

PIP XVM UTILITY MANUAL

DEC-XV-UPPUA-A-D



XVM
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PIP XVM UTILITY MANUAL

DEC-XV-UPPUA-A-D

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LIST OF ALL XVM MANUALS

The following is a list of all XVM manuals and their DEC numbers, including the latest version available. Within this manual, other XVM manuals are referenced by title only. Refer to this list for the DEC numbers of these referenced manuals.

| | |
|---|------------------|
| BOSS XVM USER'S MANUAL | DEC-XV-OBUAA-A-D |
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| DDT XVM UTILITY MANUAL | DEC-XV-UDDTA-A-D |
| EDIT/EDITVP/EDITVT XVM UTILITY MANUAL | DEC-XV-UETUA-A-D |
| 8TRAN XVM UTILITY MANUAL | DEC-XV-UTRNA-A-D |
| FOCAL XVM LANGUAGE MANUAL | DEC-XV-LFLGA-A-D |
| FORTRAN IV XVM LANGUAGE MANUAL | DEC-XV-LF4MA-A-D |
| FORTRAN IV XVM OPERATING ENVIRONMENT MANUAL | DEC-XV-LF4EA-A-D |
| LINKING LOADER XVM UTILITY MANUAL | DEC-XV-ULLUA-A-D |
| MAC11 XVM ASSEMBLER LANGUAGE MANUAL | DEC-XV-LMLAA-A-D |
| MACRO XVM ASSEMBLER LANGUAGE MANUAL | DEC-XV-LMALA-A-D |
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| VT15 XVM GRAPHICS SOFTWARE MANUAL | DEC-XV-GVTAA-A-D |
| XVM/DOS KEYBOARD COMMAND GUIDE | DEC-XV-ODKBA-A-D |
| XVM/DOS READER'S GUIDE AND MASTER INDEX | DEC-XV-ODGIA-A-D |
| XVM/DOS SYSTEM MANUAL | DEC-XV-ODSAA-A-D |
| XVM/DOS USERS MANUAL | DEC-XV-ODMAA-A-D |
| XVM/DOS V1A SYSTEM INSTALLATION GUIDE | DEC-XV-ODSIA-A-D |
| XVM/RSX SYSTEM MANUAL | DEC-XV-IRSMA-A-D |
| XVM UNICHANNEL SOFTWARE MANUAL | DEC-XV-XUSMA-A-D |

PREFACE

This manual describes and illustrates the features provided by the XVM Utility program PIP. This utility program operates only within the XVM Disk Operating System (XVM/DOS) monitor environment.

In the preparation of this manual it was assumed that the reader is familiar with the contents of the XVM/DOS USERS MANUAL and with the general operating procedures for the XVM equipment.

CHAPTER 1 INTRODUCTION

1.1 PIP PROGRAM

The PIP XVM (PIP) Utility Program 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 XVM I/O and mass storage devices; limitations and differences in operation are indicated where applicable. There are specific operations on magtape which PIP does not perform, such as create and list a file directory. Users of magtape should also read the MTDUMP XVM Utility Manual to learn how to perform these special functions using the MTDUMP XVM Utility Program.

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 XVM/DOS monitor as described in the XVM/DOS Users Manual

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

Introduction

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

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

1.3 WRITING CONVENTIONS

Table 1-1 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  
PIP JVM Vxxnnn  
>
```

followed by a right angle (>) "ready" symbol.

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 monitor.

Introduction

Table 1-1
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-directoried 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 or UNDER BAR | ← or <u>or</u> | 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. |

CHAPTER 2

COMMAND STRING FORMATS AND BASIC OPERATIONS

This Chapter 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 and 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:

| <u>Item</u> | <u>How Specified</u> |
|---|--|
| 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 XVM/DOS User's Manual 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). |

Command String Formats and Basic Operations

| <u>Item</u> | <u>How Specified</u> |
|--|--|
| 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. |
| 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)
```

Command String Formats and Basic Operations

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, filenames and option switches may also be added to the command string. For example, the command:

`>D_DT1_FILEA_SRC)`

Command String Formats and Basic Operations

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

Command String Formats and Basic Operations

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.

