pip

dos monitor utility program

digital

DEC-15-UPIPA-A-D

PIP DOS MONITOR UTILITY PROGRAM

For additional copies, order No. DEC-15-UPIPA-A-D
from Software Distribution Center, Digital Equipment
Corporation, Maynard, Mass.

digital equipment corporation · maynard. massachusetts

First Printing, September 1971
Second Printing, April 1972
Third Printing, January 1974
Revised August, 1974

The information in this document is subject to change without notice and should not be construed as a commitment by Digital Equipment Corporation. Digital Equipment Corporation assumes no responsibility for any errors that may appear in this manual.

The software described in this document is furnished to the purchaser under a license for use on a single computer system and can be copied (with inclusion of DIGITAL's copyright notice) only for use in such system, except as may otherwise be provided in writing by DIGITAL.

Digital Equipment Corporation assumes no responsibility for the use or reliability of its software on equipment that is not supplied by DIGITAL.

Copyright (C) 1971, 1972, 1974 by Digital Equipment Corporation

The following are trademarks of Digital Equipment Corporation, Maynard, Massachusetts:

CDP	DIGITAL	INDAC	PS/8
COMPUTER LAB	DNC	KA10	QUICKPOINT
COMTEX	EDGRIN	LAB-8	RAD-8
COMSYST	EDUSYSTEM	LAB-8/e	RSTS
DDT	FLIP CHIP	LAB-K	RSX
DEC	FOCAL	OMNIBUS	RTM
DECCOMM	GLC-8	OS/8	SABR
DECTAPE	IDAC	PDP	TYPESET 8
DIBOL	IDACS	PHA	UNIBUS

PREFACE

This manual describes and illustrates the features provided by the PDP-15 Utility program DOSPIP. This utility program operates only within the PDP-15 Disk Operating System (DOS) monitor environment.

In the preparation of this manual it was assumed that the reader is familiar with the contents of the "DOS SOFTWARE SYSTEM USERS MANUAL" (DEC-15-ODUMA-B-D) and with the general operating procedures for the PDP-15 equipment.

PDP-15 UTILITY PROGRAMS MANUAL

The PDP-15 Utility Programs manual is comprised of a set of individual manuals, each of which describes the operation and use of a PDP-15 Utility program. The set of manuals which make up the Utility Programs manual are listed in an Applications Guide located on the following page; the Guide also lists the order number of each manual and indicates the currently available monitor systems under which the program will operate. Individual utility manuals may be ordered by referencing the titles and order numbers specified in the Applications Guide.

Technical changes made in this version of the manual are indicated by a bar (|) in the appropriate page margin.

APPLICATION GUIDE

PDP-15 UTILITY PROGRAM MANUALS

PDP-15 Utility Program Manuals and the Application of Each

Manual		Applies to Monitor		
Title	Order Number (DEC-15-)	DOS	ADV	B/F
DDT Utility Program	YWZB-DN1	✓	✓	✓
CHAIN & EXECUTE Utility Program	YWZB-DN2	✓	✓	✓
SGEN ADVANCED Monitor	YWZB-DN3		✓	
MTDUMP Utility Program	YWZB-DN4	✓	✓	
PATCH Utility Program	UPATA-A-D	✓	✓	✓
EDIT Utility Program	YWZB-DN6	✓	✓	✓
UPDATE Utility Program	YWZB-DN7	✓	✓	✓
LINKING LOADER	YWZB-DN8	✓	✓	✓
PIP ADVANCED Monitor	YWZB-DN9		✓	✓
SRCCOM Utility Program	YWZB-DN11	✓	✓	✓
SGEN DOS Monitor	USGNA-A-D	✓		
PIP DOS Monitor	UPIPA-A-D	✓		

CONTENTS

		Page
PREFACE		iii
APPLICATION GUIDE - PDP-15 UTILITY PROGRAM MANUALS		iv
SECTION 1.	INTRODUCTION	1-1
1.1	PIP PROGRAM	1-1
1.2	MANUAL ORGANIZATION AND USE	1-1
1.3	WRITING CONVENTIONS	1-2
1.4	PIP STARTUP PROCEDURES	1-2
SECTION 2	COMMAND STRING FORMATS AND BASIC OPERATIONS	
2.1	PIP COMMAND STRING, GENERAL DESCRIPTION	2-1
2.2	TYPES OF PIP COMMANDS	2-2
2.2.1	Destination/Source Commands	2-2
2.2.2	Single-Device Commands	2-3
2.3	COMMAND STRING ELEMENTS	2-6
2.3.1	Command String Delimiters	2-6
2.3.2	Standard DOS I/O and Storage Devices	2-7
2.3.3	Primary Operations	2-7
2.3.4	Optional Functions	2-9
2.3.5	Specifying UFD's	2-11
2.3.6	Specifying Data Modes	2-11
2.3.7	PIP UFD and File Protection Codes	2-13
SECTION 3	PIP OPERATIONS, DETAILED DESCRIPTIONS AND EXAMPLES OF USE	
3.1	INTRODUCTION	3-1
3.2	N: DIRECTORY SETUP OR INITIALIZATION OPERATION	3-1
3.2.1	Create/Initialize Current UFD	3-1
3.2.2	Setting Up the UFD Protection Code	3-2
3.2.3	Deletion of UFD's	3-3
3.2.4	Initialization of DECtape Directories	3-4
3.2.5	(S) Switch: Setting up DECtape Directories with ↑Q Areas	3-5
3.3	L: DIRECTORY LIST OPERATION	3-5
3.3.1	List UFD for Current or Specified UIC	3-6
3.3.2	(M) Switch: List MFD	3-7
3.3.3	(L) Switch: List Monitor SYSBLK	3-8
3.3.4	(P) Switch: List UFD with File Protection Codes and RIB Pointers	3-9

CONTENTS

		Page
3.3.5	List DECtape Directories	3-10
3.3.6	List Selected File	3-10
3.4	T: FILE TRANSFER COMMANDS	3-12
3.4.1	Required Data Mode Specifications	3-14
3.4.2	System Device File Protection Codes	3-14
3.4.3	File Transfers to Disk	3-15
3.4.4	UFD to UFD File Transfers	3-16
3.4.5	Device to Device File Transfers	3-17
3.4.6	Transfer of Keyboard Inputs to Output Devices	3-18
3.5	FILE TRANSFERS WITH OPTIONAL FUNCTIONS	3-20
3.5.1	(G) Switch: Parity/Checksum Error Correction Facility	3-20
3.5.2	(E) and (C) Switches: Tab-to-Space, Space-to-Tab Conversion	3-21
3.5.3	(N) Switch: Directory Initialization During Transfer	3-22
3.5.4	(W) Switch: Combining Files During Transfers	3-23
3.5.5	Inputting and Combining Files from Paper Tape	3-25
3.5.6	Card Input and Card File Modification Operations	3-25
3.5.7	(T) Switch: Delete Trailing Spaces	3-26
3.6	V: VERIFY OPERATION	3-26
3.7	S: SEGMENT FILE OPERATION	3-28
3.7.1	S, Segment File Command	3-28
3.7.2	T Command Requirements for S Operations	3-29
3.7.3	Source File to Multiple Paper Tapes Segmentation Operations	3-31
3.8	D: DELETE FILE OPERATION	3-31
3.8.1	Deletion of Files from UFD's	3-32
3.8.2	Deletion of DECtape Files	3-34
3.8.3	(X) Switch: Deletion of Truncated Files	3-34
3.9	R: FILE RENAME OPERATION	3-34
3.9.1	Renaming Files	3-35
3.9.2	Setting File Protection Codes	3-36
3.9.3	Setting Directory Protection Codes	3-36
3.10	B: BLOCK COPY OPERATION	3-37
3.11	C: COPY MASS STORAGE OPERATION	3-39
3.11.1	Adding Files, Copy Operation	3-40
3.11.2	Copy with Directory Initialization	3-41

CONTENTS

		Page
3.12	U: UPDATE STORAGE ALLOCATION TABLES OPERATION	3-42
SECTION 4	MIC PIP OPERATIONS	
4.1	GENERAL PIP MIC OPERATIONS	4-1
4.2	SPECIFIC MIC FUNCTIONS	4-1
4.2.1	N Operation	4-1
4.2.2	L, List Directory Operation	4-2
4.2.3	Delete Truncated Files from System	4-2
4.2.4	I, Initialize Operation	4-2
SECTION 5	PIP ERROR DETECTION PROCEDURES AND MESSAGES	
5.1	INTRODUCTION	5-1
5.1.1	User Command String Errors	5-1
5.1.2	Operational Errors	5-2
5.2	PIP ERROR MESSAGES	5-2
5.3	CORRECTION AND RECOVERY COMMANDS	5-7
SECTION 6	QUICK REFERENCE TABLES	6-1
6.1	INTRODUCTION	6-1
6.2	OPTIONS VERSUS PRIMARY OPERATIONS	6-1
6.3	PIP COMMAND STRING FORMAT CHARTS	6-1
6.4	PIP USER OPERATION TABLES	6-1
APPENDIX A	USE OF VT-15 GRAPHICS DISPLAY SYSTEM	A-1
APPENDIX B	USE OF VP15A DISPLAY DEVICE	B-1
APPENDIX C	DOS TERMS AND ACRONYMS	C-1
APPENDIX D	SYSTEM ERROR MESSAGES	D-1
INDEX		X-1

CONTENTS

		Page
TABLES		
1-2	General Keyboard Command Characters	1-3
2-1	Command String Delimiters	2-6
2-2	PIP Command Device Mnemonics	2-7
2-3	PIP Primary Operations, Summary	2-8
2-4	PIP Optional Functions	2-9
2-5	Data Modes and Data Mode Indicators	2-12
3-1	Legal Data Mode and Function Switch Combinations for Transfer Operations	3-14
3-2	Legal Combinations of Function Switches in Transfer Operations	3-20
5-1	PIP Error Messages	5-3
5-2	User Correction and Recovery Commands	5-7
6-1	Available Options Versus Primary Operations	6-3
6-2	Directory Operations	6-6
6-3	List Operations	6-8
6-4	File Modification Operations	6-10
6-5	File Transfer Operations	6-12
6-6	COPY Operations	6-14

FIGURES		
2-1	Destination/Source Command String Format	2-4
2-2	PIP Single Device Commands, General Format	2-5
6-2	Destination/Source Command String Format	6-4
6-3	PIP Single Device Commands, General Format	6-5

SECTION 1

INTRODUCTION

1.1 PIP PROGRAM

The PIP - DOS Utility Program (DOSPIP) enables the system user to perform the following major functions via keyboard commands:

a) Interchange information between system peripheral I/O devices, the system disk device and peripheral I/O devices and between user file areas located on the system disk device.

b) Perform verification and modification procedures on information being transferred.

c) **Initialize, list and modify file directories of directoried disk and other directoried devices.**

This manual is primarily concerned with disk-oriented operations. PIP, however, may be used with all other standard PDP-15 I/O and mass storage devices; limitations and differences in operation are indicated where applicable.

1.2 MANUAL ORGANIZATION AND USE

This manual is intended for users who are familiar with:

a) the general system operating procedures (i.e., use of equipment and system startup procedures);

b) the elements, structure, and use of the DOS monitor as described in the PDP-15 DOS Software System Users Manual (DEC-15-ODUMA-B-D)

Introductory information and detailed descriptions of PIP operations and their applications are given in Sections 1 through 5. Section 6 contains quick-reference tables.

New users of PIP should familiarize themselves with the contents of Sections 1 through 5; thereafter, they need only refer to Section 6 for concise information.

DOS terms used in this manual, their acronyms and descriptions, are presented in Appendix C.

1.3 WRITING CONVENTIONS

Table 1-2 lists a group of commonly used keyboard command and control characters together with (a) their functions as recognized by PIP and (b) their representations in listing and, in this manual, in text and examples.

1.4 PIP STARTUP PROCEDURES

Once a user has completed the system log-in procedures, PIP may be called into core by the entry of the name "PIP". When loaded, PIP outputs the following message on the console printer:

```
$PIP
DOSPIP Vxxnnn
>
```

followed by a right angle (>) "ready" symbol. (Where xx is the appropriate monitor version and nnn is the PIP version.)

User commands are entered immediately after the ready symbol. Once an operation has been initiated, the user must not attempt to make any further entries until PIP prints the "ready" symbol. The only exception to this is when the user wishes to abort the current operation; the entry of:

a) CTRL P (↑P) aborts the current operation and returns control to PIP;

b) CTRL C (↑C) aborts the current operation and returns control to the DOS monitor.

TABLE 1-2

General Keyboard Command Characters

ACTUATED KEY OR KEY COMBINATION	PRINTED RESPONSE & TEXT SYMBOLS	FUNCTION INITIATED BY ENTRY
RUBOUT	\	Causes deletion of the last entered character.
CTRL U	Response - @ Text - ↑U	Causes deletion of the last entered line.
CTRL P	↑P	Restarts PIP or continues on interrupted input or output operations on a non-file oriented device.
CTRL C	↑C	Causes control to be returned to the Monitor.
CTRL R	↑R	Enables processing to be resumed when a Device Not Ready (IOPS4) error has been corrected.
CTRL D	↑D	Terminates input from the console keyboard.
SHIFT O	←	Divides PIP command string into Output and Input sections (see Section 2).
RETURN	Non-printing (Text symbol is))	Initiates a carriage return/ line feed operation. Normally used to terminate command strings.
ALT MODE	Non-printing (Text symbol is @)	Causes control to be returned to the Monitor on completion of the current operation. The monitor performs a carriage return/ line feed operation and announces itself.

SECTION 2

COMMAND STRING FORMATS AND BASIC OPERATIONS

This Section describes the basic PIP command string formats and the elements which comprise them. Included are lists and descriptions of the operations provided the user by PIP.

2.1 PIP COMMAND STRING, GENERAL DESCRIPTION

PIP command strings are limited to a maximum of 72 characters, a single console device input line and no provision is made for command string continuation lines. The items which may be specified in a PIP command string are:

Item	How Specified
1) Primary operation to be performed	Identified by an assigned single alphabetic character (e.g., T for Transfer). Refer to Table 2-3 for a description of each Primary Operation and its command character.
2) Any storage or I/O device(s) involved	Identified by an assigned 2 or 3-character alphanumeric mnemonic (e.g., DT for DECtape). Refer to Table 2-2 for a listing of the standard DOS system storage devices and the mnemonic assigned to each.
3) The names of any files involved	Identified by an assigned (user or system) 6-character filename plus a 3-character extension. Refer to the DOS Software System User's Manual DEC-15-ODUMA-B-D for descriptions of filenaming considerations.
4) Optional Functions (i.e., Data Modes and/or secondary operations) to be included	Identified by an assigned alphabetic character enclosed in parentheses e.g., (A). Refer to Table 2-4 for a description of each optional function and its assigned command character. One or more functions may be specified e.g., (A) or (AN).
5) Optionally defined Protection codes	Identified by a numeric normally enclosed in parentheses; only one code may be specified in a command. If an optional function is specified, the protection code and command character(s) should be placed within the same set of parentheses (e.g., (1) or (A1)). Refer to paragraph 2.3.7 for a description of protection codes.

Item	How Specified
6) Required User File Directory (UFD) Identification	UFD's in commands are identified by their assigned 3-character mnemonic (UIC) enclosed within angle brackets (e.g., <ABC>); refer to paragraph 2.3.5 for a detailed description.

2.2 TYPES OF PIP COMMANDS

There are two basic types of PIP commands:

a) Destination/Source commands, and

b) Single-Device commands.

These command categories are described, individually, in paragraphs 2.2.1 and 2.2.2.

2.2.1 Destination/Source Commands

Commands of this type are used to specify PIP operations which involve the transfer of data between two devices or device areas. Such commands consist of two sections separated by a ← delimiter:

[DESTINATION]←[SOURCE]

The elements within these sections specify where the data to be transferred is to be found [SOURCE] and where it is to go [DESTINATION].

The major operation to be performed is always the first character in any PIP command string; optional operations may be specified in either section of this type of command. For example, in the following command string:

>T␣DK␣DESTFL␣SRC←DT1␣FILEA␣SRC)

the destination section consists of:

[T␣DK␣DESTFL␣SRC].

The elements of this section specify:

a) T = a Transfer operation is to be performed

b) DK = the disk device is to receive the Transferred data

NOTE

When disk is specified, it represents the current UFD.

c) DESTFL␣SRC = the name of the disk file into which the Transferred data is to be written.

The SOURCE section of the above command string consists of:

[DT1␣FILEA␣SRC]

The elements of this section specify:

a) DT1 = the data to be transferred resides on the tape mounted on DECtape Unit #1

b) FILEA SRC = the name of the DT1 file which contains the data to be transferred.

Figure 2-1 illustrates the format of the most complex form of the destination/source type of command string. This figure also lists:

a) the PIP operations which require the format illustrated,

b) permitted device mnemonics,

c) permitted switch options.

2.2.2 Single-Device Commands

Commands of this type are used to specify PIP operations which involve only a single device and a file or set of files. Such a command must specify the operation to be performed and the device involved. Where needed, file names and option switches may also be added to the command string. For example, the command:

>D␣DT1␣FILEA␣SRC↵

specifies that:

a) a delete (D) operation is to be performed,

b) the device containing the item to be deleted is DECtape Unit #1 (DT1),

c) the item to be deleted is file FILEA SRC.

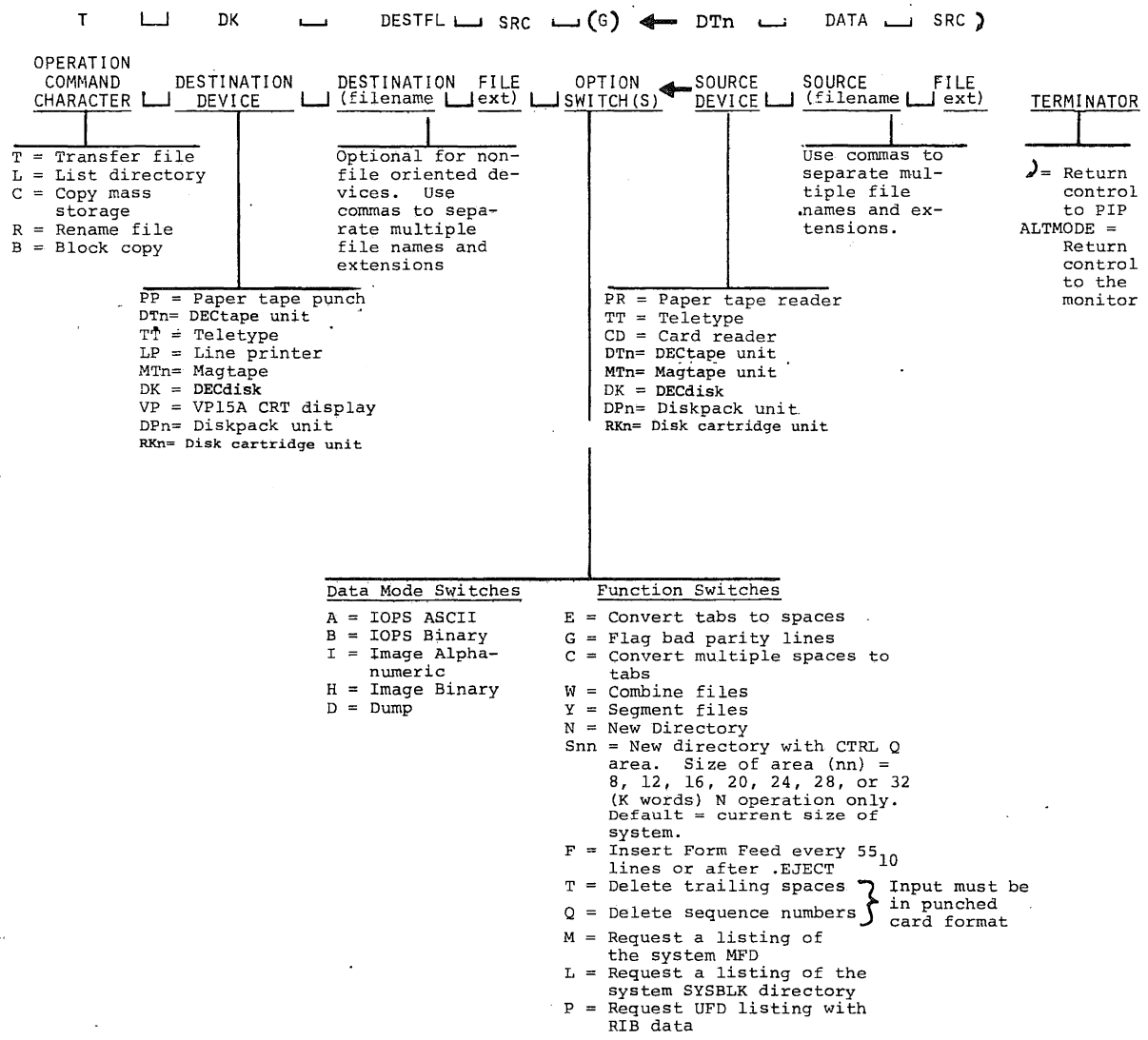


Figure 2-1 Destination/Source Command String Format

Figure 2-2 illustrates the format of the most complex form of a Single-Device PIP command. Also listed in Figure 2-2 are:

a) the operations which require the illustrated format,

b) permitted device mnemonics,

c) permitted switch options.

