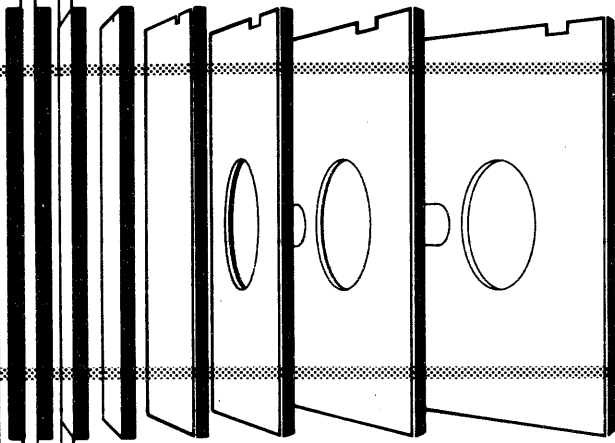


**DBS 16**



**MP/M-86**  
**DBS-NET**

**SYSTEMS REFERENCE MANUAL**

DBS 16

**MP/M-86 AND DBS-NET SYSTEMS REFERENCE MANUAL**

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PREFACE

**PURPOSE AND SCOPE**

The DBS 16 MP/M-86 and DBS-Net Systems Reference Manual is a concise review of the MP/M-86 and DBS-Net operating systems. It includes complete descriptions of the Digilog enhancements used to adapt MP/M-86 for use on the DBS 16 microcomputer system.

The manual assumes that your operating system is up and running, and is meant to provide you with sufficient information to meet your daily operating needs. The focus of this manual is on software functions. Refer to the DBS 16 User's Manual for related information on setting up and initializing your system.

**ORGANIZATION OF MANUAL**

The manual is divided into the following sections:

**Section 1 - Getting Started with MP/M-86**

This section introduces you to MP/M-86 and DBS-Net, and describes operating systems structure and their usage in daily operation.

**Section 2 - Using MP/M-86 Utilities**

This section lists and describes the MP/M-86 operating system utilities. It shows you how to use them to configure your system; to handle your peripheral device functions; to create, edit, and store your files; and to develop your own MP/M-86 programs.

**Section 3 - MP/M-86 Error Messages**

This section lists error messages that can appear during MP/M-86 operation, and, where applicable, includes information on how you can correct the problem.

**Appendix A - DIGILOG-Specific Enhancements to MP/M-86**

This appendix summarizes, for easy reference, the Digilog enhancements to MP/M-86.

**Appendix B - Commonly Used MP/M-86 Utility Functions**

This appendix summarizes, in tabular form, the most common uses of MP/M-86 utilities. It specifies the appropriate command line, and the result or description of each command.

## Glossary of Related Terms

The glossary lists and defines the terminology used in this manual. You may find it helpful to look through it before reading the rest of the document.

## RELATED READING

For more information on the MP/M-86 operating system, refer to the following documentation, or to any of the numerous MP/M-86 handbooks that are available commercially:

1. MP/M-86 Operating System User's Guide (Digital Research)
2. MP/M-86 Operating System System Guide (Digital Research)
3. MP/M-86 Operating System Programmer's Guide  
(Digital Research)

Digital Research manuals are available through many computer dealers, or you can write to:

Digital Research  
PO Box 579  
160 Central Avenue  
Pacific Grove, CA 93950

For more information on the DBS 16 system, refer to the following manuals:

1. DBS 16 User's Manual
2. DBS 16 Hardware Description and Maintenance Manual

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SECTION 1  
GETTING STARTED WITH MP/M-86

1.1 OVERVIEW

This section tells you how to get started with MP/M-86 and DBS-Net. It introduces you to both operating systems and their use on your DBS 16 microcomputer system. Operating systems structure and daily operation are also described.

1.2 WHAT ARE MP/M-86 AND DBS-NET?

Both MP/M-86 and DBS-Net are multi-user operating systems (see Figure 1-1). MP/M-86 accommodates systems of up to four users, while DBS-Net is used in systems of up to 16 users.

MP/M-86 was designed by Digital Research, but Digilog has adapted it for use on the DBS 16. It provides basic computer functions, in a multi-user, multi-tasking environment, allowing you to manage computer-stored information and the DBS 16 hardware devices. One of its special features is a secret password system to ensure file security -- an important consideration in multi-user systems.

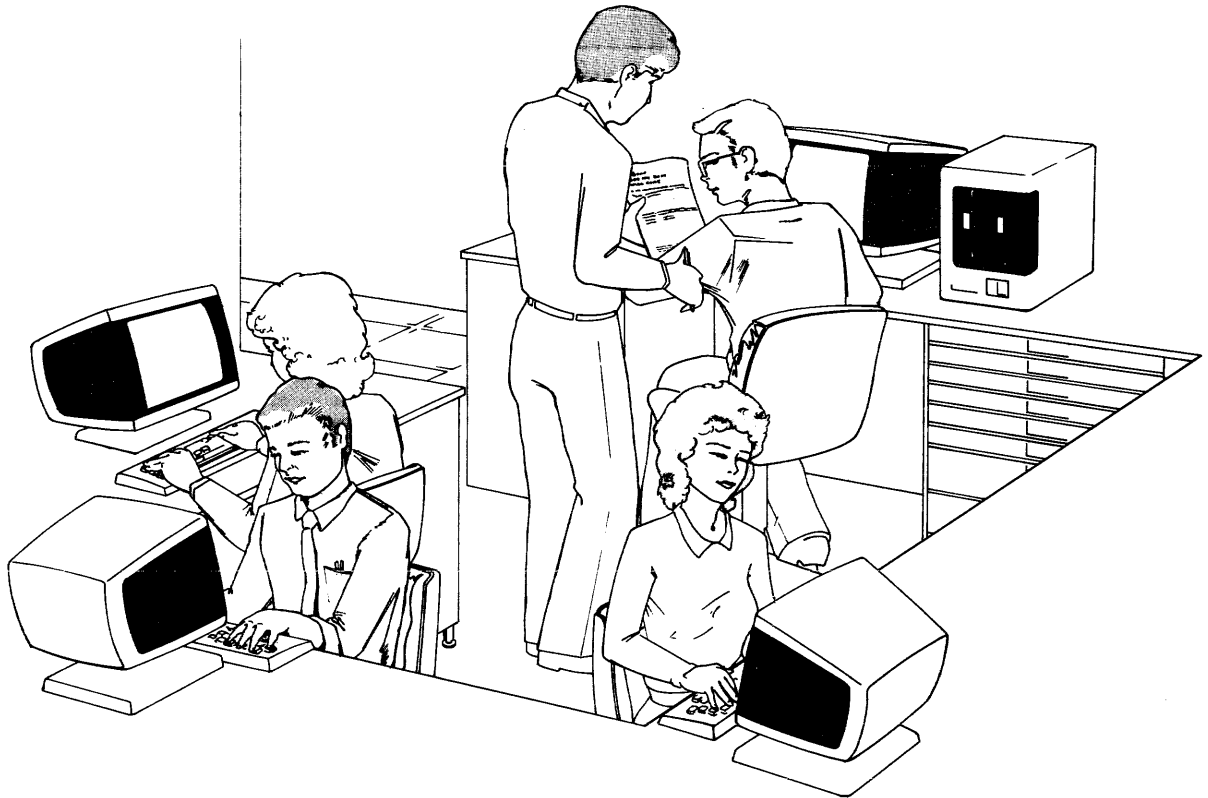


Figure 1-1. A Multi-User System Configuration



DBS-Net accommodates up to 16 users, all linked into one large network. A basic network configuration could consist of up to 16 workstations, a Desktop unit and Expansion Box, and one or more printers. DBS-Net is designed to run on a system using MP/M-86. It runs concurrently with MP/M-86 and its operation is transparent, leaving the MP/M-86 user interface unchanged. If you are operating under DBS-Net, you can still use MP/M-86 as described in this manual.

Because DBS-Net does not affect general MP/M-86 operation (nor the MP/M-86 utilities described in Section 2), all further references to MP/M-86 are understood to represent system operation using MP/M-86 alone or inclusive of DBS-Net.

### 1.3 RUNNING MP/M-86

From a user's point of view, MP/M-86 operation consists mainly of running operating system UTILITIES. These utilities are computer programs designed to perform specific functions, such as erasing or copying files. To start a utility, you must enter a COMMAND. Further on in this section, you'll find information on how to use utility commands, as well as descriptions of two other kinds of commands found in MP/M-86. In Section 2, you'll find complete descriptions of the MP/M-86 utilities available on your system disk.

After you have completed system configuration, as described in your DBS 16 User's Manual, you are ready to start computer operation. If you have not yet configured your system, refer to the User's Manual for instructions on:

1. Customizing MP/M-86 for your terminal, drives and printer.
2. Formatting your Winchester disk drive or any floppy disks you intend to use.
3. Making a backup copy of your operating system disk.

Remember, check with your computer dealer before you buy application software for your system, to be sure that it is compatible with MP/M-86.

### 1.4 THE MP/M-86 SYSTEM BANNER AND PROMPT

Assuming that you have configured MP/M-86 to your system, you will see the following system banner displayed onscreen at Workstation 0 (an abbreviated version appears on all other workstation screens):

```
MP/M-86 Version 2.1

MP/M-86 V2.0 Loader

Code Paragraph Address = 0040
Data Paragraph Address = 06F6
Last Paragraph        = 0D57

DBS-16 Master
System Generated : 02/24/84

MP/M-86 2.1 [20 July 82]
Copyright (c) 1982, Digital Research

0E>
```

Figure 1-2. MP/M-86 Banner and Prompt

The banner tells you which version of MP/M-86 is on your operating system disk. You can also see the system prompt (0A>). It tells you the default (or current) drive, and that the system is ready to accept commands.

The operating system always defaults to this drive, but if you want to change to your alternate drive, enter d: after the system prompt (d represents the letter of the alternate drive). Whenever you reboot the system, MP/M-86 returns to the default drive.

The prompt also indicates the default or current user area. Refer to paragraph 1.6.2 for more information about the MP/M-86 User feature.

By inserting the system disk in the default drive and turning on the Desktop Unit and your workstation, you have "cold booted" the system. This procedure is performed at power-up, but you can also cold boot by pressing the RESET button at the rear of the Desktop Unit. When you cold boot, any currently-running program is interrupted and the system banner appears onscreen.

### 1.4.1 Changing Disks

You must enter **DSKRESET** before changing disks. This utility checks for open disk files, and lets you know whether or not you can change disks. If there are any open files, and you change disks, the files could be inadvertently destroyed.

### 1.5 DISPLAYING THE OPERATING SYSTEM DIRECTORY

Now, enter **DIR** after the system prompt, and press Return to display the files on your operating system disk. The d: in the following listing represents the drive containing the operating system. Compare your disk directory to this display:

```

d: MPM          SYS : DBS16MPM  SYS : D16MPML  SYS : D16XIOS  MPM
d: UPDATE      DOC : ABORT     CMD : ASM86    CMD : ASM86    COM
d: ATTACH      CMD : BACK16W  CMD : BANNER   CMD : BDOS     MPM
d: CIO         MPM : CLOADER   CMD : CLOCK    RSP : CONFSIO  CMD
d: CONSOLE    CMD : CSYS16   CMD : DDT86    CMD : DIR      CMD
d: DSKRESET   CMD : ED        CMD : ERA      CMD : ERAQ     CMD
d: FORM16W    CMD : FORMATF  CMD : GENCMD   CMD : GENSYS   CMD
d: HELP       CMD : HELP     HLP : MEM     MPM : MPMLDRT  SYS
d: MPMSTAT    CMD : MPMSTAT  RSP : PIP     CMD : REN      CMD
d: REST16W    CMD : RTM      MPM : SDIR    CMD : SET      CMD
d: SHOW       CMD : SPOOL    CMD : STAT     CMD : STOPSPLR CMD
d: SUBMIT     CMD : SUP      MPM : SYSDAT  MPM : SYSVERS  CMD
d: TMP        RSP : TOD     CMD : TYPE     CMD : VERI16W  CMD
d: XIOS       MPM : $0$    SUP

```

Figure 1-3. MP/M-86 Disk Directory

If you have 48 TPI floppy disks, some of these files will be on the system disk and the remainder on the utilities disk.

If your listing does not match the listing in Figure 1-3, contact your computer dealer.

## 1.6 MP/M-86 FILES

Looking at the directory in Figure 1-3, you see a list of MP/M-86 operating system filenames, each followed by a three-character extension. This extension is known as a filetype. For example, the PIP filename is followed by the filetype, CMD. Like all MP/M-86 utilities, PIP is a CMD file. Not all files require filetype extensions. A filetype is used to group files into families, helping to differentiate one type of file from another. For example, you may want to add a filetype of TXT to all your text files.

MP/M-86 has already established the following filetypes:

- CMD -- Machine Language program; all MP/M-86 utilities.
- \$\$\$ -- Temporary file.
- A86 -- ASM.86 Source file. Used to convert assembly programs to hex machine code.
- H86 -- Assembled ASM.86 program in hex format.
- SUB -- List of commands to be executed by SUBMIT utility.
- LIB -- Library file. Used to store programming routines for user-written programs.
- BAK -- Backup file.

A filetype is assigned to a file at its creation. You can create a file using the ED utility (or an MP/M-86 compatible word processing application program). You can also create a file from an existing one by copying a file to a new disk location (using the PIP utility), and renaming it. Some MP/M-86 utilities automatically create files as a result of processing. Refer to paragraphs 2.5.3 and 2.4.3 for detailed information on the MP/M-86 ED and PIP utilities.

The filetype is one of three parts of the file specification (filespec), which identifies a file. The format for a filespec is:

**d:filename.filetype.**

Here is a typical example of a filespec:

**B:TEST.CMD**

- B: -- A one-character drive designator. Indicates the file is on the disk in drive B. You must include the drive designator if the file is on your alternate disk. No space is allowed between the drive designator and the filename. They must be separated by a colon (:).
- TEST -- A filename of up to eight characters.
- .CMD -- A filetype of up to three characters. The sample file is an MP/M-86 utility. Filename and filetype must be separated by a period (.).

An MP/M-86 filespec can also include a password (refer to paragraph 1.6.2). The password is added immediately after the filename (and type), and is separated from it by a semicolon.

### 1.6.1 Special Characters in File Specifications: Wildcards

When you want to access more than one file (i.e., during a disk directory search, or whenever a program processes several files), MP/M-86 provides two "wildcard" characters, a question mark (?) and asterisk (\*), to simplify the process. The operating system reads the filespec and searches the directory for filenames matching the wildcard pattern. ? replaces a single character in the filespec; \* replaces a group of characters.

For example:

?????????.??? matches any file

\*.\* matches any file

?ES? matches BEST, PESP, TEST, but not BERT, PREP,  
or TSET

\*.CMD matches all CMD files only

A\*.TXT matches all files that begin with A and  
have the filetype TXT

### 1.6.2 Protecting Your Files

MP/M-86 gives you several ways to secure your files against accidental change or erasure. You can protect files by assigning them user numbers, file and disk attributes, and passwords.

#### User Numbers

You can separate your files into 16 file groups, ranging from 0 (zero) to 15. You can specify a user area by invoking the USER utility, described in paragraph 2.4.11. All files created in or copied to the new user area are then restricted to that area. For example, if you are user number 5, you can get a listing of files created under user number 5, but you cannot list, change, or erase files in user area 4.

Most MP/M-86 utilities can only access files under the current user number. For instance, if you enter DIR to list the directory, you will get a display of only those files in the current user area.

## **File and Disk Attributes**

File attributes control how a file is accessed. All files default to the Read/Write (RW) and Directory (DIR) attributes. RW allows a user to change or erase a file. DIR means that a file in a specific user area cannot be accessed from any other user area.

You can change these defaults. To restrict an RW file, turn on its Read-Only (RO) attribute. RO indicates that the file can be read, but not altered or erased. If, for example, a file is a utility, a user can still run the utility, but cannot change it.

To make a DIR file accessible to users in all user areas, turn on its System (SYS) attribute. Keep the file in user area 0. (A SYS file in any other user area will not have system-wide access.) Do this for all your MP/M-86 utilities, as well as for any other files you'd like to make generally accessible.

When you want to display your files, you can use the DIR utility command to list your DIR files and your SYS files (refer to paragraph 2.5.1).

Drives, like files, default to the RW attribute. You can turn on the RO attribute for drives, too. Data on a disk in an RO drive can be read, but cannot be written to. Remember, though, when you turn off the RO attribute for the drive, the files on that disk will return to the RW default, except those that have individually been assigned RO attributes. Those files must be reassigned separately.

Refer to the STAT and SET utilities (paragraphs 2.4.8 and 2.5.8) for instructions on how to assign file and disk attributes.

## **Passwords**

You can assign any password of up to eight characters to your disk or file. There are two steps to establishing password protection:

1. You must first assign a password to the disk
2. Then turn on the protection (using the SET utility)

After following this procedure, you can assign an effective password to any new file (either newly-created or newly-copied) on the disk.

If you assign passwords to utilities, as well as to your files, remember to include the password in the command line. For example,

**REN SECRET AFILE;SECRET=BFILE;SECRET**

This command demonstrates how passwords are used in a command line, when both an MP/M-86 utility and the desired file require passwords.

A convenient password feature allows you to set a default password at the beginning of a work session. Once the password is set, you can access protected files without having to repeatedly enter the password (as long as all the files are protected by the same password).

Refer to paragraph 2.5.8, the SET utility, for a complete description of the MP/M-86 password feature.

### **1.6.3 Other File Options**

The MP/M-86 SET utility also provides date and time stamping options, as well as a means of setting up user-defined attributes.

