

DOS/BATCH
File Utility Package (PIP)
Programmer's Manual

FOR THE DOS/BATCH OPERATING SYSTEM
Monitor Version V09

August 1973

For additional copies, order No. DEC-11-UPPAA-A-D from Digital Equipment Corporation, Software Distribution Center, Maynard, Massachusetts 01754.

First Printing, May 1971
 Second Printing September 1971
 Revised, October 1972
 Revised, January 1973
 Revised, July 1973

Your attention is invited to the last two pages of this document. The "How to Obtain Software Information" page tells you how to keep up-to-date with DEC's software. The "Reader's Comments" page, when filled in and mailed, is beneficial to both you and DEC; all comments received are considered when documenting subsequent manuals.

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PREFACE

This manual describes the features and operation of version V0009 of the File Utility Package (PIP) for DOS/BATCH. The manual assumes familiarity with the DOS/BATCH Monitor.

The file Utility Package is called PIP (Peripheral Interchange Program) for compatibility with similar programs on other DEC systems. Features provided by PIP include file transfers from one device to another, file deletions, file renaming, and directory listings.

Appendix B, "Helpful Hints", contain valuable information on possible solutions to problems that can arise while becoming familiar with PIP.

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CHAPTER 1

INTRODUCTION

The File Utility Package performs transfers of data files from standard PDP-11 I/O devices to other standard PDP-11 I/O devices and performs simple editing and control functions as well. PIP, Peripheral Interchange Program, handles all standard data formats used in the DOS/BATCH system.

The major features provided by PIP are as follows:

- Transfer a file or group of files from one device to another with output being either linked or contiguous (refer to section 3.1.5);
- Merge a group of input files into a single (new) output file;
- Allocate a contiguous file on disk or DECTape;
- Rename an existing file;
- Cause an input file having the same name as a file on the output device to replace that output file - also a switch to turn this mode on or off;
- Delete a file or group of files;
- Selectively perform an operation on each file of a group of files;
- Change the protection code on a file;
- Print filename, file size, creation date, and protection code of each file in a disk, DECTape, cassette, or magtape directory.
- Print a listing of the filenames on disk, DECTape, cassette, or magtape directory.
- List the number of free blocks remaining on the device specified;
- Zero (initialize) a disk (except RP03), DECTape, cassette, or magtape;
- Perform fast copy and/or verify operations for DECTape.
- Perform read-after-write verification for cassette tape.

1.1 CALLING PIP

The user must be logged into the Operating System before running PIP. Any previous program in core must be removed with the KILL command. (The user should be familiar with the Operating System

commands before attempting to use PIP; particularly the RUN, LOGIN, KILL, and FINISH commands.)

In response to the System Monitor's dollar sign character, the user can type the RUN PIP command. For example:

```
$RUN PIP  
PIP Vxx (xx is PIP version number)  
#
```

Following the RUN command, PIP is called into core, prints its version number and a number sign. The number sign indicates that PIP is ready to accept a command string. Following completion of a command, PIP prints another number sign and awaits further commands.

NOTE

A convention followed throughout this manual is the underlining of all Monitor and system program printout to differentiate it from user-typed commands, which are not underlined. Large sections of system program continuous output (such as directory listings) are not underlined. All commands are terminated with the nonprinting RETURN key, causing a carriage return/line feed operation.

1.2 RECOVERING FROM ERRORS

When using PIP, the user may receive an error message from time to time.

An A error message issued by the Monitor indicates a need for operator intervention. In the event an A error occurs, the user should consult the DOS/BATCH-11 Programmer's Manual for a description of the error and then correct the error condition and give the CONTINUE command. For example:

```
#DT1:ABC<PR:  
A002 063320 (high-speed reader is out of tape, RAD50  
representations of standard devices are  
shown in Appendix A.)  
$CONTINUE (put tape in reader and give CONTINUE command)  
# (operation has been performed)
```

An S error message indicates some improper condition detected by PIP. Many S errors are correctable and recoverable. In the event an S error message occurs, the user should consult Chapter 7 of this manual for the meaning of the error and take corrective action accordingly. A typical problem is a bad command string, as is shown below.

<u>#DTØ:EN</u>	(the slash for the switch is absent)
<u>S242 ØØØØØØ</u>	(meaningless command; no action taken)
<u>#DTØ:/EN</u>	(retype the command correctly)
<u>#</u>	(operation is performed and PIP is ready to accept another command)

An F error message indicates a fatal condition has occurred. If an F error message occurs when using PIP, the user must perform a Monitor BEGIN or RESTART command before entering another PIP command. (See the description of error messages and of actions to take in the Appendix portion of the DOS/BATCH Monitor Programmer's Manual.)

1.3 RETURNING TO THE DOS/BATCH MONITOR

1.3.1 Interactive Environment

To exit from PIP to the DOS Monitor, type CTRL/C (hold down the CTRL key while typing the C key). This returns control to the DOS Monitor at which time the KILL command should be given prior to running another (system or user) program. Unless you wish to abort the current operation, you should not type CTRL/C and KILL until after PIP has responded with a #.

1.3.2 Batch Stream

When PIP is running from the batch mode, the batch command \$KILL terminates PIP, stops all I/O, and closes all files. Processing continues at the next command prefixed by a dollar sign (\$). No arguments are specified for \$KILL.

The \$KILL command can be entered from the console keyboard to abort the current job while in batch mode; for example, typing in the following sequence aborts the current job:

<u>↑C</u>	(CTRL/C was typed; ↑C is echoed)
<u>._KILL</u>	

The following batch commands also force a KILL sequence:

\$CHANGE
\$FINISH
\$GET
\$JOB
\$RUN

Refer to the Batch User's Guide for details.

CHAPTER 2

COMMAND STRINGS

All commands to PIP are processed by the Operating System's Command String Interpreter (CSI). This ensures a uniform command format among the various system programs operating under DOS/BATCH. This Chapter briefly describes the command string format of PIP.

2.1 GENERAL COMMAND STRING FORMATS

The most general format of a PIP command string is:

```
output file<input file(s)
```

A single input or output file is completely specified by the following information:

```
dev:filnam.ext[uic]
```

where:

dev:	is the device on which the file currently resides or will reside following a transfer;
filnam	is the name of the file (if any);
ext	is the filename extension (if any); and
[uic]	is the user identification code (if specified).

For example:

```
DTØ:MACRO.OBJ[2ØØ,2ØØ]
```

Either an output or an input file specification can be followed by a switch specification in the command string. A switch specification indicates that some special PIP action is to be performed. (See Table 2-1 for a list of PIP switches.) The switch specifications are of two forms:

 /sw

or

 /sw:n

where:

 / signals a PIP switch specification
 sw indicates the two letter switch code
 :n indicates a decimal or octal value (sup-
 portive argument required by some switches)

PIP commands can take a variety of formats, depending upon the action desired. Some PIP actions are caused when a switch is the only specification in the command string. Other PIP actions are caused by a file specification followed by one or more switch specifications in the command string. Examples of typical command strings are shown throughout the manual.

2.2 DEVICE SPECIFICATION

The device specification consists of two letters, followed, where necessary, by an octal digit indicating one of multiple units, and terminated by a colon. (The standard device specifications are shown in Appendix A.) An octal digit is required in the device specification to distinguish between units on multiple-unit devices. For example, DT1: and DT2: could be used to specify two DECTapes on the same controller. When no digit is indicated for a device, unit 0 is assumed by the system.

When no device is specified for a file, the desired device is assumed to be the last device specified on that side (input or output) of the angle bracket (<). For example:

```
#DK1:<DT1:FILE1,FILE2
```

where FILE1 and FILE2 are on DEctape unit 1.

When no device has been specified on the current side of the <, the system disk is assumed to be the default I/O device (except for /DI, /BR, and /FR switches where the teleprinter is the default output device and the System disk is the default input device). For example, /DI will list the current user's system disk directory on the teleprinter.

2.3 FILENAME SPECIFICATION

A filename specification consists of from one to six letters or digits or an asterisk. All characters in excess of six are ignored. The asterisk feature is described in section 2.5. Examples of filenames are shown below:

```
SEVENLE      is interpreted as SEVENL
A34B
FILE
*            indicates all (filenames or extensions)
```

Null fields in a command are ignored, e.g.

```
#SY:<DK1:A,,B
```

causes files A and B to be read from the DK1 disk to the system disk as properly as if the superfluous commas were not present, i.e., filenames are separated by a comma.

2.4 FILENAME EXTENSION SPECIFICATION

The filename extension specification consists of a period followed by one to three letters or digits, or an asterisk. The asterisk feature is described in section 2.5. Extensions may be used to specify the format in which a certain file is stored, the version of a particular file, or any other information the user desires. Examples of filenames used with filename extensions are shown below:

```
FORT.1A
ABC.PAL
FILE.TMP
MODS.ØØ1
MODS.ØØ2
MAT.*           all files with the name MAT
```

Filename extensions, where associated with a filename, must be used to specify that particular file, unless the asterisk feature is used. A filename extension may not be used without a filename (except with an asterisk substituted for a filename, as described below).