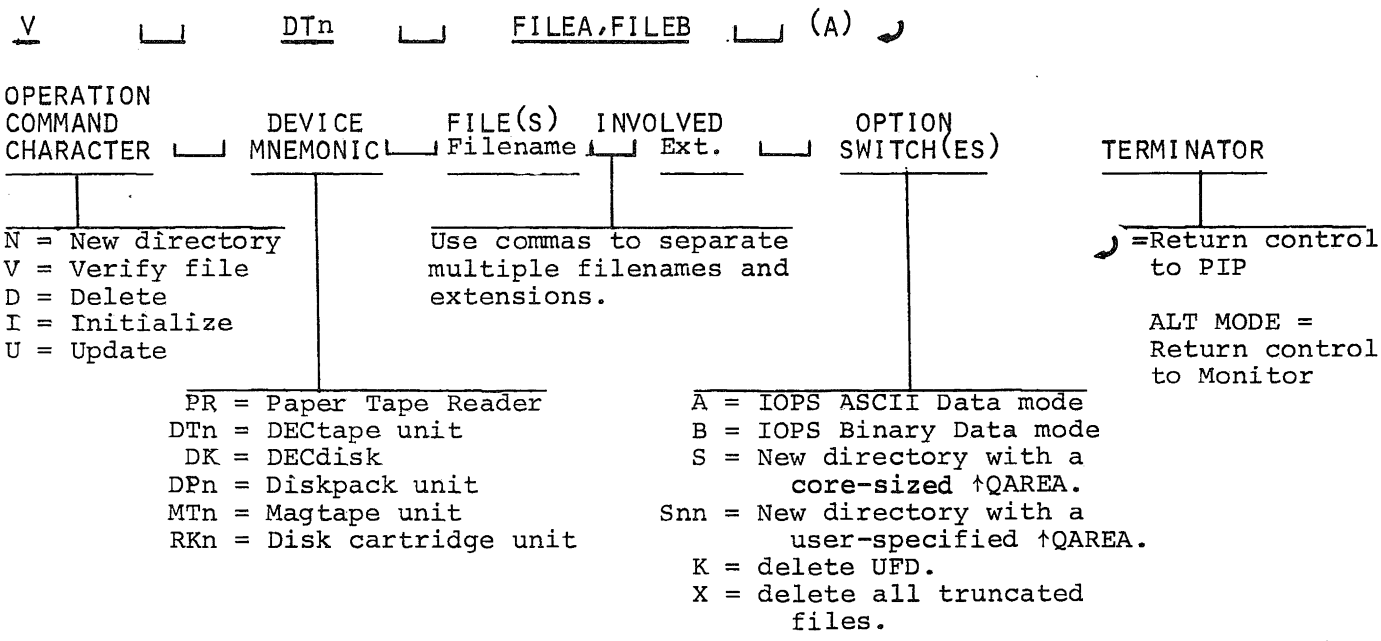


Figure 2-2. PIP Single Device Commands, General Format

2.3 COMMAND STRING ELEMENTS

The basic elements which comprise the PIP command strings (i.e., delimiters, mnemonics, format requirements, etc.) are described in the following paragraphs. Also described are the major user capabilities offered by PIP, sub-functions which may be carried out within the context of major PIP operations, and how UFD's, data modes and protection codes are specified in PIP commands.

2.3.1 Command String Delimiters

Delimiters are flags which are set to separate elements of a command string. The delimiters used in PIP commands are listed and their uses described in the following table.

TABLE 2-1 Command String Delimiters

Use Delimiter:	To	In This Manner:
␣ (space)	Separate major command string elements	T␣DK␣FILE...
← (back arrow)	Separate destination and source sections of a command string	dest. ← source T␣DK←DT1␣FILEA␣SRC
: (colon)	a) In RENAME command, separates UFD name from specified UFD protection code	<JAN:Ø>
	b) Separate device mnemonic and filename	DT1:FILEA
, (comma)	a) Separate filenames within a command string list	DT1␣FILEA,FILEB,FILEC
	b) Specify number of tapes or files involved in an operation when names are not needed	PR␣␣,, (READ 3 tapes)
; (semicolon)	Separate filename and filename extension or data mode option	DT1:FILEA,FILEB;SRC
< > (angle brackets)	Identify non-current UFDs	<JOE>
( ) (parentheses)	Identify option switches or specified protection codes	(A)
- (dash)	Separator to indicate a range of numbers	100-150

2.3.2 Standard DOS I/O and Storage Devices

The I/O and storage devices for which the DOS Monitor contains interfacing software are listed, together with their required command mnemonics, in the following table:

TABLE 2-2 PIP Command Device Mnemonics

Peripheral Device	Required Mnemonic
DECdisk (RF15)	DK
Diskpack (RPØ2)	DPn
Disk cartridge (RKØ5)	RKn
DECtape	DTn
Magnetic tape	MTn
Teletype	TT
Line Printer	LP
Card Reader	CD
Paper Tape Reader	PR
Paper Tape Punch	PP
Storage Tube Display	VP

NOTE

The letter n in the above table indicates "unit number". For example, DECtape unit #1 of a system is specified as DT1. If no unit number is specified in the mnemonic for a multi-unit device, the numeric Ø is assumed. For example, the mnemonic DP is equivalent to DPØ.

2.3.3 Primary Operations

The major capabilities provided by PIP are referred to as primary operations. Transfer, the user-directed interchange of files between storage devices, and List, the printing of user-specified user and monitor directories, are two examples of PIP primary operations. In a PIP command, the primary operation is identified by a single alphabetic letter entered as the first character of the command string. For example, in the command:

```
>T␣DK←DT1␣FILEA␣SRC)
```

the letter "T" specifies the transfer operation (i.e., FILEA SRC is to be transferred from DT1 to the current UFD on (DK).

All PIP primary operations are listed and described briefly in Table 2-3.

TABLE 2-3 PIP Primary Operations, Summary

The Primary: OPERATION	is identified by the COMMAND CHARACTER	and performs the FUNCTION
TRANSFER	T	Transfer named data files between peripheral I/O devices.
VERIFY	V	Check a named file for parity or checksum errors.
SEGMENT	S	Divide a file into a specified number of segments (16 maximum) and store each segment as a separate named file.
LIST	L	Provide listings of system directories.
NEW DIRECTORY	N	Either clear an existing directory or, if one does not exist, establish a new one.
DELETE FILE	D	Delete files from User File Directories.
RENAME	R	Rename files and change protection codes for the file or the UFD in which it is listed.
COPY, Mass Storage	C	Copy the contents of one mass storage medium onto another.
BLOCK COPY	B	Copy the contents of one or more selected data storage blocks contained by one device onto another medium. Block copy to the disk may be performed only by the MIC user.
INITIALIZE	I	Enable the system manager to clear all disk bit maps and restore the MFD to its original state. This command may be used only by the MIC user.
UPDATE	U	Update the monitor's Bad Allocation Table (BAT) and Storage Allocation Table (SAT) whenever defective storage blocks are detected on the disk.

2.3.4 Optional Functions

PIP primary operations may be executed alone or they may include one or more "optional functions".

It is used to specify parameters (such as data modes) and secondary operations (such as parity checks) which are to be carried out during the execution of the primary operation. An optional function is identified by an alphabetic letter enclosed in parentheses which is entered as a switch in a PIP command. Switch (A) which specifies that IOPS ASCII data is to be handled in the performance of the primary operation and switch (Y) which indicates that a file segmentation operation is to be performed during the primary operation are two examples of optional functions and their switches. The use of switch (A) in the following command:

```
>T␣DK←DT1␣FILEA␣(A)
```

specifies that the data contained by FILEA is in IOPS ASCII form. All PIP optional functions are listed and described in Table 2-4.

TABLE 2-4 PIP Optional Functions

OPTION	COMMAND CHARACTER	FUNCTION
IOPS ASCII Data Mode	(A)	Specifies the type of data (i.e., format) handled by the primary PIP operation.
IOPS Binary	(B)	
Image Alphanumeric	(I)	
Dump	(D)	
Image Binary	(H)	
Bad Parity & Checksum Check & Correction	(G)	Outputs error messages and the lines containing errors detected. Corrective actions are permitted.
Tab to Space Conversion	(E)	Causes all tabs found in the data handled to be expanded into a series of spaces.
Convert Multiple Spaces to Tabs	(C)	Causes each group of two or more spaces encountered during the primary operation to be contracted to a TAB.

TABLE 2-4 PIP Optional Functions (Cont'd)

OPTION	COMMAND CHARACTER	FUNCTION
Segment Files	(Y)	Indicates that the file being transferred is to be segmented.
Combine Files	(W)	Combines two or more separate files into a single file.
Form Feed	(F)	Causes a form-feed and a RETURN character to be inserted after the detection of each .EJECT statement or after every 55_{10} lines.
Delete Trailing Spaces	(T)	Causes all trailing spaces to be deleted from alphanumeric data being handled during the primary operation.
Delete Sequence Numbers	(Q)	Used for punched card input, this option causes all input sequence numbers to be deleted.
Reserve QAREA with New Directory	(Snn)	Used for DECtape devices only, this option initializes any existing directory or establishes a new directory, and causes a CTRL Q area to be allocated on the device. The size of the allocated area may be specified (i.e., nn) by the user.
New Directory	(N)	Performs the same function as the N primary operation. It either clears an existing directory or, if one does not exist, establishes a new one.
List MFD	(M)	Enables standard UIC users to obtain a listing of all unprotected UFD's contained by the device (disk). The MIC user will obtain a listing of all UFD's contained by the device.
List SYSBLK	(L)	Enables the user to obtain a listing of the system SYSBLK directory.
List UFD with Auxiliary Data	(P)	Causes file RIB data to be added to a UFD listing.
Delete UFD	(K)	Removes UFD entry from MFD.
Delete All Truncated Files	(X)	Causes all truncated files contained by the current or specified UFD to be deleted.

2.3.5 Specifying UFD's

Whenever a UFD which is not current is referenced in a PIP command string:

a) its UIC (identifying code) written within angle bracket delimiters (e.g., <xxx>) must be added to the command.

b) the UIC must be inserted immediately after the mnemonic representing the device on which its UFD resides.

For example, the command:

```
>T␣DK␣<JAN><DTL␣FILEA␣SRC)
```

specifies that FILEA SRC on DECtape unit #1 is to be transferred to the non-current UFD "JAN" located on the disk device.

2.3.6 Specifying Data Modes[1]

PIP operations which involve the interchange of data require that the form of the data being handled (i.e., its data mode) be indicated in the initiating command string.

Data modes in PIP are specified either by the filename extension of the file being transferred or by an equivalent data mode option switch. The Data Mode indicators recognized by PIP are listed in the following table (Table 2-5).

The available PIP data mode switches and their uses are:

a. (A) IOPS ASCII Switch - Files containing data in IOPS ASCII form require the use of the PIP (A) data mode switch. ASCII files are identified by the extensions:
   1) SRC or
   2) a 3-character extension where the third character is numeric (e.g., 004).

b. (B) IOPS Binary Switch - Files containing data in IOPS Binary form must be handled using the (B) switch. The filename extension BIN is used to identify binary files.

[1] Refer to DOS Software System Users Manual, DEC-15-ODUMA-B-D for detailed descriptions of data modes.

c. (I) Image Alphanumeric Switch - The (I) switch is required during transfer of Image Alphanumeric Files and, as the name Image implies, maintains the File data in its exact form as read from the source file. The (I) switch must specifically be used when copies of paper tapes in either HRM or RIM hardware reader modes (MACRO-15 .ABS or .FULL paper tape) are required.

d. (H) Image Binary Switch - Binary files (extension BIN) to be maintained in their exact form must be transferred using the (H) data mode switch.

e. (D) Dump Mode Switch - Files containing data in an absolute binary form (extension ABS) must be handled using the (D) mode switch.

The specific combinations of data mode switches and optional function switches which are permitted in each of the PIP primary operations are given in Section 3.

TABLE 2-5 Data Modes and Data Mode Indicators

		DATA MODES				
		IOPS ASCII	IOPS BINARY	DUMP	IMAGE ALPHA/ NUMERIC	IMAGE BINARY
FILENAME EXTENSIONS	SRC	✓				
	BIN		✓			
	ABS			✓		
OPTION SWITCHES	Numeric	✓				
	(A)	✓				
	(B)		✓			
	(D)			✓		
	(I)				✓	
	(H)					✓

DATA MODE SWITCHES VS. FILENAME EXTENSIONS

From the above table it can be seen that switch options (A), (B) and (D) specify the same data modes as filename extensions SRC, BIN, and ABS. Only one data mode indicator is needed in a command string; if the filename extension is given, its corresponding data mode switch is not required; conversely, the extension is not needed if the switch is given. To illustrate:

	THE COMMAND:		IS EQUIVALENT TO:
a)	T␣DK␣FILEA←DT2␣OLDFIL␣SRC↵	a)	T␣DK␣FILEA←DT2␣OLDFIL␣(A)↵
b)	T␣DK␣FILEA←DT2␣OLDFIL␣BIN↵	b)	T␣DK␣FILEA←DT2␣OLDFIL␣(B)↵
c)	T␣DK␣FILEA←DT2␣OLDFIL␣ABS↵	c)	T␣DK␣FILEA←DT2␣OLDFIL␣(D)↵

2.3.7 PIP UFD and File Protection Codes

In performing PIP operations which involve User Directories and/or the files which they contain, the user must be aware of the UFD and file protection codes involved. These codes determine the accessibility of the UFD's and of the files which they contain.

New protection codes may be assigned by the user or, by default, by the system. Existing codes may be modified using PIP command R. (refer to Section 3).

UFD's may be assigned the following codes:

DIRECTORY PROTECTION CODES

Ø	unprotected:	any user may access, manipulate the contents, and delete an unprotected UFD.
1	protected:	only the user logged in under the UIC of the UFD (or the MIC) may write into a protected UFD.

NOTE

The DEFAULT value for UFD directory protection codes is always 1.

Files may be assigned any of the following protection codes:

FILE PROTECTION CODES

CODE	PERMITTED OPERATIONS READ	WRITE	PROTECTION GIVEN
1	yes	yes	unprotected
2	yes	no	write protected
3	no	no	protected
none given	SYSTEM DEFAULT VALUE[1]		

NOTE

File protection codes are valid only when the UFD in which they are located is protected (code 1).

[1]The system default value for file protection codes is set by the system manager (MIC) during the initial configuration of the system (i.e., system generation).

SECTION 3

PIP OPERATIONS, DETAILED DESCRIPTIONS AND EXAMPLES OF USE

3.1 INTRODUCTION

This Section contains descriptions of the PIP operations which may be performed by the standard (UIC) DOS system user. The PIP operations unique to the system manager (MIC) are described in Section 4.

3.2 N: DIRECTORY SETUP OR INITIALIZATION OPERATION

The New Directory, N, operation permits the user to:

a) create a new UFD for the currently logged-in UIC or a specified UIC,

b) initialize an established UFD for the current UIC or a specified UIC,

c) initialize and change the protection code of the UFD for the current or a specified UIC,

d) delete the UFD of the current or a specified UIC from the system (i.e., remove its name from the MFD),

e) initialize the directories of peripheral file-structured mass storage devices[1].

WARNING

Each time the N command is used, all of the files on the directory involved are DELETED. Care must be taken to ensure that needed files are not lost.

Each of the above functions and the command format required for its execution are described in paragraphs 3.2.1 through 3.2.5.

3.2.1 Create/Initialize Current UFD

The command:

```
>N␣DK)
```

[1]Utility program MTDUMP must be used to initialize directories on Magtape units (MTn). Refer to manual DEC-15-YWZB-DN4 for a description of MTDUMP and its use.

is used either to:

a) establish a User File Directory (UFD) for the current UIC, or

b) initialize (delete all files from) an existing UFD set up for the current UIC.

For example, if the current UIC is "GEP" the new or initialized UFD resulting from the above command has the format:

```
    15-JUL-71
DIRECTORY LISTING  (GEP)
  1147 FREE BLKS
     Ø USER FILES
     Ø USER BLKS
```

UFD's set up or initialized using the basic N command (i.e., N DK␣) are automatically assigned a default protection code of 1 (write operation permitted only to the current UIC).

The current UIC can use the basic N command to set up UFD's under other UIC codes by specifying another UIC in the N command. For example, the current UIC "JAN" can set up a UFD under the UIC "ABC" with the command:

```
>N␣DK␣<ABC>␣
```

UFD's set up in the above manner are automatically assigned a protection code of Ø (unprotected).

Any unprotected UFD located on the disk being accessed may be initialized by the current user if he knows and specifies its UIC. For example, an unprotected UFD with a UIC of "SCR" is initialized by the command:

```
>N␣DK␣<SCR>␣
```

3.2.2 Setting up the UFD Protection Code

UFD protection codes may be specified in the N command to:

a) set a desired protection code for a new current or specified UFD,

b) change the protection code of an existing UFD.

The command formats used for these functions are:

a) >N␣DK␣(X)⏎ for current UIC UFD.

b) >N␣DK␣<AAA>␣(X)⏎ for specified UFD's.

where:

(X) represents the desired protection code
<AAA> represents the specified UIC.

The UFD protection codes are:

1	protected	write operations only permitted by the UIC or the system MIC.
Ø	unprotected	read/write operations permitted to all users.

The following are examples of the uses of the above N command formats:

a. The command:

>N␣DK␣(Ø)⏎

creates or initializes the current UFD with a directory protection code of Ø (unprotected).

b. The command:

>N␣DK␣<ABC>␣(1)⏎

creates (or initializes) the UFD "ABC" with a specified protection code of 1 (protected). Remember, if this type of command is used, the current user cannot access the specified UFD since it will be protected.

