure 1-5 Software Installation/Update Form

SignOn 8.0.2 (OS t2CLstrLfsMp-8.0.2)		Wed Mar 11, 1987 10:09 A.M.
<b>UNISYS OPERATING SYSTEM BTOS 8.0.2</b>		
User name	Enter <b>INSTALL</b> To initialize the winchester and install the system software. <input type="checkbox"/> <b>UPDATE</b> To update the system software.	
Password	Enter volume password.	
Day/Date/Time	Enter the current day, date, and time (if not already set).	
then press the <b>GO</b> key.		
User name (e.g., Allen)	<input type="text"/>	
Password	<input type="text"/>	
Date/Time (e.g., Fri Sep 9, 1983 8:00 am)	<input type="text"/>	

When installation of the second diskette of the Standalone Software package is complete, the system prompts you to press the RESET button and begin installing the Standalone Utilities package (refer to Installing the Standalone Utilities Package, in this section).

### Installing the Standalone Utilities Package

**To install the Standalone Utilities package, use the following procedure:**

- 1** Insert the first diskette of the Standalone Utilities package in the master workstation's floppy disk drive (drive [f0]).
- 2** Enter *SOFTWARE INSTALLATION* on the command line.
- 3** Press GO.
- 4** Respond to the prompts the system displays during the rest of the installation. The system displays the following types of prompts:
  - instructions for installing or omitting optional utilities
  - instructions to replace the diskette currently in the floppy disk drive with the next diskette in the package

When the software installation is complete, the system displays a message, and prompts you to remove the last diskette.

## **Installing BTOS on Cluster Systems**

To install BTOS on a cluster system, you must first install the standalone system software on the master workstation. Then you install the cluster system software on the master.

To allow cluster workstations with local file storage to boot locally, you must install the standalone system software and copy the appropriate cluster workstation system image from the master or the Cluster Utilities package.

### **Installing the Standalone System Software on the Master**

To install the standalone system software on the master, refer to the procedures in *Installing BTOS on Standalone Hard Disk Workstations*, in this section.

### **Installing the BTOS Cluster System Software**

The BTOS cluster system software includes the following packages:

- the Cluster Utilities package (eight diskettes)
- the Master Software package (one diskette)

The system software diskettes include the single-partition and multipartition versions of BTOS. During installation, the system displays a prompt offering you the option of installing the single-partition or the multipartition version (refer to *Single-Partitions and Multipartitions*, in this section).

In addition, the Cluster Utilities package includes the cluster operating system and cluster utilities for every type of workstation that can be included in a cluster, in both single-partition and multipartition versions.

### **Installing the Cluster Utilities Package and the Master Software Package**

During installation of the Cluster Utilities package, the system prompts you for information about the types of workstations you have on your cluster.

Based on the information you provide, the system copies only the applicable files from the software diskettes, and omits the rest.

**Use the following procedure to install the Cluster Utilities Package and the Master Software Package:**

- 1 Insert the first diskette of the Cluster Utilities package in the master workstation's floppy disk drive (drive [f0]).
- 2 Enter *SOFTWARE INSTALLATION* in the Executive command field.
- 3 Press GO.
- 4 When the system displays the prompt, turn off all the cluster workstations on your system.
- 5 Press GO.

The system displays a prompt instructing you to have ready the model number of each workstation in the cluster.

The system displays a prompt asking you if you intend to connect a B 22 workstation (cluster workstation only).

- 6 Choose one of the following:
  - Press GO if you are using a B 22 as a cluster workstation
  - Press CANCEL-GO if you are not using a B 22 as a cluster workstation

The system displays a prompt requesting information about the type of operating system (multipartition or single-partition) you are installing.

**7** Enter one of the following:

- **MP** for a multipartition system.
- **SP** for a single-partition system.

**8** Press **GO**.

**9** Watch the screen and respond to the prompts the system displays during the rest of the installation. The system displays the following types of prompts:

- requests for information concerning the types of workstations you have in your system
- instructions to replace the diskette currently in the floppy disk drive with the next diskette in the package

When installation of the the last diskette of the Cluster Utilities package is complete, the system prompts you to begin installing the Master Software package diskette.

**10** Insert the Master Software package diskette in the master workstation's floppy disk drive (drive [f0]).

**11** In the Executive command field, enter *SOFTWARE INSTALLATION*.

**12** Press **GO**.

**13** Watch the screen and respond to the prompts the system displays during the rest of the installation. When the installation of the Master Software package is complete, the system informs you by displaying a message and prompts you to remove the diskette.

**Installing BTOS on B 21-4/-5/-6, B 26, B 27, B 28, and B 38 Cluster Workstations with Local File Storage**

To allow a B 21-4/-5/-6, B 26, B 27, B 28, or B 38 cluster workstation with local hard disk file storage to boot locally, you install the standalone system software on the cluster workstation, then copy the appropriate system image for that workstation from the master.

**Use the following procedure to install BTOS on cluster workstations with local file storage:**

- 1 Install the standalone system software (refer to *Installing BTOS on Standalone Hard Disk Workstations*, in this section).
- 2 While you hold down the **Spacebar**, reset your workstation by pressing the **RESET** button. (On B 27 workstations, you reset by turning the power off and then on again.)

A series of characters ending with a colon appears near the bottom of the screen.

- 3 Enter the letter *t*.

The characters **OS:** appear.

- 4 Enter the appropriate workstation identifier:

- 253 for B 21-4/-5/-6 workstations
- 250 for B 26 workstations
- 125 for B 27 workstations
- 240 for B 28 workstations
- 240 for B 38 workstations

- 5 Press **RETURN**.

A series of characters ending with a colon appears near the bottom of the screen.



- 6 Enter the letter *b*.
- 7 When the SignOn form appears, sign on to the master from the cluster by entering a valid user name for the master in the User name field and a password, if the master is password-protected (refer to Signing on to Your System, in section 3).
- 8 Use the **COPY** command to copy the file [Sys]<Sys>Ws###>SysImage.Sys to the file [d0]<Sys>SysImage.Sys (refer to Copying Files, in section 5), where ### is the numerical designation for your cluster workstation (refer to table 1-4).
- 9 Enter the letter *y* in the [Overwrite ok?] field of the **COPY** command.
- 10 Reset the cluster workstation to complete the operation.

### Installing BTOS on B 22 Cluster Workstations with Local File Storage

To allow a B 22 cluster workstation with local hard disk file storage to boot locally, use the following procedure:

- 1 Set the master workstation's **POWER** switch to ON.
- 2 Make sure that the cluster workstation's mass storage unit is OFF.
- 3 Set the cluster workstation's **POWER** switch to ON, or reset the workstation. The cluster workstation automatically bootstraps the system image for a B 22 cluster workstation without local file storage.
- 4 Turn on the cluster workstation's mass storage unit.
- 5 Use the **BOOTSTRAP** command to load the system image for a B 22 cluster workstation with local file storage (refer to **BOOTSTRAP** command, in section 7).
  - For a single-partition system, enter the file B22ClstrLfsSp.run
  - For a multipartition system, enter the file B22ClstrLfsMp.run

## Installing Applications Software

After installing the system software, you must install applications software on your system. Then you can begin using your system for applications such as word processing or spreadsheet analysis.

On hard disk systems, you use the **SOFTWARE INSTALLATION** command to store applications software programs on your system's hard disk.

**Table 1-3 System Images for Cluster Workstations with Local Hard Disk File Storage**

<b>Workstation Type</b>	<b>System Image</b>
B 21-4/-5/-6 Cluster Workstation	Ws253>SysImage.Sys
B 26 Cluster Workstation	Ws250>SysImage.Sys
B 27 Cluster Workstation	Ws125>SysImage.Sys
B 28 Cluster Workstation	Ws240>SysImage.Sys
B 38 Cluster Workstation	Ws240>SysImage.Sys

## SOFTWARE INSTALLATION Command

The **SOFTWARE INSTALLATION** command includes options that allow you to customize the installation of an application program (for example, by specifying the command file where you want the system to store the command that activates the program). You can also accept the default parameters built into the program.

To activate this command, you enter *SOFTWARE INSTALLATION* in the Executive command field.

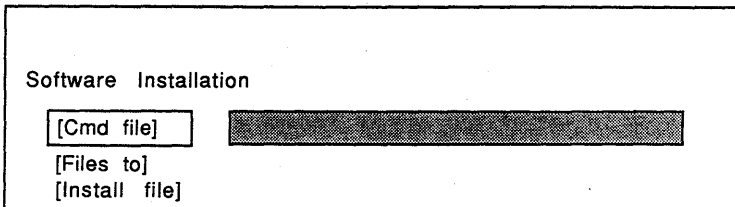
- To accept the default parameters, you press **GO**. The system begins installing the software.
- To customize the installation, you press **RETURN**. The system displays the **SOFTWARE INSTALLATION** command form (refer to figure 1-6).

The **SOFTWARE INSTALLATION** command form includes three optional fields (enclosed in square brackets). You can leave any or all of these fields blank to accept the defaults, or enter parameters to override the defaults. Refer to table 1-4 for information about the optional fields.

After you complete the command form, you press **GO**. The system begins installing the software. As the installation proceeds, the system may prompt you for additional information. Refer to the documentation accompanying your application software for a detailed installation procedure.

**Note:** Some application programs ignore these application parameters.

Figure 1-6 **SOFTWARE INSTALLATION** Command Form



Software Installation

[Cmd file] [Files to] [Install file]

Table 1-4 SOFTWARE INSTALLATION Command Optional Fields

Field	Action/Explanation
<b>[Cmd File]</b>	When you install an application program, the system stores the command that activates the program in a command file. The default is the standard system command file, [Sys]<Sys>Sys.cmds.
<b>[Files to]</b>	To specify a different command file, enter the file name or complete file specification. When you install an application program, the system stores it in a directory. The default is the system directory. To specify a different directory, enter the directory name.
<b>[Install file]</b>	The default installation file is [f0]<Sys>Install.sub. If the application program uses a different installation file, specify the file name in this field.

## XESoftware Installation Command

The **XESoftware Installation** command includes options that allow you to customize the XE 520 installation of an application program (for example, by specifying the command file where you want the XE 520 to store the command that activates the program). You can also accept the default parameters built into the program. Refer to table 1-5 for information about the optional fields.

To activate this command from a cluster workstation connected to the XE 520 (via the RS-232C port), you enter *XESoftware Installation* in the Executive command field.

- To accept the default parameters, you press GO. The XE 520 begins installing the software.
- To customize the installation, you press RETURN. The XE 520 displays the **XESoftware Installation** command form (refer to figure 1-7).

After you complete the command form, you press GO. The XE 520 begins installing the software. As the installation proceeds, the XE 520 may prompt you for additional information. Refer to the documentation accompanying your application software for a detailed installation procedure.

**Note:** Some application programs ignore these application parameters.

Figure 1-7 **XESoftware Installation** Command Form

XE Software Installation	
[Cmd file]	<input type="text"/>
[Files to]	
[Install file]	

Table 1-5 XESoftware Installation Command Optional Fields

Field	Action/Explanation
<b>[Cmd File]</b>	<p>When you install an application program, the XE 520 stores the command that activates the program in a command file. The default is the standard XE 520 command file, [!Sys]&lt;Sys&gt;Sys.cmds.</p> <p>To specify a different command file, enter the file name or complete file specification.</p>
<b>[Files to]</b>	<p>When you install an application program, the XE 520 stores it in a directory. The default is the XE 520 directory.</p> <p>To specify a different directory, enter the directory name.</p>
<b>[Install file]</b>	<p>The default installation file is [f0]&lt;Sys&gt;XEInstall.sub. If the application program uses a different installation file, specify the file name in this field.</p>



---

# Adapting the System to Your Requirements

This section explains how to adapt features of the system software to meet your special requirements. It includes:

- customizing your system for individual users, applications, and tasks
- configuring your system to interface with printers and communications devices
- configuring your screen
- managing application partitions

## Configuring Your System for Individual Users, Applications, and Tasks

The user configuration procedures described in this section allow you to create files, called User Configuration files (or simply User files), that identify each user to the system. This helps to prevent unauthorized persons from gaining access to your system.

User configuration also allows you to customize your system for individual users. For example, if a user performs word processing exclusively, you can configure the system to automatically activate the word processing program when that user signs on, and return to the SignOn form at the end of the word processing session.

You may also find it convenient to configure your system for applications you use, or for specific tasks or projects. For example, you can configure your system to bypass the Executive and activate the spreadsheet program when you sign on, or go directly to a document you are currently working on.

To do this, you must assign each user, application, or task a user name and create a User file for each.

You can then require a user to enter a valid user name to sign on to the system (refer to section 3).



## User Names

A user name is an alphanumeric string of up to 30 characters. You can require a user to enter a valid user name in the **User name** field of the SignOn form to sign on to the system (refer to section 3).

Because the user name identifies a user (or application, or task) to the system, each user name on your system must be different from the others. A user name also becomes part of the name of a corresponding User file (refer to **User File Names**, in this section).

## User Files

A User file is a file on the system directory that, in addition to identifying the user, specifies the environment the system activates after you sign on and after you exit from an application.

An environment is a program that has control of the system at any given time. Environments include the SignOn form, the Executive, the Mail Manager, utilities such as the Editor, application programs such as word processing, user-written applications, etc.

A User file can also include entries that specify files pertaining to specific applications (for example, the word processing program's Print Wheels file).

### User File Names

A User file name consists of two parts:

- the user name assigned to the user (refer to **User Names**, in this section)
- the suffix `.user`

For example, a user assigned the user name `Worker1` would have a User file named `Worker1.user`.

Figure 2-1 User File (Sample)

```
:SignOnExitFile:[sys]<sys>Exec.run  
:SignOnChainFile:[sys]<sys>Exec.run  
:SignOnTextFile:[sys]<sys>System.Txt  
:SignOnVolume:sys  
:SignOnDirectory:sys  
:SignOnFilePrefix:  
:SignOnPassword:  
:ExecCmdFile:[sys]<sys>Sys.cmds  
:WpFormatSet:[sys]<sys>Wp.fmt  
:WpPrinters:[sys]<sys>Sys.Printers  
:WpPrintWheels:[sys]<sys>Wp.whl
```

### User File Entries

A User file entry consists of a keyword enclosed in colons, followed by a parameter. For example, the first entry of the typical User file in figure 2-1 consists of the keyword :SignOnExitFile: followed by the parameter [Sys]<Sys>Exec.run.

**Note:** The system requires the colons to read the file correctly. The system ignores an entry if it does not begin with a keyword enclosed in colons.

Each entry specifies one feature of the user configuration. For example, the fourth and fifth entries in figure 2-1, :SignOnVolume:sys and :SignOnDirectory:sys specify that both the volume and directory names are sys.

User files include SignOn entries, which specify items such as the path the system sets when you sign on, and can also include entries specifying parameters for applications such as word processing.

### User File SignOn Entries

The User file SignOn entries (refer to table 2-1) specify the following items:

- the initial path
- a system password (optional)
- a message the system displays immediately when you sign on (optional)
- the Executive command file
- the initial environment (the environment that the system activates when you sign on)
- the exit environment (the environment the system activates when you exit a program or press ACTION-FINISH.)

Table 2-1 User File Keyword SignOn Entries

Keyword	Parameter
:SignOnVolume:	specifies the volume in the default path
:SignOnDirectory:	specifies the directory in the default path
:SignOnFilePrefix:	specifies a file prefix in the default path
:SignOnPassword:	specifies a password required to sign on to the system
:SignOnExitFile:	specifies the run file of the environment the system loads whenever you exit an application or press <b>ACTION-FINISH</b> .  For example, to return to the Executive when you finish a session with an application, enter the Executive run file [Sys]<Sys>Exec.run.
:SignOnTextFile:	specifies one or more files containing text the system displays when you sign on  You can specify the default text file [Sys]<Sys>Sysinit.txt and/or another file containing messages you want the system to display before activating the initial environment.
:SignOnChainFile:	specifies the run file of the initial environment.  For example, to activate the Executive when you sign on, you enter the Executive run file, [Sys]<Sys>Exec.run.  To bypass the Executive and activate an application, programming language, or BTOS utility, enter the appropriate run file (for applications and programming languages, refer to the applicable documentation; for BTOS utilities, refer to appendix A).  If the Executive command that activates the application, programming language, or BTOS utility has a command form, you can specify one or more parameters; use the following guidelines:

Table 2-1 User File SignOn Entries (continued)

Keyword	Parameter
	<ul style="list-style-type: none"> <li data-bbox="490 293 866 370">□ the parameter(s) must appear in the line(s) immediately following the SignOnChainFile entry.</li> <li data-bbox="490 399 866 451">□ the line(s) containing the parameter(s) do not begin with a colon.</li> <li data-bbox="490 480 866 557">□ the first parameter must be the command that activates the application, programming language, or BTOS utility</li> <li data-bbox="490 586 866 638">□ the parameter entries cannot include wild card characters.</li> <li data-bbox="490 667 866 743">□ if you are using the word processing program to edit the file, press <b>SHIFT-RETURN</b> to end each line.</li> </ul> <p data-bbox="524 776 793 833"><b>Note:</b> You must remove any formatting characters.</p> <ul style="list-style-type: none"> <li data-bbox="490 865 866 917">□ two or more blank lines must follow the last parameter entry.</li> <li data-bbox="490 946 866 1036">□ the next line following the blank lines must begin with a colon (even if it contains no other entry).</li> </ul>
:ExecCmdFile:	<p data-bbox="524 1068 876 1092">specifies the Executive command file.</p> <p data-bbox="524 1125 876 1214">If none is specified, the system uses the default file [Sys]&lt;Sys&gt;Sys.cmds.</p>

To be valid, a User file must include all of the SignOn entries that specify the default path (the path the system sets when you sign on). You can omit the parameter for file prefix and password; however, you must include the keyword.

The entry specifying the exit file is also required. The entries specifying a SignOn text file, chain file, and Executive command file are optional.

### User File Application Entries

User files can include entries specifying parameters for applications. For example, the last three entries in figure 2-1 specify parameters for the word processing program.

Some applications have default parameters that you can change by specifying them in a User file. Others, such as the Mail Manager, require that you make entries. Refer to the application's documentation for further information.

## Default User File

The system software includes a default User file, [Sys]<Sys>.user (refer to figure 2-2). In addition, some applications (for example, spreadsheet) place User files on the system directory when you install the software.

Refer to the application's documentation for further information.

The default User file allows any user to sign on to the system without an entry in the User Name field of the SignOn form.

**Note:** To prevent unauthorized use of your system, you should delete the default file after you create the new User files for the authorized users of your system.

Figure 2-2 Default User File [Sys]<Sys>.user

```
:ExecCmdFile:[sys]<sys>Sys.Cmds  
:SignOnVolume:sys  
:SignOnDirectory:sys  
:SignOnFilePrefix:  
:SignOnPassword:  
:SignOnExitFile:[sys]<sys>Exec.run
```

---

## Creating and Modifying User Files

You can use any of the following tools to create or modify a User file:

- the Editor
- the word processing program
- the User File Editor

When you use the Editor or the word processing program to create or modify a User file, you must be careful to make your entries in the proper format (refer to User File Entries, in this section). Be sure to remove any formatting characters produced with the word-processing program.

When you use the User File Editor, the system formats the User file automatically.



## Using the Editor or the Word Processing Program

To create or modify a User file with the Editor or the word processing program, use the following procedure (refer to the *BTOS Editor Operations Guide* or your word processing program's documentation):

- 1 Activate the Editor or your word processing program.
  - To modify an existing file, enter the file name in the appropriate field of the Editor or word processing program's command form.
  - To create a new file, enter a valid new User file name (refer to User File Names, in this section) in the appropriate field of the command form.
- 2 If you are modifying an existing User file, the system displays the file. Make the changes and/or additions you want.

If you are creating a new User file, the system opens a session. Make the required User file entries and any optional entries.

All entries must be in the proper format (refer to User File Entries, in this section).
- 3 When you have completed your entries, exit from the Editor or word processing program using the procedure that saves the file.

## User File Editor

The User File Editor is an interactive, menu-driven utility you can use to create or modify User files. It includes a series of menus and forms that prompt you for information the system uses to configure User files (refer to User File Editor Interface, in this section).

### USER FILE EDITOR Command

**To activate the User File Editor, use the following procedure:**

- 1 Enter *USER FILE EDITOR* in the Executive command field.
- 2 Choose one of the following:

- Press RETURN

The USER FILE EDITOR command form appears (refer to figure 2-3). Proceed to step 3.

- Press GO.

The User File Editor display appears with the same command form with the Template file and Command file fields filled in (refer to figure 2-4). Proceed to step 3.

- 3 Enter a user file name in the User name field.

- To create a new User file, you enter a new user name (refer to User Names, in this section). You cannot enter a wild card character in this field (refer to section 5).
- To modify an existing User file, you enter the user name corresponding to that file.

The USER FILE EDITOR command form includes four optional fields (enclosed in square brackets). You can leave any or all of these fields blank to accept the defaults, or enter parameters to override the defaults. Refer to table 2-2 for information about the optional fields.

4 After you complete the command form, press GO.

If you are modifying an existing User file, the User File Editor display appears with the Functions menu (refer to figure 2-5).

If you are creating a new User file, the User File Editor display appears with the following message:

**Configuration file does not exist, Create? (GO or CANCEL)**

5 Choose one of the following:

- Press GO to create a configuration file.
- The User File Editor display appears with the Functions menu (refer to figure 2-5).
- Press CANCEL to terminate the operation.

Figure 2-3 USER FILE EDITOR Command Form

User File Editor

User name	
[Old password]	
[New password]	
[User template file]	
[Command file]	

Table 2-2 USER FILE EDITOR Command Optional Fields

Field	Action/Explanation
<b>[Old Password]</b>	<p>The default is the currently logged-in password. The system denies access to a protected file if you attempt to open it without a valid password.</p> <p>To access an existing User file with password protection, you must enter that password in this field. The password can be a volume or file password.</p>
<b>[New Password]</b>	<p>The default is the old password.</p> <p>To assign password protection to this User file, enter the new user file password in this field.</p> <p><b>Note:</b> This parameter does not create a password-protected volume or directory.</p>
<b>[Template file]</b>	<p>The default User File Template is [Sys]&lt;Sys&gt;UserFileTemplate.sys.</p> <p>To specify a User File Template other than the default, enter the Template file name in this field.</p>
<b>[Command file]</b>	<p>Refer to User File Templates, in this section.</p> <p>The default command file is [Sys]&lt;Sys&gt;Sys.cmds.</p> <p>To specify a command file other than the default for this User file, enter the command file name in this field.</p>

Figure 2-4 User File Editor Display and Command Form

User File Editor 8.0.2

A User name is required. Enter parameters and press GO.

User name [Old password] [New password] [Template file] [sys]<sys>UserFileTemplate.sys [Command File] [sys]<sys>sys.cmds	<input type="text"/>
--	----------------------

Figure 2-5 User File Editor Display and Functions Menu

User File Editor 8.0.2

<input type="text"/>	<input type="text" value="user name"/>
----------------------	--

Make a selection and press GO.

<b>Functions</b>
Modify Options
Select Environment

## User File Editor Interface

The User File Editor interface consists of menus and forms that allow you to enter information the system uses to configure User files.

The system uses special files called User File Templates to store entries that define the User File Editor's menus and forms (refer to User File Templates, in this section). The entries consist of keywords and parameters similar to those in User files.

The system software includes a default User File Template, [Sys]<Sys>UserFileTemplate.sys. You can modify the default template, and create other User File Templates. Changes in User File Template entries produce corresponding changes in the user interface.

If you accept the default User File Template when you activate the User File Editor, the interface includes three menus and six forms:

- Functions menu (refer to figure 2-5)
- Modify Options menu (refer to figure 2-6)
- Select Environment menu (refer to figure 2-7)
  - You access the two Environment forms (one without and one with parameters) from this menu.
- Executive Option Category form (refer to figure 2-8)
- Mail Option Category form (refer to figure 2-9)
- SignOn Option Category form (refer to figure 2-10)
- Word Processor Option Category form (refer to figure 2-11)

Figure 2-6 User File Editor Display and Modify Options Menu

User File Editor 8.0.2



Select a category and press GO. Press CANCEL to return to main menu.

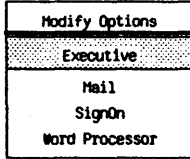


Figure 2-7 User File Editor Display and Select Environment Menu

User File Editor 8.0.2



Select an environment and press GO. Press CANCEL to return to main menu.

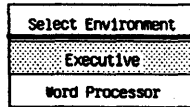


Figure 2-8 User File Editor Display and Executive Option Category Form

User File Editor 8.0.2



user name

Edit option fields and press GO or cancel.



Option category: Executive

Command file 

Figure 2-9 User File Editor Display and Mail Option Category Form

User File Editor 8.0.2



USER NAME

Edit option fields and press GO or cancel.



Option category: Mail

Mail user name   
Mail center name  
Password  
Printers file



Figure 2-10 User File Editor Display and SignOn Option Category Form

User File Editor 8.0.2

----- user name

Edit option fields and press GO or CANCEL.

Option category: SignOn

Volume

sys

Directory

sys

File Prefix

Password

Text File

Figure 2-11 User File Editor Display and Word Processor Option Category Form

User File Editor 8.0.2

----- user name

Edit option fields and press GO or CANCEL.

Option category: Word Processor

Format set file

[sys]<sys>wp.fmt

Printers file

[sys]<sys>Sys.Printers

Print wheels file

[sys]<sys>wp.whl

Standard Dictionary

Personal Dictionary

Statistics file

Phrases file

### Functions Menu

The Functions menu (refer to figure 2-5) is the main menu. It allows you to access the other two menus:

- Modify Options menu (refer to figure 2-6)
- Select Environment menu (refer to figure 2-7)

**Note:** To access a menu or form, you use the *NEXT*, *RETURN*, *Up Arrow*, or *Down Arrow* key to move the highlight to the field with the name of the menu or form, then press *GO*.

### Modify Options Menu

The Modify Options menu (refer to figure 2-6) allows you to access the following forms:

- Executive Option Category form (refer to figure 2-8)
- Mail Option Category form (refer to figure 2-9)
- SignOn Option Category form (refer to figure 2-10)
- Word Processor Option Category form (refer to figure 2-11). Tables 2-3 through 2-6 explain the fields included in each of these forms.

**Note:** To access a menu or form, you use the *NEXT*, *RETURN*, *Up Arrow*, or *Down Arrow* key to move the highlight to the field with the name of the menu or form, then press *GO*.

Table 2-3 Executive Option Category Form Field

Field	Explanation
<b>Command file</b>	<p>The entry in this field specifies the command file containing the commands available to the user.</p> <p>The default command file is [Sys]&lt;Sys&gt;Sys.cmds.</p> <p>If you specify a command file (refer to table 2-2), it appears in the field; otherwise, the field is blank.</p>

Table 2-4 Mail Option Category Form Fields

Field	Explanation
<b>Mail user name</b>	<p>The entry in this field specifies the user's Mail User name.</p> <p>The default is none.</p> <p>If a Mail User name is currently specified, it appears in the field; otherwise, the field is blank.</p>
<b>Mail center name</b>	<p>The entry in this field specifies the name of the user's mail center.</p> <p>The default is none.</p> <p>If a Mail User name is currently specified, it appears in the field; otherwise, the field is blank.</p>
<b>Password</b>	<p>The entry in this field specifies the password for the user's mailbox.</p> <p>The default is none.</p> <p>If a password is currently specified, it appears in the field; otherwise, the field is blank.</p>
<b>Printers file</b>	<p>The entry in this field specifies the Mail Manager's Printer Configuration file (the file that specifies the available printers and their characteristics).</p> <p>The default Printers file is [Sys]&lt;Sys&gt;Sys.printers.</p> <p>If a file other than the default is specified, it appears in the field.</p>

**Note:** Refer to the *BTOS Mail Manager Administration Guide* for more information.

Table 2-5 SignOn Option Category Form Fields

Field	Explanation
<b>Volume</b>	<p>The entry in this field specifies the volume in the path the system sets when you sign on.</p> <p>The default is Sys.</p> <p>If you have previously specified a volume other than the default, it appears in the field; otherwise, the default appears.</p>
<b>Directory</b>	<p>The entry in this field specifies the directory in the path the system sets when you sign on.</p> <p>The default is Sys.</p> <p>If you have specified a directory other than the default, it appears in the field; otherwise, the default appears.</p>
<b>File prefix</b>	<p>The entry in this field specifies a file prefix in the path the system sets when you sign on.</p> <p>The default is none.</p> <p>The current file prefix (if any) appears in the field; if there is none, the field is blank.</p>
<b>Password</b>	<p>The entry in this field specifies the password required to sign on to the system.</p> <p>The default is none.</p> <p>The current password (if any) appears in the field; if there is none, the field is blank.</p>
<b>Text file</b>	<p>The entry in this field specifies the file containing the text the system displays when you sign on.</p> <p>The default is none.</p> <p>If a text file is currently specified, it appears in the field, otherwise the field is blank.</p>

Table 2-6 Word Processor Option Category Form Fields

Field	Explanation
<b>Format set file</b>	<p>The entry in this field specifies the file that sets the word processing program's default format characteristics.</p> <p>The default Format Set file is [Sys]&lt;Sys&gt;Wp.fmt.</p> <p>If a file other than the default is specified, it appears in the field; otherwise, the default appears.</p>
<b>Printers file</b>	<p>The entry in this field specifies the word processing program's Printer Configuration file (the file that specifies the available printers and their characteristics).</p> <p>The default Printer file is [Sys]&lt;Sys&gt;Sys.printers.</p> <p>If you have previously specified a file other than the default, it appears in the field; otherwise, the default appears.</p>
<b>Print wheels file</b>	<p>The entry in this field specifies the word processing program's Print Wheels Configuration file (the file that specifies the available print wheels and their characteristics).</p> <p>The default is [Sys]&lt;Sys&gt;Wp.whl.</p> <p>If you have previously specified a file other than the default, it appears in the field; otherwise, the default appears.</p>
<b>Standard dictionary</b>	<p>The entry in this field specifies the file containing the standard dictionary you use with the word processing program's Spelling Checker feature.</p> <p>If you have specified a file previously, it appears in the field; otherwise, the field is blank.</p>
<b>Personal dictionary</b>	<p>The entry in this field specifies the file containing the personal dictionary you use with the word processing program's Spelling Checker feature.</p> <p>If you have specified a file previously, it appears in the field; otherwise, the field is blank.</p>

Table 2-6 Word Processor Option Category Form Fields (continued)

Field	Explanation
<b>Statistics file</b>	<p>The entry in this field specifies the Operator Statistics file you use with the word processing program's Operator Statistics feature.</p> <p>If you have specified a file previously, it appears in the field; otherwise, the field is blank.</p>
<b>Phrases file</b>	<p>The entry in this field specifies the Phrases file you use with the word processing program's Phrase Store and Recall feature.</p> <p>The system default Phrases file is [Sys]&lt;Wp&gt;xxxx.phrases (where xxxx is the user name).</p> <p>If you have specified a file previously, it appears in the field; otherwise, the field is blank.</p>

**Note:** Refer to your word processing program's documentation for further information.

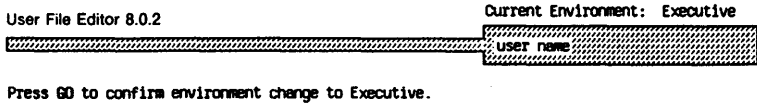
#### Select Environment Menu

The Select Environment menu (refer to figure 2-7) allows you to access the following forms:

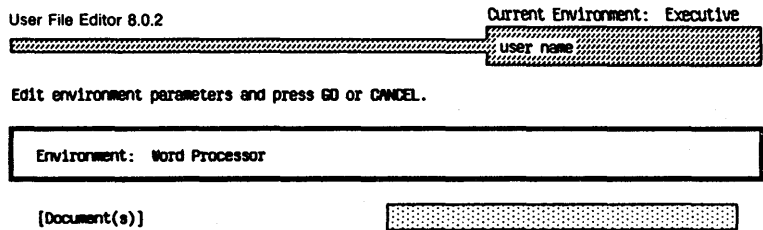
- Environment form without parameters (refer to figure 2-12)
- Environment form with parameters (refer to figure 2-13)

**Note:** To access a menu or form, you use the *NEXT*, *RETURN*, *Up Arrow*, or *Down Arrow* key to move the highlight to the field with the name of the menu or form, then press *GO*.

**Figure 2-12 User File Editor Display and Environment Form (without Parameters)**



**Figure 2-13 User File Editor Display and Environment Form (with Parameters)**



You use the Select Environment menu to specify the environment the system activates when you sign on.

The User File Template originally supplied with the system software includes environment entries for the Executive only. When the Executive is the only environment option, the system displays the Environment form without parameters (refer to figure 2-12) instead of the Select Environment menu.

You can add other environments, such as word processing, spreadsheet, Mail Manager, etc., by modifying the original User File Template or creating a new one (refer to User File Templates, in this section). When you have more than one environment option, the system displays the Select Environment menu.



## Creating a New User File

When you activate the User File Editor to create a new User file, the system automatically configures a default User file (refer to figure 2-14) using the entries from the User Template file you specify in the command form.

You can accept the default file, or use the User File Editor's menus and forms to change any or all of the default entries.

**To create a new User file, use the following procedure:**

- 1 Activate the User File Editor, entering a new user name in the User name field of the command form (refer to the **USER FILE EDITOR** command, in this section).
- 2 Press GO. The system displays the following message:  
**Configuration file does not exist, Create? (GO or CANCEL)**
- 3 Press GO again. The User File Editor display appears with the Functions menu (refer to figure 2-5).

To accept the User File Editor default file, press FINISH. The system displays the following message:

**Do you wish to save changes? (GO or CANCEL)**

When you press GO, the system saves the User file, then returns to the Executive.

To change the User File Editor default entries, follow the procedure for modifying an existing User file (refer to **Modifying an Existing User File**, in this section).

Figure 2-14 User File Editor Default File

```
:Environment:Executive
:SignOnExitFile:[sys]<sys>Exec.run
:SignOnChainFile:[sys]<sys>Exec.run
:SignOnVolume:sys
:SignOnDirectory:sys
:SignOnFilePrefix:
:SignOnPassword:
:WpFormatSet:[sys]<sys>Wp.fmt
:WpPrinters:[sys]<sys>Sys.Printers
:WpPrintWheels:[sys]<sys>Wp.whl
```

### Modifying an Existing User File

To modify an existing User file, use the following procedure:

- 1 Activate the User File Editor, entering an existing user name in the User name field of the command form (refer to the **USER FILE EDITOR** command, in this section).  
The Functions menu appears (refer to figure 2-5) with the **Modify Options** field highlighted.
- 2 Access the forms containing the parameters you want to modify or enter (refer to User File Editor Interface, in this section).
- 3 Enter the new parameters or change the existing ones.
- 4 Press **FINISH**.
- 5 Press **GO**.

### User File Templates

The User File Editor uses special files called User File Templates to store the keywords and parameters that define the User File Editor's menus and forms.

The system software includes a default User File Template, [Sys]<sys>UserFileTemplate.sys. Figure 2-15 shows the entries in the default template. The file also includes comments that explain the template and its entries. You can use the Editor, the word processing program, or the **TYPE** command to display the file and read this information (refer to section 5).

You can use the Editor or the word processing program to edit the default template, and also to create one or more additional User Template files. When you activate the User File Editor, you can accept the default file, or specify a file you have created (refer to the **USER FILE EDITOR** command, in this section).

Figure 2-15 Default User File Template

```

:Options:Modify Options
:Category:Executive
  :Field:ExecCmdFile
    :Description:Command File

:Category:Mail
  :Field:MailUserName
    :Description:Mail user name
  :Field:MailCenterName
    :Description:Mail center name
  :Field:MailPassword
    :Description>Password
  :Field:MailPrinters
    :Description:Printers file

:Category:SignOn
  :MustField:SignonVolume
    :Description:Volume
    :Default:sys
  :MustField:SignonDirectory
    :Description:Directory
    :Default:sys
  :MustField:SignonFilePrefix
    :Description:File prefix
  :MustField:SignonPassword
    :Description>Password
  :Field:SignonTextFile
    :Description:Text file

:Category:Word Processor
  :Field:WPFormatSet
    :Description:Format set file
    :Default:[sys]<sys>Wp.fmt
  :Field:WPPrinters
    :Description:Printers file
    :Default:[sys]<sys>Sys.Printers
  :Field:WpPrintWheels
    :Description:Print Wheels file
    :Default:[sys]<sys>Wp.whl
  :Field:WpDictionary
    :Description:Standard dictionary
  :Field:WpPersonalDictionary
    :Description:Personal dictionary
  :Field:WpStatistics
    :Description:Statistics file
  :Field:WpPhrasefile
    :Description:Phrases file

:Environment:Select Environment
  :Name:Executive
    :SignOnExitFile:[sys]<sys>Exec.run
    :SignOnChainFile:[sys]<sys>Exec.run

```

The following are commented out since these products may not exist on the target system. They are here as examples of other environments.

```

/* :Name:Multi Context
/* :Command:Install Context Manager
/* :SignOnExitFile:[sys]<sys>signon.run
/* :Name:WRITEOne
/* :Command:WRITEOne
/* :SignOnExitFile:[sys]<sys>exec.run

```

## User File Template Entries

Each entry in a User File Template consists of a keyword enclosed in colons, followed by a parameter (refer to figure 2-15).

**Note:** The system requires the colons to read the file correctly. The system ignores an entry if it does not begin with a keyword enclosed in colons.

Each section and subsection in a User File Template defines a menu, form, field, or default entry in the User File Editor interface.

Changes in User File Template parameters produce corresponding changes in the user interface. For example, you can change the titles of the menus and forms by changing the appropriate parameters.

The order in which the entries appear in the template determines the following features of the User File Editor interface:

- the order in which the menus appear
- the order in which the menus list the forms
- the order in which the fields appear in the forms

If a User File Template includes only one category in the Options section or only one environment in the Environment section, the system displays the corresponding Option Category form (refer to figures 2-8 through 2-11) or Environment form (refer to figures 2-12 and 2-13) instead of a menu.

The entries in a User File Template are divided into two sections (refer to figure 2-15):

- Options
- Environments

The Options section defines the menus, forms, fields, and default entries that specify characteristics of the environment(s). The Environments section defines the menus, forms, fields, and default entries that specify the initial environment and the exit environment (the environment activated when you exit a program).

## Options

The Options section (refer to figure 2-15) is divided into subsections called Categories. Each Category defines an environment that appears as a choice in the Modify Options menu (refer to figure 2-6). The items within a Category specify the characteristics of the environment.

**Note:** If the template includes only one Category, the system displays the corresponding Option Category form (refer to figures 2-8 through 2-11) instead of the Options menu.

The Options section includes the following entries:

□ *:Options:*

The system recognizes the keyword **:Options:** as the beginning of the Options section.

The parameter you enter appears as the text in one of the two fields of the Functions menu (refer to figure 2-5), and as the title of the Modify Options menu (refer to figure 2-6).

The parameter in the default User File Template is **Modify Options**. You can accept the default or enter a new parameter, up to a maximum of 18 characters.

□ *:Category:*

The keyword **:Category:** indicates an application or other environment you want to include in the User file.

The parameter you enter appears as the text in a field of the Modify Options menu (refer to figure 2-6), and as the title of the corresponding Category Option form (refer to figures 2-8 through 2-11).

The default User File Template includes the following categories:

- Executive
- Mail
- SignOn
- Word Processor

The SignOn category is required. The remaining categories are optional, and you can add others.

□ *:Field:*

The keyword **:Field:** indicates a feature of the user configuration.

The parameter you enter appears as the text of a keyword in User files you create with this template (refer to User File Entries, in this section).

□ *:FileField:*

The keyword **:FileField:** indicates that an entry is required and that it must be a file name.

The keyword **:Default:** and a parameter specifying a file name must follow.

□ *:MustField:*

The keyword **:MustField:** indicates that an entry other than a file name is required (for example, a volume specification such as Sys).

The keyword **:Default:** and a parameter other than a file name must follow.

□ *:Description:*

The parameter following the keyword **:Description:** appears as the text of a field in the Option Category form.

□ *:Default:*

The keyword **:Default:** indicates a default entry in a User file.

The parameter you enter appears as the text of a default entry in the Category Option form.

## Environments

Entries in the Environments section (refer to figure 2-15) specify the initial environment (the environment activated when you sign on) and the exit environment (the environment activated when you exit a program).

Each environment you specify in the Environments section appears as a choice in the Select Environment menu (refer to figure 2-7).

**Note:** If the template includes only one environment, the system displays the corresponding Environment form (refer to figures 2-12 and 2-13) instead of the Select Environment menu.

The Environments section includes the following entries:

□ *:Environments:*

The system recognizes the keyword **:Environments:** as the beginning of the Environments section.

The parameter you enter appears as the text in one of the two fields of the Functions menu (refer to figure 2-5), and as the title of the Select Environment menu (refer to figure 2-7).

The parameter in the default User File Template is **Select Environment**. You can accept the default, or enter a new parameter, up to a maximum of 18 characters.

□ *:Name:*

The keyword **:Name:** indicates the name of an environment, such as the Executive.

The parameter you enter appears as the text in a field of the Select Environment menu (refer to figure 2-7), and as the title of the corresponding Environment form (refer to figures 2-8 through 2-11).

The default User File Template includes the Executive as the only environment, but provides examples you can use to enter others.

□ *:Command:*

The parameter following the **:Command:** keyword specifies the Executive command that activates the environment.

Based on this entry, the system supplies the **SignOnChainFile**, the **SignOnExitFile**, and any parameters from the applicable command form.

If you include this entry, you omit entries specifying the **SignOnChainFile** and **SignOnExitFile**.

□ *:SignOnExitFile:*

The parameter following the keyword **:SignOnExitFile:** specifies the run file of the environment the system loads whenever you exit an application or press **ACTION-FINISH**.

You include this entry only if you do not include the **:Command:** keyword and parameter.

□ *:SignOnChainFile:*

The parameter following the keyword **:SignOnChainFile:** specifies the run file of the initial environment.

You include this entry only if you do not include the **:Command:** keyword and parameter.

□ *:Default:*

The **:Default:** keyword indicates the default environment when you include more than one environment in a template.

If you omit the **:Default:** keyword, the system defaults to the first environment in the template.

The **:Default:** keyword does not require a parameter.



## Configuring Your System to Interface with Devices

Your workstation incorporates three communications ports for connecting devices (such as printers and communications devices) to your system:

- two RS-232C ports, labeled Channel A and Channel B, for connecting one or two serial printers
- one Centronics-type port for connecting a parallel printer

**Note:** B 21-1 workstations (clusters only) incorporate two RS-422 ports only; neither Centronics-type nor RS-232C ports are available. An optional Four-Port Communications Expander provides four additional RS-232C ports for B 26, B 27, B 28, and B 38 workstations (refer to Configuring the Four-Port Communications Expander, in this section).

Each device you connect to your system requires a special Device Configuration file that defines its characteristics. The system software provides several default configuration files, and includes a **CREATE CONFIGURATION FILE** command to modify a default or other existing Device Configuration file, or create new files.

## CREATE CONFIGURATION FILE Command

The **CREATE CONFIGURATION FILE** command allows you to create new Device Configuration files or modify existing files for the following types of devices:

- communications devices
- serial printers (direct or spooled)
- parallel printers (direct or spooled)

To activate this command, you enter *CREATE CONFIGURATION FILE* in the Executive command field and press RETURN. The system displays the CREATE CONFIGURATION FILE command form (refer to figure 2-16).

The command form has two fields. You must enter parameters in both; use the following guidelines:

- **Configuration file name**      Enter a new configuration file name to create a new file, or enter the name of an existing configuration file you want to modify. Use the complete file name; for example, [Sys] <Sys>filename.
- **Device type (comm, parallel lpt, or serial ptr)**      Specify the type of device you want to configure:
  - Enter the letter *c* for a communications device.
  - Enter the letter *p* for a parallel printer (direct or spooled).
  - Enter the letter *s* for a serial printer (direct or spooled).

Figure 2-16 CREATE CONFIGURATION FILE Command Form

Create Configuration File	
<input type="text" value="Configuration file name"/>	<input type="text"/>
Device type (comm, parallel lpt, or serial ptr)	

When you complete the CREATE CONFIGURATION FILE command form, you press GO. Depending upon your entry in the Device type field, the system displays one of the following subforms:

- If you entered the letter *c*, the system displays the **Communications Parameters** subform (refer to figure 2-17).
- If you entered the letter *p*, the system displays the **Parallel Line Printer Parameters** subform (refer to figure 2-18).
- If you entered the letter *s*, the system displays the **Serial Line Printer Parameters** subform (refer to figure 2-19).

---

## Communications Device Configuration Files

To configure your system to interface with a communications device such as a modem, you use the **CREATE CONFIGURATION FILE** command to create a Communications Device Configuration file (refer to **CREATE CONFIGURATION FILE** command, in this section).

In the Configuration file name field, you enter a file name that includes the device name of the port you want to connect the communications device to (refer to section 3). For example, to connect the device to Channel A, you enter [Sys]<Sys>CommAConfig.sys.

In the Device type field, you enter the letter *c* to specify a communications device; then you press GO to display the **Communications Parameters** subform.

### Communications Parameters Subform

The **Communications Parameters** subform (refer to figure 2-17) includes 12 optional fields (enclosed in square brackets).

You can leave any or all of these fields blank to accept the default, or enter parameters to override the defaults. Refer to table 2-7 for information about the optional fields.

When you complete the **Communications Parameters** subform, you press **G0**. The system uses your entries to create or modify the Device Configuration file.