2.5 ASTERISK FEATURE

The asterisk (*) character can be used in a command string to replace either the filename or filename extension specification. The asterisk can be read as "all files" with the filename or filename extension indicated. For example:

```
*.TMP           indicates all files with the extension .TMP
FILE.*          indicates all files with the name FILE
```

The asterisk can appear in both positions:

```
*.*
```

which denotes all files on the specified device belonging to the user identification code specified (or the current user UIC if no UIC is specified).

Except where noted in this manual, the asterisk feature can be used in all transfer operations, all directory listing operations, deletion operations, protection operations and rename operations.

PIP can reference all files with null extensions through use of the asterisk feature. For example, to delete all files with null (no) extensions, the command is:

```
#*./DE
```

2.6 USER IDENTIFICATION CODE SPECIFICATION

The User Identification Code (UIC) specification consists of a pair of 1- to 3-digit octal numbers, each of which may have a value between 11 and 376 (0-10 are reserved for special use), separated by a comma, and enclosed within square brackets. (The left and right square brackets are typed using SHIFT/K and SHIFT/M on ASR-33's.) The left number specifies a user group and the right number specifies a particular user within a group.

The User Identification Code is used in connection with file storage and file protection (see section 3.6)¹. When a UIC does not appear in a command string, the UIC specified in the last LOGIN command is assumed. The asterisk feature is allowed in the UIC for certain switches (see sections 4.2.1 and 4.2.2.) Examples of acceptable UIC's are shown below.

Explicit non-current UIC specification and/or the asterisk feature are allowed in the UIC field for functions that do not disturb another user's area or for functions that are not explicitly prohibited by the other user. For example, if the user is logged in under account 200,200, the following actions are legal:

1. See section 4.2.1.
2. See section 4.2.2.
3. #SY:FILE.EXT<SY:OTHER.EXT[30,50]
if OTHER.EXT is not protected from other user groups.

The following actions are illegal:

1. #SY:FILE.EXT[30,40]<SY:FILE2.EXT
2. #SY:[*,*]<SY:NAME.EXT
3. #SY:FILE.EXT<SY:PROT.EXT[30,60]
if PROT.EXT is protected from other user groups.

Examples of acceptable UIC's are shown below.

```
[200,200]
[200,201]   three users in one group
[200,244]

[100,100]
[376,376]
```

¹Cassette tape does not have UIC specifications implemented.

Table 2-1
PIP Switch Options

<u>Switch Code</u>	<u>Switch Name</u>	<u>Operation</u>
/AL	Allocate	Allocates a blank contiguous file
/BR	Brief Directory	List only filenames and extensions in the directory of the device(s) specified.
/CO	Contiguous	Create a contiguous output file.
/DE	Delete	Delete the file(s) specified
/DI	Directory	List the directory or a subset thereof for the device(s) specified. This includes: filenames, extensions, file size, creation date, and protection code for each file
/EN	Enter	Enter the user identification code specified into the Master File Directory of the specified device.
/FA	Formatted ASCII	Transfer file(s) indicated in formatted ASCII mode
/FB	Formatted Binary	Transfer file(s) indicated in formatted binary mode
/FC	Fast Copy	Transfer all files from one DECTape to another
/FR	Free	List the number of free blocks on the device(s) specified
/IN	Inspect	List all files for confirmation before performing action so that user can proceed or bypass.
/PR	Protect	Change the protection on the file(s) indicated to the value given
/RE	Rename	Rename the file indicated to the name given
/RU	Rewind/Unload	Rewind the magtape or cassette tape unit specified and turn that unit off-line
/RW	Rewind	Rewind the magtape unit specified
/SU	Supersede	Cause the input file having the same name as a file on output device to replace that output file

Table 2-1 (cont'd)

<u>Switch Code</u>	<u>Switch Name</u>	<u>Operation</u>
/UA	Unformatted ASCII	Transfer file(s) indicated in unformatted ASCII mode
/UB	Unformatted Binary	Transfer file(s) indicated in unformatted binary mode
/UN	Unlock	Unlock the User File Directory to recover the file specified
/VE	Verify	Verify that blocks on two DECTapes are alike, otherwise print differences
/VW	Verified Write	Verify a write operation by reading the block after writing it
/ZE	Zero	Initializes the file structure on the device(s) specified

2.7 SWITCH SPECIFICATIONS

The switch specification consists of a slash followed by two letters, and is optionally followed by a value specification of octal or decimal digits separated from the switch code by a colon. Switch names can be of any length; but, only the first two characters are significant.

Nontransfer operations in PIP are selected by use of switches. If more than one switch is used, each switch is preceded by a slash. A summary of the switch options is shown in Table 2-1.

When present, a switch must follow any file or UIC specification; that is, a switch cannot appear before the filename, extension, or UIC of the file on which the switch is to operate. However, some switches may be specified without any file specification at all.

Some options require a numeric value to be associated with the switch. Whether the value is octal or decimal depends upon the switch. For example: /PR is the switch to change the file protection code. The new protection code is preceded by a colon as follows:

```
#DT1:ABC/PR:155
```

which changes the protection code of file ABC on DECTape unit 1 to 155. Refer to section 3.6 for a description of protection codes and their uses.

In general, PIP switch options can be grouped into two categories: action switches and qualifying switches. Action switches are generally associated with some action or operation. Only one action switch can be used in any one PIP command. The action switches are as follows:

/AL	Allocate
/BR	Brief Directory
/DE	Delete
/DI	Directory
/EN	Enter
/FC	Fast Copy
/FR	Free
/PR	Protect
/RE	Rename
/RU	Rewind and Unload
/UN	Unlock
/VE	Verify
/ZE	Zero

Qualifying switches are used to give PIP particular information about how to perform an operation. These switches can be used in conjunction with other switches in a single command string. The qualifying switches are:

/CO	Contiguous
/FA	Formatted ASCII
/FB	Formatted Binary
/IN	Inspect
/RW	Rewind
/SU	Supersede
/UA	Unformatted ASCII
/UB	Unformatted Binary
/VE	Verify
/VW	Verified Write

Another type of distinction which is made among switches is that some can be used alone, some operate upon a single file designation, and some require both an input and an output specification, as follows:

<u>Used Alone</u>	<u>Used with One or More File Designations</u>	<u>Used with Both an Input and Output Designation</u>
/BR	/BR	/BR
/DI	/DI	/DI
	/AL	/FA
	/DE	
/EN	/EN	
/FR	/FR	
	/PR	/PR
	/RE	/RE
	/UN	/RW
		/CO
		/FR
		/FB
/ZE	/ZE	/UA
	/SU	/UB
	/IN	
	/VW	

CHAPTER 3

FILE MANIPULATION

3.1 FILE TRANSFERS

The transferring of files between devices is a primary function of PIP. PIP uses the device independent features of the Operating System and can either copy a file directly onto another device or merge several files from the same or different devices into a single file on one device.

3.1.1 File Copy Operation

In the simplest case, PIP can transfer a file from one peripheral onto another. For example, to list a file, transfer a copy of the file to the line printer:

```
#LP:<DT2:FILE1.PAL   where FILE1.PAL is on DECTape
#LP:<MT1:FILE2.PAL   where FILE2.PAL is on magtape
#LP:<FILE3.PAL       where FILE3.PAL is on the system disk
```

The following command transfers the data on a paper tape from the high-speed reader and creates a file named INPUT.TST on the system disk:

```
#INPUT.TST<PR:
```

The following command duplicates a paper tape:

```
#PP:<PR:
```

There can be only one output file designation in a PIP command, although there can be any number of input files (limited only by the teleprinter line length). For example, to copy three files (ONE.PAL, TWO.PAL, and THREE.PAL) from the system disk onto DECTape unit 0, type:

```
#DT:<ONE.PAL,TWO.PAL,THREE.PAL
```

In the case shown above, the files are copied directly to DECTape unit 0, using the same filenames as on disk. In order to later change the filenames, the RENAME (/RE) switch can be used:

```
#DK:<DT1:FILE1,PR:ABC,MT:DEF.001  
#DAVE1/RE<FILE1
```

The first command transfers three files onto the RK11 disk unit 0; FILE1 from DECTape unit 1, ABC from the paper tape reader, and DEF.001 from magtape unit 0. Each file retains its original name. Note the ability to indicate the name of a file from the high-speed paper tape reader. The second command RENames the file FILE1 on DK0: to DAVE1.

3.1.2 Fast Copy and/or Verify Operations

The FAST COPY (/FC) and VERIFY (/VE or /FC/VE) operations are applicable only to DECTape. Input and output device types must be the same; unit numbers must be different. The S260 or S231 error message will result if the preceding two conditions are not met.

The format of these operations is illustrated in the three command strings shown below.

```
or      #DT1:<DT2:/FC/VE  
or      #DT1:<DT2:/FC  
or      #DT1:<DT2:/VE
```

PIP-11 allocates the largest amount of core memory available for the transfer buffer (buffers in the case of VERIFY operations); so that the larger the main memory, the faster the operation. On 28K machines, for example, a DECTape can be copied in about two minutes; verifying it takes 2 1/4 minutes.