NOTE

DO NOT use the N command to change the protection code of an existing UFD unless the UFD is to be initialized (all files deleted).

3.2.3 Deletion of UFD's

The PIP N command permits the user to delete the UFD of the current UIC and specified unprotected (code Ø) UFD's from the system (i.e., remove their names from the MFD).

The "delete" function is set up by the addition of the "K" function switch to the basic N command, as follows:

a) >N␣DK␣(K)↵ deletes the UFD of the current UIC

b) >N␣DK␣<XXX>␣(K)↵ deletes the UFD of a specified UIC (<XXX>).

For example, assume the following Master File Directory (MFD) as being current:

```
    10-AUG-71                  ———————— Current date
MFD DIRECTORY LISTING
  5753 FREE BLKS               ———————— Number of free device blocks
    47 USER FILES              ———————— Number of user files on device
   612 USER BLKS               ———————— Number of device blocks occupied
ABL     NON(0)      0      0 ——\          by files
XYZ     NON(0)      0      0 ——— Entries of Unprotected UFD's
  \          \
UFD UIC's    UFD protection code
```

NOTE

Listings of the current MFD as shown above are obtained using the PIP List (L) operation.

The commands:

>N␣DK␣<ABL>␣(K)↵
>N␣DK␣<XYZ>␣(K)↵

delete the unprotected and non-current UFD's ABL and XYZ from the disk. Their deletion is illustrated by the resultant MFD:

```
    10-AUG-71
MFD DIRECTORY LISTING
  5753 FREE BLKS
    47 USER FILES
   612 USER BLKS
```

3.2.4 Initialization of DECtape Directories

The directories of DECtape storage devices may also be initialized using the N command. The command format is:

>N device mnemonic and unit number ↵

For example, the command:

>N␣DT1↵

initializes the directory of the tape mounted on DECtape unit 1.

NOTE

When a DECtape is initialized, the tape's File Bit Map blocks are cleared and the Directory Block is set up to indicate that only the File Bit Map and Directory Blocks are occupied.

3.2.5 (S) Switch: Setting up DECtape Directories with ↑Q Areas

The optional function switch (S) added to DECtape N commands both initializes the device directory and causes a CTRL Q area (↑QAREA) to be reserved on the DECtape for core ↑Q-dump operations. The (S) switch is the only switch permitted in N DECtape commands. The basic command format is:

>N␣device mnemonic & unit number␣(S)↵

The (S) switch used:

a) alone — indicates that the size of the reserved ↑QAREA should be the same as the current system core size. For example, the command:

>N␣DT1␣(S)↵

in a system running in 16K of core establishes a 16K ↑QAREA (word locations) on the tape mounted on DECtape unit #1.

b) with a one or two digit number (i.e., (Snn)),

specifies the size of the ↑QAREA to be reserved on the tape mounted on the DECtape unit.
For example, the command:

>N␣DT1␣(S16)↵

causes a ↑QAREA, 16K in size, to be reserved on the tape mounted on DECtape unit #1.

3.3 L: DIRECTORY LIST OPERATION

The List, L, operation enables the user to obtain copies of both disk and DECtape directories in:

a) punched tape form,
b) printed form, or
c) as a CRT display.

Copies of directories which contain only selected file entries may also be obtained.

The basic command format used in L operations is:

```
>L␣listing device←source device)
```

where:

a) the listing device may be the:

   1) console teleprinter (TT)
   2) line printer (LP)
   3) paper tape punch (PP)
   4) optional CRT display devices (refer to Appendix A)

b) the source device may be any file-structured mass storage device within the system (i.e., DK, RKn, DTn, DPn[1]).

Three optional switches may be used within an L command; they are:

a) (M), list Monitor MFD table

b) (L), list Monitor SYSBLK table

c) (P), used only in UFD list operations, this switch causes additional file protection and file storage information to be included in the requested listing.

The various list operations which may be performed, the required L commands for each, and examples of the listings obtained are described in paragraphs 3.3.1 through 3.3.6.

3.3.1 List UFD for Current or Specified UIC

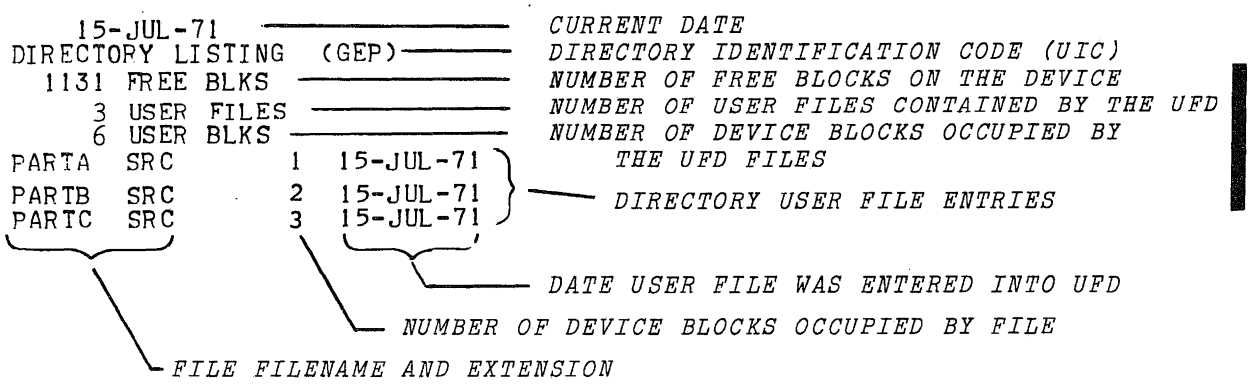
The UFD for a current UIC located on a disk device may be listed using the basic L command format.

For example, assuming a current UIC of "GEP", the command:

```
>L␣LP←DK )
```

[1]Utility program MTDUMP must be used to list Magtape directories (refer to DEC-15-YWZB-DN4).

produces a printout of the UFD with a format similar to the following:



The current user may also obtain a listing of any unprotected UFD in the system by specifying its identifying UIC in the L command. For example, the command:

```
>L␣LP←DK␣<JAN>)
```

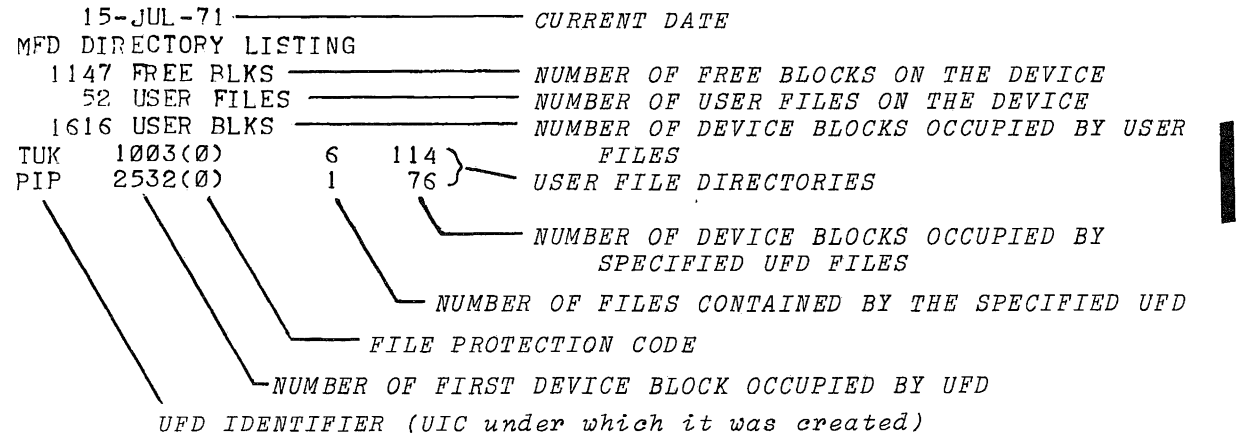
causes the printout of the unprotected disk UFD identified by the UIC "JAN".

3.3.2 (M) Switch: List MFD

A listing of a disk Master File Directory (MFD) may be obtained by the addition of the (M) switch to the L command. For example, a line printer listing of a DECdisk MFD is produced by the command:

```
>L␣LP←DK␣(M))
```

The listing produced would have a format similar to the following:



NOTE

MFD listings obtained by standard users (UIC's) list only the unprotected UFD entries. Only the system manager (MIC) can obtain a complete list of both protected and unprotected UFD's.

3.3.3 (L) Switch: List Monitor SYSBLK

The addition of the (L) switch to a list command made to the disk device containing the operating system results in a printout of the system block (SYSBLK) table on the selected listing device. For example, assuming a DK system device, the command

```
>L␣␣LP←DK␣␣(L)↵
```

produces a listing of the system SYSBLK on the system line printer, with a format and contents similar to the following:

SYSBLK LISTING

NAME	FB	NB	FA	PS	SA
.SYSLD	0	40	100	17400	0
DOS15	40	33	1352	14526	1742
↑QAREA	101	200	5	77773	0
BOSS15	301	16	12411	71640	54020
EDIT	317	15	12001	5636	12002
EDITVP	334	17	10277	7340	10551
EDITVT	353	17	10302	7335	10553
PIP	372	35	1526	16111	1671
QFILE	427	2	17041	437	17045
MACRO	431	33	2630	15005	2630
CREF	464	5	15450	2137	15451
CHAIN	471	21	7600	10037	7600
F4	512	35	2176	15441	2323
DUMP	547	5	15300	2337	15300
DTCOPY	554	3	16662	755	16701
PATCH	557	10	12700	3453	12700
UPDATE	567	13	12370	5247	12371
SRCCOM	602	13	12674	4743	12777
BTRAN	615	11	13607	4030	13671
8BTRAN	626	11	13562	4055	13644
MTDUMP	637	12	13167	4450	13260
SGEN	651	35	5740	10163	6004
TKB	706	21	7573	10044	7750

PROGRAM NAME

Number of blocks allotted to program

Program size, number of word locations

Number of first device block occupied by program

First core address occupied when program is loaded

Program starting address

SYSBLK supplies a complete listing of the language and utility programs contained by the system; the names listed in SYSBLK are the keyboard commands required to call (i.e., load) the listed program into core.

3.3.4 (P) Switch: List UFD with File Protection Codes and RIB[1] Pointers

The optional switch (P) added to an L command causes file protection code, file starting block number, and RIB date to be added to each file entry contained by the UFD. For example, assuming the UIC "JAN" to be current, the command:

```
>L␣LP←DK )
```

produces the following printout:

```
    15-JUL-71 ———————————————— CURRENT DATE
DIRECTORY LISTING  (JAN) ———————— UFD IDENTIFIER
  1125 FREE BLKS ———————————————— FREE DEVICE BLOCKS
     1 USER FILES ————————————————— NUMBER OF USER FILES
     2 USER BLKS ————————————————— NUMBER OF USER FILE DEVICE BLOCKS
CRDFL  BIN       2  15-JUL-71 ——— USER FILE ENTRY
```

To illustrate the use of the (P) switch, the command:

```
>L␣LP←DK␣(P)
```

produces the following printout:

NOTE

Only the information added by the (P) option is indicated.

```
    15-JUL-71
DIRECTORY LISTING  (JAN)
  1125 FREE BLKS
     1 USER FILES
     2 USER BLKS
CRDFL  BIN    2553(2)     2  15-JUL-71   2552      Ø
```

POINTER TO THE FIRST RIB WORD IN BLOCK

POINTER TO DEVICE BLOCK CONTAINING FILE RIB TABLE

CURRENT FILE PROTECTION CODE

FIRST BLOCK OF FILE

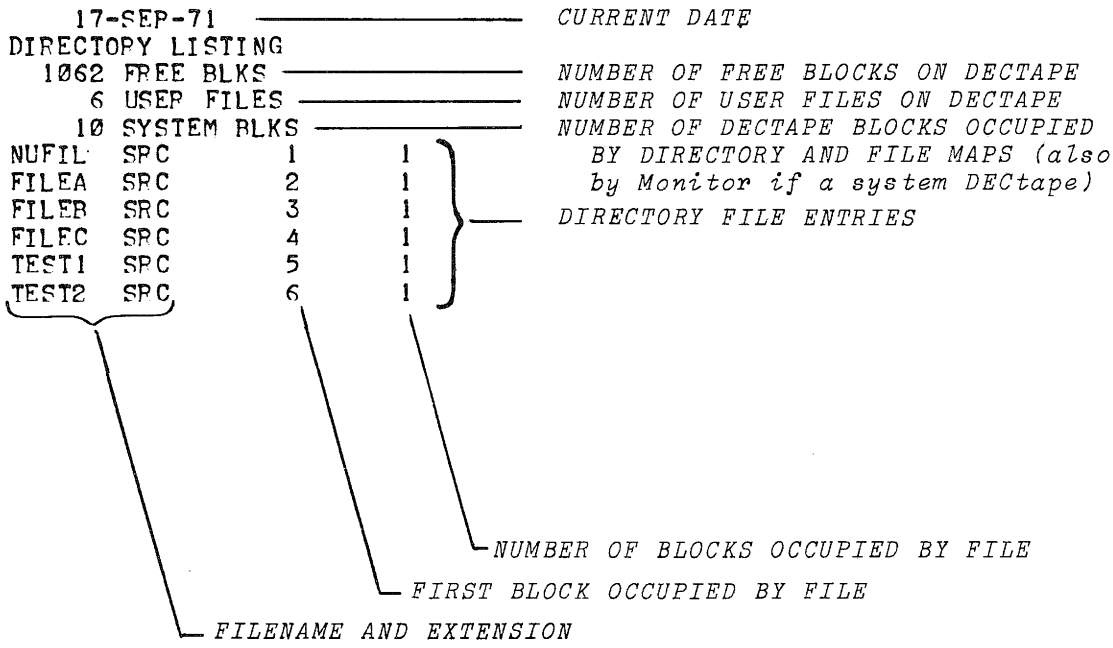
[1]Retrieval Information Block, contains pointers to the non-contiguous file storage blocks (refer to the DOS-15 Users Manual, DEC-15-ODUMA-B-D for a complete description of this table).

3.3.5 List DECtape Directories

The directory of any DECtape storage device within a system can be listed using the basic L command. For example, the command:

```
>L␣TT←DT1)
```

causes the directory of the tape mounted on DECtape Unit #1 to be listed on the console printer. Directory listings have a format similar to that of the following example:



Option switches (M) and (P) are illegal for devices other than disk devices (i.e., DK, RKn and DPn). The (L) switch, however, may be used with DECtape if the DECtape contains an operating system.

3.3.6 List Selected File

The directory entries of specific files or groups of files in a current UFD, a specified UFD, or a device directory may be listed selectively by adding elements to the L command.

To list the directory entry for a specific file, add its file name and extension to the L command. For example, assuming the following UFD to be current:

```
    15-JUL-71
DIRECTORY LISTING  (GEP)
  1131 FREE BLKS
     5 USER FILES
    15 USER BLKS
PARTA   SRC       1   15-JUL-71
PARTB   SRC       1   15-JUL-71
PARTC   SRC       1   15-JUL-71
CRDFL   BIN       2   15-JUL-71
TEST1   001      10   15-JUL-71
```

DIRECTORY HEADER

FILE ENTRY LIST

the command:

```
>L␣LP␣TEST1␣001←DK)
```

produces the following line printer listing:

```
    15-JUL-71
DIRECTORY LISTING  (GEP)
  1131 FREE BLKS
     5 USER FILES
    15 USER BLKS
TEST1   001      10   15-JUL-71
```

NOTE THAT THE HEADER REMAINS UNCHANGED

DIRECTORY ENTRY OF SELECTED FILE

All files within a directory which have a common file name extension may be listed as a selected group. The required L command format is:

```
>L␣listing dev.␣#XXX←source dev.)
```

where:

a) # indicates the function,

b) XXX is the common filename extension.

For example, assuming the UFD "GEP" to be current, the command:

```
>L␣LP␣#SRC←DK)
```

produces the following line printer listing:

```
    15-JUL-71
DIRECTORY LISTING  (GEP)
  1131 FREE BLKS
     5 USER FILES
    15 USER BLKS
PARTA   SRC       1   15-JUL-71
PARTB   SRC       1   15-JUL-71
PARTC   SRC       1   15-JUL-71
```

NOTE THAT THE INFORMATION CONTAINED BY THE DIRECTORY HEADER IS UNCHANGED

LIST OF FILE ENTRIES WHICH HAVE THE COMMON EXTENSION "SRC".

The (P) optional switch may be used in "selected file(s)" L commands. For example, assuming the UFD "GEP" to be current, the command:

```
>L␣LP␣TEST1␣ØØ1␣(P)←DK )
```

produces the following line printer listing:

```
    15-JUL-71
DIRECTORY LISTING  (GEP)
  1131 FREE BLKS
     5 USER FILES
    15 USER BLKS
TEST1  ØØ1    2542(2)    1Ø  15-JUL-71   2551     1Ø
```

NOTE THE ADDITION OF THE FILE FIRST BLOCK NUMBER, PROTECTION CODE, POINTER TO THE FILE'S RIB AND FIRST RIB BLOCK.

Files may also be "selectively listed" from DECtape directories by using the device mnemonic and unit number (i.e., DTn) as the command "source device". The (P) option cannot be used in DECtape L commands.

3.4 T: FILE TRANSFER COMMANDS

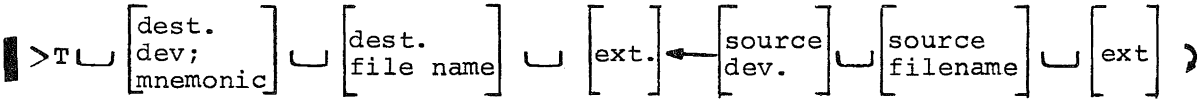
The transfer of files between standard I/O devices is carried out by the "T" operation. During a basic T operation, data is read from a source device and is written into a named area (file) on a specified destination device. In addition to basic Read/Write transfers, PIP permits performance of more complex operations by the use of optional function switches. For example, transfer operations may include such optional functions as:

a. the correction of parity errors,

b. the conversion of tabs to spaces and vice-versa,

c. the segmentation of large files or the combination of small files into a single file to be performed as part of the T operation.

The T command string format is described in detail in Section 2. However, as a reminder, the basic elements are:



For example:

```
>T␣DK␣DESTFL␣BIN←DT1␣SOURCE␣BIN )
```

The following items should be observed when structuring a "T" command:

a. During transfers between file structured devices, the filename extension of the source file or an equivalent data mode switch must be given to ensure that PIP can find the source file. For example:

```
>T␣DK␣FILEA␣←DT1␣SOURCE␣SRC)
```

b. During single file transfers, the destination file is named only if the name is to be different from that of the source file. For example:

1.
```
>T␣DK←DT1␣SOURCE␣SRC)
```

results in the contents and name of DT1 file "SOURCE SRC" being added to the current UFD.