Figure 2-17 **Communications Parameters Subform**

Communications Parameters	
[Data bits (5, 6, 7, or 8; default = 7)]	<input type="text"/>
[Parity (none, even, odd, 0, or 1; default = 0)]	<input type="text"/>
[Baud Rate (up to 19200; default = 9600)]	<input type="text"/>
[Stop Bits (1 or 2; default = 1)]	<input type="text"/>
[Transmit time out (number of seconds; default = wait forever)]	<input type="text"/>
[Receive time out (number of seconds; default = wait forever)]	<input type="text"/>
[CR/LF mapping mode (binary or new line; default = new line)]	<input type="text"/>
[New line mapping mode (binary, CR, or CR/LF; default = CR/LF)]	<input type="text"/>
[Line control (none, XON/XOFF, CTS or both; default = XON/XOFF)]	<input type="text"/>
[EOF byte (hex value or none; default = 04)]	<input type="text"/>
[Number of characters per line (default = 132)]	<input type="text"/>
[Tab expansion (default = 8)]	<input type="text"/>

Table 2-7 Communications Parameters Subform Optional Fields

Field	Action/Explanation
[Data bits (5, 6, 7, or 8; default = 7)]	The default specifies seven data bits per character.
[Parity (none, even, odd, 0, or 1; default = 0)]	<p>The data bits entry does not include the parity bit if you specify even, odd, 0, or 1 parity in the following field.</p> <p>The default specifies 0 parity (the state of the parity bit as a check on the data bits).</p>
[Baud Rate (up to 19200; default = 9600)]	<p>If you specify none, you must increase the number of data bits you specify in the preceding field to compensate for the absence of a parity bit.</p> <p>The default specifies a transmit data rate of 9600 bits per second (bps).</p>
[Stop bits (1 or 2; default = 1)]	<p>The system supports a baud rate between 20 and 19200 bps.</p> <p>Common baud rates are 110, 150, 300, 1200, 2400, 4800, and 9600.</p> <p>The default specifies 1 stop bit per character.</p> <p>You should specify 2 when transmitting at 300 baud or below in RS-232C asynchronous mode.</p>

Table 2-7 **Communications Parameters Subform Optional Fields**  
(continued)

Field	Action/Explanation
<p>[Transmit time out (number of seconds; default – wait forever)]</p>	<p>Transmit time out is the time in seconds a Write operation waits to begin transmitting a character before returning Status Code 300 and the message, <b>Device not ready</b>.</p>
<p>[Receive time out (number of seconds; default – wait forever)]</p>	<p>The default specifies no time limit for transmit time out.</p> <p>Receive time out is the time in seconds a Read operation waits to receive a character before returning Status Code 602 and the message, <b>No character available</b>.</p>
<p>[CR/LF mapping mode (binary or new line; default – new line)]</p>	<p>The default specifies no time limit for receive time out.</p> <p>If you enter <b>0</b> and no character is currently available, the Read operation immediately returns Status Code 602.</p>
<p>[CR/LF mapping mode (binary or new line; default – new line)]</p>	<p>This entry specifies the mapping of incoming carriage returns (CR) and linefeeds (LF).</p> <p>The default maps an incoming single carriage return (CR), single line feed (LF), or CR/LF combination into a <b>BTOS RETURN (0Ah)</b>.</p> <p>If you enter <b>binary</b>, the system does not map incoming CRs or LFs.</p>

Table 2-7 **Communications Parameters Subform Optional Fields**  
(continued)

Field	Action/Explanation
<p>[New line mapping mode (binary, CR, or CR/LF; default – CR/LF)]</p>	<p>This entry specifies the mapping of outgoing BTOS system RETURNS (0Ah).</p> <p>The default maps an outgoing RETURN into an ASCII CR/LF (0Dh/0Ah).</p> <p>If you enter <b>CR</b>, the system maps an outgoing RETURN into an ASCII CR (0Dh).</p> <p>If you enter <b>binary</b>, the system does not map outgoing RETURNS.</p>
<p>[Line control (none, XON/XOFF, CTS or both; default – XON/XOFF)]</p>	<p>This entry specifies the line control mode that the receiving device uses to control the data flow.</p> <p>If you accept the default, the receiving device suspends transmission from the time the device receives an XOFF control character (13h) until it receives an XON control character.</p> <p>If you enter <b>none</b>, the receiving device has no line control.</p> <p>If you enter <b>CTS</b> (Clear To Send), the receiving device suspends transmission when it does not receive the CTS signal.</p>



**Table 2-7 Communications Parameters Subform Optional Fields**  
(continued)

Field	Action/Explanation
[EOF byte (hex value or none; default = 04)]	<p>If you enter <b>both</b>, the receiving device suspends transmission if it receives an XOFF control character or if it does not receive a CTS signal.</p> <p>This entry specifies the hexadecimal value the system uses to detect the end of the input file.</p> <p>The default is 04 (the ASCII code for the EOT (End Of Transmission) character).</p>
[Number of characters per line (default = 132)]	<p>If you enter <b>none</b>, a communication byte stream never returns Status Code 1 (End of file).</p> <p>This entry specifies the maximum number of characters in a printed line.</p> <p>The default is 132 characters per line.</p>
[Tab expansion (default = 8)]	<p>The system supports a maximum of 255 characters per line.</p> <p>This entry specifies the number of blanks the system maps into a BTOS TAB character.</p> <p>The default is eight characters between tabs.</p>

## Printer Device Configuration Files

To configure a communications channel to interface with a parallel or serial printer, you use the **CREATE CONFIGURATION FILE** command to enter a new Printer Device Configuration file or modify an existing file (refer to CREATE CONFIGURATION FILE Command, in this section).

### Printer Device Names

To enable your system to distinguish the channels where printers are connected, and to associate a printer with the channel where it is connected, you must configure each channel with a different Printer Device Name. You enter a file name that includes a Printer Device Name in the Configuration file name field, in the appropriate format:

- for connecting direct printers, you enter

[Sys]<Sys>xxxxxConfig.sys

where **xxxxx** is the Printer Device Name

- for connecting spooled printers, you enter

[Sys]<Spl>yyyyyConfig.sys

where **yyyyy** is the Printer Queue Name

A Printer Device Name can be any character string up to a maximum of 40 characters; however, it is recommended that you follow the naming conventions in table 2-8 when you assign Printer Device Names.

When you configure a custom spooled printing system for a cluster, it is recommended that you assign the names MASTER, WS1, WS2, WS3, etc., to the workstations (refer to section 4). When you enter Printer Device Configuration files for the communications channels of workstations other than the master, you should prefix the name of the workstation to the Printer Device Name. For example:

- WS1SplB is the Printer Device Name for connecting a printer to Channel B of workstation WS1
- WS2Spl1C is the Printer Device Name for connecting a printer to Channel C of the first Four-Port Communications Expander on workstation WS2.

### Parallel Line Printer Parameters Subform

The **Parallel Line Printer Parameters** subform (refer to figure 2-18) includes five optional fields (enclosed in square brackets).

You can leave any or all of these fields blank to accept the default, or enter parameters to override the defaults. Refer to table 2-9 for information about the optional fields.

When you complete the **Parallel Line Printer Parameters** subform, you press GO. The system uses your entries to create or modify the Device Configuration file.

Table 2-8 Recommended Printer Device Names

Printer Device Name	Type of Printer	Channel	
Direct	Spooled		
1 Printers connected to the workstation's ports:			
Lpt	Spl	Parallel	Centronics port
PtrA	SplA	Serial	Channel A
PtrB	SplB	Serial	Channel B
2 Printers connected to the first Four-Port Communications Expander:			
Ptr1A	Spl1A	Serial	Channel A
Ptr1B	Spl1B	Serial	Channel B
Ptr1C	Spl1C	Serial	Channel C
Ptr1D	Spl1D	Serial	Channel D
3 Printers connected to the second Four-Port Communications Expander:			
Ptr2A	Spl2A	Serial	Channel A
Ptr2B	Spl2B	Serial	Channel B
Ptr2C	Spl2C	Serial	Channel C
Ptr2D	Spl2D	Serial	Channel D

Figure 2-18 Parallel Line Printer Parameters 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 = wait forever)]

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

[Translation file (default = none)]

Table 2-9 Parallel Line Printer Parameters Subform Optional Fields

Field	Action/Explanation
[New line mapping mode (binary, CR, or CR/LF; default = CR/LF)]	<p>This entry specifies the mapping of outgoing RETURNS (0Ah).</p> <p>The default maps an outgoing RETURN into an ASCII CR/LF (0Dh/0Ah).</p> <p>If you enter CR, the system maps an outgoing RETURN into an ASCII CR (0Dh). If you enter binary, the system does not map outgoing RETURNS.</p>
[Tab expansion size (default = 8)]	<p>This entry specifies the number of blanks the system maps into a BTOS TAB character.</p> <p>The default is eight characters between tabs.</p>
[Number of characters per line (default = 132)]	<p>This entry specifies the maximum number of characters in a printed line.</p> <p>The default is 132 characters per line.</p>
[Transmit time out (number of seconds; default = wait forever)]	<p>Transmit time out is the time in seconds a Write operation waits to begin transmitting a character before returning Status Code 300 and the message, Device not ready.</p> <p>The default specifies no time limit for transmit time out.</p>
[Additional ACK delay (units of 100 micro-seconds; default = 0)]	<p>The system sends a character to the printer 10-20 microseconds after receiving the falling edge of an ACK (acknowledgment) signal from it.</p> <p>Specify the additional time delay if your printer uses a longer ACK sign.</p>
[Translation file (default = none)]	<p>This entry specifies a translation file to translate characters that appear on your screen into different characters when you print a document (refer to Configuring Your Printer's Character Set, in section 4).</p>

### Serial Line Printer Parameters Subform

The **Serial Line Printer Parameters** subform (refer to figure 2-19) includes 10 optional fields (enclosed in square brackets). You can leave any or all of these fields blank to accept the default, or enter parameters to override the defaults. Refer to table 2-10 for information about the optional fields.

When you complete the **Serial Line Printer Parameters** subform, you press GO. The system uses your entries to create or modify the Device Configuration file.

Figure 2-19 Serial Line Printer Parameters Subform

Serial Line Printer Parameters	
[Data bits (5, 6, 7, or 8; default = 7)]	<input type="text"/>
[Parity (none, even, odd, 0, or 1; default = 0)]	<input type="text"/>
[Baud rate (up to 19200; default = 9600)]	<input type="text"/>
[Stop bits (1 or 2; default = 1)]	<input type="text"/>
[Transmit time out number of seconds; default = wait forever]	<input type="text"/>
[New line mapping mode (binary, CR, or CR/LF; default = CR/LF)]	<input type="text"/>
[Line control (none, XON/XOFF, CTS, or both; default = XON/XOFF)]	<input type="text"/>
[Tab expansion size (default = 8)]	<input type="text"/>
[Number of characters per line (default = 132)]	<input type="text"/>
[Translation file (default = none)]	<input type="text"/>

Table 2-10 Serial Line Printer Parameters Subform Optional Fields

Field	Action/Explanation
[Data bits (5, 6, 7, or 8; default = 7)]	<p>The default specifies seven data bits per character.</p> <p>The data bits entry does not include the parity bit if you specify even, odd, 0, or 1 parity in the following field.</p>
[Parity (none, even, odd, 0, or 1; default = 0)]	<p>The default specifies 0 parity (the state of the parity bit as a check on the data bits).</p> <p>If you specify <b>none</b>, you must increase the number of data bits you specify in the preceding field to compensate for the absence of a parity bit.</p>
[Baud rate (up to 19200; default = 9600)]	<p>The default specifies a transmit data rate of 9600 bits per second.</p> <p>The system supports a baud rate between 20 and 19200 bps.</p> <p>Common baud rates are 110, 150, 300, 1200, 2400, 4800, and 9600.</p>

Table 2-10 Serial Line Printer Parameters Subform Optional Fields  
(continued)

Field	Action/Explanation
[Stop bits (1 or 2; default = 1)]	<p>The default specifies one stop bit per character.</p> <p>You should specify 2 when transmitting at 300 baud or below in RS-232C asynchronous mode.</p>
[Transmit time out (number of seconds; default = wait forever)]	<p>Transmit time out is the time in seconds a Write operation waits to begin transmitting a character before returning Status Code 300 and the message, <b>Device not ready</b>.</p> <p>The default specifies no time limit for transmit time out.</p>
[New line mapping mode (binary, CR, or CR/LF; default = CR/LF)]	<p>This entry specifies the mapping of outgoing BTOS RETURNS (0Ah).</p> <p>The default maps an outgoing RETURN into an ASCII CR/LF (0Dh/0Ah).</p> <p>If you enter <b>CR</b>, the system maps an outgoing RETURN into an ASCII CR (0Dh).</p>
[Line control (none, XON/XOFF, CTS, or both; default = XON/XOFF)]	<p>This entry specifies the line control mode that the receiving device uses to control the data flow.</p> <p>If you accept the default, the receiving device suspends transmission from the time the device receives an XOFF control character (13h) until it receives an XON control character.</p> <p>If you enter <b>none</b>, the receiving device has no line</p>

Table 2-10 **Serial Line Printer Parameters Subform Optional Fields**  
(continued)

Field	Action/Explanation
	<p>If you enter <b>CTS</b> (Clear To Send), the receiving device suspends transmission when it does not receive the CTS signal.</p> <p>If you enter <b>both</b>, the receiving device suspends transmission if it receives an XOFF control character or if it does not receive a CTS signal.</p>
<b>[Tab expansion size (default = 8)]</b>	<p>This entry specifies the number of blanks the system maps into a BTOS <b>TAB</b> character.</p> <p>The default is eight characters between tabs.</p>
<b>[Number of characters per line (default = 132)]</b>	<p>This entry specifies the maximum number of characters in a printed line.</p> <p>The default is 132 characters per line.</p>
<b>[Translation file (default = none)]</b>	<p>Specifies a translation file to translate characters that appear on your screen into different characters when you print a document (refer to section 4)</p>



## Performing Mouse Operations

To perform mouse operations, you must install the Mouse Server System Service each time you start up your system. The Mouse Server contains the programming request and procedural interfaces for the 2- and 3-button mouse and handles cursor control and tracking.

You can install the Mouse Server manually, or you may be able to use a special file to install it automatically (refer to Install Mouse Server Command in this section).

After you install the Mouse Server you can install the Set Mouse Controls application program. The **SET MOUSE CONTROLS** command lets you select the cursor speed when you use the mouse. (Refer to the *BTOS Reference Manual*.)

**Note:** You can use a K1, K2, or K3 keyboard to install the Mouse Server System Service and the Set Mouse Controls application program. You can use the 2-button mouse with a K2 or K3 keyboard only; however, you can use the 3-button mouse with the K1, K2, and K3 keyboards.

## INSTALL MOUSE SERVER Command

To install the Mouse Server manually, you enter *INSTALL MOUSE SERVER* in the Executive command field. Then, you press GO. There is no command form.

### Installing the Mouse Server Automatically

The standard system software includes a special file, [Sys]<Sys>Sysinit.jcl, with default entries that install the Queue Manager and the Spooler automatically when you start up or reset your system (refer to section 4).

You can use the [Sys]<Sys>Sysinit.jcl file to install the Mouse Server automatically if any of the following conditions apply:

- You have a standalone workstation
- You are part of a cluster system, and you are installing the Mouse Server at a master workstation

To install the Mouse Server automatically, you use the Editor or the word-processing program to add the following entry to the [Sys]<Sys>Sysinit.jcl file:

```
$RUN [Sys]<Sys>Mouse.Run
```

**Note:** You must remove any formatting characters the word processing program produces. Also, if you use the file to install the Queue Manager and the Spooler automatically, the Mouse Server entry must appear before the Queue Manager entry, \$RUN [Sys]<Sys>InstallQMgr.Run

## **SET MOUSE CONTROLS Command**

After you install the Mouse Server System Service, you may want to install the Set Mouse Controls application program to select the speed at which the cursor moves when you use the mouse.

To install the Set Mouse Controls application program, you install the Mouse Server System Service (described earlier in this section) and then enter *SET MOUSE CONTROLS* in the Executive command field. Then you press **GO**. There is no command form.

## **Configuring the Four-Port Communications Expander**

The Four-Port Communications Expander allows you to connect additional serial printers and/or communications devices to B 26, B 27, B 28, and B 38 workstations. Each Four-Port Communications Expander provides four additional RS-232C ports; you can have a maximum of two Communications Expanders on a workstation.

The system software includes the DataComm Server, a system service that controls the operations of the Four-Port Communications Expander. The DataComm Server resides on the workstation where the Four-Port Communications Expander is connected.

## Device Naming Conventions

The system assigns a default name to each of the ports on the Communications Expander(s) you install on your workstation. This allows the system to identify the devices you connect to the ports.

The default names of the ports on the first Communications Expander you add to your system are 1A, 1B, 1C, and 1D.

If you add a second Communications Expander, the default names of the ports are 2A, 2B, 2C, and 2D.

When you connect a printer or communications device to one of the ports, you assign the device a name using the default name of the port you connect it to. You assign a name to a device when you create its Device Configuration file (refer to *Configuring Your System to Interface with Devices*, in this section). For example, a serial printer connected to port 1A in a direct printing system would be [Ptr]1A; a communications device connected to port 2B would be [Comm]2B.

## Configuring Spooled Printers for Use with the Four-Port Communications Expander

To configure the Spooler for printers you connect to a Four-Port Communications Expander, you must add entries to the Spooler Configuration file and the Queue Index file (refer to section 4).

For example, to configure the Spooler for a printer connected to port A of the first Communications Expander on your system, you make the following entries:

- Spooler Configuration file:  
1A/C1A/Spl1A/[Sys]<Spl>Spl1AConfig.sys/130/n
- Queue Index file:  
Spl1A/[Sys]<Spl>Spl1A.queue/1/1  
C1AControl/[Sys]<Spl>C1AControl.queue/1/1

## Accessing the Four-Port Communications Expander

To access the Four-Port Communications Expander, you must install the DataComm Server system service each time you start up your system. You can install the DataComm Server manually, or you may be able to use a special file to install it automatically (refer to Installing the DataComm Server Automatically, in this section).

**Note:** To perform spooled printer operations using a printer connected to a Four-Port Communications Expander, you must install the DataComm Server before you install the Queue Manager and the Spooler (refer to section 4).

## INSTALL DATACOMM SERVER Command

To install the DataComm Server manually, you enter *INSTALL DATACOMM SERVER* in the Executive command field. Then you press GO. There is no command form.

### Installing the DataComm Server Automatically

The standard system software includes a special file, [Sys]<Sys>SysInit.jcl, with default entries that install the Queue Manager and the Spooler automatically when you start up or reset your system (refer to section 4).

You can use the [Sys]<Sys>SysInit.jcl file to install the DataComm Server automatically if any of the following conditions apply:

- you have a standalone workstation
- in a cluster system, the Four-Port Communications Expander is connected to the master workstation and the DataComm Server is installed at the master workstation.

To install the DataComm Server automatically, you use the Editor or the word processing program to add the following entry to the file:

```
$RUN [Sys]<Sys>DCXServer.Run
```

**Note:** You must remove any formatting characters the word processing program produces.

**Note:** If you use the file to install the Queue Manager and the Spooler automatically, the DataComm Server entry must appear before the Queue Manager entry (\$ RUN [Sys]<Sys>InstallQMgr.Run).

## Configuring Your Screen

You can configure the screen to your needs by changing characteristics such as length, width, color (on color workstations), reverse video, timeout, and scrolling capability. The **SCREEN SETUP** command allows you to change all these attributes, while the **VIDEO** command allows changes to screen attributes you use most often.

### SCREEN SETUP Command

The **SCREEN SETUP** command allows you to change one or more screen characteristics. The attributes you set remain in effect until you reset them or log out of the Executive. The screen characteristics you can change include:

- length of screen
- width of screen
- default color (color workstations only)
- reverse video
- scrolling capabilities
- screen timeout

To activate this command, you enter *SCREEN SETUP* in the Executive command field. If you press **GO**, the system sets all the screen attributes to the default values. To change one or more screen attributes, you press **RETURN**. The system displays the **SCREEN SETUP** command form shown in figure 2-20.

The **SCREEN SETUP** command form has seven optional fields (enclosed in square brackets). You can leave any or all of these fields blank to accept the defaults or enter parameters to override the defaults. Refer to table 2-11 for information about each optional field.

Figure 2-20 SCREEN SETUP Command Form

Screen Setup

[Reverse video?]

[Large characters?]

[Screen length (default = full screen)]

[Supress character attributes?]

[Supress pause between pages?]

[Color (e.g., Green)]

[Screen timeout (in minutes)]



Table 2-11 SCREEN SETUP Command Optional Fields

Field	Action/Explanation
<b>[Reverse video?]</b>	The default is no; the system displays light characters on a dark background.
<b>[Large characters?]</b>	To display dark characters on a light background, enter <b>y</b> . This field applies only to B 22 (clusters only) and B 27 workstations, that have wide screen capabilities.
<b>[Screen length (default – full screen)]</b>	The default is no; the system sets the screen width at 132 columns. To set the screen width at 80 columns, enter <b>y</b> . The default sets the screen length at full screen. The number of lines required for a full screen display varies, depending on the workstation you are using. To specify the screen length, enter the desired length in number of lines. To display a shorter screen, enter a number between 10 and 34. If you specify a screen length less than full screen, the amount of memory the screen uses is reduced.
<b>[Suppress character attributes]</b>	The default is no; the system does not suppress character attributes and the command form parameter fields remain in reverse video. To suppress character attributes and eliminate the reverse video highlight from command form parameter fields, enter <b>y</b> .
<b>[Suppress pause between pages?]</b>	The default is no; the system prompts you to press <b>NEXT PAGE</b> before scrolling any information off the screen. To suppress a pause between pages displayed on the screen, enter <b>y</b> .

Table 2-11 SCREEN SETUP Command Optional Fields (continued)

Field	Action/Explanation
<b>[Color (e.g., green)]</b>	<p>This field applies to color workstations only.</p> <p>The system sets this parameter to the color you specified most recently.</p> <p>To specify a color other than green, enter the name of the color. Other available colors are white, blue, yellow, and amber.</p>
<b>[Screen timeout (in minutes)]</b>	<p>The screen timeout feature turns the screen off automatically when you do not enter characters for a specified number of minutes. You can turn the screen back on by pressing any key.</p> <p>The default does not use the screen timeout feature; the screen remains on as long as the workstation is on.</p> <p>To use the screen timeout feature, enter the number of minutes delay after an entry before the system turns off the screen.</p>

When you complete the SCREEN SETUP command form, you press GO to activate the command. The system sets the screen attributes according to your specifications.

Figure 2-21 VIDEO Command Form

Video

[Suppress pause  
between pages?]

[Screen timeout  
(in minutes)]

[Color (default = green)]

[132 columns  
(B 22, B 27 only?)]

## VIDEO Command

The **VIDEO** command allows you to change screen characteristics that you use most often:

- scrolling capabilities
- screen timeout
- default color (color workstations only)
- screen width (B 22 [clusters only] and B 27 workstations only)

To activate this command, you enter *VIDEO* in the Executive command field. If you press **GO**, the system sets all the screen characteristics to the default values. To change one or more screen attributes, you press **RETURN**. The system displays the **VIDEO** command form shown in figure 2-21.

The **VIDEO** command form has four optional fields (enclosed in square brackets). You can leave any or all of these fields blank to accept the defaults or enter parameters to override the defaults. Refer to table 2-12 for information about each optional field.

Table 2-12 VIDEO Command Optional Fields

Field	Action/Explanation
<b>[Suppress pause between pages?]</b>	<p>The default is no; the system prompts you to press <b>NEXT PAGE</b> before scrolling any information off the screen.</p> <p>To suppress a pause between pages displayed on the screen, enter <b>y</b>.</p>
<b>[Screen timeout (in minutes)]</b>	<p>The screen timeout feature turns the screen off automatically when you do not enter characters for a specified number of minutes. You can turn the screen back on by pressing any key.</p> <p>The default does not use the screen timeout feature; the screen remains on as long as the workstation is on.</p>
<b>[Color (default = green)]</b>	<p>To use the screen timeout feature, enter the number of minutes delay after an entry before the system turns the screen off.</p> <p>This field applies to color workstations only. The system sets this parameter to the color you specified most recently.</p> <p>To specify a color other than green, enter the name of the color. Other available colors are white, blue, yellow, and amber.</p>
<b>[132 Columns (B 22, B 27 only)]</b>	<p>This field applies only to B22 (clusters only) and B27 workstations, that have wide screen capabilities.</p> <p>The default is no; the system sets the screen width at 80 columns.</p> <p>To set the screen width at 132 columns, enter <b>y</b>.</p>

When you complete the VIDEO command form, you press **GO** to activate the command. The system sets the screen attributes according to your specifications.

## Managing Application Partitions

BTOS memory consists of two types of partitions:

- a system partition, which holds BTOS and dynamically installed system services
- application partitions, each of which can contain an application system

Application partitions are also of two types:

- primary application partitions
- secondary application partitions

During software installation, you have the option of installing a single or multipartition operating system. If you choose a multipartition system, you can access the Application Partition Management facility which allows you to simultaneously execute several application programs, each in its own secondary partition.

### Primary Application Partitions

When you install your system, BTOS loads into the system partition at the low-address end of memory. Dynamically installed system programs load into an extended system partition at the high-address end of memory. The remaining memory in the system partition becomes a single application partition called the primary application partition.

The primary application partition supports interactive programs (such as the Editor or a word processing program) that interact with the user by receiving input from the keyboard and displaying information on the screen.

## Secondary Application Partitions

If you select the option of a multipartition operating system when you install the BTOS software, you can divide the user memory into secondary partitions and direct the system to load applications into them. The system uses secondary partitions only for noninteractive user applications and/or system services such as the printer spooler. It places secondary application partitions at the high-address end of the existing application partition.

## Application Tasks

Within a partition, the system can simultaneously execute multiple tasks to perform an application that you define (for example, accessing data from a file while prompting you for input). Tasks currently loaded in a specific application partition make up an application system.

A program has a task image that resides on the disk and contains code and/or data segments. A task's code and data can be unique or shared with other tasks. The file containing a task image is a run file.

An exit run file is a file you specify that the system loads and activates when an application system exits. This file is a primary task that loads additional tasks into its partition. Each application partition has an exit run file.

## Application Partition Management Facility

The Application Partition Management facility of multipartition BTOS provides partition and task control utilities that allow you to:

- create or remove secondary partitions
- load a noninteractive application into a secondary partition
- obtain partition status information
- terminate all tasks in a secondary partition and leave the partition vacant

## Creating a Secondary Partition

Before you can use a noninteractive application on a multipartition system, you must create a secondary partition to hold the application.

The memory size required by the application is important in determining the size of the partition you want. You create the partition with the **CREATE PARTITION** command.

### **CREATE PARTITION** Command

The **CREATE PARTITION** command allows you to create a vacant secondary application partition.

To activate this command, you enter *CREATE PARTITION* in the Executive command field. If you press **GO**, the system creates a default secondary partition named *Background00* with the memory size of 200Kb. If you press **RETURN**, the system displays the command form shown in figure 2-22.

The **CREATE PARTITION** command form has two optional fields (enclosed in square brackets). You can leave one or both of these fields blank to accept the defaults or enter parameters to override the defaults. Refer to table 2-13 for information about each optional field.

When you complete the **CREATE PARTITION** command form, you press **GO** to activate the command. The system creates a secondary partition according to your specifications.

**Note:** The system loads the default exit run file after you create the partition. If there is not enough memory in the remaining primary partition, the message, *Cannot load exit run file*, appears. You must then reset your system.

## Monitoring and Modifying Partitions

You can use the Application Partition Management facility to monitor the status of each partition within a multipartition operating system and to perform partition operations such as loading applications, terminating tasks, and removing partitions. You use the **PARTITION STATUS** command to activate the Application Partition Management facility.

Figure 2-22 **CREATE PARTITION** Command Form

Create Partition	
[Memory Size (default = 200K)]	[ ]
[Partition name (default = Background00)]	[ ]



Table 2-13 CREATE PARTITION Command Optional Fields

Field	Action/Explanation
[Memory size (default = 200K)]	<p>The default sets the partition memory size at 200Kb.</p> <p>To specify the memory size of the partition, enter the size in K bytes. The partition requires 1.5Kb to store system data structures associated with it; include this amount in your total memory size.</p>
[Partition name (default = Background00)]	<p>The default names the partition Backgroundnn, where nn begins with 00. If you create more than one secondary application partition with a default partition name, the system names the first partition Background00, the second partition Background01, etc.</p> <p>To specify a name for the partition, enter the name.</p>

**PARTITION STATUS Command**

The **PARTITION STATUS** command allows you to display and/or modify the status of partitions in a multipartition operating system. It displays partition names, partition and application memory sizes, application run files, and partition first byte addresses. It also provides four partition operations: load, remove, vacate, and update.

To activate this command, you enter *PARTITION STATUS* in the Executive command field and press G0. The **PARTITION STATUS** display appears (refer to figure 2-23).

**Figure 2-23 Sample PARTITION STATUS Display**

Partition Status 8.0.2				User name:	
Path: [Sys]<Sys>				Wed Mar 11, 1987 10:09 A.M.	
Partition	#	Tot1	Size	Used	Run File Executing
System	0	158K	158K	158K	instmp-7.0.4-Dbg
Primary	1	481K	479K	20K	[Sys]<sys>PartitionStatus.Run
Total		640K			
High Bound		98E6:0000	Low Bound		2394:0000 Termination etc 0
<div style="display: flex; justify-content: space-between; align-items: center;"> <span>Load <input type="checkbox"/></span> <span>Remove <input type="checkbox"/></span> <span><input type="checkbox"/></span> <span><input type="checkbox"/></span> <span><input type="checkbox"/></span> <span><input type="checkbox"/></span> <span>Vacate <input type="checkbox"/></span> <span>Update <input type="checkbox"/></span> </div>					

The **PARTITION STATUS** display consists of two areas: a Status area and a Function Key Display area.

#### Status Area

The partition Status Area contains a table that lists each partition in the system with corresponding information under the following headings:

- Partition. The name of the partition.
- #. The partition handle (an integer value).
- Totl. The amount of memory (in Kb) allocated to the partition by the operating system.
- Size. The amount of this partition's memory (in Kb) that is available to the application program.
- Used. The amount of memory (in Kb) used by the application program.
- Run file executing. The run file name of the executing application program.

Within the table, a full-bright, reverse-video highlight indicates the currently selected partition. You can change the partition selection by using the **Up Arrow**, **Down Arrow**, **NEXT**, or **RETURN** key to move the highlight to another partition name.

At the bottom of the Status Area, three fields provide additional information about the currently selected partition:

- High bound. The address of the first byte beyond the end of the partition.
- Low bound. The address of the first byte of the partition.
- Termination etc. The Status Code stored in the Application System Control Block (can indicate why a partition is vacant).

### Function Key Display Area

The Function Key Display area appears at the bottom of the PARTITION STATUS display. It consists of three groups of half-bright rectangles which represent the 10 keyboard function keys. Only the labeled keys activate operations. Four operations are available:

- Load            F1
- Remove        F3
- Vacate        F8
- Update        F10

### Loading an Application

**To load an application program into a partition, use the following procedure:**

- 1** Select the partition you want to place an application in by moving the highlight to the partition name in the Status Area table.

- 2** Press Load (F1).

The system prompts you to enter the application run file name and the highlight in the Status Area table moves to a blank field.

- 3** Enter the run file name of the application in the highlighted field of the Status Area table.

- 4** Press GO.

The system loads the specified run file into the selected partition.

### Removing a Partition

To remove a partition from the system, you select the partition by moving the highlight to the partition name in the Status Area table and press **Remove (F3)**. You cannot remove a partition unless it is vacant (refer to **Terminating Application Tasks**, in this section).

### Terminating Application Tasks

To terminate all tasks in an application partition, you select the partition by moving the highlight to the partition name in the Status Area table and press **Vacate (F8)**. The system removes the application tasks from the partition, leaving it vacant. The system does not load the exit run file of the partition.

### Updating the PARTITION STATUS Display

To update the PARTITION STATUS display, you press **Update (F10)**. The system displays the current status of all partitions.

## Managing Clusters

In addition to the features included in standalone configurations, the system software includes the following utilities for monitoring and managing cluster activities:

- The **DISABLE CLUSTER** command allows you to temporarily suspend cluster activities (for example, when you install software on the master).
- The **RESUME CLUSTER** command allows you to resume cluster activities after a temporary suspension.
- The **CLUSTER STATUS** command allows you to monitor the activities of each workstation in a cluster.

### DISABLE CLUSTER Command

Occasionally, it is necessary to temporarily suspend cluster activities. For example, many applications require you to disable the cluster when you install the software at the master.

When you enter the **DISABLE CLUSTER** command from the master workstation, BTOS at the master stops communicating with the cluster workstations and closes all currently open files.

If a user enters a request for a file or a system service while cluster activities are suspended, the master returns Status Code 6 and the message, **Master workstation not running**.

You enter the *RESUME CLUSTER* command to restore communications between the master and cluster workstations (refer to **RESUME CLUSTER Command**, in this section).

To activate the command, you enter **DISABLE CLUSTER** in the Executive command field.

- To disable the cluster immediately, you press GO.
- To specify a period of time you want the system to wait before disabling the cluster, you press RETURN. The system displays the **DISABLE CLUSTER** command form (refer to figure 2-24).

Figure 2-24 **DISABLE CLUSTER Command Form**

Disable Cluster	
[Time interval (seconds)]	<input type="text"/>

The **DISABLE CLUSTER** command form includes one optional field, **[Time interval (seconds)]**. If you want the system to wait before disabling the cluster, specify the length of the delay in seconds. The default is 0.

After you complete the command form, you press **GO**.

## **RESUME CLUSTER Command**

When you are ready to restore the cluster, you enter the **RESUME CLUSTER** command at the master workstation; then press **GO**. BTOS at the master workstation resumes communications with the cluster workstations.

**Note:** The system does not reopen files that it closes when you disable the cluster.

The **RESUME CLUSTER** command has no command form.

## **CLUSTER STATUS Command**

The **CLUSTER STATUS** command allows you to monitor the status of the cluster and the activity of the workstations connected to the master on a specified communications line.

When you enter the **CLUSTER STATUS** command, the system presents the Cluster Status display (refer to figure 2-25). The upper portion of the display provides an overview of the cluster, including the following information:

- the release level of the Cluster Status utility

Figure 2-25 Cluster Status Display

Cluster Status 8.0.2 Wed Mar 11, 1987 10:09 A.M.

Master Version: Mini master  
Line Speed: 307Kb  
WS Total: 3 WS Active: 1

ID	User Name	Timeout	CRC	OvRun	Other	Frames	Rqs Out
00	Master Totals.....	0	0	0	0	-	-
03	bernie.....	-	-	-	-	224	0



- the type of master you have
- the line speed of the communications line
- the total number of workstations on the line
- the number of workstations currently active

The following detailed information about each workstation appears under the highlighted headings:

- ID number
- user name
- the number and types of errors encountered (timeout, CRC [Cyclic redundancy check], overrun, others)

The “others” category of errors is for mechanical problems with the cluster line.

**Note:** If the number and types of errors encountered is considerably higher than usual, there is a possibility that mechanical problems exist on the cluster line.

- the number of request frames received since the user became active
- the number of requests out (requests that are queued waiting to be serviced by the system)

To activate the command, you enter *CLUSTER STATUS* in the Executive command field.

- To accept the default parameters, you press GO. The Cluster Status display appears on the screen with information about the cluster workstations connected to the standard channel (refer to figure 2-25). The display remains on the screen, and the system updates the information continuously until you press FINISH.
- To specify a different communications line, or to instruct the system not to update the Cluster Status display, you press RETURN. The system displays the CLUSTER STATUS command form (refer to figure 2-26).

The CLUSTER STATUS command form has two optional fields (enclosed in square brackets). You can leave one or both of these fields blank to accept the defaults or enter parameters to override the defaults. Refer to table 2-14 for information about each optional field.

Figure 2-26 CLUSTER STATUS Command Form


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

Table 2-14 CLUSTER STATUS Command Optional Fields

Field	Action/Explanation
[Line number (default -- 0)]	The default is 0 for a standard channel.  To request status information for a communications line other than the standard channel, enter the line number (refer to table 2-15).
[One time display?]	The default is no; the status display remains on the screen and is updated every second.  To request a one-time status display, enter y; the status display remains on the screen, but is not updated.

Table 2-15 Cluster Communications Lines

Line Number	Communications Line
0	Standard Channel
1-4	Reserved for XE 500

When you complete the form, you press GO to activate the command. The system displays the status information according to your specifications.

## Assigning Identification Numbers to Cluster Workstations (B 26, B 27, B 28, and B 38 Only)

The BTOS Hardware ID service and the optional Cluster Hardware Identification device (for B 26, B 27, B 28, and B 38 workstations) allow you to assign a different identification (ID) number to each workstation in a cluster (up to a maximum of 126). This feature is for use with applications and system services that must be able to identify the workstations within a cluster and distinguish them from one another.

**Note:** To use the Hardware ID service feature, you must make sure a workstation has the optional Hardware Identification device installed. For more information concerning the Cluster Hardware Identification device, contact your Customer Support Representative.

The Hardware ID service includes the following three commands:

- The **INSTALL HARDWARE ID** command clears the partition in which the service runs and installs the service into your system's memory.
- The **WRITE HARDWARE ID** command allows you to assign an ID number to a workstation, or change the currently assigned number.
- The **READ HARDWARE ID** command allows you or an application program or system service to access a workstation's currently assigned ID number.

The Hardware ID service is a dynamically installed system service; that is, it is not part of the system that activates automatically when you turn on or reset your workstation.

You can install the service manually, or you can use the [Sys]<Sys>SysInit.jcl file to install the service automatically (refer to Installing the Hardware ID Service Automatically, in this section). From a cluster, you use WSxxx>SysInit.jcl, where xxx is your workstation number.

## Installing the Hardware ID Service Manually

To install the Hardware ID service in your system's memory, you enter the *INSTALL HARDWARE ID* command. Next, you enter the *WRITE HARDWARE ID* command to assign an ID number to your workstation. Finally, you use the **READ HARDWARE ID** command to put it into an area of memory where applications and system services can retrieve it.

**Note:** You should enter these commands only once between signing on and turning off or resetting your system, or logging out.

### INSTALL HARDWARE ID Command

To clear the partition and install the Hardware ID service in memory, you enter *INSTALL HARDWARE ID* in the Executive command field. Then you press **GO**. There is no command form.

### WRITE HARDWARE ID Command

You use the **WRITE HARDWARE ID** command to assign an ID number to a workstation, or to change its currently assigned ID number.

The Hardware Identification device's memory stores the ID number and retains it when you turn off or reset your workstation, or log out.

To assign an ID number to a workstation, or to change the currently assigned ID number, you enter *WRITE HARDWARE ID* in the Executive command field, and press **RETURN**. The system displays the *WRITE HARDWARE ID* command form (refer to figure 2-27).

You must enter a parameter in the **Integer value (1-126)** field. You assign your workstation a number from 1 through 126 that is different from the numbers assigned to the other workstations on the cluster.

When you complete the *WRITE HARDWARE ID* command form, you press **GO**.

The Hardware Identification device contains memory which stores the workstation's ID number. The workstation retains that ID number until you change it.

**READ HARDWARE ID Command**

You use the **READ HARDWARE ID** command to access your workstation's currently assigned ID number. Entering this command displays the workstation's ID number, and puts it into an area of memory where applications and system services can retrieve it. The number remains there until you turn off or reset your workstation, or log out.

To access your workstation's currently assigned ID number, you enter *READ HARDWARE ID* in the Executive command field. Then you press **GO**; there is no command form. Your workstation's current ID number appears below the command prompt.

Figure 2-27 **WRITE HARDWARE ID Command Form**

Write Hardware ID	
Integer value (1-126)	

### **Installing the Hardware ID Service Automatically**

The standard system software includes a special file, [Sys]<Sys>SysInit.jcl, with default entries that install the Queue Manager and the Spooler automatically (refer to *Installing the Queue Manager and the Spooler Automatically*, in section 4).

You can use the [Sys]<Sys>SysInit.jcl file to install the Hardware ID service and read your workstation's ID number automatically when you start up or reset your system.

You use the Editor or the word processing program to add the following entries to the file:

```
$RUN [Sys]<Sys>HWID.run
```

```
$RUN [Sys]<Sys>RHWID.run
```

## Configuration file, [Sys]<Sys>Config.Sys

B 26, B 27, B 28, or B 38 workstations can maintain an optional configuration file, config.sys in its [sys]<sys> directory.

A B 26, B 27, B 28, or B 38 master workstation uses config.sys to set the cluster line speed to 1.8 Mbps.

Also, B 26, B 27, B 28, or B 38 workstations use config.sys to determine the X-Bus window requirements for attached X-Bus modules.

### Cluster Line Speed

A cluster consisting of only B 26, B 27, B 28, or B 38 workstations can operate at 1.8 Mbps. A cluster line speed of 1.8 Mbps requires 32k of memory.

To cause B 26, B 27, B 28, or B 38 cluster workstations to operate at 1.8 Mbps, edit [Sys]<Sys>Config.sys at the master workstation and add the following entry:

```
:ClusterLineSpeed: 1.8 Mbps
```

After editing [Sys]<Sys>Config.sys, reboot the master. You can use spaces and tabs when you edit this file.

---

**Caution:** B 21 and B 22 workstations will not operate in the cluster if the cluster line speed is 1.8 Mbps.

---

If you attached B 21 and B 22 cluster workstations to a B 26, B 27, B 28, or B 38 master workstation, remove the :ClusterLineSpeed: entry from [Sys]<Sys>Config.sys and reboot the master. This allows the cluster to operate at 307 Kbps (kilobits per second).

## Per Module X-Bus Window Size Declaration

The X-Bus window is the mechanism by which a program executing in the 1-Mb address space of a B 26, B 27, B 28, or B 38 processor can access memory in the 16-Mb X-Bus address space.

The X-Bus window is a map between a region of processor memory and X-Bus memory. For example, the X-Bus window enables a program to access memory in the Graphics module.

A region of addresses at the end of the 1-MB processor address space is reserved at system initialization time, if the X-Bus window is used.

The size of this region is the maximum X-Bus window size of all X-Bus modules attached to the workstation.

At system initialization, the operating system determines the X-Bus window size of each X-Bus module by reading <Sys><Sys>Config.sys.

For each X-Bus module containing memory that the processor can access, config.sys should contain an entry in the following format:

```
:ModuleType: xx
```

```
:XBusWindowSize: 96K
```

The variable number (represented by xx) following :ModuleType: is a module type code in decimal.

The number following :XBusWindowSize: is the decimal size in Kbps of the X-Bus window for that module and must have a value of 96, 224, or 480. You should check the hardware specification of the module to determine the correct size.

The operating system knows the X-Bus window size of some modules so entries in config.sys are unnecessary.





# Operating Your System

This section explains the operating procedures for BTOS, including:

- starting up the system
- signing on to the system
- using the Executive
- setting the path
- setting the date and time
- receiving and resolving system errors
- listing the contents of the log file

## Starting Up Your System

When you start up your system by setting the **POWER** switch to **ON**, the system automatically performs a bootstrap operation. Bootstrapping (or booting) the system loads or reloads BTOS from disk storage to active memory.

### Bootstrapping Hard Disk Systems

On standalone and master workstations with disk storage, bootstrapping occurs automatically when you set your workstation's **POWER** switch to **ON**, or reset your system.

When bootstrapping a system with floppy storage, the system tries to boot from drives [f0] and [f1] before trying the master, [d0] and [d1], if it is connected by a communications line.

If you have a cluster workstation without local file storage, you must turn on the master first (refer to Standalone Versus Master/Cluster Workstations, in section 1). Then, when you turn on the cluster workstation, the system loads BTOS from the master onto the cluster workstation.

If you have a cluster workstation with local file storage, you can bootstrap from the master, or locally.

- To bootstrap from the master, you must turn on the master workstation first, then the cluster.
- To bootstrap locally, the master must be **OFF** when you turn on the cluster workstation.

## Bootstrapping Cluster Workstations

If your B 22 cluster workstation has local file storage, you must copy the system image for a B 22 workstation with local file storage from the cluster utilities package into the file B22ClstrLfs?P.Run (? = S or M) on the master workstation's hard disk. You use the **BOOTSTRAP** command to specify this file when you perform the final bootstrap operation.

After completing the required preparations, you can boot your cluster workstation.

**If the cluster workstation does not have local file storage, use the following procedure:**

- 1 Set the master workstation's **POWER** switch to ON.
- 2 Set the cluster workstations's **POWER** switch to ON, or reset the workstation.

The cluster workstation bootstraps automatically.

**If the cluster workstation has local file storage, use the following procedure:**

- 1 Set the master workstations's **POWER** switch to ON.
- 2 Make sure that the cluster workstation's mass storage unit is OFF.
- 3 Set the cluster workstation's **POWER** switch to ON, or reset the workstation.

The cluster workstation automatically bootstraps the system image for a B 22 cluster workstation without local file storage.

- 4 Turn on the cluster workstation's mass storage unit.
- 5 Use the **BOOTSTRAP** command to load the file B22ClstrLfs?P.Run (? = S or M), which contains the system image for a B 22 cluster workstation with local file storage (refer to **BOOTSTRAP** Command in section 7).

## BTOS Diagnostic Test

At startup, BTOS performs a diagnostic test to ensure that your system is functioning properly. The test takes less than a minute; during this time, the red lights on the disk drives flash on and off, and the system displays various letters and symbols. Upon successful completion of the test, the SignOn form appears (refer to figure 3-1).

## Signing on to Your System

Each time you turn on your system or logout (refer to **LOGOUT** command, in this section), the SignOn form appears on the screen (refer to figure 3-1). You use this form to sign on to BTOS and gain access to the system files.

The User Configuration file for your system (refer to *Configuring Your System for Individual Users, Applications, and Tasks*, in section 2) specifies the options available to you through the SignOn form. This file also determines the procedure you use to sign on.

## SignOn Form

At the top of the SignOn form, the name of the form and version number of BTOS appear on the left, and the day, date, and time (if set) appear on the right. A double line separates this information area called the Status Area from the operating system name and a partitioned box which holds the SignOn prompts and their explanations.

Three fields, **User name**, **Password**, and **Date/Time**, appear below this box. The **User name** prompt is in full-bright reverse video and its input field is half-bright reverse video. On B 21, B 22, B 26, B 28, and B 38 workstations, the cursor appears as a blinking underline in the input field, marking the location of your next entry. On B 27 workstations, the cursor is a blinking rectangle within the input field.

Figure 3-1 SignOn Form

SignOn 8.0.2 (OS t2CLstrLfsMp-8.0.2)		Wed Mar 11, 1987 10:09 A.M.
<b>UNISYS OPERATING SYSTEM BTOS 8.0.2</b>		
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).	
Then press the <b>GO</b> key.		
User name (e.g., Allen)	<input type="text"/>	
Password	<input type="text"/>	
Date/Time (e.g., Fri Sep 9, 1983 8:00 am)	<input type="text"/>	

You do not need to make any entries in the SignOn form fields if:

- the default User file has not been edited for a specific user or application (refer to *Configuring Your System for Individual Users, Applications and Tasks*, in section 2)
- a password has not been assigned to the system (refer to *User File Entries*, in section 2)
- you do not want to change the date and/or time

If these criteria are true for your system, you press **GO**. The Executive command field appears below the SignOn form.