The VERIFY operation as shown above can be performed alone. If the data on the two devices differ, a message indicating the block and word in disagreement is printed at the console in the following octal format:

<u>Block</u>	<u>Word</u>
N	M

3.1.3 File Merge Operation

When there are several input files involved in a transfer, the files can be transferred individually, as the previous examples illustrate, or they can be merged into a single output file.

When no output filename is specified on the output device, input files are copied without combining:

```
#DT3:<ABC,DT2:RASP,PR:DEF
```

Three files are copied onto DECTape unit 3; one from the system disk, one from DECTape unit 2, and one from the high-speed paper tape reader. Each retains the same name given on the input side.

When a filename is specified on the output device, all input files are combined to create a single new output file. In order to combine the three files shown above into a single file named MERGE, the following command is used:

```
#DT3:MERGE<ABC,DT2:RASP,PR:DEF
```

Numerous variations on this operation are possible. One or more of the input files can be specified as being under another UIC, input files can be on the same or different devices, etc.

An operation to merge a single file is equivalent to creating another copy of that file with a different name, e.g.

```
#ABC<DT1:FILE1
```

takes FILE1 on DECTape unit 1 and puts it on the system disk under the name ABC.

3.1.4 File Transfer Modes

The modes of transfer under the Operating System are either formatted or unformatted, either ASCII or binary. Refer to the DOS/BATCH Monitor Programmer's Reference Manual for further details on the modes of transfer.

In PIP, the mode of transfer of any file is determined by the format switch specified in the command string. If a format switch is not specified in a command string, the mode assumed for the transfer is unformatted binary (unformatted ASCII if either device does not support binary). This means, for example, that files transferred from paper tape without a mode specification include blank frames, leader and trailer tape. Files transferred in this way may be larger than necessary.

A switch specified in the command string may be used to force a particular mode of transfer. The switches that specify format are /FA, /FB, /UA, and /UB. Only one type of format switch shall be specified in a command. The switch can be used with both input and output files. For example, to transfer the files ABC.DAT and ABC.TST in formatted binary mode:

```
#DT4:<ABC.DAT/FB,ABC.TST/FB  
or  
#DT4:/FB<ABC.DAT,ABC.TST
```

In the case of the paper tape reader, use of these switches guards against putting the tape in the reader backwards. For example, if the paper tape were in backwards, the command:

```
#SPRMAN.OBJ<PR:/FB
```

would cause PIP to print a S202 error message on the teleprinter.

3.1.5 Contiguous Files

Contiguous files are handled differently by the Operating System than are regular, linked files. Blocks of contiguous files are guaranteed to be physically adjacent, whereas linked files are generally separated by a minimum fixed distance (called the interleave factor) to take advantage of the rotational delay inherent in a disk. Contiguous files are generally used for random accessing of data, a feature which is impossible with linked files.

Unless otherwise specified, file transfers will produce linked files. The /CO switch is used to specify an output file as contiguous.

Three cases exist where use of the /CO switch is valid. The first two cases apply to a merge operation and a copy operation. For each operation, a new filename is specified in the output field

of the command string. The /CO switch must be specified in the output side of the command string if the new file is to be created as a contiguous file, as shown below.

1. A merge operation where the new file is to be made contiguous. For example,

```
#SY:FILEME.RGE/CO<DK1:FIL1,DT1:FIL2
```

2. A copy operation where the new file is to be made contiguous. For example,

```
#SY:FILB/CO<DK1:FILA (see Note)
```

NOTE

In the case where the output file is explicitly named, the /CO switch must be on the output side.

In both of the above cases, it makes no difference whether the input file(s) is contiguous or linked. The output file must be designated contiguous with the /CO switch.

The third case applies to a simple transfer operation where no new filename is specified explicitly but the new output file(s) is to be made or is to remain contiguous. In this case, the /CO switch must be given on the input side of the command string for the file(s) desired to be contiguous on the output device. For example,

```
#SY:<DK1:FIL1/CO,FIL2,FIL3/CO
```

Both FIL1 and FIL3 are created as contiguous files on the output device. FIL2 is created as a linked file, whether or not it is linked or contiguous. The same applies to the simplest case. For example,

```
#SY:<DK1:FILA/CO
```

FILA is created as a contiguous file on the output device. If the /CO switch is not used, FILA would be created as a linked file on the output device, whether or not it is linked or contiguous on the input device.

All other uses of the /CO switch are invalid.

A contiguous file is denoted in a full directory listing by a C following the number of blocks for that file.

3.1.6 Transfers from the Teleprinter

Occasionally, the user may wish to transfer a file from the teleprinter keyboard to another device. This is accomplished as follows:

```
#PP:<KB:
```

Subsequent characters typed at the keyboard are output to the high-speed paper tape punch. (Punching is performed in bursts as the tape punch buffer fills.) To indicate an end-of-file with such an operation (i.e. to stop transferring data to the punch), the DOS convention is to type CTRL/C followed by the END command.

In order to execute the command, the terminal must be in Monitor mode. Consequently, the sequence is:

```
↑C          (type CTRL/C)
↓END        (followed by the RETURN and
             LINE FEED keys respectively)
```

The terminal LINE FEED keying is necessary to force control back to PIP after the END command is executed. PIP returns with a number sign (#) when the above sequence is completed.

This same sequence is necessary when transferring from the low-speed paper tape reader. However, it is necessary to indicate the end-of-file from the user keyboard; the END PT command is given in this case. If the user types:

```
#DF:FILEIN.MAC<PT:
```

It is necessary to type:

```
↑C          (type CTRL/C)
↓END PT     (followed by the RETURN key
             and LINE FEED key respectively;
             no colon is used after PT)
```

after the tape has been read and the low-speed reader stops.

Note: Binary transfers are not allowed from the low-speed paper tape reader.

3.2 RENAMING FILES

The RENAME switch is provided to allow the user a means of changing the name of a file. The general form of the command is:

```
new filename<old filename
```

with /RE on either side of the left angle bracket.

If no device is specified, the system disk is assumed; for example:

```
#MAIN.OBJ/RE<TESTX.OBJ
```

changes the name of the system disk file TESTX.OBJ to MAIN.OBJ.

When renaming, it is mandatory that the same device be used on both sides of the left angle bracket. The following is allowed:

```
#DT:FILE1<FILE2/RE
```

The device for FILE2 is assumed to be the DECTape. The same command could be written as:

```
#DT:FILE1<DT:FILE2/RE
```

If the /RE switch is omitted in the command string, the operation performed is a copy operation which duplicates the input file on the same device, but under another name. In this case two copies of the file would exist on the same device. For example:

```
#DT:FILE1<DT:FILE2
```

copies FILE2 into FILE1, both on DEctape unit Ø. No error message is given since the command is for a valid transfer operation.

Only one file at a time can be renamed.

3.3 DELETING FILES

The DELETE switch is provided to allow the user a means of deleting one or more files. The simple form of the command consists of a file designator followed by the /DE switch. For example:

```
#DT:MAIN.LDA/DE
```

which deletes the file MAIN.LDA from DEctape unit Ø.

Several files can be deleted by specifying a sequence of filenames before the DELETE switch. For example:

```
#AB,DT:CD,DT1:EF.OBJ/DE
```

deletes three files on three different devices.

The DELETE switch supports the asterisk in the filename and/or extension fields of the file specifications. The asterisk is interpreted as "all", as in *.PAL meaning all files under the current UIC with an extension of .PAL. For example:

```
#DT1:*.LDA/DE
```

deletes all files with the extension .LDA from DEctape unit 1.

```
#*.* /DE
```

deletes all files under the current UIC from the system disk.

Files can be deleted from cassette tape without destroying adjacent files. For example:

```
#CT1:FILE.MAC/DE
```

To delete all files from a DEctape, magtape, or cassette tape, it is recommended that the Zero switch be used, since that operation is much faster (see Sections 4.4.1 and 5.4).

3.4 INSPECTING FILES

The INSPECT switch (/IN) is an auxiliary switch which instructs PIP to type out the name of each eligible file, followed by a question mark, before executing the main operation. The user can then perform the operation on that particular file, by typing a Y (for yes) followed by the RETURN key; or he may bypass the file by simply typing the RETURN key.

In general, /IN is used with file transfers and with the /SU, /DE and /RE switches and is particularly useful when used in conjunction with asterisk-type commands. For example:

```
#*.* /DE /IN
```

which allows the user to edit (accept or reject) the contents of a whole directory. To continue:

```
ABC.OBJ? Y      ;Delete this file
DEF.PAL?       ;Do not delete this file
.
.
.
etc.
```

In the examples above, typing Y at the console caused the deletion of file ABC.OBJ. PIP listed another filename; the RETURN key was typed, file is left intact; PIP lists another file, etc.