2.
```
>T␣DK␣NUFIL←DT1␣SOURCE␣SRC)
```

results in the contents of DT1 file "SOURCE SRC" being transferred to the current UFD under the name "NUFIL SRC".

c. More than one file may be transferred in one T operation: the files, however, must be in the same data mode. In multi-file transfers, the listed filenames must be separated by commas; the common extension (BIN, ABS, or SRC) or an equivalent data mode switch is required only once in the series. For example:

```
>T␣DK␣TESTA,TESTB␣←DT1␣FILEA,FILEB␣SRC)
```

transfers two files from DT1 into two differently named file areas of the current UFD.

d. During multiple file transfers in which the source names are to be retained on the destination device, commas must be used on the destination side of the command. The commas indicate to PIP the number of files involved; the number of commas used must be one less than the number of source files. For example, the command:

```
>T␣DK␣,,←DT1␣FILEA,FILEB,FILEC␣SRC)
```

effects the transfer of three files from DT1 to the current UFD. Note the use of two commas, one less than the number of source files specified.

e. Whenever optional switches are added to a T command, they may be placed on either side of the dividing symbol (i.e., ←).

```
>T␣DT␣(N)←DK␣FILEA␣(A)↓
```

3.4.1 Required Data Mode Specifications

In transfer operations, the form of the data being handled must be indicated in the command string either by a Data Mode Option switch or by the Filename extensions used.

The use of data mode switches or filename extensions in command strings is described in paragraph 2.3.4. The specific combinations of data mode switches and optional function switches permitted within the Transfer command are listed in Table 3-1.

TABLE 3-1. Legal Data Mode and Function Switch Combinations for Transfer Operations

DATA MODE SWITCHES	FUNCTION SWITCHES									
	E	G	C	W	Y	N	S	F	T	Q
A	X	X	X	X	X	X	X	X	X	X
B				X		X	X			
I						X	X			
H						X	X			
D						X	X			

3.4.2 System Device File Protection Codes

During file transfer operations between disk storage devices or UFD's, the user may specify a protection code for the transferred file. (File protection codes are listed and described in Section 2. paragraph 2.3.7).

For example, assuming that the UFD "JAN" is current:

```
    01-AUG-71
DIRECTORY LISTING  (JAN)
  2263 FREE BLKS
     0 USER FILES
     0 USER BLKS
```

and that the system file protection code default value is 2, the following series of commands:

```
>T␣DK←DT1␣SEGA␣(A)↵
>T␣DK←DT1␣SEGB␣(A)↵
>L␣LP←DK␣(P)↵
```

transfers files "SEGA" and "SEGB" from the tape mounted on DECtape unit #1 and lists the directory "JAN" with the applicable file protection and RIB data:

```
    01-AUG-71
DIRECTORY LISTING  (JAN)
  2260 FREE BLKS
     2 USER FILES
     2 USER BLKS
SEGA    SRC    1313(2)      1  01-AUG-71    1313      56
SEGB    SRC    1312(1)      1  01-AUG-71    1312      24
                    \_ file protection code
```

As shown in the directory, file SEGA was assigned the default protection code while file SEGB was assigned the specified value (i.e., 1).

3.4.3 File Transfers to Disk

Files may be transferred to disk devices from any standard input or mass storage device within the system. An entry for each file transferred is listed in the current or specified UFD. Files may be transferred:

a) as a complete copy of the source file including the same filename;

b) with the same filename but a specified file protection code;

c) with a new name specified for the destination file.

Sample illustrations of the above functions appear below.

(A) `>T DK←DT1 TEST1 001` — *transfer file, keep same name and accept system default file protection code.*

(B) `>T DK←DT1 TEST2 002 (1)` — *transfer file, keep same name but specify desired file protection code.*

(C) `>T DK DESTFL←DT1 TEST1 001 (1)` — *transfer file, rename file and specify desired file protection code.*

```
    10-AUG-71
DIRECTORY LISTING  (GEP)
  5717 FREE BLKS
     3 USER FILES
    33 USER BLKS
TEST1   001    1605(2)     10  10-AUG-71    1650      10
TEST2   002    1652(1)     13  10-AUG-71    1676      66
DESTFL  SRC    1700(1)     10  10-AUG-71    1716      10
```

Filename extension *Protection code*

3.4.4 UFD to UFD File Transfers

Files may be read from:

a) unprotected UFD's (code Ø);

Example command:

```
>T␣DK␣←DK␣<JAN>␣TEST1␣(A)⏎
```

b) protected UFD's (Code 1) if the file protection code of the desired file permits the operation;

Example command:

```
>T␣DK←DK␣<JAN>␣FILEA␣(B)⏎
```

c) the current UFD;

Example command:

```
>T␣DK␣<JAN>←DK␣EXAMP␣(A)⏎
```

d) one file of the current UFD into a second, differently named, file of the current UFD.

Example command:

```
>T␣DK␣NUFIL←DK␣OLDFIL␣(A)⏎
```

NOTE

UFD and file protection codes need not be considered in transfer operations with the current UFD.

Files may be written into:

a) unprotected UFD's (code Ø);

Example command:

```
>T␣DK␣<JAN>←DK␣TEST1␣(A)⏎
```

b) the current UFD or a specified file within the current UFD.

Example command:

```
>T␣DK␣TEST1←DK␣<JAN>␣PATCH␣(A)⏎
```

In addition to the above, transfer operations may be carried out between files of the current UFD including the creation of a new file from another file within the UFD. For example, assuming the following UFD as current:

```
    11-AUG-71
DIRECTORY LISTING  (GEP)
  1500 FREE BLKS
     3 USER FILES
    24 USER BLKS
TEST1   001     5214(2)     10  11-AUG-71   5232      10
TEST2   002     5234(2)     13  11-AUG-71   5257      66
CONTS   SRC     5261(2)      1  11-AUG-71   5212       0
```

The command:

```
>T␣DK␣COUNTS␣SRC←DK␣CONTS␣(1)↵
```

creates a new file "COUNTS SRC" from file "CONTS SRC" with a specified file protection code of 1.

The operations performed result in the following UFD:

```
    11-AUG-71
DIRECTORY LISTING  (GEP)
  1476 FREE BLKS
     4 USER FILES
    25 USER BLKS
TEST1   001     5214(2)     10  11-AUG-71   5232      10
TEST2   002     5234(2)     13  11-AUG-71   5257      66
CONTS   SRC     5261(2)      1  11-AUG-71   5212       0
COUNTS  SRC     5265(1)      1  11-AUG-71   5263       0
```

New file *Specified Protection code*

The capability of performing transfer operations within current UFD's simplifies these operations and enables the user to take full advantage of the interactive speeds of disk devices.

3.4.5 Device to Device File Transfers

The read/write transfer of files between non-disk mass storage devices and/or I/O devices is performed using the same types of commands as described in the preceding paragraphs. Protection codes and user passwords (UIC's), however, are not required since these items are unique to disk file structures. Typical examples of device to device command strings are:

a) DECtape 2 to DECtape 1 transfer:

```
>T␣DT1␣NEWFIL←DT2␣OLDFIL␣(A)↵
```

b) Papertape Reader to DECtape 1 transfer:

```
>T␣DT1␣NEWFIL␣ {(A)} ←PR ↵
               {(I)}
```

NOTE

When inputting information from paper tape, it is recommended that the (I) data mode switch be used unless the contents of the tape are known.

c) DECtape 1 to Line Printer (listing):

```
>T␣LP←DT1␣NEWFIL␣(A)↵
```

3.4.6 Transfer of Keyboard Inputs to Output Devices

The PIP transfer "T" command may be used to transfer console terminal keyboard (device TT) entries (line by line) to output devices as they are typed. This capability is useful in the creation of ASCII source paper tapes or the entry of personal comments at the beginning or end of line printer listings. The user, however, should consider that the text editorial and correction features provided by PIP are minimal and that the service program EDIT (refer to DEC-15-YWZB-DN6) provides complete editorial functions.

Once started, transfer operations of this type must be terminated by a CTRL D (↑D entry). The CTRL D entry must be made on a separate line, since any data on the same line as CTRL D will be deleted from the output.

Examples:

a) To punch a paper tape via keyboard entries, use:

```
>T␣PP␣(A)←TT ↵
```

b) To enter data directly from the keyboard into the current UFD, use the following (note that a file is named in the command to receive the keyboard inputs):

```
>T DK KEYBD←TT (A)
```

Keyboard-to-Disk Operation Command

```
THIS IS AN EXAMPLE OF THE MANNER IN WHICH DATA CAN
BE ENTERED INTO A FILE ON THE DISK DIRECTLY
FROM THE CONSOLE KEYBOARD.
THE EDITORIAL COMMANDS FOR CHARACTER RUBBOUT
AND LINE DELETION MAY BE USED IN THIS MODE OF
OPERATION. FOR EXAMPLE
        .TITAL\\LE  EXANP\\MP
A CTRL D ENTRY MUST BE MADE TO TERMINATE
THE KEYBOARD ENTRY MODE OF OPERATION.
↑D
```

Inputs from Keyboard

```
>T TT←DK KEYBD SRC
```

File to Teleprinter Command

```
THIS IS AN EXAMPLE OF THE MANNER IN WHICH DATA CAN
BE ENTERED INTO A FILE ON THE DISK DIRECTLY
FROM THE CONSOLE KEYBOARD.
THE EDITORIAL COMMANDS FOR CHARACTER RUBBOUT
AND LINE DELETION MAY BE USED IN THIS MODE OF
OPERATION. FOR EXAMPLE
        .TITLE  EXAMP
A CTRL D ENTRY MUST BE MADE TO TERMINATE
THE KEYBOARD ENTRY MODE OF OPERATION.
```

Teleprinter listing of File KEYBD SRC

3.5 FILE TRANSFERS WITH OPTIONAL FUNCTIONS

As stated in paragraph 3.4, PIP option Function Switches may be included in "T" commands to provide the use of a broad variety of secondary operations during file transfers. The legal switches and switch combinations permitted in T commands are given in Table 3-2.

TABLE 3-2 Legal Combinations of Function Switches in Transfer Operations

	E	G	C	W	Y	N	S	F	T	Q
E		X		X	X	X	X	X		
G	X		X	X	X	X	X	X	X	X
C		X		X	X	X	X	X	X	X
W	X	X	X			X	X	X	X	X
Y	X	X	X			X	X	X	X	X
N	X	X	X	X	X				X	
S	X	X	X	X	X				X	
F	X	X	X	X	X				X	X
T		X	X	X	X	X	X	X		X
Q		X	X	X	X			X	X	

The operations provided by the use of switch functions are described in paragraphs 3.5.1 through 3.5.7.

3.5.1 (G) Switch: Parity/Checksum Error Correction Facility

During data mode (A) or (B) file transfer operations, PIP checks the parity and checksum of the file(s) involved. If an error is detected, PIP halts the transfer and outputs on the console printer the message:

```
PARITY ERR
```

or

```
CKSUM ERR
```

depending on the error found. During (A) mode transfers, each parity error message output is followed by a listing of the line containing the error.

The addition of the (G) switch to (A) mode commands provides the user with the following options when a parity or checksum error is found:

a. Accept the line containing the error as it is, by entering a) (RETURN);

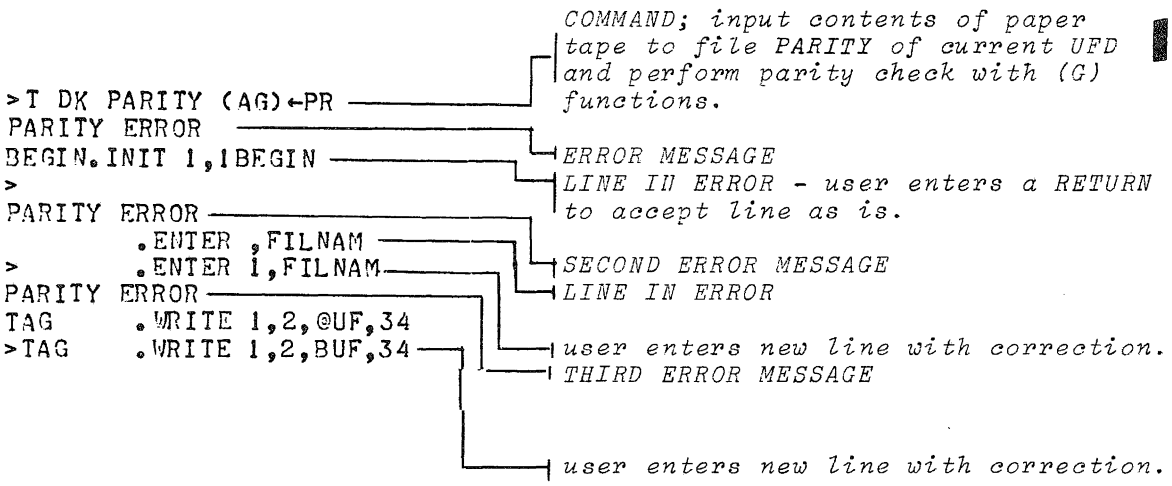
   (PIP does not pass the parity error even if the line is accepted; it will change the incorrect parity bit to ensure even parity)

b. Delete the line containing the error by typing D and proceed;

c. Replace the line by typing in a new correct line which is terminated by) ;

d. Abort the transfer by typing CTRL P (↑P) to restart PIP or CTRL C (↑C) to return to the Monitor.

The (G) switch may only be used in IOPS ASCII data mode (A) operations. The following is a typical example of the use of the (G) switch:



3.5.2 (E) and (C) Switches: Tab-to-Space, Space-to-Tab Conversion

Listing devices may or may not have tabbing mechanisms; therefore, it is sometimes necessary to convert file tab and space delimiters to meet the needs of the listing devices.

a) (E) Switch - the addition of switch (E) to a "T" command string causes all Tab codes in the transferred file to be converted to the number of spaces required to achieve the same spacing of the printed material as would be obtained if a Tab were present.

The (E) switch may only be used in data mode (A) transfer. Following is a typical example of a T command incorporating an (E) switch:

```
>T␣TT←DT1␣FILEA␣(AE)
```

b) (C) Switch - the addition of switch (C) to a "T" command string causes any group of two or more contiguous spaces to be converted to a Tab code in the transferred file according to the following rule:

i) a tab character is output for each tab-stop position which is reached or exceeded by the group of spaces.

ii) any spaces occurring after the last tab stop position, which was reached by the group of contiguous spaces, are output.

The effect of this operation is that a printout of the resulting file will look as if the C switch had not been invoked, but the operation, reading a tab position will be performed via tab characters, whenever they were formerly reached by spaces.

Note that any group of spaces, which fails to reach at least one tab stop position, will result in the output of just that set of spaces without any tab characters. Note further, that any group of spaces ending at a tab stop position will result in the output of more tab characters without any spaces.

The (C) switch may only be used in data mode (A) operations.

The following is a typical example of a T command incorporating a (C) switch:

```
>T␣TT←DT1␣FILEA␣(AC)
```

3.5.3 (N) Switch: Directory Initialization During Transfer

In addition to being a Primary PIP operation, the New Directory N command may also be used as an optional function to be carried out in the context of other operations. The (N) option may be used to initialize directories on both disk and DECtape mass storage devices.

Switch (N), when used in a transfer to disk operation, initializes the UFD associated with the current user.

Used in a transfer to a non-existent UIC, the (N) switch causes a UFD to be set up under the specified UIC. The transferred file then appears as the first entry in the new UFD.

Transfers made to DECtape devices by T commands containing the (N) switch initialize the DECtape directory and write the transferred file(s) onto the tape.

The following example illustrates the use of the (N) switch in T commands.

Assuming the file TEST1 ØØ1 to be present in the current UFD, the command:

```
>T␣DK␣<XYZ> ←DK␣TEST1␣ØØ1␣(N)⏎
```

sets up a new UFD under the UIC "XYZ" and transfers the file TEST1 ØØ1 into the new UFD as its first entry as follows:

```
    11-AUG-71
DIRECTORY LISTING  (XYZ)
  1465 FREE BLKS
     1 USER FILES
    10 USER BLKS
TEST1  001      10  11-AUG-71
```

UFD's established in this manner are automatically given a UFD protection code of "0".

3.5.4 (W) Switch: Combining Files During Transfers

The (W) combine file switch, when incorporated into a T command, enables the user to read two or more files from a source device and write them, in the indicated sequence, into a single file on the destination device.

The (W) switch may be used with data mode switches (A), IOPS ASCII and (B), IOPS Binary.

During (W) operations, PIP pauses and outputs a ↑P (when input is from a non-directoried device) at the console teleprinter after each file is transferred. The user must respond with a ↑P entry to continue the transfer operation.

For example, the command:

```
>T␣DT1␣COMTST←DT2␣TEST1,TEST2,TEST3␣(BW)⏎
```

results in the binary files TEST1, TEST2, and TEST3 being written into the file COMTST on device DT1. With a source file, the pseudo-operators .EOT or .END which occur at the end of all but the last of the files being combined are deleted to enable the resultant file to be processed as a single continuous file.

The following is an example of a combine files (W), transfer operation:

```
    17-SEP-71
DIRECTORY LISTING  (GEP)
  6163 FREE BLKS
     2 USER FILES
     2 USER BLKS
SEGA    SRC        1   17-SEP-71
SEGB    SRC        1   17-SEP-71
```

LISTING OF CURRENT UFD

```
>T DK  EXAMP SRC (AW)←DK SEGA SRC,SEGB SRC
```

COMBINE FILES COMMAND

```
    17-SEP-71
DIRECTORY LISTING  (GEP)
  6162 FREE BLKS
     3 USER FILES
     3 USER BLKS
SEGA    SRC        1   17-SEP-71
SEGB    SRC        1   17-SEP-71
EXAMP   SRC        1   17-SEP-71
```

LISTING OF CURRENT UFD SHOWING NEW FILE "EXAMP" CREATED BY COMBINING FILES "SEGA" AND "SEGB".

```
        .TITLE EXAMP
        .IODEV 1,2
BEGIN   .INIT 1,1,BEGIN
        .ENTER 1,FILNAM
        .EOT
```

LISTING OF FILE "SEGA"

```
TAG     .WRITE 1,2,BUF,34
        .EOT
```

LISTING OF FILE "SEGB"

```
        .TITLE EXAMP
        .IODEV 1,2
BEGIN   .INIT 1,1,BEGIN
        .ENTER 1,FILNAM
TAG     .WRITE 1,2,BUF,34
        .EOT
```

LISTING OF NEW FILE "EXAMP"

3.5.5 Inputting and Combining Files from Paper Tape

The (W) option with a transfer operation permits the user to input files from separate paper tapes and to combine the files into a single named file on a specified destination device.

The procedure required is:

1) The first tape to be read should be loaded into the paper tape reader (PR).

2) The user must specify in the command string the number of paper tapes to be read. This is done by following the source device mnemonic (i.e., PR) by N-1 commas (,) where N is the total number of tapes to be read. For example, the command:

   >T␣DT1␣NUFILE␣(AW)←PR␣,,,,)

   specifies that five (5) paper tapes (4 commas) are to be read in IOPS ASCII data mode and combined into a single file (NUFILE SRC) located on DECtape unit #1.

3) The termination of the command string causes the first paper tape to be read. PIP pauses after each tape is read to permit the user to place the next tape in the reader. A pause is indicated by the printing of "↑P" at the console printer.

4) Until the last tape is read, the user must enter CTRL P (↑P) after loading each new tape to continue the input operation. PIP determines which is the last tape to be read from the number specified in the command string and terminates the operation after the last tape is read.