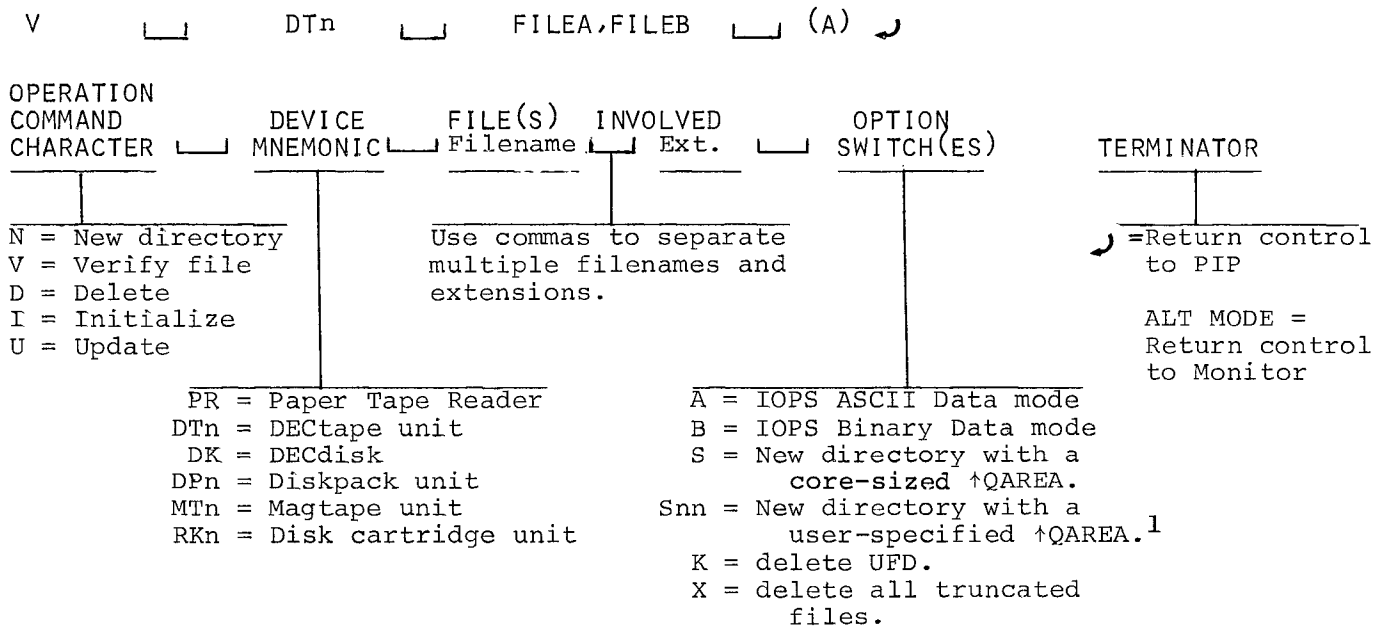


Figure 2-2
PIP Single Device Commands, General Format

¹ DEctape only

Command String Formats and Basic Operations

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

| <u>Use Delimiter:</u> | <u>To</u> | <u>In This Manner:</u> |
|-----------------------|--|-------------------------|
| _ (space) | Separate major command string elements | T _DK _FILE... |
| ← (back arrow) | Separate destination and source sections of a command string | dest. ← source |
| — (underbar) | | 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) |
| ; (semi-colon) | Separate filename and filename extension or data mode option | DT1:FILEA,FILEB;SRC |
| <> (angle brackets) | Identify non-current UFD's | <JOE> |
| () (parentheses) | Identify option switches or specified protection codes | (A) |
| - (dash) | Separator to indicate a range of numbers | 100-150 |

Command String Formats and Basic Operations

2.3.2 Standard XVM/DOS I/O and Storage Devices

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

Table 2-2
PIP Command Device Mnemonics

| <u>Peripheral Device</u> | <u>Required Mnemonic</u> |
|--------------------------|--------------------------|
| 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 |
| Graphics Display | VT |
| XY11/XY311 Plotters | XY |
| Printer/Plotter | LV |

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).

Command String Formats and Basic Operations

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

Table 2-3
PIP Primary Operations, Summary

| The Primary | is identified | and performs the |
|--------------------|--------------------------|--|
| | by the | |
| <u>OPERATION</u> | <u>COMMAND CHARACTER</u> | <u>FUNCTION</u> |
| 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 | 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. |

Command String Formats and Basic Operations

2.3.4 Optional Functions

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

The optional functions are 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 operations. 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

| <u>OPTION</u> | <u>COMMAND CHARACTER</u> | <u>FUNCTION</u> |
|--|------------------------------|--|
| IOPS ASCII Data Mode | (A) | |
| IOPS Binary | (B) | |
| Image Alphanumeric Dump | (I) (D) | Specifies the type of data (i.e., format) handled by the primary PIP operation. |
| 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 pri- mary operation to be contracted to a TAB. |

Command String Formats and Basic Operations

Table 2-4 (Cont)
PIP Optional Functions

| <u>OPTION</u> | <u>COMMAND CHARACTER</u> | <u>FUNCTION</u> |
|----------------------------------|------------------------------|---|
| 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 | (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. |
| Vertical Forms Control | (V) | Translates standard FORTRAN IV vertical form control characters to those that can be interpreted by the line printer handler. |
| File Protection Codes | (N) | Specifies a protection code if a code other than the default is desired for the output files. |

2.3.5 Specifying UFD's

Whenever a user logs in to the XVM/DOS Monitor prior to calling PIP, he specifies a user identification code, e.g.,

\$LOGIN RPK

This code (in this example, RPK) is taken to be the name of the UFD (User File Directory) used in operation to and from disk whenever a UFD is not specified in a command. It is called the default or current UFD.