During the SignOn procedure, you can use all the editing functions available to the Executive. Refer to *Keyboard Functions for the Executive*, in this section.

You use the following SignOn procedure if one or more User files have been created for specific users or applications, a password has been assigned to the system, or you want to set the date and/or time:

- 1 Enter a user or application name in the highlighted User name field.

If no specific User file exists, leave this field blank.

**Note:** On cluster systems, two users can sign on with the same user name at different workstations; however, they cannot both access the same application at the same time.

- 2 Press RETURN.

The highlight and cursor move to the Password field.

- 3 Enter the name of the password (if any) assigned to you.

This is an optional item; leave the field blank if you do not have a password.

- 4 Press RETURN.

The highlight and cursor move to the Date/Time field.

- 5 If the date and time are not set for your system or you want to change the date and/or time (at the top right of the screen), enter the current day, date, and time as shown in the prompt example or in one of the following formats:

- 9/6/85 Fri 8:00 PM
- 6-Sep-85 20:00
- 8:00 Friday 6 September 1985 PM

**Note:** You can also enter the time based on a 24-hour clock. The system assumes the time entries between 7:00 and 11:59 are AM, and between 12:00 and 6:59 are PM. To specify a time before 7:00 AM or after 7:00 PM, you must include AM or PM.

- 6 Press GO.

If you make errors in your entries (for example, the day and date do not agree), an error message appears. If no errors exist, the current day, date, and time appear in the upper right corner of the screen. On B 27 systems, the time updates continually; on B 21, B 22, B 26, B 28, and B 38 systems, it updates only while the system is on.

If only one parameter (day, date, or time) is inaccurate, you need correct that one parameter only.

If you entered an application name in step 1, the system activates the application program.

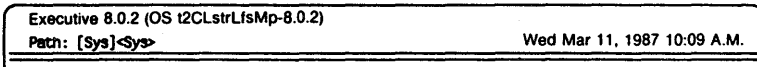
If you entered a User name in step 1, the Executive command field appears below the SignOn form. At the top of the screen above a double line, status information appears (see figure 3-2). The following items display from left to right on the first line of this Status Area:

- the name and version of the Executive
- the release number and type of operating system running on your workstation
- the name you entered in the User name field

The second line of the Status Area displays the following items from left to right:

- the current path, which includes the volume name (or drive device name), directory name, node name (in brackets) if you are using an application with Communications, and (optionally) the file prefix of the current file (refer to Setting the Path, in this section)
- status messages such as **Recording** or **Replaying** if the Executive is in a special mode
- the date and time to which the system clock is set

Figure 3-2 Status Area



## Using the Executive

When you complete the SignOn form procedure, BTOS enters the Executive level of operation and a command field appears on the screen. At this level, you interact with your workstation by entering commands that tell your workstation what you want it to do. The Executive acts as an interface between you and BTOS or application programs installed on your workstation.

**Note:** You can include entries in your User Configuration file that allow you to type the name of an application in the *User name* field of the SignOn form, bypass the Executive, and activate the application directly (refer to User File Entries, in section 2).

## Executive Commands

Executive commands allow you to activate system operations, including:

- file management tasks
- user or application programs
- status information
- system management functions

BTOS has a standard set of Executive commands defined in a command file on the system directory. The default file is [Sys]<Sys>Sys.cmds. However, your particular workstation's command set depends on its disk and system configurations.

You can modify the [Sys]<Sys>Sys.cmds file to add, change, or delete existing commands. You can also create a customized command file for a specific user by copying the default command file to a new file; adding, changing, or deleting commands; and then specifying the name of this new command file in the User Configuration file (refer to Modifying a Command File, in section 7 and Configuring Your System for Individual Users, Applications, and Tasks, in section 2).



There are two types of Executive commands: Executive Intrinsic commands and commands that cause the execution of another run file.

The Executive implements Intrinsic commands within itself. They have no corresponding run files; their codes are internal to the Executive. The Executive Intrinsic commands are:

APPEND	REMOVE DIRECTORY
COPY	RENAME
CREATE DIRECTORY	RUN
CREATE FILE	RUN FILE
DELETE	SCREEN SETUP
LIST	SET FILE PREFIX
LOGIN	SET PROTECTION
PATH	STOP RECORD
PLAYBACK	TYPE
RECORD	VIDEO

Executive commands that are implemented within a run file have separate, corresponding run files named to identify the command; they end with the suffix `.run` (for example the **IVOLUME** command run file is `IVolume.run`).

Appendix A lists the Executive commands with their capabilities, run files or internal code symbols, and the sections of this guide where you can find more information about each command.

If you have a workstation with a local storage unit or a workstation clustered to a master, the operating system software is on the hard disk. You can display a list of the commands available at your workstation by pressing the HELP key once. If you press the HELP key twice, the system displays a brief explanation of each available command.

## **Command Forms**

The Executive recognizes the commands you enter, and if necessary, prompts you for more information by displaying a command form for you to complete. Figure 3-3 illustrates a sample command form for the COPY command.

### **Command Form Parameters and Subparameters**

Each command form consists of one or more fields (a parameter prompt followed by an entry area). When a form appears, the first field is highlighted. On B 21, B 22, B 26, B 28, and B 38 workstations, the cursor appears as a blinking underline within the field at the place where you can make your next entry. On B 27 workstations, the cursor is a blinking rectangle within the field. The items of information you enter in command form fields are called parameters. If you enter more than one item in a field, each is referred to as a subparameter.

If a field requires a parameter entry, its prompt is unbracketed (for example, **File from**). If an entry is optional, the prompt is enclosed in square brackets (for example, **[Overwrite ok?]**). Each optional field has a default value, that the Executive uses if you leave the field blank.

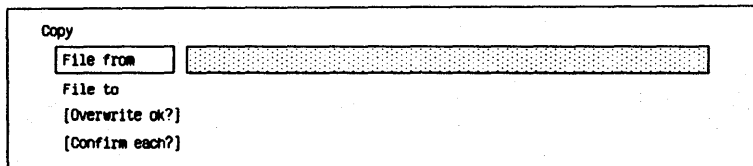
**Note:** If you complete a command form and then press *HELP*, the information you enter does not display when the command form reappears.

To redisplay the information, you must press **Right Arrow**.

### Keyboard Functions for the Executive

Table 3-1 lists the keyboard keys and their functions that are available to you when you use the Executive.

Figure 3-3 Sample Command Form



The figure shows a rectangular command form with a border. At the top left, the word "Copy" is displayed. Below it, there are two input fields: a small box labeled "File from" and a larger shaded box. Underneath these fields, the text "File to" is shown, followed by two optional prompts: "[Overwrite ok?]" and "[Confirm each?]" on separate lines.

Table 3-1 Keyboard Editing Functions

Key	Function
<b>ACTION-DELETE</b>	clears the type-ahead buffer
<b>ACTION-OVERTYPE</b>	turns off the screen (press any key to turn it on again)
<b>BACKSPACE</b>	<ul style="list-style-type: none"> <li>□ in insert mode (<b>OVERTYPE</b> key not activated), deletes the last character entered</li> <li>□ in overtype mode, moves the cursor one space to the left</li> </ul>
<b>CANCEL</b>	<ul style="list-style-type: none"> <li>□ terminates the present command form and returns to a new command form without completing the execution of the original command</li> <li>□ terminates a multipage display initiated by the <b>TYPE</b> and <b>DUMP</b> commands</li> </ul>
<b>CODE-DELETE</b>	deletes the entire entry in a field where the cursor is located
<b>CODE-Left Arrow</b>	moves the cursor to the leftmost column
<b>CODE-Right Arrow</b>	moves the cursor to the rightmost column
<b>DELETE</b>	deletes the character at the cursor position

Table 3-1 Keyboard Editing Functions (continued)

Key	Function
<b>Down Arrow</b>	moves the cursor to the next field of a command form
<b>F1</b>	<ul style="list-style-type: none"> <li data-bbox="370 375 684 480">□ activates the Redo feature of the Executive (refer to Using the Executive Redo Feature, in this section)</li> </ul> <p data-bbox="402 508 793 557"><b>Note:</b> The Redo feature is not available for some commands.</p> <ul style="list-style-type: none"> <li data-bbox="370 589 694 662">□ activates the Retry feature of the LCOPY command (refer to LCOPY command, in section 5)</li> </ul>
<b>FINISH</b>	ends the execution of a command and returns to the Executive command field
<b>GO</b>	initiates a command when you complete the command form
<b>HELP</b>	<ul style="list-style-type: none"> <li data-bbox="370 872 833 896">□ displays a list of all the available Executive commands</li> <li data-bbox="370 928 641 1002">□ (pressed twice) displays a description of each available Executive command</li> <li data-bbox="370 1034 694 1156">□ (pressed after partially entering a command name) lists and describes the Executive commands that match the partially entered name</li> <li data-bbox="370 1188 694 1320">□ (pressed for a specific command) displays a short description of the command, the name of its run file, the command case, and the command form</li> </ul>

Table 3-1 Keyboard Editing Functions (continued)

---

<b>Key</b>	<b>Function</b>
<b>Left Arrow</b>	moves the cursor left one column
<b>NEXT</b>	moves the cursor to the next field of a command form
<b>NEXT PAGE</b>	displays the next page when the current command requests more than one screen of information
<b>OVERTYPE</b>	places the system into overtype mode and lights the indicator on the <b>OVERTYPE</b> key. In this mode, the characters you type overwrite existing characters at the same positions.
<b>RETURN</b>	moves the cursor to the next field of a command form
<b>Right Arrow</b>	moves the cursor right one column
<b>SCROLL UP</b>	rolls text up one line at a time, displaying one additional line at the bottom of the screen; the cursor does not move
<b>SHIFT-GO</b>	signals the Executive not to store the command in the memory buffer used for the Redo feature (refer to Using the Executive Redo Feature, in this section)
<b>SHIFT-Left Arrow</b>	moves the cursor left five columns
<b>SHIFT-Right Arrow</b>	moves the cursor right five columns
<b>TAB</b>	moves the cursor to the next field of a command form
<b>Up Arrow</b>	moves the cursor to the preceding field of a command form

---

### Command Form Entry Conventions

The following conventions apply to entries you make in command form fields:

- You can use all characters in uppercase and/or lowercase, but you must follow special procedures for some entries:
  - If a subparameter contains spaces, you must enclose it in single quotation marks. For example:  
'The word filename' 'The word volume'
  - To include a single quotation mark or a back slash (\) in a quoted parameter, you must type the character twice. For example:  
'The word''s filename'  
'new\\old information'
- Prompts that include a question mark (for example **[Overwrite ok?]**) require a yes or no entry. You can abbreviate these to y or n.
- You must include a space between each subparameter in a field. For example:  
[Accounting]<user>    [Accounting]<manager>

For more information, refer to **Specifying File Names in Executive Command Fields**, in section 5.

### Type-Ahead Feature

BTOS has a feature called type-ahead that makes use of a buffer to store any keystrokes that BTOS cannot respond to immediately. BTOS looks in the buffer for keystrokes first before reading them directly from the keyboard.

If your screen is blank and you are waiting for an Executive command prompt, you can type a command name and press RETURN. When the Executive screen appears, BTOS reads your keystrokes from the type-ahead buffer, fills in the command field, recognizes the RETURN, and displays the command form.

You can clear the Type-Ahead buffer by pressing ACTION-DELETE.

### Entering Special Keyboard Characters

You can enter a keyboard action character (such as those for the GO or MOVE keys) in a field by typing the back slash (\) and then the action character key. The back slash directs the Executive to include in the parameter the value of the next keyboard character typed. The back slash does not show on the screen when you type it; the action character key displays as a graphics character.

### Substituting the Contents of a File for a List of Subparameters

You can use the contents of a file to replace a parameter in a field by using an at-file. An at-file is a file you create with the Editor (refer to the *BTOS Editor Operations Guide*) or the **FILES** command (refer to **FILES** command, in section 5) that contains a list of all the entries or names of the files you want to include in a parameter. If the entries contain spaces, you must enclose them in single quotation marks. You can use at-files when you need to give more subparameters than the command form allows space for, or when you use a certain parameter or list of subparameters frequently.

To enter an at-file in a field, you type the at-sign @ and then the file name you assigned to the file you created with the Editor or **FILES** command (for example, @Myfile). You do not leave a space between @ and the name. The at-sign signals the system that the parameter that follows is a file specification. When you move the cursor to the next field, the system reads the file specified and uses the contents as subparameters.

### Specifying a Device as a Parameter

You can specify a device as a parameter in a command form field. You use device names as parameters to direct the system to activate a command using a particular device, for example, to display command information on the screen, to print command information on a printer, to use a specific disk drive, etc.



Table 3-2 lists typical devices you can specify in command form fields and the correct entry for each. To specify a device, you enclose the device name in square brackets, in the same way that you specify a volume.

## Activating an Executive Command

Use the following procedure to activate an Executive command:

- 1 Type the command in the Executive command field.  
You can enter the entire command, or abbreviate it by entering only as many characters as necessary to uniquely identify it.  
If the command requires additional information, press RETURN; a command form appears. If no additional information is necessary, skip to step 3.
- 2 Fill in all required fields of the command form and any optional fields where you want to specify additional parameters.
- 3 Press GO.  
The system activates the command.

To cancel a command before completing the command form, you press CANCEL; a new Executive command prompt appears. The system does not activate the original command.

Table 3-2 Device Parameters

Device	Device Name
screen	[VID]
keyboard	[KBD]
printers (nospooled)	[PTR]A [PTR]1A [PTR]2A [PTR]B [PTR]1B [PTR]2B [LPT] [PTR]1C [PTR]2C [PTR]1D [PTR]2D
communications channels	[COMM]A [COMM]B
spooled printers	[SPL] [SPL1A] [SPL2A] [SPLB] [SPL1B] [SPL2B] [SPL1C] [SPL2C] [SPL1D] [SPL2D]
disk drives	[d0] or [!d0]* [d1] [f0] or [!f0]* [f1]
null device	[NUL]

\* ! indicates a remote disk drive

## Using the Executive Redo Feature

The Executive Redo feature allows you to automatically reenter your most recent command and display the command form with the same parameter entries.

**Note:** The Redo feature is not available for some commands.

When you execute a command, the system stores the parameters and subparameters you enter in a Variable Length Parameter Block (VLPB).

To reenter the command and display the command form and parameters, you press F1 at the Executive command prompt. The system reenters the command and puts the contents of the VLPB in the command form. You can then change the parameters or execute the command again with the same parameters.

**Note:** If you attempt to redo a command several times, changing parameters each time, you can cause the Type-Ahead buffer to overflow. You must then reenter the command manually.

If you hold down SHIFT while you press GO to execute a command, the system does not store the command; therefore, you cannot recall it with the Redo feature. If you activate a command using GO and then activate a command using SHIFT-GO, when you press F1 at the next Executive command prompt, the system displays the previous command (the last command activated with GO).

**Note:** The Executive does not store special keyboard characters in the memory buffer (refer to Entering Special Keyboard Characters, in this section). If any of the parameters include special keyboard characters, the Redo feature may not produce the result you desire.

## Storing and Retrieving Commands

You can store an Executive command in any function key from F2 through F10; then, when you want to retrieve the command, you press the appropriate function key.

**Use the following procedure to store an Executive command:**

- 1 Type the command in the Executive command field.

You can enter the entire command, or abbreviate it by entering only as many characters as necessary to uniquely identify it.

If the command requires additional information, press RETURN; a command form appears. If no additional information is necessary, skip to step 3.

- 2 Fill in all required fields of the command form and any optional fields where you want to specify additional parameters.
- 3 Hold down CODE and press the function key (F2 through F10) that you want to assign to this command.
- 4 Press GO.

The system executes the command.

- 5 Repeat steps 1 through 4 to assign commands to other function keys.

You can also replace a stored command with a different command by repeating steps 1 through 4 and, in step 3, pressing a function key that is currently storing a command.

To retrieve a stored command, press the appropriate function key (F2 through F10). The command automatically appears on the screen, along with any associated command forms, command fields, and parameters you entered in those fields.

## Exiting from the Executive

To exit from the Executive and return to the SignOn form, you use the **LOGOUT** command.

### LOGOUT Command

The **LOGOUT** command ends your current session, removes any information you specified previously at the SignOn form or with the **PATH** command (refer to **PATH** command, in this section), and displays a new SignOn form. This command requires no parameters and, therefore, does not have a command form.

To activate the **LOGOUT** command, you type *LOGOUT* in the Executive command field and press **G0**. A new SignOn form appears. You must fill in this form before activating any other commands.

## Setting the Path

The path is the route that the operating system takes to access a file. It consists of a node name (applicable in network systems), a volume name, a directory name, and, optionally, a file prefix and/or password. When you are at the Executive level, the current path values (also called the logged-in values) appear on the left of the second line of the Status Area. When you first sign on to the system, the path is set to the values specified in your User file (refer to User Files, in section 2).

If you try to access a file using a file name only, the system assumes that the file is located in the node, volume, directory, and (if set) the file prefix of the current path; these are the defaults.

To access a file in another directory on the same volume, you must include the directory name in your entry, for example, if the current path is [Accounting]<manager> and you want to access an Expenses file in the <User> directory of the [Accounting] volume, you enter:  
<User>Expenses.

To access a file in another volume, for example, [Purchasing], you must enter the complete file specification: [Purchasing]<User>Expenses.

**Note:** You can use a device name (such as [d0] or [f0]) instead of a volume name to access a file in another volume.

You change the current path by using either the **PATH** command or the **LOGIN** command.

## **PATH Command**

The **PATH** command allows you to change the currently logged-in path. You can change the node, volume, directory, file prefix, and/or password for the specified volume or directory.

To activate this command, you type *PATH* in the Executive command field and press **RETURN**. The system displays the **PATH** command form shown in figure 3-4.

The **PATH** command has no mandatory fields, but it has five optional fields (enclosed in square brackets). To change the current path, you must make an entry in at least one of the optional fields. To accept the default in a field, you leave the field blank. Refer to table 3-3 for information about each optional field.

When you complete the **PATH** command form, you press **GO**. The new path then appears in the Status Area.

Figure 3-4 PATH Command Form

Path	
[Volume]	
[Directory]	
[Default file prefix]	
[Password]	
[Node]	

Table 3-3 PATH Command Optional Fields

Field	Action/Explanation
<b>[Volume]</b>	<p>The default directs the system to use the currently logged-in volume as the volume name.</p> <p>To change the volume name, enter the name of the volume you want for the path. You do not need to enclose your entry in square brackets. You can use a drive device name in this field.</p>
<b>[Directory]</b>	<p>The default directs the system to use the currently logged-in directory as the directory name.</p> <p>To change the directory name, enter the name of the directory you want for the path. You do not need to enclose the name in angle brackets.</p>

Table 3-3 PATH Command Optional Fields (continued)

Field	Action/Explanation
<b>[Default file prefix]</b>	<p>The default directs the system to use the currently logged-in default file prefix (if any).</p>
	<p>To assign a default file prefix name for use as part of a filename in calling up a file, enter a name ending with a right angle bracket, for example, mgr&gt;. The system places this prefix at the beginning of any subsequent file specification you give.</p>
	<p>To remove an assigned default file prefix from the path, enter "" (two single quotation marks with no space between) in this field.</p>
<b>[Password]</b>	<p>The default directs the system to use the password you assigned (if any) when you signed onto the system.</p>
	<p>If the directory has an assigned password, enter its volume or directory password to gain access to the directory.</p>
	<p>To remove an assigned password from the path, enter "" (two single quotations marks with no space between) in this field. These marks appear on the screen as pound signs (##).</p>
<b>[Node]</b>	<p>This field applies only to workstations with B-NET (network systems).</p>
	<p>If you accept the default, the system uses the currently logged-in node (if any).</p>
	<p>To specify a node name, enter the appropriate name. You do not need to enclose the name in braces.</p>
	<p>To remove a node name from the path, enter "" (two single quotation marks with no space between) in this field.</p>



## LOGIN Command

The **LOGIN** command allows you to change the currently logged-in path. You can change the node, volume, directory, file prefix, and/or password for a specified volume or directory.

To activate this command, you type *LOGIN* in the Executive command field and press RETURN. The system displays the LOGIN command form shown in figure 3-5.

The **LOGIN** command has no mandatory fields, but it has five optional fields (enclosed in square brackets). To change the current path, you must make an entry in at least one of the optional fields. To accept the default in a field, you leave the field blank. Refer to table 3-4 for information about each optional field.

When you complete the LOGIN command form, you press GO. The new path then appears in the Status Area.

## Setting the System Date and Time

To change the system date and/or time for any reason (power failure, daylight savings/standard time change, etc.), you can make the changes without returning to the SignOn form by using the **SET TIME** command.

You can also change the format of the date and/or time (for example, to international or military format).

Figure 3-5 LOGIN Command Form

Login

[Volume] [Directory]

[Default file prefix]

[Password]

[Node]

Table 3-4 LOGIN Command Optional Fields

Field	Action/Explanation
<b>[Volume]</b>	<p>The default directs the system to use the currently logged-in volume as the volume name.</p> <p>To change the volume name, enter the name of the volume you want for the path. You need not enclose your entry in square brackets. You can use a drive device name in this field.</p>
<b>[Directory]</b>	<p>The default directs the system to use the currently logged-in directory as the directory name.</p> <p>To change the directory name, enter the name of the directory you want for the path. You need not enclose your entry in angle brackets.</p>
<b>[Default file prefix]</b>	<p>The default directs the system to use the currently logged-in default file prefix (if any).</p> <p>To assign a default file prefix name for use as part of a filename in calling up a file, enter a name ending with a right angle bracket, for example, mgr&gt;. The system places this prefix at the beginning of any subsequent file specification you give.</p>

Table 3-4 LOGIN Command Optional Fields (continued)

Field	Action/Explanation
[Default file prefix] (continued)	To remove an assigned default file prefix from the path, enter "" (two single quotation marks with no space between) in this field.
[Directory]	<p>The default directs the system to use the password you assigned (if any) when you signed onto the system.</p> <p>If the directory has an assigned password, enter its volume or directory password to gain access to the directory.</p> <p>To remove an assigned password from the path, enter "" (two single quotation marks with no space between) in this field. These marks appear on the screen as pound signs (##).</p>
[Node]	<p>This field applies only to workstations with B-NET (network systems).</p> <p>If you accept the default, the system uses the currently logged-in node (if any).</p> <p>To assign or change a node name, enter the appropriate name. You do not need to enclose the name in braces.</p> <p>To remove a node name from the path, enter "" (two single quotation marks with no space between) in this field.</p>

## SET TIME Command

The **SET TIME** command allows you to set the system clock. If you use this command at any workstation in a cluster configuration, it sets the system clock for the entire configuration.

To activate this command, you type *SET TIME* in the Executive command field and press RETURN. The system displays the SET TIME command form shown in figure 3-6.

The **SET TIME** command form has one mandatory field, **Date/Time**.

You should use the following guidelines when you enter a parameter in this field:

- Day of week  
Enter the current day. You can enter only enough of the name to identify it (for example, mo for Monday).
- Month  
Enter the current month. You can enter only enough of the name to identify it (for example, Ja for January).
- Day of Month  
Enter a number between 1 and 31 that specifies the current day of the month.
- Year  
Enter the current year. You can enter either two or four digits (19 is optional).
- Abbreviated Form  
You can, optionally, enter the current month, day, and year combined in an abbreviated form (for example, 6/4/85 for June 4, 1985).

### □ Time

Enter the current hour, minute, and, optionally, time qualifier in the format: 7:00 AM.

If you omit the optional qualifier (AM or PM), the system interprets a time between 7:00 and 11:59 as AM, and a time between 12:00 and 6:59 as PM. To specify a time before 7:00 AM or after 7:00 PM, include the qualifier (AM or PM).

You can use the 24-hour notation of two digits to specify the hour (for example, 14:22). However, the system does not automatically display the time in 24-hour notation unless you edit the DTConfig.Sys file (refer to Changing the Date/Time Format, in this section.)

## Changing the Date/Time Format

The system software includes a Date/Time Configuration file, [Sys]<Sys>DTConfig.sys, that determines the format of the date and time.

The default file causes the system to display the date and time in the following format:

Mon Sep 16, 1985 2:35 PM

To change the format of the date and/or time, you use the Editor to modify this file (refer to Accessing the Editor to Modify File Text, in section 5). For example, you can instruct the system to display the date numerically and/or the time in 24-hour (military) format, as in the following:

Mon 09/16/85 14:35

**Note:** The colon is required in both the AM/PM format and the 24-hour format.

Table 3-5 gives the possible formats and the codes you enter for each.

Figure 3-6 SET TIME Command Form

Set Time

Date/Time (e.g., Mon Jun 1, 1981 8:00 pm)

Table 3-5 Date/Time Configuration File Code

<b>Day/Month/Year Sequence:</b>		
<b>Code</b>	<b>Format</b>	<b>Example</b>
0	MM/DD/YY	09/16/85
1	DD/MM/YY	16/09/85
2	YY/MM/DD	85/09/16

<b>Time Format:</b>		
<b>Code</b>	<b>Format</b>	<b>Example</b>
0	AM/PM format	2:35 PM
1	24-hour format	14:35

<b>Date Format:</b>		
<b>Code</b>	<b>Format</b>	<b>Example</b>
0	xxx nn, nnnn	Sep 16, 1985
1	nn/nn/nn	09/16/85
2	xxx nn, nnnn	Sep 16, 1985

Use the following procedure to change the date or time format:

**1** Activate the Editor by entering the *EDIT* command in the Executive command field.

**2** Press RETURN.

The system displays the EDIT command form.

**3** Enter [Sys]<Sys>DTConfig.sys in the File field.

**4** Press GO.

The system activates the Editor and opens the file; the letter **D** appears, followed by three blank spaces and a blank square.

**5** Enter the codes for the date/time format features you want (refer to table 3-5). The file must contain a code for each feature, in the following order:

Day/Month/Year Sequence

Time Format

Date Format

You must overwrite the original blank spaces or delete the existing codes before entering new codes.

To change a code entry, position the cursor in the appropriate location following the letter **D**. Press CODE-I to activate the Editor's insert mode, type the appropriate code, and press GO. A symbol appears corresponding to the number you enter:

0: blank space

1: up arrow ↑

2: right triangle ▷

For each code inserted, you must delete any remaining codes or spaces before the end-of-file square. For example, to display the date/time as Mon 09/19/85 14:35, the DTConfig.Sys file should consist of the letter **D**, a blank, two up arrows, and the end-of-file square.

**6** Press FINISH.

**7** Press GO to exit the Editor.

**8** Turn your system off; then turn it on to set the system clock to the new date/time configuration.

## Receiving and Resolving System Errors

While you are using BTOS, system events and errors can occur which the system reports to you with an error message and/or Status Code. Error messages are usually self-explanatory. If a Status Code appears, you should refer to the *BTOS Status Codes Reference Manual* for assistance in resolving the problem.

### Listing the Contents of the Log File

The log file [Sys]<Sys>Log.sys is the error-logging file that you can request the system to create when you initialize a disk (refer to **IVOLUME** command, in section 5).

Each time a recoverable or nonrecoverable system error or a system event occurs, the system enters a report in this log file. The system generates an entry for the following:

- cluster communications errors
- disk errors
- ISAM errors
- system crashes
- system boot errors
- system initialization errors

Each entry in the log file contains the date and time of the error, the error type, and additional information about the error. Figure 3-7 shows a sample log file entry.

As the log file fills, the system overwrites the oldest entries with the newest ones. Therefore, you should check the log file periodically to identify marginally functioning hardware or data base errors.

**Note:** The Status Code 290 (*Log buffer overflow*) appears when multiple errors occur so rapidly that the system cannot log all of them.

You can display the log file contents by using the **PLOG** command.



Figure 3-7 PLOG Command Form

PLog	
[Error type (Cr, B, In, D, Cl, Is)]	
[Print to]	
[Volume name]	
[After Date/Time]	

## PLOG Command

The **PLOG** command allows you to display the contents of the error-logging file [Sys]<Sys>Log.sys. You can display the log on the screen or, optionally, write it to a file or print it.

To activate this command, you type *PLOG* in the Executive command field and press RETURN. The system displays the PLOG command form shown in figure 3-7.

The PLOG command form has no mandatory fields, but it has four optional fields (enclosed in square brackets). You can press GO to accept the defaults in these fields. The system then displays the entire list of entries in the log file for the [Sys] volume.

You can enter parameters in any or all of the optional fields to override the defaults. Refer to table 3-6 for information about each optional field.

When you complete the PLOG command form, you press GO. The system displays the log file according to your specifications. Figure 3-8 shows a sample log file entry.

Figure 3-8 Sample Log File Entry

```
Executive 8.0.2 (OS i2CLstrLfsMp-8.0.2)
Path: [Sys]<Sys> Wed Mar 11, 1987 10:09 A.M.

Plog 8.0.2
Volume: win

DISK ERROR - Winchester Unit 1 (ERC = 301) Wed Jan 22, 1986 10:05 AM
Description: CRC error in data field
AMS240, Cluster WorkStation, with File System
Memory Size: 512K, SignOn User Name: Exec
Number of Retries 1 (Recovered) Volume Name: Win
Cylinder: 148, Head: 3, Sector: 31, Number of Sectors: 64
Command: 46 30 9A 1F C0 5A 6E 0F 00
Primary Status: 33 Secondary Status: 41 10 20 29 00 00 00
```

Table 3-6 PLOG Command Optional Fields

Field	Action/Explanation														
[Error type (Cr, B, In, D, Cl, Is)]	<p>The default directs the system to display all entries in the log file.</p> <p>To specify the type(s) of errors you want the system to display, enter the error type code(s), using the following guidelines:</p> <table border="0" data-bbox="477 472 857 656"> <thead> <tr> <th data-bbox="477 472 525 496">Error</th> <th data-bbox="812 472 857 496">Code</th> </tr> </thead> <tbody> <tr> <td data-bbox="477 500 722 524">cluster communication errors</td> <td data-bbox="812 500 836 524">Cl</td> </tr> <tr> <td data-bbox="477 527 568 552">disk errors</td> <td data-bbox="812 527 825 552">D</td> </tr> <tr> <td data-bbox="477 555 583 579">ISAM errors</td> <td data-bbox="812 555 830 579">Is</td> </tr> <tr> <td data-bbox="477 583 639 607">system boot errors</td> <td data-bbox="812 583 825 607">B</td> </tr> <tr> <td data-bbox="477 610 610 634">system crashes</td> <td data-bbox="812 610 836 634">Cr</td> </tr> <tr> <td data-bbox="477 638 700 662">system initialization errors</td> <td data-bbox="812 638 830 662">In</td> </tr> </tbody> </table>	Error	Code	cluster communication errors	Cl	disk errors	D	ISAM errors	Is	system boot errors	B	system crashes	Cr	system initialization errors	In
Error	Code														
cluster communication errors	Cl														
disk errors	D														
ISAM errors	Is														
system boot errors	B														
system crashes	Cr														
system initialization errors	In														
[Print to]	<p>The default directs the system to display the log file on the screen.</p> <p>To write the log to a file or print it, enter the name of the destination file or the printer device name (for example, [Lpt]).</p>														
[Volume name]	<p>The default directs the system to display the log file for the current [Sys] volume.</p> <p>To specify the volume of the log file you want to display, enter the volume name. The system maintains log files for system volumes only, and only if you direct the system to do so using the <b>IVOLUME</b> command (refer to <b>IVOLUME</b> command, in section 5).</p>														
[After date/time]	<p>The default directs the system to display all the log file entries after the earliest date and time recorded in the file.</p> <p>To display log file entries after a particular date/time, enter the starting date/time. Use the date/time format entered in the <b>SET TIME</b> command or at the SignOn form (refer to <b>SET TIME</b> command and SignOn Form, in this section).</p>														

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## Using Your Printer

This section describes the printing capabilities of BTOS and the procedures for operating your printer, including:

- preparing your system for printing
- printing directly, with a spooler, and from application programs
- using Executive printing commands
- formatting files for printing
- monitoring and controlling spooled printing

### Types of System Printing

Your system supports two types of printing: direct printing and spooled printing.

#### Characteristics of Direct Printing

With direct printing systems, you can print the contents of files using the Executive **COPY** and **FORMAT** commands and with applications that include print commands (for information on the **COPY** command, refer to section 5).

When you enter a direct print command, the system sends the document directly from your files to a printer connected to your workstation.

Direct printing systems have the following additional characteristics:

- If a print operation is currently in progress, you cannot begin additional print operations.
- Workstations in a cluster system cannot share printers; a printer must be directly connected to the workstation initiating the print job.
- You cannot use your workstation for any other tasks during direct printing operations.

## Characteristics of Spooled Printing

With spooled printing systems, you can print using the **COPY** command, the **FORMAT** command, the **PRINT** command, the **PRINT FILE** subcommand of the **SPOOLER STATUS** command, and with applications that include print commands (for example, word processing).

When you enter a spooled print command, the system sends your request to a special file called a queue, and stores it there until a printer becomes available.

Spooled printing systems have the following additional characteristics:

- Spooled printing frees your system for other tasks during printing operations.
- You do not have to wait for the printer to complete an operation before you begin another.
- Spooled printing allows workstations in a cluster system to share printers.
- The system flags a queued file until the Spooler prints the file, or halts or terminates the operation. If you must access a queued file prior to printing, you must cancel the queued file before you can edit it.

## Preparing Your System for Printing

To prepare your workstation for printing, you must connect each printer to a workstation and test the interface to ensure that the system communicates with the printer properly.

Both direct and spooled systems require a Device Configuration file for each printer.

In addition, spooled printing requires the following utilities and related files:

- the Queue Manager
- the Queue Index file
- the Spooler
- the Spooler Configuration File

Applications that include print commands (for example, the word processing program) reference a printer description file, [Sys]<Sys>Sys.printers. The system software includes a default printer description file; some applications include a default file, also.

Your system may require modification of the printer description file. Refer to your application's documentation for further information.

## Connecting the Printers

Each workstation incorporates three communications ports that you can use for connecting printers to your system:

- two RS-232C ports, labeled Channel A and Channel B, for connecting one or two serial printers
- one Centronics-type port for connecting a parallel printer

**Note:** B 21-1 workstations (cluster workstations only) incorporate two RS-422 ports only; neither Centronics-type nor RS-232C ports are available. For B 26, B 27, B 28, or B 38 workstations, the optional Four-Port Communications Expander provides four additional RS-232C ports (refer to section 2).

If you are configuring your system for direct printing, you connect each printer directly to the workstation initiating the print job.

If you are configuring your system for spooled printing, you can connect one or more printers to any workstation in your system, in a variety of configurations:

- a single printer connected to a standalone workstation
- a single printer connected to any workstation (master or cluster) in a cluster system
- two or more printers connected to a standalone workstation
- two or more printers connected to a single workstation (master or cluster) in a cluster system
- two or more workstations in a cluster system with one or more printers connected to each workstation

For information about connecting the printer to your workstation, refer to your printer's documentation.

## Testing the Interface

You can test the interface between a workstation and a printer by transferring characters directly from the keyboard to the printer without creating a file.

**Note:** If your printer does not correspond to one of the default Printer Device Configuration files, you must enter a Printer Device Configuration file for the printer (refer to Customizing the Printer Device Configuration Files, in this section).

**Use the following procedure to test the interface between your workstation and the printer:**

1 Enter *COPY* in the Executive command field.

2 Press RETURN.

The system displays the COPY command form.

3 Enter *[KBD]* in the highlighted File from field.

[KBD] is the device name for the keyboard).

4 Press RETURN.

The highlight moves to the File to field.

5 Enter the printer device name (refer to section 3 for information about device-naming conventions).

□ For a parallel printer, enter *[Lpt]*.

□ For a serial printer connected to Channel A, enter *[Ptr]A*. (On B 22 workstations, Channel A is an RS-422 port unless it has been modified; therefore, you cannot connect a printer to it.)

□ For a serial printer connected to Channel B, enter *[Ptr]B*.

6 Press GO.

7 Type a line or two of text.

8 Press FINISH.

If the workstation and the printer interface correctly, the system prints the text.

## Device Configuration Files

The system requires a Printer Device Configuration file for each communications channel to which you connect a printer.

A Printer Device Configuration file provides information about the printer you are connecting to that channel. The system needs this information (the maximum number of characters per line, the number of data bits, etc.) to communicate properly with the printer (refer to section 2).

In addition, Printer Device Configuration files supply the names the system uses to distinguish the channels where printers are connected, and to associate a printer with the channel where it is connected.

A Printer Device Configuration file normally resides on the workstation to which you connect the printer. If you connect the printer to a cluster workstation without local file storage, however, the file resides on the master.

## The Queue Manager

The Queue Manager is a utility that coordinates users' print commands with the Spoolers that manage the system's printers.

When you enter the **COPY** command, the **FORMAT** command, the **PRINT** command, the **PRINT FILE** subcommand of the **SPOOLER STATUS** command (refer to the descriptions of these commands in this section), or a print command through an application program, the system generates a print request and sends it to the Queue Manager.

The Queue Manager stores print requests in a file called a Scheduling queue (refer to Scheduling Queue Entries, in this section) until a printer becomes available. The Spooler then takes the request from the Queue Manager and sends it to the printer.

The system software includes the Queue Manager. On cluster systems, you install the Queue Manager on the master workstation only.



## The Queue Index File

The Queue Manager references a special file called the Queue Index file. The Queue Index file contains the entries that define your system's queues. The system software includes a default Queue Index file, [Sys]<Sys>Queue.index.

The Queue Index file includes entries for three types of queues:

- Scheduling queues
- Control queues
- a Spooler Status queue

## The Spooler

The system software includes the Spooler, a utility that manages the operations of printers you assign to its control. You can install the Spooler from the Executive, or automatically (refer to Installing the Queue Manager and the Spooler, in this section).

To allow all of the workstations in a cluster to share the system's printers, you must install the Spooler on each workstation to which you connect one or more printers (after installing the Queue Manager on the master). A Spooler can control a single printer, or several printers simultaneously.

When a printer becomes available, the Spooler takes a request from the Scheduling queue assigned to it in the Queue Index file and sends it to the printer.

## The Spooler Configuration File

The system uses the information in a file called the Spooler Configuration file to coordinate print operations between the Spooler and the Queue Manager. The entries in the Spooler Configuration file include such things as the name of each printer a Spooler controls, the Scheduling queue the Spooler gets its print requests from, etc.

The Spooler Configuration file also specifies whether or not the system prints a banner page to flag the beginning of each document (refer to Banner Page, in this section).

## Banner Page

If you enter commands to print additional documents while a spooled print operation is in progress, the Spooler prints the documents continuously in the order you enter the commands.

To allow you to separate the documents easily, you can include an entry in the Spooler Configuration file that instructs the Spooler to print a banner page (refer to figure 4-1) at the beginning of each document (refer to Customizing the Spooler Configuration File, in this section).

In addition to flagging the beginning of a document, the banner page provides the following information:

- the name of the file
- the date and time of printing
- the copy number

You can also include the text of a notice file. The notice file, [Sys]<Sys>Spooler.notice, is a text file you create and revise using the Editor or the word processing program. If the file exists on your system, the text appears on each banner page.

## Configuring Your System For Direct Printing

The standard system software includes the utilities and files that allow you to connect one or more printers to your system and begin printing.

You can modify the standard software to configure a custom system for your special requirements.

Figure 4-1 Banner Page (Sample)

```
***** File format1 Printed Fri Jul 12, 1985 10:19 AM Copy 1
***** File format1 Printed Fri Jul 12, 1985 10:19 AM Copy 1
***** File format1 Printed Fri Jul 12, 1985 10:19 AM Copy 1
```

### Configuring a Standard Direct Printing System

The system software includes two default Printer Device Configuration files:

- [Sys]<Sys>LptConfig.sys  
for a parallel printer connected to the Centronics-type port
- [Sys]<Sys>PtrBConfig.sys  
for a serial printer connected to Channel B

You can use the default files without modification if the following conditions apply:

- you connect no more than one serial and one parallel printer to the workstation you want to print from
- the default parameters apply to your system's printer(s) (refer to section 2, and to your printer's documentation)

**Note:** If you use the default configuration file for a serial printer, you must connect the printer to the RS-232C port labeled Channel B.

### Configuring a Custom Direct Printing System

If you connect more than one serial printer to a single workstation, you must enter a Printer Device Configuration file for the printer you connect to Channel A, using the **CREATE CONFIGURATION FILE** utility (refer to section 2). You can use the standard Device Configuration file for the printer you connect to Channel B by copying it to [Sys]<Sys>PtrAConfig.Sys, if the printer you are connecting to Channel A is a standard printer type (for example, AP 1305).

## Configuring Your System for Spooled Printing

The standard system software includes the utilities and files that allow you to simply connect one or more printers to your system and begin printing.

You can modify the standard software to configure a custom system for your special requirements.

### Configuring a Standard Spooled Printing System

The system software includes the following default files for spooled printing.

- two Printer Device Configuration files for spooled printers:
  - [Sys]<Spl>SplConfig.sys  
for a parallel printer connected to the Centronics-type port
  - [Sys]<Spl>SplBConfig.sys  
for a serial printer connected to Channel B
- a Spooler Configuration file, [Sys]<Sys>SplCnfg.sys, containing the following entries:
  - 0/Parallel/Spl/[Sys]<Spl>SplConfig.sys/130/n  
for a Spooler that controls a parallel printer
  - B/Serial/SplB/[Sys]<Spl>SplBConfig.sys/130/n  
for a Spooler that controls a serial printer connected to Channel B
- a default Queue Index file, [Sys]<Sys>Queue.index, containing the following entries:
  - two Scheduling queue entries  
Spl/[Sys]<Spl>Spl.queue/1/1  
for parallel printers  
SplB/[Sys]<Spl>SplB.queue/1/1  
for serial printers

- two Control queue entries  
ParallelControl/[Sys]<Spl>ParallelControl.queue/1/1  
for a parallel printer  
SerialControl/[Sys]<Spl>SerialControl.queue/1/1  
for a serial printer
- one Spooler Status queue entry  
SpoolerStatus/[Sys]<Spl>SpoolerStatus.queue/1/1

You can use the default files without modification if the following conditions apply:

- you connect the printer(s) to a standalone workstation or the master of a cluster system
- your system includes no more than one parallel and one serial printer
- the default parameters apply to your system's printer(s) (refer to section 2, and to your printer's documentation)

**Note:** If you use the default configuration file for a serial printer, you must connect the printer to the RS-232C port labeled Channel B.

### **Configuring a Custom Spooled Printing System**

You must configure a custom spooled printing system if either (or both) of the following conditions apply:

- your system includes more than one printer of each type (parallel or serial)
- you connect one or more printers to a workstation other than a standalone or master of a cluster system

To configure a custom system, you revise, replace, or create the following:

- Device Configuration files
- Spooler Configuration file(s)
- Queue Index file entries

### **Customizing the Printer Device Configuration Files**

The system requires a Printer Device Configuration file for each communications channel to which you connect a printer (refer to section 2). A Printer Device Configuration file provides information the system needs to communicate properly with the printer.

In addition, Printer Device Configuration files supply the names the system uses to distinguish the channels where printers are connected, and to associate a printer with the channel where it is connected.

The system software includes two default Printer Device Configuration files for spooled printers:

- [Sys]<Spl>SplBConfig.sys  
for a serial printer connected to Channel B
- [Sys]<Spl>SplConfig.sys  
for a parallel printer connected to the Centronics-type port

You can use the default Printer Device Configuration files for one serial and one parallel printer connected to a standalone workstation or the master workstation of a cluster system (you must connect the serial printer to Channel B).

You must enter a new Printer Device Configuration file for each additional printer, using the **CREATE CONFIGURATION FILE** command (refer to section 2).

## Customizing the Spooler Configuration File

A Spooler Configuration file must be resident on each workstation where the Spooler and the printer(s) it controls are located.

The system software includes one default Spooler Configuration file, [Sys]<Sys>SplCnfg.sys (refer to *Configuring a Standard Spooled Printing System*, in this section), You can revise the entries in the default file, or create a new file using the Editor or the word processing program.

You can use the default file for one Spooler on your system. You must create a new Spooler Configuration file with a different name for each additional Spooler.

The system uses the information in Spooler Configuration files to coordinate print operations between the Spoolers and the Queue Manager. For this reason, if you install more than one Spooler, each Spooler Configuration file must have a different file name.

For example, if your system includes a master and three cluster workstations (WS1, WS2, and WS3), with printers connected to the master and WS1, you would install the Spooler at both the master and WS1.

You could use the default file for the master, and create a new file for WS1. The new file would require a different name, such as [Sys]<Sys>WS1SplCnfg.sys. For further information, refer to section 2.

A Spooler Configuration file contains an entry for each printer the Spooler controls. Spooler Configuration file entries appear in the following format:

Channel/PrinterName/QueueName/ConfigurationFile/  
Priority/Banner(Y/N)

Refer to table 4-1 for an explanation of each component of a Spooler Configuration file entry.

Table 4-1 Spooler Configuration File Entries

Component	Explanation
<b>Channel</b>	<p>specifies the channel to which the printer is connected</p> <p>0 – Centronics-type (parallel) port</p> <p>A – Channel A (serial)</p> <p>B – Channel B (serial)</p>
<b>Printer Name</b>	<p>specifies the name of the printer connected to the channel</p> <p>The printer name can be the same as the device type that you specified when you configured your printer using the <b>CREATE CONFIGURATION FILE</b> command (refer to section 2); however, it must be the same as the Control Queue entry in Queue.Index.</p>
<b>Queue Name</b>	<p>specifies the name of the Scheduling queue assigned to the printer (refer to Scheduling Queue Entries, in this section)</p>
<b>Configuration File</b>	<p>specifies the Printer Device Configuration file (refer to section 2)</p>
<b>Priority</b>	<p>specifies the priority of the Spooler process for the printer</p> <p>The entry is a number from 10 to 254; 10 is the highest priority. The default is 130.</p> <p>Accepting the default or entering a higher number ensures that the printer does not slow down the performance of interactive applications (such as the word processing program).</p> <p>Entering a lower number (such as 127) speeds spooled printing, although application performance is slightly degraded.</p>
<b>Banner (Y/N)</b>	<p>specifies whether the system prints a banner page at the beginning of each document (refer to Banner Page, in this section)</p> <p>The default is no.</p>



### Customizing the Queue Index File

The Queue Index file contains the entries that define your system's queues. The system software includes a default Queue Index file, [Sys]<Sys>Queue.index (refer to *Configuring a Standard Spooled Printing System*, in this section).