#### **Time Stamping**

The MP/M-86 date and time stamping option lets you track file creation, date of last file access, and date of last update. However, you can only record two of the three options at one time: either creation and update dates, or last access and update dates.

Once you choose which combination you want for your disk, don't change the options unless you reformat your disk. Simply changing the option does not alter the dates for already-existing files. Only the column headings will change, to indicate the new time stamping options.

To turn on time stamping, you use the SET commands in paragraph 2.5.8. Once you have turned on the desired time stamping options for the disk, any new files, or files newly-copied to the disk, are automatically time stamped. Time stamping for any existing file will have to be turned on individually. This procedure is also given in paragraph 2.5.8.

#### **User-Defined Options**

Using a special SET utility command, you can activate up to four undefined attributes. You can assign them any meaning or attach them to an application program (or one written yourself) to determine more information about a file itself.

#### 1.6.4 The Directory Label

MP/M-86 creates a directory label when a password or time stamping is set for a drive. The label (see the example under paragraph 2.4.5, the SHOW utility) tells MP/M-86 that these attributes have been turned on for the disk. If you are working with several disks, you can create your own directory labels to help identify them. Instructions are provided with the SET utility description.

#### 1.7 MP/M-86 UTILITIES

You can run some MP/M-86 utilities by simply typing in the utility name and pressing Return. However, most command lines include filenames with options in the command tail.

For example:

##### **ERA B:YRFILE**

ERA -- This is the command keyword, identifying the command to be executed. ERA is the MP/M-86 utility used to delete files. You can leave a space between the prompt and the keyword.

B:YRFILE -- This is the command tail, consisting of the drive designator and the filename. The command tail contains optional information such as filename, options, or parameters. The drive designator and command tail must be separated by a colon.

Always press Return to execute the command. If your spelling or punctuation is incorrect, the system responds by displaying the command as you typed it, followed by a question mark (?). Re-enter the command.

Commands can be entered in any combination of uppercase and lowercase letters. Any spaces shown among the various parts of the command tail are usually required. See the examples in Section 2 for correct command line syntax.

MP/M-86 has set aside the following special characters for use as delimiters in both command lines and filespecs. Be sure to use these symbols only as delimiters, not as part of a file or command name:

. , ; : = [ ] < >

You will see these delimiters in use under the descriptions for MP/M-86 utilities in Section 2.



The following table lists the MP/M-86 utilities available on your operating system disk.

**Table 1-1. MP/M-86 Utilities (Part 1 of 2)**

<u>UTILITY</u>	<u>FUNCTION</u>
ABORT	Halts processing of detached programs.
ASM86	For user-written programs: translates assembly language programs into hex machine code.
ATTACH	Reattaches program to workstation sending command.
BACK16W	Copies Winchester contents to diskette.
BANNER	Allows customization of sign-on screen.
CLOADER	Writes the operating system from one disk(ette) to another.
CNET16	Configures DBS-NET to terminal and slave cards.
CONFPIO	Configures MP/M-86 to peripheral devices.
CONSOLE	Displays current console (workstation) number.
CSYS16	Configures MP/M-86 to a terminal and drives..
DDT86	Tool used to debug errors in user-written programs.
DIR	Displays all disk files assigned the DIR attribute. The option [SYS] added to the command displays SYS attribute files.
DSKRESET	Resets drive to accept new diskette.
ED	Allows user to create and alter text files.
ERA (built-in)	Deletes file from diskette.
ERAQ	Verifies file to be deleted before deletion.
FORMATF	Formats (48 TPI or 96 TPI) diskettes.
FORM16W	Formats and verifies Winchester disk.

**Table 1-1. MP/M-86 Utilities (Part 2 of 2)**

<u>UTILITY</u>	<u>FUNCTION</u>
GENCMD	Generates an executable program file from the output of ASM.86.
GENSYS	Generates the MP/M-86 operating system for use on the DBS 16.
MPMSTAT	Displays current operating system status.
PIP	Combines and copies files.
PRINTER	Displays and sets current printer number. (Not listed in directory.)
REN (built-in)	Renames files.
REST16W	Restores diskette contents to Winchester disk.
SDIR	Displays optional disk directory data.
SET	Sets file attributes, password protection, and time stamping.
SHOW	Displays directory label, password and time stamping information.
SPOOL	Sends files to printer for printing without interrupting console activity.
STAT	Displays and alters file and disk status.
STOPSPLR	Halts spooling to printer.
SUBMIT	Sends a file of commands to MP/M-86 for execution.
TOD	Sets and displays system time and date.
TYPE (built-in)	Scrolls text file contents onscreen.
USER (built-in)	Changes one user number to another.
VERI16W	Verifies Winchester disk format.

## 1.8 OTHER MP/M-86 COMMANDS

MP/M-86 provides two more command types for system operation: control character and line editing control character commands.

### 1.8.1 Control Characters

MP/M-86 control characters perform certain program functions without the use of a command line. To invoke a control character command, simultaneously press the CTRL key on your keyboard and the required letter key. Table 1-2 lists the key combinations and the result of each command. (The syntax used for pressing two keys simultaneously is: CTRL-Keyname.)

**Table 1-2. Control Character Commands**

<u>COMMAND</u>	<u>RESULT</u>
CTRL-C	1. Ends the currently operating program. 2. Resets the operating system; warm boot.
CTRL-D	Detaches process from console. Press again to reattach.
CTRL-P	Causes the printer to reproduce all console activity. Press CTRL-P a second time to end printing.
CTRL-Q	Resumes console listing after being halted by CTRL-S.
CTRL-S	Halts console listing temporarily. Press CTRL-Q to resume the listing activity.

### 1.8.2 Line Editing Control Characters

These control characters can be used to edit your MP/M-86 command lines. They are also invoked by simultaneously pressing the CTRL key and the desired letter. Please note that an application program can override these control key functions by assigning its own functions to the control keys. Refer to your application program documentation for any changes. Table 1-3 lists the line editing commands and their functions.

**Table 1-3. Line Editing Commands (Part 1 of 2)**

<u>COMMAND</u>	<u>RESULT</u>
CTRL-E	Moves the cursor to the beginning of the next line without erasing previous input.
CTRL-H	Deletes characters while backspacing the cursor.
CTRL-J	Same effect as pressing the Return key.

**Table 1-3. Line Editing Commands (Part 2 of 2)**

<u>COMMAND</u>	<u>RESULT</u>
CTRL-M	Same effect as pressing the Return key.
CTRL-R	Repeats on the next line what is typed on the current line.
CTRL-U	Deletes what is typed on the current line, and moves the cursor to the next line.
CTRL-X	Deletes all characters in a line, and moves the cursor back to the beginning of that line.

### **1.9 MP/M-86 MULTI-PROCESSING**

MP/M-86 enables users to run more than one program at a time. Once executing, a program is called a "process." Press CTRL-D to detach processes from your console screen. The number of programs you can detach and process is limited only by the amount of available space in memory. Once the process is complete, it must be reattached to your workstation. Press CTRL-D again to reattach, or use the ATTACH utility, paragraph 2.6.2.

When more than one program is sent to memory for processing, MP/M-86 "queues" them up. You can check the status of your programs (i.e., the number in the queue, or if completed) by using MPMSTAT (refer to paragraph 2.6.3).

SECTION 2  
USING MP/M-86 UTILITIES

2.1 OVERVIEW

This section defines each of the MP/M-86 utilities available with your DBS 16 system. There are four groups of utilities. You use them to:

1. Configure your operating system.
2. Provide general computer functions.
3. Handle files.
4. Handle and create programs.

Table 2-1 lists all the utilities described in this section.

Table 2-1. DBS 16 MP/M-86 Utilities

CONFIGURATION	GENERAL	FILE	PROGRAM
FORM16W	CONSOLE	DIR	ABORT
VERI16W	DSKRESET	SDIR	ATTACH
FORMATF	PIP*	ED	MPMSTAT
CSYS16	PRINTER	ERA	ASM.86
CLOADER	SHOW	ERAQ	GENCMD
CONFSSIO	SPOOL	PIP*	DDT.86
GENSYS	STOPSPLR	REN	
BANNER	STAT*	SET	
CNET16	TOD	STAT*	
	TYPE	SUBMIT	
	USER		
	BACK16W		
	REST16W		

\*PIP and STAT can be invoked for both general computer functions and specific file handling functions.

## 2.2 HOW MP/M-86 UTILITIES ARE DESCRIBED

Each utility description includes the command line format, the purpose(s) of the utility, usage examples, and, if applicable, general information about the utility not covered by the examples.

The following example shows you the notation used in presenting the command line format.

**PIP (destination filespec)=(source filespec)**

All command keywords, like PIP in the example, are shown in uppercase. However, you can enter command lines in either uppercase or lowercase. The destination and source filespecs can be any filenames you want. Parentheses are used here to enclose generic terms. Do not include the parentheses when you are actually entering the command line.

### Command Line Notations

- n -- Any number can be substituted for the n.
- d: -- Any drive letter
- (filespec) -- The name of any file. (Don't include parentheses in the command line.)
- [ ] -- Brackets. These are required. They enclose special command line options.
- ... -- The item preceding the dot triplet can be repeated any number of times.

## 2.3 SYSTEM CONFIGURATION UTILITIES

The following utilities are used to configure MP/M-86 to your system.

1. FORM16W
2. VERI16W
3. FORMATF
4. CSYS16
5. CLOADER
6. CONFSIO
7. GENSYS
8. BANNER

### 2.3.1 FORM16W Utility

Command Line: FORM16W

Purpose: To prepare the Winchester disk for data storage.

#### How to Use the FORM16W Utility

Example: FORM16W

This command formats the Winchester disk drive, and also verifies that formatting was successful. It divides the disk into tracks, and records whether any bad tracks were found. When successfully formatted, the Winchester drive is ready for data storage.

FORM16W is only used when you want to reformat the Winchester disk. Remember, the entire disk is erased when you run this utility.

FORM16W prompts you through the formatting procedure described here:

1. Enter **FORM16W** after the system prompt, and press the Return key. The following message appears onscreen:

**Winchester Format and Verify Utility - Version 01/21/84.**

**\*\*\* WARNING \*\*\***

**Formatting the Winchester drive will ERASE ALL DATA stored on it.**

**MP/M-86 Note: Notify other users - the system is unaccessible during the Winchester format and verify.**

**Winchester Disk Storage Capacity:**

- (A) - 5 Megabytes
- (B) - 10 Megabytes
- (C) - 15 Megabytes
- (D) - 40 Megabytes

**Select ==>**

If you incorrectly select c (or C), FORM16W will attempt to format, but will respond with the following message:

**The disk size selected is larger than the physical capacity of the disk.**

2. After you have correctly selected the disk size, the following message appears:

**The Winchester has a storage capacity of:**

**(\_) - \_\_ Megabytes**

**Is this correct (Y/N) ?**

3. If the disk size is correct, type Y. The following message will display. If it is incorrect, type N and enter the correct disk storage capacity.

**Enter the word "FORMAT" followed by return to begin  
formatting;  
Type CTRL-C to exit safely -**

4. After you type in FORMAT, the system responds with:

**Formatting...** (Dots appear continually during  
format.)

If the format is successful, the system responds with:

**Format complete.**

If the format is not successful, the system responds with:

**\*\*\*FORMAT ERROR!!!**

5. FORM16W then verifies formatting and displays the following message:

**Verifying Track ####** (The #### field displays  
each track number during  
verification.)

**Verify completed.**

6. When format verification is complete, the following message is displayed along with the system prompt. The Winchester drive is now ready to accept data.

**Number of defective tracks found = #.**

(Where # is the number of tracks.)



### FORM16W Error Messages

If FORM16W detects an error, it displays one of the following messages:

**\*\*\* Disk Error. Unable to assign disk parameters!!!**

Appears at the beginning of formatting. Indicates a problem with the Winchester disk.

**\*\*\* THE MAXIMUM NUMBER OF ALTERNATE TRACKS HAS BEEN USED. \*\*\*  
\*\*\* WINCHESTER INTEGRITY SHOULD BE QUESTIONED. \*\*\***

This message is displayed if FORM16W finds errors in more than two percent of the drive (i.e., more than 2% of your drive is unusable). If this message appears, contact your computer dealer.

### 2.3.2 VERI16W Utility

Command Line: VERI16W

Purpose: To verify the physical condition of the Winchester drive.

#### How to Use the VERI16W Utility

Example: VERI16W

This command tests the Winchester disk. After the test is completed, VERI16W informs you whether or not an error has been detected. If an error is detected, VERI16W retrieves as much data as possible from the bad track, copies it to another track, and then notifies you which tracks are affected. It also places **LOST DATA** messages wherever data could not be saved in the affected files on your disk.

VERI16W is non-destructive. No data will be lost while the utility is verifying. However, you cannot perform any other system function while the test is in progress. (Press CTRL-C to abort the utility.)

1. Enter **VERI16W** after the system prompt, and press Return. The following message appears onscreen:

**Winchester Verification Utility - Version 01/21/84.**

**\*\*\* WARNING \*\*\***

**The Winchester will be unaccessible during the verification process.**

**Select option:**

**1 - Verify Disk**

**2 - Display Defective Track Summary**

**Enter ==>**

2. If you select 1, disk verification begins and the following message is displayed:

**Verifying Track ####** (The #### field displays each track number during verification.)

If an error is detected, VERI16W responds with:

**Disk verification completed.**

**Number of defective tracks found on this pass = #.**

**Defective sectors are filled with "...LOST DATA..." message.**

**Defective Track Relocation Log: Error on Track ####; data relocated to Track ####.**

**Number of Alternate Tracks used = ##**

**Number of Alternate Tracks remaining = ##**

-OR-

**Alternate Track #### is defective --- not used for data relocation.**

If no error is detected, VERI16W responds with:

**Disk verification completed.**

**Number of defective tracks found on this pass = 0.**

**No defective tracks on disk.**

3. If you select 2, and no defective tracks are found, the following message is displayed:

**No defective tracks on disk.**

If any defective tracks are found, the following message is displayed:

**Defective Track Relocation Log:**

**Error on Track ####; data relocated to Track ####.**

OR

**Alternate Track #### is defective --- not used for data relocation.**

4. When verification is complete, the system prompt reappears.

#### **VERI16W Error Messages**

If VERI16W detects an error during verification, it displays one of the following messages:

1. This message appears as a result of an initial read error:

**Unable to read Winchester Disk Log sector!**

2. This message appears if there is not enough free memory to verify the disk:

**Unable to allocate memory (BDOS Function 55)!**

3. This message appears if reserved memory cannot be accessed:

**Unable to free reserved memory (BDOS Function 57)!**

#### **2.3.3 FORMATF Utility**

Command Line: **FORMATF**

Purpose: To prepare floppy disk (diskette) for data input.  
Must use for all new disks.

#### **How to Use the FORMATF Utility**

Example: **FORMATF**

This command formats a floppy disk. **FORMATF** divides the disk into tracks, and records whether any bad tracks are found. After successful formatting, the floppy disk is ready for data entry.

You must invoke the **FORMATF** utility for all new disks before you can write to them. You can also invoke the utility to reformat any floppy disk. **FORMATF** erases the disk and re-establishes tracks.

You can format either 48 TPI or 96 TPI diskettes. **FORMATF** automatically checks the size of the disk before formatting it. If the utility fails to format a disk, the disk is probably defective.

**FORMATF** prompts you through the following procedure (press CTRL-C to abort the procedure):

1. Enter **FORMATF** after the system prompt, and press Return. The following message appears onscreen:

**Enter drive to format  
Key return to reboot:**

2. Enter the letter designating the drive to be used to format the disk, and press Return. The following message appears:

**Insert diskette in drive d. Key return to begin:**

3. The d in the message denotes the drive that you indicated. Insert your disk and press Return. The following message appears:

**Formatting...**

If formatting is successful, **FORMATF** displays the following message:

**Successful format.**

**Enter drive to format  
Key return to reboot.**

4. If you want to format another floppy, repeat steps 2 and 3. To exit the utility, press Return. The system prompt reappears.

#### **2.3.4 CSYS16 Utility**

Command Line: **CSYS16**

Purpose: To adapt MP/M-86 for existing DBS 16 terminal and drives.

##### **How to Use the CSYS16 Utility**

Example: **CSYS16**

This command gives your MP/M-86 operating system the necessary terminal data (i.e., number and type of drives, and their capacity), as well as the terminal type you are using, and its capabilities.

You must run **CSYS16** whenever you change your terminal or disk drive setups.

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CSYS16 prompts you through the following procedure. (Press CTRL-C to abort the utility.) If any of your entries do not correspond to the selections provided, the following message will appear onscreen:

**Invalid Entry**  
**Please re-enter =>**

1. Enter **CSYS16** after the system prompt, and press Return. The following display appears:

**System Customization Utility 01-Mar-84**

**Operating Systems:**

- (A) CP/M-86
- (B) MP/M-86

**Enter the letter of the system being configured: =>**

2. Enter the letter denoting your type of operating system. The following display appears:

**Do you want the MP/M Directory-Buffer option? (Y/N) =>**

3. After you enter either Y or N for the buffer option, the following display appears:

**Mass Storage Systems:**

- (A) Dual floppy-disk System
- (B) Winchester/floppy System

**Enter the letter of your selection: =>**

3. If you select the dual floppy disk system, the following display appears:

**Floppy Disk Sizes:**

- (A). Dual 48 tpi drives
- (B). Dual 96 tpi drives

**Enter your selection: =>**

If you select the Winchester/floppy system, the following display appears:

**Floppy Disk Sizes:**

- (A) 48 tpi Drives
- (B) 96 tpi Drives

**Enter your selection: =>**

5. After you select the size of the Winchester and floppy disk drives, the following display appears:

**Winchester sizes:**

- (A) 5 Megabyte
- (B) 10 Megabyte
- (C) 15 Megabyte
- (D) 40 Megabyte

**Enter your selection: =>**

6. After you select the size of the disk drives, the following display appears:

**Currently supported Non-DBS16 disk formats are:  
(Not required for normal System operation)**

- (A) IBM (48 tpi, 156kb)
- (B) TeleVideo (48 tpi, 342kb)
- (C) Altos (96 tpi, 708kb)

**Enter the letter of your choice or return to ignore: =>**

7. The following display appears after you make your selection:

**Do you want the default setup for the terminal(s)  
(9600 baud, 7-bit chars, Even parity)**

**(Y/N)? =>**

8. If yes, the disk drive and terminal configurations are displayed. If no, terminal information will be displayed for you to configure each terminal.