3.5.6 Card Input and Card File Modification Operations

The Transfer operation may be used to input files from punched cards. The format of the data being input from cards may be modified by adding one or more of the following switches to the T command:

1) (Q) Switch - The addition of a (Q) switch causes the information input from card columns 73 through 80 (card sequence numbers) to be deleted. This switch may be used only in an (A) data mode transfer operation and only on information which is in a card format. That is, the Q switch may be used during the transfer of files, the contents of which are still in card format, as well as during the input of data from the card reader. Examples of the command strings used are as follows:

   a) To modify input from card reader

      T␣DT1␣FILEA␣(AQ)←CD)

b) To modify file data format during storage device transfer operations:

T␣DT1␣FILEA←DT1␣SOURCE␣(AQ)↵

2) (C) Switch - The (C) switch (spaces-to-tabs) may be combined with the (Q) switch to further modify the contents of files being input or transferred. The following is an example of a command string containing both the (C) and (Q) switches:

T␣DT1␣FILEA←DT2␣SOURCE␣(AQC)↵

3) (T) Switch - The (T) switch (delete trailing spaces) may be combined with either the (Q) switch or both the (Q) and (C) switches to further modify the contents of files being input or transferred. The following is an example of a T command string which contains all three modifying switch options:

T␣DT1␣FILEA←DT2␣SOURCE␣(AQCT)↵

NOTE

The Q switch cannot be used to modify the contents of files which have been previously modified by the use of either or both the (C) and (T) switches since the contents would no longer be in a card format.

3.5.7 (T) Switch: Delete Trailing Spaces

The (T) option switch may be added to transfer commands used to input data from a card reader or to transfer files containing data in a punched card format (i.e., 80-character ASCII data groups). The use of the (T) switch causes PIP to locate and insert a RETURN (↵) character immediately after the last non-blank character in each file (or input) card-format data group. The (T) switch thus deletes the trailing spaces which result from inputting the unused portions of the original punched card sources.

3.6 V: VERIFY OPERATION

IOPS ASCII or Binary files may be checked for parity and checksum errors by using the PIP Verify V operation.

Data mode switches (A) IOPS ASCII and (B) IOPS Binary are the only optional PIP switches permitted with V operations.

The Verification command string requires:

a) the V operation control character;

b) the mnemonic of the device containing the file to be examined;

c) the filename and extension of the file being checked;

d) data mode switch (A) or (B). As in the T command, the mode switches may be dropped if the extensions SRC or BIN are used; conversely, these extensions may be dropped when the mode switches are indicated. **Note that in multiple file verifications, all files must be of the same data mode (i.e., all IOPS ASCII or all Binary).**

COMMAND STRING EXAMPLES:

a) the command

V␣DK␣FILEA␣(A)↵

will verify the file FILEA SRC listed in the UFD of the current user (UIC).

b) the command:

V␣PR␣(B)↵

verifies the contents of a binary paper tape mounted in the paper tape reader.

c) the command:

V␣DT3␣FILEA,FILEB,FILEC␣(A)↵

verifies three ASCII files contained on DECtape unit 3.

If either a parity or a checksum error is detected during a Verify operation, the message:

"PARITY ERR"

or

"CHKSUM ERR"

is output at the console printer by PIP.

A Verify, V, operation is interrupted only for the printing of error messages, it continues the verify operation until the entire file has been examined.

During verification of IOPS ASCII files (mode (A)) the line containing each detected error is printed at the console printer immediately

after the error message printout. The following is an actual example of the error message/error line printout obtained during the verification of an ASCII file.

```
 V PR  (A)
PARITY  ERROR
START    WØ ————————————————
PARITY ERROR
         JMP  TE ————————————
PARITY ERROR
@=1 ————————————————————————
PARITY ERROR
TELP     Ø ————————————————
```

Lines in the file which contain a detected error

3.7 S: SEGMENT FILE OPERATION

PIP provides commands which enable a single IOPS ASCII file located on either a mass storage device (e.g., DT, DK, DP, RK, MT) or a paper tape to be segmented into up to 16 individual files or tapes. The PIP segmentation operation is initiated by an S (segment file) command followed immediately by a T (transfer) command containing a (Y) option switch.

NOTE

The (Y) switch may only be used with data mode switch (A), (IOPS ASCII).

3.7.1 S, Segment File Command

The S command enables the user to specify up to 16 "segmentation points" within a file that is to be segmented.

A segmentation point is defined as a group of from 1 to 5 characters which identify a specific line within a file. The characters of a segmentation point must appear in the FIRST five character positions of a line.

Each segmentation point indicates to PIP that all lines of the file from the beginning of the file or the preceding segmentation point, up to but not including the current segmentation point, are to be transferred as a single file.

The format of the S command command string is as follows:

```
S␣SEG1,SEG2,...,SEG15,SEG16
```

As shown above, commas must be used as delimiters between the specified segmentation points.

3.7.2 T Command Requirements for S Operations

The T command used in file segmentation operations must:

a) contain a (Y) switch;

b) name a corresponding destination file for each segment of the source file;

NOTE

The number of destination filenames required in a T command is equal to the number of S command segmentation points plus 1.

c) contain the source device mnemonic and source filenames and extensions.

d) immediately follow the S command.

During S operations:

a) PIP examines the file line-by-line for the segmentation points specified in the S command.

b) As each segmentation point is found, PIP appends the appropriate pseudo-op (.END or .EOT) to the defined segment and transfers it to the corresponding destination file.

Assuming the following file present in the current UFD:

```
        .TITLE EXAMP
        .IODEV 1,2
BEGIN   .INIT 1,1,BEGIN
        .ENTER 1,FILNAM
TAG     .WRITE 1,2,BUF,34
        .CLOSE 1
        .EXIT
BUF     L1-./2*1000+2; 0
        .ASCII 'HEJ!'<175>
L1=.
FILNAM  .SIXBT 'DTIO DAT'
        .END BEGIN
        .EOT
```

the manner in which file EXAMP may be divided into three segments, with each segment a separate named file, is shown in the following example:

```
>S BEGIN,TAG
```

SEGMENTATION S AND T COMMANDS

```
>T DK PARTA,PARTB,PARTC (AY)←DK SEGEX SRC
↑P
↑P
↑P
↑P
```

```
>L TT←DK
```

LIST CURRENT UFD

```
    11-AUG-71
 DIRECTORY LISTING  (GEP)
   1510 FREE BLKS
      4 USER FILES
      4 USER BLKS
 PARTA   SRC       1   11-AUG-71
 PARTB   SRC       1   11-AUG-71
 PARTC   SRC       1   11-AUG-71
 SEGEX   SRC       1   11-AUG-71
```

```
>T TT←DK PARTA (A)
```

LIST SEGMENT A

```
        .TITLE EXAMP
        .IODEV 1,2
        .EOT
```

```
>T TT←DK PARTB (A)
```

LIST SEGMENT B

```
BEGIN   .INIT 1,1,BEGIN
        .ENTER 1,FILNAM
        .EOT
```

```
>T TT←DK PARTC (A)
```

LIST SEGMENT C

```
TAG     .WRITE 1,2,BUF,34
        .CLOSE 1
        .EXIT
BUF     L1-./2*1000+2; 0
        .ASCII 'HEJ!'<175>
L1=.
FILNAM  .SIXBT 'DTIO DAT'
        .END BEGIN
        .EOT
```

3.7.3 Source File to Multiple Paper Tapes Segmentation Operations

The segmentation of a file and the outputting of each segment onto separate paper tapes is performed in a manner similar to that described in paragraphs 3.7.1 and 3.7.2. The use and format of the S command is the same, the T command differs as follows:

> No destination filenames need be used in the T command; however, a series of commas must then be used to indicate the number of paper tapes required.

For example, the commands needed to segment file EXAMP (refer to previous example) onto 3 paper tapes are:

```
>S BEGIN,TAG↵
>T␣PP␣,,␣(Y)←DK␣EXAMP␣SRC↵
```

The operations performed by PIP when outputting file segments onto paper tape are similar to those described in paragraph 3.7.2.

When a file is segmented and the segments are output onto paper tapes:

1) An .EOT pseudo-operation is appended to the end of each segment.

2) With the exception of the last output tape, PIP pauses after each segment tape has been punched and causes a ↑P (CTRL P) message to be printed at the console printer. The pause permits the user to remove each tape before the next one is punched.

3) The user must enter CTRL P (↑P) to continue the segmentation operation after each pause.

4) When the last tape is punched, control is returned to PIP from the segmentation operation.

3.8 D: DELETE FILE OPERATION

The Delete operation enables the user to delete files from user directories. The basic command format is:

```
>D␣device containing file(s)␣filename␣extension )
```

for example:

```
>D␣DK␣FILEA␣SRC )
```

More than one filename may be listed in a D command; however, they must be separated by commas. For example:

```
>D␣DK␣FILEA␣SRC,FILEB␣SRC,FILEC␣SRC)
```

NOTE

The complete name (filename and extension) of the file(s) must be specified exactly as entered in the directory from which they are to be deleted. If more than one file in a directory has the same name, PIP will delete the first file of the specified name which it finds.

One option switch, (X), is permitted in the Delete command. This switch deletes all truncated files from the current or a specified (unprotected) UFD. The following are examples of the use of the (X) switch:

a) `>D␣DK␣(X)`) for current UFD;

b) `>D␣DK␣<AAA>␣(X)`) for specified UFD.

3.8.1 Deletion of Files from UFD's

When a file is deleted from a UFD, its entry is removed from the user directory and the quantities given in the Directory listings (i.e., FREE BLKS, USER BLKS and USER FILES) are adjusted to reflect the deletion.

Files are deleted from the current UFD by using the basic D command. For example, assuming the following directory as current:

```
    Ø2-AUG-71
DIRECTORY LISTING  (JAN)
  5751  FREE BLKS
     2  USER FILES
    11  USER BLKS
TEST1   ØØ1       1Ø   Ø2-AUG-71
MIN     SRC        1   Ø2-AUG-71
```

the command

```
>D␣DK␣TEST1␣ØØ1)
```

results in the deletion of the file "TEST1 ØØ1" as illustrated in the following listing of JAN:

```
    Ø2-AUG-71
DIRECTORY LISTING  (JAN)
  5761 FREE BLKS
     1 USER FILES
     1 USER BLKS
MIN    SRC       1  Ø2-AUG-71
```

More than one file may be deleted from a directory during a D operation. The deletion of four files by a single D command is shown in the following:

```
>L TT←DK

    11-JUN-71
DIRECTORY LISTING  (GEP)
  2251 FREE BLKS
    1Ø USER FILES
    1Ø USER BLKS
SEGB   SRC       1  11-JUN-71
SEGA   SRC       1  11-JUN-71
EXAMP  SRC       1  11-JUN-71
TTYFL  SRC       1  11-JUN-71
PARTA  SRC       1  11-JUN-71
TTYFLB SRC       1  11-JUN-71
PARTB  SRC       1  11-JUN-71
PARTC  SRC       1  11-JUN-71
```

Original UFD

```
>D DK SEGB SRC,SEGA SRC,TTYFL SRC,TTYFLB SRC
```

Delete Command

```
>L␣TT←DK

    11-JUN-71
DIRECTORY LISTING  (GEP)
  2255 FREE BLKS
     4 USER FILES
     4 USER BLKS
EXAMP  SRC       1  11-JUN-71
PARTA  SRC       1  11-JUN-71
PARTB  SRC       1  11-JUN-71
PARTC  SRC       1  11-JUN-71
```

Revised UFD

NOTE

The protection code assigned each individual file is overridden by the UFD protection code. If the UFD is unprotected (code Ø) any file it contains may be deleted by other users of the system regardless of the protection code of the individual file.

3.8.2 Deletion of DECtape Files

When a file is deleted from a DECtape directory, all references to the file are removed from the directory and the File Bit Map blocks.

The command format is the same as that described for the basic operation. For example, to delete a file from device DT1, the command:

```
>D␣DT1␣filename␣extension)
```

is used.

3.8.3 (X) Switch: Deletion of Truncated Files

The use of the (X) optional switch in a "D" command deletes all truncated files contained by the current UFD or any specified non-current UFD (unprotected). For example, assuming the following UFD as being current:

```
    16-SEP-71
DIRECTORY LISTING  (GEP)
  5372 FREE BLKS
     2 USER FILES
     3 USER BLKS
SEGEX  SRC       3  16-SEP-71
.TFIL1 EDT*      0  16-SEP-71
```

the command:

```
>D␣DK␣(X)
```

causes the truncated file ".TFIL1 EDT*" to be deleted from the UFD. The resulting UFD appears as:

```
    16-SEP-71
DIRECTORY LISTING  (GEP)
  5436 FREE BLKS
     1 USER FILES
     3 USER BLKS
SEGEX  SRC       3  16-SEP-71
```

3.9 R: FILE RENAME OPERATION

The PIP R operation enables the system user to:

a) Change filenames within current UFD's, specified UFD's and DECtape directories;

b) change the protection code for the current or specified UFD's;

c) change the protection codes of files within the current or specified UFD's.

The basic format for the R command is:

```
>R␣directory device␣new name␣ext←directory device␣old name␣ext )
```

The "directory device" must be the same on both sides of the back-arrow (←). This is the device which contains the file to be operated upon by the R command.

3.9.1 Renaming Files

Files within the current UFD or located in DECtape directories may be renamed using the basic R command. For example, assuming the following UFD to be current:

```
    16-SEP-71
DIRECTORY LISTING  (GEP)
  5436 FREE BLKS
     1 USER FILES
     3 USER BLKS
XMPLE  SRC       3  02-FEB-91
```

Original UFD

The filename "XMPLE" is changed to "SEGEX" by the following:

```
>R DK SEGEX SRC ←DK XMPLE SRC

>L TT←DK
    16-SEP-71
DIRECTORY LISTING  (GEP)
  5436 FREE BLKS
     1 USER FILES
     3 USER BLKS
SEGEX  SRC       3  16-SEP-71
```

Revised UFD

Files on DECtape are renamed using the same command format as shown for disk (UFD) files.

3.9.2 Setting File Protection Codes

R commands may be used to change both the name and protection codes for disk files. The format for this function is:

```
>R␣device␣new name␣ext←device␣old name␣ext␣(#)↵
```

where (#) is the specified file protection code (see Table 3-4 for codes).

For example, assume that the revised UFD of the preceding example is still current, the file protection code of file "SEGEX SRC" is changed from 2 to 1 in the following manner:

```
>R DK SEGEX1 SRC←DK SEGEX SRC (1)
```

R command

```
>L TT←DK (P)
     16-SEP-71
 DIRECTORY LISTING  (GEP)
   5436 FREE BLKS
      1 USER FILES
      3 USER BLKS
 SEGEX1 SRC    220I(1)     3  16-SEP-71   2205      74
```

UFD listing showing new file protection code

3.9.3 Setting Directory Protection Codes

R commands may specify a new protection code for the current or a specified UFD. The following command format is required for this function.

```
>R␣disk␣[XXX:Z]↵
```

where:

1) XXX is the 3-character UIC of the UFD involved
2) : is the required delimiter for this function

3) Z is the protection code to be assigned to the specified UFD: Ø = unprotected; 1 = protected.

For example:

```
>L TT←DK (M)

     11-JUN-71
 MFD DIRECTORY LISTING
   2255 FREE BLKS
     43 USER FILES
    515 USER BLKS

>R DK <GEP:Ø>

>L TT←DK (M)

     11-JUN-71
 MFD DIRECTORY LISTING
   2255 FREE BLKS
     43 USER FILES
    515 USER BLKS
 GEP   1ØØ3(Ø)      4      4
```

Original MFD indicates that no unprotected UFD's are in the system

Revised MFD showing the unprotected UFD "GEP"

3.10 B: BLOCK COPY OPERATION

The PIP B operation enables the user to copy the contents of selected storage blocks or ranges of blocks from one device into specified blocks of another similarly structured device. For this operation the user must specify:

1) the destination device and the storage blocks which are to receive the copied information,

2) the source device and the specific blocks which are to be copied.

The command format required is:

```
>B␣Dest.Dev.␣List of Rec. Blocks←Source Dev.␣List of Blocks to be copied
```

The blocks to receive data and those which are to be copied are identified by their respective octal numbers.

A series of non-consecutive blocks (either source or destination) is specified by listing their octal numbers, in sequence, separated by commas (required delimiter). For example:

```
>B␣DT1␣50,55,60←DT2␣101,107,200 )
```

specifies that the contents of blocks 101, 107 and 200 on DT2 are to be copied into blocks 50, 55, and 60 of DT1 (i.e., 101 to 50, 107 to 55, and 200 to 60).

A series of consecutive blocks (either source or destination) may be specified as a range of numbers. The range is specified by listing the first and last block numbers of the series separated by a dash (-), the required delimiter. For example:

```
>B␣DT1␣50-55←DT2␣100-105 )
```

specifies that blocks 100, 101, 102, 103, 104 and 105 of DT2 are to be copied into blocks 50, 51, 52, 53, 54 and 55 of DT1.

When data is to be copied from and written into the same blocks on both source and destination devices, only one set of block numbers is required. For example:

```
>B␣DT1␣1,2,4←DT2 )
```

and

```
>B␣DT1←DT2␣1,2,4 )
```

specify that blocks 1, 2 and 4 are to be copied from DT2 into blocks 1,2 and 4 of DT1.

UIC block copy operations are permitted between the following devices:

a)	Disk Area to DECtape	permitted for the UIC user.
b)	DECtape to DECtape	permitted for any system user. Option switches (N) and (S) may be included in B commands for this type of operation.

In all copy operations, the data transferred (copied) is automatically verified.

3.11 C: COPY MASS STORAGE OPERATION

The PIP C operation provides the system user with the ability to:

a) add the contents of one device to that of another device

b) copy the complete contents of one file-structured device onto another similarly-structured device.

The format for the C command is:

>C␣destination device←source device)

The following option switches may be added to the C command:

a) (N) New Directory switch

Permits destination device directory to be initialized during C operation.

b) (S) Initialize with QAREA switch

Initializes the directory of the destination device and establishes a ↑QAREA on the device prior to the copy operation.

c) (H) Image Mode switch

H mode copy is a total replacement operation in that each block on the destination device is replaced by the corresponding block of the source device. This form of copy, therefore, may only be used between like devices (i.e., DP to DP, DT to DT); it is most useful for copying DECtapes. As each block is written onto the destination device, a word-by-word comparison is made between the destination block and source block to ensure accuracy. If an error occurs, the number of the block containing the error is output on the console printer. Once the copy operation is complete the blocks which contain errors may then be recopied using the Block Copy (B) function; this eliminates having to repeat the entire device copy operation.

All available free core is used during H Mode Copy operations; the more core that is available the faster the copy operation. It is therefore advantageous, prior to calling PIP, to assign only those handlers needed for the copy operation using the A (Assign) monitor command. For example, the fastest possible copy operation between DECtapes is achieved by assigning handler DTE to all possible .DAT slots.

3.11.1 Adding Files, Copy Operation

The use of the basic C command results in files being copied from the source device and added to the contents of the destination device. For example, the command:

```
>C␣DT1←DT2 )
```

causes the files on DT2 to be added to the contents of DT1.

The basic copy (i.e., add-on) operation is permitted between:

DEVICES	OPERATION PERFORMED
a) DECtape to Disk	integrates all DECtape files into the current UFD. A typical command is: `>C␣DK␣←DT1 )`
b) Disk to DECtape	integrates all files contained by the current UFD onto the specified DECtape. A typical command is: `>C␣DT1←DK )`
c) UFD to UFD	copy operations (i.e., the integration of files) may be carried out between the current UFD and an unprotected UFD. For example, the command: `>C␣DK␣<JAN>←DK )` adds the files of the current UFD to the UFD "JAN". Copy operations may also be performed between the current UFD and a protected UFD; however, truncated files and files with a protection code of 3 are not copied.
d) DECtape to DECtape	integrates all files from the source device onto the destination device. A typical command is: `>C␣DT1←DT2 )` NOTE If the destination device cannot store all of the input files, all possible files are copied and an error message printed at the console teleprinter.