To create additional queues, you use the Editor or the word processing program to add entries to the default Queue Index file, or replace it with a new file. The Queue Index file includes three type of entries:

- Scheduling queue entries
- Control queue entries
- a Spooler Status queue entry

Queue Index file entries appear in the following format:

QueueName/FileSpecification/EntrySize/QueueType

### Scheduling Queue Entries

The Queue Manager stores print requests in a file called a Scheduling queue until a printer becomes available. The Queue Index file must include at least one Scheduling queue entry for each printer device type (parallel or serial) you connect to the workstation.

The default Queue Index file includes two Scheduling queue entries (refer to *Configuring a Standard Spooled Printing System*, in this section):

- Spl/[Sys]<Spl>Spl.queue/1/1  
for parallel printers
- SplB/[Sys]<Spl>SplB.queue/1/1  
for serial printers

You can use the default Scheduling queue entries for all of the printers connected to your system. If you have printers connected to more than one workstation, however, you can reduce the waiting time by creating additional Scheduling queues.

Each Spooler Configuration file specifies the Scheduling queue for the printers the Spooler controls (refer to Customizing the Spooler Configuration File, in this section). The Queue Manager references the entries in your system's Spooler Configuration files to coordinate Scheduling queues with printers.

For this reason, the names specified in the Spooler Configuration files and the Queue Index file must correspond.

If you create new Scheduling queues, each one must have a different name. For example, if your system includes a master and three cluster workstations (WS1, WS2, and WS3), with printers connected to the master and WS1, you could use the default Scheduling queues for the entire system. Alternatively, you could use the defaults for the master and create new queues for WS1. The new queues would require different names, as reflected in the following entries:

- WS1Spl/[Sys]<Spl>WS1Spl.queue/1/1  
for a parallel printer
- WS1SplB/[Sys]<Spl>WS1SplB.queue/1/1  
for serial printers

To create additional Scheduling queues, you add Scheduling queue entries to the Queue Index file using the Editor or the word processing program.

Refer to table 4-2 for an explanation of each component of a Scheduling queue entry.

## Control Queue Entries

When you enter a printer control subcommand from the **SPOOLER STATUS** command, (for example **CANCEL PRINT**, **HALT PRINTER**, **RESTART PRINTER**, etc.), or enter a printer control command from an application program (such as word processing), the system stores printer control entries in files called Control queues (refer to *Monitoring and Controlling Spooled Printing*, in this section). The Spooler checks the Control queues for entries as it performs print operations.

The Queue Index file must include a Control queue entry for each printer on your system. The default file includes two Control queue entries (refer to *Configuring a Standard Spooled Printing System*, in this section):

- SerialControl/[Sys]<Spl>SerialControl.queue/  
1/1 for a serial printer
- ParallelControl/[Sys]<Spl>ParallelControl.queue/  
1/1 for a parallel printer

You can use the default Control queues for one serial and one parallel printer on your system. You must create a Control queue for each additional printer. To create additional Control queues, you add Control queue entries to the Queue Index file using the Editor or the word processing program.

Each Control queue must have a different name. For example, if your system includes a master and three cluster workstations (WS1, WS2, and WS3), with printers connected to the master and WS1, you could use the default Control queues for the master, and create new queues for WS1. The new queues would require different names, as reflected in the following entries:

- WS1SerialAControl/[Sys]<Spl>WS1SerialAControl.queue  
/1/1 for a serial printer connected to Channel A
- WS1SerialBControl/[Sys]<Spl>WS1SerialBControl.queue  
/1/1 for a serial printer connected to Channel B
- WS1ParallelControl/[Sys]<Spl>WS1ParallelControl.queue/1/1 for a parallel printer

Refer to table 4-2 for an explanation of each component of a Control queue entry.

Table 4-2 Queue Index File Entries

Component	Explanation
<b>Queue Name</b>	specifies the name you assign to the queue
<b>File Specification</b>	<p>designates the queue's file specification</p> <p>You enter Scheduling queue file specifications in the following format:</p> <p style="text-align: center;">[Sys]&lt;Spl&gt;xxxx.queue</p> <p>where xxxxx is the appropriate queue name (refer to Scheduling Queue Entries, in this section).</p> <p>You enter Control queue file specifications in the following format:</p> <p style="text-align: center;">[Sys]&lt;Spl&gt;xxxxControl.queue</p> <p>where xxxxx is the appropriate printer name (refer to Control Queue Entries, in this section) or HP7475A for plotters.</p> <p>You enter the Spooler Status queue specification in the following format:</p> <p style="text-align: center;">[Sys]&lt;Spl&gt;SpoolerStatus.queue</p>
<b>Entry Size</b>	specifies the number of sectors per entry. The Spooler requires the entry 1.
<b>Queue Type</b>	Enter the number 1 to specify a Spooler queue.

### **Spooler Status Queue Entry**

The system stores information about its Spoolers, such as the names of the printers under their control, files currently queued for printing, etc., in a file called the Spooler Status queue. The system references this file when you activate the **SPOOLER STATUS** command and makes status entries in the various subcommands (refer to Monitoring and Controlling Spooled Printing, in this section).

The Queue Index file requires only one Spooler Status queue entry for the entire system. You can use the default entry without modification (refer to Configuring a Standard Spooled Printing System, in this section).

Refer to table 4-2 for an explanation of each component of a Spooler Status queue entry.

### **Installing the Queue Manager and the Spooler**

Spooled printing operations require installing the Queue Manager and the Spooler, in that order (refer to The Queue Manager, and The Spooler, in this section). If you attempt to install the Spooler before the Queue Manager, the system displays an error message.

**Note:** To perform spooled printer operations using a printer connected to a Four-Port Communications Expander, you must install the DataComm Server before you install the Queue Manager and the Spooler (refer to section 2).

On cluster systems, you install the Queue Manager at the master workstation, and the Spooler at each of the workstations to which you connect the system's printers.

The Queue Manager and the Spooler are dynamically installed system services; that is, they are not part of the system that activates automatically when you turn on or reset your system.

### Installing the Queue Manager and the Spooler Automatically

The standard system software includes a special file, [Sys]<Sys>SysInit.jcl, with default entries that install the Queue Manager and the Spooler when you turn on or reset your system (refer to figure 4-2). You can use the Editor or the word processing program to revise this file.

You can use this file on a standalone system or on a master workstation where both the Queue Manager and the Spooler reside.

You must remove the entry that installs the Queue Manager on cluster workstations where the Spooler resides. In addition, you must ensure that you start up the master workstation (and install the Queue Manager) before you start the cluster.

You must delete or deactivate the file on cluster workstations with hard disk storage where neither the Queue Manager nor the Spooler resides. To deactivate the file, you use the **RENAME** command to add the suffix -save to the file name extension; that is, you rename the file [Sys]<Sys>SysInit.jcl-save (refer to section 5).

If you prefer, you can delete or deactivate the file and install the Queue Manager and the Spooler manually.

Figure 4-2 [Sys]<Sys>SysInit.jcl File

```
$ JOB SysInit
$ RUN [Sys]<Sys>Batch.Run
$ RUN [Sys]<Sys>InstallQmgr.Run
$ RUN [Sys]<Sys>InstallSp1.Run
$ END
```

### INSTALL QUEUE MANAGER Command

To install the Queue Manager manually, you type *INSTALL QUEUE MANAGER* in the Executive command field. Then you press GO; there is no command form.

### INSTALL SPOOLER Command

The **INSTALL SPOOLER** command includes an option that allows you to specify a custom Spooler Configuration file. The default is the standard software Spooler Configuration file, [Sys]<Sys>SpICnfg.sys.

To install the Spooler manually, you type *INSTALL SPOOLER* in the Executive command field.

- If the Spooler uses the standard Spooler Configuration file (refer to Configuring a Standard Spooled Printing System, in this section), you press GO. The system installs the Spooler.
- If the Spooler uses a Spooler Configuration file you have created for a custom system (refer to Customizing the Spooler Configuration File, in this section), you press RETURN. The system displays the **INSTALL SPOOLER** command form (refer to figure 4-3).

The **INSTALL SPOOLER** command form includes one optional field, [Spooler configuration file]. You enter the name of the custom Spooler Configuration file; then you press GO. The system installs the Spooler.

Figure 4-3 **INSTALL SPOOLER** Command Form

Install Spooler
[Spooler configuration file] <input type="text"/>

## Performing Direct Printing on a Spooled Printing System

On a system configured for spooled printing, you can configure one or more printers for direct printing (refer to *Configuring Your System for Direct Printing*, in this section).

You can perform direct printing operations any time the Spooler is not installed on the workstation where the printer configured for direct printing is located. When the Spooler is installed, you can free the channel for direct printing by entering the **FREE PRINTER CHANNEL** subcommand of the **SPOOLER STATUS** command (refer to **FREE PRINTER CHANNEL Subcommand**, in this section).

## Creating Translation Files

The **MAKE TRANSLATION FILE** utility allows you to translate characters in a document into different characters or printer control sequences as you print a document. It is intended primarily for inserting printer function control (escape) sequences in text. You can use it to translate any character into any other single character, or a single character into a series of characters.

**Note:** It is possible to use the *MAKE TRANSLATION FILE* utility for text substitution (for example, substituting the word *ONE* for the number *1*). However, this can interfere with the system's ability to determine when it has reached the line length specified in the Printer Device Configuration file (refer to section 2). Therefore, you should not use translation files for text substitution.



You use the Editor to create a source file that lists the characters you want to translate (refer to the *BTOS Editor Operations Guide*). When the source file is complete, you use the **MAKE TRANSLATION FILE** command to convert the source file into a Translation file.

You can then specify the Translation file when you create or modify the Printer Device Configuration file (refer to section 2).

**Note:** To access the translation file, you must reboot or reset your system prior to printing.

### Entering the Source File

To enter the source file, you activate the Editor, then make an entry for each character you want to translate, using hexadecimal codes (refer to appendix B) to represent the characters. Your entries should be in the following format:

XX = YY

where XX is the hexadecimal code for the character you want to translate, and YY is the hexadecimal code for the translated character.

For example, if you have an AP 1311 printer and 10 hexadecimal is a function code for 10 cpi, then to translate the pound sign (#) into the printer function control code, **Select 10 cpi**, you make the following entry:

23 = 1D

**Note:** Refer to your printer's documentation for a listing of printer function control codes.

### MAKE TRANSLATION FILE Command

You use the **MAKE TRANSLATION FILE** command to convert a source file into a Translation file that you can specify when you create or modify the Printer Device Configuration file (refer to section 2).

To activate this command, you type *MAKE TRANSLATION FILE* in the Executive command field and press RETURN. The system displays the **MAKE TRANSLATION FILE** command form (refer to figure 4-4).

You must enter a parameter in both fields:

- **Source file** Enter the name of the source **name** file you want to convert into a Translation file.
  
- **Translation** Enter a name for the Translation **file name** file

When you press GO, the system creates a Translation file and completes the conversion.

Figure 4-4 **MAKE TRANSLATION FILE** Command Form

Make Translation File	
Source file name	<input type="text"/>
Translation file name	<input type="text"/>

### **Printing Files Created Within an Application Program**

Some application programs, such as word processing, have their own printing facilities. You can configure these for direct or spooled printing; however, the programs have specific commands for printing files. If you create a file within an application program, you should use the facilities it provides for printing.

### **Executive Printing Commands**

The Executive commands you use to activate printing operations differ, depending on whether you are printing directly or with the Spooler. Five commands are available for printing:

- APPEND
- COPY
- FORMAT
- PRINT
- SPOOLER STATUS

Refer to table 4-3 for information about these commands.

Table 4-3 Executive Printing Commands

Command	Type of Printing	Action/Explanation
<b>APPEND</b>	direct printing or spooled printing	<p>Refer to section 5.</p> <p>This command transfers the contents of a file to the printer with no formatting such as pagination, margins, etc.</p> <p>To print a file, enter the name of the file in the <b>File from</b> field and the spooled or nonspooled device name (refer to table 4-4) for the printer attached to your workstation, in the <b>File to</b> field.</p>
<b>COPY</b>	direct printing or spooled printing	<p>Refer to section 5.</p> <p>This command transfers the contents of a file to the printer with no formatting such as pagination, margins, etc.</p> <p>To print a file, enter the name of the file in the <b>File from</b> field and the device name (nonspooled or spooled, refer to table 4-4) for the printer attached to your workstation, in the <b>File to</b> field.</p>
<b>FORMAT</b>	direct printing or spooled printing	<p>This command allows you to set the format of a file's contents and then print it.</p> <p>Refer to <b>FORMAT Command</b>, in this section for detailed information.</p>
<b>PRINT</b>	spooled printing	<p>Refer to <b>PRINT Command</b>, in this section for detailed information.</p>
<b>SPOOLER STATUS</b>	spooled printing	<p>This command allows you to monitor and control spooled printing as well as print files. Refer to <b>SPOOLER STATUS Command</b>, in this section for detailed information.</p>

Table 4-4 Printer Device Names

<b>Nonspoiled Device Name</b>	<b>Spoiled Device Name</b>	<b>Printer Description</b>
[Lpt]	[Spl]	Parallel printer interface
[Ptr]A		Serial printer (Channel A)
[Ptr]B	[SplB]	Serial printer (Channel B)
[Ptr]1A	[Spl1A]	Serial printer (Channel A on four-port communications expander)
[Ptr]1B	[Spl1B]	Serial printer (Channel B on four-port communications expander)
[Ptr]1C	[Spl1C]	Serial printer (Channel C on four-port communications expander)
[Ptr]1D	[Spl1D]	Serial printer (Channel D on four-port communications expander)
[Ptr]2A	[Spl2A]	Serial printer (Channel A on four-port communications expander)
[Ptr]2B	[Spl2B]	Serial printer (Channel B on four-port communications expander)
[Ptr]2C	[Spl2C]	Serial printer (Channel C on four-port communications expander)
[Ptr]2D	[Spl2D]	Serial printer (Channel D on four-port communications expander)

**Note:** [Ptr]A and [Ptr]0A are synonyms.

---

## Special Executive Command Procedures for Printing

The Executive commands used for printing have fields in which you must enter parameters or follow procedures specific to printers. These procedures include:

- specifying printer device names
- specifying printing modes
- specifying printing of password-protected files
- manual intervention during printing

### Printer Device Names

The Executive commands used for printing require that you specify the type of printer you are using, direct or spooled. You do this by entering a device name for your type of printer. Table 4-4 lists printer device names and descriptions. You must enter the device name parameter as shown in table 4-4. For example, for a nonspooled serial printer connected to Channel A, you enter, *[Ptr]A*.

## Printing Modes

The **PRINT** command and the **PRINT FILE** subcommand of the **SPOOLER STATUS** command (refer to the descriptions of these commands in this section) have optional fields that prompt you to specify a printing mode.

BTOS supports four printing modes:

- ASCII
- Plotter
- Binary
- WP

### ASCII Mode

In ASCII mode, the system prints the banner page (refer to Banner Page, in this section), converts tabs into spaces, converts end-of-line characters into device-dependent codes, and recognizes the escape sequences for manual intervention.

### Plotter Mode

In Plotter mode, the system prints the banner page and recognizes the escape sequences for manual intervention. It does not perform character-code conversions.

### Binary Mode

Binary mode does not print the banner page, send any code not in the file to the printer, or recognize the escape sequences for manual intervention.

### WP Mode

The system uses WP mode for spooled printing of documents with the word processing program. WP mode is reserved for the system's use; you do not specify this mode.

## Printing Password-Protected Files

For spooled printing only, the **FORMAT**, **PRINT** and **SPOOLER STATUS** commands (refer to descriptions of these commands in this section) expand a file specification but do not append the SignOn password (if any) before sending the queue entry to the Queue Manager.

To permit the Spooler to read a protected file, you must either specify security mode or add a password to the file specification when you enter it in a command field. If security is a particular concern, you should use security mode.

### Security Mode

If you request security mode when a command form prompts for it, the Spooler pauses before printing the file and waits for you to enter a password. The Spooler remains paused until you either:

- use the **SPOOLER STATUS** command (refer to **SPOOLER STATUS Command**, in this section) to enter the password, and execute the command from the workstation attached to the printer
- cancel the print request with the **CANCEL PRINT** subcommand of the **SPOOLER STATUS** command

If you enter a password, the Spooler completes the printing.

## Manual Intervention During Printing

During spooled printing, a printer can require manual intervention for either unintentional or intentional reasons.

Unintentional reasons can include:

- out of paper
- off line
- paper-jam conditions

Intentional reasons can include:

- forms changes
- print wheel changes
- generic printer pause



Whenever a printer requires manual intervention, you can use the **SPOOLER STATUS** command (refer to **SPOOLER STATUS Command**, in this section) to determine the cause. In a cluster configuration, you can activate this command from any workstation.

After determining and correcting the need for manual intervention, you can restart the printing process with the **RESTART PRINTER** subcommand of the **SPOOLER STATUS** command.

## **PRINT Command**

The **PRINT** command allows you to print a file by spooled printing only. It does not create a temporary file, but adds the actual file to the queue for spooled printing. Therefore, you should not delete or modify the file until printing is complete.

**Note:** If the Spooler and the printer are both at the master workstation, you cannot print files from the cluster workstation's local file storage. You must print the files from the master workstation's diskette or hard disk.

To activate this command, you type *PRINT* in the Executive command field and press **RETURN**. The system displays the **PRINT** command form shown in figure 4-5.

You must enter a parameter in the File list field. You enter the name(s) of the file(s) you want to print.

The **PRINT** command has eleven optional fields (enclosed in square brackets). You can leave any or all of these fields blank to accept the defaults or enter parameters to override the defaults. Refer to table 4-5 for information about each optional field.

When you complete the **PRINT** command form, you press **GO**. The system prints the file(s) according to your specifications.

Figure 4-5 PRINT 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?]	

Table 4-5 PRINT Command Optional Fields

Field	Action/Explanation
[Queue name (default = SPL)]	The default directs the system to use [Spl] as the scheduling queue.  To specify the scheduling queue that contains the queue entry generated by this print request, enter the queue name. The name must match a queue name defined for the system (refer to Customizing the Queue Index File, in this section)
[Number of copies]	The default directs the system to print one copy.  To specify the number of copies of the file to print, enter the number.
[Delete after printing?]	If you accept the default (no entry) or enter n, the system does not delete the file(s) after printing it.  To direct the system to delete the file(s) after printing it, enter y.

Table 4-5 PRINT Command Optional Fields (continued)

Field	Action/Explanation
[Special forms name]	<p>If you accept the default, the printer does not pause before printing to load special paper.</p>
[Print wheel name]	<p>To use special paper to print the file, enter the name (a maximum of 12 characters) of the paper. The printer pauses before printing so that you can load this paper. The default does not specify a particular print wheel.</p> <p>To use a specific print wheel, enter the name (a maximum of 12 characters) of the print wheel. The printer pauses before printing so you can install the print wheel. To restart the printer, enter the <b>SPOOLER STATUS</b> command and use the <b>RESTART PRINTER</b> subcommand. Refer to <b>SPOOLER STATUS Command</b>, in this section.</p>
[Printing mode]	<p>The default is the ASCII mode.</p> <p>To specify the Plotter mode, enter the letter <b>p</b>.</p> <p>To specify the Binary mode, enter the letter <b>b</b>.</p> <p>For further information, refer to <b>Printing Modes</b>, in this section.</p>
[Align form?]	<p>The default is no; the printer does not pause for forms alignment.</p> <p>To direct the printer to pause after printing the first page so that you can align the paper, enter <b>y</b>.</p> <p>To align the form again, enter the <b>SPOOLER STATUS</b> command, and use the <b>ALIGN FORM</b> subcommand (refer to <b>SPOOLER STATUS Command</b>, and <b>ALIGN FORM Subcommand</b>, in this section).</p>

Table 4-5 PRINT Command Optional Fields (continued)

Field	Action/Explanation
[Align form?] (continued)	To restart the printer, enter the <b>SPOOLER STATUS</b> command, and use the <b>RESTART PRINTER</b> subcommand (refer to <b>SPOOLER STATUS</b> Command, and <b>RESTART PRINTER</b> Subcommand, in this section)
[After date/time]	<p>The default directs the system to print the file as soon as possible.</p> <p>To specify the earliest date/time for the system to print the file, enter the date/time in this format:</p> <p>Mon Jun 3 1986 8:00 pm</p>
[Security mode?]	<p>The default is no; the printer does not pause for a password entry before printing the file(s).</p> <p>To direct the printer to pause for a password entry before printing the file, enter <b>y</b>. A user must enter a password at the workstation connected to the printer before the system can print the file.</p>
[Priority]	<p>Scheduling queue priorities are 0–9, with 0 as the highest.</p> <p>The default sets the priority at 5.</p> <p>To assign the file a priority in the Scheduling queue, enter the priority number.</p>
[Confirm each?]	<p>The default is no; the system prints the file(s) without prompting you for confirmation.</p> <p>To receive prompts to confirm the printing of the file(s), enter <b>y</b>. When you complete the command form and press <b>GO</b>, the prompts appear. You press <b>GO</b> to confirm printing a file, <b>CANCEL</b> to deny, or <b>FINISH</b> to stop the command.</p>

## Formatting a File for Printing

You can format the contents of a file into a paginated document for direct or spooled printing. You can specify margins, page length, line spacing, tabbing, the title of the file, and the date/time it is printed. To format a file in this way and then print it, you use the **FORMAT** command.

### **FORMAT Command**

The **FORMAT** command allows you to format the text of one or more files into a paginated document and print the file(s) by direct or spooled printing. This command does not create a copy of your file. For spooled printing, the Spooler creates a queue entry and appends it to the specified Scheduling queue. You should not delete or modify the file until the system finishes printing it.

To activate this command, you type *FORMAT* in the Executive command field and press RETURN. The system displays the **FORMAT** command form shown in figure 4-6.

You must enter a parameter in the File list field. You enter the file specification, file list, or at-file name for the file(s) you want to format.

The **FORMAT** command form has 16 optional fields (enclosed in square brackets). You can leave any or all of these fields blank to accept the defaults or enter parameters to override the defaults. The defaults format the text to fit an 8-1/2-by-11-inch page (if the printer prints six vertical lines and 10 horizontal spaces per inch) and print the formatted text on the spooled printer. Refer to table 4-6 for information about each optional field.

Figure 4-6 **FORMAT 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?]	

Table 4-6 **FORMAT Command Optional Fields**

Field	Action/Explanation
<b>[Print to]</b>	<p>The default directs the system to print the formatted file on the spooled printer [Spl].</p> <p>To direct the printing to a printer other than the spooled printer enter one of the following:</p> <ul style="list-style-type: none"> <li data-bbox="479 464 836 540">□ the device name of a local printer for direct printing (for example, [Ptr]A, [Ptr]B, or [Lpt])</li> <li data-bbox="479 570 836 721">□ the name of a Scheduling queue (for example, [SplB]) for spooled printing. The name must match a queue name defined for the system refer to Customizing the Queue Index File, in this section.</li> <li data-bbox="479 750 865 854">□ the name of the file in which you want the system to write the formatted image of the input file. Do not enclose this name in brackets.</li> </ul>
<b>[Confirm each?]</b>	<p>The default is no; the system does not prompt you for confirmation before formatting the file.</p> <p>To receive confirmation prompts before the system formats each file, enter <b>y</b>. When you complete the command form and press <b>GO</b>, the prompts appear. You press <b>GO</b> to confirm the formatting of a file, <b>CANCEL</b> to deny, or <b>FINISH</b> to stop the command.</p>

Table 4-6 **FORMAT Command Optional Fields** (continued)

<b>Field</b>	<b>Action/Explanation</b>
<b>[Title]</b>	<p>The default directs the system to print the file name as the title.</p> <p>To specify a title for the top of each page of the file, enter the title. If the title includes spaces, enclose it in single quotation marks (for example, 'Accounting Records').</p>
<b>[First page to format]</b>	<p>The default is page one of the file.</p> <p>To specify the first page you want formatted, enter the number of the page.</p>
<b>[Last page to format]</b>	<p>The default is the last page of the file.</p> <p>To specify the last page you want formatted, enter the number of the page.</p>
<b>[Suppress page numbers?]</b>	<p>The default is no; the system inserts page numbers at the top of each page of the file.</p> <p>To suppress the printing of page numbers at the top of each page of the file, enter <b>y</b>.</p>
<b>[Suppress date?]</b>	<p>The default is no; the system inserts the date at the top of each page of the file.</p> <p>To suppress the printing of the date at the top of each page of the file, enter <b>y</b>.</p>



Table 4-6 **FORMAT Command Optional Fields** (continued)

Field	Action/Explanation
<b>[Suppress time?]</b>	<p>The default is no; the system inserts the time at the top of each page of the file.</p> <p>To suppress the printing of the time at the top of each page of the file, enter <b>y</b>.</p>
<b>[Double-space?]</b>	<p>The default is no; the system single spaces the lines of the file text.</p> <p>To specify double-spacing of the lines of the file text, enter <b>y</b>.</p>
<b>[Left margin (default 10 spaces)]</b>	<p>The default sets a left margin of 10 spaces on the printed page.</p> <p>To set the size of the left margin, enter the number of spaces for this margin.</p>
<b>[Text width (default 65 spaces)]</b>	<p>The default sets the text width at 65 spaces.</p> <p>To set the text width for the file, enter the number of spaces you want it to occupy. The system splits lines longer than specified into two or more lines. Split lines do not wrap into succeeding lines.</p>
<b>[Page length (default 66 lines)]</b>	<p>The default sets the page length at 66 lines.</p> <p>To set the page length, enter the number of lines you want per page, including the top and bottom margins.</p>

Table 4-6 **FORMAT Command Optional Fields** (continued)

Field	Action/Explanation
<b>[Top margin (default 6 lines)]</b>	<p>The default leaves six blank lines for the margin at the top of each page.</p> <p>To specify the size of the margin at the top of each page, enter the number of blank lines to allow for the margin.</p>
<b>[Bottom margin (default 6 lines)]</b>	<p>The default leaves six blank lines for the margin at the bottom of each page.</p> <p>To specify the size of the margin at the bottom of each page, enter the number of blank lines to allow for the margin.</p>
<b>[Tab width (default 8 spaces)]</b>	<p>The default sets eight spaces between tab stops.</p> <p>To set tab stops, enter the number spaces to allow between them.</p>
<b>[Suppress page ejects between files?]</b>	<p>The default is no; the system starts a new page for each file.</p> <p>To print the files as continuous text, enter y.</p>

When you complete the **FORMAT** command form, you press **GO**. The system formats the file according to your specifications and, if requested, prints it.

## Monitoring and Controlling Spooled Printing

If your system has spooled printing capability, you can use the Spooler utility to monitor and control printing. With this utility you can check the status of every printer in your system, both standalone and cluster, and the status of the Scheduling queues.

The Spooler utility also provides operations that enable you to control printing, such as canceling and deleting print requests, printing files with specific criteria, stopping and restarting printing, aligning printer forms, entering printing passwords, and freeing the printer channel from the Spooler's control. To activate the Spooler utility, you use the **SPOOLER STATUS** command.

### SPOOLER STATUS Command

The **SPOOLER STATUS** command allows you to display the status of printers and printer scheduling queues, and provides twelve subcommands from which you can select and control a printer and queue. The subcommands and their character codes are:

- |                        |   |
|------------------------|---|
| □ ALIGN FORM           | A |
| □ CANCEL PRINT         | C |
| □ DELETE PRINT REQUEST | D |
| □ ENTER PASSWORD       | E |
| □ FREE PRINTER CHANNEL | F |
| □ HALT PRINTER         | H |
| □ MAIN STATUS DISPLAY  | M |
| □ NEW PRINTER          | N |
| □ PRINT FILE           | P |
| □ SELECT QUEUE         | Q |
| □ RESTART PRINTER      | R |
| □ SELECT PRINTER       | S |

You can activate the **SPOOLER STATUS** from any workstation where the Spooler is installed. Refer to *Configuring Your System for Spooled Printing*, in this section.

To activate this command, you type *SPOOLER STATUS* in the Executive command field and press GO; this command has no command form or parameter fields. When you press GO, the Main Status display appears (refer to figure 4-7). The information displayed includes the names, queue names, and the printing status (printing, paused, etc.) of each printer in the system.

**Figure 4-7 Sample Main Status Display of the SPOOLER STATUS Command**

Spooler 8.0.2 (OS t2CLstrLfsMp-8.0.2)		Wed Mar 11, 1987 10:09 A.M.
Path: [Win]-<Sys>		
Printer Name	Queue Name	Status
Parallel	Sp1	Printing [Win]-<Sys>New.Txt
Serial 1	SPLB	Paused Please change print wheel to A
Serial 2	SPLB	Paused [Win2]-<Current>Ans.Doc Please enter the appropriate password
		[Win]-<Private>Letter
Commands: <To invoke a command, enter the character shown. To exit a program, press Finish.>		
N - New printer	Q - Select queue	S - Select printer

At the bottom of the Main Status display, the system lists three subcommands that are available to you at this point in the **SPOOLER STATUS** command operations:

- **NEW PRINTER**
- **SELECT QUEUE**
- **SELECT PRINTER**

**NEW PRINTER Subcommand**

The **NEW PRINTER** subcommand allows you to place a specified printer under the control of the Spooler and then redisplay the Main Status display.

To activate this subcommand, you press **N**. The system displays the **NEW PRINTER** subcommand form shown in figure 4-8.

You must enter parameters in four **NEW PRINTER** subcommand fields:

- **Printer channel**      Enter the character code that specifies the printer channel connected to the printer. Use the following guidelines:

<b>Code</b>	<b>Printer Channel</b>
0	Parallel Printer
A, 0A	Channel A
B, 0B	Channel B
1A, 1B, 1C, 1D	Four-Port Communications Expander
2A, 2B, 2C, 2D	Four-Port Communications Expander

- 
- **Printer name**            Enter the name of the new printer.
  - **Queue name**            Enter the name of the scheduling queue associated with the new printer.
  - **Printer configuration file**    Enter the name of the Printer Configuration file. This file describes the printer parameters. You create this file with the **CREATE CONFIGURATION FILE** command (refer to section 2).

The **NEW PRINTER** subcommand also has two optional fields (enclosed in square brackets). You can leave one or both of these fields blank to accept the defaults or enter parameters to override the defaults. Refer to table 4-7 for information about each optional field.

Figure 4-8 NEW PRINTER Subcommand Form

```

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

```

Table 4-7 NEW PRINTER Subcommand Optional Fields

Field	Action/Explanation
[Priority]	<p>You can set the priority at which you want the Spooler process to run from 10 to 254, with 10 the highest. A priority less than 128 (the default priority of the interactive application system) ensures that the Spooler does not impact the interactive application system.</p> <p>The default priority is 10.</p> <p>To set a specific Spooler priority, enter the priority number.</p>
[Suppress banner?]	<p>The default is no; the printer prints the banner page at the beginning of the file. Refer to Banner Page, in this section.</p> <p>To suppress printing a banner page at the beginning of the file, enter y.</p>

When you complete the **NEW PRINTER** subcommand form, you press **GO** to execute the command, **CANCEL** to deny and return to the previous status display, or **FINISH** to exit the **SPOOLER STATUS** command.

### **SELECT QUEUE Subcommand**

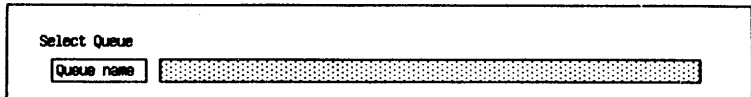
The **SELECT QUEUE** subcommand allows you to display detailed status information for the files in the specified Scheduling queue and allows access to five subcommands:

- **DELETE PRINT REQUEST**
- **MAIN STATUS DISPLAY**
- **PRINT FILE**
- **SELECT QUEUE**
- **SELECT PRINTER**

To activate the **SELECT QUEUE** subcommand, you press **Q**. The system displays the **SELECT QUEUE** subcommand form shown in figure 4-9.

The **SELECT QUEUE** subcommand form has one mandatory field, **Queue name**. You enter the name of the Scheduling queue for which you want status information displayed. You press **GO** to execute the subcommand, **CANCEL** to deny and return to the previous status display, or **FINISH** to exit the **SPOOLER STATUS** command.

Figure 4-9 **SELECT QUEUE Subcommand Form**



The image shows a rectangular form with a border. Inside the form, the text "Select Queue" is positioned at the top left. Below it is a text input field. The first part of this field contains the text "Queue name" in a smaller font, indicating it is a required or placeholder text. The rest of the input field is empty and has a light gray stippled background.



When you press **GO**, the the Queue Status display appears (refer to figure 4-10). The information displayed includes the name of the queue, the printer which serves the queue, the names of the files in the queue with the priority number of each file. If the queue status list is longer than the screen, you can press **NEXT PAGE** to scroll to the end of the list. You press **CANCEL** to stop the listing and **PREV PAGE** to redisplay the queue status information.

After you check the queue status, you can choose from the list of five subcommands located at the bottom of the Queue Status display.

To display the status of a different queue, you press **Q**. The system redisplay the **SELECT QUEUE** subcommand form shown in figure 4-9.

**Figure 4-10 Sample Queue Status Display of the SELECT QUEUE Subcommand**

Spooler 8.0.2 (OS t2CLstrLfsMp-8.0.2)		Wed Mar 11, 1987 10:09 A.M.	
Path: [Win]<Sys>			
Queue: SPL			
Served by: 89251-1, 89252			
Files Queued		Priority	
[Win]<Sys>Aws.Doc		2	
[Win]<Joe>A		2	
[Win2]<File>File		3	
[Win1]<Sys>Sp1Doc		4	
[Win1]<Sys>Sp1Doc		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 a program, press Finish.>			
N - New printer		Q - Select queue	
H - Main status display		S - Select printer	
P - Print file			

**DELETE PRINT REQUEST Subcommand**

The **DELETE PRINT REQUEST** subcommand allows you to delete a specified queue entry from the scheduling queue.

To activate this subcommand, you press D. The system displays the **DELETE PRINTER REQUEST** subcommand form shown in figure 4-11.

The **DELETE PRINT REQUEST** subcommand form has one mandatory field, **File list**. You enter the list of files or file specification(s) you previously requested for printing.

**Note:** If you use the wild card character (\*) in the **File list** field to delete all files from the queue, the system deletes the currently printing file in addition to the others.

When you complete your entry, you press GO to delete the print request, CANCEL to deny and return to the previous status display, or FINISH to exit the **SPOOLER STATUS** command.

**MAIN STATUS DISPLAY Subcommand**

The **MAIN STATUS DISPLAY** subcommand allows you to redisplay the Main Status display shown in figure 4-7.

To activate this subcommand, you press M. The following prompt appears on the screen:

**Main Status Display**

<Press GO to execute, CANCEL to deny, or FINISH to exit.>

You press GO to return to the Main Status display, CANCEL to deny and return to the previous status display, or FINISH to exit the **SPOOLER STATUS** command.

Figure 4-11 DELETE PRINT REQUEST Subcommand Form

Delete Print Request	
File list	
[Confirm each?]	

### PRINT FILE Subcommand

The **PRINT FILE** subcommand allows you to create a queue entry for file printing and to add it to the Scheduling queue.

To activate the **PRINT FILE** subcommand, you press P. The system displays the subcommand form shown in figure 4-12.

You must enter a parameter in the File list field. You enter the list of files or the specification(s) of the file(s) you want to print.

The **PRINT FILE** subcommand has ten optional fields (enclosed in square brackets). You can leave any or all of these fields blank to accept the defaults or enter parameters to override the defaults. Refer to table 4-8 for information about each optional field.

Figure 4-12 PRINT FILE Subcommand Form

Print	
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?]	

Table 4-8 PRINT FILE Subcommand Optional Fields

Field	Action/Explanation
<b>[Number of copies]</b>	<p>The default directs the system to print one copy of the file(s).</p> <p>To specify the number of copies of the file(s) to print, enter the number.</p>
<b>[Delete after printing?]</b>	<p>If you accept the default (no entry) or enter <b>n</b>, the system does not delete the file(s) after printing it.</p> <p>To direct the system to delete the file(s) after printing it, enter <b>y</b>.</p>
<b>[Special forms name]</b>	<p>If you accept the default, the printer does not pause before printing to load special paper.</p> <p>To use special paper to print the file, enter the name (a maximum of 12 characters) of the paper. The printer pauses before printing so that you can load this special paper.</p>
<b>[Print wheel name]</b>	<p>The default does not specify a particular print wheel.</p> <p>To use a specific print wheel, enter the name (a maximum of 12 characters) of the print wheel. The printer pauses before printing so you can install the print wheel.</p> <p>To restart the printer, use the <b>RESTART PRINTER</b> subcommand. Refer to <b>RESTART PRINTER Subcommand</b>, in this section.</p>

Table 4-8 PRINT FILE Subcommand Optional Fields (continued)

Field	Action/Explanation
<b>[Printing mode]</b>	<p>The default is the ASCII mode.</p> <p>To specify the Plotter mode, enter the letter <b>p</b>.</p> <p>To specify the Binary mode, enter the letter <b>b</b>.</p> <p>For further information, refer to Printing Modes, in this section.</p>
<b>[Align form?]</b>	<p>The default is no; the printer does not pause for forms alignment.</p> <p>To direct the printer to pause after printing the first page so that you can align the paper, enter <b>y</b>.</p> <p>To align the form again, enter the <b>SPOLLER STATUS</b> command, and use the <b>ALIGN FORM</b> subcommand (refer to <b>SPOOLER STATUS</b> Command, and <b>ALIGN FORM</b> Subcommand, in this section).</p> <p>To restart the printer, enter the <b>SPOOLER STATUS</b> command, and use the <b>RESTART PRINTER</b> subcommand (refer to <b>SPOOLER STATUS</b> Command, and <b>RESTART PRINTER</b> Subcommand, in this section).</p>
<b>[After date/time]</b>	<p>The default directs the system to print the file as soon as possible.</p> <p>To specify the earliest date/time to print the file, enter the date/time in this format:</p> <p>Mon Jun 3 1986 8:00 pm</p>

Table 4-8 **PRINT FILE** Subcommand Optional Fields (continued)

Field	Action/Explanation
<b>[Security mode?]</b>	<p>The default is no; the printer does not pause for a password entry before printing the file(s).</p> <p>To direct the printer to pause for a password entry before printing the file, enter <b>y</b>. A user must enter a password at the workstation connected to the printer before the system can print the file.</p>
<b>[Priority]</b>	<p>Scheduling queue priorities are 0–9, with 0 as the highest.</p> <p>The default sets the priority at 5.</p> <p>To assign the file a priority in the Scheduling queue, enter the priority number.</p>
<b>[Confirm each?]</b>	<p>The default is no; the system prints the file(s) without prompting you for confirmation.</p> <p>To receive prompts to confirm the printing of the file(s), enter <b>y</b>. When you complete the form and press <b>GO</b>, the prompts appear. You press <b>GO</b> to confirm printing a file, <b>CANCEL</b> to deny, or <b>FINISH</b> to stop the <b>SPOOLER STATUS</b> command.</p>

When you complete the **PRINT FILE** subcommand form, you press **GO** to print the files, **CANCEL** to deny and return to the previous status display, or **FINISH** to exit the **SPOOLER STATUS** command.

### SELECT PRINTER Subcommand

The **SELECT PRINTER** subcommand allows you to display detailed status information for the specified printer and the files listed in the associated Scheduling queue. You can access all twelve **SPOOLER STATUS** subcommands through the **SELECT PRINTER** subcommand.

To activate this subcommand, you press **S**. The system displays the **SELECT PRINTER** subcommand form shown in figure 4-13.

You must enter a parameter in the Printer name field. You enter the name of the printer for which you want status information displayed (for example, Serial).

When you complete your entry, you press **GO** to execute the subcommand, **CANCEL** to deny and return to the previous status display, or **FINISH** to exit the **SPOOLER STATUS** command. When you press **GO**, the Printer and Scheduling Queue Status display appears (refer to figure 4-14). This display includes both printer and queue information.

The printer information is:

- name of the printer
- status (printing, paused, etc.)
- description of the printer
- name of the Printer Configuration file
- location of the printer

The queue information is:

- name of queue
- printers served by the queue
- names of files in the queue with priority numbers for each

Figure 4-13 **SELECT PRINTER** Subcommand Form

Select Printer	
Printer name	<input type="text"/>

Figure 4-14 Sample Printer and Scheduling Queue Status Display of the SELECT PRINTER Subcommand

```

Spooler 8.0.2 (OS i2CLstrLfsMp-8.0.2)
Path: [win]<Sys>
Wed Mar 11, 1987 10:09 A.M.

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>Sp1BConfig.Sys
Location: Cluster workstation
Queue: SPL
Served by: Serial 1, Serial 2
Files Queued Priority
[win]<Sys>Aws.Doc 2
[win]<Job>A 2
[win2]<File>File 3
[win1]<Sys>Sp1Doc 4
[win1]<Sys>Sp1Doc 4
[win1]<Mary>Memorandum01 5
[win2]<Frank>SalesOrder 5
Press NEXT PAGE to continue, or CANCEL to stop listing.

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

A - Align form F - Free printer N - New printer
C - Cancel print channel P - Print file
D - Delete print request H - Halt printer Q - Select queue
E - Enter password H - Main status display R - Restart printer
S - Select printer
  
```

If this information is longer than the screen, you press **NEXT PAGE** to scroll the screen up. You press **CANCEL** to stop the listing of status information or **PREV PAGE** to redisplay the status information.

After you check the printer and queue status, you can choose from the list of 12 subcommands at the bottom of the Printer and Scheduling Queue display. The following paragraphs explain the subcommands not previously discussed in this section.

To display the status of a different printer and scheduling queue, you press **S**. The system redisplay the **SELECT PRINTER** subcommand form shown in figure 4-13.



### **ALIGN FORM Subcommand**

The **ALIGN FORM** subcommand allows you to reprint the first page of a file after the printer pauses for you to align the form. After reprinting the first page, the printer pauses again to allow you realign the form if necessary.

**Note:** To use the *ALIGN FORM* subcommand, you must specify *yes* in the *[Align form?]* field of the **PRINT** command form, or the *PRINT FILE* subcommand (refer to **PRINT Command**, and **PRINT FILE Subcommand**, in this section).

To activate this command, you press **A**. The system displays the following prompt:

#### **Align Form**

<Press **GO** to execute, **CANCEL** to deny, or **FINISH** to exit.>

You press **GO** to execute the subcommand, **CANCEL** to deny and return to the previous status display, or **FINISH** to exit the **SPOOLER STATUS** command. If you press **GO**, the system reprints the first page of the document.

To restart the printer after this subcommand finishes, you use the **RESTART PRINTER** subcommand (refer to **RESTART PRINTER Subcommand**, in this section).

### **CANCEL PRINT Subcommand**

The **CANCEL PRINT** subcommand allows you to cancel the current printing request. The printing operation terminates. If you use this subcommand to cancel the printing of a temporary file (with the suffix *.tmp*), the system deletes the file.

To activate this command, you type **C**. The system displays the following prompt:

### Cancel Print

<Press **GO** to execute, **CANCEL** to deny, or **FINISH** to exit.>

You press **GO** to cancel the printing operation, **CANCEL** to deny and return to the previous status display, or **FINISH** to exit the **SPOOLER STATUS** command.

When you press **GO**, a brief delay can occur before the printer stops.

### ENTER PASSWORD Subcommand

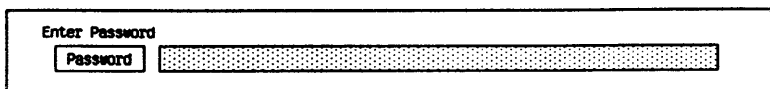
The **ENTER PASSWORD** subcommand allows you to enter a password when the printer pauses in response to a security mode request given in the **PRINT** command (refer to **PRINT** Command, in this section) or to the **PRINT FILE** subcommand of the **SPOOLER STATUS** command. The printer does not print the file until you enter the password at the workstation connected to the printer.

To activate this subcommand, you type *E*. The system displays the **ENTER PASSWORD** subcommand form shown in figure 4-15.

You must enter a parameter in the **Password** field. You enter the word or characters (a maximum of 12) that you want to use for the password.

When you complete your entry, you press **GO** to assign the password, **CANCEL** to deny and return to the previous status display, or **FINISH** to exit the **SPOOLER STATUS** command.

Figure 4-15 **ENTER PASSWORD** Subcommand Form



The image shows a rectangular window titled "Enter Password". Inside the window, there is a small box on the left labeled "Password" and a larger rectangular area to its right with a dotted background, intended for entering the password.

**FREE PRINTER CHANNEL Subcommand**

The **FREE PRINTER CHANNEL** subcommand allows you to free a printer channel from the control of the Spooler. You use this subcommand to change the existing configuration for installation of a new printer, or to release RS-232C Channel B for data communications operation.

To activate this subcommand, you type *F*. The system displays the following prompt:

**Free Printer Channel**

<Press **GO** to execute, **CANCEL** to deny, or **FINISH** to exit.>

You press **GO** to free the channel, **CANCEL** to deny and return to the previous status display, or **FINISH** to exit the **SPOOLER STATUS** command.

**HALT PRINTER Subcommand**

The **HALT PRINTER** subcommand allows you to stop the printer.

To activate this subcommand, you type *H*. The system displays the following prompt:

**Halt Printer**

<Press **GO** to execute, **CANCEL** to deny, or **FINISH** to exit.

You press **GO** to halt the printer, **CANCEL** to deny and return to the previous status display, or **FINISH** to exit the **SPOOLED STATUS** command.

When you press **GO**, a brief delay can occur before the printer stops.

**RESTART PRINTER Subcommand**

The **RESTART PRINTER** subcommand allows you to restart the printer after a pause.

To activate this subcommand, you type *R*. The system displays the **RESTART PRINTER** subcommand form shown in figure 4-16.

This subcommand has two optional fields, [Restart from page number], and [Restart from top of current page]. If you accept the default, printing restarts where the printer stopped.

To restart the printing from a specific page, you enter the page number in the [Restart from page number] field.

To restart the printing from the beginning of the next page in the document, you enter *y* in the [Restart from top of current page] field (for example, if the system printed page one and then paused, it will begin printing page two).

When you complete your entry, you press **GO** to restart the printing, **CANCEL** to deny and return to the previous status display, or **FINISH** to exit the **SPOOLER STATUS** command.

**Figure 4-16 RESTART PRINTER Subcommand Form**

The image shows a rectangular window titled "Restart Printer". Inside the window, there is a small box containing the text "[Restart from page number]". To the right of this box is a larger, shaded rectangular area, likely representing a cursor or a selection field.