3.5 SUPERSEDE OPERATION

When used on the input side of a transfer command, the SUPERSEDE switch (/SU) causes any input file having the same name as a file on the output device to replace that output file. Input files not existing on the output device will simply be transferred as usual. The /SU switch will not delete an output file if the input file to

replace it is not present on the input device. In this instance, an S error condition will be given and PIP will proceed to transfer any remaining files.

The command is normally used in association with specific filenames specified only on the input side of the command string:

```
#dev:<devl:A,B,C/SU
```

or for asterisk-type transfers

```
#dev:<devl:*/SU
```

If the filename specification appears in the output side of the command string and the file already exists on the output device, the transfer is not made and an S257 error occurs, e.g., the command dev:A<devl:A/SU.

In addition to its use as a stand-alone command, one can evoke a supersede mode with a /SU:ON command which will remain in effect until the mode is turned off with a /SU:OFF or until the program is killed through a return to the Monitor. The Monitor's BEGIN command does not affect the mode. Enabling the mode in this way obviates entering an /SU switch following each command.

3.6 FILE PROTECTION CODES

The PROTECT switch is provided to allow the user a means of changing the protection of a file. It is not applicable to cassette tape.

The protection code is specified as an octal value argument to the switch and is treated as three fields corresponding to owner, user group, and all others. Each field is assigned an octal digit as described in Figure 3-1.

The general form of this command is:

```
dev:filnam.ext/PR:value
```

such as:

```
#FILE3/PR:355
```

which changes the protection code of FILE3 to 355. The protection switch works for DEctape and disk:

#DTØ:FILE4/PR:155

as well as:

#DK1:ABC.DAT/PR:3ØØ

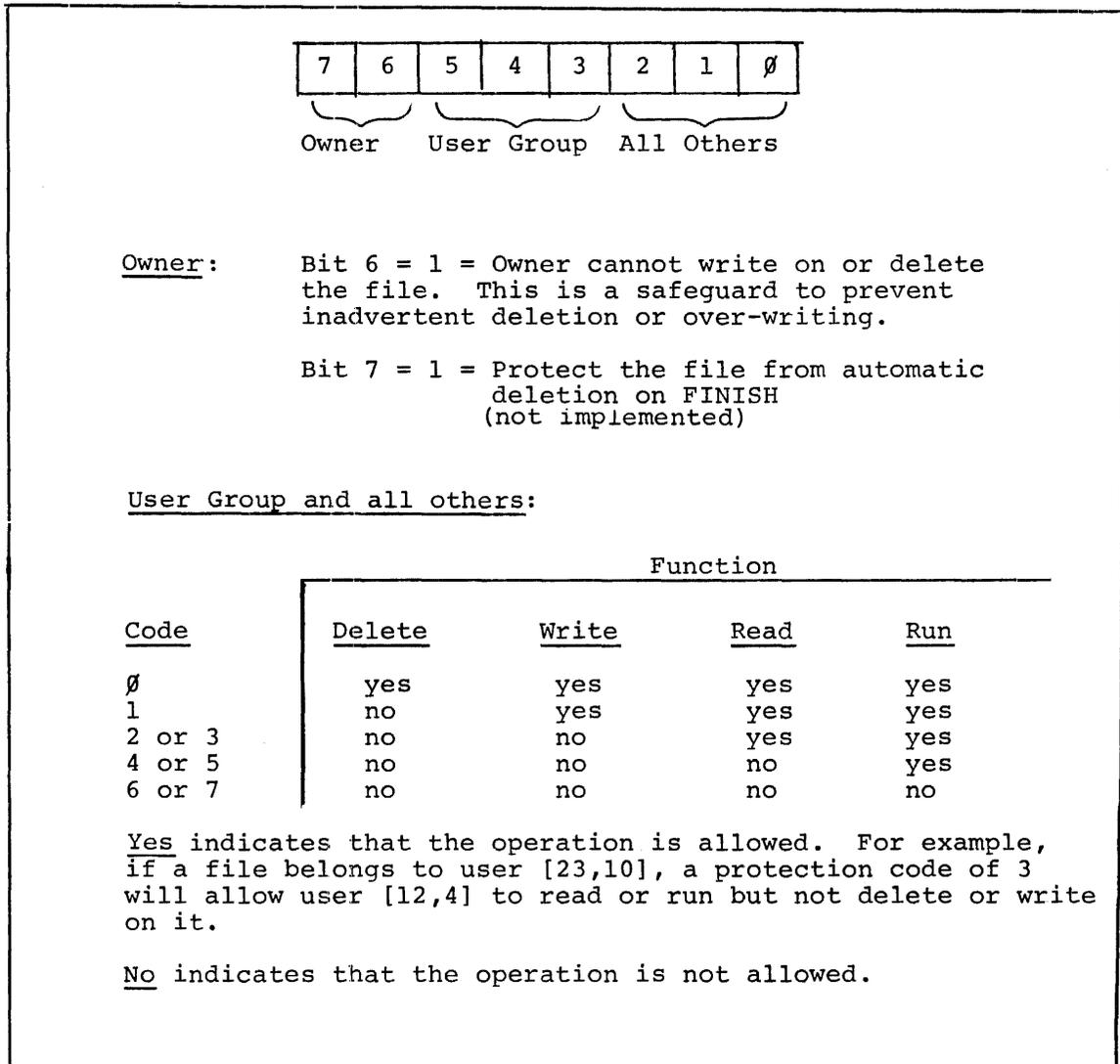


Figure 3-1. File Protection Codes

3.7 ALLOCATING A CONTIGUOUS FILE

Whenever it is necessary to load a contiguous file from paper tape, a blank, contiguous file is first created. The ALLOCATE switch provides a means of creating a blank, contiguous file. This option requires a filename and a decimal integer value (being the number of 64-word segments of storage to be allocated). For example:

```
#DF:FILE/AL:10
```

allocates 640 contiguous words of file storage on the RF11 disk. A subsequent PIP command:

```
#FILE<PR:
```

causes the paper tape to be read into the contiguous file previously created.

The ALLOCATE switch can be used to create a contiguous file on disk or DEctape. Note that the segments allocated are always 64 words and do not depend upon the block size of the device. For example,

```
#DK0:FILE/AL:100
```

creates a blank contiguous file named FILE on device DK0. Since an RK11 device contains 256 words per block, the allocated file contains 25 blocks, each 256 words in length. Each block contains four 64-word file segments. The number 25 followed by C is shown as the number blocks of the file on the full directory listing for the device on which the contiguous file was created. For example:

```
#DK0:FILE/DI
DIRECTORY DK0: [200,200]
24-AUG-72
FILE      25C      24-AUG-72 <233>
```

Whenever it is necessary to create an empty, contiguous file, the characters :E are appended to the command string. For example:

```
#DF:FILE1/AL:1Ø:E
```

allocates 640 contiguous words of file storage on the RFl1 disk as normally. However, pointers are set in the UFD file entry such that the space is apparently empty. A file allocated in this manner can accept partial sequential output (through a Monitor .OPENC call). The pointers are updated to reflect the end of the actual data entered in part of the allocated space. The same file can subsequently be extended (through a Monitor .OPENE call) within the unfilled, allocated space.

DIRECTORY MANIPULATION

A significant number of PIP features center around the manipulation of files within directories and of the directories themselves.

4.1 ENTERING USER IDENTIFICATION INTO THE MASTER FILE DIRECTORY

The User Identification Code (UIC) must appear in the Master File Directory (MFD) before a user is able to create his own files on the disk or DECTape. This code is generally entered into the MFD by using the ENTER switch in PIP, although the DOS system building program creates a few fundamental User File Directories (UFD's). Refer to the DOS/BATCH System Manager's Guide for further details.

The UIC of the current user of the system is passed to the Operating System by the LOGIN command. For example:

```
$LOGIN 11,11
```

sets the current UIC to [11,11]. In using the ENTER switch, the UIC of the current user is obtained from the system and written into a spare slot in the MFD. The recommended sequence is then:

```
$LOGIN uic
$RUN PIP
PIP Vxxx
#/EN
```

The LOGIN UIC code is now a valid UIC on the system disk. In order to enter a UIC onto the system disk other than the one used in the LOGIN command, the UIC can be specified as follows:

```
#[200,213]/EN
```

which enters the UIC[200,213] onto the system disk.

If no spare slots exist in the MFD¹, PIP prints a fatal error message, and no attempt is made to extend the MFD.

¹See Section C.2 for the number of UIC slots available on the UFD.

This procedure is not always necessary for DECTapes because the ZERO switch enters the UIC of the current user when the directory is initialized (see section 4.4.1).

If a user other than the one originally zeroing the DECTape wishes to access files on the tape, he must enter his UIC on the DECTape or explicitly reference the UIC field of the original user during each reference. For example, if the DECTape on unit 1 had been originally zeroed and filled by UIC [50,50], user UIC [200,200] could reference those files by logging in under [200,200] and giving the following command:

```
#DT1:/EN
```

In general, then, an ENTER operation performs one of two services: for DECTapes it allows any user to access all files on the DECTape as though he had initialized the DECTape; and on the disk it creates a UFD for the current (logged in) UIC (or the UIC specified), allowing that user to store files on the system disk with whatever protection is desired.