**You have set the following Configuration:**

**MP/M Operating System**

**The MP/M directory-buffer option is NOT enabled**

**Mass Storage:**

**Drive A:** (Your selections appear  
**Drive E:** after the colon.)  
**Drive F:**

**Workstation Configuration:**

**Terminal 1:** (Your selections appear  
**Terminal 2:** after the colon.)  
**Terminal 3:**  
**Terminal 4:**

**Make this configuration PERMANENT? (Y/N) =>**

9. When all the data is correct, enter Y. The following message appears:

**Standby while your new System files are being written...**

**Now writing system loader...**

**Copy System Loader Utility - Vers 02-21-84 A  
Loader written to disk**

10. To change any entries, enter N. The following message appears:

**The following parameters may be altered:**

**(A) Re-select Mass Storage  
Change Workstation parameters:  
(B) Character size  
(C) Parity  
(D) Baud-rate  
(E) Re-select Non-Standard format disks  
(F) Change the Directory Buffer option**

**Enter letter of parameter to be changed: =>**

11. Enter your changes when the selected parameter screen appears. After you have made your corrections, the disk drive and terminal configuration in step 8 will re-appear.
12. After CSYS16 is complete, run the GENSYS utility.
13. If you entered the incorrect operating system type, the following error message will appear while CSYS16 is attempting to configure the system:

**One of the systems files cannot be found on the  
currently logged disk!!!**

### 2.3.5 CNET16 Utility

Command Line: CNET16

Purpose: To adapt DBS-Net for existing DBS 16 terminal(s) and slave cards.

## How to Use the CNET16 Utility

Example: **CNET16**

This command gives your DBS-Net operating system necessary terminal data, as well as the number of slave cards you are using.

You must run CNET16 whenever you change your terminal or the number of slave cards.

CNET16 prompts you through the following procedure. (Press CTRL-C to abort the utility.) If any of your entries do not correspond to the selections provided, the following message will appear onscreen:

**Invalid entry, please try again =>**

1. Enter **CNET16** after the system prompt, and press Return. The following display appears:

**CNET16 - DBS-NET alteration program. (vers: 03/21/84)**

- (A) Change the number of slave cards in system.**
- (B) Alter terminal parameters.**
- (C) Configure and write loader to system tracks.**
- (D) Exit.**

**Please Enter Selection =>**

2. If you select **A**, you must enter the current number of slave cards in the system.

**Please enter the number of slave cards you have in your system (1-6)=>**

The following messages display after you make a selection:

**Loading Master File MASTCOM.DBS  
Copying MASTCOM.DBS to MASTCOM.RSP**

**Loading Master File CHILD.DBS  
Copying CHILD.DBS to CHILD.RSP**

The DBS-Net utility options are displayed again.



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3. If you select **B**, the following message and terminal parameters are displayed:

**The default values for terminal parameters are:  
9600 Baud  
Even Parity  
7 bits per character  
Do you wish to change any terminal parameters (Y/N)?**

If you answer **Y**, the following display appears:

**Please enter terminal number to change (5 - 28)=>**

If you answer **N**, the DBS-Net utility options are redisplayed.

4. After you enter the current number of terminals, the following display appears:

**Baud Rate Choices:**  
(A) 110 BAUD  
(B) 300 BAUD  
(C) 600 BAUD  
(D) 1200 BAUD  
(E) 2400 BAUD  
(F) 4800 BAUD  
(G) 9600 BAUD  
(H) 19.2K BAUD  
**Please Enter Selection =>**

5. After you select the terminal baud rate, the following display appears:

**Parity Choices:**  
(A) EVEN PARITY  
(B) ODD PARITY  
(C) NO PARITY  
**Please Enter Selection =>**

6. After you select the parity type, the following display appears:

**Bits Per Character Choices**  
(A) 5 BITS  
(B) 6 BITS  
(C) 7 BITS  
(D) 8 BITS  
**Please Enter Selection =>**

7. After you select the number of bits per character, a display summarizing the current terminal parameters appears. The following display is an example of a typical terminal:

```
Your choices were:  
(G) 9600 BAUD  
(A) EVEN PARITY  
(C) 7 BITS  
Is this correct (Y/N)?
```

8. If all your entries are correct, enter Y and the following message appears:

```
Do you wish to change another (Y/N)?
```

If you answer Y, the terminal parameter selections (step 3) will reappear.

If you answer N, the following messages and DBS-Net utility options will appear:

```
Loading Master File D16SXIOS.MPM  
Copying D16SXIOS.MPM to SXIOS.MPM
```

9. If any of your entries are incorrect, enter N. The terminal parameter selections will reappear.
10. If you select C, the following message appears:

```
Loading Master File MPMLDRT.SYS  
Copy System Loader Utility - Vers 02-21-84 A  
Loader written to disk
```

11. After this message appears, the CNET16 utility terminates and the system prompt reappears.
12. If you select D in step 1, the CNET16 utility exits and the system prompt reappears.

NOTE

You must run MGENSYS every time you change the number of slave cards.

You must run SGENSYS every time you change the terminal parameters.

### 2.3.6 CLOADER Utility

Command Line: CLOADER

Purpose: To put a loader on an MP/M-86 operating system disk(ette).

#### How to Use the CLOADER Utility

Example: CLOADER

This command writes the MP/M-86 operating system loader (bootstrap) program from one disk(ette) to another disk(ette).

You must run CLOADER whenever you want to create an operating system disk(ette) for system initialization at power-up or reset.

NOTE: You must also copy the MPM.SYS system file onto the same disk(ette), using the PIP utility, when creating an operating system disk(ette).

CLOADER prompts you for the source and destination drives. The source drive is where the system loader program, MPMLDRT.SYS, resides. The destination drive is the one to which the loader program is copied (written).

If you enter a non-existent drive designator, the following message appears, with the actual incorrect letter in place of the Z:

**System Loader file not found on drive Z:**

If you enter an incorrect character (e.g., a numeral), the following message appears:

**Invalid Drive**

Follow these steps to create an operating system disk(ette):

1. Enter **CLOADER** at the system prompt, and press the Return key. The following message appears onscreen:

**Copy System Loader Utility - Vers 02-21-84 A**

**Select loader to write:**

**A - CP/M-86 Loader (CPMLDRT.SYS)**

**B - MP/M-86 Loader (MPMLDRT.SYS)**

**Enter -**

2. After you select the loader file, the following message will appear:

**Enter source drive of System Loader file -**

3. Enter the letter for the drive containing the system disk(ette). The following message appears:

**Destination Drive (or return to quit) -**

4. Enter the letter for the drive to which you want to write the operating system, or press the Return key to exit CLOADER. The following message then appears, with the drives that you selected in place of X and D:

**Source on X: -- Destination to D:.**

**Hit <RETURN> to write it, CTRL-C to quit -**

5. If you press the Return key, the following message appears:

**Loader written to disk**

6. If you press CTRL-C, the following query is displayed:

**CLOADER: Abort (Y/N)?**

If you answer Y, the CLOADER utility terminates.

If you answer N, the message in step 5 will appear.

### 2.3.7 CONFSIO Utility

Command Line: CONFSIO

Purpose: To alter current MP/M-86 configuration for your DBS 16 peripheral devices.

#### How to Use the CONFSIO Utility

Example: **CONFSIO**

This command allows you to change your current serial I/O port configuration. You only need to change the default configuration if the printer (or other input or output hardware device) that you want to attach to your DBS 16 has different parameter requirements.

CONFSIO prompts you through the following procedure. After you enter **CONFSIO**, you do not have to press Return for any other entries. CONFSIO reacts automatically to each response you enter.

Press CTRL-C to abort the utility.

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1. Enter **CONFSIO** after the system prompt and press Return. The following message appears onscreen:

**Serial I/O Port Configuration Utility-Version 09-15-83**

**Current Serial I/O Port Configuration:**

**Baud Rate** :  
**Character Length (bits)** :  
**Parity** :  
**Number of Stop Bits \*** :  
**Carrier Detect Option** :

(\* This parameter cannot be altered. It is provided for your information only.)

**Options:**

**A - Modify Serial I/O Port Configuration**  
**B - Set the selected configuration temporarily**  
**C - Set the selected configuration permanently**  
**D - Quit**

**Enter A to make changes to the I/O port configuration.**

2. If you select **A**, the following screen is displayed:

**Baud Rate:**

<b>A - 50</b>	<b>I - 1800</b>
<b>B - 75</b>	<b>J - 2000</b>
<b>C - 110</b>	<b>K - 2400</b>
<b>D - 134.5</b>	<b>L - 3600</b>
<b>E - 150</b>	<b>M - 4800</b>
<b>F - 300</b>	<b>N - 7200</b>
<b>G - 600</b>	<b>O - 9600</b>
<b>H - 1200</b>	<b>P - 19.2K</b>

**Select baud rate- H**

The system displays the default baud rate.

**NOTE:** CONFSIO calculation of the number of stop bits that the system uses is based on baud rate. If the baud rate is less than 300, the number of stop bits is 2; if more than 300, it is 1.

3. After you enter the letter denoting the desired baud rate, the following is displayed onscreen:

**Enter character length (number of data bits: 5/6/7/8)- 7**

The system displays the default character length.

4. After you enter the letter denoting the number of data bits, the following is displayed onscreen:

**Parity Error Detection:**

**A - NONE  
B - ODD  
C - EVEN**

**Select parity- C**

The system displays the default parity.

5. After you enter the letter denoting the parity, the following is displayed onscreen:

**Carrier Detect (CD) Option:**

**Enabling the carrier detect option provides the necessary handshake for a modem.**

**A - DISABLED  
B - ENABLED**

**Select Carrier Detect option- A**

6. After you enter the letter denoting the carrier detect option, CONFSIO summarizes your selections in the following display:

**Selected Serial I/O Port Configuration**

**Baud Rate :  
Character Length (bits) :  
Parity :  
Number of stop bits :  
Carrier Detect Option :**

**Options:**

**A - Modify Serial I/O Port Configuration  
B - Set the selected configuration temporarily  
C - Set the selected configuration permanently  
D - Quit**

7. If you want to change your selections, enter **A**. Enter **B** to retain the configuration until you re-boot the system (i.e., through the current work session). Enter **C** if you want to make the changes permanent. Enter **D** to end the utility. If you enter **D** without selecting **B** or **C**, your changes are deleted, and the current I/O port configuration maintained.

If, at anytime while running CONFSIO, you make an invalid entry, the following is displayed onscreen:

**\*\*\* Improper Selection \*\*\***

### 2.3.8 GENSYS Utility

Command Line: GENSYS

Purpose: To generate the MP/M-86 operating system for use on the DBS 16 system.

#### How to Use the GENSYS Utility

Example: GENSYS

This command generates MP/M-86 for your DBS 16 system. Do not reboot the system (press RESET) until GENSYS has finished executing. During execution, GENSYS destroys the current operating system on the disk. A new operating system is not written to disk until the final stage of GENSYS execution. Refer to the Digital Research MP/M-86 Operating System Guide for more information on GENSYS. Also refer to "Installation Procedures DBS 16 and Expansion Chassis" (provided with the manual) for GENSYS examples.

### 2.3.9 BANNER Utility

Command Line: BANNER

Purpose: To design a screen banner for display at system power-up.

#### How to Use the Banner Utility

Example: BANNER

This command lets you create a banner of your choice to display whenever the system is powered up or reset.

1. Enter **BANNER** after the system prompt, and press Return. The following display appears:

**Set System Banner Utility - Version 02-27-84**

**Options:**

- A - Display system banner**
- B - Enter new system banner**
- C - Make new system banner permanent**
- D - Quit**

**Enter selection -**

2. If you select **A**, the current system banner and the BANNER utility options are displayed onscreen.
3. If you select **B**, the following message is displayed. After you press the ESCAPE key twice, the BANNER utility options are redisplayed.

**Enter the desired system banner (up to 199 characters),  
press <ESCAPE> twice when done**

4. If you select **C**, the following display appears:

**Select Multiuser System to Update:**

- A - MP/M Master (MPM.SYS, XIOS.MPM)**
- B - DBS/NET (MASTER.SYS, SXIOS.MPM)**

**Enter -**

5. After you select the operating system, one of the following displays appears:

**Updating MP/M-86 System files:  
Updating file MPM.SYS...Done.  
Updating file XIOS.MPM...Done.**

OR

**Updating DBS/NET System files:  
Updating file MASTER.SYS...Done.  
Updating file SXIOS.MPM...Done.**

6. If you select an operating system (e.g., DBS/NET) that is not on the disk(ette) in the current drive, the following message will appear:

**Updating MP/M-86 System files:**

**The file MASTER.SYS was not found on drive A:  
Type <RETURN> to continue, CTRL-C to abort -**



7. If you select **D**, the command is terminated and the system prompt is displayed.

## 2.4 GENERAL COMPUTER UTILITIES

The following utilities are used for general computer functions:

1. CONSOLE
2. DSKRESET
3. PIP
4. PRINTER
5. SHOW
6. SPOOL
7. STOPSPLR
8. STAT
9. TOD
10. TYPE
11. USER
12. BACK16W
13. REST16W

### 2.4.1 CONSOLE Utility

Command Line: CONSOLE

Purpose: To display the current console number.

#### How to Use the CONSOLE Utility

Example: CONSOLE

This command displays the number of the console at which the command is entered. Each console (workstation) in your system is assigned a console number during system power-up. Console numbers range from 0 to 15.

The console number is important when using ABORT (to abort a program from another console) and DSKRESET (to reset disks currently accessed by users at other consoles). Console 0 displays the entire system banner when MP/M-86 is cold-booted (refer to paragraph 1.4).

### 2.4.2 DSKRESET Utility

Command Lines: DSKRESET  
DSKRESET d:  
DSKRESET d:,d:,d: ...

Purpose: To enable the user to change disks.

## How to Use the DSKRESET Utility

### 1. Resetting All Disk Drives

Example: **DSKRESET**

This command resets all disk drives at any time after initial system power-up. At power-up, MP/M-86 automatically resets all the disk drives.

### 2. Resetting Specific Drives

Example: **DSKRESET B:, C:, D:**

This command resets drives B, C, and D for any new disks inserted in those drives. You must invoke DSKRESET before changing a disk, in case other users are accessing files on that disk. If DSKRESET finds an open file on a drive, a message similar to the following example would appear:

**DISK RESET DENIED, DRIVE B: CONSOLE 4 PROGRAM ERA**

The example shows that DSKRESET did not occur because the user at console 4 was using the ERA utility on the disk in drive B.

## General Information

If you remove a disk while another user is accessing a file on that disk, that file could be damaged.

If you forget to reset the drive before changing disks, and try to access a file on the new disk, MP/M-86 will set the drive to Read-Only. Enter DSKRESET to successfully access the file.

### 2.4.3 PIP Utility

Command Lines: PIP (destination filespec [destination user number])=(source filespec [options])

PIP (destination disk [destination user number])=(source filespec [options])

PIP (destination filespec;password [destination user number])=(source filespec;password [options])

PIP (destination filespec [destination user number])=(source filespec1, source filespec2 [options])

PIP (destination device)=(source device [options])

- Purposes:
1. To copy file(s) from one disk to another
  2. To copy file(s) from one user area to another.
  3. To rename a file after copying.
  4. To combine two or more files into one.
  5. To copy a text file from disk to printer (or other logical output device).
  6. To create a file on disk from a logical input device.
  7. To transfer data from a logical input device to a logical output device.

### How to Use the PIP Utility

#### 1. Copying a File from Disk to Disk

Example: **PIP B:=YRFILE**

This command copies a file from the default disk to the designated disk; in this case, B. Both disks now contain files named YRFILE. If there were a file on the designated disk already named YRFILE, it would be erased as a result of the copy.

Files are always copied from and to corresponding user areas, unless otherwise specified. (See subtopic 4.)

PIP displays the message, **COPYING**, followed by the filespec, until the procedure is completed.

#### 2. Copying a Group of Files

Example: **PIP B:=YR\*.\***

This command copies all files with names matching the wildcard characters to the disk in drive B. Any file with the same name as the destination file(s) is erased as a result of the copy.

PIP displays the message, **COPYING**, followed by each filespec, until the procedure is completed.

#### 3. Copying Files Within the Same User Area

Example: **PIP LEFILE=YRFILE**

This command copies YRFILE to the disk in the default drive, within the same user area. The name of the new file is LEFILE. Any file with the same name as the destination file is erased as a result of the copy.

PIP displays the message, **COPYING**, followed by the filespec, until the procedure is completed.

4. Specifying a Destination User Area in a Copy Command

Example: **PIP [G4]=YR\*.#**

This command copies all files matching the filename wildcard characters to the disk in the default drive, and into user area 4. You can specify a user area for the destination. However, you cannot specify a user area in the "source" part of the command tail. The source file must be in the current user area in order to be copied.