Assuming a current UFD containing the file "XMPLED SRC", the following is an example of a basic copy (i.e., C) operation:

```
   02-AUG-71
DIRECTORY LISTING
  1066 FREE BLKS
     1 USER FILES
    10 SYSTEM BLKS
EDTST  SRC       1      2
```

DTØ DIRECTORY BEFORE COPY OPERATION

```
>C␣DT0←DK)
```

COPY CONTENTS OF CURRENT UFD ONTO DTØ

```
   02-AUG-71
DIRECTORY LISTING
  1062 FREE BLKS
     2 USER FILES
    10 SYSTEM BLKS
EDTST  SRC       1      2
XMPLED SRC       2      4
```

DTØ DIRECTORY AFTER COPY OPERATION

3.11.2 Copy with Directory Initialization

Switches (N) and (S) may be added to C commands to initialize the directory of the destination device.

The (N) switch is used in the following manner:

a) Copy to System Device Operations

When added to a basic C command, the (N) switch either initializes the UFD for the current or specified UIC or, if no UFD exists, creates a new UFD.

For example, the command:

```
>C␣DK<JAN>␣(N)←DT1)
```

first initializes the UFD for UIC "JAN" or, if none exists creates one, then the files contained by DT1 are incorporated into the UFD for "JAN".

b) DECtape to DECtape copy

When added to a DECtape to DECtape C command, the (N) switch initializes the directory of the destination device before the copy operation is carried out.

The (S) switch is permitted only for DECtape to DECtape copy operations. This switch initializes the directory of the destination device and establishes a QAREA on the device prior to the copy operation.

When the (S) switch is used alone, the ↑QAREA reserved on the initialized device has the same size as the core available in the system. For example, the command:

```
>C␣DT1␣(S)←DT2 )
```

will:

a) initialize the directory of DT1,

b) reserve a ↑QAREA on DT1 equivalent in size to the core contained by the system,

c) copy the contents of DT2 onto DT1.

Two digits may be added to the (S) switch (i.e., (Snn) to indicate in 4K (i.e., 4Ø96-word) units the size of the ↑QAREA to be reserved). This size is normally specified in 4K units starting at 16K (minimum DOS core requirement). For example, the command:

```
>C␣DT1␣(S32)←DT2 )
```

initializes the directory on DT1, causes a 32K ↑QAREA to be reserved on DT1 and copies the contents of DT2 onto DT1.

3.12 U: UPDATE STORAGE ALLOCATION TABLES OPERATION

It is possible for areas on disk devices to be faulty or damaged in such a manner that they cannot be read from or written on. When a faulty area is detected, the Monitor outputs an error message which describes the condition and lists the block number of the bad area.

On the detection of faulty read/write disk areas, the current user must delete the current file where the error was indicated, then utilize the PIP UPDATE operation to:

a) Cause the system Storage Allocation Table (SAT) to be updated to reflect the removal of the faulty blocks from "available storage".

b] Update the system Bad Allocation Table (BAT) with the numbers of the detected faulty blocks. If no BAT exists, the table is created by the update operation.

The command string format for a PIP U operation is:

```
>U␣DK␣N )
```

where N may:

a) be the octal number of one faulty block or a series of numbers identifying a list of non-sequential faulty blocks.

   For example, the command:

```
>U␣DK␣101,105,115 )
```

   updates the BAT and SAT to indicate that disk storage blocks 101, 105 and 115 are faulty.

b) Indicate a range of numbers which describes a series of contiguous blocks which are found to be faulty.

   For example, the command:

```
>U␣DK␣101-105 )
```

   updates the BAT and SAT to indicate that disk storage blocks 101 through 105 are faulty.

On completion of each UPDATE operation, PIP outputs the message

```
n  BAD BLOCKS IN SYSTEM
```

on the console printer. The letter "n" represents a number which indicates the total number of bad blocks on the disk.

SECTION 4

MIC PIP OPERATIONS

4.1 GENERAL PIP MIC OPERATIONS

The system manager, when logged in under the Monitor Identification Code (MIC), can perform all of the operations described in Section 3; he is required only to specify the UFD or device involved. For example, to transfer a file between UFD's the MIC enters a command similar to the following:

```
>T␣DK␣<JAN>␣DESTFL←DK␣<GEP>␣SOURCE␣(A)↵
```

Protection codes, file or UFD, do not apply to the MIC.

4.2 SPECIFIC MIC FUNCTIONS

The following paragraphs describe PIP operations which are unique to the MIC or give different results to the MIC user.

4.2.1 N Operation

The MIC user may initialize any user UFD or DECtape directory in the system by specifying the directory's UIC or device/unit mnemonic in the command. For example:

a) `>N␣DK␣<JAN>↵`

clears all files from the UFD identified by the UIC "JAN".

b) `>N␣DT1 ↵`

clears the directory of DECtape unit #1.

WARNING

The command ">N␣DK↵ " issued by the MIC, initializes either the PAG (page mode) or BNK (bank mode) system UFDs. If either of these UFD's is initialized, the current operating system is destroyed and the system must be restored.

4.2.2 L, List Directory Operation

The only difference between the UIC and MIC "L" operations is that in listing the MFD, the MIC user obtains a complete listing of all UFD's in the system, regardless of their respective protection codes.

For example, the listing obtained by the command:

```
>L␣LP←DK  (M)↵
```

a) by a standard user (UIC)-

```
    02-AUG-71
MFD DIRECTORY LISTING
 5766 FREE BLKS
   52 USER FILES
  641 USER BLKS
```

b) by the MIC -

```
    02-AUG-71
MFD DIRECTORY LISTING
 5766 FREE BLKS
   52 USER FILES
  641 USER BLKS
BNK    1000(1)      5   157
PAG    1001(1)      5   160
IOS    1002(1)     30   247
SCR     NON(1)      0     0
WAD    1240(1)      1     4
JAN    1566(1)      1     1
TMP    1573(1)      6    26
GEP     NON(1)      0     0
```

4.2.3 Delete Truncated Files from System

A Delete command with an (X) option switch issued by the MIC will delete <u>all</u> truncated files from <u>all</u> UFD's contained by the operating system. The command required is:

```
>D␣DK␣(X)↵
```

4.2.4 I, Initialize Operation

The use of this operation clears all of the system device bit maps and initializes the MFD. Initialization of the MFD sets it to a default state. The system is completely destroyed. The required command is:

```
>I␣DK↵
```

SECTION 5

PIP ERROR DETECTION PROCEDURES AND MESSAGES

5.1 INTRODUCTION

This Section describes the error detection, reporting and corrective procedures employed in PIP operations. Only the error messages and procedures output and followed by the PIP program are described. A complete list of system error messages (IOPS) is given in Appendix D.

PIP error detection and reporting operations are concerned primarily with:

a) the detection of errors in the user command string,

b) the detection of errors during the performance of the user-requested operation.

5.1.1 User Command String Errors

When each input command string is terminated, PIP immediately scans the entered string for such items as:

a. Format errors,
b. Error in function requested,
c. Conflicts in requested function,
d. Completeness of information.

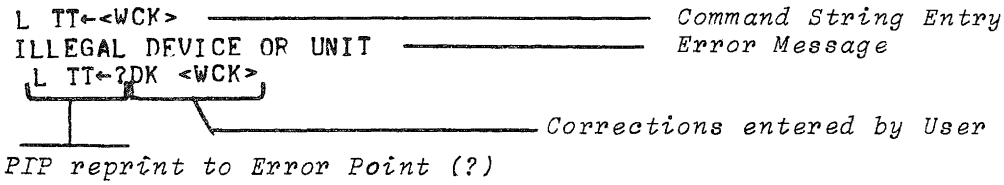
Errors in the command string are normally handled in the following manner:

a. A message identifying the error found is printed on the console teleprinter,

b. the command string entered is retyped by PIP, on a separate line up to the point where the error was detected. PIP outputs a question mark (?) at the point of the error,

c. the user may enter CTRL P or carriage return to abort the operation or may complete the command string from the ? symbol on, entering the needed correct information. The latter should initiate the requested operation if no further error exists.

EXAMPLE: the following is an example of the detection, reporting and correction of a command string error:



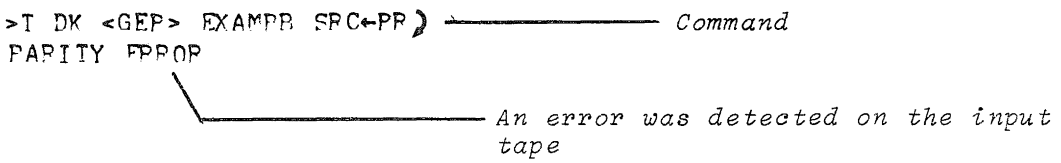
In the above example, the user forgot to enter a source device mnemonic (i.e., DK). PIP detected the error, output an error message and that part of the command line up to the error (i.e., >L_TT←?); the user chose to complete the operation and entered the needed data (i.e., DK<WCK>) to complete the string and initiate the desired operation.

NOTE

In correcting errors involving a source filename, it is necessary to respecify the file data mode.

5.1.2 Operational Errors

PIP also detects and reports errors found during the performance of the requested function. Parity errors, checksum errors, the inability of PIP to find a referenced filename, and protection code violations fall into this category. These errors are reported by PIP by messages output on the console teleprinter. The following is an example of an operational error:



PIP restarts itself after outputting the error message.

5.2 PIP ERROR MESSAGES

The messages output by PIP on the detection of command string or operational errors are listed and described in Table 5-1.

TABLE 5-1 PIP Error Messages

	Printed Message	Interpretation
1)	ILL DEV/UNIT	Illegal device mnemonic specified in command string.
2)	ILL TERMINATOR	Command improperly terminated: only RETURN or ALT MODE is legal.
3)	DEVICE NOT IN +.DAT	Return to the monitor and use the A (Assign) command to assign the device involved to a positive .DAT slot.
4)	DEV ILL FOR OPTION FUNCTION	Change function or device.
5)	FILE NAME TOO LONG	Filenames are restricted to a maximum of 6 characters plus a 3-character extension: the user has exceeded this limit.
6)	FILE NOT ON INPUT DEVICE	There is no file under the specified name on the directoried input device.
7)	ILL SWITCH	An optional switch entered in the command is not permitted in the primary operation being performed.
8)	SWITCH CONFLICT	Two or more switches entered in the command can not be used together.
9)	NEED DATA MODE	User must enter the proper data mode switch.
10)	CHKSUM ERR	An error has occurred in the transfer of data; retry transfer.
11)	PARITY ERR	File being processed contains a parity error. During T, transfer operation, this message may be accompanied by a printout of the line which contains the error. The user must correct the indicated line (Use (G) switch in a Transfer, T, operation or the Editor).
12)	S FUNCTION NOT DONE	A segmentation operation requires the entry of an S command followed by a T command. This message indicates the S command was not entered.

TABLE 5-1 PIP Error Messages (Cont.)

Printed Message	Interpretation
13) TOO FEW FILES 14) TOO MANY FILES	These error messages indicate that the number of files on the destination side of the command does not match the number given on the source side.
15) INPUT LINE TOO LONG	Input commands are limited to one physical line of 72 characters; the user has attempted to exceed this limitation.
16) READ-COMP ERROR ON BLK: XXXXX	During H mode or Block (B) copy operations, PIP compares the newly written data blocks against the original blocks and outputs this message if they are different.
17) ILL BLK #	Improper block number (i.e., too large, or negative) specified in command.
18) STRINGS 1-16 ACCEPTED	If a Segment, S operation divides a file into more than 16 segments, PIP will load segments 1-15 to their respective destination files. All remaining segments are put into the 16th file and this message is printed.
19) ILL FUNCTION FOR UIC	The operation specified is not permitted at the level of the current user. For example, a standard user (UIC) cannot employ the (H) switch in a copy to system device operation.
20) ILL UIC	User has given an improper code; the UIC must be a 3-character code within angle brackets (i.e., <XXX>).
21) UIC NOT IN MFD	Indicates that a File Directory (UFD) has not been established for the current user. The user should employ the PIP, N, command to set up a UFD under his identification code (i.e., UIC).
22) NEED BLK #	No block number was given in an UPDATE command; enter required octal number.
23) P VIOLATION	Current user has attempted an operation which violates the established protection code of a UFD or a file.

TABLE 5-1 PIP Error Messages (Cont.)

	Printed Message	Interpretation
24)	ILL P CODE	Specified directory code is illegal (i.e., something other than Ø or 1) or the directory just read has an illegal protection code).
25)	SYSBLK NOT ON DEV	Device specified is not the system device.
26)	DISK FULL	Device has no further storage available.
27)	NULL FILE NAME ILL	A filename must be specified; a Null-name is not acceptable.
28)	ILL CMD STRUCTURE	The command string entered was not properly ordered or structured.
29)	FILE STRUCTURE CONTAMINATED	The file structure on the device (i.e., disk) is faulty; this error indicates that the system bit map(s)is(are)incorrect.
30)	COMMAND STRING TOO LONG	The command string entered exceeds 72 characters.
31)	TOO MANY FILES OR BLOCKS	The limit of 28_{10} in either case was exceeded.
32)	ILL FUNCTION	The function specified in the command string entered (i.e., first character) is not a legal PIP function.
33)	ILL CNT	This error message is printed only in DECtape Directory listings. When output, it will appear immediately after the directory line "SYSTEM BLKS" (for example: Ø SYSTEM BLKS ILL CNT). This message indicates that an illegal number of system blocks have been detected. The user, on detection of this error message, should immediately attempt to transfer any files contained by the DECtape involved onto another DECtape. The files should be transferred one at a time. The faulty DECtape should be initialized to clear the error condition.
34)	ILL UFD ENTRY SIZE or ILL MFD ENTRY SIZE	The size of an entry (i.e., filename or UFD) in the directory involved is illegal. This error indicates that the system is faulty.

TABLE 5-1 PIP Error Messages (Cont.)

Printed Message	Interpretation
35) WARNING - FILE HAS ILL P CODE	This message indicates that the file last read has an illegal protection code. The requested operation will be carried out; however, an error message of this type indicates that the system is faulty.
36) FILE ALREADY PRESENT	There is already a file present under the new file name and extension supplied in a 'R' function.

5.3 CORRECTION AND RECOVERY COMMANDS

If a user detects an error in the command string before it is terminated, he may

a) delete the incorrect character,

b) negate the line entered (prior to terminator) and restart on a new line.

If an error is detected in the user's command string by PIP, he may

a) respond to the PIP error report and command string printout by correctly completing the command;

b) abort the task by entering a CTRL P or RETURN.

The commands which permit the above procedures are listed and described in Table 5-2.

TABLE 5-2 User Correction and Recovery Commands

To:	Type:	Which is Echoed on the Teleprinter as:
1) Delete a character from the command string	RUBOUT	\
NOTE: Characters are deleted one per entry starting from the last entered character and proceeding to the left.		
2) Negate (delete) line entered	CTRL U	@
NOTE: The CTRL U entry must be made before the line is terminated.		
3) Abort the current task and/or return control to PIP	CTRL P or RETURN	↑P Nonprinting
NOTE: CTRL P entries are also requested by PIP during paper tape input and file segmentation operations to continue operations after a tape or file segment has been transferred.		
4) Abort the current task and/or return control to the monitor	CTRL C	↑C
5) Continue the requested operation after a "DEVICE NOT READY" condition has been corrected for a PDP-15 device (not needed for a UC15 device).	CTRL R	↑R

SECTION 6

QUICK REFERENCE TABLES

6.1 INTRODUCTION

This section contains tabularized data intended as an aid to recall for users who are familiar with the contents of Sections 2 and 3. Tables are supplied which describe the Primary PIP Operations, PIP Optional operations, optional functions permitted within each primary operation, and the PIP command structure, plus a series of tables describing specific operations which may be carried out using PIP facilities. In some cases, the tables presented in this section are duplicates of those contained in earlier sections of the manual; this redundancy is necessary to make this section a complete single source of information.

6.2 OPTIONS VERSUS PRIMARY OPERATIONS

The matrix Table 6-1 illustrates the optional PIP function switches permitted in each of the PIP primary operations.

6.3 PIP COMMAND STRING FORMAT CHARTS

Figure 6-2 illustrates the general format of the Destination/Source command strings; Figure 6-3 illustrates the general format of the Single-Device Command Strings.

6.4 PIP USER OPERATION TABLES

Tables 6-4, 6-5, 6-6, 6-7 and 6-8 describe the operations which may be performed by the standard user (UIC); they contain:

a) a description of the operation,

b) the optional switches which may be used,

c) an example of a command string for each operation described.

No attempt is made to describe all possible operation/switch combinations or applications. However, the user is provided with sufficient commands to meet his own requirements if he has familiarized himself with Sections 2 and 3 of this manual.

The User Operation Tables are organized according to the following functional areas:

Table	Function Described
6-2	Directory Operations, how to set up, list, modify, and operate with disk (UFD) and DECtape directories.
6-3	List Operations, how to obtain printouts of directory and file information.
6-4	File Modification Operations, how to modify and manipulate files and file contents.
6-5	File Transfer Operations, how to transfer files between system storage devices.
6-6	Copy Operations, how to copy device contents, large groups of files or data blocks from system mass storage devices.

TABLE 6-1 Available Options Versus Primary Operations

PRIMARY OPERATIONS												
	TRANSFER	VERIFY	SEGMENT	LIST	NEW DIRECTORY	DELETE FILE	RENAME FILE	COPY TAPE	BLOCK COPY	INITIALIZE	UPDATE	
SWITCHES	T	V	S	L	N	D	R	C	B	I[2]	U	DESCRIPTIONS
(A)	X	X										IOPS ASCII Data Mode
(B)	X	X										IOPS Binary Data Mode
(C)	X											Space to Tab Conversion
(D)	X											Dump Mode
(E)	X											Tab to Space Conversion
(F)	X											Insert Form Feed
(G)	X											Correct Bad Parity
(H)[1]	X							X				Image Binary Mode
(I)	X											Image Alphanumeric Mode
(N)	X							X	X			New Directory
(Snn)	X				X			X	X			New Directory with CTRL Q area
(T)	X											Delete Trailing Spaces
(Q)	X											Delete Sequence Numbers (cards)
(W)	X											Combine Files
(Y)[3]	X											Segment Files
(K)					X							Delete Current UFD
(M)				X								List Unprotected UFDs
(X)						X						Delete Truncated Files
(P)				X								List Current UFD & RIB data
(L)				X								List SYSBLK

[1]Legal only with DECtape or Disk Pack or Disk cartridge copy operations.

[2]Legal only when the current password is the MIC.

[3]Transfer, T, commands which include a Y option switch must be preceded by an S, segment command string.