4.2 DIRECTORY LISTINGS

A listing of the directory of all or certain selective files on any file structured device can be printed on the teleprinter or line printer; (PIP assumes the teleprinter unless another device is specified in the command string). The information listed in a directory is a subset of all the information in the UFD entry for each file.

4.2.1 Full Directories

A full directory (/DI) listing contains: two title lines to identify the device, UIC, and the data which are followed by all filenames and extensions; the number of blocks per file (followed by a C if the file is contiguous), file creation date, and file protection code (enclosed within angle brackets); plus the total number of blocks and file for that UIC. For example:

#/DI

DIRECTORY DFØ: [5Ø,5Ø]

22-FEB-72

MONLIB	5Ø8C	ØØ-XXX-7Ø	<377>
LINK11.OVR	72C	22-FEB-72	<233>
PIP .LDA	77	22-FEB-72	<233>
LINKOB.LDA	1Ø7	22-FEB-72	<233>
LINK11.LDA	63	22-FEB-72	<233>
EDIT11.LDA	56	22-FEB-72	<233>
PAL11R.OVR	4ØC	22-FEB-72	<233>
PALOB .LDA	1Ø7	22-FEB-72	<233>
ODT11R.OBJ	53	22-FEB-72	<233>
PAL11R.LDA	65	22-FEB-72	<233>
FORTRN	9Ø	22-FEB-72	<233>
LIBR11.LDA	35	22-FEB-72	<233>
FORTRN.OVR	2Ø4C	22-FEB-72	<233>
FORCOM.DGN	68C	22-FEB-72	<233>
FORRUN.DGN	4ØC	22-FEB-72	<233>
FORLIB.OBJ	6Ø4	22-FEB-72	<233>
EAELIB.OBJ	6Ø4	22-FEB-72	<233>
ADD4B .PAL	66	22-FEB-72	<233>
DEFIN .OBJ	5	22-FEB-72	<233>
DVBØ7 .PAL	33	22-FEB-72	<233>
PALSYM.PAL	85	22-FEB-72	<233>
FORTOV.12K	3ØØC	22-FEB-72	<233>
FORTRN.12K	118	22-FEB-72	<233>
LINKOB.OBJ	154	22-FEB-72	<233>
LINK11.OBJ	94	22-FEB-72	<233>
EDIT11.OBJ	85	22-FEB-72	<233>
PALOB .OBJ	138	22-FEB-72	<233>
PALSYM.OBJ	17	22-FEB-72	<233>
PAL11R.OBJ	77	22-FEB-72	<233>

TOTL BLKS: 3965

TOTL FILES: 29

Notice that the system device (DFØ: in this case) was assumed and the user was logged in under UIC[5Ø,5Ø].

Whenever a file is transferred onto disk, cassette tape, or DECTape, the date in the directory reflects the date on which the transfer took place, not the date on which the file was created.

The full directories of multiple devices can be obtained:

#DF: ,DT1:/DI

DIRECTORY DFØ: [5Ø,5Ø]

24-JUL-71

MONLIB	5Ø8C	ØØ-XXX-7Ø	<377>
LINK11.OVR	36C	17-JUL-71	<233>
PIP .LDA	7Ø	17-JUL-71	<233>
ODT11R.OBJ	51	17-JUL-71	<233>
FORTRN.OVL	152C	24-JUL-71	<233>
FORTRN	118	24-JUL-71	<233>
LINKØB.LDA	96	17-JUL-71	<233>
LINK .LDA	58	17-JUL-71	<233>
EDIT .LDA	56	17-JUL-71	<233>
PALØB .LDA	1Ø7	17-JUL-71	<233>
PAL .LDA	65	17-JUL-71	<233>
PAL11R.CVR	4ØC	17-JUL-71	<233>
LIBR .LDA	41	17-JUL-71	<233>
FORCOM.DGN	112C	17-JUL-71	<ØØ >
EAELIB.LDA	555	19-JUL-71	<233>
EAELIB.OBJ	555	19-JUL-71	<233>
TOTAL BLKS:	262Ø		
TOTL FILES:	16		

DIRECTORY DT1: [1,1]

24-JUL-71

FORLIB.OBJ	135	Ø1-JUL-71	<233>
EAELIB.OBJ	136	Ø1-JUL-71	<233>
IØLØ1 .OBJ	1	Ø1-JUL-71	<233>
DEFIN .OBJ	1	Ø1-JUL-71	<233>
DVTBØ6.PAL	7	Ø1-JUL-71	<233>
FREE BLKS:	282		
FREE FILES:	51		

When a full DECTape or cassette tape directory is obtained, the listing is concluded with the total number of free blocks and files, whereas with a disk the number of used blocks and files are reported.

The full directory listing can be limited to produce a partial list of specified files on one or more devices. The following example illustrates the use of the asterisk to list only those files with the extensions specified on the two devices specified:

#DF:*.OVR,*.OBJ,DT1:*.PAL/DI

DFØ:

LINK11.OVR	36C	17-JUL-71	<233>
PAL11R.OVR	4ØC	17-JUL-71	<233>
ODT11R.OBJ	51	17-JUL-71	<233>
EAELIB.OBJ	555	19-JUL-71	<233>

DT1:

DVTBØ6.PAL	7	Ø1-JUL-71	<233>
------------	---	-----------	-------

Notice that the UIC, date, and number of blocks and files for that UIC are not reported in partial /DI listings.

Directory information about a particular file can be obtained by specifying the filename and extension with the /DI switch. For example:

#FTNØØØ.OVL/DI

DKØ:

FTNØØØ.OVL	1ØC	15-JUL-71	<233>
------------	-----	-----------	-------

This obtains all information about FTNØØØ.OVL if it is in the DKØ: directory. (If the file is not in the directory, there is no listing, and no error message.)

Any UIC directory on any device can be listed by specifying that UIC in the command to PIP. For example, if a user is logged in under UIC 2ØØ,2ØØ, he can give the following command (the results are shown below):

#DK1:[5Ø,5Ø]/DI

DIRECTORY.DK1: [50,50]

21-JUL-71

FORCOM.DGN	27C	01-JUL-71	<233>
FORTRN.08K	23	01-JUL-71	<233>
IVK08K.LDA	27	01-JUL-71	<233>
OVL18K.LDA	26	01-JUL-71	<233>
OVL28K.LDA	23	01-JUL-71	<233>
OVL38K.LDA	26	01-JUL-71	<233>
OVL48K.LDA	28	01-JUL-71	<233>
OVL58K.LDA	28	01-JUL-71	<233>
OVL68K.LDA	25	01-JUL-71	<233>
FORTRN.12K	23	01-JUL-71	<233>
OVL0 .LDA	27	01-JUL-71	<233>
OVL1 .LDA	26	01-JUL-71	<233>
OVL2 .LDA	23	01-JUL-71	<233>
OVL3 .LDA	26	01-JUL-71	<233>
OVL4 .LDA	28	01-JUL-71	<233>
OVL5 .LDA	28	01-JUL-71	<233>
OVL6 .LDA	25	01-JUL-71	<233>

TOTL BLKS: 123
TOTL FILES: 39

If the user requests information on any particular file or uses the asterisk feature where no such file exists, no error message is given. The directory is considered blank; and a blank line is printed. In the example below there is no *.OVR file on DT0:

#DF:*.OVR,DT0:*.OVR/DI

DF0:

LINK11.OVR	36C	21-JUL-71	<233>
PAL11R.OVR	40C	21-JUL-71	<233>

DT0:

4.2.2 Brief Directory Listings

The BRIEF DIRECTORY (/BR) switch can be used to list only the device name, filenames, and extensions. The asterisk and specific filenames can be used with the BRIEF DIRECTORY switch to obtain partial brief directories.

The following PIP example demonstrates the correspondence between /DI and /BR directory listings.

#*.OVL/DI

DKØ:

FTNØØØ.OVL	1ØØ	15-JUL-71	<233>
FTNØØ1.OVL	9C	15-JUL-71	<233>
FTNØØ2.OVL	7C	15-JUL-71	<233>
FTNØØ3.OVL	9C	15-JUL-71	<233>
FTNØØ4.OVL	1ØC	15-JUL-71	<233>
FTNØØ5.OVL	11C	15-JUL-71	<233>
FTNØØ6.OVL	8C	15-JUL-71	<233>

#*.OVL/BR

DKØ:

FTNØØØ.OVL
FTNØØ1.OVL
FTNØØ2.OVL
FTNØØ3.OVL
FTNØØ4.OVL
FTNØØ5.OVL
FTNØØ6.OVL

An example of the /BR switch with the system device assumed is shown below:

#/BR

DFØ:

MONLIB
LINK11.OVR
PIP .LDA
FCL .PAL
PAL11R.OVR
PAL
LINK

Other examples of /BR switch usage are shown below:

#FOR.E/BR

DFØ:

FOR .E

The asterisk (*) feature for filenames and extensions works for directory listings, both full and brief form. For example, the command:

```
#*.PAL/ER
```

gives a brief directory listing for all files on the user's disk area with an extension of .PAL. The asterisk can appear in the filename field, the extension field, or both. In addition, groups of file specifiers can be arranged to provide sequential listings, as in:

```
#DTØ:*.MAC,DF:FORTRN.*/DI
```

The asterisk feature can be used in the UIC field when obtaining directory listings.

```
#LP:<DK:[*,*]/DI
```

All directories on RK11 unit Ø are listed on the line printer.

```
#LP:<DF:[*,2ØØ]/DI
```

A listing is produced of all directories associated with user number 2ØØ, in every project.

```
#LP:<DK:*.MAC[*,*]/DI
```

A directory of all files with extension .MAC, on RK11 unit Ø, is produced.