PIP displays the message, **COPYING**, followed by each filespec, until the procedure is completed.

5. Combining Files into One File

Example: **PIP B:LEFILE [G10]=A:AFILE,BFILE,CFILE**

This command combines three source files into one file called LEFILE. The source files are copied from drive A to drive B, and into user area 10.

6. Echoing Keyboard Entry at the Printer

Example: **PIP LST:=-CON:**

This command writes whatever is being typed at the keyboard to the printer. You can terminate the echo by pressing CTRL-Z.

7. Copying Password Protected Files

Example: **PIP B:=A:DFILE.TXT;SECRET**

This command copies DFILE, which is password-protected, from drive A to drive B. If the password had not been included, PIP would display the following message:

**INVALID PASSWORD**

8. Printing Out a File

Example: **PIP LST:=-B:AFILE.TXT**

This command writes AFILE to the printer.

## 9. Issuing Multiple PIP Commands

Example: PIP

When this command is entered, PIP responds with an asterisk (\*). Press Return after entering each PIP command. When you have finished making your entries, simply press the Return key once more. A sample display follows:

```
A>PIP
*LEFILE=AFILE,BFILE,CFILE
*B:=-YRFILE.DAT
*XFILE=A:TFILE
*QFILE=*,*
*
```

### PIP Guidelines

- PIP always "copies to" and "gets from" the current user number, unless you specify a user area in the destination part of the command line.
- PIP will not make a copy if there is not enough space on the disk to which you are copying. Be sure to check the available space on disk before attempting a copy (see STAT utility).
- PIP does not erase a previously generated file copy until the new copy is completed. If there is insufficient space for the new copy, the old copy remains.
- File attributes are transferred with a file (i.e., a copy of a file with an RO attribute retains that attribute). If you are copying over an RO file, PIP displays a message asking if you want to delete it. Answer Y or N.
- You can use PIP to copy entire disks; however, PIP will not copy MP/M-86 system files.
- Whenever you are copying to or from a logical device, you can end the copy by pressing any key. The following list of logical device names are those you can use for this type of copying:
  - CON: -- Use to refer to keyboard input or output to console screen.
  - RDR: -- Used to refer to input from auxiliary device.
  - PUN: -- Used to refer to output from auxiliary device.
  - LST: -- Used to refer to output list device, the printer.

Each of these logical device names is an assignment for an actual device in your DBS 16 system. The names are assigned before you receive your system.

- PIP checks to see if a file is open (being accessed by another user) before copying it. If a file is open, PIP aborts the copy command.

### PIP Command Options

The PIP utility, by giving you a variety of copying options, lets you process source files several ways. These options are listed in Table 2-2. The following paragraph explains the table.

The n represents any number; s can be any word (or sequence of characters). An option follows the file or device it affects, and must be enclosed in brackets, [ ]. No space is allowed between the numeric value and the option letter.

The only option allowed in the destination portion of a command line is the user area option, [Gn].

Table 2-2. PIP Options (Part 1 of 2)

<u>OPTION</u>	<u>DESCRIPTION</u>
A	Speeds the disk backup process. When you include [A] in a PIP command line, PIP turns on a marker in every file being copied. If any file is subsequently accessed, the marker is turned off. PIP then copies only those files onto the backup disk at the next disk copy. Enter this command line to generate a backup: <b>PIP D:=D:*.#[A]</b>
Dn	The n denotes the maximum column width of the printer (destination device). This option deletes characters past column n, and is used if source file lines are too long for the printer (i.e., an 80-character printer).
E	Displays onscreen the data being copied.
F	Removes the form feed settings in source file. Used with P option to set new page length in your destination file.
Gn	User specifies either the user area of the source file, or the user area of the destination file.

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Table 2-2. PIP Options (Part 2 of 2)

<u>OPTION</u>	<u>DESCRIPTION</u>
H	Checks for proper Intel hex file format. Error messages are displayed onscreen.
I	Automatically invokes H option, and tells program to ignore :00 records in source data.
K	Stops filename display during multiple file copies. Detaches PIP from the console.
L	Changes uppercase in source file to lowercase in destination file.
N	Adds line number to destination file. For example, N2 places a 0 (zero) before the line number, and a tab after the number. If T option is also set, tabs are expanded.
O	Used if combining object code files.
Pn	Sets page length (n=number of lines). Default is 60 lines per page. The F option removes form feed settings in source file.
Qs	Ends copying from source after word or characters denoted by s. End word with CTRL-Z. (See "Ss".)
R	Used to copy SYStem files.
Ss	Starts copying from source at word or characters denoted by s. End word with CTRL-Z. Qs and Ss are used together. Ss marks first word of text to be copied; Qs marks last word of text to be copied.
Tn	Changes tab to n spaces in destination file. Tab settings are divisible by n.
U	Changes lowercase characters in source file to uppercase in destination file.
V	Verifies that data has been correctly copied to a disk file.
W	Overrides R0 attribute of a file being copied over by new file of the same name.
Z	When Z follows a source filename, PIP resets the parity bit of each data byte in output.

## How to Use PIP Options

### 1. Copying Part of a File

Example: **PIP LST:=YRFILE[SOOnce upon^Z Qever after.^Z]**

The syntax **^Z**, in this example, means pressing CTRL-Z. This command copies only that portion of YRFILE to the printer that begins with "Once upon" and ends with "ever after."

### 2. Setting Page Length

Example: **PIP LST:=MFILE[FP65]**

This command sends MFILE to the printer, changing its page length to 65 lines per page. The F option overrides the form feed parameters already set in the source file. New form feed parameters are established in the new file to accommodate the line numbers specified in the P option.

### 3. Using Several Options at Once

Example: **PIP B:=\*.\*[VWR]**

Three options are used in this example, which directs PIP to copy all the files from the default drive to drive B (except for MP/M-86 files). The V tells PIP to verify that the files have been correctly copied. The W lets PIP copy over any RO destination files. The R tells PIP to copy all SYS files also.

## 2.4.4 PRINTER Utility

Command Lines: **PRINTER**  
**PRINTER (n)**

Purpose: To assign or set a printer to a console.

### How to Use the PRINTER Utility

#### 1. Displaying Printer Number for Requesting Console

Example: **PRINTER**

This command asks MP/M-86 which printer is assigned to the console making the request. A typical response follows:

**LIST NUMBER = 0**

The response indicates that when the console operator requests that data be copied to the printer, the data will be printed at printer 0. Printers are assigned sequential numbers in the order that you attach them during system configuration; i.e., printer 0, printer 1, printer 2.



## 2. Assigning a Console to a Printer

Example: **PRINTER 3**

This command assigns the console to printer 3. The system responds with:

**LIST NUMBER = 3**

Now all print requests sent from the console will go to printer 3. Once you reset the system (cold or warm boot), the **PRINTER** command is cancelled. Your console then defaults to the printer assigned during configuration.

### 2.4.5 SHOW Utility

Command Lines: **SHOW**  
**SHOW [option]**  
**SHOW d: [option]**

Purpose: To display the following information about designated drives:

1. Drive attributes. Remaining space is expressed in K-bytes.
2. Drive characteristics.
3. Current user number and all active user areas.
4. Directory label.
5. List of **SHOW** options.

NOTE: **SHOW** displays the same information as the **STAT** utility. In addition, **SHOW** lets you display the directory label.

#### How to Use the SHOW Utility

##### 1. Displaying Drive Attributes and Remaining Space

Example: **SHOW** or **SHOW SPACE**

Both commands provide the same information. A sample response follows:

**A: RW, SPACE: 78K**

The response shows that you can read from and write to the default drive, and that it has 78K bytes of space remaining.

## 2. Displaying Drive Characteristics

Example: **SHOW C:DRIVE**

This command displays how data is stored on the disk in drive C. A sample response follows:

```
C: DRIVE CHARACTERISTICS
1,800: 128 BYTE RECORD CAPACITY
200: KILOBYTE DRIVE CAPACITY
50: 32 BYTE DIRECTORY ENTRIES
50: CHECKED DIRECTORY ENTRIES
100: RECORDS/DIRECTORY ENTRY
8: RECORDS/BLOCK
12: SECTORS/TRACK
8: RESERVED TRACKS
```

The following abbreviated listing explains the drive characteristics:

REC.CAP.	=	maximum record storage capacity
DRIVE CAP.	=	maximum K-byte storage capacity
DIR.ENT.	=	maximum number of available directory entries
CHK.DIR.ENT.	=	number of directories checked to verify disk identity
REC./DIR.ENT.	=	maximum file size in records before requiring another directory entry. (Directory keeps track of file location; large files may require several directory entries.)
REC./BLK.	=	block size: minimum amount of space assigned to a file
SEC./TRK.	=	number of tracks on disk
RES.TRK.	=	number of tracks reserved for MP/M-86 use

To display drive characteristics for all online drives, enter:

**SHOW DRIVES**

3. Displaying User Information

Example: **SHOW USERS**

This command displays the current user number and all active user areas on the default drive. A sample response follows:

```
ACTIVE USER : 5
ACTIVE FILES : 0 1 2 3 4 6
```

The second line of the display shows user areas with files assigned to them. These are the active user areas.

4. Displaying the Directory Label

Example: **SHOW B:LABEL**

This command displays the directory label for drive B. A sample response follows:

**LABEL FOR DRIVE B:**

<b>DIRECTORY LABEL</b>	<b>PASSWDS REQD</b>	<b>MAKE XFCBS</b>	<b>STAMP CREATE</b>	<b>STAMP UPDATE</b>	<b>LABEL CREATED</b>	<b>LABEL UPDATED</b>
------------------------	---------------------	-------------------	---------------------	---------------------	----------------------	----------------------

<b>LABEL2</b>	<b>ON</b>	<b>ON</b>	<b>ON</b>	<b>ON</b>	<b>07/03/86 8:10</b>	<b>08/19/86</b>
---------------	-----------	-----------	-----------	-----------	----------------------	-----------------

The display shows that the directory label name for drive B is LABEL2.

Password protection is ON. The passwords assigned to all new files (or newly-copied files), as of the label creation date, are activated. File passwords would not be required if password protection were turned off for the drive.

The MAKE XFCBS attribute is turned ON automatically when time stamping or password protection is turned on. XFCBs are Extended File Control Blocks allotted to disk files to accommodate password and time stamping data. When this attribute is ON, the system automatically allocates XFCBs to new files. (Refer to paragraph 2.5.8, SET Utility.)

STAMP CREATE indicates that the CREATE time stamping option has been turned ON for the disk. The system records the creation date and time for any new file on the disk, and stores the information in the file XFCB. If the ACCESS option were selected, this field would be marked STAMP ACCESS. The system would then record the latest access date and time for any new file on disk. (Refer to paragraph 2.5.8, SET Utility.)

STAMP UPDATE indicates that the UPDATE time stamping option has been turned ON for the disk. The system will record the date and time of the latest update for any new file on the disk. The information is stored in the file XFCB. (Refer to paragraph 2.5.8, SET Utility.)

The last two columns store the time stamping information for the directory label, LABEL2, showing the date and time of label creation and the latest update.

## 5. Getting Help

Example: **SHOW HELP**

This command displays SHOW options.

### 2.4.6 SPOOL Utility

Command Lines: SPOOL (filespec)  
SPOOL (filespec, filespec, ...)  
SPOOL (filespec) [DELETE]

Purpose: To send a file to the printer for printing.

#### How to Use the SPOOL Utility

##### 1. Getting a Printout

Example: **SPOOL MYFILE**

This command prints out MYFILE, and frees the console for other uses. A sample response follows:

```
MP/M-86 V2.0 SPOOLER
- ENTER STOPSPLR TO ABORT THE SPOOLER
- ENTER ATTACH SPOOL TO RE-ATTACH CONSOLE TO SPOOLER
***SPOOLER DETACHING FROM CONSOLE***
```

##### 2. Printing Out and Deleting a File

Example: **SPOOL C:ZFILE [DELETE]**

This command prints out ZFILE. After the file is printed, it is deleted.

The SPOOL utility is more advantageous than the PIP utility when sending files to the printer, because it frees up the console for other uses. After processing a file, you must reattach SPOOL to the console using the ATTACH SPOOL command line. (If reattaching SPOOL from another console, specify the console number that sent the original SPOOL command.)

### 2.4.7 STOPSPLR Utility

Command Line: STOPSPLR

Purpose: To halt a spooling operation in progress, and empty the spool queue.

#### How to Use the STOPSPLR Utility

Aborting a Spooling Operation

Example: **STOPSPLR**

This command aborts a spooling operation, and empties the SPOOL queue. You can specify a console number with this command, by including the number of the console that originated the SPOOL command in the STOPSPLR command line.

### 2.4.8 STAT Utility

Command Lines: STAT  
STAT d:=RO  
STAT d: (filespec)  
STAT (filespec) [RO or SYS or DIR or SIZE]  
STAT DSK: or USR:  
STAT VAL:

Purposes: 1. To provide information about disks, drives, files, or devices.  
2. To assign or change drive or file attributes.

#### How to Use the STAT Utility

##### 1. Checking Available Space on Disks

Example: **STAT**

This command requests a readout of the amount of free storage space on all system disks. (To check a specific drive, include the drive designator.) A sample system response follows:

**A: RO, Free Space: 88K**  
**B: RW, Free Space: 32K**

Drive A is Read-Only (cannot be altered), and has 88K bytes of available space.

Drive B is Read/Write (can be accessed, changed, or deleted), and has 32K bytes of available space.

2. Checking Available Space on Specific Disk

Example: **STAT B:**

This command displays the amount of free space on a specified disk. However, it does not display the drive attribute.

3. Assigning a Drive Attribute

Example: **STAT B:=RO**

This command sets drive B, previously set to Read/Write, to Read-Only. You can access, but not alter, data on the disk. The default attribute for drives and files is RW.

4. Assigning a File Attribute

Example: **STAT YRFILE=DIR**

This command assigns the DIRectory attribute to YRFILE. The file was previously set to the SYStem attribute, making it available to all users. The file is now accessible only to the current or default user number.

(The default attribute for drives and files is DIR).

5. Checking Available File Space

Example: **STAT YRFILE [SIZE]**

This command requests a display of the amount of space, in K-bytes, used by the specified file. A sample system response follows:

DRIVE A:					USER 0
SIZE	RECS	BYTES	FCBs	ATTRIBUTES	NAME
32	16	18K	1	DIR RW	B:YRFILE.DAT
TOTAL:		18K	1		

**B: RW, FREE SPACE: 50K**

The sample response displays the drive that the file is on (drive A), and the user number assigned to the file (user number 0).

SIZE -- The amount of space taken up by the file. Includes both empty and consumed records. The example was written to at random, so that empty records may appear throughout the file. If the example were written to sequentially, the file size would equal the number of records shown in the next column.

RECS -- The number of records in the file. (Files are made up of records.)

BYTES -- The number of bytes in the file.

FCBs -- File Control Blocks. Indicates the number of directory entries used by the file. The system uses FCBs to access a file on disk.

ATTRIBUTES -- Defines file accessibility. In this case, the file has the default attributes DIR and RW. Access is limited to User 0, but the user can alter the file as needed.

If the example had requested information about more than one file (i.e., STAT YR\*.\*), the files would be listed alphabetically, and their BYTES and FCBs included in the total.

## 6. Displaying File Attributes

Example: **STAT B:MYFILE.TXT**

This command requests a display of the attributes assigned to MYFILE. The file is on drive B. A typical response follows:

RECS	BYTES	FCBs	ATTRIBUTES	NAME
16	16K	1	DIR RW	B:MYFILE.TXT

-----

16K 1 (1 file=2-1K blocks)

**Bytes remaining on B:24K**

MYFILE takes up 16K bytes of space, and uses one FCB per directory entry. The file attributes are DIRectory (accessible only to current user area), and Read/Write (data can be accessed and altered).

The totals under the dotted line are helpful when a group of files is involved. They show how many K-bytes are taken up by the files. The information in parentheses shows the space that a group of files occupies on a 48 TPI disk. You can use this data to determine if enough space exists to back up the files from your hard disk.

## 7. Listing Drive Characteristics

Example: **STAT DSK:**

This command requests a display of drive characteristics for online drives. It performs the same function as the command: **SHOW D:DRIVE**. Refer to paragraph 2.4.5, SHOW Utility, for more complete information.

## 8. Determining User Numbers on Disk

Example: **STAT USR:**

This command displays the current user number, and which user areas have files in them (i.e., active user numbers). A sample system response follows:

```
A:ACTIVE USER: 0  
A:ACTIVE FILES: 0, 4, 9
```

Designate a drive to display the active user areas on that disk.

## 9. Displaying Possible STAT Commands

Example: **STAT VAL:**

This command displays possible STAT commands. A sample system response follows:

```
READ WRITE DISK: A:=-RW  
SET ATTRIBUTE: A:(filename.typ) [RO/RW/SYS/DIR]  
DISK STATUS: DSK: A:DSK  
USER STATUS: USR: A:USR
```

### General Information

If you enter wildcard characters in the filespecs when invoking the STAT utility, MP/M-86 lists the files in alphabetical order.

### 2.4.9 TOD Utility

Command Line: TOD (time specification or P)

Purposes:

1. To display the time and date.
2. To set the time and date.
3. To continuously display time and date.

#### How to Use the TOD Utility

##### 1. Displaying Date and Time

Example: **TOD**

This command displays the date and time currently set on your system. For example:

```
10/09/84                02:08:22
```

NOTE: At delivery of your system, the time and date are set to zero.