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><DT1 _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 Modes¹

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.

¹Refer to the XVM/DOS Users Manual for detailed descriptions of data modes.

Command String Formats and Basic Operations

- 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 .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 | | | ✓ | | |
| | Numeric | ✓ | | | | |
| OPTION SWITCHES | (A) | ✓ | | | | |
| | (B) | | ✓ | | | |
| | (D) | | | ✓ | | |
| | (I) | | | | ✓ | |
| | (H) | | | | | ✓ |
| | | | | | | |

Files that contain more than one data mode per file cannot be manipulated using PIP. The XY11 plotter handler, XYA., accepts consecutive write commands in a combination of both IOPS ASCII and IOPS BINARY modes. Further, a user program could create a mixed-mode file on a mass storage device.

Command String Formats and Basic Operations

DATA MODE SWITCHES VS. FILENAME EXTENSIONS

From Table 2-5 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)) |

Files with extensions used by PIP to determine data modes must not actually be of another mode. PIP will refuse to transfer the file if the data mode derived from the command string does not match that in the first header word of the file. For example, FILE1 BIN should be a file written in IOPS binary mode (0 in bits 14-17 of the first header word). It should not have been written, for example, in IOPS ASCII (2 in bits 14-17) and then had its extension changed to BIN.

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

| | | |
|---|--------------|---|
| 0 | 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.

Command String Formats and Basic Operations

Files may be assigned any of the following protection codes:

FILE PROTECTION CODES

| <u>CODE</u> | <u>PERMITTED OPERATIONS</u> | | <u>PROTECTION GIVEN</u> |
|---------------|-----------------------------------|--------------|-------------------------|
| | <u>READ</u> | <u>WRITE</u> | |
| 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).

¹The 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).

CHAPTER 3

PIP OPERATIONS, DETAILED DESCRIPTIONS AND EXAMPLES OF USE

3.1 INTRODUCTION

This Chapter 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 Chapter 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.

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.

¹Utility program MTDUMP must be used to initialize directories on Mag-tape units (NTn). Refer to the MTDUMP XVN Utility Manual for a description of MTDUMP and its use.

PIP Operations, Detailed Descriptions and Examples of Use

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

3.2.1 Create/Initialize Current UFD

The command:

```
>N _DK )
```

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:

```
24-NOV-75
DIRECTORY LISTING (GEP)
1147 FREE BLKS
  0 USER FILES
  0 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 0 (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

PIP Operations, Detailed Descriptions and Examples of Use

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)
```

PIP Operations, Detailed Descriptions and Examples of Use

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

The R command, Section 3.9.3 should be used 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 0) 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:

| | | | | |
|-----------------------|-------|---------------------|--|----------------------------------|
| 24-NOV-75 | | | | 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:

Pip Operations, Detailed Descriptions and Examples of Use

24-NOV-75
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 as performed by the QDMP XVM utility program. 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 (S24)

causes a QAREA, 24K 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), (LV)
 - 3) paper tape punch (PP)
 - 4) optional CRT display devices (refer to Appendices A and B)
 - 5) XY plotter
- b) the source device may be any directoried mass storage device within the system (i.e., DK, RKn, DTn, DPn). The exceptions are magtape directories which cannot be listed with PIP; MTDUMP must be used.