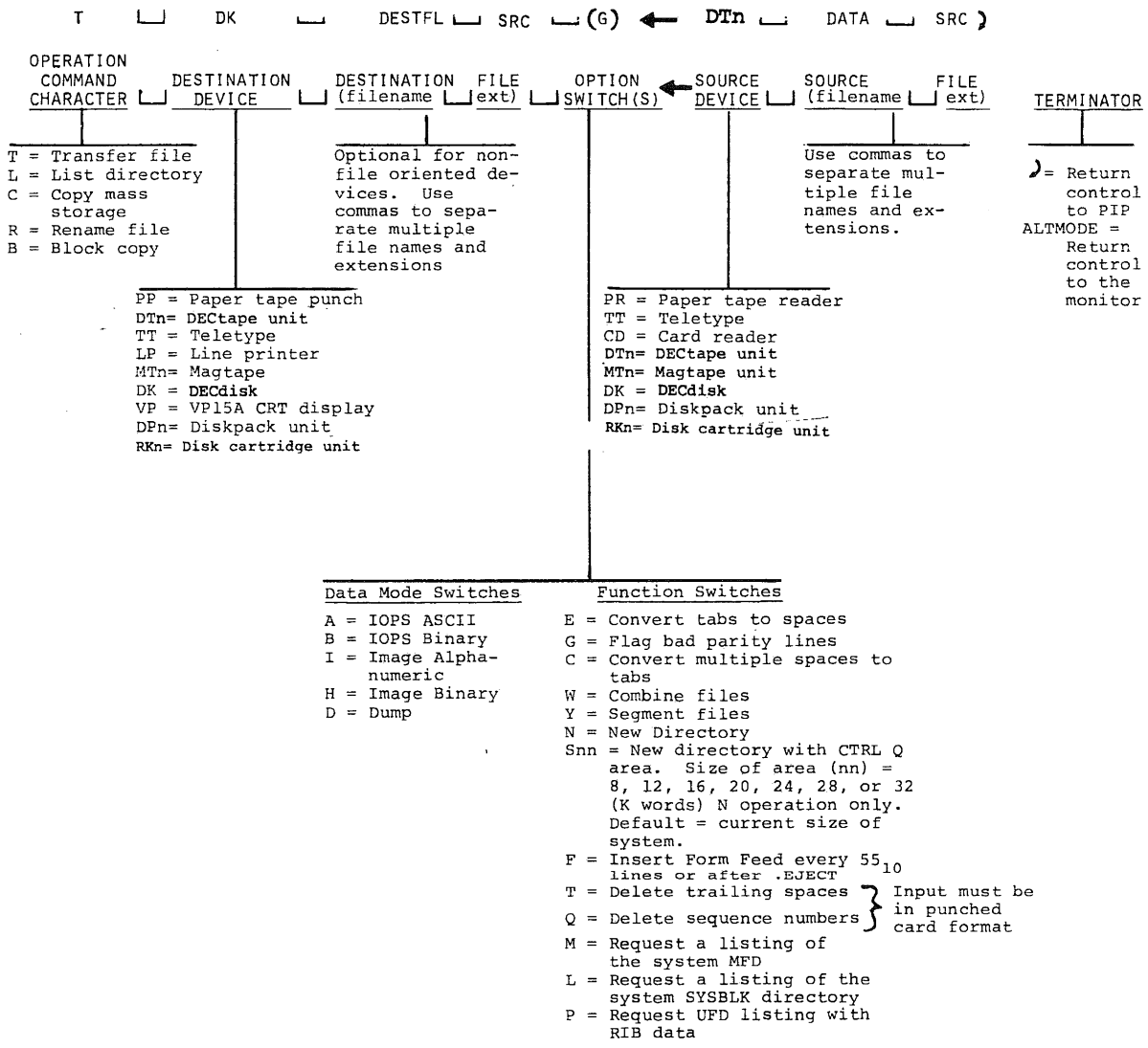


Figure 6-2 Destination/Source Command String Format

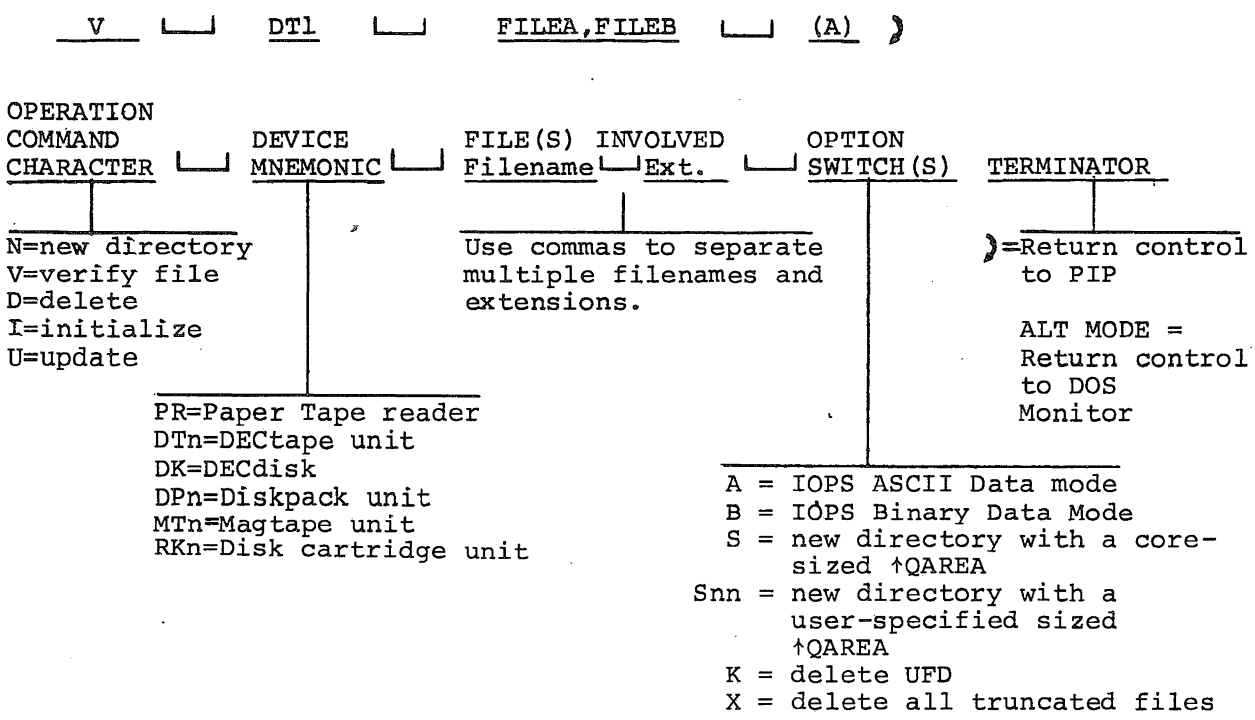


Figure 6-3 PIP Single Device Commands, General Format

TABLE 6-2 Directory Operations

	IN ORDER TO	USE OPERATIONS	AND OPTIONS	IN THIS MANNER
1)	Initialize the existing UFD or create a new UFD for the current UIC	N, New directory	None	>N␣DK)
2)	Initialize the existing UFD or create a new UFD for the current UIC during a T transfer	T, Transfer	(N),(NA),(NB)	>T␣DK␣DESTFL←DTl␣SOURCE␣(NA))
3)	Initialize or create a UFD for the current UIC with a specified UFD protection code	N with code specified written (cd)	(None)	>N␣DK␣(Ø))
4)	Delete a file from the current UFD	D, Delete	None	>D␣DK␣DESTFL␣BIN) Note: Filename extension is required.
5)	Rename a file in the current UFD and set its protection code.	R, Rename	None	>R␣DK␣NEWNAM␣BIN←DK␣OLDNAM␣BIN) Note: Filename extension is required.
6)	Rename a file in the current UFD and set its protection code	R, Rename	None	>R␣DK␣NEWNAM␣BIN←DK␣OLDNAM␣BIN␣(3)) Note: Protection code is specified within parentheses.
7)	Change protection code of the current UFD	R, Rename	None	>R␣DK␣<JOE:Ø>)

TABLE 6-2 Directory Operations (Cont'd)

IN ORDER TO	USE OPERATIONS	AND OPTIONS	IN THIS MANNER
8) Initialize the directory of a Mass storage device	N, New directory	None	>N␣DT1)
9) Initialize mass device directory and set up a ↑QAREA of:	N, New directory		
a) System core size		(S)	>N␣DT1␣(S))
b) Specified size		(Snn)	>N␣DT1␣(S32))
10) List contents of directories:			
a) MFD	L, List	(M)	>L␣TT←DK␣(M))
b) UFD	L, List	None	>L␣TT←DK)
c) DECtape	L, List	None	>L␣TT␣DT1)
11) List contents of unprotected, non-current UFD	L, List	None	>L␣TT←DK␣< JOE>)

TABLE 6-3 List Operations

	IN ORDER TO	USE OPERATIONS	AND OPTIONS	IN THIS MANNER
1]	List the system MFD	L, List	(M)	>L␣LP←DK␣(M))
2]	List the UFD of the current UIC	L, List	None	>L␣TT←DK)
3]	List the contents of an unprotected non-current UFD	L, List	None	>L␣TT←DK␣<JPE>)
4]	List the system SYSBLK	L, List	(L)	>L␣TT←DK␣(L))
5]	List current UFD with File Protection Codes and RIB information	L, List	(P)	>L␣TT←DK␣(P))
6]	List directories of Mass Storage devices	L, List	None	>L␣TT←DT1)
7]	List a selected file entry from the current UFD or device directory	L, List	None	>L␣TT␣FILNAM␣BIN←DK)
8]	List a selected file entry from an unprotected non-current UFD	L, List	None	>L␣TT␣FILNAM␣SRC←DK␣<JOE>)

TABLE 6-3 List Operations (Cont'd)

IN ORDER TO	USE OPERATIONS	AND OPTIONS	IN THIS MANNER
9) List all file entries having the same filename extension from			
a) the current UFD or device directory, or	L, List	None	>L␣TT␣#SRC←DK)
b) an unprotected non-current UFD	L, List	None	>L␣TT␣#BIN←DK␣<JOE>)

TABLE 6-4 File Modification Operations

IN ORDER TO	USE OPERATION	AND OPTIONS	IN THIS MANNER
1) Rename a file	R, Rename	None	>R␣DK␣NEWNAM␣BIN←DK␣OLDNAM␣BIN)
2) Rename and set the protection code for a file	R, Rename	None	>R␣DK␣NEWNAM␣BIN←DK␣OLDNAM␣BIN␣(3))
3) Delete a file:			
a) from current UFD	D, Delete	None	>D␣DK␣FILEA␣BIN)
b) from unprotected UFD	D, Delete	None	>D␣DK␣<JOE>␣FILEA␣BIN)
c) from mass storage device directory	D, Delete	None	>D␣DT1␣FILEA␣BIN)
4) Delete all truncated files from a UFD which is:			
a) current	D, Delete	(X)	>D␣DK␣(X))
b) specified	D, Delete	(X)	>D␣DK␣<ABC>␣(X))
5) Convert multiple spaces to tabs	T, Transfer	(C), (CA)	>T␣LP␣DESTFL←DT1␣SOURCE␣(CA))
6) Convert tabs to spaces	T, Transfer	(E), (EA)	>T␣LP␣DESTFL←DT1␣SOURCE␣(EA))
7) Detect and Correct File Parity and Checksum errors	T, Transfer	(G), (GA)	>T␣DK␣DESTFL←DT1␣SOURCE␣(GA))
8) Delete Trailing Spaces from file contents	T, Transfer	(T), (TA)	>T␣DK␣DESTFL←DT1␣SOURCE␣(TA))

TABLE 6-4 File Modification Operations (Cont'd)

IN ORDER TO	USE OPERATION	AND OPTIONS	IN THIS MANNER
9) Delete sequence numbers from file (card input or card format data files only)	T, Transfer	(Q), (QA)	>T␣DT1␣DESTFL␣SRC␣(Q)←CD)
10) Combine separate files into one file	T, Transfer	(W)	>T␣DT1␣LIBR␣(WB)←DT2␣FILA␣BIN,FILB␣BIN)
11) Segment a file into 2 to 16 separate:			
a) files	S, Segment +	None	>S␣TAG,TAGB,TAGC)
	T, Transfer	(Y), (YA)	>T␣DT1␣FILA,FILB,FILC,FILD␣(YA)←DT2␣SOURCE)
b) papertapes	S, Segment +	None	>S␣TAGA,TAGB,TAGC)
	T, Transfer	(Y), (YA)	>T␣PP␣,,,␣(YA)←DT1␣SOURCE)
12) Verify a file for parity and/or checksum errors	V, Verify	(A), (B)	>V␣DK␣FILEA␣(A))

TABLE 6-5 File Transfer Operations

IN ORDER TO	USE OPERATION:	AND OPTION(S):	IN THIS MANNER
1) Transfer a file to the current UFD	T, Transfer	(A) or (B)	>T␣DK␣DESTFL←DT1␣SOURCE␣(A))
2) Transfer a file to a selected non-current UFD when protection code permits	T, Transfer	(A) or (B)	>T␣DK␣< JOE>DESTFL←DT1␣SOURCE␣(A))
3) Transfer a file from a current UFD to a specified, non-current unprotected UFD	T, Transfer	(A) or (B)	>T␣DK␣< JOE>DESTFL←DK␣SOURCE␣(A))
4) Transfer console keyboard entries, line-by-line, to a system output device	T, Transfer	(A) only	>T␣LP␣(A)←TT)
5) Transfer file and:			
a) Convert spaces to tabs	T, Transfer	(C) or (CA) only	>T␣TT←DT1␣SOURCE␣(CA))
b) Convert tabs to spaces	T, Transfer	(E) or (EA) only	>T␣TT←DT1␣SOURCE␣(EA))
c) Enable parity or checksum error to be detected	T, Transfer	(G) or (GA) only	>T␣DT1␣←DT2␣SOURCE␣(GA))

TABLE 6-5 File Transfer Operations (Cont'd)

IN ORDER TO	USE OPERATION:	AND OPTION(S):	IN THIS MANNER:
d) Initialize the directory of a mass storage device	T, Transfer	(N) or (NA) or (NB)	>T␣DT1␣DESTFL←DT2␣SOURCE␣␣(NA)↵
e) initialize or create a UFD for the current UIC	T, Transfer	(N) or (NA) or (NB)	>T␣DK␣DESTFL←DT1␣SOURCE␣␣(NA)↵
f) Combine two or more files into one file	T, Transfer	(W) or (WA) or (WB)	>T␣DK␣DESTFL←DT2␣A,B,C␣␣(WA)↵
g) Delete sequence numbers from card reader inputs	T, Transfer	(Q) or (QA) (QAC) (QAT)	>T␣DT1␣DESTFL␣␣(QA)←CD↵

TABLE 6-6 COPY Operations

IN ORDER TO	USE OPERATION:	AND OPTIONS:	IN THIS MANNER
1) Copy the contents of a specific device storage block	B, Block copy	None	>B␣DT1␣5Ø,51←DT2␣1Ø1,1Ø2)
2) Copy the contents of a specific series (i.e., range) of device storage blocks	B, Block copy	None	>B␣DT1␣5Ø-55←DT2␣1ØØ-1Ø5)
3) Copy the contents of one or more blocks and:			
a) initialize the directory of the destination device	B, Block copy	(N)	>B␣DT1␣5Ø-55(N)←␣DT2␣1ØØ-1Ø5)
b) initialize the directory and reserve a ↑QSAVE area equal to core size	B, Block copy	(S)	>B␣DT1␣5,6,7␣(S)←DT2␣5Ø,51,52)
c) initialize directory and specify size of ↑QSAVE area to be reserved	B, Block copy	(Snn)	>B␣DT1␣5,6,7␣(S32)←DT2␣5Ø,51,52)
4) Add (copy) the files on one device to those of a second device	C, Copy	None	>C␣DK←DT1)
5) Copy and add files from one device to another device and:			

TABLE 6-6 COPY Operations (Cont'd)

IN ORDER TO:	USE OPERATIONS:	AND OPTIONS:	IN THIS MANNER
a) initialize the directory of the destination device	C, Copy	(N)	>C␣DK␣␣(N)←DT1)
b) initialize the destination device directory and reserve a core-sized ↑QAREA	C, Copy	(S)	>C␣DT1␣␣(S)←DK)
c) initialize the directory and specify size of ↑QAREA	C, Copy	(Snn)	>C␣DT1␣␣(S32)←DK) (S) not permitted for disk
6) Copy entire contents of a device onto another device. The contents of the source device replace completely that of the destination device.	C, Copy	(H)	>C␣DT1␣␣(H)←DT2)
7) Copy a paper tape	T, Transfer	(I)	>T␣PP␣␣(I)←PR)

APPENDIX A

USE OF VT-15 GRAPHICS DISPLAY SYSTEM

PIP users may employ the VT-15 display unit as either a listing or a general purpose display device.

PROCEDURE

a) Before PIP is loaded, the command:

```
$VT␣ON)
```

must be issued to the monitor to set up the display system for use.

b) Once PIP is loaded, the user need only type CTRL X to activate the display function. For all practical purposes, the CTRL X (↑X) command causes the VT Display to take the place of the console printer unit. Command characters entered at the console keyboard are echoed both by the console printer and on the VT Display screen; all other information normally output to the printer (i.e., error messages, listings, etc.) is displayed on the VT display screen only.

c) To discontinue the VT Display function, the user must issue a second CTRL X command. This action returns the display/print function to the console printer. The display unit, however, remains on and continues to display the information contained before the second CTRL X command was issued.

d) To clear the VT-15 Display screen, the user must actuate the rightmost display control pushbutton (see CONTROLS) and enter a RETURN at the keyboard.

e) To turn the VT-15 Display off (i.e., deactivate the CTRL X feature) the user must return control to the monitor (CTRL C) and enter the command:

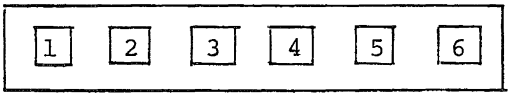
```
$VT␣OFF)
```

VT-15 CONTROLS AND DISPLAY MODES

CONTROLS

The VT-15 Display console contains a horizontal strip of six square push-to-light pushbuttons which are used in display operations. These pushbuttons are unmarked since their function is determined by software and may vary according to the particular program (system or user) which is in control of the system.

In PIP operations, only the two rightmost pushbuttons are needed; these switches are referred to as #'s 5 and 6, based on the following numbering scheme:



DISPLAY MODES

The VT-15 Display operates in two display modes:

a) SCROLL Mode - When the #5 pushbutton is in the ON (lit) position, the display is in the SCROLL mode. In this mode, when the display screen is full, the next line of data to be displayed causes the displayed material to "roll" upwards, line-by-line, with new data displayed at the bottom of the screen.

b) PAGE Mode - When the #5 pushbutton is in the OFF (unlit) position, the display is in the PAGE mode. In this mode, when the screen is full, the next entered material for display causes the complete, full-screen display (i.e., PAGE) to be erased; the new material is then displayed starting at the top line of the screen.

PAGING OPERATION

When a large file is to be displayed in the Page mode, the #6 control pushbutton is used to advance the display through the file page (screen) by page (screen). Each time this pushbutton is actuated, the screen is cleared and the next set of data available is displayed.

APPENDIX B

USE OF VP15A DISPLAY DEVICE

In PDP-15 systems which have a VP15A Storage Tube Display, the PIP user may use the display device as a listing device. The PIP user may list system and device directories and files in the following manner:

a) Listing Directories - System and device directories may be displayed on the VP15A by specifying the display's device mnemonic (VP) as the destination device in an L, List, command. For example, to cause the current UFD to be displayed in its most complete version, the user would issue the command:

```
>L␣VP←DK␣(P)↵
```

b) Listing Files - The contents of files may be displayed on the VP by specifying it as the destination device in a T, Transfer, command. For example, to display the file TEST1 ØØ1 on the VP, the user would issue the command:

```
>T␣VP←DK␣TEST1 ØØ1↵
```

DISPLAY CONTROLS

The VP15A display unit is provided with two pushbutton controls, ERASE and VIEW which are located on the right front panel of the CRT enclosure. These controls are used in the following manner:

a)	ERASE	When operated, it causes the current display to be erased from the display.
b)	VIEW	The normal brightness of displayed data fades after 90 seconds unless renewed; this control enables the user to renew (brighten) the display when desired.