2. Setting Date and Time

Example: **TOD 03/26/85 02:15:30**

This command sets the desired date and time. You enter the correct figures in the command tail. The system responds with the following message:

**PRESS ANY KEY TO SET TIME**

When the time that you designated occurs, press any key. The system displays the current date and time.

3. Continuously Displaying Date and Time

Example: **TOD P**

This command continuously displays the date and time until you press any key.

**General Information**

The date and time display is not essential to MP/M-86 operation. After system shutdown or reset, you have to reset the time and date.

**2.4.10 TYPE Utility**

Command Lines: **TYPE (filespec)**  
**TYPE (filespec) [PAGE]**  
**TYPE (filespec) [Pn]**

Purpose: To display the contents of a text file onscreen.

**How to Use the TYPE Utility**

1. Displaying a File

Example: **TYPE B:YRFILE.TXT**

This command displays file YRFILE, on drive B, on the screen.

2. Displaying a File Page by Page

Example: **TYPE MYFILE [PAGE]**

This command displays MYFILE, but halts the file display every 24 lines. Press any key to restart the display.

### 3. Designating Number of Lines to Display

Example: **TYPE MYFILE [P15]**

This command displays MYFILE by the number of lines that you designate in the command. In the example, the file is displayed 15 lines at a time. Press any key to restart the display.

#### General Information

Press CTRL-S to halt the scroll. Press CTRL-Q to restart. To list a file at the printer simultaneously with the screen display, press CTRL-P. (Pressing CTRL-P a second time halts the echo at the printer.)

If the requested file is not found, the message, **NO FILE**, appears onscreen. You cannot display a CMD file; only unintelligible characters will appear onscreen.

#### 2.4.11 USER Utility

Command Line: **USER (number)**

Purpose: To display or change the current user number.

#### How to Use the USER Utility

##### 1. Displaying the Current User Number

Example: **USER**

This command displays the current user number.

##### 2. Assigning a User Number

Example: **USER 6**

This command changes the current user number to 6. When assigning a user number, you can select any number from 0 to 15.

#### General Information

The User concept is explained in paragraph 1.6.2. Also, refer to paragraph 2.4.8, subtopic 6, for information on how to display the active user numbers (user areas containing files).

## 2.4.12 BACK16W Utility

Command Line: BACK16W

Purpose: To copy files from the Winchester disk to pre-formatted floppy disks.

### How to Use the BACK16W Utility

#### 1. Copying the Entire Winchester Disk

Example: **BACK16W**

This command copies the files in all user areas from the Winchester disk to floppy disk(s). The following message is displayed:

**Backing up ENTIRE winchester, ALL user groups.  
Continue? (Y/N) :=>**

#### 2. Copying Files in Current User Area

Example: **BACK16W \*.\***

This command backs up all files in the current user area.

#### 3. Copying Specific Files

Example: **BACK16W \*.CMD**

This command copies all files in the current user area with a .CMD filetype from the Winchester disk to floppy disk(s). The following message is displayed:

**Backing up from User Group # -  
Continue? (Y/N) :=>**

#### 4. Copying Multiple Files

Example: **BACK16W (filename filename ...)**

This command copies the specified filename(s) in the current user area from the Winchester disk to floppy disk(s). The following message is displayed:

**Backing up from User Group # -  
Continue? (Y/N) :=>**

4. If you answer Y in step 1, 2, or 3, the following message is displayed. If you answer N, the BACK16W utility terminates, and the system prompt appears.

**Verify floppy writes? (Y/N) =>**

Verifying each backup increases execution time.

5. After you answer Y or N, the following message appears:  
**Install first disk in volume, hit return when ready:**
6. After you press the Return key, the following message appears:  
**Enter Volume ID string (16 chars max):**
7. Enter an identification name to label the first disk, the following message appears:  
**Enter Date of backup (MM-DD-YY):**
8. After you enter the date, the following display appears:  
**Enter time of backup (HH:MM)**
9. After you enter the time, the following message displays:  
**Backing up User Number #:**
10. Each file is displayed onscreen after it is successfully copied to the floppy disk(s).
11. The following message appears, if another floppy disk is required for backup:  
**\*\* Disk 0 done! \*\***  
**Load next disk, hit return when ready**  
**\*\* Waiting for Next Disk! \*\***
12. When all specified files are copied, the following messages is displayed:  
**BACKUP complete. ## files saved.**

### 2.4.13 REST16W Utility

Command Line: REST16W

Purpose: To restore a Winchester disk previously backed up to floppy disk(s).

#### How to Use the REST16W Utility

1. Enter REST16W after the system prompt, and press Return. The following message appears onscreen:  
**Winchester Restore Utility V3.0**  
**Continue? (Y/N): =>**

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2. If you answer Y, the following message appears. If you answer N, the REST16W utility terminates and the system prompt will appear:

**Install first disk in volume, hit return when ready:**

3. After you press the Return key, the following message is displayed (floppy disk header info was entered in backup):

**Restoring from Volume ID:** (floppy disk header info)  
**date time**

**Continue? (Y/N) : =>**

If you answer Y, the following message is displayed. If you answer N, the REST16W utility terminates, and the system prompt appears.

**Restoring to User #**

4. Each file is displayed after it is successfully restored. When all files have been restored, the following message appears:

**RESTORE complete. ## files recovered.**

## 2.5 FILE HANDLING UTILITIES

The following utilities are used to handle files:

1. DIR
2. SDIR
3. ED
4. ERA
5. ERAQ
6. PIP
7. REN
8. SET
9. STAT
10. SUBMIT

### 2.5.1 DIR Utility

Command Lines: DIR d:  
DIR (filespec)  
DIR (filespec, filespec, ...)  
DIR (filespec) [SYS]  
DIR (filespec) [Gn]

- Purposes:
1. To display DIR attribute online disk files.
  2. To display SYS attribute online disk files.
  3. To display a directory from another user area.

### How to Use the DIR Utility

#### 1. Listing the Directory Contents

Example: **DIR**

This command lists the files under the current user number (on the default disk) that have the DIR attribute. Use the drive designator if needed. If there are also SYS files on the default disk under the current user number, the following message appears: **SYSTEM FILE(S) EXIST.**

#### 2. Specifying Files in a DIR Request

Example: **DIR B:LEFILE**

This command searches for LEFILE in the disk directory on drive B. If LEFILE is under the current user number and has the DIR attribute, the filename will appear on your screen.

#### 3. Requesting a Multiple Directory Listing

Example: **DIR \*FILE.\*,\*.TXT**

This command requests a multiple directory display on the default disk. The listing will contain filenames of all DIR attribute files (in the current user area) that match the wildcard characters.

#### 4. Listing SYS Files

Example: **DIR [SYS]**

This command lists all files on the default drive (under the current user number) including those with the SYS attribute.

#### 5. Listing Files in Another User Area

Example: **DIR LEFILE [G3]**

This command displays a directory for LEFILE in user area 3.

### General Information

If the requested file is not found, the message, **NO FILE**, appears onscreen.

## 2.5.2 SDIR Utility

Command Line: SDIR [options]

Purpose: To display complete disk and file directory information. (Expanded version of DIR utility.)

### How to Use the SDIR Utility

#### 1. Displaying All Files on Default Disk

Example: **SDIR**

This command displays, in alphabetical order, complete directory information for all files on the default disk. The information includes filename, file size (number of records and K-bytes), and file attributes. If you created a directory label for this disk (refer to paragraph 2.5.8, the SET utility), the password and time stamp would be listed as well.

#### 2. Displaying SDIR Information for Specific Files

Example: **SDIR B:\*.TXT**

This command displays the full SDIR format for all the TXT files on the disk in drive B. The following is a sample response (drive B in this example has no directory label):

#### DIRECTORY FOR DRIVE B: USER 0

NAME	BYTES	RECS	ATTRIBUTES	NAME	BYTES	RECS	ATTRIBUTES
YRFILE	2K	10	DIR RW	MYFILE	8K	14	DIR RW
BFILE	12K	70	DIR RW	CFILE	14K	85	SYS RO

TOTAL BYTES = 36K

TOTAL RECORDS = 179 FILES FOUND = 4

TOTAL 1K BYTES = 36K

USED/MAX DIR ENTRIES FOR DRIVE B: 4/64

If the disk had a directory label, the system would display one file across the screen, rather than two as shown.

BYTES -- the amount of disk space MP/M-86 allocated for the file.

RECS -- the actual file size in 128 byte units.

TOTAL NUMBER OF 1K BYTES -- the amount of space required to store the files on a single density diskette, or a drive with a block size of 1K.

USED/MAX DIR ENTRIES -- the number of directory entries.  
Maximum number of entries allowed is 64.

## How to Use SDIR Options

### 1. Displaying Directory Data

Example: **SDIR [SHORT]**

This command displays directory data for all files on the default drive, excluding password and time stamping information. The files are listed randomly.

### 2. Excluding Certain Files from Display

Example: **SDIR [USER=ALL,EXCLUDE] \*.TXT**

This command lists files in all user areas on the default disk, excluding files with a TXT filetype.

### 3. Listing SYS Files on Designated Drives

Example: **SDIR [SYS] A: B: C:**

This command lists all SYS files on specified drives.

## General Information

SDIR provides the following options. Unless you designate the alternate drive, SDIR displays default disk files.

<u>OPTION</u>	<u>DESCRIPTION</u>
[SYS]	Displays all SYS files only.
[RO]	Displays all RO files only.
[DIR]	Displays all DIR files only.
[RW]	Displays all RW files only.
[XFCB]	Displays all files with XFCBs.
[NONXFCB]	Displays all files without XFCBs.
[USER=n]	Displays all files under specified user area.
[USER=ALL]	Displays all files under all user areas.
[DRIVE=D:]	Displays all files on specified drive.
[DRIVE=ALL]	Displays all files on all online drives.
[FULL]	Same as entering SDIR.



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<u>OPTION</u>	<u>DESCRIPTION</u>
[LENGTH=n]	Displays specified number of lines (greater than 4) of filenames before table heading is inserted.
[SIZE]	Displays the amount of file space allotted on a disk.
[FF]	Used with CTRL-P to print hard copy of directory. Sends a form feed to the printer. If [LENGTH] is specified, a form feed is issued for the designated length.
[MESSAGE]	Optionally used when requesting files in more than one user area or drive. System displays the names of the specified drives or user areas, and the files. Displays <b>FILE NOT FOUND</b> if no files are found.
[NOSORT]	Displays files as located, rather than in alphabetical order.
[EXCLUDE]	Excludes specified file(s) from display.
[HELP]	Displays examples of SDIR commands.
[SHORT]	Displays files, without password and time stamping information. Files are listed randomly.

### 2.5.3 ED Utility

Command Line: ED (input filespec;password) followed by (d:)  
or (output filespec;password)

Purpose: To create and edit a file.

#### How to Use the ED Utility

##### 1. Creating a New File

Example: **ED STORYFILE.TXT**

This command creates a file called STORYFILE.TXT. Then the following message and system prompt appear:

```
NEW FILE  
: *
```

If STORYFILE.TXT already exists, then only the system prompt (: \*) will appear.

## 2. Entering Text

Example: I

If this is an old file, enter #A (an ED command option) after the ED prompt. #A tells the system to make room in memory for a temporary copy of your file, while you make your entries. If this is a new file, the ED utility automatically allots enough space in memory for it.

Enter data in your file using the ED command I (insert). To exit the insert mode, press CTRL-Z, and then the Return key.

## 3. Editing with the ED Utility

You can generate text files with this utility, if you have no word processing application program for your system. When you create a file, space is allocated for it in computer memory.

Enter I. This command initiates the insert mode, enabling you to enter text in your file. Text entry activates a visible line numbering feature. Enter -V if you want to turn off the option. However, it is probably more convenient to keep line numbering in effect. (Line numbers do not appear in printouts.)

You enter data directly into an invisible memory file. This means that you cannot list the file onscreen and see the changes in displayed text. If you display the file and attempt to alter data onscreen, the changes will not be made to the file in memory.

You edit data using the Character Pointer (CP), which performs like an invisible cursor. It, too, functions only in memory. The ED commands control its movement through the text in the memory file. Refer to Table 2-4, Basic Editing Commands. Direct the CP to the desired position in the file, then add, delete, or replace your text by entering any of the commands listed in Table 2-4.

Although you cannot edit a file onscreen, you can view file portions or the whole file, to check that you entered your changes correctly. Enter B#T at the ED prompt to display the whole file, or merely add T to your ED command line to display the portion of text following the CP.

The following example illustrates how to correct a spelling error in an existing file. The misspelled word, **elephant's**, appears in line #3:

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**1: Way down South where cotton grows,  
2: a grasshopper stepped on an  
3: elephant's toe.**

By following this procedure, you can correct the misspelling:

- a. Enter **B** at the ED prompt. This command places the CP at the "home" position (before the word **Way**).
- b. Next, enter **2L**. This command moves the CP to line #3, in front of the word **elephant's**.
- c. To change the "e" to an "a", enter **5CD**. This combination command (ED commands can be combined) moves the CP to the sixth character in the line (C command), and then deletes it (D command).
- d. Enter **Ia**, press CTRL-Z, then press Return. The **I** activates the insert mode, and "a" is the character to be inserted. Do not press the space bar. CTRL-Z exits the insert mode, and re-enters the command mode.

Remember, while you enter this series of commands, the file contents and any changes you make do not appear onscreen. To see what is happening, add a **T** to the command line. To display the entire file, enter **B#T**:

If you followed the procedure correctly, the text, when displayed, would appear as follows:

**1: Way down South where cotton grows,  
2: a grasshopper stepped on an  
3: elephant's toe.**

#### 4. Exiting the ED Utility

Example: **E**

Enter **E** to end the ED session. This command removes your file from temporary storage in memory and saves it as a permanent file on disk. If the edited file is a new file, disk space is automatically made available for it, and the file is added to the directory. If the edited file is an old file, data from the memory file is added to it. New lines are added, and specified changes are made.

The operating system automatically creates a backup copy of your file, and assigns it the filetype BAK. The backup file is created before your changes are sent to the permanent file on disk. This file always contains data from your most recent editing session.

If you enter a DIRectory command after you finish editing, both your original and the backup file will be listed there, as follows:

**STORYFILE.TXT**  
**STORYFILE.BAK**

### **General Information**

If you do not want to save the changes, you can "kill" the temporary file by entering Q. The permanent disk file remains intact. The system prompt then reappears.

If a message appears onscreen during the editing session, alerting you that there is no more room in memory for your temporary file, enter W. (Refer to Table 2-3, ED Text Transfer Commands.) This command sends a portion of your file to disk. You can then resume editing the rest of your file without ending the ED session.

### **ED Commands**

You can enter most ED utility commands in a combination of uppercase and lowercase letters. However, some ED commands cannot be entered that way. If you enter the commands I, F, S, or N in uppercase (they are capitalized for clarity in the examples), your text will be put into uppercase. If you enter these commands in lowercase, your text will be recorded exactly as entered.

These restrictions apply to ED utility command lines:

- . The combined command line cannot exceed 128 characters.
- . A character string cannot exceed 100 characters.
- . If a command string is the last item in a command line, terminate it by pressing Return.
- . Commands that terminate an ED session (E, H, O, or Q) cannot be included in the command string.

The ED utility features two types of commands: text transfer and basic editing.

### **Text Transfer Commands**

Text transfer commands move data from the source file to memory, or from memory to disk. Table 2-3 lists the text transfer commands.

**Table 2-3. ED Text Transfer Commands**

<u>COMMAND</u>	<u>DESCRIPTION</u>
nA	Reserves specific amount (n=any number) of memory space for the input file. The A specifies a default amount of space to be held open in memory. The default accommodates most average size files.
nW	Sends specific number (n=any number) of lines in memory to disk without interrupting edit session. This makes room in memory for more input from your source file. Entering 0W (zero W) sends half the current hold file from memory to disk.
E	Ends edit, saves the file, and returns the system to MP/M-86.
Q	Ends edit, abandons current editing changes, and returns the system to MP/M-86.

**Basic Editing Commands**

The basic editing commands move the CP from left to right, and from top to bottom. A command preceded by a negative symbol (-) moves the CP in reverse. An n denotes any number that you specify in the command. Table 2-4 lists the basic editing commands.

**Table 2-4. Basic Editing Commands (Part 1 of 2)**

<u>COMMAND</u>	<u>FUNCTION</u>
B	Moves the CP to the beginning of the file.
-B	Moves the CP to the end of the file.
nC	Moves the CP forward n characters.
-nC	Moves the CP backward n characters.
nD	Deletes n characters after the CP.
-nD	Deletes n characters before the CP.
F	Finds and moves the CP to the specified character string: Fcharacter stringCTRL-Z.
I	Initiates insert mode. Use the insert mode to add text to your file. For example, Icharacter stringCTRL-Z.

**Table 2-4. Basic Editing Commands (Part 2 of 2)**

<u>COMMAND</u>	<u>FUNCTION</u>
CTRL-Z	Ends insert mode and returns ED to command mode.
nK	Deletes n lines after the CP.
-nK	Deletes n lines before the CP.
nL	Moves the CP n lines down the file.
-nL	Moves the CP n lines up the file.
OL	(zero L) Moves the CP to the beginning of the line on which it is currently situated.
O	(letter oh) Abandons changes made during current editing session, and returns to original file.
OP	(zero P) Moves the CP 23 lines forward, and displays 23 lines on the screen.
nT	Displays n lines after the CP.
-nT	Displays n lines before the CP.
B#T	Displays an entire file.
V	Turns on line numbering.
-V	Turns off line numbering.
OV	(zero V) Displays free buffer space.
n	Moves the CP n lines down the file, and displays that line.
-n	Moves the CP n lines up the file, and displays that line.