4.3 FREE BLOCKS

Since a full directory listing of a system disk provides the user only with a summary of the number of blocks used by his current UIC, the /FR switch is available for determining the number of free blocks remaining. For example:

```
#/FR
```

```
DFØ:
```

```
FREE BLKS: 5513
```

This switch can be used with any file-structured device, but is generally only necessary with disk, as the information is provided automatically with a DECTape. Further examples of the /FR switch follow:

```
#/FR
```

```
DKØ:
```

```
FREE BLKS: 4113
```

```
#DF:,DTØ:/FR
```

```
DFØ:
```

```
FREE BLKS: 3243
```

```
DTØ:
```

```
FREE BLKS: 282
```

4.4 DECTAPE AND RK11 DISK INITIALIZATION

(See Chapter 5 for magtape initialization and Chapter 6 for cassette initialization.)

4.4.1 DECTape

In order to initialize a new DECTape with the basic file structure information required by the DOS/BATCH Monitor, the ZERO switch is provided.

The ZERO switch causes PIP to create on the DECTape specified the permanent bit maps, the file bit maps, the MFD, and a UFD for the UIC currently running on the System.

The ZERO switch can be used either by itself, as in:

```
#DTØ:/ZE
```

or in combination with other actions, as in:

```
#DTØ:ONE/ZE<DT1:A,B,C
```

The latter command zeroes DTØ: first, then creates file ONE on DTØ: by merging files A, B, and C from DECTape unit 1. When used in combination with other actions, ZERO is performed before any other implied actions.

The /ZE switch can be used to zero only one DECTape per PIP command string. In order to zero two DECTapes, proceed as follows:

```
#DT:/ZE  
#DT1:/ZE
```

4.4.2 RK11 Disk

Before initializing an RK11 cartridge with the ZERO switch, ensure that the cartridge has been formatted using either the RK11 diagnostic program (MAINDEC-11-D5HA-PB2) or the SYSLOD System Program. Consult the system administrator for local procedures. The following actions occur during cartridge initialization.

1. The entire disk cartridge is zeroed;
2. The first and second MFD blocks are written;
3. The UIC of the current user (and only this UIC) is entered in the MFD; then
4. Bit map blocks are written

A RK11 disk is initialized by typing:

```
#DKn:/ZE
```

where n is the octal number of the appropriate cartridge (or omitted

if DKØ is meant). PIP responds by printing:

CONFIRM:

to which type either H (for high-density) or L (for low-density) followed by the RETURN key. Should the user decide not to initialize the disk, he types the SPACE bar before typing the RETURN key.

High-density cartridges are marked 22ØØ BPI, and low-density cartridges are marked 11ØØ BPI.

When the disk has been initialized (there is a noticeable pause) PIP again prints the number sign (#) to indicate readiness to accept another command.

4.5 RECOVERING FILES

There are a number of infrequent ways in which a file can be left in a state which makes it inaccessible for subsequent processing. For example, if a file is open and a system crash (hardware or software) occurs causing the Monitor to be reloaded, the file will likely be left in an inaccessible state.

Files which are declared inaccessible by the Monitor will likely have up to three things wrong with them:

1. The LOCK bit in the UFD entry for this file will be set.
2. The USAGE COUNT in the UFD entry for this file will be invalid.
3. Some blocks allocated for this file may not have the proper bits set in the permanent bit map.

PIP provides a partial solution to this problem with the UNLOCK switch. The function of this switch is to restore the LOCK and USAGE COUNT fields so that the file can be read. It does not make an attempt to set bits in the bit map for the blocks.

The sequence for recovery is to use the UNLOCK switch, such as:

```
.RUN PIP  
PIP Vxxx  
#DF:FILE.OLD/UN
```

which allows the file to be accessed.

Then, BEFORE WRITING ANY NEW DATA ON THE DISK, copy the file (if you want it) to another device and DELETE IT from the disk.

#DT:<FILE

#FILE/DE

Copy, then delete ALL FILES WHICH WERE OPEN WHEN THE CRASH OCCURRED.
You may then use the disk safely.

CHAPTER 5

MAGTAPE OPERATION

5.1 GENERAL MAGTAPE INFORMATION

Magnetic tape is supported by PIP for following operations:

- a. Directory listings;

```
#MT1:/DI  
#MTØ:/BR
```

- b. File transfer operations; (a magtape reel must be initialized before any files are transferred to the reel for the first time. See Section 5.4 for the initialization procedure).

```
#MT1:FILE<DT2:ABC  
#MT:MERGE<ABC,DTØ:FACT,MT1:DATA
```

- c. Magtape initialization (see Section 5.4);

```
#MT1:/ZE
```

- d. Rewind, Rewind Suppression, and Rewind and Unload (see Section 5.2 and 5.3).

Transfer and directory operations include all asterisk features used for other file-structured devices. For example, it is possible to type:

```
#MT1:[*,*]/DI
```

or

```
#MT1:[*,*]/BR
```

This allows the user to obtain a complete listing of all files on the specified magtape(s). When this option is used, the UIC specification is printed as part of the file information. For example:

```
#MTØ:[*,*],MT1:[*,*]/DI
```

5.2 REWIND

The REWIND switch is applicable to magtape units (MTn) and cassette drives (CTn) only, and controls rewind operations for one or more specified units. The specified unit(s) can still be addressed after use of the REWIND switch. The specifications /RW and /RW:YES cause the specified unit(s) to be rewound; the specification /RW:NO prevents rewinding of the specified unit(s).

EXAMPLES: #MT1:/RW

causes magtape unit 1 to be rewound on its original reel.

#DKØ:<MT2:*/RW:NO

causes all files under the current UIC on magtape unit 2 to be transferred to disk Ø without rewinding magtape unit 2 between file transfers.

#DKØ:<MT1:FILE.ONE/RW:YES

causes magtape unit 1 to be rewound before and after transferring FILE.ONE to disk Ø.

#MTØ:/RW:NO<MT1:*/RW:NO,MT2:*.MAC/RW:NO

causes the following to take place, in order: (1) starting at the current position of magtape unit 1, all files under the current UIC on magtape unit 1 are transferred to magtape unit Ø without rewinding between file transfers; then (2) starting at the current position of magtape unit 2, all files under the current UIC with extension .MAC on magtape unit 2 are transferred to magtape unit Ø without rewinding between file transfers.

If the REWIND switch is not specified for an operation, a default value of /RW:YES is assumed.

5.3 REWIND/UNLOAD

The REWIND/UNLOAD switch is applicable only to tape units. This switch causes the tape to be wound back on its original reel and the tape unit to be switched off-line. Following this option the tape unit(s) cannot be addressed for further processing. For example:

```
#MT:/RU
```

or

```
#MT2:,MT3:/RU
```

5.4 ZERO (INITIALIZATION)

It is mandatory that a magtape be zeroed before use. The /ZE switch writes two end-of-file marks on the tape so that it can be handled correctly by the System Monitor. For example:

```
#MT2:/ZE
```

5.5 MAGNETIC TAPE FORMAT

All files on magnetic tape have the general format, exclusive of data format, as shown in Figure 5-1.

Any file on the tape may be retrieved by name.