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## Managing Data

This section describes the tasks you perform to manage data on your system, including:

- organizing data into volumes, directories, and files
- accessing the Editor to modify the text of files

## Organizing Data

BTOS organizes storage for data and programs into three categories:

- volumes (diskettes or hard disks formatted and initialized to store data or programs)
- directories (groups of related documents, programs, or other data stored on volumes)
- files (documents, programs, or other sets of related data within directories)

The following paragraphs explain each of these categories in detail.

### Volumes

Volumes are diskettes or hard disks on which you store data or programs. Before you can use a diskette or hard disk as a volume you must prepare it for storage purposes by naming and initializing it.

#### Naming Volumes

You can identify each BTOS volume by two names:

- a drive device name that specifies the drive in which the volume is located
- the volume name

## Drive Device Names

A drive device name indicates the drive in which a volume is located. The drive device name is a default volume name. You can use it as an alternate volume name entry in any command form except forms that request both device and volume names. Table 5-1 lists and explains typical drive device names.

When you use a drive device name or a volume name in a complete file name, you must enclose it in square brackets, for example, [f0]<sys>anyfilename.

You assign a device name to a volume at the time you initialize the volume with the **IVOLUME** command (refer to *Initializing Volumes*, in this section). In the **Device name** field of the **IVOLUME** command form, you enter the symbol for the drive in which the volume is located.

Table 5-1 Typical Drive Device Names

Device Name	Drive Description
d0	the first hard disk drive at the master workstation or at a workstation with local file storage
d1	an additional hard disk drive on a workstation
!d0	the hard disk drive at the master workstation when specified from a cluster workstation with local file storage  <b>Note:</b> You cannot initialize the !d0 drive with the <b>IVOLUME</b> command.
f0	the first floppy disk drive of a local workstation
f1	the second floppy disk drive on a workstation with two floppy disk drives
!f0	the first floppy disk drive of the master workstation when specified from a cluster workstation with local file storage

## Volume Names

You can use the volume name to describe the contents of a volume, for example, Accounting for accounting files or JohnDoe for John Doe's files. You can use a maximum of 12 characters, a period, and a hyphen in a volume name.

A volume name must not duplicate any other volume or device name. Invalid names are (the italicized characters represent any characters you add to complete the name):

*Comanything*  
*Lptanything*  
*Splanything*  
*Tapeanything*  
*Vidanything*  
d0, d1, d2, d3  
f0, f1, f2, f3  
Nu1  
Kbd

When you refer to volumes as part of a complete file name, you must enclose the volume name in square brackets, for example, [Accounting].

To assign a name to a volume, you enter the name in the Volume name field of the IVOLUME command form when you initialize the volume.

## Initializing Volumes

Before you can use a volume for storing data you must initialize it.

Initialization of hard disks differs, depending on how you intend to use the disk. Two types of hard disk volumes are possible:

- a system volume which contains the BTOS system image and its associated files
- a nonsystem volume that is for additional storage space only and does not contain the BTOS system image

Initialization of a hard disk used as a system volume takes place during the software installation procedure (refer to section 1).



You must initialize all diskettes and B 26, B 27, B 28, and B 38 nonsystem extension hard disks by using the **IVOLUME** command.

You cannot use the **IVOLUME** command to initialize a volume currently in use. Initialization erases the entire contents of a volume.

### IVOLUME Command

The **IVOLUME** command allows you to prepare a diskette or hard disk for use as a BTOS volume. During this initialization process, **IVOLUME**:

- formats the disk or diskette
- identifies surface defects with write/read tests
- writes volume control structures onto the disk or diskette
- creates system files

To activate this command, you type *IVOLUME* in the Executive command field and press RETURN. The system displays the **IVOLUME** command form shown in figure 5-1.

You must enter parameters in two **IVOLUME** fields:

- In the **Device name** field, enter the name of the device that contains the volume you want to format. Typically, for a standard system the names of the floppy disk drives are f0 and f1; the hard disk drives are d0, d1, and d2.
- In the **Volume name** field enter a name (a maximum of 12 characters) to identify the volume. This name must not duplicate any device or active volume name.

The **IVOLUME** command form also has 19 optional fields (enclosed in square brackets). The defaults for these fields are set for a nonsystem volume. You can leave any or all the fields blank to accept the defaults or enter parameters to override the defaults. Refer to table 5-2 for information about each optional field.

When you complete the **IVOLUME** command form, you press **GO**. The initialization of the volume begins. You must respond to the prompts that appear during the initialization procedure.

To avoid accidentally erasing a volume that contains data, the system determines 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 requests confirmation of the volume's reinitialization.

**Note:** The system states the maximum number of files on the volume as a range (for example, 47 to 71). This is an approximation; the actual number depends on the physical arrangement of the files on the volume. Similarly, the system states the maximum number of files on the directory **SYS** as a range approximating the number of file names on the volume's **SYS** directory. The actual number depends on the length of the file names and the maximum number of files on the volume.

Figure 5-1 **IVOLUME** Command Form

**IVolume**

Device name	
-------------	--

[Device password]  
Volume name  
[Volume password]  
[System image (default = 0)]  
[Log file (default = 0)]  
[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?]  
[Hard disk type code (default = A)]  
[Use ECC format?]  
[Bad spots (See Doc.)]

Table 5-2 **IVOLUME Command Optional Fields**

<b>Field</b>	<b>Action/Explanation</b>
<b>[Device password]</b>	<p>The default leaves the device that contains the volume unprotected; no password is necessary to access it.</p> <p>To assign a password to the device, enter the word or characters (a maximum of 12) you want to use for the password. Refer to section 6.</p> <p><b>Note:</b> To avoid duplication of device passwords on systems that have more than one hard disk, you should make the device password the same as the device name. For example, a disk initialized as d0 should have d0 as its device password.</p>
<b>[Volume password]</b>	<p>The default leaves the volume unprotected. No password is necessary to access it, and none of its directories or files can have passwords.</p> <p>To assign a password to this volume, enter a maximum of 12 characters. You must use this password when you create files or directories, or when you open files on this volume.</p> <p>You can assign a password to a volume at a later time with the <b>CHANGE VOLUME NAME</b> command.</p>

Table 5-2 **IVOLUME Command Optional Fields** (continued)

Field	Action/Explanation
<b>[System Image (default = 0)]</b>	<p>The default allocates 0 sectors for the system image. To initialize a nonsystem disk (for example, an archive diskette or an expansion disk), accept the default.</p> <p>To initialize a system disk with a standard system image, enter <b>512</b>.</p> <p>To initialize a system disk with a nonstandard system image, you must enter the number of sectors required for the system run file. You can obtain this number by using the <b>FILES</b> command (refer to <b>FILES</b> command).</p> <p>When you enter <b>y</b> in the <b>[Details?]</b> field of the <b>FILES</b> command form, the name of the system image file and the size of the run file at system build appear.</p> <p>For an expanded system, allow enough sectors to support another BTOS run file. You cannot expand the number of sectors later without reinitializing the disk.</p> <p><b>IVOLUME</b> creates the file <b>[Sys]&lt;Sys&gt;SysImage.sys</b> with the specified number of sectors, but does not copy the system image to it.</p> <p>You use the <b>COPY</b> or <b>RESTORE</b> command to perform this function.</p> <p>You cannot copy the <b>SysImage.sys</b> file to an initialized volume without using <b>IVOLUME</b> to allocate space to it. If the area for <b>SysImage.sys</b> is smaller than the <b>SysImage.sys</b> file being copied, the system displays an error message. You must reinitialize the disk to recover.</p>

Table 5-2 **IVOLUME Command Optional Fields** (continued)

Field	Action/Explanation
<b>[Log file (default = 0)]</b>	<p>The default directs the system to allocate 0 sectors for the log file.</p> <p>The system writes log entries to the system disk only. If this volume does not contain a system image, accept the default.</p> <p>To specify the size of the log file, enter the number of sectors to allocate for it (2 is recommended). If the log file overwrites existing entries before it is convenient to print, enter a larger number in this field.</p>
<b>[Crash file (default = 0)]</b>	<p>After a system crash, bootstrapping dumps the entire memory contents into a Crash Dump file that you specify. This file helps determine the cause of the crash. You should make an entry in this field if you want to use the system for program development or if you experience hardware or software problems.</p> <p>The default directs the system to allocate no sectors for the Crash Dump file; thus, the system does not create a Crash Dump file when BTOS is bootstrapped.</p> <p>To create a Crash Dump file, enter two sectors for each 1Kb of memory you want to dump.</p>
<b>[Max. directories]</b>	<p>The default directs the system to set the maximum number of directories for this volume, according to the volume size. To specify the maximum number of directories, enter the number.</p>

Table 5-2 **IVOLUME Command Optional Fields** (continued)

<b>Field</b>	<b>Action/Explanation</b>
<b>[Max. files on volume]</b>	<p>The default sets the maximum number of files for this volume, according to the volume size.</p> <p>To specify the maximum number of files, enter the number. Allow a sufficient number for future expansion; you cannot increase this number at a later date without reinitializing the volume.</p>
<b>[Primary file headers only?]</b>	<p>The default (no) directs the system to allocate space for both primary and secondary File Header Blocks.</p> <p>To conserve disk space, enter <b>y</b> to allocate space for a primary File Header Block only. This destroys the secondary file structure, but gains a large amount of disk space.</p>
<b>[Max. files in Sys Directory]</b>	<p>The default directs the system to set the maximum number of files in the &lt;Sys&gt; directory, according to the volume size.</p> <p>To specify the maximum number of files, enter the number. Allow for more files than needed; file system performance degrades if the directory exceeds 80% capacity. Remember that the system files reside in the &lt;Sys&gt; directory.</p>

Table 5-2 IVOLUME Command Optional Fields (continued)

Field	Action/Explanation
<b>[Sys Directory password]</b>	<p>The default leaves the files in the &lt;Sys&gt; directory unprotected; no password is necessary to access it.</p> <p>To assign a password to the &lt;Sys&gt; directory, enter a maximum of 12 characters. A user must enter this password to create a file in this directory and to authorize the opening of the &lt;Sys&gt; directory file.</p> <p><b>Note:</b> Password protection does not work unless you also specify passwords for the volume at the appropriate fields in this form.</p>
<b>[Write protect Sys Directory?]</b>	<p>The default is no; the system does not set the protection level of the files in the &lt;Sys&gt; directory to modify protected.</p> <p>To set the default file protection level of the files in the &lt;Sys&gt; directory to modify protected, enter y. You must have specified previously both a volume and a &lt;Sys&gt; directory password.</p>
<b>[Suppress format of medium?]</b>	<p>The default (no) does not reduce the time required to reinitialize a previously formatted volume. You should accept the default if you are initializing a new disk.</p> <p>To reduce the time required to reinitialize a medium that was previously a formatted volume, enter y.</p>

Table 5-2 **IVOLUME Command Optional Fields** (continued)

Field	Action/Explanation
<b>[Surface tests]</b>	<p>A 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 tests specified, the more reliable the results.</p> <p>You should run surface tests the first time you initialize diskettes. Do not use any diskettes that have surface errors.</p> <p>The default values are 1 test for diskettes, 1 for initialized hard disks, and 8 for uninitialized hard disks.</p> <p>If you want more tests than the default, enter the number you want.</p> <p>If you enter 0, the system reduces the time required to reinitialize a hard disk or a diskette.</p>
<b>[Debug?]</b>	<p>The default is no; the system does not display debugging information.</p> <p>To display debugging information for system programming, enter y.</p>
<b>[Log file]</b>	<p>The log file receives a report of the IVOLUME operation. If this file does not exist, the system creates it; if it exists, the system automatically appends the log to it.</p> <p>The default directs the system to display the log only.</p> <p>To receive a printed log of the volume initialization, enter the name of the file that you want to receive this information.</p>



Table 5-2 **IVOLUME Command Optional Fields** (continued)

Field	Action/Explanation
[Extended floppy tracks?]	<p>The default (no) directs the system to create a system diagnostic file on the innermost (extended) six tracks of a diskette.</p> <p>To use these innermost tracks for storage, enter <b>y</b>. Although this option results in an 8% increase in the diskette's storage capacity, it also degrades diskette reliability.</p>
[Hard disk type code (default - A or B)]	<p>Enter a code in this field only if you are initializing a B 26, B 27, B 28, or B 38 hard disk drive.</p> <p>If you do not know the type code for your hard disk drive or your hard disk drive does not contain a type code, press <b>Help</b>. The system displays Vendor Codes with their corresponding hard disk type codes to assist you in making an entry.</p> <p>Table 5-3 lists the parameters of available types of hard disk drives. The default is a type A drive.</p> <p>If your drive type is listed in table 5-3, enter its type code letter.</p> <p>If your drive type is not listed in table 5-3, enter its cylinder/heads/sectors separated by slash marks</p> <p><b>Note:</b> If you are reinitializing a hard disk drive, no entry is required in this field.</p>

Table 5-2 IVOLUME Command Optional Fields (continued)

Field	Action/Explanation
<b>[Use ECC format?]</b>	<p>If the field is left blank, the system uses the existing CRC or ECC format. If the controller supports ECC and there is no previous format information on the disk drive, IVOLUME selects the ECC format.</p> <p>If you enter <b>y</b>, BTOS uses ECC when formatting and writing to the disk. The controller does not support the ECC capability if the current OS is not at least revision 8.0.2.</p> <p><b>Note:</b> If the controller supports ECC, drives larger than 40Mb's must use ECC. The error message, <b>Drive this size must be formatted with ECC</b>, displays if the capacity is greater.</p>
<b>[Bad spots (See Doc.)]</b>	<p>This field applies only to hard disk drives. Each drive comes with a report of bad spots. Locate and read the media defect report that came with your system. Table 5-4 lists five types of defect reports with sample bad spot information entries.</p> <p>The default indicates that no bad spots exist on the disk.</p>
	<p><b>Caution:</b> IVOLUME performs a surface test to identify bad spots on the medium, but it may not detect marginal spots. Marginal bad spots can fail; thus, they are not appropriate areas in which to store data. Whenever you initialize a new hard disk drive, you must enter the bad spot information for the drive. To reinitialize a hard disk drive, no entry is required in this field.</p>
	<p>If your media report lists bad spots, use the following instructions:</p> <ul style="list-style-type: none"> <li>□ Type entries for your report as formatted in the Sample Entries column in table 5-4. Insert slashes between the columns and use no spaces within an entry.</li> </ul>

Table 5-2 IVOLUME Command Optional Fields (continued)

Field	Action/Explanation
	<ul style="list-style-type: none"> <li>□ If you have more than one entry, separate each entry with a space.</li> <li>□ Two extra fields appear below this parameter prompt field to allow space for entering additional bad spot information.</li> <li>□ If the bad spot information does not fit on one line, press RETURN to continue on the next line. Do not divide an entry.</li> <li>□ If you cannot fit all of the bad spot information in the available space, create an at-file for it (refer to section 3).</li> </ul>

Table 5-3 Parameters of Available Hard Disk Drives

Type	Size	Cylinders	Heads	Sectors
A	10Mb	306	4	16
B	10Mb	306	4	16
C	20Mb	612	4	16
D	40Mb	645	7	16
F	20Mb	612	4	16
G	20Mb	612	4	16
K	80Mb	1024	8	16
M	80Mb	1024	8	16
N	40Mb	699	7	16
O	80Mb ECC	830	10	16
P	40Mb ECC	989	5	16

Table 5-4 Bad Spot Reports and Sample Entries

Report Type	Sample Bad Spot Information			Sample Entries
	Cylinder	Head	Sector	
Media Defect Reports	11 30	0 2	4 12	11/0/#4 30/2/#12

**Note:** In your entry, place a number sign before the sector number.

Media Error Maps	Trk Hd	Byte Count	Length (bits)	
	005 4	00107	03	5/4/107/3
	084 1	002646	04	84/1/2646/4

**Note:** In your entry, eliminate leading zeros in all columns.

Quantum Q2000 Media Defect Reports	Cylinder	Head Displacement	Error Length	Error	
	84/54	1	2646/A56	4/4	84/1/2646/4
	241/F1	2	8130/1FC2	39/27	241/2/8130/39

**Note:** In your entry, use only the first number set in any column. Do not use the numbers following the slash marks.

Test Summaries	Hard Cyl	Map Hd	Sec	Byte	
	26	3	1	7	26/3/#1
	38	2	2	5	38/2/#2

**Note:** In your entry, use numbers from columns 1 through 3 only; place a number sign before the sector number.

Media Defect Report	Cylinder	Head	Byte From Index (BFI)	Length (Bits)
	139	0	1505	201
	294	3	9061	221

### Increasing Disk Storage Space for Data with the IVOLUME Command

You can increase the amount of disk space available for general data storage by making the following entries in the IVOLUME command form when you initialize hard disks or diskettes:

- Accept the default 0 in the [System Image (default = 0)] field so that no space is allocated for the system image file on the disk. For diskettes not used for booting, this also makes the removal of the floppy during boot unnecessary.
- Accept the default at the [Crash file (default = 0)] field so that the system does not create a **CrashDump.sys** file on the disk.
- Enter a small number at the [Max. directories] and [Max. files on volume] fields.
- Enter *y* in the [Primary file headers only?] field. The system destroys the primary file structure; however, you gain a large amount of disk space.

### Avoiding Volume Fragmentation with the IVOLUME Command

When you request BTOS to create or extend a file, 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 you have recently initialized or reinitialized a hard disk volume using the **IVOLUME** command, the system can easily find a single-disk extent large enough to satisfy your request.

However, if you create and delete files many times after initializing a hard disk volume, the disk extents available for allocation can scatter, making it impossible for the system to allocate a single disk run. In this case, the available storage of the volume fragments, and the system must allocate two or more smaller disk runs whose total size satisfies the request.

Volume fragmentation causes the system to perform at a reduced level of efficiency in several ways:

- The system requires more time to create or extend a file because it must access more sectors of the Allocation Bit Map to find enough disk extents to satisfy the request.
- The system requires more time to process a file sequentially because disk sectors that are logically consecutive are not necessarily physically consecutive.
- Fragmentation 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.

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.

To avoid fragmentation of hard disk volumes you should regularly reinitialize them using the **IVOLUME** command.

---

**Caution:** The **IVOLUME** command erases the entire contents of a disk. Before you reinitialize a volume using the **IVOLUME** command, you must backup your disk to prevent loss of data. Refer to section 6.

---

### Changing Volume Names

You can change a name previously assigned to a volume or add, change, or delete a volume password by using the **CHANGE VOLUME NAME** command. You can use a maximum of 12 characters for volume and password names. Volume names can contain periods and hyphens. Refer to section 6.

### CHANGE VOLUME NAME Command

The **CHANGE VOLUME NAME** command allows you to change the name or password of a volume. You can also use it to add or delete a volume password; however, you cannot add, change, or delete a password for the volume currently in use.

To activate this command, you type **CHANGE VOLUME NAME** in the Executive command field, and press RETURN. The system displays the **CHANGE VOLUME NAME** command form shown in figure 5-2.

You must enter parameters in two **CHANGE VOLUME NAME** fields:

- In the Device name field, enter the name of the device that contains the volume.
- In the New volume name field, enter the new name (a maximum of 12 characters). To add, change, or delete a password only for the volume, you enter the existing name and then enter parameters in the appropriate optional fields.

The **CHANGE VOLUME NAME** command form has three optional fields (enclosed in square brackets). You can leave any or all of these fields blank to accept the defaults or enter parameters to override the defaults. Refer to table 5-5 for information about each optional field.

When you complete the **CHANGE VOLUME NAME** command form, you press GO. The system makes the changes you indicated.

Figure 5-2 **CHANGE VOLUME NAME Command Form**

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

Table 5-5 **CHANGE VOLUME NAME** Command Optional Fields

Field	Action/Explanation
<b>[Device password]</b>	The default indicates that no password is assigned to the device containing the volume you want to change.  If a password is assigned to the device containing the volume you want to change, enter the password in this field.
<b>[Old volume password]</b>	The default indicates that no password is assigned to the volume you want to change.  If a password is assigned to the volume you want to change, enter the password in this field.
<b>[New volume password]</b>	The default directs the system to leave the new volume unprotected; no password is necessary to access it.  To change or assign a password to the volume named in the <b>New volume name</b> field, enter a maximum of 12 characters. You cannot change or assign a password to the volume currently in use.

### Determining the Contents of Volumes

You can obtain information about the contents of a volume by using the **VOLUME STATUS** command. The system displays the current status of the volume and its directories.



## VOLUME STATUS Command

The **VOLUME STATUS** command allows you to display the following information about the status of a volume:

- volume name
- initialization date
- last modification date
- number of unused sectors and file headers
- total number of sectors and file headers
- percent of used sectors and file headers
- alphabetized list of directories, current protection levels, and estimate of the maximum number of files for each directory in the volume

You can specify whether you want the information with or without details. Volume status information with details includes all the information listed above plus the file count and total sectors for each directory in the volume and the total file count and sectors for all the directories.

**Note:** The system usually reports different figures for the approximate maximum number of files when you specify information with details than it does without details. This is because:

- the system cannot determine exactly the maximum number of files for a directory
- the system uses a different method for determining this number when you specify with details than it does without details

To activate this command, you type *VOLUME STATUS* in the Executive command field. To display the contents of the volume of the current path without details, you press GO; the volume information appears on the screen.

If you want to display detailed information of the volume or the contents of a volume other than the one of the current path, you press RETURN. The system displays the **VOLUME STATUS** command form shown in figure 5-3. When you complete the **VOLUME STATUS** command form, you press GO.

The VOLUME STATUS command form contains five optional fields (enclosed in square brackets). You can leave any or all of these fields blank to accept the defaults or enter parameters to override the defaults. Refer to table 5-6 for information about each optional field.

Figure 5-4 shows a sample of a detailed Volume Status Display. It includes:

- the date the volume was last initialized
- the date it was last modified
- the current number of used sectors and file headers
- the total number of sectors and file headers
- the percent of used sectors and file headers

Each sector is equal to 512 bytes. A File Header Block exists for each file. It contains information about the file such as its name, password, date/time it was last modified, disk address, and the size of each of its disk extents. Each File Header Block is one sector in size.

Figure 5-3 VOLUME STATUS Command Form

VOLUME STATUS	
[Volume or device name]	
[Details?]	
[Print file]	
[Directory spec (default = '*')]	
[Include temporary directories?]	

Figure 5-4 Sample of a Detailed Volume Status Display

Executive 8.0.2 (OS t2CLstrLfsMp-8.0.2)				
Path: [Sys]<Sys>			Wed Mar 11, 1987 10:09 A.M.	
Command Volume Status				
Volume Status 7.0.4				
Status of Volume ton				
Initialized	Jun 11, 1985 10:19 AM			
Last Modified	Jun 20, 1985 8:28 AM			
	Unused	Total	Used	
Sectors	563	16384	96%	
File Headers	745	1199	37%	
Directory	Protection	Max Files	File Count	Total Sectors
7.0editor	15	283	5	5
edf	15	102	7	185
edit7.0	15	108	31	46
exec7.0	15	421	106	1649
FileUtil7.0	15	249	100	1259
ncf	15	117	12	95
nole	15	127	21	210
sp1	15	84	5	95
strings	15	102	6	62
SYS	15	613	150	11996
Totals			443	15602
Command	<input type="text"/>			

Table 5-6 **VOLUME STATUS Command Optional Fields**

Field	Action/Explanation
<b>[Volume or device name]</b>	<p>The default is the volume of the current path.</p> <p>To display the status of a volume other than that of the current path, enter the volume or device name.</p>
<b>[Details?]</b>	<p>The default is no; the system displays the status information with no details.</p> <p>To display detailed status information for the volume, enter y.</p>
<b>[Print file]</b>	<p>If you accept the default, the system does not store or print the information the command generates. The information appears only.</p> <p>To store the information in a file from which you can later display or print it, enter a file name for the storage file.</p> <p>To send the information directly to a device such as a printer, enter an appropriate device name (for example, [Lpt]).</p>
<b>[Directory spec (default = '*')]</b>	<p>The default directs the system to display volume status information for all the directories in the volume.</p> <p>To display status information for specific directories only, enter the name(s) of each directory enclosed in angle brackets (for example, &lt;office&gt;).</p>

Table 5-6 **VOLUME STATUS Command Optional Fields** (continued)

Field	Action/Explanation
<b>[Include temporary directories?]</b>	The default is no; the system does not include information about temporary directories in the volume status display.
	To include information about temporary directories in the volume status display information, enter <b>y</b> .

The detailed Volume Status Display also alphabetically lists all the directories on the volume and the protection level code of each (refer to section 6). It includes an estimate of the maximum files in the directory based on the average file name length, a file count for each directory, and the total sectors of each. The total sectors of a directory reflect the maximum number of file headers for the directory.

At the bottom of the Volume Status Display, the system shows the total file count and total sectors of all the directories in the volume.

## 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 directory serves as an index of the location of each file stored on a volume.

Your system includes two types of directories:

- a system directory
- directories you create for organizing files and programs

The system directory <Sys> contains files and data needed for system operation. You should not delete, remove, or overwrite these files. The **IVOLUME** command creates the system directory on a diskette or hard disk during the initialization procedure. For more information about the system directory, refer to the *BTOS Reference Manual*.

### Creating Directories for Files and Programs

You create directories for organizing files and programs by using the **CREATE DIRECTORY** command. You assign each directory a different name (a maximum of 12 characters). To use a directory name as part of a complete file specification, you must enclose it in angle brackets (for example, <DirName>).

#### CREATE DIRECTORY Command

The **CREATE DIRECTORY** command allows you to create one or multiple directories with names you specify. You can also use it to set protection levels for the files of new directories, and to set the maximum number of files.

To activate this command, you type **CREATE DIRECTORY** in the Executive command field, and press RETURN. The system displays the **CREATE DIRECTORY** command form shown in figure 5-5.

You must enter a parameter in the **New directory name(s)** field. Each name can have a maximum of 12 characters each. If the new directory is not on the volume of the current path, you must also enter its volume name with the new directory name, for example, [VolName]DirName or [VolName]<DirName>.

**Note:** Do not use angle brackets within the directory name; use them only at the beginning and end of the name.

The **CREATE DIRECTORY** command form has four optional fields (enclosed in square brackets). You can leave any or all of these fields blank to accept the defaults or enter parameters to override the defaults. Refer to table 5-7 for information about each optional field.

Figure 5-5 CREATE DIRECTORY Command Form

Create Directory	
<input type="text" value="New Directory name(s)"/>	<input type="text"/>
[Protection level (default = 15)]	
[Maximum number of files (default = 75)]	
[Password for new directory]	
[Volume password]	

Table 5-7 CREATE DIRECTORY Command Optional Fields

Field	Action/Explanation
[Protection level (default = 15)]	<p>The default assigns an unprotected (15) protection level to all files in the directories.</p> <p>To assign a modify protected (5) or an access protected (0) protection level to the files in a directory, enter the appropriate number. Refer to section 6.</p> <p>If you entered multiple names in the <b>New Directory name(s)</b> field, you must enter the corresponding protection level numbers in the same order. To omit a protection level assignment from a directory in a multiple entry, enter " (two single quotation marks with no space between) at the corresponding position in this field.</p>

Table 5-7 CREATE DIRECTORY Command Optional Fields (continued)

Field	Action/Explanation
[Maximum number of files (default = 75)]	<p>The default sets the maximum number of files for each directory at 75. To set the maximum file limits for the directory to a larger or smaller number, enter the number.</p> <p>If you entered multiple names in the <b>New Directory name(s)</b> field, you must enter the corresponding maximum file numbers in the same order. To omit a number assignment for a directory in a multiple entry, enter " (two single quotation marks with no space between) at the corresponding position in this field.</p>
[Password for new directory]	<p>The default leaves the new directories unprotected; no password is necessary to access it.</p> <p>To assign a password to the directory, enter a maximum of 12 characters.</p> <p>If you entered multiple names in the <b>New directory name(s)</b> field, you must enter the corresponding passwords in the same order. To omit a password for a directory in a multiple entry, enter " (two single quotation marks with no space between) at the corresponding position in this field.</p>



Table 5-7 CREATE DIRECTORY Command Optional Fields (continued)

Field	Action/Explanation
<b>[Volume password]</b>	<p>The default indicates that a password is not assigned to the volume.</p> <p>If the volume has an assigned password, you must enter the password to gain access to the volume.</p> <p>If you entered multiple names in the <b>New directory name(s)</b> field, enter the corresponding password for the volume(s) in the same order. To omit a volume password from a multiple entry, enter " (two single quotation marks with no space between) at the corresponding position in this field.</p>

When you complete the CREATE DIRECTORY command form, you press GO. The system creates the directories.

### Deleting Directories

You can delete existing directories from a volume by using the **REMOVE DIRECTORY** command. The system deletes empty directories only. If the directories you want to delete contain files, the system prompts you to delete them.

#### REMOVE DIRECTORY Command

The **REMOVE DIRECTORY** command allows you to delete one or multiple directories from a volume.

To activate this command, you type *REMOVE DIRECTORY* in the Executive command field, and press RETURN. The system displays the REMOVE DIRECTORY command form shown in figure 5-6.

You must enter a parameter in the Old directory name(s) field. You enter the names of the directories. If a directory is not in the volume of the current path, you must include the volume in the name (for example, [VolName]<DirName>).

The REMOVE DIRECTORY command form also has three optional fields (enclosed in square brackets). You can leave any or all of these fields blank to accept the defaults or enter parameters to override the defaults. Refer to table 5-8 for information about each optional field.

When the REMOVE DIRECTORY command form is complete, you press GO. The system removes the specified directories according to your specifications.

Figure 5-6 REMOVE DIRECTORY Command Form

Remove Directory	
Old directory name(s)	
[Volume or directory password]	
[Delete all files in directory?]	
[Confirm each while deleting?]	

Table 5-8 REMOVE DIRECTORY Command Optional Fields

Field	Action/Explanation
[Volume or directory password]	<p>The default indicates that a password is not assigned to the directories or volumes.</p> <p>If the directory or its volume has a password, enter the password in this field. If you entered multiple names in the Old directory name(s) field, enter the corresponding passwords in the same order in this field. To omit a password for a directory in a multiple entry, enter "" (two single quotation marks with no space between) in the corresponding position of this field.</p>

Table 5-8 REMOVE DIRECTORY Command Optional Fields (continued)

Field	Action/Explanation
[Delete all files in directory?]	<p>The default is no; the system does not delete any files in any directories.</p> <p>To delete all the files in all the directories listed in the <b>Old directory name(s)</b> field, enter <b>y</b>.</p>
[Confirm each while deleting?]	<p>The default is no; the system does not prompt you to confirm the deletion of each file.</p> <p>To receive a prompt to confirm the deletion of each file in each directory, enter <b>y</b>. When you complete the command form and press <b>GO</b>, the system displays these prompts. You press <b>GO</b> to confirm the deletion of a file, <b>CANCEL</b> to pass a file, or <b>FINISH</b> to stop the command.</p>

## Files

A file is a document, program, or other set of related data stored as a unit in a directory on a single volume.

### Naming Files

Each file must have a unique name that describes its contents. A file name can contain a maximum of 50 alphanumeric characters including uppercase and lowercase letters, periods, hyphens, and right angle brackets (>). You should not use the following characters in file names: [ + = < : & @.

## File Suffixes

By adding a file suffix to a file name, you can further identify a file. A file suffix consists of a period, hyphen, or right angle bracket followed by three or more alphabetic characters, added to the end of the file name, for example, addresses-old, addresses-new, addresses>clients.

The system uses file suffixes to identify certain types of commonly used files. You should be familiar with these suffixes, so you can recognize file types while you use the system. Refer to table 5-9 for a list of commonly used file suffixes.

## File Prefixes

You can divide groups of files into categories or subdirectories that have a common feature or point of reference. To identify these related files you can add a common prefix, followed by a right angle bracket to the beginning of the file name. For example, you can use the following file specifications to distinguish between the two major groupings, Personnel files and Expense files:

Personnel>Jones  
Personnel>Smith

Expense>Trip  
Expense>PettyCash

**Table 5-9 Commonly Used File Suffixes**

<b>File Suffix</b>	<b>File Description</b>
.run	Run file
.sub	Submit file
.sys	System file
.lst	List file
.txt	Text file
.user	User signon file

Table 5-9 Commonly Used File Suffixes (continued)

File Suffix	File Description
.config	Text Configuration file
.cnfg	Code Configuration file
.tmp	Temporary file
.jcl	Job Control Language
.form	Form file
.fmt	Format file
.lib	Library file
.map	Linker Map file
.obj	Object file
-old	Old file (The system adds this suffix to the original file name when you save a file.)
>save	Saved file (similar to an -old file)
-new	New file (The system adds this suffix to a file name during a recovery procedure.)

You can use an additional level of file prefixes to further subdivide categories. For example, you can indicate a subcategory of files in the Personnel>Jones file by adding another prefix level: Personnel>Jones>Salary.

You can create a default file prefix that the system automatically adds to the beginning of each file name you create. For example, if you create the default file prefix Expense> and then create the files named 10-24-85>Trip and 10-17-85>PettyCash, the system places both of these files in the Expense subdirectory: Expense> 10-24-85>Trip and Expense> 10-17-85>PettyCash.

To create a default file prefix, you use the **PATH** command (refer to Setting the Path, in section 3) or the **SET FILE PREFIX** command.

#### **SET FILE PREFIX Command**

The **SET FILE PREFIX** command creates a default file prefix that you specify. The system adds this prefix to newly created files under the current path. The system also uses the default prefix to call up files when you omit the volume and directory names in file specifications. You can also use this command to delete a previously created default file prefix.

To activate this command, you type *SET FILE PREFIX* in the Executive command field and press RETURN. The system displays the SET FILE PREFIX command form shown in figure 5-7.

You must enter a parameter in the Default file prefix field. You enter the name of the file prefix you want the system to use as a default. You should include a right angle bracket at the end of the name, for example, Expenses>. When you complete your entry, you press GO; the name you entered becomes the default for all future files created under the current path.

If you want to delete a previously created default file prefix, you enter " (two single quotation marks with no space between) in the Default file prefix field and press GO. This entry tells the system to blank out the field.

#### **Specifying File Names in Executive Command Fields**

The form of file names you enter in Executive command fields can differ depending on the current path, the default file prefix (if any), and the information the Executive requires to identify the file.

The distinction between uppercase and lowercase is not significant for matching file specifications; the system retains the case form of the name as you enter it. You can alter the case of the name with the **RENAME** command.

In some command fields, you must enter complete file specifications. In others, you can enter abbreviated specifications. You can use the wild card character to facilitate some file specifications. The following paragraphs explain each of these types of file name entries.

Figure 5-7 SET FILE PREFIX Command Form

Set File Prefix	
Default file prefix	

### Complete File Specification

A complete file specification defines a particular file within a specific directory and volume. It has the following format:

[VolumeName]<DirectoryName>FileName.

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

The complete file specifications of files with prefixes also include the volume and directory names, for example, [Accounting]<Manager>Personnel>Jones>Salary.

You use the complete file specification to access a file in a volume or directory other than those of the current path. You also use it as a parameter in many Executive command forms.

### Abbreviated File Specification

You can abbreviate the complete file specification by including only as many parts of the file specification as the Executive needs to identify the file. You use the following formats:

- [VolName]<DirName>FileName
- <DirName>FileName
- FileName

The SignOn procedure (refer to Signing on to Your System, in section 3) sets the default values for the volume and directory. You can change these values with the **PATH** command (refer to PATH Command, in section 3). If you do not specify a volume name or directory name in a file specification, the Executive assumes that you want to use the default values of the path.

## The Wild Card Character

You can include a special character called a wild card character in a file specification. A wild card character represents a character or group of characters in a file or directory of a complete file specification. This character directs the Executive to search for other file specifications that are identical to the entered specification except for the wild card characters. You can use two characters as wild cards:

- an asterisk (\*) for one character or a string of characters
- a question mark (?) for a single character

You can use wild card characters in specifications for two purposes:

- as a shorthand method of entering long file names in fields
- to list files which match the remainder of the file specification

To use the wild card character as a shorthand method for entering long file names in fields, you enter only enough letters to uniquely identify the file followed by the wild card character. However, this shortcut works only if no other files on the directory begin with the characters you enter.

For example, you can shorten the full file name Accounting by entering Acc\* or A\*, but you can use this method only if no other files on the directory begin with Acc or A.

If you specify a wild card instead of a complete file name or directory name, the system expands the wild card into a list of file or directory 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. 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, such as Ea.lst, Eb.lst, etc.



Table 5-10 shows examples of how you can use the wild card character to specify lists of files.

If you enter a specification with a wild card character in a field and then move the cursor to another field by pressing RETURN, the Executive automatically expands the file specification and displays the list of matching files.

If the list is too long for the field, the system displays an ellipsis (. . .) between the beginning and end of the list.

Exceptions to this procedure are the **COPY**, **DELETE**, **FILES**, and **RENAME** commands, which do not expand a file specification containing a wild card character until you press GO. During a wild card expansion, the system turns off the cursor to indicate that a keystroke has been accepted. When the system is ready to accept an entry in the next field, it turns the cursor on again.

---

**Caution:** When you use wild card characters with the **DELETE**, **COPY**, or **RENAME** commands, you should use the file confirmation options to ensure that the system acts on only the files you want it to. Refer to explanations of these commands in this section.

---

**Table 5-10 File Specifications for Listing Files**

<b>File Specification</b>	<b>Action</b>
[VolName]<*>*	The system lists all the files in all the directories of the specified volume.
[!VolName]<*>*	The system lists all the files in all the directories on the master workstation's mass storage unit when specified on a cluster workstation.
*	The system lists all the files in the current directory.
<DirName>*	The system lists all the files in the specified directory.

Table 5-10 File Specifications for Listing Files (continued)

File Specification	Action
<*>FileName	The system lists all the files with the specified file name in all directories.
*>FileName	The system lists all the files with the specified file name in all directories and subdirectories.
SubDirName>*	The system lists all files in the specified subdirectory.

### Creating Files

You can create files in three ways:

- with the Editor
- with an application program that allows you to create files
- with the **CREATE FILE** command

To create files using the Editor, you activate the text Editor using the **EDIT** command. Refer to the *BTOS Editor Operations Guide*.

To create files using an application program such as a word processing program, refer to the documentation for the appropriate application.

### CREATE FILE Command

The **CREATE FILE** command allows you to create a new file without defining its contents.

To activate this command, you type *CREATE FILE* in the Executive command field, and press RETURN. The system displays the form shown in figure 5-8.

You must enter a parameter in the File name field. Enter the name you want to assign to the new file. If you enter a file name with more than one word, you must place single quotation marks (') around the filename.

The CREATE FILE command form has five optional fields (enclosed in square brackets). You can leave any or all of these fields blank to accept the defaults or enter parameters to override the defaults. Refer to table 5-11 for information about each optional field.

When you complete the CREATE FILE command form, you press GO. The system creates the file according to your specifications.

Figure 5-8 CREATE FILE Command Form

Create File

File name

[Volume or Directory password]

[File password]

[File protection level (default = 15)]

[Size in sectors (default = 0)]

[Overwrite ok?]

Table 5-11 CREATE FILE Command Optional Fields

Field	Action/Explanation
<b>[Volume or directory password]</b>	<p>The default indicates to the system that no password is assigned to the volume or directory of the new file.</p> <p>If a password is assigned to the volume or directory of the new file, enter the password in this field.</p>

Table 5-11 CREATE FILE Command Optional Fields (continued)

Field	Action/Explanation
<b>[File password]</b>	<p>The default leaves the new file unprotected; a password is not necessary to access it.</p>
	<p>To assign a password to the new file, enter a maximum of 12 characters. A file password is not valid unless the file's volume also has a password (refer to section 6).</p>
<b>[File protection level (default - 15)]</b>	<p>The default protection level for a new file takes on the protection level of the directory. For example, if the directory protection level is set at 5, any file created within that directory has a protection level of 5.</p>
	<p>To set the protection for the file at a level other than the directory's level, enter the protection decimal value.</p>
<b>[Size in sectors (default - 0)]</b>	<p>The default sets the file length to 0 sectors.</p>
	<p>To set a size for this file other than 0 sectors, enter the number of sectors you want to assign to it.</p>
<b>[Overwrite ok?]</b>	<p>If a file with the name you entered in the <b>File name</b> field already exists, the default directs the system to prompt you for confirmation before overwriting the file's contents. When you complete the command form and press <b>GO</b>, this prompt appears. You press <b>GO</b> to confirm overwriting, <b>CANCEL</b> to deny, or <b>FINISH</b> to stop the command.</p>
	<p>To overwrite the contents of an existing file with the same name as you entered in the <b>File name</b> field, enter <b>y</b>.</p>
	<p>If a file with the same name as you entered in the <b>File name</b> field exists and you do not want to overwrite its contents, enter <b>n</b>. The system cancels the <b>CREATE FILE</b> command.</p>

## Listing Files

You can obtain information about the files in specified directories by using the **LIST** command or the **FILES** command.

The **LIST** command displays a list with no details of all the files in a directory.

With the **FILES** command, two levels of information are available. You can request a list of the names of the files only, or you can request details about each file.

### LIST Command

The **LIST** command allows you to display a list of files in a directory. The list includes unsorted file names without details about the files.

To activate this command, you type *LIST* in the Executive command field.

If you want to list the files in the directory of the current path, you press **GO**. The list of files appears on the screen.

If you want to list the files in a directory other than that of the current path, you press **RETURN**. The system displays the **LIST** command form shown in figure 5-9.

The LIST command form has one optional field, [File list]. If you accept the default by leaving the field blank, the system lists the files in the directory of the current path. To list files in other volumes or directories, you enter the file specification(s). When you complete your entry, you press GO. The system displays the file list you specified.

### FILES Command

The **FILES** command allows you to display information about each of the files in a specified directory. You can, optionally, print the information or save it in a file. This file can serve as an at-file, or you can use it to view or print the information at a later time.

You can list complete file names only or details about each file. The detailed information includes the following items:

- complete file name
- length in bytes
- number of sectors used (one sector = 512 bytes)
- date last modified
- protection level

The total number of sectors that all the files in the directory use also appears with the detailed information.

Figure 5-9 LIST Command Form

The diagram shows a rectangular box representing the command form. Inside the box, the word "List" is positioned at the top left. Below it, there is a text input field. The first part of this field contains the text "[File list]" in a smaller, bold font. The remainder of the input field is filled with a stippled or shaded pattern, indicating it is a placeholder for user input.

To activate this command, you type *FILES* in the Executive command field.

If you want to list the files of the directory in the current path with no details, you press GO. The list of files appears on the screen.

If you want to list the files in a directory other than that of the current path, display file details, or save or print file information, you press RETURN. The system displays the FILES command form shown in figure 5-10.

The FILES command form has three optional fields (enclosed in square brackets). You can leave any or all of these fields blank to accept the defaults or enter parameters to override the defaults. Refer to table 5-12 for information about each optional field.

When you complete the FILES command form, you press GO. The system displays the file information. Figure 5-11 shows a sample FILES detail display. If you entered a printer device name in the [Print file] field, the system sends the information to the printer.

Figure 5-10 FILES Command Form

The diagram shows a rectangular box representing the FILES command form. Inside the box, the word "Files" is written at the top left. Below it, there are three optional fields, each enclosed in square brackets: "[File list]", "[Details?]", and "[Print file]". The "[File list]" field is followed by a long, shaded rectangular area, indicating a list of files.

Table 5-12 FILES Command Optional Fields

Field	Action/Explanation
<b>[File list]</b>	<p>The default is the asterisk wild card character. It directs the system to display the file names in the directory of the current path.</p> <p>To display information about specific files or files in a directory other than that of the current path, enter the file name(s) or complete file specification. You can use the wild card character in this field. Refer to The Wild Card Character, in this section.</p>
<b>[Details?]</b>	<p>The default (no) directs the system to display the file name(s) only. To display details about the file(s), enter y.</p>
<b>[Print file]</b>	<p>If you accept the default, the system does not store or print the FILES information; it appears only.</p> <p>To store the information in a file from which you can later display or print the information, enter a file name for the storage file. You can use this file as an at-file by preceding it with @ in a parameter field (for example, @Filename).</p> <p>To send the information directly to a device such as a printer, enter an appropriate device name (for example, [Lpt]).</p>

### Displaying the Contents of Files

You can display the contents of one or more files by using the **TYPE** command. This command is for file review only; you cannot use it to modify the contents of a file.

#### TYPE Command

The **TYPE** command allows you to display the contents of a file(s), one screen at a time. You can examine only the file contents; you cannot make changes to the file.

To activate this command, you type *TYPE* in the Executive command field, and press RETURN. The system displays the **TYPE** command form shown in figure 5-12.



You must enter a parameter in the File list field. You enter the name(s) of the file(s) you want to display. You can use a wild card character in this field. Refer to The Wild Card Character, in this section.

The TYPE command form also has an optional field [Confirm each?]. If you accept the default (no) for this field, the system does not prompt you for confirmation before displaying each file you request.

If you want to confirm each requested file before the system displays it, you enter *y* in the [Confirm each?] field.

When you complete the TYPE command form, you press GO. If you entered *y* in the [Confirm each?] field, the system prompts you with the file names. You press GO to confirm, CANCEL to deny, or FINISH to stop the command.

Figure 5-11 Sample Files Detail Display

Executive 8.0.2 (OS t2CLstrLfsMp-8.0.2)		Wed Mar 11, 1987 10:09 A.M.		
Path: [Sys]<Sys>				
	Length	Sectors	Last Modified	Protection
[Win]<Sys>crashDump.sys	1024	2	Jan 20, 1986 5:26 PM	15
[Win]<Sys>FileHeaders.sys	2457600	4800	Jan 20, 1986 5:26 PM	5
[Win]<Sys>Sys.Keys	742	2	Jan 20, 1986 5:26 PM	5
[Win]<Sys>Assembler.Run				
[Win]<Sys>	100274	196	Jan 21, 1986 11:56 AM	5
[Win]<Sys>Dump.Run	24496	48	Jan 21, 1986 12:21 PM	5
[Win]<Sys>ISNTStatus.Run	9771A	191	Jan 21, 1986 4:04 PM	5
[Win]<Sp1>SERIAL.CONTROL.QUEUE	512	1	Jan 21, 1986 2:36 PM	15
[Win]<Sp1>SPLB.QUEUE	512	1	Jan 21, 1986 2:36 PM	15
[Win]<800>Boot.Sub	544	2	Jan 21, 1986 1:27 PM	15
[Win]<800>submit1.tmp	6556	13	Jan 21, 1986 3:57 PM	15
[Win]<800>submit0.tmp	3342	7	Jan 21, 1986 4:00 PM	15
Total sectors: 15609				
Command	<input type="text"/>			

Figure 5-12 TYPE Command Form

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

## Renaming Files

You can change the name of one or more existing files, including the directory name, with the **RENAME** command. You cannot rename files in a volume other than that of the current path.