#### **Additional Editing Command**

You can also give a command to substitute one character string for another. Enter the command line as follows:

**Sdelete stringCTRL-Zinsert stringCTRL-Z**

#### **2.5.4 ERA Utility**

Command Lines: ERA (filespec)  
ERA (filespec) [XFCB]

Purpose: To delete file(s) from disk.

### How to Use the ERA Utility

1. Deleting a Specific File

Example: **ERA B:YRFILE**

This command deletes YRFILE from the disk on drive B.

2. Deleting All Files

Example: **ERA \*.\***

This command deletes all files on the default disk.

3. Deleting XFCBs

Example: **ERA \*FILE.\* [XFCB]**

This command erases all Extended File Control Blocks (XFCBs) for specified files. This helps to reclaim disk space when password and time stamping data is not needed.

### General Information

ERA cannot delete files with Read-Only attributes, or files on a disk with a Read-Only attribute.

### 2.5.5 ERAQ Utility

Command Lines: ERAQ (filespec)  
ERAQ (filespec) [XFCB]

Purpose: To delete specified files (queries erasures).

### How to Use the ERAQ Utility

Deleting Specified Files

Example: **ERAQ C:\*.TXT**

This command erases all files with the TXT filetype on the disk in drive C. ERAQ responds with the following:

```
00:04:05    A:ERAQ          .CMD (USER 0)
C:MYFILE          TXT ?Y
C:YRFILE          TXT ?N
C:BFILE           TXT ?Y
C:DFILE           TXT ?Y
```

ERAQ displays each filename. Answer Y if you want to delete the file, or N if you do not.

### General Information

You can use ERAQ instead of the ERA utility. It lets you see the names of the files you are about to delete, so that you can prevent unwanted deletions.

You can use the [XFCB] option (i.e., ERAQ (filespec) [XFCB]) to erase the file Extended File Control Blocks to reclaim disk space (as long as blocks are no longer needed).

### 2.5.6 PIP Utility

PIP handles both general computer functions and specific file functions. Refer to paragraph 2.4.3 for a detailed explanation of the uses for this utility.

### 2.5.7 REN Utility

Command Line: REN (newfilespec)=(oldfilespec)

Purpose: To change filenames.

#### How to Use the REN Utility

Changing a Filename

Example: **REN B:OURFILE=MYFILE**

This command changes the filename MYFILE, on drive B, to OURFILE. This is not a copy command, so you cannot change a filename from one disk to another.

### 2.5.8 SET Utility

Command Lines: SET (filespec) [attribute]  
SET d:[attribute]  
SET d:[drive option=modifier]  
SET (filespec) [option=modifier]  
SET (filespec) [option]  
SET [DEFAULT = PASSWORD]

Purposes:

1. To set file attributes.
2. To set drive attributes.
3. To set drive password protection.
4. To set file password protection.
5. To set file PROTECT mode.



6. To set a default password for your console.
7. To set drive time stamping.
8. To set file time stamping.
9. To set the ARCHIVE attribute.
10. To set user-defined attributes.
11. To name the disk directory label.
12. To get HELP.

### How to Use the SET Utility

#### 1. Setting a File Attribute

Example: **SET \*FILE.TXT [RW]**

This command changes the file attribute for all default drive files matching the wildcard specification. The files have been changed from Read-Only to Read/Write. These files can now be accessed and changed as desired.

#### 2. Setting a Drive Attribute

Example: **SET B:[RO]**

This command sets drive B to the Read-Only attribute. Now drive B files cannot be altered, renamed, or deleted. They can only be listed.

#### 3. Setting Drive Password Protection

Example: **SET [PASSWORD=RESTRICT]  
SET [PROTECTION=ON]**

The first command assigns the password RESTRICT to the disk in the default drive. The second turns on password protection.

Restricting disk use is a two-step procedure:

1. Assign a password to the drive.
2. Turn on the drive password protection.

The password is actually assigned to the disk directory label (if a label has not yet been created, MP/M-86 creates a label and names it LABEL). The drive is secured. No one can access it or change its options without the password.

The commands in subtopic 3 are invoked separately. After you enter the second command, the system requests a password. You cannot see the password while you are entering it.

After you enter the password, the system responds with a display similar to the following example:

**LABEL FOR DRIVE A:**

<b>DIRECTORY LABEL</b>	<b>PASSWDS REQD</b>	<b>MAKE XFCBS</b>	<b>STAMP CREATE</b>	<b>STAMP ACCESS</b>	<b>STAMP UPDATE</b>
<b>A:LABEL</b>	<b>ON</b>	<b>ON</b>	<b>OFF</b>	<b>OFF</b>	<b>OFF</b>

This display shows that the PROTECT command has turned on the password option for the drive. Now you can assign passwords to files on this disk. If you turn off the password option (by entering **SET [PROTECT=OFF]**), file passwords are invalidated.

The directory label display is fully detailed in paragraph 2.4.5, subtopic 4.

4. Nullifying an Existing Password

Example: **SET [PASSWORD=<carriage return>]**

By pressing Return in the command line, you can erase the password for the default or specified drive. When you enter this command, the system asks you for the password before you can nullify it.

**CAUTION**

KEEP A RECORD OF YOUR DISK PASSWORD. IF YOU FORGET IT, YOU WILL BE UNABLE TO ACCESS THE DISK FILES OR TO TURN OFF PASSWORD PROTECTION FOR THE DISK.

5. Assigning a File Password

Example: **SET C:YRFILE [PASSWORD=RED]**

This command assigns the password RED to YRFILE on the disk in drive C. After the password is assigned, you must include it in the command line when accessing YRFILE. The following command line lets you access YRFILE.

**TYPE C:YRFILE;RED**

The password is separated from the filename by a semicolon. If you fail to include the password, MP/M-86 prompts you for it.

Before you can assign a password to a file, you have to turn on the PROTECT option for the drive containing that file (see subtopic 3).

6. Assigning a File Password with a PROTECT Mode

Example: **SET MYFILE [PASSWORD=LEMON PROTECT=DELETE]**

When you assign a password to a file, you can also assign it one of three levels of protection. These protection modes are READ, WRITE, and DELETE.

This command sets password protection for MYFILE on the disk in the default drive. In the example, it also invokes one of the PROTECT mode options. The PROTECT mode defines when the password (in this case, LEMON) is required to access MYFILE. In this case, the password is required only if you try to delete the file. Otherwise, the file may be freely listed and changed.

If you do not specify a PROTECT mode, SET defaults to the READ mode, which requires a password before you can even list the file. Refer to Table 2-5 for a description of all the PROTECT mode options.

7. Cancelling a File Password

Example: **SET MYFILE.TXT [PROTECT=NONE]**

This command invokes the file PROTECT mode option, NONE, which cancels the password for the specified file.

8. Setting a Default Password at Your Console

Example: **SET [DEFAULT=LEMON]**

When all files are assigned the same password, you can use this command to conveniently access your protected files. This feature allows you to access files without entering the password each time. The command in the example sets the user's console to the default password, LEMON. Each time the user specifies a file, the system references the default for the required password. The default password must be the same one assigned to your files.

9. Time Stamping a Drive

Example: **SET B:[CREATE=ON]**

MP/M-86 provides three time-stamping options: CREATE, ACCESS, and UPDATE. This command activates the CREATE time stamping option for drive B. The CREATE option records the creation time and date for new files (including those newly-copied to the disk) on the disk in drive B. Existing disk files must be set separately (see subtopic 12). To display file creation date and time, use the SDIR utility. To turn off CREATE, enter **SET [CREATE=OFF]**.

You can set a drive for both CREATE and UPDATE options, but not for both CREATE and ACCESS options.

#### 10. Activating the ACCESS Option

Example: **SET D:[ACCESS=ON]**

This command activates the ACCESS time stamping option for drive D. The ACCESS option records the latest access time for new files on the disk (including files newly-copied to the disk). Existing disk files must be set separately (see subtopic 12). To display the latest file access time and date, use the SDIR utility. To turn off ACCESS, enter **SET [ACCESS=OFF]**.

You can set a drive for both ACCESS and UPDATE options, but not for both ACCESS and CREATE options.

#### 11. Activating the UPDATE Option

Example: **SET [UPDATE=ON]**

This command activates the UPDATE time stamping option for the default drive. The UPDATE option records the date of the latest file update for new files on the disk (including files newly-copied to the disk). Existing disk files must be set separately (see subtopic 12). To display the latest file update time and date, use the SDIR utility. To turn off UPDATE, enter **SET [UPDATE=OFF]**.

You can set a drive for CREATE and UPDATE options or for ACCESS and UPDATE.

#### 12. Time Stamping an Existing File

Example: **SET D:YRFILE [TIME]**

When you turn on drive time stamping, only new files (or files newly-copied to the drive) are time stamped. Existing files must be time stamped individually. This command activates the time stamping option for YRFILE on the disk in drive D, establishing time stamp fields for that file. (This step creates XFCBs for the file that will contain the time stamp data.) Time stamping must have already been turned on for the drive to enable you to time stamp existing files.

When you invoke the SDIR utility to display information about YRFILE, the system responds with the following display. (Time stamping information appears in the last two columns.)

**DIRECTORY FOR DRIVE D:**

<b>NAME</b>	<b>BYTES</b>	<b>RECS</b>	<b>ATTRIBUTES</b>	<b>PROT</b>	<b>UPDATE</b>	<b>ACCESS</b>
YRFILE	8K	66	DIR RW	NONE		05/07/86 11:06

If you had selected the CREATE option, CREATE would appear in the last column. If you had chosen the UPDATE option, the date and time of the latest file update would appear in that column.

13. Time Stamping a Group of Existing Files

Example: **SET B:\*FILE.\* [TIME]**

This command activates the time stamping option for the group of files matching the filespec on the disk in drive B.

14. Setting a File ARCHIVE Attribute after Backup

Example: **SET ZFILE [ARCHIVE=ON]**

This command turns on the ZFILE ARCHIVE attribute. The command overrides archive markers inserted into a file by the PIP utility. The ARCHIVE attribute facilitates routine backup copying by copying only the files accessed since the last backup copy. PIP searches for the markers to determine which files to copy. The command in subtopic 10 turns on the markers. PIP then will NOT make a copy of that file.

To turn off an ARCHIVE attribute, enter:

**SET ZFILE [ARCHIVE=OFF]**

15. Setting User-Defined Attributes

Example: **SET LEFILE [F1=ON]**

This command activates the first of four user-definable attributes for LEFILE. The attributes range from F1 to F4. You can assign any meaning to these attributes; or, you can run an application program (or a program you have written) using any or all of these attributes to provide more information about the file itself. MP/M-86 does not use these attributes.

You can display user-defined attributes using STAT or SDIR. A sample STAT display follows:

RECS	BYTES	FCBs	ATTRIBUTES	NAME
15	32K	1	DIR RW A F1 F2	ACCOUNT.TXT

This display shows all the attributes currently activated for the file ACCOUNT.TXT. The two user-defined attributes (F1 and F2) have been turned on, in addition to the ARCHIVE attribute.

To turn off user-defined attributes, use the following command format:

**SET LEFILE [Fn=OFF]**

#### 16. Naming a Disk

Example: **SET C:[NAME=LABEL1]**

This command names the disk in drive C, LABEL1. The command actually creates a directory label for the disk. The label contains disk attribute data. You can assign a disk an eight-character name and a three-character filetype.

Naming disks makes it easier to keep track of them, especially when you are working with several disks.

SET automatically creates a directory label called LABEL, if one of the other SET label options is entered before you use the **SET [NAME]** command.

#### 17. Getting HELP

Example: **SET [HELP]**

This command displays SET command line uses.

#### 18. Including Multiple SET Options in the Command Line

Example: **SET \*.TXT [DIR, RW, PASS=BLUE]**

This command contains three SET options in the command tail. All default disk files matching the specified wildcard characters are set to DIRectory and Read/Write attributes, and require the password BLUE before they can be accessed.

## General Information

The SET utility:

- . Turns on password protection.
- . Turns on time stamping.
- . Assigns DIR, SYS, RO, and RW attributes.

When turning on password protection and time stamping, you must first turn on the drive features. This automatically turns on the features for any new (or newly-copied) disk files. The preceding table illustrates how to turn on password protection and time stamping for existing files.

The MP/M-86 password protection system offers a variety of options to limit disk and file access. Maximum drive protection is achieved using the following example:

**SET ZFILE.COMD [RO,SYS,PASS=RED,PROT=READ]**

This command gives ZFILE absolute protection. PROT=READ designates that the file cannot even be read until the password RED is entered. (READ is a PROTECT default, but is included in the example for illustrative purposes.)

When the file is accessed, the user can only read it, because the Read-Only attribute was assigned. The information in the file cannot be changed. However, users can run ZFILE (CMD filetype indicates the file is an MP/M-86 program). Because ZFILE has been assigned the SYS attribute, it becomes a system file and is available to all users.

The following example protects MP/M-86 utilities from accidental change or erasure:

**SET \*.CMD [RO,SYS]**

**Table 2-5. MP/M-86 Attributes (Part 1 of 3)**

<u>ATTRIBUTE</u>	<u>ASSIGNMENT</u>	<u>COMMAND LINE</u>	<u>FUNCTION</u>
RW (Read-Write)	Disk	SET d:[RW]	Files on disk can be accessed for listing, changing, or deleting. Default attribute.
	File	SET (filespec)[RW]	Specific files can be accessed for listing, changing, or deleting. Default attribute.
RO (Read-Only)	Disk	SET d:[RO]	Files on disk can be read but not altered.
	File	SET (filespec)[RO]	Specified file can be read but not altered. To enable all users to run MP/M-86 utilities, but not to alter or erase them, assign them the RO attribute.
DIR (Directory)	File	SET (filespec)[DIR]	File(s) accessible only to current user number. Default attribute.
SYS (System)	File	SET (filespec)[SYS]	File(s) accessible from all user areas. Assign MP/M-86 utilities the SYS attribute and keep them in user area 0 to make them accessible to all users.
PASSWORD	Disk	SET d:[PASSWORD=SECRET]	Creates disk directory label and assigns it a password.
	File	SET (filespec) [PASSWORD=SECRET]	Assigns password to specific file(s).



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Table 2-5. MP/M-86 Attributes (Part 2 of 3)

<u>ATTRIBUTE</u>	<u>ASSIGNMENT</u>	<u>COMMAND LINE</u>	<u>FUNCTION</u>
PROTECT	Disk	SET d: [PROTECT= ON or OFF]	Sets following PROTECT options:  ON Turns on password protection for the drive, allowing you to assign passwords to files on that disk.  OFF Turns off password protection for the drive, nulling file passwords on that disk.
	File	SET (filespec) [PROTECT=(mode option)	Sets following file PROTECT mode options:  READ Password is required before file can be read. Default option.  WRITE Password not required unless user tries to write to file.  DELETE Password not required unless user tries to delete file.  NONE Nulls file password.
CREATE	Disk	SET d:[CREATE=ON or OFF]	Turns on CREATE time stamp for disk and provides XFCBs for new (or newly-copied) disk files.

**Table 2-5. MP/M-86 Attributes (Part 3 of 3)**

<u>ATTRIBUTE</u>	<u>ASSIGNMENT</u>	<u>COMMAND LINE</u>	<u>FUNCTION</u>
ACCESS	Disk	SET d:[ACCESS=ON or OFF]	Turns on ACCESS time stamp for disk and provides XFCBs for new (or newly-copied) disk files.
UPDATE	Disk	SET d:[UPDATE=ON or OFF]	Turns on UPDATE time stamp for disk and provides XFCBs for new (or newly-copied) disk files.
ARCHIVE	File	SET (filespec) [ARCHIVE=ON or OFF]	ON or OFF. Turns PIP ARCHIVE option marker on or off for specific file(s).
F1 - F4	File	SET (filespec) [Fn=ON or OFF]	User-defined attributes.
NAME	Disk	SET d:[NAME= (name)]	Assigns name to drive label. Otherwise, when a SET option is turned on, MP/M-86 creates a label called LABEL.

### 2.5.9 STAT Utility

STAT handles general computer functions and specific file functions. Refer to paragraph 2.4.8 for a more detailed explanation of the uses for this utility.

### 2.5.10 SUBMIT Utility

Command Line: SUBMIT (filespec (parameters))

Purpose: To group commands for batch processing.

#### How to Use the SUBMIT Utility

1. Sending Commands for Processing

Example: **SUBMIT THISFILE**

This command sends a group of commands in THISFILE to MP/M-86 for processing. Any file to be processed by the SUBMIT utility must have a SUB filetype, but you do not have to enter this filetype in the SUBMIT command line. The SUB file in the example is on the default disk; you do not need to enter a drive letter designation.

## 2. Including SUBMIT Parameters

Example: **SUBMIT THATFILE FILE TXT**

This command sends a group of commands in THATFILE to MP/M-86 for processing. The command line includes two parameters (FILE and TXT). The parameter symbols (\$\$1 and \$\$2 in the following example) are placed in the SUB file. SUBMIT replaces the file symbols with the parameters given in the command line. A listing of THATFILE would appear as follows, before the SUBMIT utility is invoked:

```
TOD
DIR B:$$1.$$2
PIP LST:=B:$$1.$$2
```

The following listing shows THATFILE after the SUBMIT utility has replaced the file symbols with the sample parameters given in the example:

```
TOD
DIR B:*FILE.TXT
PIP LST:=B:*FILE.TXT
```

When THATFILE is submitted for processing, the current time and date are first displayed (TOD). Then, a directory of the filenames matching FILE and filetype TXT is displayed (DIR B:). Finally, all those files are copied to the printer (PIP LST:).