WARNING

The same display should not be maintained on the CRT for a period exceeding 15 minutes; if this occurs, the phosphor of the display CRT may be damaged.

DISPLAY MODES

The VP15A CRT is capable of displaying fifty-six 72-character lines. If the data file to be displayed exceeds the 56-line display capacity, the display will operate in either a SCAN or PAGE mode depending on the type of handler installed in the system (VPA or VPA.S) for the VP15A[1].

SCAN Mode

When the VPA device handler is installed in the operating system, the VP15A display operates in a SCAN mode. In this mode, each time the display screen is filled it is erased, automatically, after the 56th list is written and is refilled from the display file. This fill-erase-rewrite cycle is continued until the screen is completely or partially filled and no more data is in the file to be displayed. The last display is not erased but remains and may be renewed (brightened) manually by the viewer when necessary.

PAGE Mode

When the VPA.S handler is installed in the operation system, the VP15A Display operates in a PAGE mode. In this mode the erase-rewrite operations of the display are controlled by the manual operation of the Accumulator zero switch (ACSØ). Each time the display is filled, the full screen (i.e., page) is not erased and rewritten with the next set of available display file data if the ACSØ switch is actuated. This feature permits the user to manually advance through a file page-by-page.

---

[1]The type of VP15A handler available in the operating system will be that selected by the System Manager during the configuration of the system.

APPENDIX C

DOS TERMS AND ACRONYMS

Terms unique to the PDP-15 DOS Software System which are used in the PIP manual are listed and described in the following table. The acronyms for each term are also given. Detailed descriptions of the items identified by the following terms are given in the DOS Software System Users Manual, DEC-15-ODUMA-B-D.

TERM	ACRONYM	DEFINITION
Bad Allocation Table	BAT	A device (disk) table which indicates, in storage blocks, any faulty disk areas in which data cannot be stored.
Master File Directory	MFD	A master device (disk) file directory which contains pointers to all user directories (UFD's) within a disk device.
Monitor Identification Code	MIC	The master system password which permits full access to all files within the system. This code identifies the system manager and should be used only by him.
Storage Allocation Table	SAT	The device (disk) table which stores busy, not-busy indicators for the disk storage area.
System Block	SYSBLK	The system table which contains the names, locations, and loading and starting parameters for all system programs within the operating system.
User File Directory	UFD	File directories for each user who establishes disk file storage areas within the system.
User File Directory Table	UFDT	The system directory table which maintains the relationship between the system's .DAT slots and each unique user identification code (UIC).
User Identification Code	UIC	A password entered by a user to uniquely define himself and any files which he may enter. If necessary, a user may enter more than one UIC to establish several unique sets of files. Since only one user may employ the system at any one time, the current UIC is the last logged-in UIC.

APPENDIX D

SYSTEM ERROR MESSAGES

The system Input/Output Programming System, loaders, and Object Time System error messages are output at the console printer as an identifying acronym plus a numeric error code (i.e., IOPS47). The acronyms used are:

a)	Input/Output Programming System	IOPS
b)	Loaders	.LOAD or .SYSLD
c)	Object Time System	.OTS

The numeric error codes and the meaning of each are as follows:

DOS-15 - .IOPS:

```
 0 ILL FUNCTION CAL - CAL ADDR
 1 CAL* ILL - CAL ADDR
 2 .DAT SLOT ERROR - CAL ADDR
 3 ILL INTERRUPT - I/O STATUS REGISTER
 4 DEV NOT READY  - TYPE AR WHEN READY *
 5 ILL .SETUP CAL - CAL ADDR
 6 ILL HANDLER FUNCTION - CAL ADDR *
 7 ILL DATA MODE - CAL ADDR *
10 FILE STILL ACTIVE - CAL ADDR **
11 SEEK/ENTER NOT EXECUTED - CAL ADDR *
12 UNRECOVERABLE DEVICE ERROR - STATUS REG B AND UNIT NO.
13 FILE NOT FOUND - CAL ADDR **
14 DIRECTORY FULL - CAL ADDR
15 DEVICE FULL - CAL ADDR **
16 OUTPUT BUFFER OVERFLOW - CAL ADDR
17 TOO MANY FILES FOR HANDLER - CAL ADDR *
20 DISK FAILURE (AR TO RETRY) - DISK STATUS,BLK #,DEVICE/UNIT #,CAL FUNC,UIC
21 ILL DISK ADDR - BLOCK NO,DEVICE/UNIT NO,CAL FUNCTION,UIC
22 TWO OUTPUT FILES ON ONE DECTAPE UNIT - CAL ADDR
23 ILL WORD PAIR COUNT - CAL ADDR **
25 NEGATIVE OR 0 CHARACTER COUNT (IOPS ASCII WRITE)
   X OR Y INCREMENT TOO LARGE (>2**14) (BINARY WRITE)
27 ILLEGAL WRITE TYPE
30 API SOFTWARE LEVEL ERROR - API STATUS REG
31 NON-EXISTENT MEMORY REF - PC
32 MEMORY PROTECT VIOLATION - PC
33 MEMORY PARITY ERROR - PC
34 POWER FAIL SKIP NOT SETUP - PC
37 LINE OVFLO - CAL ADDR
40 HEADER LABEL ERROR - CAL ADDR
41 DIRECTORY FORMAT ERROR - CAL ADDR
42 ACCESSIBILITY MAP OVFLO - CAL ADDR
43 DIRECTORY RECORDING ERROR - CAL ADDR
44 LOGICAL EOT FOUND - CAL ADDR
45 LONG INPUT RECORD - CAL ADDR
46 ATTEMPT TO DELETE SYSTEM FILE - CAL ADDR
47 ILL HORIZONTAL TAB - CAL ADDR
51 ILLEGAL USER FILE DIRECTORY - CAL ADDR **
```

```
55 NO BUFFERS AVAILABLE - CAL ADDR *
61 PARITY ERROR IN DIRECTORY OR FILE BIT MAP - CAL ADDR *
63 PROTECTED USER FILE DIRECTORY - CAL ADDR *
64 PROTECTED FILE - CAL ADDR **
65 UNRECOVERABLE MAGTAPE ERROR - MT STATUS
66 RELATIVE BLOCK IS 0 OR NOT WITHIN FILE SCOPE (.RTRAN) **
67 .RTRAN ARGUMENTS CAUSE DATA BLOCK OVERFLOW - CAL ADDR **
70 BUFFER SIZE TOO SMALL - CAL ADDR *
71 EMPTY UIC **
72 INPUT PARITY OR WRITE CHECK ERROR (^R TO RETRY)
    - CALADDR,BLOCK NO,DEVICE/UNIT NO,CAL FUNCTION,UIC
73 NULL FILE NAME GIVEN ON SEEK/ENTER/DLETE/FSTAT/RAND *
74 FILE STRUCTURE DEGRADATION - ATTEMPT TO CLEAR SUBMAP
   BIT THAT WAS ALREADY OFF **
75 FILE STRUCTURE DEGRADATION - ILLEGAL SUBMAP WORD1
76 FILE STRUCTURE DEGRADATION - ILLEGAL BACKWARD POINTER FOR FIRST
   MFD OR UFD BLOCK (^R TO RETRY)
77 ATTEMPTED USE OF NON-EXISTANT ^Q AREA
  *          DISK ONLY!


             CAL ADDR,DEVICE AND UNIT NO.,CAL FUNCTION,UIC
   **        DISK ONLY!
             CAL ADDR,DEVICE AND UNIT NO.,CAL FUNCTION,UIC,FILE NAME
LOADER ERRORS - .LOAD OR .SYSLD

  1 MEMORY OVERFLOW
  2 DATA ERROR
  3 SUBR NOT FOUND
  4 .DAT SLOT ASSIGNMENT ERROR
  5 PROG SEGMENT GREATER THAN 4K (PAGE MODE)
OBJECT TIME SYSTEM ERRORS - .OTS
  5 ILL REAL SQUARE ROOT ARG
  6 ILL DOUBLE SQUARE ROOT ARG
  7 ILL INDEX IN COMPUTED GOTO
 10 ILL I/O DEV #
 11 ILL INPUT DATA
 12 ILL FORMAT STATEMENT
 13 ILL REAL LOG ARG
 14 ILL DOUBLE LOG ARG
 15 ZERO RAISED TO ZERO OR NEGATIVE POWER
 16 ATAN2(0.0,0.0)
 17 DATAN2(0.000,0.000)
 21 UNDEFINED FILE
 22 ILLEGAL RECORD SIZE
 23 SIZE DISCREPANCY
 24 TOO MANY RECORDS OR ILLEGAL RECORD #
 25 MODE DISCREPANCY
 26 TOO MANY OPEN FILES
 30 SINGLE INTEGER OVERFLOW
 31 EXTENDED (DOUBLE) INTEGER OVERFLOW
 32 SINGLE FLT. OVERFLOW
 33 DOUBLE FLT. OVERFLOW
 34 SINGLE FLT. UNDERFLOW
 35 DOUBLE FLT. UNDERFLOW
 36 FLT. DIVIDE CHECK
 37 INTEGER DIVIDE CHECK
 40 ILLEGAL CHARACTER COUNT
 41 ARRAY EXCEEDED
 42 BAD INPUT DATA
 50 FPP MEMORY PROTECT/NON-EXISTANT MEMORY VIOLATION
 51 ILLEGAL I/O DIRECTION CHANGE TO DISK
```

The Error messages from tasks running under PIREX have the following format:

```
                          EST
                          ESD
          IOPSUC          RKU       XXXX
                          DTU
                          LPU
                          CDU
                          PLU
                          ESP
                          EMA
```

where	EST	denotes	ST	(Stop all I/O)	task
	ESD	-	SD	(Software Driver)	-
	RKU	-	RK	(Disk Cartridge)	-
	DTU	-	DT	(DECtape)	-
	LPU	-	LP	(Line Printer)	-
	CDU	-	CD	(Card Reader)	-
	PLU	-	PL	(Plotter)	-
	ESP	-	SP	(Spooler)	-
	EMA	-	MA	(MAC 11)	-

XXXX denotes a 4-digit error code.
The low order 2 digits are the task error codes while the high order 2 digits are the spooler task error codes (only for LP, CD and PL tasks).

The following are the error codes for all the currently implemented tasks:

LP	4	Not Ready
CD	3	Illegal Interrupt to Driver
	4	Not Ready
	12	Device Failure
	45	Greater than 8Ø columns
	72	Illegal punch combinations
	74	Timing error, card column lost
	75	Hardware busy, driver not
	76	Hardware error between cards
PL	4	Not ready
SP	4	Spooler empty
	15	Spooler full
	77	Task not supported

INDEX

Acronyms, C-1
Adding files, 3-40
Angle brackets (<>), 2-6
ASCII (A) switch, 2-11

Back arrow (←) delimiter, 2-6
Bank mode, 4-1
B: block copy, 3-36
Binary (B) switch, 2-11

↑C, 1-2
Card file modification, 3-25
Card input, 3-25
C: copy mass storage, 3-39
Characters, keyboard command, 1-3
Characters, maximum number in
  command string, 2-1
Checksum error correction, 3-20
Colon (:) used as delimiter, 2-6
Commands,
  destination source, 2-3, 2-4
  error correction, 5-7
  single device, 5-7
Command string, 2-1
  delimiters, 2-6
  errors, 5-1
Command types, 2-2
Commas used in file transfer
  commands, 3-13
Comma used as delimiter, 2-6
Continuation lines, 2-1
Copy operations, 6-14
Create/initialize current UFD, 3-1
CTRL C, 1-2
CTRL D, 3-18
CTRL P, 1-2
CTRL Q area, 3-5
(C) switch, space to tab
  conversion, 3-21, 3-22
  with card files, 3-26

↑D, 3-18
Dash (-) used as delimiter, 2-6
Data mode indicators, 2-12
Data mode specification, 2-11,
  2-12, 3-14
Data mode switches, 2-13, 3-14
D command, MIC, 4-2
D: delete file, 3-31
(D) Dump mode switch, 2-12
DECtape directories initialization,
  3-4
DECtape file deletion, 3-34
DECtape initialization, 3-5
Definitions of DOS terms, C-1

Deletion of
  DECtape files, 3-34
  files from UFD's, 3-32
  truncated files, 3-34
  UFD's, 3-3
Delimiters for command strings, 2-6
Destination-source commands, 2-2
  format, 2-4, 6-4
Device mnemonics, 2-7
Devices, I/O and storage, 2-7
Directory operations, 6-6
Directory protection codes,
  2-13, 3-36
Directory setup operation, 3-1
Dump operations, 3-5

Error messages
  PIP, 5-3 through 5-6
  system, D-1
  UC15 system, D-3
Errors
  operational, 5-2
  recovery from, 5-7
  user command string, 5-1
(E) switch, tab to space
  conversion, 3-21
Extensions to filenames, 2-13

File combination during transfer,
  3-23
File modification operations, 6-10
File names, 2-3
  extensions, 2-13, 3-14
File protection codes, 2-14, 3-14
  setting, 3-36
Files, truncated, 3-32
File transfer, 3-12, 6-10
  between structured devices, 3-13
  device to device, 3-17
  keyboard to output devices, 3-18
  to disk, 3-15
  UFD to UFD, 3-16
  with optional functions, 3-20
Functions of MIC, 4-1
Functions, optional, 2-9, 2-10
Function switches, 3-20

Graphics display
  VP15A, B-1
  VT-15, A-1
(G) switch: Parity/checksum error
  correction, 3-20

(H) switch - Image Binary, 2-12
  in C command, 3-39

I command, MIC, 4-1
Image Alphanumeric (I) switch, 2-12
Image Binary (H) switch, 2-12
(I) switch - Image Alphanumeric, 2-12
Initialization, 3-1
  of DECtape, 3-5
  of DECtape directories, 3-4
Input/output devices, 2-7
IOPS, D-1

Keyboard command characters, 1-3
Keyboard inputs to output devices, 3-18
L, Directory List operations, 3-5, 6-8
  DECtape directories, 3-10
  MFD, 3-7
  Monitor SYSBLK, 3-8
  selected file, 3-10
  UFD, 3-6, 3-9
Loaders, D-1
(L) switch with L command, 3-6,3-8

MFD, 3-7
MIC operations, 4-1
Mnemonics, device, 2-7
Modification operations, 6-10
Monitor SYSBLK, 3-8
(M) switch with L command, 3-6, 3-7
Multi-file transfers, 3-13

N command, New directory, 3-1, 4-1
  format, 3-3
(N) switch
  in B command, 3-38
  in C command, 3-39, 3-41

Object Time System (.OTS), D-1
Operational errors, 5-2
Optional functions, 2-9, 2-10
Options versus primary operations, 6-3
Option switches, 2-3

↑P, 1-2
Page mode, 4-1, B-2
Paper tape input, 3-25
Parentheses ( ) used as delimiter, 2-6
Parity, 3-20
PIREX, D-3
Primary operations, 2-7, 2-8, 6-3
Protection codes, 2-13, 2-14, 3-2, 3-3
(P) switch with L command,3-6, 3-9

↑QAREA, 3-5
(Q) switch with card files, 3-25,3-26

Recovery from errors, 5-7
Renaming files, 3-35
R: file rename, 3-34
Right angle bracket (>), 1-2

Scan mode, B-2
S command (segment file), 3-28
Segmentation, source file to multiple paper tape, 3-31
Selected file listing, 3-10
Semicolon (;) as delimiter, 2-6
Single device commands, 2-3
  format, 2-5, 6-5
Single file transfers, 3-13
Size of QAREA, 3-5
Source commands, 2-2
Space to tab conversion, 3-21, 3-22
Space used as delimiter, 2-6
(S) switch, 3-5
  in B command, 3-38
  in C command, 3-39, 3-41
Startup procedure, 1-2
Storage devices, 2-7
Switches, 2-3, 2-11, 2-13
  in List operations, 3-6
SYSBLK listing, 3-8
.SYSLD, D-1
System device file protection codes, 3-14
System manager (MIC), 3-1

Tab to space conversion, 3-21
T command, Transfer files, 3-12 through 3-19
  in file segmentation, 3-29
Terms, DOS, C-1
Transfer operations, 6-12
Truncated files, 3-32, 3-34
(T) switch with card files, 3-26

UFD, 2-11, 3-6 through 3-9
  deletion, 3-3
  protection codes, 2-13, 3-2, 3-3
  UFD to UFD transfers, 3-16
UIC, 2-11
User directories, 2-13
U: Update Storage Allocations Tables, 3-42

VP15A Storage Tube display, B-1
VT-15 Graphics display, A-1
V: Verify operation, 3-26

(W) option, paper tape input and combination, 3-25
(W) switch, combining files, 3-23

(X) switch in delete command, 3-32, 3-34

HOW TO OBTAIN SOFTWARE INFORMATION

SOFTWARE NEWSLETTERS, MAILING LIST

The Software Communications Group, located at corporate headquarters in Maynard, publishes newsletters and Software Performance Summaries (SPS) for the various Digital products. Newsletters are published monthly, and contain announcements of new and revised software, programming notes, software problems and solutions, and documentation corrections. Software Performance Summaries are a collection of existing problems and solutions for a given software system, and are published periodically. For information on the distribution of these documents and how to get on the software newsletter mailing list, write to:

Software Communications
P. O. Box F
Maynard, Massachusetts 01754

SOFTWARE PROBLEMS

Questions or problems relating to Digital's software should be reported to a Software Support Specialist. A specialist is located in each Digital Sales Office in the United States. In Europe, software problem reporting centers are in the following cities.

Reading, England	Milan, Italy
Paris, France	Solna, Sweden
The Hague, Holland	Geneva, Switzerland
Tel Aviv, Israel	Munich, West Germany

Software Problem Report (SPR) forms are available from the specialists or from the Software Distribution Centers cited below.

PROGRAMS AND MANUALS

Software and manuals should be ordered by title and order number. In the United States, send orders to the nearest distribution center.

Digital Equipment Corporation
Software Distribution Center
146 Main Street
Maynard, Massachusetts 01754

Digital Equipment Corporation
Software Distribution Center
1400 Terra Bella
Mountain View, California 94043

Outside of the United States, orders should be directed to the nearest Digital Field Sales Office or representative.

USERS SOCIETY

DECUS, Digital Equipment Computer Users Society, maintains a user exchange center for user-written programs and technical application information. A catalog of existing programs is available. The society publishes a periodical, DECUSCOPE, and holds technical seminars in the United States, Canada, Europe, and Australia. For information on the society and membership application forms, write to:

DECUS
Digital Equipment Corporation
146 Main Street
Maynard, Massachusetts 01754

DECUS
Digital Equipment, S.A.
P.O. Box 340
1211 Geneva 26
Switzerland

PIP, DOS Monitor
Utility Program
DEC-15-UPIPA-A-D

READER'S COMMENTS

Digital Equipment Corporation maintains a continuous effort to improve the quality and usefulness of its publications. To do this effectively we need user feedback--your critical evaluation of this document.

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

_____

_____

_____

_____

_____

How can this document be improved?

_____

_____

_____

_____

_____

How does this document compare with other technical documents you have read?

_____

_____

_____

_____

_____

Job Title_____Date:_____

Name:_____Organization:_____

Street:_____Department:_____

City:_____State:_____Zip or Country_____

---------- Fold Here ----------

---------- Do Not Tear - Fold Here and Staple ----------

FIRST CLASS
PERMIT NO. 33
MAYNARD, MASS.

BUSINESS REPLY MAIL
NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

Postage will be paid by:

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

printed in U.S.A.