### RENAME Command

The **RENAME** command allows you to change a file name or multiple file names.

To activate this command, you type *RENAME* in the Executive command field and press RETURN. The system displays the RENAME command form shown in figure 5-13.

Figure 5-13 RENAME Command Form

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

You must enter parameters in two **RENAME** fields:

- In the **Old file name** field, enter the name of the file. 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). If you use a wild card character here, you must also use it in the same part of the file specification in the **New file name** field.

To change the names of multiple files, enter the file names separated by spaces.

- In the **New file name** field, enter the new name for the file. You can use the wild card character in this field. However, if you used it in the **Old file name** field, you must use it again here in the same part of the file specification.

If you entered multiple file names in the **Old file name** field, you must enter the same number of destination file names in corresponding order in this field. For example, if you make the following entry, the system renames **f1** to **nf1**, **f2** to **nf2**, and **f3** to **nf3**:

<b>Old file name</b>	f1 f2 f3
<b>New file name</b>	nf1 nf2 nf3

The **RENAME** command form also has two optional fields. You can leave one or both of these fields blank to accept the defaults or enter parameters to override the defaults. Refer to table 5-13 for information on each optional field.

When you complete the **RENAME** command form, you press **GO**. The system renames the files according to your specifications.

Table 5-13 RENAME Command Optional Fields

Field	Action/Explanation
<b>[Overwrite ok?]</b>	<p>The default is no entry. If you accept the default and the name you enter in the <b>New file name</b> field already exists, the system prompts you to confirm overwriting the file.</p> <p>If you enter <b>n</b> in this field, the system does not perform an overwrite operation. If a name you enter in the <b>New file name</b> field already exists, the system displays the following message:</p> <p><b>Did not copy (file name) file. (File name) already exists.</b></p> <p>To assign the name entered in the <b>New file name</b> field to the file in the <b>Old file name</b> field, enter <b>y</b>. If a file with the <b>New file name</b> parameter already exists, the system overwrites that file and assigns the <b>New file name</b> parameter to the <b>Old file name</b> file.</p>
<b>[Confirm each?]</b>	<p>The default is no; the system does not prompt you to confirm each RENAME operation.</p> <p>To receive prompts to confirm each rename operation, enter <b>y</b>. When you complete the command form and press <b>GO</b>, the system displays the confirmation prompts. You press <b>GO</b> to confirm renaming a file, <b>CANCEL</b> to deny, or <b>FINISH</b> to stop the command.</p>

## Deleting Files

You can permanently delete a file or list of files from a volume and directory by using the **DELETE** command. When you delete a file, the system erases the entire contents of the file. You cannot recover these files.

### DELETE Command

The **DELETE** command allows you to delete a file or list of files. This operation permanently erases the contents of the specified files.

To activate this command, you type *DELETE* in the Executive command field and press RETURN. The system displays the DELETE command form shown in figure 5-14.

You must enter a parameter in the File list field. You enter the name(s) of the file(s) you want to delete. You can use the wild card character in this field. (Refer to The Wild Card Character, in this section.)

---

**Caution:** Be careful when you use wild card characters with the **DELETE** command. Unless you use the confirmation option (which allows you to confirm or cancel the deletion of a file) you may delete files in error.

---

The DELETE command form has an optional field [Confirm each?]. The default for this field is no; the system does not prompt you to confirm each file you want to delete.

If you want to confirm each file before the system deletes it, you must enter *y*.

When you complete the DELETE command form, you press GO. If you entered *y* in the [Confirm each?] field, the system then displays prompts to confirm each file's deletion. You press GO to confirm deletion, CANCEL to deny, and FINISH to stop the command.

Figure 5-14 **DELETE Command Form**

Delete	
File list	
[confirm each?]	

## Combining Files


You can combine one or more files into a single file without overwriting the contents by using the **APPEND** command.

### APPEND Command

The **APPEND** command allows you to merge 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. **APPEND** also allows you to display or print the combined files, creating a composite document containing a number of separate files.

To activate this command, you type *APPEND* in the Executive command field. The system displays the APPEND command form shown in figure 5-15.

Figure 5-15 **APPEND Command Form**



Append

File list from [dotted pattern]

File to

[Confirm each?]

You must enter parameters in two APPEND fields:

- In the **File list from** field, enter the names of the files you want to append. If the files you want to append are not in the current path or are in different volumes or directories, include the complete file specification for each, for example:

[Accounting]<Mgr>sales [Personnel]<Reps>expense

You can use the wild card character in this field.

- In the **File to** field, enter the name of the file in which you want the file or list of files merged. If this destination file does not exist, the system creates it. In this field, you can enter a device name (for example, [Vid] for video or [Lpt] for direct printer) to direct the system to display the composite file on the screen or print it.

**Note:** If the file specified in the **File list from** field does not exist, the system still creates the file specified in the **File to** field.

The **APPEND** command has an optional field, [Confirm each?]. If you accept the default (no), the system does not prompt you for confirmation of each file you want to append. To receive a prompt for confirmation of each file, you enter *y* in this field.

When you complete the APPEND command form, you press GO. If you entered *y* in the [Confirm each?] field, the system displays prompts for confirmation of files you want to append. You press GO to confirm, CANCEL to deny, or FINISH to stop the command.

## Copying Files

You can use various commands for copying files depending on how you want to manipulate the file information.

These are the commands you can use to copy files:

- **COPY**                      copies contents of files to other files  
  
                                    If the file you copy to already exists, its contents are overwritten.
- **LCOPY**                     copies a file to a new volume or directory without renaming the file
- **APPEND**                   adds contents of a file to an existing file
- **FLOPPY COPY**           copies files from one diskette to another diskette

You use the **LCOPY** command to copy a file or list of files to a new volume or a new directory without renaming the files. **LCOPY** is especially useful for copying all the files used for an application system onto a diskette.

To copy the entire contents of a diskette to another diskette, you should use the **FLOPPY COPY** command. However, to copy the contents of an 8-inch diskette to a 5-1/4-inch diskette, you must use the **COPY** or **LCOPY** command.



The following paragraphs describe the **COPY** and **LCOPY** commands. Refer to section 6 for a description of the **FLOPPY COPY** command.

### **COPY** Command

The **COPY** command allows you to copy the contents of one or more files to other files.

To activate this command, you type *COPY* in the Executive command field and press **RETURN**. The system displays the **COPY** command form shown in figure 5-16.

You must enter parameters in two **COPY** fields:

- In the **File from** field, enter the file name. You can use a wild card character to replace the directory name and the file name part of the file specification.  
To copy multiple files, enter the file names separated by spaces.
- In the **File to** field, enter the new file name. If the file does not exist, the system creates it. If you used wild card characters in the **File from** specification, you must use the same number of them in the same order in this file specification.  
If you entered multiple file names in the **File from** field, you must enter the same number of file names in corresponding order in this field. The system copies the first file named in the **File from** field to the first in the **File to** field, the second to the second, etc.

The **COPY** command form has two optional fields (enclosed in square brackets). You can leave one or both of these fields blank to accept the defaults or enter parameters to override the defaults. Refer to table 5-14 for information about each optional field.

When you complete the **COPY** command form, you press **GO**. The system copies the file(s) according to your specifications.

Figure 5-16 COPY Command Form

Copy	
File from	<input type="text"/>
File to	<input type="text"/>
[Overwrite ok?]	
[Confirm each?]	

Table 5-14 COPY Command Optional Fields

Field	Action/Explanation
<b>[Overwrite ok?]</b>	<p>If you accept the default and a file named in the <b>File to</b> field already exists, the system prompts you for confirmation before overwriting the file.</p> <p>If you enter <b>n</b>, the system displays the following message:</p> <p><b>Did not copy (copy from) filename, (copy to) filename already exists.</b></p> <p>To overwrite an existing <b>File to</b> field file, enter <b>y</b>. The system deletes the contents of the existing file and continues the copy operation.</p>
<b>[Confirm each?]</b>	<p>The default is no; the system does not prompt you to confirm each copy operation.</p> <p>To receive prompts to confirm each copy operation, enter <b>y</b>.</p>

### LCOPY Command

The **LCOPY** command allows you to copy one or more files. You can divide the file specification into three parts: prefix, name, and suffix. (Prefix means anything that precedes the file name, including volume and directory names as well as file prefixes.)

The system combines the prefix, name, and suffix logically to form a file specification before it copies the file. If you do not specify one or more of these parts, the system uses a null string.

You can specify passwords for the source and destination files using the caret (^) (for example JohnDoe^ felix, where felix is the password for the file JohnDoe). The system ignores null passwords and does not allow passwords of more than 12 characters. For more information about passwords, refer to section 6.

To activate this command, type *LCOPY* in the Executive command field, and press RETURN. The system displays the *LCOPY* command form shown in figure 5-17.

You must enter parameters in the File list field. You enter the name(s) of the file(s) you want to copy. You can use wild card characters in this field (refer to The Wild Card Character, in this section). If you include the node, volume, and directory names here, the system removes them from the file name for creating the source and destination file specifications. Passwords you specify using a caret (^) apply only to the source file.

The *LCOPY* command form has seven optional fields (enclosed in square brackets). You can leave any or all of these fields blank to accept the defaults or enter parameters to override the defaults. Refer to table 5-15 for information about each optional field.

When you complete the *LCOPY* command form, you press GO. The system copies the files according to your specifications.

If the LCOPY operation fails during the copying procedure, you can retry copying the current file by pressing the F1 key. You can use this Retry feature if you are copying files to a diskette and fail to insert the diskette in the drive. You can also use it as a multivolume backup utility. For example, if you are copying all files in a directory to a diskette and the diskette becomes full, you can place a new diskette in the drive, press F1 to retry the current file, and continue the copying operation without losing the current file or reentering parameters.

Figure 5-17 LCOPY Command Form

LCopy	
File list	
[File prefix(es) from]	
[File prefix(es) to]	
[File suffix(es)]	
[Overwrite OK?]	
[Confirm each?]	
[Continue on error?]	
[Verify copy?]	

Table 5-15 LCOPY Command Optional Fields

Field	Action/Explanation
<b>[File prefix(es) from]</b>	<p>The default directs the system to use the volume, directory, and file prefix (if any) of the current path as the file-from prefix.</p> <p>To add prefixes to the names you entered in the <b>File list</b> field, enter the characters you want to use as a prefix. You can use a volume, directory, and/or prefix name. The system uses the prefix to create a file-from specification.</p> <p>Passwords you specify here, using the caret (^) as part of the file specification, apply to the source file if you did not specify a password in the <b>File list</b> field.</p>
<b>[File prefix(es) to]</b>	<p>The default directs the system to use the volume, directory, and file prefix (if any) of the current path as the file-to prefix.</p> <p>To add prefixes to the names you entered in the <b>File list</b> field, enter the characters you want to use as a prefix. You can use a volume, directory, and/or prefix name. The system uses the prefix to create a file-to specification.</p> <p>If you made only one entry in the <b>[File prefix(es) from]</b> field, the system copies each file with that prefix in the <b>File from</b> field to a new file with the prefixes specified in this field.</p> <p>If you did not make an entry in the <b>[File prefix(es) from]</b> field, the system copies each file of the current path listed in the <b>File from</b> field to a new file with the prefixes specified in this field.</p>

Table 5-15 **LCOPY Command Optional Fields** (continued)

Field	Action/Explanation
<b>[File prefix(es) to]</b> (continued)	Passwords specified here, using the caret (^) as part of the file specification, apply to the destination file if you do not specify a password in the <b>[File suffix(es)]</b> field.
<b>[File suffix(es)]</b>	<p>The default directs the system to use the existing file suffixes (if any).</p> <p>To apply a suffix to the source and destination file specification, enter the characters to use as a suffix. If you make more than one entry, the system creates file specifications using each entry.</p>
<b>[Overwrite OK?]</b>	If the destination file already exists and you accept the default (no entry) or enter <b>n</b> , the system prompts you for confirmation before it overwrites the existing file. When you complete the command form and press <b>GO</b> , these confirmation prompts appear. You press <b>GO</b> to confirm overwriting the file, <b>CANCEL</b> to deny, or <b>FINISH</b> to stop the command.
<b>[Confirm each?]</b>	<p>If you accept the default or enter <b>n</b>, the system does not prompt you for confirmation of each copy operation.</p> <p>To direct the system to overwrite the destination file if it already exists, enter <b>y</b>.</p> <p>To receive confirmation prompts for each copy operation, enter <b>y</b>. When you complete the command form and press <b>GO</b>, the prompts appear. You press <b>GO</b> to confirm copying the file, <b>CANCEL</b> to deny, or <b>FINISH</b> to stop the command.</p>

Table 5-15 **LCOPY Command Optional Fields** (continued)

Field	Action/Explanation
[Continue on error?]	If you accept the default, <b>LCOPY</b> stops when it encounters an error and the system prompts you for confirmation to continue.
	To have the system report errors and continue, enter <b>y</b> .
	To have <b>LCOPY</b> stop when it encounters an error, enter <b>n</b> .
[Verify copy?]	The default is no; the system does not verify that the copies are correct.
	To have the system verify that the copies are correct by reading the source and destination files and comparing them, enter <b>y</b> .

## Accessing the Editor to Modify File Text

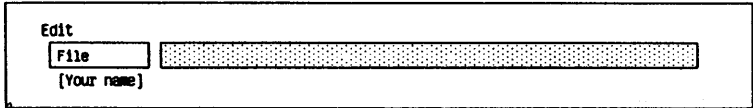
You can change the text within files by using the Editor. The Editor also allows you to create a file in which to enter text. You enter the Editor through the Executive by using the **EDIT** command (refer to the *BTOS Editor Operations Guide*) or the **REPLAY** command (refer to the **REPLAY** Command in this section).

### EDIT Command

The **EDIT** command accesses the Editor utility. The Editor allows you to create a file in which you can enter text or allows you to modify text in an existing file. It shows the text as it appears on a typewritten page. The screen acts as a window for viewing the text file. During an editing session, the Editor creates a typescript file (.ts) which holds the typescript for the session.

To activate this command, you type *EDIT* in the Executive command field and press **RETURN**. The system displays the **EDIT** command form shown in figure 5-18.

Figure 5-18 EDIT Command Form



EDIT Command Form

File [ ]

[Your name]

You must enter a parameter in the **File** field. Enter the name of a file you want to edit. If you enter the name of a file that does not already exist the system prompts you to confirm creation of a new file.

The EDIT command form has an optional field **[Your name]**. The default is `xxxx.ts` where `xxxx` is the logged-on user name. If you want to use a prefix for the `.ts` file other than the logged-on user name, you enter the name in this field. If there is no logged-on user and you leave this field blank, the default is `.ts`.

When you complete the EDIT command form, you press **G0**. The system activates the Editor. For instructions on how to operate the Editor, refer to the *BTOS Editor Operations Guide*.

## Replaying an Editing Session

During each Editor session, the system creates a typescript (`.ts`) file in the logged-on directory that contains the typescript of that session. This file is then available for replay in a subsequent session by using the **REPLAY** command.

If the system crashes, you can recover your edited file by replaying the edited typescript file.

**Note:** All keystrokes are written to a system buffer and then passed to the `.ts` file in 130-keystroke segments. The system cannot replay sessions of less than 130 keystrokes (keystrokes in the buffer) and these are lost when you use the **REPLAY** command.

You can also use this command to duplicate entries you make to one file in several other files.



## REPLAY Command

The **REPLAY** command allows you to repeat an Editor session.

To activate this command, you type *REPLAY* in the Executive command field and press RETURN. The system displays the REPLAY command form shown in figure 5-19.

You must enter a parameter in the File field. You enter the same name of the file you created or edited with the **EDIT** command, or the name of a file in which you want to save the replay session.

The REPLAY command form has an optional field, [Your name]. If you accept the default, the system uses the typescript file .ts if no user name was logged on when you activated the Editor, or the default user.ts file if a user name was logged on.

If you entered a parameter in the [Your name] field of the **EDIT** command (refer to EDIT Command, in this section), you make the same entry in this [Your name] field. This directs the system to use the typescript file with your specified prefix in the replay session.

When you complete the REPLAY command form, you press GO; the replay operation begins.

Figure 5-19 REPLAY Command Form

Replay	
File	<input type="text"/>
[Your name]	<input type="text"/>

## Protecting Data

This section explains how you protect your data from:

- unauthorized access by other users
- loss caused by disk damage, hardware failure, or inadvertent deletion

## Protecting Data From Unauthorized Access

If you have a workstation with a hard disk, you can protect your data files from unauthorized use with the BTOS file security system. File security precautions are important if your workstation shares a hard disk with other workstations. To prevent other users from accessing, changing, or reading your files, two methods of protection are available:

- passwords that control access to a specific device, volume, directory, or file
- protection levels that define the type of access allowed to each file

When you use both of these protection methods, you can define a file security system to meet your needs.

You can also use passwords and protection levels to control the access that users have to the commands available on your system. By assigning protection levels to commands that are potentially harmful to your files, you can protect your data at the Executive command level.

**Note:** You can restrict access to your system at the SignOn form by assigning a User name to each user. Refer to section 2.

## Assigning Passwords

You can control access to your files by requiring a user to enter a password. A valid password can have a maximum of 12 characters, including alphanumeric characters, periods, and/or hyphens. You should select a password that is easy to remember and unique to your system.

You can include a password when you enter a file specification by placing it at the end and separating it with a caret (^). For example, the file specification [Personnel]<Engineering>Salaries^ABC includes the password ABC.

When you enter a password, each character of the password appears on the screen as a pound sign (#) to ensure confidentiality. Once you assign a password, a user must enter it to access a file. If a user does not supply a required password or enters an incorrect one, the system displays the error message **Access denied**.

Password protection is available at four levels:

- device
- volume
- directory
- file

The following paragraphs describe each password level.

### Device Passwords

You use a device password for operations that work directly with the disk, such as the **IVOLUME** command or **BACKUP VOLUME** command. Unless you have a customized operating system, default passwords assigned with the standard software apply.

For the hard disk, the password is the same as the drive device name, for example, d0 or d1. For diskettes, the default is no password.

### Volume Passwords

A volume password controls access to all files on the volume. The volume password overrides directory or file passwords. Without a volume password, there is no password protection for files or directories.

If a volume password exists, you must enter it to create directories or to open the volume. For example, signing on with the volume password gives you access to all files on that volume, whether they are password protected or not; you do not need to enter directory or file passwords.

You can assign volume passwords when you initialize the volume (**IVOLUME** command) or after initialization (**CHANGE VOLUME NAME** command). Refer to section 5.

**Note:** You cannot assign a volume password to a volume currently in use.

### Directory Passwords

A directory password restricts the access, creation, and renaming of files within a directory.

**Note:** A directory password has no effect unless the volume containing the directory has a password.

After you assign a password to a directory, you must specify the password to access files within the directory, unless you assign a protection level to the file that ignores the directory password (refer to Assigning Protection Levels, in this section).

You must also specify the password to remove a directory from a password protected volume.

You can assign a password to a directory when you create the directory (**CREATE DIRECTORY** command). Refer to section 5. If a directory already exists, you can add, change, or remove a directory password (**SET DIRECTORY PROTECTION** command).

### File Passwords

A file password restricts access to a specific file, depending on the protection level you assign (refer to Assigning Protection Levels, in this section). A file password has no effect unless the volume containing the file has a password.

Once you assign a password to a file, you must use the password to gain access to the file. You can assign file passwords to allow access to certain files in a directory without allowing access to the other files. You can also access a file if you know its volume or directory password.

You assign a password to a file when you create the file (**CREATE FILE** command). Refer to section 5. You can also assign a password to an existing file (**SET PROTECTION** command).

## Assigning Protection Levels

You can control the type of access that other users have to your files with file protection levels. These levels determine the type of passwords, if any, that a user must enter to gain read access or modify access to a specific file.

You assign protection levels to files only. When you create a file, it automatically receives a default file protection level. You set this default level at the time you create a directory with the **CREATE DIRECTORY** command. Each file you create in the directory assumes the assigned default file protection level, unless you specify a different level for the file. Refer to section 5.

Eight protection levels are available. Table 6-1 lists the protection levels, their numbers, and the types of passwords required to read or modify files for each level.

Usually you use only three of these levels:

- Unprotected allows all users to have unlimited file access and requires no password to read or modify the file.
- Modify Password requires a password to modify the file, but does not require a password to read the file.
- Access Password requires a password to modify or read the file.

To provide full security for your files, you must use protection levels in conjunction with password protection.

For example, you can use an appropriate file protection level so that users cannot change your files; however, unless you also assign password protection, an unauthorized user can change the file protection level and then access and change your file.

Table 6-1 Protection Levels

Protection Level	Decimal Value	To Read	Password Required To Modify
unprotected	15	none	none
modify password	7	none	volume, directory, or file
access password	3	volume, directory, or file	volume, directory, or file
nondirectory password	51	volume or file	volume or file
nondirectory modify password	23	none	volume or file
nondirectory access password	19	volume, directory, or file	volume or file
modify protected	5	none	volume or directory
access protected	0	volume or directory	volume or directory
read password	1	volume, directory, or file	volume or directory

### Setting and Changing Directory Protection

When you create a directory with the **CREATE DIRECTORY** command (refer to section 5), you can assign a password to the new directory. With this command, you can also set a default protection level for all files created in the directory.

After you create a directory, you can add, delete, or change the password and reset the file default protection level (see **SET DIRECTORY PROTECTION** command).

**Note:** A directory password has no effect unless the volume of the directory has a password.

**SET DIRECTORY PROTECTION Command**

The **SET DIRECTORY PROTECTION** command allows you to add, change, or remove a password for an existing directory. You can also, optionally, change the default file protection level for the files in the directory.

To activate this command, you enter *SET DIRECTORY PROTECTION* in the Executive command field and press RETURN. The system displays the SET DIRECTORY PROTECTION command form shown in figure 6-1.

You must enter a parameter in the Directory name field. You enter the name of the existing directory whose password protection you want to change.

The SET DIRECTORY PROTECTION command form has three optional fields (enclosed in square brackets). You leave any or all of these fields blank to accept the defaults or you can enter parameters to override the defaults. Refer to table 6-2 for information about each optional field.

When you complete the command form, you press GO.

Figure 6-1 **SET DIRECTORY PROTECTION Command Form**

<b>Set Directory Protection</b>	
<input type="text" value="Directory name (e.g., sys)"/>	<input type="text"/>
[Volume or directory password]	
[New protection level (e.g., 15)]	
[New password]	



Table 6-2 SET DIRECTORY PROTECTION Command Optional Fields

Field	Action/Explanation
<b>[Volume or directory password]</b>	<p>The default indicates that this directory and its volume currently do not have passwords.</p> <p>If this directory currently has a password, enter it or its volume password in this field.</p>
<b>[New protection level (e.g., 15)]</b>	<p>The default is no change.</p> <p>To change the existing default file protection level for this directory, enter the decimal value for the new protection level. Refer to table 6-1 for protection level information.</p>
<b>[New password]</b>	<p>The default is no change to the current password status.</p> <p>To add or change a password, enter a maximum of 12 characters for the new password.</p> <p>To delete an existing password, enter " (two single quotation marks with no space between) in this field.</p>

## Setting and Changing File Protection

When you create a file with the **CREATE FILE** command (refer to section 5), you have the option of assigning a password and a protection level to the file. The protection level overrides the default level for the files set at the time you created the file's directory (**CREATE DIRECTORY** command).

You can change the protection level of an existing file and, optionally, assign a password to the file by using the **SET PROTECTION** command.

**Note:** A file password has no effect unless the volume of the file has a password.

### SET PROTECTION Command

The **SET PROTECTION** command allows you to set a new protection level for an existing file or list of files. It also, optionally, allows you to assign a password to the same files.

To activate this command, you enter *SET PROTECTION* in the Executive Command field and press RETURN. The system displays the SET PROTECTION command form shown in figure 6-2.

You must enter parameters in two **SET PROTECTION** fields:

- In the File list field, enter the name of the file or list of files. If the file is in a volume or directory other than the current path, you must enter a full file specification.
- In the New protection level (e.g., 15) field, enter the decimal value of the protection level. Refer to table 6-1.

**Note:** If you assign a protection level that requires a password, you must also enter a parameter in the *[New password]* field. Refer to table 6-3.

The SET PROTECTION command form has two optional fields (enclosed in square brackets). You can leave one or both of these fields blank to accept the defaults or enter parameters to override the defaults. Refer to table 6-3 for information about each optional field.

When you complete the SET PROTECTION command form, you press GO.

Figure 6-2 SET PROTECTION Command Form

Set Protection

File list

New protection level (e.g., 15)

[New password]

[Confirm each?]

Table 6-3 SET PROTECTION Command Optional Fields

Field	Action/Explanation
<b>[New password]</b>	<p>If you accept the default, the system does not assign a password to the file.</p> <p>To assign a new password to the file, enter a maximum of 12 characters for the new password.</p> <p>If you entered a protection level that requires a password in the <b>New protection level</b> field, you must enter a parameter in this field.</p>
<b>[Confirm each?]</b>	<p>If you accept the default (no), the system does not prompt you for confirmation before setting the protection level.</p> <p>To receive confirmation prompts before a protection level is set for each file, enter y. When you complete the command form and press <b>GO</b>, the system prompts you for confirmation before protecting each file.</p>

## Protecting Executive Commands

You control access to commands available on your system by assigning protection specifications to them.

Passwords and protection levels can protect your data from unauthorized access at the Executive command level. Since some Executive commands destroy data (for example, **IVOLUME**), you can use passwords to limit their use.

You can protect any command in the system directory that has a .run file suffix. To obtain a list of the commands you can protect, you use the **FILES** command and enter [Sys]<Sys>\*.run in the [File list] optional field (refer to section 5).

To protect your Executive commands, you use the **SET PROTECTION** command.

**Use the following procedure to set the protection level for a file:**

- 1 Enter *SET PROTECTION* in the Executive command field.
- 2 Press RETURN.
- 3 Enter the complete run file specification for the command in the File list field.  
For example, to protect the **IVOLUME** command, you enter [Sys]<Sys>IVolume.run.
- 4 Enter 0 in the New protection level field.  
Level 0 ensures that other users must enter a specific password to access the command run file.
- 5 To assign a password to a file or change an existing password, enter a maximum of 12 characters in the [New password] optional field.

## Protecting Data From Loss

Hardware failure, damage, or inadvertent deletion can cause the loss of data stored on volumes. To protect your data from loss, you should regularly make copies. This procedure is known as backing up or archiving files. The copies are your insurance against data loss.

### Backing up Data Stored on Diskettes

You back up data stored on diskettes by making copies of the diskettes on workstations that have one or more floppy disk drives. If the master diskettes are damaged, the data is available on the copy. You use the **FLOPPY COPY** command to copy diskettes.

#### **FLOPPY COPY** Command

The **FLOPPY COPY** command allows you to duplicate the contents of a diskette to another diskette. You can make multiple copies of a diskette.

On workstations with a hard disk and one floppy disk drive, the system sets up a temporary file on the hard disk ([Scr]<\$>FloppyCopy.tmp). In this file, the system temporarily stores information from the master diskette and then copies the information to a new diskette you insert in the floppy disk drive.

**Note:** You cannot use the **FLOPPY COPY** command to duplicate the contents of an 8-inch diskette to a 5-1/4-inch diskette or vice versa. You use the **COPY** command for this operation (refer to section 5).

To activate the **FLOPPY COPY** command, you enter **FLOPPY COPY** in the Executive command field and press **RETURN** or **GO** depending on whether or not you want to change the default parameters. The **FLOPPY COPY** command form has no mandatory fields, but it has seven optional fields.

When you press **RETURN**, the system displays the command form shown in figure 6-3. You can enter parameters to override the defaults. Refer to table 6-4 for information about each optional field. After you complete the form, press **GO**.

After you press GO, the system starts to copy the diskette and prompts you for confirmation.

Figure 6-3 FLOPPY COPY Command Form

Floppy Copy

[Number of copies]	
[Overwrite OK?]	
[Dual floppy?]	
[Suppress verify?]	
[Device name(s)]	
[Volume 1 password]	
[Volume 2 password]	

Table 6-4 FLOPPY COPY Command Optional Fields

Field	Action/Explanation
<b>[Number of copies]</b>	<p>The default is unlimited copies.</p> <p>To specify the number of copies you want to make from each master diskette, enter the number.</p>
<b>[Overwrite ok?]</b>	<p>If you accept the default, the system prompts you to confirm the overwrite before copying the diskette.</p> <p>To overwrite existing data on the diskette used for the copy, enter <b>y</b>.</p>
<b>[Dual floppy?]</b>	<p>The default is no for workstations with a single floppy disk drive.</p> <p>If your workstation has dual floppy disk drives and one or more hard disk drives, enter <b>y</b>. The system makes the copy with the master diskette in floppy disk drive [f0] and the duplicate diskette in [f1].</p>
<b>[Suppress verify?]</b>	<p>The default (no) directs the system to reread the information on the diskettes and to verify that it is correct.</p> <p>If you do not want the system to reread the master and duplicate diskettes to verify that no errors occurred during the copy operation, enter <b>y</b>. The <b>FLOPPY COPY</b> command operates 40% faster if the system does not perform verification.</p>

Table 6-4 FLOPPY COPY Command Optional Fields (continued)

Field	Action/Explanation
<b>[Device name(s)]</b>	<p>The default is [f0] (left-hand drive) and [f1] (right-hand drive). You accept this value unless you have a customized operating system with different disk drive names or more than two floppy drives.</p> <p>If you have a customized operating system with disk drives names other than [f0] (left-hand drive) and [f1] (right-hand drive), enter the device names in this field.</p>
<b>[Volume 1 Password]</b>	<p>The default indicates that the source diskette from which you are copying does not have a password.</p> <p>If you want to password protect your source diskette, enter a password in this field.</p>
<b>[Volume 2 Password]</b>	<p>The default indicates that the destination diskette will not be password-protected.</p> <p>If you want to password protect your destination diskette, enter a password in this field.</p>

## Preparing Archive Diskettes

An archive file is a data set used to back up a hard disk. The data set consists of diskettes with the same volume name and numeric suffixes. Before you back up the hard disk, you must initialize a supply of diskettes for use as archive files.

The system uses archive files with the **BACKUP VOLUME, SELECTIVE BACKUP, and RESTORE** commands only. To prepare diskettes for use as archive files, you use the **IVARCHIVE** command in conjunction with the **IVOLUME** command. **IVARCHIVE** formats the diskette, performs write/read tests to identify surface defects, writes volume control structures onto the diskette, and creates system files.

To make sure you initialize enough diskettes to hold all the files you want to back up, you must first determine the approximate number you need by using the **FILES** command (refer to section 5). In the [Details?] field of the **FILES** command form, you enter *y*. The system displays the number of sectors each file uses; you then calculate the diskettes as follows:

- For 8-inch diskettes, you divide this number by 800 to determine the approximate number of diskettes you need.
- For 5-1/4-inch diskettes, you divide this number by 1000 to determine the approximate number of diskettes you need.

If there is a remainder, you prepare an extra diskette for the remaining sectors.

**Note:** You must start your backup operation with enough diskettes; you cannot stop in the middle to initialize more.



## IVARCHIVE Command

The **IVARCHIVE** command allows you to initialize diskettes for use as archive volumes.

**Note:** You cannot initialize a diskette with the **IVARCHIVE** command if another volume with the name Archive is mounted in the cluster configuration.

To activate this command, you enter **IVARCHIVE** in the Executive command field and press GO. The **IVOLUME** command form appears with several parameters filled in (refer to figure 6-4).

The system automatically enters the default parameters as shown in this form. You cannot override these defaults. The system prompts you for confirmation during the initialization.

Figure 6-4 **IVOLUME Command Form with IVARCHIVE Default Parameters**

IVolume	
Device name	
[Device password]	f0
Volume name	##
[Volume password]	Archive
[System Image (default = 0)]	
[Log file (default = 0)]	
[Crash file (default = 0)]	
[Max. directories]	2
[Max. files on volume]	30
[Primary file headers only?]	
[Max. files in Sys Directory]	9
[Sys Directory password]	
[Write protect Sys Directory?]	
[Suppress format of medium?]	
[Surface tests]	
[Debug?]	
[Log file]	
[Extended floppy tracks?]	
[Hard disk type code (default = A)]	
[Use ECC format?]	
[Bad spots (See Doc.)]	

## Backing up Data Stored on Hard Disk Systems

After you use the **IVARCHIVE** command to prepare the diskettes, you have two backup options:

- You can use the **BACKUP VOLUME** command to copy all files from the hard disk onto the diskettes.
- You can use the **SELECTIVE BACKUP** command to copy only selected files from the hard disk onto the diskettes.

Both of these commands copy the files you want to back up into an archive file. The archive file is a read-only file; you cannot edit it. The system uses the archive file with the **BACKUP VOLUME**, **SELECTIVE BACKUP**, and **RESTORE** commands only.

You should use one of these options at least once a week or whenever you add a significant amount of data to your hard disk.

### **BACKUP VOLUME** Command

The **BACKUP VOLUME** command allows you to:

- copy all files from a volume to an archive file
- copy only those files modified on or after a specified date or date and time
- verify the integrity of the volume control structures with or without backing up files
- identify volumes that you have changed so extensively that BTOS no longer recognizes them automatically
- display the log of the backup operation and, optionally, write it to a file or print it

To activate this command, you enter **BACKUP VOLUME** in the Executive command form and press **RETURN**. The system displays the **BACKUP VOLUME** command form shown in figure 6-5.

You must enter the name of the volume or device you want to back up in the **Volume or device name** field.

The **BACKUP VOLUME** command form has nine optional fields (enclosed in square brackets). You can leave any or all of these fields blank to accept the defaults or enter

parameters to override the defaults. Refer to table 6-5 for information about each optional field.

When you complete the **BACKUP VOLUME** command form, you press **GO**. The system prompts you to insert the first diskette in the archive file and prompts you as needed.

You can access the volume while the **BACKUP VOLUME** command is executing because the **BACKUP VOLUME** command does not dismount the volume or take it offline.

During a backup, it is best to restrict other user's access to the volume. Otherwise, the system can include other file modifications in the backup. Also, when you do not restrict access, the verification can indicate nonexistent consistency errors.

Figure 6-5 **BACKUP VOLUME** Command Form

Backup Volume	
<input type="text" value="Volume or device name"/>	<input type="text"/>
[Volume or device password]	
[Incremental from (e.g., Mon. 3 Dec 1984 8:00 pm)]	
[Suppress backup?]	
[Suppress verification?]	
[Archive file]	
[Delete existing archive file?]	
[Log file]	
[Display structures?]	
[Verify write?]	

Table 6-5 **BACKUP VOLUME Command Optional Fields**

Field	Action/Explanation
<b>[Volume password]</b>	<p>The default indicates that no password is assigned.</p> <p>If the volume or device has a password, enter the password in this field.</p>
<b>[Incremental from (e.g., Mon 3 Dec 1984 8:00 pm)]</b>	<p>The default directs the system to back up all files.</p> <p>To back up only those files modified on or after a specific date, enter the date. (The time is optional; if you do not enter a time, the system backs up all files modified and/or created since midnight.)</p> <p>When you increase a directory size, you perform a full backup.</p>
<b>[Suppress backup?]</b>	<p>The default is no; the system backs up the files you specified.</p> <p>To verify the integrity of the volume control structures without performing a backup, enter <b>y</b>. The system performs extensive checks for consistency on all volume control structures and it reports irregularities to the log file (refer to the <b>[Log file]</b> field).</p>
<b>[Suppress verification?]</b>	<p>The default is no; the system verifies the integrity of the volume control structures.</p> <p>To back up the files only, without verifying the integrity of the volume control structures, enter <b>y</b>. You should suppress verification only when the system does a full backup, and only if you reinitialize the volume with <b>IVOLUME</b> immediately following backup. The system displays any errors encountered during backup.</p>

Table 6-5 BACKUP VOLUME Command Optional Fields (continued)

Field	Action/Explanation
<b>[Archive file]</b>	<p>The default directs the system to create [Archive]&lt;Sys&gt;.nn as the default archive file name (nn represents a number the system assigns).</p> <p>To assign a name other than Archive, enter the name. The files you back up usually occupy more space than is available on one diskette. Therefore, [Archive file] can extend across more than one volume, and split into files named [Archive]&lt;Sys&gt;.01, [Archive]&lt;Sys&gt;.02, etc.</p> <p>The system supplies the file extensions. If you specify a name other than Archive, you must also specify a directory name, so the addition of a sequence number produces a valid file specification.</p>
<b>[Delete existing archive file?]</b>	<p>For example, you specify [XYZ]&lt;Sys&gt; to get [XYZ]&lt;Sys&gt;.01, or [XYZ]&lt;Sys&gt;Abc to get [XYZ]&lt;Sys&gt;Abc.01, etc.</p> <p>The default is no. The system prompts you for confirmation before deleting an existing file.</p> <p>To automatically overwrite the existing archive file, enter y.</p> <p>The system must overwrite archive files in sequence. For example, .01 must overwrite .01, .02 must overwrite .02, etc. Otherwise, the system does not recognize that it can overwrite the archive file on the diskette during a BACKUP VOLUME operation.</p>

Table 6-5 **BACKUP VOLUME Command Optional Fields** (continued)

Field	Action/Explanation
<b>[Log file]</b>	<p>The default directs the system to display the log only.</p> <p>To write a report of the BACKUP VOLUME operation to a file, enter the file name. If the log file already exists, the system automatically appends the log to it. If it does not exist, the system creates it.</p> <p>To send the log file directly to a printer, enter a device name (for example, [Lpt]).</p>
<b>[Display structures?]</b>	<p>The default is no; the system does not display an analysis of the volume control structures.</p> <p>To display an analysis of the volume control structures, enter y. You can use this for file system error analysis.</p>
<b>[Verify Write?]</b>	<p>The default is no; the system does not perform a physical read after each write to insure that the file you are backing up is the same as the previously backed up file.</p> <p><b>Note:</b> It is probably not necessary to fill in the <b>[Verify Write?]</b> field if you have verified the hard disk or diskette for bad spots using the IVARCHIVE command.</p> <p>To automatically verify each read and write operation for the file(s) that you are backing up, enter y.</p>

## SELECTIVE BACKUP Command

The **SELECTIVE BACKUP** command allows you to:

- copy individual files or directories from a volume to an archive file
- copy personal files with read access only to the archived files
- copy only those selected files modified on or after a specified date, or date and time
- display a log of the **SELECTIVE BACKUP** operation on the screen and, optionally, write the log to a file or print it

Unlike the **COPY** command (refer to section 5), the **SELECTIVE BACKUP** command copies files to an archive file; it also operates more quickly than the **COPY** command.

To activate the **SELECTIVE BACKUP** command, you type *SELECTIVE BACKUP* in the **Executive** command field and press **RETURN**. The system displays the command form shown in figure 6-6.

You must enter the file names in the **File list** field. The list can include single files, directories, or sets of files using wild card characters (refer to section 5).

Table 6-6 gives examples of parameters for the **SELECTIVE BACKUP File list** field with a description of the files that each parameter backs up.

You assign a password to a file specification by appending a password to the specification. For example, in the specification `<Work1>^ABC`, `ABC` is the password used to access all files in the `Work1` directory. `ABC` appears as `###` on the screen.

The **SELECTIVE BACKUP** command form has six optional fields (enclosed in square brackets). You leave any or all of these fields blank to accept the defaults or enter parameters to override the defaults. Refer to table 6-7 for information about each optional field.

When you complete the **SELECTIVE BACKUP** command form, the system verifies the consistency of the specified parameters and opens the log file (if you specified one). It prompts you to insert the first volume of the archive file. You insert the appropriate volume and press GO. The system creates the archive file.

The system opens each file you want to back up and copies it to the archive file. It lists each file it archives. If any sectors of a file are unreadable, the system writes status information to the archive file.

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 you require larger directories or a different protection level, you must create the directories before you start the restore operation.

Figure 6-6 **SELECTIVE BACKUP** Command Form

Selective Backup

File list [ ]

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

[Confirm each?]

[Archive file]

[Delete existing archive file?]

[Log file]

[Verify write?]

Table 6-6 **Sample SELECTIVE BACKUP** File List Parameters

File List Field Parameter	Description of Files Archived
[ABC]<*>*	The system copies all files on volume ABC to an archive file. This is similar to the <b>BACKUP VOLUME</b> operation with no verification.
[Win]<Work2>*	The system copies all files in the directory Work2 to an archive file.



Table 6-6 Sample SELECTIVE BACKUP File List Parameters (continued)

File List Field Parameter	Description of Files Archived
@MyFile	<p>The system copies a list of files to an archive file. You use the Editor or FILES command to create an at-file containing the list of files you want to copy.</p> <p>For example, here the at-file MyFile contains the list of files. Refer to section 3 for information about at-files.</p>

Table 6-7 SELECTIVE BACKUP Command Optional Fields

Field	Action/Explanation
[Incremental from (e.g., Mon Jun 1 1984 8:00 pm)]	The default directs the system to back up all files. To back up files modified on or before a specific date, enter the date. The time is optional. If you do not specify a time, the system backs up all files from midnight.
[Confirm each?]	<p>The default is no; the system backs up the files without individual confirmation.</p> <p>To receive confirmation prompts before the system copies a file, enter y.</p>
[Archive file]	<p>If you accept the default, the system creates an archive file named [Archive]&lt;Sys&gt;.nn, where nn represents a number that the system supplies.</p> <p>To assign a name other than Archive to this file, enter the name you want to use. You must also specify a directory name so that adding a sequence number produces a valid file specification.</p> <p>For example, you specify [XYZ]&lt;Sys&gt; to get [XYZ]&lt;Sys&gt;.01, [XYZ]&lt;Sys&gt;.02, etc., or [XYZ]&lt;Sys&gt;ABC to get [XYZ]&lt;Sys&gt;ABC.01, [XYZ]&lt;Sys&gt;ABC.02, etc.</p>

Table 6-7 **SELECTIVE BACKUP Command Optional Fields** (continued)

Field	Action/Explanation
<b>[Delete existing archive file?]</b>	<p>If you accept the default (no entry) or enter <b>n</b>, the system prompts you for confirmation before deleting an existing file.</p> <p>To automatically overwrite the existing archive file, enter <b>y</b>.</p> <p>The system must overwrite archive files in sequence. For example, .01 must overwrite .01, .02 must overwrite .02, etc. Otherwise, the system does not recognize that it can overwrite the archive file on the diskette during a BACKUP VOLUME operation.</p>
<b>[Log file]</b>	<p>The default directs the system to display the log only.</p> <p>To write a report of the backup operation to a file, enter the file name (for example, BackupLog). If the file already exists, the system appends the log to it; if it does not exist, the system creates it.</p> <p>To send the log file directly to a printer, enter a device name (for example, [Lpt]).</p>
<b>[Verify Write?]</b>	<p>The default is no; the system does not perform a physical read after each write to insure that the file(s) you are backing up are the same as the previously backed up file(s).</p> <p><b>Note:</b> It is probably not necessary to fill in the <b>[Verify Write?]</b> field if you have verified the hard disk or diskette for bad spots using the <b>IVARCHIVE</b> command.</p> <p>To verify each read and write operation for the file(s) that you are backing up, enter <b>y</b>.</p>

## Restoring Files from an Archive Diskette

You restore files onto a volume from an archive diskette created with the **BACKUP VOLUME** command or with the **SELECTIVE BACKUP** command. You can use the **IVOLUME** command (refer to section 5) to reinitialize the volume on which you want the files restored, or the volume can already have files on it. You use the **RESTORE** command to restore files to a volume.

### RESTORE Command

The **RESTORE** command allows you to restore files to a volume from an archive diskette created with the **BACKUP VOLUME** or **SELECTIVE BACKUP** command.

With the **RESTORE** command you can:

- restore an entire volume, creating any needed directories on the destination volume
- restore selected files to the same or different file specifications
- restore a file's characteristics as they existed at the time of backup
- display the log on the screen or, optionally, write the log of the **RESTORE** operation to a file or print it

**Note:** The **RESTORE** command does not copy system files (for example, *SysImage.sys*). To restore system files, you must copy them to the disk using the **COPY** command (refer to section 5).

To activate this command, you type *RESTORE* in the Executive command field and press RETURN. The system displays the **RESTORE** command form shown in figure 6-7.

The **RESTORE** command form has no mandatory fields, but it has nine optional fields. You press GO to accept all the defaults in the optional fields. The system then restores all the files from the default archive file to the default volume (the currently logged-in volume).

You enter parameters in any or all of the optional fields to override the defaults. Refer to table 6-8 for information about each optional field.

---

When you complete the RESTORE command form, you press GO to start the RESTORE operation. The system prompts you to insert the first diskette. During the RESTORE operation, it prompts you to insert successive volumes.

The system usually reads each volume of the archive file in sequence starting with the first. To restore selected files, you begin with the volume that contains one of the files you want to restore. However, you must load each volume of the archive file in sequence after the first one you load, for example, 3, 4, 5 or 7, 8, 9.

---

**Caution:** Only the first volume of the archive file maintains directory information. 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, you should create a directory of the proper size before activating the RESTORE command.

---

At the end of the RESTORE operation, the system reports the following:

- number of files processed (the number of files read)
- number of files successfully backed up (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 (the number of restored files, including input/output errors in the data portion of the file)
- number of files with missing header information (the number of files that have unrecoverable header information)

Unless you enter *y* 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 (the number of files that the system cannot correctly restore to the destination volume)

The causes include invalid file specification, nonexistent volume, etc.

- number of files not recoverable (the number of files that the system cannot recover, because input/output errors on the archive file make the entire header and data portion of the file unreadable)

**Note:** Some files belong in multiple categories. For example, a file with missing file header information also can have input/output errors in the data portion.