## General Information

The SUBMIT utility is particularly efficient if you choose to use one command sequence repeatedly. You create a file with a SUB filetype (using the ED utility or any MP/M-86 compatible word processing application program), and enter all commands in the desired sequence. When invoking the SUBMIT utility, include the filespec in the command line. MP/M-86 processes the commands one at a time. You can interrupt processing by pressing CTRL-C, or by pressing any key after MP/M-86 displays the system prompt.

You cannot nest SUBMIT commands; however, you can use the last line of your SUB file as a SUBMIT command to specify another SUB file.

As shown in the examples of THATFILE, the SUBMIT utility also uses parameters, ranging from 1 to 9. Parameters function like wildcard characters in file specifications. When creating a SUB file, you can include a special character symbol (e.g., \$1 through \$9. To enter a single dollar sign, enter a pair of dollar signs. SUBMIT associates a single dollar sign with a parameter) wherever needed. When responding to a SUBMIT command line, MP/M-86 reads the first addition to the command tail as parameter \$1, the second as \$2, and so forth.

## 2.6 PROGRAMMING UTILITIES

MP/M-86 has a special function that automatically executes command files at initial system power-up. The Auto-execute function, supporting up to 28 terminals (numbered 0 through 27), searches for '\$0\$.SUP' (up to '\$27\$.SUP') files. These files contain a single command line that would be executed automatically when the system is powered up. The files can be created with an editor.

There are two kinds of programming-related utilities in MP/M-86; those used when running a program, and those used to create a program.

These are the utilities used when you run a program:

1. ABORT
2. ATTACH
3. MPMSTAT

They are described in paragraphs 2.6.1 through 2.6.3.

The following utilities are used when you create an MP/M-86 program:

1. ASM.86
2. GENCMD
3. DDT.86

These utilities are described in general terms in paragraphs 2.6.4 through 2.6.6. For more specific information on programming, refer to Digital Research manuals, or any commercially available literature on the subject.

### 2.6.1 ABORT Utility

Command Lines: ABORT (programname)  
ABORT (programname n)

Purpose: To halt a specified program in operation.

#### How to Use the ABORT Utility

1. Aborting a Program from the Current Console

Example: **ABORT PIP**

This command immediately halts PIP operation at the current console. You can only use the ABORT utility on programs that are detached from your console, or when requesting an ABORT from another console. To halt attached programs, press CTRL-C.

2. Aborting a Program from Another Console

Example: **ABORT SUBMIT 2**

This command immediately halts the SUBMIT operation at console 2. Use MPMSTAT to determine which console number is associated with the program that you want to abort (refer to paragraph 2.6.3).

#### General Information

If an abort cannot be executed, the system responds with:

**ABORT FAILED**

Press CTRL-C if you want to stop a program that is currently attached to the console. In response to CTRL-C, the system temporarily halts processing and responds with:

**ABORT (Y/N)?**

Enter Y, if yes; any character, if no.

### 2.6.2 ATTACH Utility

Command Line: ATTACH (programname)

Purpose: To reattach a program to the console that detached the program.

## How to Use the ATTACH Utility

Reattaching a Program to a Console

Example: **ATTACH PIP**

This command reattaches the PIP utility to the console. The system responds with:

**ATTACH: PIP**

## General Information

MP/M-86 allows you to detach programs from your console, so that you can run more than one program at a time. You can detach a program by pressing CTRL-D. You must then reattach the program to your console. There are two ways to do this:

1. Press CTRL-D again.
2. Use the ATTACH utility.

Pressing CTRL-D reattaches programs in the order that they were detached. Using the ATTACH utility, you can specify the program to be reattached.

If MP/M-86 cannot find the specified program, it responds with:

**ATTACH FAILED**

Use MPMSTAT to check the status of your detached processes.

### 2.6.3 MPMSTAT Utility

Command Line: MPMSTAT

Purpose: To display the following information:

1. Status information, including number of consoles
2. Processes ready to execute
3. Processes waiting to read from an empty queue
4. Processes waiting to write to a full queue
5. Processes waiting on a time delay
6. Processes waiting for a polled I/O event
7. Processes waiting for an interrupt
8. A list of all queues in the system
9. Console number and process attached to it
10. Console number and processes waiting for it
11. Printer number and process attached to it

12. Printer number and processes waiting for it
13. Names of programs allocated to each memory segment
14. Console number from which the process originated, in brackets

### How to Use the MPMSTAT Utility

Example: **MPMSTAT**

Figure 2-1 represents a sample response to this command. The information is not shown in its entirety, because it is scrolled onto the screen.

```
MP/M-86 2.1 [20 July 82]
Copyright (c) 1982, Digital Research

***** Status Display - Values Shown in Hexadecimal *****

Number of Physical Consoles = 04
Number of Virtual Consoles = 00
Number of List Devices = 01
Number of Free Process Descriptors = 18
Number of Free Memory Descriptors = 4C
Number of Free Queue Control Blocks = 20
Free Queue Buffer Area = 0200
Number of Flags = 20
Maximum Paragraphs Per Process = 2000

Ready Process(es):
    MPMSTAT [00] Idle [00]
Process(es) DQing:
Process(es) NQing:
```

Figure 2-1. MPMSTAT Display

### 2.6.4 ASM.86 Utility

Command Line: **ASM.86** (filespec [parameters])

Purpose: To convert assembly language, user-created programs into hex machine code.

### How to Use the ASM.86 Utility

1. Processing a Program

Example: **ASM.86 ZFILE**

This command processes ZFILE on the default disk into hex machine code. Files generated by processing include ZFILE.LST, ZFILE.H86, and ZFILE.SYM. During ASM.86 processing, the operating system default copies these three files and the original file to the same disk.

## 2. Using ASM.86 Parameters

Example: **ASM.86 ZFILE \$\$PY HB**

This command also converts ZFILE on the default disk into hex machine code. However, in this example, the two parameters in the command tail (after the \$\$) override the operating system default for two of the generated files, ZFILE.LST and ZFILE.H86. In this case, LST is printed at the printer, and H86 is copied to the disk in drive B. Refer to the list of parameters and their functions in the following paragraph.

MP/M-86 recognizes a drive designator in the command line as the destination drive for the ASM.86 output files, unless parameters are added to the command tail to override the default. The output files are:

LST -- contains annotated listing of original source file.

H86 -- contains the 8086 machine code in hex format.

SYM -- contains all symbols defined by the program writer, and includes their addresses.

The ASM.86 utility recognizes the following parameters:

<u>PARAMETER</u>	<u>FUNCTION</u>
A	Overrides default drive designator to obtain the original source file.
H	Overrides default drive designator for H86 output file.
P	Overrides default drive designator for LST output file.
S	Overrides default drive designator for SYM output file.
F	Determines format of H86 output file. FI puts file in Intel hex format; FD puts it in Digital Research hex format. FD is the default. Use FI when combining program with one generated by Intel compiler/assembler.



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The device options used with the ASM.86 parameters are:

<u>OPTION</u>	<u>FUNCTION</u>
A thru P	Denotes disk drive of corresponding letter.
X	Denotes the screen.
Y	Denotes the printer.
Z	Denotes no output files to be generated.

### 2.6.5 GENCMD Utility

Command Line: GENCMD (filespec (8080 CODE[options] DATA[options] STACK[options] EXTRA[options] Xn[options..]))

Purpose: To create a CMD program. Converts hex output of ASM.86 to MP/M-86 transient program with CMD filetype.

#### How to Use the GENCMD Utility

##### 1. Creating a CMD File

Example: **GENCMD ZFILE**

This command creates a CMD program, ZFILE.CMD, from the ZFILE H86 file (ZFILE.H86, generated by ASM.86 processing of ZFILE). ZFILE can now be invoked like any other MP/M-86 utility.

##### 2. Using GENCMD Parameters

Example: **GENCMD ZFILE CODE[A40] DATA[M30,XFFF]**

This command produces ZFILE.CMD. The code group must be loaded at location 400H. The data group requires a minimum 300H bytes, but, if more are available, the program can use up to FFF0H bytes.

#### GENCMD Keywords

Use the 8080 keyword for programs converted from 8-bit microprocessors to MP/M-86. The programs are loaded into an area with overlapping code and data segments. The program code segment must begin at location 100H.

GENCMD provides nine keywords for parameters:

**8080 CODE DATA STACK EXTRA X1 X2 X3 X4**

8080 identifies the CMD file as an 8080 Memory Model. The other keywords define segment groups that have specific memory requirements.

Values for these keywords are given in the following listing. The n represents a hexadecimal constant of one to four digits; n designates a paragraph 16 bytes long, corresponding to the byte value n x 16, or hhh0 in hex.

<u>KEYWORD VALUES</u>	<u>DESCRIPTION</u>
An	Load group at absolute location n. Use when any group must be loaded at absolute location in memory.
Bn	Begin group at address n in hex file. Use when the hex file does not contain information identifying the segment groups. This value is only required if the ASM.86 FI parameter was used.
Mn	The group requires a minimum n x 16 bytes. Use when you include a data segment that has an uninitialized data area at the end of the segment.
Xn	The group can address up to n x 16 bytes. Use when your program requires a larger data area, if available, than the minimum area given by Mn.

### 2.6.6 DDT.86 Utility

Command Line: DDT.86 (filespec)

Purpose: To monitor and test user-written programs.

#### How to Use the DDT.86 Utility

##### 1. Invoking the DDT.86 Utility

Example: **DDT86**

This command invokes the DDT.86 utility. After the DDT.86 prompt appears (-), you can enter any of the DDT.86 commands listed in Table 2-6.

## 2. Moving a File into Memory

Example: **DDT86 ZFILE**

This command invokes the DDT.86 utility, and moves the file into memory. DDT.86 displays the file address in memory along with its prompt.

### **General Information**

The DDT.86 utility provides various commands to test the program file while it is being executed. DDT.86 cannot test programs in the hex format. You must first convert your H86 file to a command (CMD) file using the GENCMD utility. Table 2-6 lists and describes these commands. The parameters used with the commands are listed in Table 2-7.

Table 2-6. DDT.86 Commands

<u>COMMAND</u>	<u>FUNCTION</u>	<u>DESCRIPTION</u>
As	Assemble	Enter assembly language statements.
Bs, f, sl	Block Cmp	Compare blocks of memory.
D(W) (s(,f))	Display	Display memory in hex and ASCII character mode.
E(filespec)	Execute	Load program for execution.
Fs, f, bc	Fill	Fill memory block - byte.
FWs, f, wc	Fill	Fill memory block - word.
G(s) (b1(,b2))	Go	Begin execution.
Hwc1, wc2	Hex	Hexadecimal sum and difference.
I(command tail)	Input	Set up input command line.
L(s(,f))	List	List memory in mnemonic form.
Ms, f, d	Move	Move memory blocks.
R(filespec)	Read	Read disk file to memory.
S(W)s	Set	Set memory values.
T(n)	Trace	Trace program execution.
TS(n)	Trace	Trace and show all registers.
U(n)	Untrace	Monitor execution without trace.
US(n)	Untrace	Monitor and show all registers.
V	Verify	Show memory layout after disk read.
W(filespec(,s,f))	Write	Write block contents to disk.
X(r)	Examine	Examine and modify CPU registers.

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**Table 2-7. DDT.86 Parameters and Replacements**

PARAMETERS	REPLACE WITH
bc	Byte Constant
b1	Breakpoint One
b2	Breakpoint Two
d	Destination for Data
f	Final Address
n	Number of Instructions to Execute
r	Register or Flag Name
s	Starting Address
s1	Second Starting Address
W	Word 16-bit
wc	Word Constant

SECTION 3  
MP/M-86 ERROR MESSAGES

**3.1 OVERVIEW**

This section lists and defines the MP/M-86 system error messages that can appear on your screen. These are known as Basic Disk Operating System (BDOS) messages. The error generating each message is defined, and any recommended corrective action is provided.

**Table 3-1. MP/M-86 System Error Messages (Part 1 of 2)**

ERROR MESSAGE	DEFINITION/CORRECTIVE ACTION
<b>BAD SECTOR</b>	<p>A disk hardware error exists. Or, you tried to read a disk of a density other than that for which the drive is set.</p> <p>ACTION: Check the disk.</p>
<b>CLOSE CHECKSUM ERROR</b>	<p>BDOS detected a checksum error. The error is in the FCB passed to BDOS by the application program with a BDOS Close File Call.</p>
<b>FILE ALREADY EXISTS</b>	<p>When creating a file, you tried to assign it a filespec already existing in that drive and user number.</p> <p>ACTION: Use another name or delete the old file.</p>
<b>FILE CURRENTLY OPEN</b>	<p>You tried to delete, rename, or change the attribute of a previously opened file. This message can also appear if you try to open a file in a mode incompatible with a previous file opening process.</p>
<b>FILE OPENED IN READ-ONLY MODE</b>	<p>You tried to write to a file opened in the Read-Only mode. (Open a file in the Read-Only mode if it is present in User 0, but is being accessed from another user number). This message also appears if you enter an incorrect password when accessing a file.</p>
<b>FILE R/O</b>	<p>You tried to write to a Read-Only attribute file.</p>
<b>ILLEGAL ? IN FCB</b>	<p>You used a wildcard character where wildcard filespecs are not permitted.</p>
<b>INVALID USER NUMBER, IGNORE</b>	<p>The specified user number exceeds 15.</p>
<b>INVALID PRINTER NUMBER, IGNORED</b>	<p>MP/M-86 does not recognize the printer number.</p>

**Table 3-1. MP/M-86 System Error Messages (Part 2 of 2)**

ERROR MESSAGE	DEFINITION/CORRECTIVE ACTION
<b>NO ROOM IN SYSTEM LOCK LIST</b>	(Entry is maintained in Lock List for each file opened by each process, and is not removed until file is closed or process owning entry terminates.) You tried to open a file, or process exceeds open file limit set at system generation. No space available for new entries in system lock list.
<b>OPEN FILE LIMIT EXCEEDED</b>	You tried to access more files per process than the system can accommodate.
<b>PASSWORD ERROR</b>	Missing or incorrect password.  ACTION: Enter correct password.
<b>R/O</b>	You tried to write to a file with a Read-Only attribute.  ACTION: Change file attribute to RW.
<b>SELECT</b>	You chose a non-existent file.  ACTION: Check your directory for correct filename. Re-enter filename.
<b>?BAD FILE SPEC</b>	You entered an improperly formatted file specification.  ACTION: Re-enter filespec.
<b>?CAN'T FIND COMMAND</b>	MP/M-86 cannot find the requested command file.
<b>?LOAD ERROR</b>	A physical error occurred while loading a CMD file.
<b>?NOT ENOUGH MEMORY</b>	There is not enough memory to run the CMD program.
<b>RSP COMMAND QUE FULL</b>	The queue specified in the command line is full.



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**APPENDIX A  
DIGILOG-SPECIFIC ENHANCEMENTS TO MP/M-86**

DBS 16 MP/M-86 AND DBS-NET SYSTEMS REFERENCE MANUAL  
APPENDIX A  
DIGILOG-SPECIFIC ENHANCEMENTS TO MP/M-86

This appendix summarizes the utilities that Digilog has added to MP/M-86 to adapt it for use on the DBS 16 microcomputer system.

**Table A-1. Digilog Enhancements to MP/M-86**

<u>UTILITY</u>	<u>DESCRIPTION</u>
<b>FORM16W</b>	Winchester Drive Format Utility. Formats and verifies the Winchester drive.
<b>VERI16W</b>	Winchester Drive Non-Destructive Verification Utility. Tests for and reports any bad tracks found on previously formatted Winchester drive.
<b>FORMATF</b>	Floppy Disk Format Utility. Formats floppy disk for use on the DBS 16 system.
<b>CSYS16</b>	System Customization Utility. Customizes MP/M-86 for DBS 16 terminal and disk drives.
<b>CONFSIO</b>	Serial I/O Port Configuration Utility. Configures I/O ports for DBS 16 peripheral devices.
<b>CNET16</b>	Network Customization Utility. Customizes DBS-NET for terminal parameters and number of slave cards.
<b>BACK16W</b>	Copies information from the Winchester disk to floppy disks.
<b>REST16W</b>	Restores information from floppy disks to Winchester disk.

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**APPENDIX B  
COMMONLY USED MP/M-86 UTILITY FUNCTIONS**

DBS 16 MP/M-86 AND DBS-NET SYSTEMS REFERENCE MANUAL  
 APPENDIX B. COMMONLY USED MP/M-86 UTILITY FUNCTIONS

The following table summarizes the basic MP/M-86 operating system functions, and relates them to the appropriate utility. It lists the command line, the function, and description or result of the command operation. Remember, to execute any program, enter the command line (the program name and any desired options), and press Return.

**Table B-1. MP/M-86 Utility Functions (Part 1 of 7)**

<u>COMMAND LINE</u>	<u>FUNCTION</u>	<u>DESCRIPTION/RESULT</u>
<b>CONFIGURATION UTILITIES</b>		
FORM16W	Format Winchester drive.	Prepares disk to accept data for storage.
FORMATF	Format floppy diskette.	Prepares disk to accept data for storage.
VERI16W	Test Winchester drive.	Verifies and reports any problems on the Winchester drive.
CSYS16	Configure MP/M-86 to terminal.	Establishes link between MP/M-86 and the terminal.
CONFSIO	Configure I/O ports.	Establishes link between MP/M-86 and peripheral devices.
CLOADER	Write operating system to a disk(ette).	Copies operating system from one disk(ette) to another.
GENSYS	Generate MP/M-86.	Generates operating system.
CNET16	Configure DBS-NET to terminal.	Establishes link between DBS-NET and the terminal.
<b>GENERAL UTILITIES</b>		
TOD TOD (mm/dd/yy hh:mm:ss)	Display or set time and date.	Displays time and date. Sets time and date.
d:	Change the default disk drive.	d is the symbol of the new drive (A or B).
CONSOLE	Determine current console number.	Displays current console number.