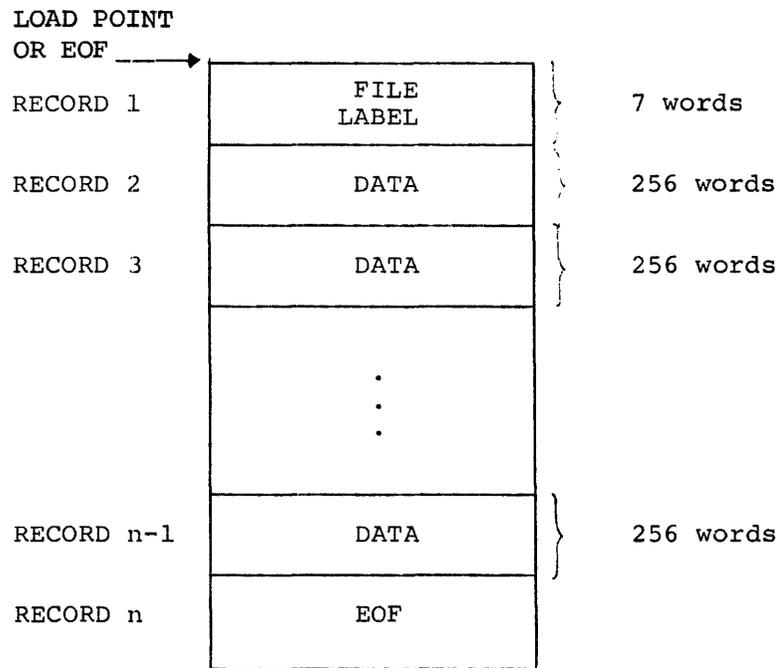


Figure 5-1 Magtape General Format

CHAPTER 6

CASSETTE TAPE OPERATION

6.1 GENERAL CASSETTE TAPE INFORMATION

Cassette tape is supported by PIP for the following operations:

a. Directory Listings;

```
#CTØ:/BR
```

```
#CT:/DI
```

b. File Transfer Operations (a cassette cartridge must be initialized before any files are transferred to the cartridge for the first time. Refer to section 6.3 for the initialization procedure);

```
#CT:SOURCE.MAC<DK:MACRO.MAC
```

```
#CT:MERGE.MAC<CTL:FILE1.MAC,DK1:FILE2.MAC
```

c. Cassette Tape Initialization (Refer to section 6.3);

```
#CT:/ZE
```

d. Rewind Specifications (Refer to section 6.2);

```
#CT:/RW
```

```
#CT:/RW:NO<CTL:*/RW:NO
```

e. Read-after-Write Verification (Refer to section 6.5).

```
#CT:/VW<CTL:FILE.MAC
```

The transfer and directory operations include all asterisk features used for other file-structured devices. This allows the user to obtain a complete listing of all files on the specified cassette.

6.2 REWIND

The REWIND switch is applicable only to cassette (CTn) and mag-tape (MTn) drives. This switch causes the tape to be rewound back onto its original reel. Following this operation, the cassette unit(s) still can be addressed. The following are examples.

```
#CTL:/RW)
```

```
#CTØ:,MT1:/RW)
```

The REWIND switch can be used to explicitly enable rewinds during the specified cassette operation. The following example rewinds CTL before seeking the file specified for the transfer operation.

```
#DKØ:<CTL:FILNAM.EXT/RW:YES)
```

The REWIND switch also can be used to suppress rewinds during the specified cassette operation. For example,

```
#DKØ:<CTL:*/RW:NO)
```

transfers all files onto the disk without rewinding CTL.

6.3 ZERO (INITIALIZATION)

It is mandatory that a cassette be zeroed before use. The /ZE switch writes a sentinel label record (i.e., logical EOT) on the tape so that it can be handled correctly by the System Monitor. The following example,

```
#CTL:/ZE
```

zeroes (initializes) CTL.

6.4 CASSETTE TAPE FORMAT

All files on cassette tape have the general format, exclusive of data format, shown in Figure 6-1. Any file on the tape can be retrieved by name.

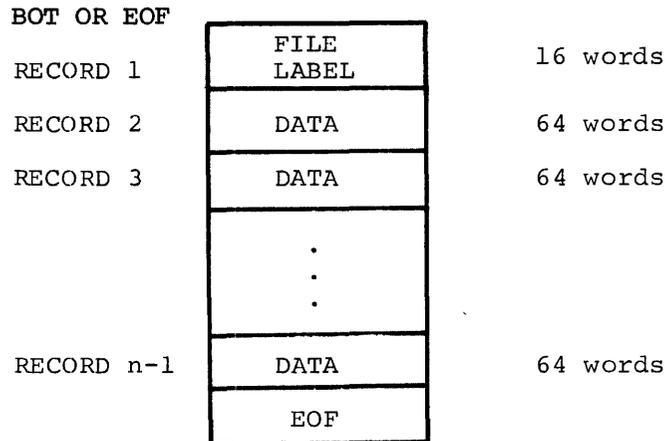


Figure 6-1 Cassette General Format

6.5 READ-AFTER-WRITE VERIFICATION

Throughout the transfer, after writing each record, the cassette is backspaced and the record is read and verified against the contents of the user's buffer. Notification of verification failures are printed on the operator's console as either I1ØØ or FØ76 error diagnostics.

CHAPTER 7

ERROR MESSAGES

As a system program under the DOS/BATCH Operating system, error messages received when using PIP conform to the standards for error handling. PIP's error messages are of the form:

Sxxx n

where Sxxx indicates a system program error number and n is one octal word displaying additional information.

Error messages that PIP may issue are listed in Table 7-1. Consult the DOS/BATCH Monitor Programmer's Reference Manual or the DOS/BATCH Batch User's Guide for a description of all Monitor error messages.

Table 7-1

PIP System Program Error Messages

<u>ERROR CODE</u>	<u>ADDITIONAL INFORMATION</u>	<u>MEANING</u>
S202	Error Status Byte	End of Data (EOD) or device error on .WRITE or .READ.
S203	Ø	Illegal switch, or too many switches, or illegal switch value, switch value not given or illegal switch in output field
S204	Ø	Too many or too few output files
S205	Ø	Too many or too few input files
S207	Error Status Byte	EOD or device error on .TRAN
S231		Illegal command, file-structured device required
S232		More than one action switch (only one permitted)
S233		Specified UIC not found in MFD
S234		Null filename or * given where filename required
S235		No files found in UFD
S236		Operation applicable to DECTape only
S237		File not found during file recovery operation
S240		No space for file allocate
S241		MFD is full
S242		Meaningless command (no action taken)
S252	Ø	Filename given when none allowed
S257	File Block Error Code dev:file,ext.	Illegal file operation. For example, protect code does not allow transfer of file; UIC different from login UIC thus making certain "wild card" operations illegal. The operation in question is not performed.
S260	Ø	Same device needed for input and output in fast copy operation.

Table 7-1 (cont'd)

<u>ERROR CODE</u>	<u>ADDITIONAL INFORMATION</u>	<u>MEANING</u>
S262	Ø	Record size too big for buffer.
S263	File Number	File record sizes do not agree on verify /VE).
S264	Ø	Conflict in standard filename extension which determines mode of transfer. Use explicit switches to resolve.
S265	Ø	Operation attempted on device which is not legal for non-privileged user.
I1ØØ	Hardware Status Register Content	Single verification failure on cassette tape.
I354	Ø	Illegal response to CONFIRM; when attempting to zero an RK11 disk cartridge. Legal responses are: H - for high density disks (RKØ3/Ø5) L - for low density disk (RKØ2) blank - to cancel the request
FØ76	Device (RAD5Ø)	Cassette tape encountered enough read-after-write failures to exhaust the retry count.

APPENDIX A

SUMMARIES

<u>Switch</u>	<u>Name</u>	<u>Example</u>	<u>Operation</u>
/AL	Allocate	#DF:FILE/AL:1Ø	640 (10 x 64) contiguous words of file storage is allocated on disk.
/BR	Brief Directory	#DTØ:/BR	List all filenames and extensions in directory for DECTape Ø on the user's teleprinter.
/CO	Contiguous	#DTØ:<ABC/CO	Transfer file ABC as contiguous file from system disk to DECTape Ø.
		#DTØ:AD/CO<ABC,DEF	Merge files ABC and DEF (on system disk) as one contiguous file on DECTape Ø.
/DE	Delete	#MAIN/DE	Delete file MAIN from system disk.
		#DTØ:ABC,DT1:DEF/DE	Delete files ABC and DEF from DECTapes Ø and 1 respectively.
/DI	Directory	#DTØ:/DI	List all filenames, extensions, size, creation date, and protection codes in directory for DECTape Ø onto the user's teleprinter
/EN	Enter	#DF:/EN	Enter current user's UIC in MFD on the specified disk (device)
/FA	Formatted ASCII	#LP:/FA<DTØ:ABC	Copy file ABC from DECTape Ø to line printer in formatted ASCII mode.
/FB	Formatted Binary	#DTØ:<ABC/FB	Copy file ABC from system disk to DECTape Ø in formatted binary mode.
/FC	Fast Copy	#DT1:<DT2:/FC	Data on DECTape #2 is fast copied onto DECTape #1.
/FC/VE	Fast Copy and Verify	#DT1:<DT2:/FC/VE	Data on DECTape #2 is fast copied and verified onto DECTape #1.
/FR	Free	#DT1:/FR	List the number of free blocks remaining on DECTape unit 1.