Figure 6-7 RESTORE Command Form

Restore	
[Archive File]	
[File list from]	
[File list to]	
[Overwrite ok?]	
[Confirm each?]	
[Sequence number]	
[Merge with existing file?]	
[List files only?]	
[Log file]	

Table 6-8 RESTORE Command Optional Fields

Field	Action/Explanation
<b>[Archive file]</b>	<p>The default is the file name, [Archive]&lt;Sys&gt;.01.</p> <p>To specify an archive file created with <b>BACKUP VOLUME</b> or <b>SELECTIVE BACKUP</b> that has a name other than Archive, enter the file name.</p> <p>An archive file can extend across more than one volume. When it does, it splits into files such as [Archive]&lt;Sys&gt;.01, [Archive]&lt;Sys&gt;.02, etc.</p>
<b>[File list from]</b>	<p>If you accept the default, the system restores all the files on the archive file.</p> <p>To specify a list of files you want to restore, enter the file names in the following format: &lt;DirName&gt;FileName. Do not use volume names.</p> <p>You can use the asterisk wild card character for the directory name and the file name. For example, to restore all files in a directory, enter &lt;DirName&gt;*. Refer to section 5.</p> <p>The files you specify in this field must match in number the files you specify in the <b>[File list to]</b> field. For example, to restore the files from directory Work1 to a new directory, Work2, enter &lt;Work1&gt;* in this field and &lt;Work2&gt;* in the <b>[File list to]</b> field.</p>

Table 6-8 RESTORE Command Optional Fields (continued)

Field	Action/Explanation
<b>[File list to]</b>	<p data-bbox="397 266 873 342"><b>Note:</b> On a cluster workstation with a local floppy disk drive, restoration can take place only from the local diskette; you cannot use a volume name in this field.</p> <p data-bbox="397 380 868 483">If you accept the default, the system restores the files to the directory and file they were in when they were archived, but places them in the currently logged-in volume.</p> <p data-bbox="397 513 873 589">To restore the files to a new file destination, enter the new file names in the following form: [VolName]&lt;DirName&gt;FileName.</p> <p data-bbox="397 618 871 695">The volume and directory names are optional. If you enter only a file name, the system restores the files to the currently logged-in volume.</p> <p data-bbox="397 724 849 773">You can use the asterisk wild card character for the directory name and the file name.</p> <p data-bbox="397 802 871 850">The files you specify in this field must match in number the files specified in the <b>[File list from]</b> field.</p>
<b>[Overwrite ok?]</b>	<p data-bbox="397 889 862 966">If you accept the default, the system prompts you for confirmation before it overwrites any file of the same name.</p> <p data-bbox="397 995 859 1045">To automatically overwrite any file of the same name before restoring a new one, enter <b>y</b>.</p>
<b>[Confirm each?]</b>	<p data-bbox="397 1084 868 1133">If you accept the default, the system does not prompt you for confirmation before restoring each file.</p> <p data-bbox="397 1162 849 1214">To receive prompts for confirmation before restoring each file, enter <b>y</b>.</p>
<b>[Sequence number]</b>	<p data-bbox="397 1253 862 1278">The default is 1 (the first volume of the archive file).</p> <p data-bbox="397 1307 868 1356">To specify a different volume, you enter the sequence number.</p> <p data-bbox="397 1385 878 1458">If the RESTORE operation does not begin with the first volume, the system creates any required directories 10 sectors in size. These directories are unprotected.</p>

Table 6-8 RESTORE Command Optional Fields (continued)

Field	Action/Explanation
<b>[Merge with existing file?]</b>	<p>If you accept the default, the system overwrites the target file sectors with zeros when it detects any input/output errors on the archive file.</p>
<b>[List files only?]</b>	<p>To bypass overwriting target file sectors when the system detects input/output errors on corresponding sectors of the archive file, enter <b>y</b>.</p> <p>The default is no; the system restores the files indicated.</p>
<b>[Log file]</b>	<p>To list the files on the archive file only, not restore them, enter <b>y</b>.</p> <p>If you accept the default, the system displays the log only.</p> <p>To write a report of the RESTORE operation to a file, enter the name you want to use for the file (for example, ERRORS). If a log file currently exists, the system appends the log. If a log file does not exist, the system creates one.</p> <p>To send the log file directly to a printer, enter a device name (for example, [Lpt]).</p>





## Modifying BTOS Features

The Executive commands in this section are complex; they aid programmers and system administrators by allowing them to:

- load a different BTOS version
- debug run files
- display hexadecimal values of files
- modify an Executive command or a system command file
- add or remove an Executive command
- use submit files to activate commands
- activate run files without using Executive commands
- maintain ISAM, RSAM, and DAM files

## Loading a Different BTOS Version

You load a different BTOS version by using the **BOOTSTRAP** command. This command reloads the operating system from a disk or diskette.

If you have a B 26, B 27, B 28, or B 38 workstation with multiple hard disks, the following conditions apply to bootable volumes (that is, disks that contain a valid system image):

- if drive [d0] is a bootable volume, no other hard disk can also be bootable
- if drive [d1] (or a disk further removed from the processor module) is required as the bootable volume, volumes closer to the processor module cannot also be bootable

**Note:** You should not install a standalone operating system with the **BOOTSTRAP** command if a cluster configuration exists that boots from a master workstation.

## BOOTSTRAP Command

The **BOOTSTRAP** command allows you to load a different BTOS version.

**To load a different BTOS version on your system:**

- 1 Enter *BOOTSTRAP* in the Executive command field.
- 2 Press RETURN.

The system displays the **BOOTSTRAP** command form shown in figure 7-1.

- 3 You must enter a parameter in the File name to bootstrap from field (for example, [Sys]<Sys>SysImage.sys).
- 4 The optional field [Sys volume or wsNNN] allows you to specify a local volume or the master volume as the system volume. (The default is your workstation volume and file name.)
  - To specify a different volume, you enter the volume name.
  - To specify the current path as the system volume, you enter a period.
  - To specify the master as the system volume, you enter the workstations's numerical designation (for example, WS250) in the [Sys volume or wsNNN] field. (NNN is a number from 000 to 255.)

**Note:** If you leave this field blank, the system volume does not change when you execute the command. For example, if your system volume is [d0], and you enter [!Sys]<Sys>ws250>SysImage.sys in the *File to bootstrap from* field, your system volume remains [d0].

- 5 Press GO.

The workstation boots from the file you specified.

Figure 7-1 **BOOTSTRAP Command Form**

Bootstrap	
File to bootstrap from	
[Sys volume or WSHNN]	

### Activating the Run File Debugger

To display or change run files, you activate the Run File Debugger by using the **DEBUG FILE** command.

The Run File Debugger functions like the BTOS Debugger. (The BTOS Debugger is only available on systems configured for the Debugger.) For more information on the BTOS Debugger, refer to the *BTOS Debugger Programming Reference Manual*.

### DEBUG FILE Command

The **DEBUG FILE** command allows you to use the Run File Debugger.

**Use the following procedure to activate the DEBUG FILE command:**

- 1 Enter *DEBUG FILE* in the Executive command field.
- 2 Press RETURN.

The system displays the **DEBUG FILE** command form shown in figure 7-2.

- 3 You must enter the run file name in the File name field (for example, [Sys]<Sys>Editor.run).

The **DEBUG FILE** command form has two optional fields as listed in table 7-1.

Figure 7-2 DEBUG FILE Command Form

Debug File	
File name	<input type="text"/>
[Write?]	
[Image mode?]	

Table 7-1 DEBUG FILE Command Optional Fields

Field	Action/Explanation
[Write]	The default (no) does not allow you to modify the file.  To allow file changes, enter y.
[Image mode?]	The default is no. The system interprets the file as it appears when BTOS loads it into memory.  To direct the system to interpret the data as it appears in the run file, enter y.

### Displaying File Hexadecimal Values

You use the **DUMP** command to display the hexadecimal values of a file or to compare the hexadecimal values for two files. These values correspond with ASCII (American Standard Code for Information Interchange) character sets (refer to appendix B). You cannot modify the displayed file using this command.

Figure 7-3 is an example of a single file display (no parameter was entered in the Compare file field).

Figure 7-4 is an example of a two file display (a parameter was entered in the Compare file field).

Figure 7-3 Sample Single File Dump Display

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	efghijklmnopqstu
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	abcdefghijklmnopklm
0006	6F	71	72	73	74	75	76	77	78	79	7A	61	62	63	64	20	opqrstuvwxyzabcd
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	jklmnopqrstuvwxyz
000A	7A																z

Figure 7-4 Sample Two File Dump Comparison Display

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	qrstuvwxyzabcdq
0002	65	66	67	68	6A	6B	6C	6D	6E	6F	70	71	72	73	74	75	efghijklmnopqstu
0002	66	67	68	69	6A	6B	6C	6D	6E	6F	70	71	72	73	74	75	fghijklmnopqrstu
0005	61	62	63	64	65	66	67	68	69	77	6A	6B	6C	6D	6E	20	abcdefghijklmnopklm
0005	61	62	63	64	65	66	67	68	69	6A	6B	6C	6D	6E	6F	20	abcdefghijklmnopklmno
0006	6F	71	72	73	74	75	76	77	78	79	7A	61	62	63	64	20	opqrstuvwxyzabcd
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	jklmnopqrstuvwxyz
0009	6A	6B	6C	6D	6E	6F	70	71	72	73	74	75	76	77	78	79	klmnopqrstuvwxyz

## DUMP Command

The **DUMP** command allows you to display the hexadecimal values of one or two files.

Use the following procedure to activate the Dump command:

- 1 Enter *DUMP* in the Executive command field.
- 2 Press RETURN.

The system displays the **DUMP** command form shown in figure 7-5.

- 3 You must enter a file name in the input file field (for example, [Sys]<Acctg>Month).

The **DUMP** command form also has five optional fields as listed in table 7-2.

Figure 7-5 **DUMP Command Form**

The screenshot shows a terminal window titled "Dump". It contains the following fields and options:

- Input file**: A text input field with a dotted background, currently empty.
- [Compare file]**: A checkbox option.
- [Output file]**: A text input field.
- [File address first]**: A text input field.
- [File address limit]**: A text input field.
- [Continue on differences?]**: A checkbox option.

Table 7-2 DUMP Command Optional Fields

Field	Action/Explanation
[Compare file]	<p>The default is no comparison; the system displays only the input file.</p> <p>To compare the input file with another file, enter the other file name. The system limits the display to the file address range specified in the [File address first] and [File address limit] fields.</p> <p>At the end of the comparison, the system displays either the message, <b>Differences encountered</b>, or the message, <b>No differences encountered</b>.</p>
[Output file]	<p>The default directs the system to only display the comparison; the comparison is not saved.</p> <p>To write the comparison to a file, enter the file name. If the file exists, the system discards the contents of this file and saves the comparison in it. If the output file does not exist, the system creates it.</p>
[File address first]	<p>The default (0) directs the system to display a comparison, starting at the beginning of the file.</p> <p>To specify a beginning file address for the display or comparison, enter the hexadecimal number of the file address. The final h of the hexadecimal number is unnecessary.</p>
[File address limit]	<p>The default is the file end.</p> <p>To specify an ending file address for the display or comparison, enter the hexadecimal number of the file address (for example, 1F2E). The final h of the hexadecimal number is unnecessary. The display or comparison goes up to, but does not include, this address.</p> <p>If the value you enter is greater than the end of the file, the limit is the end of the file.</p>
[Continue on differences?]	<p>The default is no. When you use the <b>DUMP</b> command in a submit file, the system halts the submit execution.</p> <p>To continue execution if the system finds differences while executing a submit file, enter <b>y</b>.</p>



### Modifying a Command File

The **COMMAND FILE EDITOR** allows you to display and modify any Executive command file, add or remove commands, transfer a command from one command file to another, modify a command, and output commands to create a submit file.

**Note:** You can also modify commands by creating and removing commands. Refer to *Adding or Removing an Executive Command*, in this section.

The system recognizes commands that are defined in the default command file ([Sys]<Sys>Sys.cmds) located on the system directory. The default command file lists all Executive commands.

## COMMAND FILE EDITOR Command

Use the following procedure to activate the **COMMAND FILE EDITOR** command:

- 1 Enter *COMMAND FILE EDITOR* in the Executive command field.
- 2 Choose one of the following:
  - To access the default command file, press **G0**.  
The system displays the default command file, [Sys]<Sys>Sys.cmds.
  - To access a specific command file, press **RETURN**.  
The system displays the **COMMAND FILE EDITOR** command form shown in figure 7-6.
- 3 Enter the command file you want to access in the [Command field] field.
- 4 Press **G0**.

When you activate the **COMMAND FILE EDITOR**, the Executive commands are displayed in alphabetical order and the function key display appears at the bottom of the screen as shown in figure 7-7.

You scroll the command file by using the scroll or cursor control keys. (The cursor control keys are the Up Arrow, Down Arrow, Left Arrow, and Right Arrow keys.)

There are three ways to select a command for a function:

- Type the name of the command in the **Command Name** field at the top of the display.
- Type the name of the command in the **Command Name** field at the top of the display; then press **RETURN** or **NEXT**. The system searches for the command and highlights it.
- Highlight the command using the scroll or cursor control keys. (The highlight appears on the first command when the command file is displayed.)  
To exit any function and return to the command file, press **CANCEL**.

After you select the command, you can press a function key to change the command or create a submit file.

## The Edit Function

To edit a command or run file, use the following procedure:

- 1 Select the command.
- 2 Press **EDIT (F1)**.  
A form displays the command name, parameters, run file, case, and help message.
- 3 Edit the command or run file using the **DELETE**, **BACKSPACE**, or **OVERTYPE** keys.

While your system is in the Edit mode, you can use the functions shown in figure 7-8. Refer to table 7-3 for information on edit functions.

- 4 Press **RETURN (F7)**.

The system returns you to the Executive command file. The prompt **Save changes?** appears with the default **(YES)** highlighted. To save the changes, you press **GO**.

If you do not want to save the changes, you enter **N** and press **GO**.

To return to the editing mode instead of the Executive command file, you press **CANCEL**. The system discards your changes.

Figure 7-6 **COMMAND FILE EDITOR Command Form**



Figure 7-7 **COMMAND FILE EDITOR Function Keys**

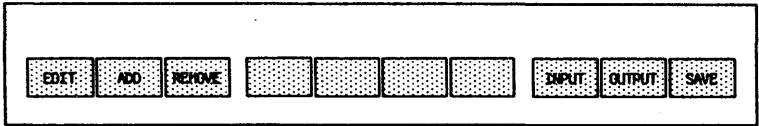


Figure 7-8 **COMMAND FILE EDITOR Sub Function Keys**

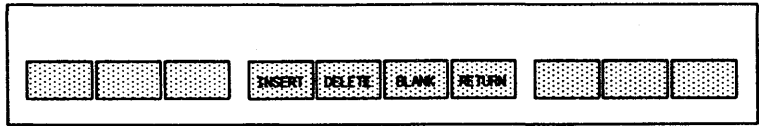


Table 7-3 Special Command Edit Functions

Function	Key	Procedure
<b>INSERT</b>	<b>F4</b>	<p>To insert a line in the command form:</p> <ol style="list-style-type: none"> <li>1 Position the highlight below the insert location.</li> <li>2 Press <b>INSERT (F4)</b>.</li> <li>3 Type the line.</li> </ol>
<b>DELETE</b>	<b>F5</b>	<p>To delete a line in the command form:</p> <ol style="list-style-type: none"> <li>1 Position the highlight on the line.</li> <li>2 Press <b>DELETE (F5)</b>.</li> </ol>
<b>BLANK</b>	<b>F6</b>	<p>To insert a blank line:</p> <hr/> <p><b>Caution:</b> Do not press <b>BLANK (F6)</b> when the highlight is over a line you want to retain. If you do, the system replaces the existing line with a blank line.</p> <hr/> <ol style="list-style-type: none"> <li>1 Position the highlight below the insert location.</li> <li>2 Press <b>INSERT (F4)</b>.</li> <li>3 Press <b>BLANK (F6)</b>. The message <b>&lt;blank&gt;</b> appears.</li> </ol>
<b>RETURN</b>	<b>F7</b>	<p>To return to the command file:</p> <ol style="list-style-type: none"> <li>1 Press <b>RETURN (F7)</b>.</li> <li>2 When the message <b>Save changes?</b> appears, choose one of the following: <ul style="list-style-type: none"> <li><input type="checkbox"/> Press <b>GO</b> to save the changes.</li> <li><input type="checkbox"/> Enter <b>N</b> and press <b>GO</b> to discard your changes.</li> <li><input type="checkbox"/> Press <b>CANCEL</b> to discard your changes and return to the editing mode instead of the command file.</li> </ul> </li> </ol>

### **The Add Function**

**To add a command to the command file, proceed as follows:**

- 1** Select the command.
- 2** Press ADD (F2).
- 3** Enter the name of the command in the Command Name field.
- 4** Press GO.
- 5** Complete the command form.
- 6** Press RETURN (F7) to save the command file.

To copy the parameter list, run file, and description from another command, you move the cursor to the Copy from Command field and enter the name of the command file you want to copy for the new command. Then you press GO.

The command form for the new command appears with the information from the copied command and the Edit function keys. (Refer to figure 7-8 and table 7-3.)

### **The Remove Function**

**To remove a command from the command file:**

- 1** Select the command.
- 2** Press REMOVE (F3).  
The command you select appears in the Command Name field.
- 3** Choose one of the following:
  - To remove the command, press GO.
  - To retain the command, press CANCEL.

### The Input Function

To display or modify a command from another command file, proceed as follows:

- 1 Select the command.
- 2 Press INPUT (F8).
- 3 Enter the name of the command in the Command Name field and the command file name in the Command File field (for example, [!Sys]<Sys>Sys.cmds).
- 4 Press GO.  
The system displays the command with the Edit functions.
- 5 Edit the command, if desired.
- 6 Choose one of the following:
  - To save the changes, press RETURN (F7).
  - To discard the changes, press CANCEL.

### The Output Function

To create a submit file or write a command and its parameter list to a file, you select the command and press OUTPUT (F9). The command name displays on the top line of the form in figure 7-9.

To create a submit file incorporating this command, you enter the submit file name in the Output file field and press GO.

To create a submit file to create this command using the NEW COMMAND command, you change the Output file format field to N (for NEW COMMAND).

To create a file containing only the command name and its parameters, you change the Output file format field to U (for unformatted).

To overwrite an existing file, you enter N in the Append? field. The default (Y) directs the system to add the new entry to the end of the output file.

Figure 7-9 Form for Creating a Submit File

Command Name:	(selected command appears here)	
Output file:	<input type="text"/>	Append? <input checked="" type="checkbox"/>
Output file format:	<input checked="" type="checkbox"/>	(S = Submit File, N = New Command, U = Unformatted)

### The Save Function

To save the changes you make, you press **SAVE (F10)**; the system returns you to the command file.

**Note:** You can press *FINISH* to exit to the Executive.



## Adding or Removing an Executive Command

In addition to the **COMMAND FILE EDITOR**, you use the **NEW COMMAND** or **REMOVE COMMAND** commands to add or delete commands.

The system recognizes commands defined in the command file located on the system directory; the default command file, [Sys]<Sys>Sys.cmds, contains information for all Executive commands.

### Adding Executive Commands

You can add three types of commands to the Executive command file:

- commands that call run files
- commands implemented within the Executive
- commands that call submit files

The Executive implements Intrinsic commands within its program; these commands do not access run files. Table 7-4 lists these commands and the symbols you enter in the Run file field of the **NEW COMMAND** command form.

For more information on run files, refer to the *BTOS Linker/Librarian Programming Reference Manual*.

Table 7-4 Executive Intrinsic Commands

---

Command Name	Run File Field Parameter
APPEND	!1
COPY	!2
CREATE DIRECTORY	!14
CREATE FILE	!5
DELETE	!3
LIST	!8
LOGIN	!7
PATH	!7
PLAYBACK	!21
RECORD	!19
REMOVE DIRECTORY	!15
RENAME	!4
RUN	!18
RUN FILE	!16
SCREEN SETUP	!17
SET FILE PREFIX	!9
SET PROTECTION	!10
STOP RECORD	!20
TYPE	!6
VIDEO	!11

---

## NEW COMMAND Command

The **NEW COMMAND** command allows you to add a command to the command file. To activate this command, you enter *NEW COMMAND* in the Executive command field and press RETURN. The system displays the **NEW COMMAND** command form shown in figure 7-10.

You must enter parameters in two fields:

□ **Command name**

Enter the new command name. A user enters this name in the Executive command field to activate the run file. If the name has more than one word, enclose the entire name (up to 35 characters) in single quotation marks (for example, 'New Command').

□ **Run file**

Enter the complete run file name ([VolName]<DirName> FileName) or, if the command is an Executive Intrinsic Command, enter the appropriate symbol (refer to table 7-4).

The **NEW COMMAND** command form has five optional fields. Refer to table 7-5 for information about optional fields.

When you complete the **NEW COMMAND** command form, you press GO. The system then adds the new command to the command file.

Figure 7-10 **NEW COMMAND** Command Form

**New Command**

Command name

Run file

[Field names]

[Description]

[Overwrite OK?]

[Case (default = 00)]

[Command file]

Table 7-5 NEW COMMAND Command Optional Fields

Field	Action/Explanation
[Field names]	<p>The default is no field names.</p> <p>To specify parameter fields, enter the name of each field. Enclose each field name in single quotation marks (for example, '[Volume name]').</p> <p>If the parameter field names do not fit in this field, create an at-file containing the names. Then enter the at-file name in this field preceded by an @ sign (for example, @command.fields). For information about at-files, refer to section 3.</p> <p>You can control the use of the wild card character in each field when you use it in the field parameter. By default, the wild card character expands a parameter when you press RETURN. To suppress expansion of wild card characters until you press GO, enter the parameter field name followed by an asterisk (for example, 'File to*'). The asterisk does not appear in the command form. Refer to section 5.</p> <p>You can include a password field in the command form. The parameters you enter in this field do not display on the screen but appear as pound signs (#). To specify a password field, type a caret (^) as the last character in the field name (for example, '[Password] ^'). The caret does not appear in the form.</p>

Table 7-5 NEW COMMAND Command Optional Fields (continued)

Field	Action/Explanation
<b>[Description]</b>	<p>The default is no HELP description.</p> <p>To specify a HELP description, enter a description enclosed in single quotation marks. If the description does not fit in this field, create an at file containing the description. Enter the at-file name in this field (for example, @command.desc).</p> <p>For information about at files, refer to section 3.</p>
<b>[Overwrite OK?]</b>	<p>The default (y) directs the system to prompt you for confirmation before overwriting an existing command.</p> <p>If you enter n, and the command already exists, the system cancels the new command.</p>
<b>[Case (default -- 00)]</b>	<p>Case values specify which command called the run file when more than one path of execution exists within the run file. (The run file queries the case value.) The default is 00.</p> <p>Enter the case value (if necessary). Enclose the case value in single quotation marks.</p> <p>For more information on case values, refer to the <i>BTOS Reference Manual</i>.</p>
<b>[Command file]</b>	<p>The default directs the system to add this command to the command file currently in use.</p> <p>To add this command to a different command file, enter the name of the command file.</p>

## Removing Executive Commands

You remove (delete) a command from a command file by using the **REMOVE COMMAND** command. Once you delete a command, the system does not recognize it or include it in the command listing or descriptions when you press HELP.

### **REMOVE COMMAND** Command

The **REMOVE COMMAND** command allows you to delete a command from the command files. Once you delete a command, the system does not recognize it or include it in the command listing or descriptions when you press HELP.

**Use the following procedure to activate the REMOVE COMMAND command:**

- 1 Enter *REMOVE COMMAND* in the Executive command field.

Press RETURN.

The system displays the **REMOVE COMMAND** command form shown in figure 7-11.

- 2 Enter a parameter in the Command name field.

You must enter the full name of the command you want to remove or its unique abbreviation (for example, *DELETE* can be entered as *DEL*). If a name includes spaces, enclose it in single quotation marks (for example, 'FLOPPY COPY').

The **REMOVE COMMAND** command form has an optional field [Command file]. If you accept the default for this field by leaving it blank, the system removes the command from the command file currently in use.

To remove a command from a command file not currently in use, you enter the file specification for the command file in the [Command file] field.

Figure 7-11 REMOVE COMMAND Command Form

Remove Command	
Command name	<input type="text"/>
[Command file]	

## Customizing the Command File for Specific Users

You can customize command files so that different users of a workstation have access to different Executive commands.

To create a customized command file for a specific user, you copy the system's command file, add or delete the commands desired, and change the User Configuration file as follows:

- 1 Copy the default command file [Sys]<Sys>Sys.cmds to a new file with a name that identifies it as a custom command file.
- 2 Change the file using the **NEW COMMAND**, **REMOVE COMMAND**, or **COMMAND FILE EDITOR** command.
- 3 Edit the user's User Configuration file with the **USER FILE EDITOR** command (refer to section 2), changing the existing command file name to the customized command file name.

## Using Submit Files to Enter Commands

You can file complex sequences of commands and resubmit them for repetitive execution from the file. You use the **RECORD** and **STOP RECORD** commands to enter a series of commands in a file. You can then replay this file with the **SUBMIT** command.

**Note:** You can also use the Editor to build generalized submit files through escape sequences. These sequences allow you to insert explanatory comments in a submit file or to replace a submit escape sequence in a command form with a parameter specified in the **SUBMIT** command form. Refer to the *BTOS Editor Operations Guide*.

## RECORD Command

The **RECORD** command creates a recording file. The file contains all the characters typed at the keyboard.

**Use the following procedure to activate the RECORD command:**

- 1 Enter *RECORD* in the Executive command field.
- 2 Press RETURN.  
The system displays the **RECORD** command form shown in figure 7-12.
- 3 You must enter a parameter in the File to record on field (for example, Routine.sub).  
The file name specifies the file containing the commands you are recording.
- 4 Press GO.  
The system begins recording keystrokes.

## STOP RECORD Command

The **STOP RECORD** command ends the recording session begun with the **RECORD** command. There is no command form for **STOP RECORD**.

To end your recording session, enter *STOP RECORD* in the Executive command field and press GO. (You can also terminate **RECORD** by using the **SUBMIT** command, refer to **SUBMIT** Command, in this section.)

---

**Caution:** When you call up a command file with the *SUBMIT* command, parameters entered for Executive forms in 132-column mode may not fit in the 80-column mode.

---

Figure 7-12 **RECORD** Command Form

Record
File to record on <input type="text"/>



## Creating Submit Files with the Editor

You use the Editor to create a submit file. For Editor procedures, refer to the *BTOS Editor Operations Guide*.

For example, to create a submit file to delete `-old` and `.tmp` files from your system, enter the following information, line for line, in the file:

*Delete*

```
<*>*-old <*>*.tmp
```

When you use the **SUBMIT** command to run this file, the system deletes all files with the suffix `-old` or `.tmp`.

To create conditional submit files, refer to appendix C.

## Activating Submit Files

You activate submit files by using the **SUBMIT** command or by adding a new command to activate the submit file.

**SUBMIT Command**

The **SUBMIT** command allows you to access and run a submit file that you create either with the **RECORD** and **STOP RECORD** commands or with the **EDIT** command.

In addition, the **SUBMIT** command allows you to terminate a recording session if you are in the **RECORD** mode (an alternative to using the **STOP RECORD** command).

**Use the following procedure to activate the SUBMIT command:**

- 1 Enter *SUBMIT* in the Executive command field.
- 2 Press RETURN.  
The system displays the **SUBMIT** command form shown in figure 7-13.
- 3 You must enter a parameter in the File list field.  
This specifies the name of the file you want the system to read and execute; for example, [Sys]<Sys>Daily.sub.

The **SUBMIT** command form also has three optional fields. Refer to table 7-6 for information about each optional field.

---

**Caution:** When you run a submit file, parameters entered in 132-column mode may not fit in 80-column mode.

---

Figure 7-13 **SUBMIT Command Form**

The diagram shows a rectangular box representing the SUBMIT command form. At the top left, the word "Submit" is written. Below it, there are four fields:
 

- File list:** A rectangular input field with a shaded background.
- Parameters:** A text label.
- [Force Expansion?]:** A text label.
- [Show Expansion?]:** A text label.

Table 7-6 **SUBMIT Command Optional Fields**

<b>Field</b>	<b>Action/Explanation</b>
<b>[Parameters]</b>	Specifies parameters (up to 10) that replace escape sequences in the form %n in the file specified in the <b>File list</b> field. The first parameter replaces all instances of %0; the second, %1; and so on through %9.
<b>[Force Expansion?]</b>	The default is no. Enter <b>y</b> to have the system force the expansion of submit escape sequences in a file (even though you are not passing parameters). This may be necessary for conditional expansions. Refer to appendix C.
<b>[Show Expansion?]</b>	The default is no. Enter <b>y</b> to direct the system to display the file expansion. This is useful for debugging complicated conditional expansions.

### **Adding a Command to Activate a Submit File**

You create a command to activate a submit file by using the **NEW COMMAND** command. (Refer to Adding or Removing an Executive Command, in this section.)

You enter the prefix of the submit file in the **Command name** field of the **NEW COMMAND** command form. (For example, if the name of your submit file is Daily.sub, the name of your command is Daily.)

**Note:** Your submit file, Daily.sub, must be in [Sys]<Sys>.

You enter the parameter [Sys]<Sys>Subcmd.run in the **Run file** field of the **NEW COMMAND** command form.

To create the command, you complete the optional fields as desired and then press **G0**. To activate the submit file specified in the command, enter the command name in the **Executive command** form and press **G0**.

To implement an immediate version of a subcommand by playing back the submit file, you create a new command with the subcommand file name in the **Command name** field and !21 in the **Run file** field. You can then complete the optional fields (as desired).

If the submit file uses no parameters, you use that file as keyboard input by activating the **PLAYBACK** command (refer to **PLAYBACK** command, in this section).

## Replaying Submit Files

You replay a submit file using the **SUBMIT** command. You enter the name of the submit file, in the File list field and press GO.

The Executive enters the replaying mode and reads the characters from the submit file. The message **Replaying** appears.

### Activating Run Files without Using Executive Commands

You use the **RUN FILE** or **RUN** commands to activate run files. The **RUN** command form allows you to enter up to 16 parameters and to identify a case value for the run file (if you can call it by more than one command). It also allows you to run a program with the Debugger.

## RUN FILE Command

The **RUN FILE** command activates the run file you specify. You use this command to run programs that have no Executive command. The Executive passes optional commands to the program.

**Use the following procedure to activate the RUN FILE command:**

- 1 Enter *RUN FILE* in the Executive command field.
- 2 Press RETURN.

The system displays the **RUN FILE** command form shown in figure 7-14.

- 3 You must enter a run file name in the File name field (for example, [Sys]<Sys>Spooler.run).

The **RUN FILE** command form has an optional field to allow you to specify parameters. The default is no parameter. To specify parameters, you enter them in the [Parameters] field. For example, if the program requires an input and an output file, enter the names of the files, separated by a space (for example, Inputfile Outputfile).

## RUN Command

The **RUN** command activates the run file you specify. This command also allows you to run a program with the Debugger.

**Use the following procedure to activate the RUN command:**

- 1 Enter *RUN* in the Executive command field.
- 2 Press RETURN.

The system displays the **RUN** command form shown in figure 7-15.

- 3 You must enter a parameter in the Run file field (for example, [Sys]<Sys>Spooler.run).

The **RUN** command form has 18 optional fields. Refer to table 7-7 for information on optional fields.

Figure 7-14 **RUN FILE Command Form**

Run File	
File name	
[Parameters]	

Figure 7-15 RUN Command Form

Run	
Run file	
[Case]	
[Command]	
[Parameter 1]	
[Parameter 2]	
[Parameter 3]	
.	
.	
[Parameter 16]	

Table 7-7 RUN Command Optional Fields

Field	Action/Explanation
[Case]	<p>The default is 00.</p> <p>To change the default, you enter a two-digit case value (a string to identify the command if more than one command can call the run file).</p> <p>For more information about case values, refer to the <i>BTOS Reference Manual</i>.</p>
[Command]	<p>The default is no command name. To specify a command name, you enter it in this field.</p>
[Parameter (1-16)]	<p>The default is none.</p> <p>You enter parameters for the first command form field here in order (up to 16).</p>

## **PLAYBACK Command**

The **PLAYBACK** command activates the file you specify in the **PLAYBACK** command form. You use this command to run submit files that do not require parameters.

**Use the following procedure to activate the PLAYBACK command:**

- 1** Enter *PLAYBACK* in the Executive command field.
- 2** Press RETURN.

The **PLAYBACK** command form shown in figure 7-16 displays:

- 3** You must enter a file name in the file field (for example, FileName.sub).

### **Maintaining ISAM, RSAM, and DAM Files**

The **MAINTAIN FILE** command allows you to modify and read data files, including the data store files of Indexed Sequential Access Method (ISAM) data sets, Record Sequential Access Method (RSAM) files, and Direct Access Method (DAM) files.

The **MAINTAIN FILE** command also allows you to produce a log showing verification of the file structure. The log displays while you are using the **MAINTAIN FILE** command; you can also copy it to a file.



## MAINTAIN FILE Command

Use the following procedure to activate the **MAINTAIN FILE** command:

- 1 Enter *MAINTAIN FILE* in the Executive command field.
- 2 Press RETURN.

The **MAINTAIN FILE** command form shown in figure 7-17 displays.

- 3 You must enter one or more data files in the Input files field. You separate more than one file with spaces.

If you enter parameters in the Input files field only, the system verifies the file structure and displays the log. Figure 7-18 is a sample file log.

The **MAINTAIN FILE** command form has four optional fields. Refer to table 7-8 for information about each optional field.

Figure 7-16 **PLAYBACK** Command Form

Playback

File

Figure 7-17 **MAINTAIN FILE** Command Form

Maintain File

Input files

[Output files]

[Log file]

[Remove deleted records?]

[Suppress confirmation?]

Figure 7-18 Sample of a File Log

```
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.
```

Table 7-8 MAINTAIN FILE Command Optional Fields

Field	Action/Explanation
<b>[Output files]</b>	<p>The default varies depending on your input files: If all files are readable using DAM, the output file is a DAM file; otherwise the output file is an RSAM file.</p> <p>If an output file exists, the system overwrites the file.</p> <p>To change the default, enter a file name.</p>
<b>[Log file]</b>	<p>The default directs the system to only display the log.</p> <p>To direct the system to save the log, specify a file name. You can then print the log by printing that file.</p> <p>The log file lists the number of data bytes processed, logical file address, and length of any malformed records.</p>
<b>[Remove deleted records?]</b>	<p>The default value is no. If the output file is an RSAM file, the system ignores deleted and malformed records. If the output file is a DAM file, the system places deleted and malformed records in the output file.</p> <p>To override the default for a DAM file, enter <b>y</b> in this field. The system does not place deleted or malformed records in the DAM output file.</p>
<b>[Suppress confirmation?]</b>	<p>The default value is no. When a malformed record appears in the input file, the system displays a message specifying its file address and length. It prompts you to skip the malformed record and keep processing the input file or terminate processing.</p> <p>To override the default, enter <b>y</b> in this field. When a malformed record appears in the input file, the system proceeds with user interaction. Refer to <b>[Remove deleted records?]</b>.</p>

## Sorting and Merging Data Files

You can sort files of data records (RSAM, DAM, or ISAM) according to sort keys embedded within those data records, thus ordering a set of data records. You do this using the **Sort** command.

**Note:** If you sort an ISAM data store file, the result is a file accessible with RSAM or DAM, but not with a new ISAM data set.

You can merge several sorted data record files according to sort keys embedded within those records, thus combining one or more standard access method files into a single ordered file. You do this using the **Merge** command.

A brief discussion of these commands follows. For detailed information, refer to the *BTOS Sort/Merge Operations Reference Manual*.

## Sort Command

The **Sort** Command sorts preexisting files of data records according to sort keys embedded within those records.

**Use the following procedure to activate the the Sort command:**

- 1 Enter *Sort* in the Executive command field.
- 2 Press RETURN.  
The system displays the **Sort** command form shown in figure 7-19.
- 3 You must enter a parameter in the Input files field (the names of one or more files to be sorted).
- 4 You must enter a parameter in the Output file field (the name of the file to which you want the output written).
- 5 You must enter a parameter in the Keys field. This field specifies how the sort keys are embedded within each data record. Refer to the *BTOS Sort/Merge Operations Reference Manual*.

The **Sort** command form has five optional fields. Refer to table 7-9 for information on optional fields.

Figure 7-19 SORT Command Form

Sort	
Input files	<input type="text"/>
Output file	<input type="text"/>
Keys	
[Stable sort?]	
[Work File 1]	
[Work File 2]	
[Log file]	
[Suppress confirmation?]	

Table 7-9 SORT Command Optional Fields

Field	Action/Explanation
[Stable sort?]	Enter <b>y</b> for a stable sort. A Stable sort specifies that you want the input records with equal sort keys to appear in the output file in the same order as they appear in the input file.  The default is no.
[Work file 1]	The Sort Utility requires two work files, each the same size as the input file. You can enter the name of an existing file, or if you specify a file that does not exist, Sort creates it for you and deletes it at the end of the Sort.  If you do not specify a work file name, the system work files are placed on the logged-in volume and directory (SortWorkfile1.Dat).
[Work file 2]	The Sort Utility requires two work files, each the same size as the input file. You can enter the name of an existing file, or if you specify a file that does not exist, Sort creates it for you and deletes it at the end of the Sort.  If you do not specify a work file name, the system work files are placed on the logged-in volume and directory (SortWorkfile2.Dat).
[Log file]	The system writes a status report and sort statistics to the filename you specify here.
[Suppress confirmation?]	If you enter <b>y</b> , Sort automatically skips any corrupt input records and searches for the next valid record.  If you enter <b>n</b> , Sort automatically skips any corrupt input records and displays a message inquiring if you want to continue or terminate the sort.

## MERGE Command

The **MERGE** command merges several preexisting files of sorted data records according to sort keys embedded in those data records.

Use the following procedure to activate the the **MERGE** command:

- 1 Enter *MERGE* in the Executive command field.
- 2 Press RETURN.

The system displays the **MERGE** command form shown in figure 7-20.

- 3 You must enter a parameter in the Input Files field (the names of one or more files to be merged).
- 4 You must enter a parameter in the Output file field (the name of the file to which you want the output written.)
- 5 You must enter a parameter in the Keys field. This field specifies how the sort keys are embedded within each data record. Refer to the *BTOS Sort/Merge Operations Reference Manual*.

The **MERGE** command form has two optional fields. Refer to table 7-10 for information on optional fields.

Figure 7-20 **MERGE** Command Form

Merge

Input file

Output files

Keys

[Log file]

[Suppress confirmation?]

Table 7-10 MERGE Command Optional Fields

Field	Action/Explanation
[Log file]	The system writes a status report and merge statistics to the filename you specify here.
[Suppress confirmation?]	If you enter <b>y</b> , the MERGE operation skips any corrupt input records and searches for the next valid record. If you enter <b>n</b> , MERGE skips any corrupt input records and displays a message inquiring if you want to continue or terminate the merge operation.

## BTOS Standard Commands

Table A-1 contains a complete listing of the standard Executive commands available with BTOS. The table includes:

- a brief explanation of what each command allows you to do
- the run file for the command or the run code for Executive Intrinsic commands
- the section of this guide where you can find detailed information about the command

Table A-1 **BTOS Standard Commands**

Command Run File/Code	Allows You To:	Section
<b>APPEND</b> (I1)	<ul style="list-style-type: none"> <li>□ merge one or more files into a single file</li> <li>□ display or print the composite document</li> </ul>	5
<b>BACKUP VOLUME</b> (BackupVolume.run)	<ul style="list-style-type: none"> <li>□ copy files from a volume to an archive file</li> <li>□ verify the integrity of the volume control structures</li> </ul>	6
<b>BOOTSTRAP</b> (Bootstrap.run)	<ul style="list-style-type: none"> <li>□ load a different version of BTOS</li> <li>□ run a diagnostic from a workstation by loading it into memory and logically disconnecting the workstation from the cluster</li> </ul>	7
<b>CHANGE VOLUME NAME</b> (ChgVolName.run)	<ul style="list-style-type: none"> <li>□ change a volume name</li> <li>□ add, change, or delete a volume password</li> </ul>	5



Table A-1 BTOS Standard Commands (continued)

<b>Command</b> <b>Run File/Code</b>	<b>Allows You To:</b>	<b>Section</b>
<b>CLUSTER STATUS</b> (ClusterStatus.run)	<ul style="list-style-type: none"> <li><input type="checkbox"/> display information about the activity on a cluster system for a specified communications line, including the total number of workstations configured for the line, the number currently active, the time elapsed since the cluster system began operation, the line activity, and the number of the types of errors encountered</li> <li><input type="checkbox"/> display, for each active workstation, the total number of requests received since it became active, and the number of requests currently outstanding</li> </ul>	1
<b>COMMAND FILE EDITOR</b> (CmdFileEditor.run)	<ul style="list-style-type: none"> <li><input type="checkbox"/> add, remove, modify, and/or examine any Executive command file interactively</li> <li><input type="checkbox"/> create submit files</li> </ul>	7
<b>COPY</b> (I2)	<ul style="list-style-type: none"> <li><input type="checkbox"/> duplicate the contents of a file to another file</li> <li><input type="checkbox"/> print a file by direct printing</li> </ul>	5
<b>CREATE CONFIGURATION FILE</b> (CreateConfig.run)	create a configuration file which specifies characteristics for configuring a device	2
<b>CREATE DIRECTORY</b> (I14)	<ul style="list-style-type: none"> <li><input type="checkbox"/> create a directory with a specified name</li> <li><input type="checkbox"/> set a file protection level and a maximum number of files for the new directory</li> <li><input type="checkbox"/> assign passwords to the directory and its volume</li> </ul>	5
<b>CREATE FILE</b> (I5)	create a new file without defining its contents	5

Table A-1 BTOS Standard Commands (continued)

<b>Command</b>	<b>Allows You To:</b>	<b>Section</b>
<b>Run File/Code</b>		
<b>CREATE PARTITION</b> (CreatePartition.run)	create a vacant secondary application partition	2
<b>DEBUG FILE</b> (DebugFile.run)	activate the Debugger to examine and modify the data in files and devices	7
<b>DELETE</b> (!3)	delete a file or file list, permanently destroying the contents of the file	5
<b>DISABLE CLUSTER</b> (DisableCluster.run)	disable cluster operations by stopping communication between BTOS in the master workstation and cluster workstations, and closing all files (operates from the master workstation only)	1
<b>DUMP</b> (Dump.run)	<input type="checkbox"/> display the contents of a file in hexadecimal values <input type="checkbox"/> display the differences between two files	7
<b>EDIT</b> Editor.run	access the Editor utility	5
<b>FILES</b> (Files.run)	<input type="checkbox"/> display the names of all the files in a specified directory <input type="checkbox"/> display detailed information about each file in a specified directory	5
<b>FLOPPY COPY</b> (FloppyCopy.run)	duplicate the contents of a diskette onto another diskette	6
<b>FORMAT</b> (Format.run)	<input type="checkbox"/> format the text of one or more files into a paginated document <input type="checkbox"/> print file(s) by direct or spooled printing	4

Table A-1 BTOS Standard Commands (continued)

<b>Command</b> <b>Run File/Code</b>	<b>Allows You To:</b>	<b>Section</b>
<b>INSTALL DATACOMM SERVER</b> (DCXServer.run)	install the DataComm Server at the (DCXServer.run) workstation with a Four-Port Communications Expander	2
<b>INSTALL HARDWARE ID</b> (HwlID.run)	install the Hardware service at a cluster workstation (B 26, B 27, B 28, and B 38 with Cluster Hardware Identifier)	2
<b>INSTALL QUEUE MANAGER</b> (InstallQMgr.run)	install the Queue Manager at the master workstation	4
<b>INSTALL SPOOLER</b> (InstallSpl.run)	install the Spooler at a master, cluster, or standalone workstation	4
<b>IVARCHIVE</b> (SubCmd.run)	prepare a diskette for use as an archive volume, by formatting the diskette, performing write/read tests to identify surface defects, writing volume control structures on the diskette, and creating system files	6
<b>IVOLUME</b> (Volume.run)	initialize a diskette or hard disk for use as a volume by formatting the disk, performing write/read tests to identify surface defects, writing volume control structures onto the disk, and creating system files	5
<b>LCOPY</b> (LCopy.run)	copy the contents of files to other files (a more complex copying procedure than the COPY command)	5
<b>LIST</b> (!8)	display an unsorted list of directory files with no details	5
<b>LOGIN</b> (!7)	change the current path (node, volume, directory, file prefix, and/or volume and directory passwords)	3

Table A-1 BTOS Standard Commands (continued)

<b>Command</b>	<b>Allows You To:</b>	<b>Section</b>
<b>Run File/Code</b>		
<b>LOGOUT</b> (SignOn.run)	end the current session, remove information previously specified at the SignOn form or with the <b>PATH</b> command, and display a new SignOn form	3
<b>MAINTAIN FILE</b> (MaintainFile.run)	<ul style="list-style-type: none"> <li><input type="checkbox"/> modify and read data files, Record Sequential Access Method (RSAM) files, Direct Access Method (DAM) files, and the data storage files of Indexed Sequential Access Method (ISAM) data sets</li> <li><input type="checkbox"/> verify file structures</li> <li><input type="checkbox"/> remove malformed records</li> <li><input type="checkbox"/> write a verification log of the file structure to a file</li> </ul>	7
<b>MAKE TRANSLATION</b> (MakeTxFile.run)	generate a custom translation file for a serial or parallel printer, which translates individual characters into other characters, lowercase characters to uppercase, or a single character into a series of characters	4
<b>MERGE</b> (Merge.run)	merge several existing files of sorted data records according to sort keys embedded within those data records	7
<b>NEW COMMAND</b> (Command.run)	add a new command to the Executive command file	7
<b>PARTITION STATUS</b> (PartitionStatus.run)	display status information for all the application partitions, including size, memory boundaries, and the run file currently executing in the partition	2
<b>PATH</b> (!7)	change the current path (node, volume, directory, file prefix, and/or volume and directory passwords)	3

Table A-1 BTOS Standard Commands (continued)

<b>Command</b> <b>Run File/Code</b>	<b>Allows You To:</b>	<b>Section</b>
<b>PLAYBACK</b> (!21)	implement immediately the submit facility for a submit file that uses no parameters	7
<b>PLOG</b> (PLog.run)	<input type="checkbox"/> display the contents of the error-logging file <input type="checkbox"/> write the error log to a file or print it	3
<b>PRINT</b> (Print.run)	add a file to the scheduling queue for spooled printing	4
<b>READ HARDWARE ID</b> (rHwID.run)	determine a cluster workstation's currently assigned ID number B 26, B 27, B 28, and B 38 workstations with Cluster Hardware Identifier)	2
<b>RECORD</b> (!19)	record a sequence of commands into one file that can be activated as a single operation	7
<b>REMOVE COMMAND</b> (Command.run)	delete a command name from the Executive command file	7
<b>REMOVE DIRECTORY</b> (!15)	delete one or more empty directories from a volume	5
<b>RENAME</b> (!4)	change the name of one or more existing files to another specified name	5
<b>REPLAY</b> (Editor.run)	replay an editing session	5
<b>RESTORE</b> (Restore.run)	restore files to a volume from an archive diskette created with the <b>BACKUP VOLUME</b> or <b>SELECTIVE BACKUP</b> command	6

Table A-1 BTOS Standard Commands (continued)

<b>Command</b>	<b>Allows You To:</b>	<b>Section</b>
<b>Run File/Code</b>		
<b>RESUME CLUSTER</b> (ResumeCluster.run)	resume normal cluster operations, except for files opened on the cluster workstations before cluster communications were disabled	1
<b>RUN</b> (I18)	activate a user program	7
<b>RUN FILE</b> (I16)	activate a specified user program (primarily programs not named with the <b>NEW COMMAND</b> command)	7
<b>SCREEN SETUP</b> (I17)	change one or more screen attributes	2
<b>SELECTIVE BACKUP</b> (SelectiveBackup.run)	copy individual files or directories, personal files with read access only, and files modified on or after specific dates or times from a volume to an archive file	6
<b>SET DIRECTORY PROTECTION</b> (SetDirectoryProtection.run)	<input type="checkbox"/> add, change or delete a directory password <input type="checkbox"/> set the default file protection level for files in a directory	6
<b>SET FILE PREFIX</b> (I9)	create a default file prefix which the system adds to newly created files under the current path and uses to call up files when the volume and directory names are omitted from file specifications	5
<b>SET MOUSE CONTROLS</b> (SetMouse.run)	select the speed at which the cursor moves when you use the mouse	2
<b>SET PROTECTION</b> (I10)	<input type="checkbox"/> assign a new protection level to one or more files <input type="checkbox"/> assign a password to one or more files	6

Table A-1 BTOS Standard Commands (continued)

<b>Command</b>	<b>Allows You To:</b>	<b>Section</b>
<b>Run File/Code</b>		
<b>SET TIME</b> (SetTime.run)	set the system date/time	<b>3</b>
<b>SOFTWARE INSTALLATION</b> (SubCmd.run)	<ul style="list-style-type: none"> <li><input type="checkbox"/> install software after the initial system installation</li> <li><input type="checkbox"/> customize the installation of application programs</li> </ul>	<b>1</b>
<b>SORT</b> (Sort.run)	<input type="checkbox"/> separate existing files of data records according to sort keys embedded within those records	<b>7</b>
<b>SPOOLER STATUS</b> (Spooler.run)	<ul style="list-style-type: none"> <li><input type="checkbox"/> display the status of printers and scheduling queues</li> <li><input type="checkbox"/> access subcommands to select and control printers and queues</li> </ul>	<b>4</b>
<b>STOP RECORD</b> (I20)	stop the recording of keystrokes into a command file	<b>7</b>
<b>SUBMIT</b> (Submit.run)	direct the system to read characters from a command file or submit file rather than from the keyboard	<b>7</b>
<b>TYPE</b> (I16)	display the contents of a file, one screen at a time	<b>5</b>
<b>USER FILE EDITOR</b> (UserFileEditor.run)	create and modify User Configuration files	<b>2</b>
<b>VIDEO</b> (I11)	change one or more screen attributes (contains fewer fields than the <b>SCREEN SETUP</b> command)	<b>2</b>

Table A-1 BTOS Standard Commands (continued)

Command	Allows You To:	Section
<b>Run File/Code</b>		
<b>VOLUME STATUS</b> (VolumeStatus.run)	<input type="checkbox"/> display on the screen two levels of status details for a specified volume  <input type="checkbox"/> print the status information for a specified volume	5
<b>WRITE HARDWARE ID</b> (wHwID.run)	assign an ID number to a cluster workstation (B 26, B 27, B 28, and B 38 workstations with Cluster Hardware Identifier)	2
<b>XESOFTWARE INSTALLATION</b> (SubCmd.run)	<input type="checkbox"/> install software on the XE 520 after the initial system initialization  <input type="checkbox"/> customize the installation of application programs on the XE 520	





## ASCII Table

Table B-1 lists the ASCII characters with their decimal and hexadecimal values. The following key describes the abbreviations and acronyms which appear on table B-1.