**Table B-1. MP/M-86 Utility Functions (Part 2 of 7)**

<u>COMMAND LINE</u>	<u>FUNCTION</u>	<u>DESCRIPTION/RESULT</u>
DSKRESET	Reset all system drives.	Resets disks, enabling user to change disks.
DSKRESET d:	Reset disk for specific drive.	Resets specified disk, enabling user to change disks.
PRINTER	Determine current printer number.	Displays number of printer currently attached to the inquiring console.
SHOW	Determine drive attribute.	Displays whether specified drive is RW or RO.
SHOW or SHOW SPACE	Determine space left on disk.	Displays amount of space left in K-bytes on the specified drive.
SHOW USER	Display all active user areas.	Displays all user areas currently being used.
SHOW D:DRIVE	Display drive characteristics.	Displays a variety of data for specified drive; i.e., capacity, number of records, tracks in use.
SHOW D:LABEL	Display drive directory label.	Displays label for specified drive, showing password and time stamping data.
SPOOL (filespec, filespec ...)	Send file to printer.	Results in printout of file without tying up console.
STOPSPLR	Empty spool queue.	Stops any currently printing file, and keeps others in the queue from printing.
STAT d:=attribute	Set file or drive access.	Sets drive attribute. (RW -- can be read from and written to. RO -- can be read from only.)

**Table B-1. MP/M-86 Utility Functions (Part 3 of 7)**

<u>COMMAND LINE</u>	<u>FUNCTION</u>	<u>DESCRIPTION/RESULT</u>
STAT (filespec) (attribute)	Set file attribute.	Sets file attribute. (RW -- can be read from and written to. RO -- can be read from only. DIR -- accessible to current user only. SYS -- accessible to all users.)
STAT DSK: STAT (filespec)	Display drive or file attribute.	Displays disk status. Displays file status.
STAT	Determine amount of space left on disk.	Displays the amount of space left on default disk. Include drive designator if needed.
STAT (filespec) [SIZE]	Determine amount of space used by file(s).	Displays the amount of space used and the amount of space remaining for that file.
USER	Display current user number.	Displays current or default user number.
USER (n)	Divide disk into user areas.	n is any number from 0 to 15.
TYPE (filespec)	Display a text file on your screen.	Allows you to list a file, but not to alter that file. Include drive designator if needed.
PIP LST:=(filespec)	Get a printout of a file.	Copies file from disk onto printer device.
PIP LST:=CON or CTRL-P	Get a printout of all keyboard activity.	Copies keyboard input onto printer device.
BACK16W	Back up contents of one disk on second disk.	Copies contents of Winchester disk to floppy disk(s).
REST16W	Restore contents of second disk back to original disk.	Restores contents of floppy disk(s) onto Winchester disk.

**Table B-1. MP/M-86 Utility Functions (Part 4 of 7)**

<u>COMMAND LINE</u>	<u>FUNCTION</u>	<u>DESCRIPTION/RESULT</u>
<b>FILE HANDLING UTILITIES</b>		
DIR	List all files on disk.	Lists all files with DIR attribute available to current user. Use drive designator if needed.
DIR [SYS]	List all system files on disk.	Lists all files with SYS attribute in current user area. Use drive designator if needed.
DIR (filespec)	Find a file on disk.	Displays directory information on specified file. Use drive designator if needed.
SDIR [option] (filespec)	Display file(s) space and size.	Displays total bytes and records for specified file.
SDIR [option] (filespec)	Display file(s) attributes.	Displays size, space and attributes for specified file(s).
SDIR [SHORT] (filespec)	Display file data excluding time stamping data.	Displays size, space, and attributes for specified file, but excludes time stamping information.
ED (filespec)	Create a text file.	Allocates disk space for file, and allows keyboard data entry for that file. Use drive designator if needed.
ED (filespec)	Edit a text file.	ED utility provides a number of command options and command keys to aid in text editing. Use drive designator if needed.

**Table B-1. MP/M-86 Utility Functions (Part 5 of 7)**

<u>COMMAND LINE</u>	<u>FUNCTION</u>	<u>DESCRIPTION/RESULT</u>
ERA (filespec)	Delete file(s).	Deletes file(s) from disk directory, and reclaims space. Use drive designator if needed.
ERAQ (filespec)	Delete file(s) with a query.	Repeats filename to verify file to be deleted.
PIP (newfile)=(file1, file2, ...)	Combine files.	Replaces file1, file2, and any other files with one file.
PIP (newfile)=(oldfile)	Rename file(s).	Copies a file and gives it a new name. This procedure results in two separate files.
REN (newfile)=(oldfile)	Change filename.	Merely changes the designated filename.
SET (filespec) or d:[option]	Assign file or drive attributes.	Used to assign RO or RW attribute to disk or file; and DIR or SYS to file.
SET [PASSWORD=XXXXXXX]	Turn password protection on for drive.	Two-step procedure: 1. Assigns drive password. 2. Turns on protection.
SET [PROTECT=ON]		
SET (filespec) [PASSWORD=XXXXXX]	Assign password to file.	Assigns file password. Drive protection attribute must be turned on or password is not effective.
SET [DEFAULT=XXXXX]	Assign a default password for current work session.	Lets you access any file assigned the password specified as the default. Convenient when all your protected files have the same password.
SET [option=ON] d:	Time stamp a drive.	Activates one of three options: CREATE, ACCESS, or UPDATE. CREATE and ACCESS cannot be on at the same time.



**Table B-1. MP/M-86 Utility Functions (Part 6 of 7)**

<u>COMMAND LINE</u>	<u>FUNCTION</u>	<u>DESCRIPTION/RESULT</u>
SET (filespec) [TIME]	Time stamp an existing file prior to turning on drive time stamping.	Drive time stamping must already be on.
SET d:[NAME=XXXXX]	Name a disk.	Creates disk directory label. Helpful when working with many disks. Label is automatically created whenever a SET option is turned on.
<b>PROGRAM HANDLING UTILITIES</b>		
ABORT (programname)	Halt a program.	Use only to halt detached processes.
CTRL-C	Halt attached processes.	Use to halt attached processes.
CTRL-D	Detach a program from your console.	Frees up your console for other processes. Program must be reattached to be completed.
ATTACH (programname)	Reattach a program to the console.	Reattaches program to console that detached it.
MPMSTAT	Display current processing information.	Displays status of active queues, consoles, printers.
ED (filespec)	Create a user-written program.	ED creates text file. Subsequent MP/M-86 programs convert the program into an executable program.
ASM86 (filespec)	Convert user-written program to machine readable code.	Converts file written in assembly language into machine language.
GENCMD (filespec)	Create an executable program file from ASM86 processing.	Converts machine language output of ASM86 into a working program.

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APPENDIX B. COMMONLY USED MP/M-86 UTILITY FUNCTIONS

**Table B-1. MP/M-86 Utility Functions (Part 7 of 7)**

<u>COMMAND LINE</u>	<u>FUNCTION</u>	<u>DESCRIPTION/RESULT</u>
DDT86 (filespec)	Tool for debugging a program.	Enables testing and monitoring of any program that results from GENCMD processing. DDT86 has numerous command options for testing specific aspects of a program.
SUBMIT (filespec)	Process several programs with one command (batch processing).	Before invoking SUBMIT command, create a file (using ED utility) listing all desired commands. SUBMIT reads the file and processes the commands.

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alphanumeric

The combination of alphabetic and numeric characters seen on the screen (i.e., in a filespec; e.g., B:SECTN8.TXT).

application program

A program that performs specific tasks, such as word processing or accounting. An application program is separate from the basic operating system.

archive attribute

File attribute that indicates whether or not the file has been backed up. When you use PIP with the ARCHIVE option, it turns on the archive attribute. When a file is updated, MP/M-86 turns off the archive attribute, indicating that the file requires a backup.

ASCII

Acronym for American Standard Code for Information Interchange. A standardized 7-bit sequence for digital data communications.

attribute

File characteristic that can be set to on or off.

backup

To copy a disk or file for safekeeping.

bit

The abbreviation for a binary digit, the smallest piece of information understood by a computer. Usually represented by a 1 (on) or 0 (zero) (off).

block

Area of disk reserved for a specific use.

boot

To invoke a program which automatically loads MP/M-86 into memory. This can occur during system power-up and by pressing the RESET button (cold boot), or by pressing CTRL-C (warm boot).

buffer

Area of memory that temporarily stores data during the transfer of information.

byte

A group of 8 bits, which represents a single character.

character

A single letter, number, or symbol used to interpret computer information.

cold boot

Performed either at system power-up to bring up the operating system, or by pressing the RESET button to interrupt a program while it is running.

command

A word, abbreviation, or character used to instruct the computer to perform a certain operation.

command file

Series of instructions stored on disk as a program file, invoked in MP/M-86 by typing the command keyword next to the system prompt. MP/M-86 command files have a CMD filetype. Files are either command files or data files.

command keyword

Name that identifies an MP/M-86 command. It precedes the command tail in the command line.

command syntax

Statement that defines correct command entry. Generally includes the command keyword and the command tail. A syntax line usually contains symbols that you should replace with actual values when you enter the command.

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command tail

Optional part of a command that follows the command keyword in the command line. Can include a drive specification, a filename, filetype, and options or parameters.

console

Workstation. Primary input/output device. The console consists of a listing device, such as a screen, and a keyboard through which the user communicates with the operating system or application program.

control character

Non-printing character combination that sends a simple command to MP/M-86. Some control characters perform line editing functions. To enter a control character, simultaneously press the CTRL key on your console with the character key specified.

cursor

A block or symbol shown on the display screen, indicating where the next entry will be positioned. Can be a blinking block, underline, or other symbol.

data file

A collection of related information that generally requires a command file to manipulate it.

default

Currently selected disk drive and user number. Any command that does not specify a disk drive or a user number references the default disk drive and user number. When MP/M-86 is first invoked, the default disk drive is drive A, and the default user number is 0, until changed with the USER command.

delimiter

Special characters that separate different items in a command line. For example, in MP/M-86, a colon separates the drive designator from the filename. A period separates the filename from the filetype. Brackets separate any options from their command or file specification. A comma separates one item in an option list from another.

DIR attribute

File attribute. A file with the DIR attribute can be displayed by entering a DIR command. The file can only be accessed from the default user number and drive.

directory

A listing of the names of all the files on disk. MP/M-86 displays the listing in response to the entry of **DIR**.

disk, diskette

Magnetic media used to store computer information. Disk can refer to a diskette, a removable cartridge disk, or a fixed hard disk. Diskette is used interchangeably with the term "floppy disk."

disk drive

The physical mechanism in the computer which reads information from (retrieves it), or writes information to (records it) the disk or diskette.

editor

Utility program that creates and modifies data files. An editor can be used for creation of documents or creation of code for computer programs. (Refer to paragraph 2.5.3, ED Utility.)

execute a program

Run a program. When a program is running, the computer executes a sequence of instructions.

FCB

File Control Block.

file

A collection of related data residing on disk(ette), treated by the computer as a single unit which can be read from or written to. The user can create and name files on a disk.

File Control Block

Structure used for accessing files on disk. Contains the drive, filename, filetype, and other information describing a file to be accessed or created on the disk.

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filename

Name assigned to a file. A filename can include both a primary filename of 1-8 characters and a filetype of 0-3 characters. A period separates the primary filename from the filetype.

file specification (filespec)

Unique file identifier. A complete MP/M-86 file specification includes a disk drive designator followed by a colon (d:), a primary filename (see **filename**), a period, and a filetype. For example, B:EXAMPLE.TXT is a complete file specification.

filetype

Extension to a filename. A filetype contains from 0-3 characters and must be separated from the primary filename by a period. A filetype gives more specific information about a file. Some programs require that files to be processed have certain filetypes.

floppy disk (diskette)

Flexible magnetic disk used to store information. Floppy disks are available in 5-1/4 and 8-inch diameters.

hard disk

Rigid, platter-like, magnetic disk sealed in a container. Stores more information than a floppy disk.

hard disk drive

The housing for a nonremovable (fixed) disk, which is used as a data storage medium.

hardware

Physical components of a computer; i.e., keyboard, screen, disk drives.

hex file

ASCII-printable representation of a command (machine language) file.

hexadecimal notation

Notation for the base 16 number system using the symbols 0-9 and A-F to represent the sixteen digits. Machine code is often converted to hexadecimal notation because it can be easily represented by ASCII characters, and therefore printed on the console screen or on paper.

input

Data entered into a computer, usually by an operator typing at the terminal or by a program reading from the disk.

k

The symbol for the prefix kilo, representing the multiple  $10^3$ ; i.e., 1000 in decimal notation.

K

When referring to storage capacity, represents the multiple  $2^{10}$ ; i.e., 1024 in decimal notation. For example, the expression 1K bytes of memory represents 1024 bytes; the expression 8K bytes represents 8 times 1K bytes, or 8192 bytes.

keyword

See **command keyword**.

label

Entry within the directory. The optional label contains information that describes special attributes of the disk to the operating system. For example, the label tells MP/M-86 whether or not time stamping and password protection are turned on for that disk. You can give a label a name to help identify the disk.

list device

Device such as a printer, onto which data can be listed or printed.

load

To store a program in computer memory.

M

The symbol for the prefix mega, which represents the multiple  $10^6$ ; i.e., 1,000,000 in decimal notation. When referring to storage capacity, represents the multiple  $2^{20}$ ; i.e., 1,048,576 in decimal notation.

memory

The part of the computer hardware that retains information. Reference to memory is normally made in "K" increments; "K" stands for 1024.



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microprocessor

Silicon chip that is the Central Processing Unit (CPU) of the microcomputer.

multi-programming

Capability of the operating system to coordinate the execution of more than one program at a time.

multi-user

Ability of an operating system to support more than one independent user executing different programs at the same time.

network

Term used in the computer industry to denote the connection of two or more computers.

operating system

The collection of programs that enables the computer to function as an intelligent machine, and allows for the development and execution of application programs.

operating system banner

Information about the operating system that is displayed onscreen at insertion of the operating system disk.

option

One of many parameters that can be part of a command tail. Use options to specify additional conditions for the execution of a command.

output

Data that the processor sends to the console or printer.

parameter

A value in the command tail that provides additional information for the command. Technically, a parameter is a required element of a command.

password

User-created extension to a filename that enables a user to add extra protection to files. The password may then be required to access that file. A password can be up to eight characters long, and can include numeric or upper/lowercase characters and some special characters.

peripheral device

External equipment that is connected to the computer but is not a part of it; e.g., a printer, a modem.

physical environment

Actual computer hardware. Can vary from computer to computer.

primary filename

First 8 characters of a filename. The primary filename is a unique name that helps the user identify the file contents. A primary filename contains 1 to 8 characters, and can include any letter or number and some special characters. The primary filename follows the optional drive specification and precedes the optional filetype.

process

When a program is actually executing, as opposed to being in a static state of storage on disk, it is called a process.

program

A precise sequence of instructions used to direct the computer to perform requested operations.

prompt

An indicator, in the form of a character or symbol, that the system is ready for input, or a message guiding the user through a computer process.

queue

MP/M-86 lines up (or "queues") processes in memory, and completes their execution one-by-one. They line up in the order they are sent. You can check queue status using MPMSTAT.

Read-Only

Attribute assigned to a disk file or a disk drive, restricting file access. A file can be read from but not changed. When the attribute is assigned to a drive, you can read any file on the disk, but cannot add a new file, or alter or erase any of the disk. (Refer to STAT utility, paragraph 2.4.8.)

Read-Write

Attribute assigned to a disk file or a disk drive. Allows you to read from and write to a specific file with that attribute, or to any file on a disk in a drive set to Read-Write.

record

Collection of related data. A file consists of one or more records stored on disk. An MP/M-86 record is 128 bytes long.

RO

Abbreviation for Read-Only.

RW

Abbreviation for Read-Write.

software

Any program that controls system operation.

source file

An input file containing commands, text, or other data for a processing program such as an editor, text formatter, or assembler.

spooling

Printing a file from disk. The SPOOL utility, which is detached from the console, can print a file from disk. This leaves your console free for other tasks while your file is being printed.

syntax

Format to be used when entering a given command.

**system**

The combination of all parts of a device, such as a computer, that enable it to perform a specific function.

**SYSTEM attribute**

A file attribute. You can assign this attribute using the SYS option in the STAT command. A SYS attribute file can be displayed using the DIR utility (or the SDIR utility with options). SYS files in user area 0 are accessible to all users.

**system prompt**

Symbol displayed by the operating system indicating that the system is ready to receive input. See **prompt**.

**time stamp**

Record of when a file was created, accessed or updated. In MP/M-86, the SET command turns on time stamp. The time and date information is appended to a file in the XFCB. The time stamps are displayed by the SDIR command described in Section 2.

**TPI**

Acronym for tracks per inch allocated on a disk (i.e., 48 TPI or 96 TPI) or other data storage medium of this type. The TPI of the medium is arranged so that the computer can read from or write to it.

**tracks**

The concentric rings on a disk, to which data is written, and from which data is read.

**user number**

Number assigned to files in the disk directory so that different users need only deal with their own files and have their "own" directories, even though they are all working from the same disk. In MP/M-86, files can be divided into 16 user groups.

**utility**

Program that enables the user to perform certain operations, such as copying files, erasing files, and editing files.

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