<u>Switch</u>	<u>Name</u>	<u>Example</u>	<u>Operation</u>
/IN	Inspect	#*.*/DE/IN	Used in conjunction with file transfers and /SU, /DE, and /RE switches. Allows user to selectively perform the primary function. (User gives Y to perform action on the displayed file or types the RETURN key to leave file intact.)
/PR	Protect	#ABC/PR:355	Change protection code of system disk file ABC to 355.
/RE	Rename	#ABC/RE<DEF #DTØ:GHI/RE<DTØ:JKL	Rename file DEF to ABC. Rename DEctape Ø file JKL to GHI.
/RU	Rewind and Unload	#MT1:/RU	Causes the tape on magtape unit #1 to be wound back on its reel and the unit to be switched off-line.
/RW	Rewind	#MT1:/RW	Causes the tape on magtape unit #1 to be wound back on its reel. The unit can still be addressed.
/SU	Supersede	#dev:<dev1:A,B,C/SU	Causes files on the input side (DEV1) to replace files of the same name which may already be on the output device (dev).
/UA	Unformatted ASCII	#LP:/UA<DTØ:ABC	Copies file ABC from DEctape Ø to line printer in unformatted ASCII mode.
/UB	Unformatted Binary	#DTØ:<ABC/UB	Copies file ABC from system disk to DEctape Ø in unformatted binary mode.
/UN	Unlock	#DF:FILE.OLD/UN	Unlocks FILE.OLD after a system failure so that FILE.OLD can be accessed.
/VE	Verify	#DT1:<DT2:/VE	Data on DEctape #1 and DEctape #2 are compared block-by-block; disagreements are shown by printing block and word numbers at the console.
/VW	Verified Write	#CT:VW<CT1:FILE.MAC	Verify a write operation by reading it after writing it.
/ZE	Zero	#DTØ:/ZE	Erases all files from directory of DEctape Ø by initializing the file structure.

<u>Standard Device Specification</u>	<u>Device</u>	<u>Radix-50 Equiv. Code</u>
CR:	Card Reader	012620
CTn:	Cassette Tape, n=0,1	01270
DC:	Fixed Head Disk, RC11	014570
DF:	Fixed Head Disk, RF11	014760
DKn:	Cartridge, RK11, n=0-7	015270
DPn:	Cartridge, RP11, n=0,7	015600
DTn:	DEctape, unit 0-7	016040
KB:	Keyboard (teleprinter)	042420
LP:	Line Printer	046600
MTn:	Magnetic tapes, unit = 0-7	052140
PP:	High-speed paper tape punch	063200
PR:	High-speed paper tape reader	063320
PT:	Low-speed (teleprinter) paper tape reader/punch	063440
SY:	System Device	n/a (see note below)

NOTE

The device specification, SY, is used to designate the device on which the Resident Monitor and system software are resident.

APPENDIX B

HELPFUL HINTS

There are a few things which are obvious to experienced DOS/BATCH users, but the beginner often has to learn them empirically. This section is meant to help the beginner avoid some common pitfalls.

1. If you are having difficulty running PIP, make sure that:
 - a. You are logged in,
 - b. You did a KILL command after running the last program prior to running PIP.
 - c. The PIP load module is on the disk, or,
 - d. You are accessing the proper UIC field on the DECTape, if attempting to run from DECTape, i.e., you should be logged in under the same UIC as shown on the directory of the DECTape.
2. If you are having difficulty accessing a DECTape file which you are positive is there, you are probably logged in under a different UIC than appears on the DECTape. In this case, either:
 - a. Explicitly specify the UIC in the command
 - b. FINISH and LOGIN under the proper UIC, or,
 - c. ENTER your UIC on the DECTape (see Section 4.1).
3. If you are having difficulty transferring to the line printer, make sure the printer is on-line; set the switch to ON LINE.
4. If you are having difficulty reading a file and there has recently been a software or hardware crash, read Section 4.5, Recovering Files.
5. If you continue to get file structure errors on output files, you are probably trying to create a file which already exists. The System does not allow this, so delete the file first or use the SUPERSEDE (/SU) switch.

6. If you are logged in for the very first time and cannot create any files, it is because you have no User File Directory (UFD) in the Master File Directory (MFD). To create one, log in, call PIP and type:

#SY:/EN

and you are all set.

7. If you cannot write anything on a DECTape even though the WRITE switch is on, it is likely that:
 - a. The DECTape belongs to someone else and he does not want you to write on it accidentally, or
 - b. The tape has not been certified.

If the DECTape does belong to someone else, you may still write on it by using the ENTER switch to put your UIC in the directory of the DECTape, as in:

#DTØ:/EN

Uncertified DECTapes can be certified using a diagnostic program (TC11 DECTape Formatter MAINDEC-11-YPTB-PB) supplied with the maintenance programs.

8. Use of the /RW:NO option when transferring files from magtape and cassette can save much time normally lost during a rewind operation.
9. If experiencing trouble with transfers from the card reader, check to ensure that (1) control cards are compatible with the card reader type, and (2) end-of-file cards are compatible with the current version of the Monitor.

APPENDIX C

PROGRAMMING CAUTIONS

C.1 ASTERISK FEATURE

Use of the asterisk feature with the /CO switch in a merge operation only obtains the first of the asterisk-specified input files. No error message is given.

If the user attempts to transfer a series of files (with the *) in which one has a protection code that does not allow transfer, a fatal Monitor error will result when PIP attempts to transfer that file, and successive files designated for transfer in that command string will not be transferred.

If a file appears on disk or DEctape with a name not acceptable to the CSI, it must be deleted using the * feature. For example:

```
ABC. A          (2 spaces in extension)
```

is not acceptable and should be deleted:

```
ABC.*/DE
```

The above works unless the file is locked; in which case it must be unlocked. See Section 4.5.

To copy files from one device to another using the *, the * must be in the input field of the command string. For example:

```
dev1:<dev2:*.*
```

or

```
dev1:<dev2:*.PAL
```

When transferring files, the * cannot be specified in the output field of the command string; it will create a file with the extension (space) AB, and no error message is given.

C.2 UIC CAPACITY ON DISK DEVICES

The maximum number of UIC's that a disk device directory can contain is dependent upon the block size of the device type. The maximum numbers are shown in Table C-1.

Table C-1

UIC Capacity of Disk Devices

Disk Device Type	Block Size (in words)	Maximum Number of UIC's
RC11	64	15
RF11	64	15
RK11	256	63

(The maximum capacity is the integer result of subtracting one from the block size and dividing that by four.)

C.3 TRANSFER OF ASCII CARDS

To transfer ASCII cards from the card reader to disk or DECTape, the /FA switch must be used.

C.4 ALLOCATE SWITCH

The ALLOCATE switch (/AL:) allows the user to create a blank contiguous file and specify its length. Data subsequently can be transferred from a nonfile-structured device to the blank contiguous file. Without the ALLOCATE switch, it would be impossible for the system to determine the size of the file from a nonfile-structured input device. Data can also be transferred from a file-structured device to a blank contiguous file. However, allocation of the file space is not necessary since the file-structured input device contains the necessary size information in its directory. (See the description of the CONTIGUOUS (/CO) switch.)

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HOW TO OBTAIN SOFTWARE INFORMATION

Announcements for new and revised software, as well as programming notes, software problems, and documentation corrections, are published by Software Information Service in the following newsletters.

DIGITAL Software News for the PDP-8 and PDP-12

DIGITAL Software News for the PDP-11

DIGITAL Software News for 18-bit Computers

These newsletters contain information applicable to software available from DIGITAL'S Software Distribution Center. Articles in DIGITAL Software News update the cumulative Software Performance Summary which is included in each basic kit of system software for new computers. To assure that the monthly DIGITAL Software News is sent to the appropriate software contact at your installation, please check with the Software Specialist or Sales Engineer at your nearest DIGITAL office.

Questions or problems concerning DIGITAL'S software should be reported to the Software Specialist. If no Software Specialist is available, please send a Software Performance Report form with details of the problems to:

Digital Equipment Corporation
Software Information Service
Software Engineering and Services
Maynard, Massachusetts 01754

These forms, which are provided in the software kit, should be fully completed and accompanied by terminal output as well as listings or tapes of the user program to facilitate a complete investigation. An answer will be sent to the individual, and appropriate topics of general interest will be printed in the newsletter.

Orders for new and revised software manuals, additional Software Performance Report forms, and software price lists should be directed to the nearest DIGITAL field office or representative. USA customers may order directly from the Software Distribution Center in Maynard. When ordering, include the code number and a brief description of the software requested.

Digital Equipment Computer Users Society (DECUS) maintains a user library and publishes a catalog of programs as well as the DECUSCOPE magazine for its members and non-members who request it. For further information, please write to:

Digital Equipment Corporation
DECUS
Software Engineering and Services
Maynard, Massachusetts 01754

READER'S COMMENTS

NOTE: This form is for document comments only. Problems with software should be reported on a Software Problem Report (SPR) form (see the HOW TO OBTAIN SOFTWARE INFORMATION page).

Did you find errors in this manual? If so, specify by page.

Did you find this manual understandable, usable, and well-organized? Please make suggestions for improvement.

Is there sufficient documentation on associated system programs required for use of the software described in this manual? If not, what material is missing and where should it be placed?

Please indicate the type of user/reader that you most nearly represent

- Assembly language programmer
- Higher-level language programmer
- Occasional programmer (experienced)
- User with little programming experience
- Student programmer
- Non-programmer interested in computer concepts and capabilities

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