- column headings
  - **Char** = Character
  - **Dec** = Decimal
  - **Hex** = Hexadecimal
- control characters
  - **NUL** = Null string; all zero
  - **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

Table B-1 ASCII Table

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	a	096	60
HT	009	09	5	053	35	b	097	61
LF	010	0A	6	054	36	c	098	62
VT	011	0B	7	055	37	d	099	63
FF	012	0C	8	056	38	e	100	64
CR	013	0D	9	057	39	f	101	65
SO	014	0E	:	058	3A	g	102	66
SI	015	0F	;	059	3B	h	103	67
DLE	016	10	<	060	3C	i	104	68
DC1	017	11	=	061	3D	j	105	69
DC2	018	12	>	062	3E	k	106	6A
DC3	019	13	?	063	3F	l	107	6B
DC4	020	14	@	064	40	m	108	6C
NAK	021	15	A	065	41	n	109	6D
SYN	022	16	B	066	42	o	110	6E
ETB	023	17	C	067	43	p	111	6F
CAN	024	18	D	068	44	q	112	70
EM	025	19	E	069	45	r	113	71
SUB	026	1A	F	070	46	s	114	72
ESC	027	1B	G	071	47	t	115	73
FS	028	1C	H	072	48	u	116	74
GS	029	1D	I	073	49	v	117	75
RS	030	1E	J	074	4A	w	118	76
US	031	1F	K	075	4B	x	119	77
SP	032	20	L	076	4C	y	120	78
!	033	21	M	077	4D	z	121	79
"	034	22	N	078	4E	{	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	DEL	126	7E
'	039	27	S	083	53		127	7F
(	040	28	T	084	54			
)	041	29	U	085	55			
*	042	2A	V	086	56			
+	043	2B	W	087	57			

## Conditional Submit Files

Conditional submit files allow you to create submit files for commands and utilities that require varying data. Section 7 includes information on creating sequences of commands using the **RECORD** and **EDIT** commands and replaying them using the **SUBMIT** command. You can use these submit files for repetition of an exact sequence of commands, such as installing the Queue Manager and Spooler. Refer to section 7 for additional submit file information.

To pass data to a submit file, the particular fields in the command forms must contain special codes called submit escape sequences, rather than actual parameters. The system passes parameters specified in the **SUBMIT** command form to the submit file, where they are used to replace the escape sequences in the designated fields.

**Note:** An escape sequence is a series of characters (usually three) that sets up special handling for subsequent data. Escape sequences usually are started with one set of characters and terminated with another similar set.

Parameter passing involves transferring actual data from one function (or device) to another, under Executive control. For example, a directory name entered at the keyboard is passed to the software module that sets your path.

You must add escape sequences to submit files with the Editor (see Creating Submit Files with the Editor, in section 7). You can generate a submit file with the **RECORD** command and modify it with the Editor or generate the file entirely with the Editor.

This appendix shows you how to:

- program submit escape sequences
- create nesting escape sequences
- develop System Input Manager (SysIn) facility escape sequences
- create subcommands

**Note:** Nesting is a condition within a condition. Depending upon whether or not the condition is met, further conditions are then specified. The second condition and subsequent ones are called nested.

## Submit Escape Sequences

You can build generalized submit files through escape sequences. These begin with a percent character (%). The percent character notifies the system to treat the following characters in a special way. The escape sequences use the components described in table C-1.

You define fields by enclosing parameters in exclamation points (!). Fields are a fixed width by default. The system truncates (cuts) values to fit into the specified width: on the left for numeric values and on the right for alphabetic values. To fill leading digit positions with zeros, you use zero (0) as the first character in the field.

You can obtain variable width fields by entering an asterisk (\*) as the first character in the field. The resulting field is exactly as wide as needed to hold the replacement value.

**Table C-1 Escape Sequence Components**

<b>Component</b>	<b>Function</b>
<b>%</b>	introduces an escape sequence (You can include it in the text by typing it twice, %, in which case, the system ignores it.)
<b>D</b>	expands the current date/time
<b>[</b>	expands the current volume selection
<b>&lt;</b>	expands the current directory specification
<b>^</b>	expands the current password specification
<b>U</b>	expands the current user name specification

Table C-1 Escape Sequence Components (continued)

Component	Function																						
'	introduces a comment																						
"	introduces a comment																						
?	introduces a type of conditional expansion																						
#	introduces a type of conditional expansion																						
n	represents one of the digits 0 through 9 used to indicate which of the parameters in the [Parameters] field in the SUBMIT command form replaces the escape sequence																						
b	is a character that delimits the start and end of conditional expansions																						
text	is a sequence of characters inserted in a conditional expansion, including other calls to SUBMIT, other command invocations, messages to be output to the screen, etc.																						
>n	is one of the digits 0 through 9 preceded by another character, such as ]																						
date/time	is the template for introducing date/time; the date and time can be formatted by using any of the following parameters: <table border="1" data-bbox="434 1013 827 1333"> <thead> <tr> <th>Key</th> <th>Expansion</th> </tr> </thead> <tbody> <tr> <td>h</td> <td>hour in 12-hour notation (1-12)</td> </tr> <tr> <td>t</td> <td>hour in 24-hour notation (0-23)</td> </tr> <tr> <td>m</td> <td>minute (0-59)</td> </tr> <tr> <td>s</td> <td>second (0-59)</td> </tr> <tr> <td>a</td> <td>AM/PM</td> </tr> <tr> <td>y</td> <td>year (1952-2042)</td> </tr> <tr> <td>o</td> <td>month number (1-12)</td> </tr> <tr> <td>n</td> <td>month name</td> </tr> <tr> <td>d</td> <td>day of month (1-31)</td> </tr> <tr> <td>w</td> <td>weekday name</td> </tr> </tbody> </table>	Key	Expansion	h	hour in 12-hour notation (1-12)	t	hour in 24-hour notation (0-23)	m	minute (0-59)	s	second (0-59)	a	AM/PM	y	year (1952-2042)	o	month number (1-12)	n	month name	d	day of month (1-31)	w	weekday name
Key	Expansion																						
h	hour in 12-hour notation (1-12)																						
t	hour in 24-hour notation (0-23)																						
m	minute (0-59)																						
s	second (0-59)																						
a	AM/PM																						
y	year (1952-2042)																						
o	month number (1-12)																						
n	month name																						
d	day of month (1-31)																						
w	weekday name																						
	<table border="1" data-bbox="434 1357 671 1463"> <thead> <tr> <th>Modifier</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>zero-filled</td> </tr> <tr> <td>*</td> <td>variable width</td> </tr> </tbody> </table>	Modifier	Meaning	0	zero-filled	*	variable width																
Modifier	Meaning																						
0	zero-filled																						
*	variable width																						

Capitalization of name values corresponds to the capitalization of the key character. Thus !AA! results in AM and !aa! results in am. Similarly, !N! produces MAY and !n! produces May. Weekday and month names always begin with a capital letter. Capitalization of key characters for numeric values is not significant.

Text not enclosed in exclamation marks copies directly to the output string. For example, Today is !\*W!. expands to Today is Wednesday. Other characters following the percent sign (%) generate an error message on the screen.

Submit escape sequences provide these capabilities:

- |                           |  |
|---------------------------|--|
| Commenting                | You can insert explanatory text into a submit file by prefacing it with the percent character followed by a single quote (%) or double quotes (%"). (You terminate a comment beginning with the percent character followed by a single quote or double quotes with a single <b>RETURN</b> .) |
| Nonconditional expansions | You can replace a submit escape sequence with a parameter specified in the <b>[Parameters]</b> field in the <b>SUBMIT</b> command form expansions  |
| Conditional expansions    | An action is conditional on the presence or absence of parameters in the <b>SUBMIT</b> command. It allows you to nest alternate commands in a submit file or list messages to the screen depending on the parameters in the <b>SUBMIT</b> command.   |

## Adding Comments to a File

To force expansion of the file, you put the comment escape sequence at the beginning. Any one of the following escape sequences adds comments to a file (and expands to the null string when the system expands the file):

- %' <text> '
- %" <text> "
- %' <text> (RETURN)
- %" <text> (RETURN)

**Note:** A null string is a sequence of blank letters that usually does not change the default condition set up in the original command or submit file.

For example, you can enter or read the following lines with the Editor, but the system does not display them on the screen when the submit file is executed:

```
%' example of a submit file
%' shows some functions in sequence
%' can be accomplished with the submit files
```

## File Expansion

File expansion is the replacement of escape sequences by parameters. Expansion also occurs if you name more than one file in the **File list** parameter field of the SUBMIT command form. The system creates a temporary file during expansion that replaces all escape sequences with the designated parameters and performs all tests for conditional expansions, including recursive calls to additional submit files.

**Note:** Recursive means automatically coming back to the original starting point unless deliberately stopped.



The system expands a file or forces expansion automatically under any one of the following conditions:

- more than one file is named
- the parameters are specified
- the first character in the named file is a percent sign (%)
- the **[Show expansion?]** parameter of the SUBMIT command form is **y**

A file submitted without parameters runs without expansion. Entering **y** in the **[Force expansion?]** parameter field of the SUBMIT command form, however, can force expansion.

A nonexpanded or nonforced file runs more quickly than an expanded file, and no temporary file is created. In a nonexpanded file, however, any outstanding characters from a recursive call to **SUBMIT** are lost. That is, nonexpanded submit files are not nested.

To display the expansion of the file, you enter **y** in the **[Show expansion?]** field of the SUBMIT command form. This is useful for debugging complicated conditional expansions. The system makes all parameter substitutions and displays the temporary expanded file on the screen.

The system always performs expansion from the inside out. For example, if the parameters 0 and 1 are red and blue, respectively, then the escape sequence:

this is %0 this is %1 ...

is expanded to the following sequence:

this is %0 this is blue ...

this is red this is blue ...

When the system creates a temporary file, either automatically or because you specify **y** in the **[Force Expansion?]** parameter, it is first expanded. Then the system appends any outstanding characters from a recursive call to **SUBMIT** to the file.

The temporary file is then opened in Read mode, the file handle is marked long-lived, and the file is given to BTOS as the source for character input of the System Input Manager (SysIn) facility. If the SysIn facility already has a file for character input (because of a recursive call), it is now closed.

The temporary file is located either in the <\$> directory of the system volume ([Sys]<\$>) or in the logged-in volume and directory. Because recursive calls are permitted, two temporary files are tried in each directory. The temporary files that **SUBMIT** tries in order are:

- 1 [Sys]<\$>Submit0.tmp
- 2 [Sys]<\$>Submit1.tmp
- 3 Submit0.tmp
- 4 Submit1.tmp

If a recursive call to **SUBMIT** produces an infinite expansion, the temporary files expand to fill all available disk space. **SUBMIT** terminates with the Status Code, **Disk full** or **Too many runs**.

The following paragraphs describe the two types of file expansions: nonconditional and conditional.

**Nonconditional Expansions**

Nonconditional expansions allow simple parameter substitution. The escape sequence, in the form %n (where n is any digit from 0 to 9), is replaced by the corresponding parameter in the **[Parameters]** field of the SUBMIT command form. If no parameter is given, %n expands to the null string.

You use %>n to indicate that all the parameters greater than n (where n is any digit from 0 to 9) expand to <text> with a space between parameters if more than one exists.

For example, if you enter in the **[Parameters]** field:

'par 0' 'par 2' 'this is par 3'

then the system expands any occurrences of the escape sequence %0 through %9 as:

%0            par 0

%1            null string

%2            par 2

%3            this is par 3

%4 to %9     null string

The following example shows how you use the escape sequences for nonconditional expansion to delete a directory named *Work* and all the files in it. You use the Editor to create the file *Delete.sub* containing the following lines:

*%'* Remove a directory (**RETURN**)

Delete *RETURN*

<%0>\* *GO* *%'* Delete all files in the directory (**RETURN**)

Remove Directory *RETURN*

%0 *GO* *%'* Delete the directory (**RETURN**)

where *RETURN* and *GO* denote the single characters with the hexadecimal codes 0A and 1B, respectively, generated by the **RETURN** and **GO** keys (refer to **Entering Special Characters**, in this appendix); <%0>\* equals <Work>\* (all files in the directory *Work*); and %0 equals the directory *Work*.

To execute this routine, you enter *Delete.sub* in the **File list** field and *Work* in the [**Parameters**] field of the **SUBMIT** command form. The parameter *Work* replaces both occurrences (in the **File list** field of the **DELETE** command form and in the **Old directory name** field of the **REMOVE DIRECTORY** command form) of the escape sequence %0 when the submit file is activated. The system deletes the directory *Work* and all the files in it.

## Conditional Expansions

You can use the escape sequences for conditional expansions to test the presence or absence of a parameter *n* in the [Parameters] field of the SUBMIT command form and to perform an operation defined by <text>.

You can nest these sequences within each other, but they must be balanced and not overlapped. For example, <text> can contain other conditional expansions and escape sequences and is expanded from the inside out. Here *b* is the delimiter character (a character used to separate other characters):

- `##nb<text>b` expands to <text> if the parameter *n* does not exist (has a zero length) or, otherwise, to a null string
- `##>nb<text>b` expands to <text> if all parameters greater than *n* do not exist or, otherwise, to a null string
- `??nb<text>b` expands to <text> if the parameter *n* exists (has a nonzero length) or, otherwise, to a null string
- `??>nb<text>b` expands to <text> if a parameter greater than *n* exists or, otherwise, to a null string

Another example is the following escape sequence (here the colon is the delimiter character):

`##0:You did not specify a file:`

which expands to the string **You did not specify a file** if parameter 0 is not specified in the [Parameters] field of the SUBMIT command and, otherwise, to a null string.

The following example shows the use of the escape sequences for conditional expansion to delete old temporary files and typescript files from the disk. You can pass a volume password to the submit file as indicated in figure C-1.

If you enter the volume password, the system deletes all old files, temporary files, typescript files, and dollar sign directory files on the entire disk. If you do not enter the volume password, the system deletes the files only from the current directory.

Figure C-1 Completed **SUBMIT** Command Form for Example

Submit	
File list	Cleansub
[Parameters]	*Password
[Force Expansion?]	<input type="text"/>
[Show Expansion?]	

You can use the Editor to create the file Clean.sub containing the following lines:

```
%' Clean.sub (RETURN)
%' This submit file cleans the disk of all old, (RETURN)
%' temporary, and dollar directory files. If (RETURN)
%' a volume password was a passed parameter, it
(RETURN)
%' allows cleaning of a protected disk. (RETURN)
%#0>Delete RETURN
*-old *tmp *.ts' RETURN
%?0>Delete RETURN
<*>*-old^%0 <*>*tmp^%0 <*>*.ts^%0 <$*>^^%0'GO
```

where *RETURN* and *GO* denote the single characters with the hexadecimal codes 0A and 1B, respectively, generated by the RETURN and GO keys.

## Entering Special Characters

When you use the **RECORD** command to create a submit file, simply enter **RETURN** and **GO** by pressing the appropriate key on the keyboard. When you create or modify a submit file using the Editor, however, pressing **RETURN** or **GO** executes that function in the Editor. You must use a special procedure to enter these characters:

- 1 Press **CODE** and hold it down while you press **I** (the capital letter i). This action puts the Editor in a mode for entering hexadecimal codes. The message **INSERT HEXADECIMAL** displays.
- 2 Enter the hexadecimal code (shown in table C-2) for the special key you want to include in the file. For example, to enter **GO**, you type the code **1B**.
- 3 The display character shown in table C-2 represents the character in the file. For example, **GO** is represented by a solid bullet.

In the example `Delete.sub` given under **Nonconditional Expansions** in this appendix, the file that the Editor displays actually appears as follows:

```
%' Remove a directory
```

```
Delete
```

```
<%0>* o %'Delete all the files in the directory
```

```
Remove Directory
```

```
%0 o %' Delete the directory
```

The **RETURN** character displays as a curved arrow, and the **GO** character displays as a solid bullet.

## Nesting Escape Sequences

You may require an actual parameter substitution if a certain parameter is present. In this case, you enter a nonconditional expansion as the text of the conditional expansion.

Table C-2 Hexadecimal Codes for Special Keys

Key	Hex Code	Display Character
HELP	00	null
MARK	02	solid right triangle
FINISH	04	solid square
PREV PAGE	05	hollow square
CANCEL	07	bell
BACKSPACE	08	backspace
TAB	09	tab
RETURN	0A	new line
DOWN ARROW	0B	down arrow
NEXT PAGE	0C	formfeed
BOUND	0D	solid left triangle
MOVE	0F	double dagger
SCROLL UP	11	dagger
SCROLL DOWN	13	trough
COPY	14	raised dot
F1	15	division sign
F2	16	vertical bar
F3	17	dollar sign
F4	18	not equal
F5	19	similarly
F6	1A	paragraph
G0	1B	solid bullet
F7	1C	not
F8	1D	equal to or less than
F9	1E	plus or minus
F10	1F	equal to or greater than



## SysIn Escape Sequences

Submit files also can contain System Input Manager (SysIn) escape sequences that begin with the cent sign (¢). You use these escape sequences to alternate the operation of the submit file with keyboard input. There are three types:

- ¢ the character ¢
- ¢1b where b is any character you select. This sequence allows real keyboard input until the character b is typed. The ¢1b escape sequence and the b entered at the keyboard are discarded.
- ¢2 terminates the currently running submit file and returns to the keyboard for character input

You should use the ¢1 escape sequence carefully with submit files that submit other files. When a second call to **SUBMIT** occurs, **SUBMIT** interprets any ¢1b escape sequences not yet encountered as ¢2 escapes, and discards all characters from that point.

SysIn escape sequences are used in conjunction with escape sequences for conditional expansion to enable the keyboard for input, depending on the presence or absence of user input in the [Parameters] field of the **SUBMIT** command.

For example, during software installation, a submit sequence could display a menu of software to be installed or give you discretion at certain points to install or not to install specific programs. Through the SysIn escape sequence, you can evaluate the keyboard input.

## Creating Subcommands

You activate submit files with a subcommand of their own forms rather than with the **SUBMIT** command. The parameters you enter in the **NEW COMMAND** command form are accessible to the submit file as escape sequences. You place these parameters in the %n escape sequence in the following order:

- 1 The first parameter of each field in the form from top to bottom.
- 2 The remainder of the parameters of each field in the form from top to bottom.

You create the subcommand with the **NEW COMMAND** command. Specify [Sys]<Sys>Subcmd.run in the **Run file** field of the **NEW COMMAND** command form. After you create the subcommand with the Editor, you place the submit file in [Sys]<Sys>Name.sub, where name is the subcommand name (embedded spaces removed).



## List of Product Information

This appendix lists and explains briefly the available product information for BTOS systems.

### Introductory and Planning

*Burroughs B 20* provides a general description of the B 20 system.

*Your B 20 Installation Planning Guide* offers suggestions to new B 20 system owners about preparation for B 20 installation.

### Hardware Installation

*B 20 Cluster Workstations, Installation and Operations Guide* provides guidelines for setting up a cluster of workstations around a master.

*BTOS Systems Installation Guide* shows the user how to connect the components of B 21, B 22, B 26, B 27, and B 28, and B 38 systems.

*AP 1302 Printer, Installation, Operation, and Maintenance Guide* provides information on hardware and software installation, operation, and maintenance of the AP 1302 printer.

*AP 1305 Printer, Installation, Operation, and Maintenance Guide* provides information on hardware and software installation, operation, and maintenance of the AP 1305 printer.

*AP 1311 Printer, Installation, Operation, and Maintenance Guide* provides information on hardware and software installation, operation, and maintenance of the AP 1311 printer.

*AP 1351 Printer, Installation, Operation, and Maintenance Guide* provides information on hardware and software installation, operation, and maintenance of the AP 1351 printer.

*B 9251-1 Printer, Installation, Operation, and Maintenance Guide* provides information on hardware and software installation, operation, and maintenance of the B 9251-1 printer.

*B 9252 Printer, Installation, Operation, and Maintenance Guide* provides information on hardware and software installation, operation, and maintenance of the B 9252 printer.

*B 9253 Printer, Installation, Operation, and Maintenance Guide* provides information on hardware and software installation, operation, and maintenance of the B 9253 printer.

## **Software Documentation**

*B 20 Systems Batch Reference Manual* describes the format of JCL files for activating programs by way of the Batch Manager.

*BTOS 2780/3780 RJE Terminal Emulator Reference Manual* describes the 2780/3780 Emulator package.

*BTOS 3270 Terminal Emulator Reference Manual* describes the 3270 Emulator package.

*BTOS Assembler Programming Reference Manual* provides detailed operating system information with reference information on the Assembly programming language.

*BTOS Asynchronous Terminal Emulator (ATE) Reference Manual* describes the Asynchronous Terminal Emulator.

The following seven guides and reference manuals provide language reference information and procedures for creating object modules (compiled programs) to run on Unisys workstations.

*BTOS BASIC Compiler Programming Reference Manual*

*BTOS BASIC Interpreter Programming Reference Manual*

*BTOS FORTRAN Compiler Programming Reference Manual*

*BTOS High COBOL Compiler Operations Guide*

*BTOS High COBOL Compiler Training Guide*

*BTOS High COBOL Language Reference Manual*

*BTOS Pascal Compiler Programming Reference Manual*

*BTOS Context Manager Operations Reference Manual* provides descriptive and procedural information for using the Context Manager utility on Unisys workstations.

*BTOS Customizer Programming Reference Manual* provides detailed information on the operating system structure and operation. It includes procedures which a system programmer can use to build a customized operating system.

*BTOS Data Manager Programming Guide* contains an overview of the Data Manager and procedures for creating particular applications.

*BTOS Data Manager Programming Training Guide* teaches experienced programmers how to use Data Manager programming forms.

*BTOS Data Manager Run-Time Interpreter Applications Operations Guide* explains procedures for installing and running the Data Manager application system.

*BTOS Debugger Programming 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.)

*BTOS Editor Operations Guide* describes the text editor.

*BTOS Font Designer Programming Reference Manual* is an interactive programming tool which you can use to design fonts for B 22, B 26, and B 27 workstations.

*BTOS Forms Designer Programming Reference Manual* provides procedures and information on (1) the Forms Editor, used to interactively design and edit forms; (2) the Forms Reporter, used to display information (such as size, number, and type of field) on a form; and (3) the Forms run time, called by applications to display forms and accept user input.

*BTOS Indexed Sequential Access Method (ISAM) Operations Reference Manual* specifies the ISAM procedural interfaces and shows how the various languages call them.

*BTOS Linker/Librarian Programming Reference Manual* provides information and procedures for the Linker (used to create run files from object modules) and the Librarian (used to file object modules).

*BTOS Mail Manager Administration Guide* contains technical introductory, planning, procedural, and reference information for BTOS Mail Manager administrators.

*BTOS Mail Manager Operations Guide* contains introductory, procedural, training, and reference information for registered Mail Users of the BTOS Mail Manager.

*BTOS MS-DOS Implementation Guide* provides information for using the MS-DOS operating system on Unisys workstations.

*BTOS Protected Mode Operating System Server (PMOSS) Installation Guide* provides procedures for installing the Protected Mode operating system.

*BTOS Protected Mode Programming Guide* provides information for the experienced user to write programs in Protected Mode.

*BTOS Reference Manual, Volume 1 and Volume 2* describe the operating system. They specify services for managing processes, messages, memory, exchanges, tasks, video, disk, keyboard, printer, timer, communications, and files. In particular, these volumes specify the standard file access methods.

*BTOS Sort/Merge Operations Reference Manual* describes the utilities that you can use to sort and merge data on Unisys workstations.

*BTOS Standard Software Operations Quick Reference Guide* contains reference information for experienced operators and administrators who are already familiar with the features and functions of BTOS, and BTOS workstations and with the material presented in this guide.

*BTOS Status Codes Reference Manual* provides descriptive and operational information on BTOS Status Codes.

*BTOS Support Guide* provides BTOS support information and reference material for experienced support personnel.

*BTOS System Performance Accelerator (SPA) Installation Guide* provides installation and configuration information for the System Performance Accelerator system service.

*BTOS Terminal Mail Manager Reference Card* provides the experienced user with operational information about the Mail Manager.

*BTOS Voice Services Programming Reference Manual* provides voice processor programming, procedural and operational information.





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# Glossary

**allocation bit map.** The Allocation Bit Map controls the assignment of disk sectors. It has one bit for every sector on the disk, and the bit is set if the sector is available. The Allocation Bit Map is disk-resident.

**application partition.** An application partition is a section of user memory reserved for the execution of an application.

**Application Partition Management facility.** The Application Partition Management facility allows simultaneous execution of several applications, each in its own secondary partition. It provides operations for creating, removing, loading, and managing secondary application partitions.

**applications.** Applications are programs that provide a complete user interface.

**application system.** An application system is the collection of all tasks currently loaded in an application partition.

**archive file.** An archive file is a data set consisting of floppy diskettes with the same volume name and numeric suffixes. The system uses archive files with the **BACKUP VOLUME**, **SELECTIVE BACKUP**, and **RESTORE** commands only.

**ASCII.** ASCII, the American Standard Code for Information Interchange, defines the character set codes used for information exchange between equipment.

**at-file.** An at-file is a file you create with the Editor or the **FILES** command that contains a list of all the entries or names of the files you want to include in a parameter.

**backup copy.** A backup copy is a duplicate of a volume, directory, and/or file which is stored in an archive file.

**banner page.** The banner page is a distinctive page that you can request the Spooler to print at the beginning of each document. In addition to flagging the beginning of documents printed one after the other, the banner page provides information including the name of the file, date and time of printing, copy number, and, optionally, the text of a notice file.

**BASIC.** BASIC is one of the high level languages you can use to write BTOS programs. You can use the BASIC Compiler to convert the programs into BTOS object modules, or you can use the BASIC Interpreter to create, edit, and run BASIC programs.

**binary mode.** Binary mode is a printing mode option that does not print the banner page or recognize the escape sequences for manual intervention during printing. This mode sends only the code in the file to the printer.

## Glossary-2

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**bootstrap.** Bootstrap is the operation that starts the system by loading or reloading the operating system from a disk.

**B 21 workstation.** A B 21 workstation is one of six different models. B 21-1 contains no disk drives; B 21-2 contains one floppy disk drive only; B 21-3 contains two floppy disk drives; B 21-4 contains one floppy disk drive and a 5Mb hard disk drive; B 21-5 contains one floppy disk drive and a 10Mb hard disk drive; and B 21-6 contains one floppy disk drive and a 20Mb hard disk drive. Each model has a lectern to the right of the screen that contains the processor module and disk drives (if any). Models with floppy disk drives use Glossary-1/4-inch floppy diskettes.

**B 22 workstation.** A B 22 workstation has the following video capabilities: a 34-line, 80-column or 132-column screen that can be split horizontally and/or vertically into multiple, overlapping frames, and a 256-character set that can be modified by software. This workstation has a lectern to the right of the screen which holds the processor and a separate mass storage unit which holds a single 8-inch floppy disk drive.

**B 26 workstation.** A B 26 workstation has a table-top modular unit that, in addition to a processor module, can include hard disk drives, and one or more floppy disk drives, depending on the number and type of its modules. You can alter the capabilities of this workstation by adding or removing modules. The video capabilities of the B 26 workstation are: a 29-line, 80-column screen that can be split horizontally and/or vertically into multiple, overlapping frames, and a 256-character set that can be modified by software.

**B 27 workstation.** A B 27 workstation has a table-top modular unit that, in addition to a processor module, can include hard disk drives, and one or more floppy disk drives, depending on the number and type of its modules. You can alter the capabilities of this workstation by adding, changing, or removing modules. The B 27 video capabilities include 30 or 34 lines per screen, 80 or 132 columns, and double-high, double-wide characters.

**B 28 workstation.** A B 28 workstation has the same appearance, modular expandability, and video capabilities as the B 26 workstation. Because it incorporates a different central processing unit (CPU), it has some capabilities that the B 26 does not have.

**B 38 workstation.** A B 38 workstation has the same appearance, modular expandability, and video capabilities as the B 28 workstation. Because it incorporates a different central processing unit (CPU), it can accommodate the BTOS System Performance Accelerator (SPA) and the BTOS Protected Mode Operating System Server (PMOSS).

**case value.** A case value is an element in a variable-length parameter block that specifies which command activated the current command when more than one possibility exists. A command run file can query a case value to determine which command actually activated it.

**cluster configuration.** A cluster configuration is a local resource-sharing group of workstations consisting of a master and one or more cluster workstations. The operating system can execute in each cluster workstation and in the master workstation.

**cluster workstation.** A cluster workstation is connected to a master workstation within a cluster configuration. B 21, B 22, B 26, B 27, B 28, and B 38 workstations can serve as cluster workstations.

**Note:** B 21 and B 22 workstations are supported only as cluster workstations, not as master or standalone workstations.

**COBOL.** COBOL is one of the high level languages you can use to write BTOS programs. You can use the COBOL Compiler to convert the programs into BTOS object modules.

**command.** A command is a direction which you configure and give to the Executive to activate as a system operation.

**command form.** A command form is an interactive display that appears after a command entry and requests additional information with parameter prompts and entry fields.

**conditional expansion.** A conditional expansion depends on the presence or absence of parameters in the **SUBMIT** command. It allows you to nest alternate commands in a submit file or list messages to the screen depending on the parameters in the **SUBMIT** command.

**configuration file.** Configuration files specify the characteristics of devices, such as parallel printers, serial printers, or other devices you connect to a workstation's communications ports.

**crash dump.** A crash dump is the output (memory dump) resulting from a system failure.

**cursor.** On B 21, B 22, B 26, B 28, and B 38 workstations, the cursor is a blinking underline that indicates the place within a field where you can make your next entry. On B 27 workstations, the cursor is a blinking rectangle within the field.

**DAM.** See Direct Access Method.

## Glossary-4

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**debugger.** The Debugger is a process used at the symbolic instruction level to debug FORTRAN, Pascal, and Assembly language programs. It allows you to examine and modify memory, to set and clear breakpoints, and to produce formatted displays of memory.

**delimiter.** A delimiter is a character used to separate other characters.

**device.** A device is a hardware component such as a printer, tape, floppy disk drive, or hard disk drive.

**device configuration file.** A Device Configuration file provides information that the system needs to communicate properly with a device such as a printer.

**device password.** A device password protects a device.

**diacritical characters.** Diacritical characters are special characters found in some languages. These characters are usually vowels that have a diacritical mark above them.

**diacritic escape keys.** Diacritic escape keys are keys on non-USA systems that provide a method for producing the diacritical characters found in some languages.

**Direct Access Method.** The Direct Access Method (DAM) provides random access to disk file records identified by record number. When you create the DAM file, you specify the record size.

DAM supports COBOL Relative I/O; any BTOS language program can use a direct call for DAM.

**directory.** A directory is a group of related documents, programs, or other data stored in files on a volume. When you request files from a directory other than the current path you must enclose the directory name in angle brackets (<>).

**directory password.** A directory password protects a directory on a volume.

**direct printing.** Direct printing transfers text directly from files to a parallel or serial printer attached to the workstation. You cannot begin a direct printing operation while another is in progress, and you must wait until a direct printing operation finishes before you can use the workstation for other activities.

**\$directories.** When BTOS receives a request with the directory \$, the directory name is expanded to \$nnn. (nnn represents the application user number.)

**Editor.** The Editor is an application that allows you to edit text using the keyboard. The text appears on the screen as it would on a typewritten page. You can activate the Editor with the **EDIT** command.

**environment.** An environment is a program that has control of the system at any given time. Environments include the SignOn form, the Executive, the Mail Manager, utilities (such as **FLOPPY COPY**), applications (such as word processing), and Compilers.

**error message.** An error message is a message that appears on the screen when an error occurs in the file management system or a subsystem.

**escape sequence.** An escape sequence is a sequence of characters that activates a function.

**Executive.** The Executive is the BTOS user interface program; it provides many convenient utilities for file management.

**exit run file.** An exit run file is a user-specified file that the system loads and activates when an application system exits. Each application partition has its own exit run file.

**expansion.** See File expansion.

**field.** A field is an area of a command form in which you enter parameters.

**file.** A file is a document, program, or other set of related data stored as a unit in a directory on a single volume.

**File Area Block.** There is a File Area Block for each contiguous disk sector in an open file. The File Area Block specifies how many sectors exist and where they are located.

**file expansion.** File expansion is the replacement of escape sequences in a submit file. The system substitutes the parameters passed to the file for the escape sequences, and activates nested calls to other submit files.

**file name.** A file name is a unique name which describes the contents of a file. It can contain a maximum of 50 alphanumeric characters including uppercase and lowercase letters, periods, hyphens, and right angle brackets (>).

**file prefix.** A file prefix is the part of a file name that identifies a subdirectory. It appears at the beginning of the file name and is followed by a right angle bracket.

**file specification.** A complete file specification has the form [VolumeName]<DirectoryName>FileName.

**file suffix.** A file suffix appears at the end of a file name and further identifies the file. It consists of a period, hyphen, or right angle bracket followed by three or more alphabetic characters.

**floppy disk drive.** A floppy disk drive is a mass storage device that uses a flexible mylar disk coated with a suitable substance to record information in the form of electromagnetic signals.

## Glossary-6

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**FORTRAN.** FORTRAN is one of the high level languages you can use to write BTOS programs. You can use the FORTRAN Compiler to convert the programs into BTOS object modules.

**Function Key display.** The Function Key display is a highlighted field, divided into ten sections corresponding to the ten variable function keys. The function key labels appear in reverse video indicating the operation each key performs.

**hard disk.** A hard disk is a mass storage device that has very light read/write heads and very close head-to-disk clearance. Its storage medium is a rigid disk enclosed in a dust-free environment to achieve high information density and fast access time.

**hexadecimal values.** Hexadecimal values make up the notation system of representing numbers in base sixteen. The numerals 0 through 9 retain their standard numeric values, and A equals 10, B equals 11, etc. up through F equals 15. Each key on the keyboard has an assigned two-digit hexadecimal value.

**image mode.** Image mode is a printing mode option that prints the banner page and recognizes the escape sequences for manual intervention. It does not perform character-code conversions.

**Indexed Sequential Access Method.** The BTOS Indexed Sequential Access Method (ISAM) provides random access to fixed-length records identified by multiple keys stored in disk files.

**initialization.** Initialization is a process performed at the beginning of a program to ensure that all indicators and constants are set to prescribed conditions and values before you use the program.

**ISAM.** See Indexed Sequential Access Method.

**.lib.** .lib is the standard file name suffix for library files.

**log file.** The log file [Sys]<Sys>log.sys is the error-logging file. Each time a system error or event occurs, the system enters a report in this log file.

**.map.** .map is the standard file name suffix for list files.

**master workstation.** A master workstation is the hub of a cluster configuration. It provides a file system, queue management facility, and other services to all the cluster workstations. In addition, it supports its own interactive and application systems.

**mouse device.** A desk-top hand-held device used with the K2 (revision 1 or later) keyboard (2-button mouse) or the K1, K2, or K3 keyboards (3-button mouse). You use it to simulate keys by selecting menu items, pointing the cursor to text or graphics, or using it in interactive graphics applications.

**nesting escape sequences.** Nesting escape sequences refers to the creation of a series of escape sequences arranged at different levels—one written within another. The second and subsequent ones are called nested.

**node.** A node is the name of a workstation within a communications network. A node must have the communications software installed.

**nonconditional expansion.** A nonconditional expansion allows you to replace a submit escape sequence with a parameter you specify in the SUBMIT command form.

**nonconditional expansion.** A nonconditional expansion allows you to replace a submit escape sequence with a parameter you specify in the SUBMIT command form.

**normal mode.** Normal mode is a printing mode option that 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 during printing.

**notice file.** The notice file, [Sys]<Sys>Spooler.notice, is a text file you create and revise using the Editor or a word processing program. It contains text that the system prints on banner pages.

**null string.** A null string is a sequence of blank characters that usually does not change the default condition set up in the original command or submit file.

**.obj.** .obj is the standard file name suffix for object module files.

**operating system.** An operating system is the part of the system software that supervises the running of individual programs. Its functions include loading programs, allowing concurrent operation of two or more programs, scheduling processes within the system, and providing management of information.

**parameter.** A parameter is a variable or constant that is transferred to and from a subroutine or program. You enter parameters in the fields of Executive command forms.

**parameter passing.** Parameter passing occurs when the system passes parameters specified in the SUBMIT command form to the submit file where they replace the escape sequences in the designated fields.

**partition.** A partition is a memory area of an operating system. There are two types of partitions: system and application.

**Pascal.** Pascal is one of the high level languages you can use to write BTOS programs. You can use the Pascal Compiler to convert the programs into BTOS object modules.

**password.** A password is a string of characters or a word which provides a security measure. You can assign a password to a user, device, volume, directory, or file. Once a password is assigned, a user must enter the password to gain access to the designated level of the system.



## Glossary-8

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**primary application partition.** A primary application partition supports interactive programs, such as the Editor or a word processing program, that use the keyboard and screen to interact with the user.

**process.** A process is a program that is running.

**Queue Index file.** The Queue Index file is a special file containing the entries that define your system's queues.

**Queue Manager.** The Queue Manager is a BTOS utility that coordinates users' print commands with the Spoolers that manage the system's printers.

**read mode.** In read mode, you can only read files, not modify them.

**Record Sequential Access Method.** Record Sequential Access Method (RSAM) files are sequences of fixed-length or variable-length records. You can open the files for read, write, or append operations.

**redo feature.** The Redo feature of the Executive allows you to recall to the screen the last command form you used with the parameters as you typed them. To redisplay the last command form, you press the **F1** key at the Executive Command field.

**request frame.** A request frame is a unit of measure that the operating system uses to designate a block of data being transferred.

**retry feature.** The Retry feature of the **LCOPY** command allows you to retry copying the current file after operation fails during the copying procedure. To initiate Retry, you press **F1**.

**reverse video.** Reverse video displays dark characters on a light screen.

**RSAM.** See Record Sequential Access Method.

**.run.** .run is the standard file name suffix for run files.

**run file.** A run file is a complete program: a memory image of a task in relocatable form, linked into the standard format BTOS requires.

**SAM.** See Sequential Access Method.

**screen attributes.** Screen attributes control the presentation of characters on the screen.

**secondary application partition.** A secondary application partition is a memory area created and controlled with operations provided by the Application Partition Management facility. The system uses secondary partitions only for noninteractive user applications and/or system services.

**Selective backup.** Selective backup is the process of copying selected files to an archive file. You implement this process with the **SELECTIVE BACKUP** command.

**Sequential Access Method.** Sequential Access Method (SAM) files emulate a conceptual, sequential character-oriented device known as a byte stream to provide device-independent access to devices.

**Spooler.** The Spooler is a BTOS utility that manages the operations of printers you assign to its control. The Spooler uses special files called queues to store print requests until a printer becomes available.

**Spooler Configuration file.** The Spooler Configuration file contains information that the system uses to coordinate print operations between the Spooler and the Queue Manager.

**stable sort.** A stable sort is a sort in which input records whose sort keys are equal always appear in the output in the same order as they appear in the input.

**Status Area.** The Status Area is the top two lines of the screen in the Executive level, which provides continuously updated information about the system status.

**Status Code.** A Status Code reports the success or failure of a requested operation. Information about BTOS Status Codes appears in the *BTOS Status Codes Reference Manual*.

**subcommand.** A subcommand appears within the operational procedures of a command and makes available an additional operation.

**subdirectory.** A subdirectory is a set of related files within a directory.

**submit facility.** The submit facility allows the substitution of a sequence of characters from a file for characters typed at the keyboard.

**submit file.** A submit file, used in the submit facility, contains the same sequences of characters that you would type to desired programs.

**submit file escape sequence.** A submit file escape sequence consists of two or three characters that indicate the presence of the escape sequence (% or >), followed by a code to identify the special function, followed by an argument to the function.

**Sys.cmds.** The Executive Command file ([Sys]<Sys>Sys.cmds) contains information on each Executive command.

**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 BTOS image.

**system directory.** The system directory <Sys> of each volume contains entries for all the system files. You create this directory with the **IVOLUME** command.

## Glossary-10

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**System Image.** The System Image file ([Sys]<Sys>SysImage.sys) contains a run file copy of BTOS.

**system partition.** The system partition contains BTOS and dynamically installed system services.

**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.

**system volume.** The operating system bootstraps from the system volume [Sys]. The <Sys> directory of the system 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.

**task.** A task consists of executable code, data, and one or more processes.

**task image.** A task image is a program stored in a run file that contains code segments and/or static data segments.

**text file.** A text file contains bytes that represent printable characters (such as letters, numbers, punctuation, etc.) and/or control characters (such as tab, new line, etc.).

**type-ahead buffer.** The type-ahead buffer stores keystrokes that BTOS cannot respond to immediately. BTOS looks in the buffer for keystrokes first before reading them directly from the keyboard.

**typescript file.** The system creates a typescript file in the logged-on directory during each Editor session. This file contains the typescript of the session.

**User Control Block.** The User Control Block (UCB) contains the default volume, directory, password, and file prefix set by the last **PATH** or **SET FILE PREFIX** operation.

**user file.** A user file is a file on the system directory that identifies the user and specifies the environment the system activates after the user signs on and exits from an application.

**User File Editor interface.** The User File Editor interface consists of menus and forms that allow you to enter information the system uses to configure user files.

**user file templates.** User file templates are special files that store the keywords and parameters that define the User File Editor's menus and forms.

**utilities.** Utilities are programs that use the Executive user interface (such as **FLOPPY COPY** or **IVOLUME**).

**volume.** A volume is a floppy diskette or hard disk on which you store data or programs. You must initialize a volume before you can use it.

**Volume Home Block.** Each volume has a Volume Home Block that contains information about the volume, such as its name and the date it was created. The Volume Home Block also contains pointers to the log file, the system image file, the Crash Dump Area, the Allocation Bit Map, the Master File Directory, and the File Header Blocks.

**volume password.** A volume password protects a volume. A volume must have a password for directory or file passwords to take effect.

**wild card character.** The system has two wild card characters: an asterisk (\*) and a question mark (?). The asterisk represents any string of characters; the question mark represents any individual character. For some operations, you can use wild card characters in file specifications. The system then tries to match the portion of the name that appears before or after the wild card character and performs the requested operation for each matched file name.



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