PIP Operations, Detailed Descriptions and Examples of Use

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 Sections 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
```

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

| | | |
|-------------------|-------------|---|
| 24-NOV-75 | _____ | CURRENT DATE |
| DIRECTORY LISTING | (GEP) _____ | DIRECTORY IDENTIFICATION CODE (UIC) |
| 1131 FREE BLKS | _____ | NUMBER OF FREE BLOCKS ON THE DEVICE |
| 3 USER FILES | _____ | NUMBER OF USER FILES CONTAINED BY THE UFD |
| 6 USER BLKS | _____ | NUMBER OF DEVICE BLOCKS OCCUPIED BY |
| PART A SRC | 1 24-NOV-75 | THE UFD FILES |
| PART B SRC | 2 24-NOV-75 | DIRECTORY USER FILE ENTRIES |
| PART C SRC | 3 24-NOV-75 | |

_____ DATE USER FILE WAS ENTERED INTO UFD

_____ NUMBER OF DEVICE BLOCKS OCCUPIED BY FILE

_____ FILE FILENAME AND EXTENSION

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".

PIP Operations, Detailed Descriptions and Examples of Use

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:

| | | | | |
|---|---------|---|-----|---|
| 24-MCV-75 | | | | CURRENT DATE |
| MFD DIRECTORY LISTING | | | | |
| 1147 FREE BLKS | | | | NUMBER OF FREE BLOCKS ON THE DEVICE |
| 52 USER FILES | | | | NUMBER OF USER FILES ON THE DEVICE |
| 1616 USER BLKS | | | | NUMBER OF DEVICE BLOCKS OCCUPIED BY USER |
| TUK | 1003(0) | 6 | 114 | FILES |
| PIP | 2532(0) | 1 | 76 | USER FILE DIRECTORIES |
| | | | | NUMBER OF DEVICE BLOCKS OCCUPIED BY SPECIFIED UFD FILES |
| | | | | NUMBER OF FILES CONTAINED BY THE SPECIFIED UFD |
| | | | | FILE PROTECTION CODE |
| | | | | NUMBER OF FIRST DEVICE BLOCK OCCUPIED BY UFD |
| UFD IDENTIFIER (UIC under which it was created) | | | | |

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:

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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 |
| STRAN | 615 | 11 | 13607 | 4030 | 13671 |
| 89TRAN | 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 first device block occupied by program

Number of blocks allotted to program

First core address occupied when program is loaded

Program size, number of word locations

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 RIB¹ Pointers

The optional switch (P) added to an L command causes file protection code, file starting block number, and RIB data to be added to each

¹ Retrieval Information Block, contains pointers to the non-contiguous file storage blocks (refer to the XVM/DOS Users Manual, for a complete description of this table).

PIP Operations, Detailed Descriptions and Examples of Use

file entry contained by the UFD. For example, assuming the UIC "JAN" to be current, the command:

```
>L LP+DK
```

produces the following printout:

| | | |
|-------------------|-------------------|-----------------------------------|
| 24-NOV-75 | _____ | 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 24-NOV-75 _____ | 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.

| | | | | |
|-------------------|---------|-------------|------|---|
| 24-NOV-75 | | | | |
| DIRECTORY LISTING | (JAN) | | | |
| 1125 FREE BLKS | | | | |
| 1 USER FILES | | | | |
| 2 USER BLKS | | | | |
| CRDFL BIN | 2553(2) | 2 24-NOV-75 | 2552 | 0 |

POINTER TO THE FIRST RIB WORD IN BLOCK

POINTER TO DEVICE BLOCK CONTAINING FILE RIB TABLE

CURRENT FILE PROTECTION CODE

FIRST BLOCK OF FILE

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:

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```

24-NOV-75          CURRENT DATE
DIIRECTORY LISTING
1062 FREE BLKS      NUMBER OF FREE BLOCKS ON DECTAPE
6 USER FILES        NUMBER OF USER FILES ON DECTAPE
10 SYSTEM BLKS      NUMBER OF DECTAPE BLOCKS OCCUPIED
                     BY DIRECTORY AND FILE MAPS (also
                     by Monitor if a system DECTape)
NUFIL SPC           1 1 }
FILEA SPC           2 1 }  DIRECTORY FILE ENTRIES
FILEB SRC           3 1 }
FILEC SPC           4 1 }
TEST1 SPC           5 1 }
TEST2 SPC           6 1 }

```

Diagram labels with arrows pointing to the output fields:

- FILENAME AND EXTENSION (points to the first column of file names)
- FIRST BLOCK OCCUPIED BY FILE (points to the second column of block numbers)
- NUMBER OF BLOCKS OCCUPIED BY FILE (points to the third column of block counts)

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 ADSS 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 filename and extension to the L command. For example, assuming the following UFD to be current:

```

24-NOV-75
DIIRECTORY LISTING (GEP)
1131 FREE BLKS
5 USER FILES
15 USER BLKS
PARTA SRC           1 24-NOV-75
PARTB SRC           1 24-NOV-75
PARTC SRC           1 24-NOV-75
CRDFL BIN           2 24-NOV-75
TEST1 001          10 24-NOV-75

```

Diagram labels with arrows pointing to the output fields:

- DIRECTORY HEADER (points to the first three lines of the listing)
- FILE ENTRY LIST (points to the list of file entries)

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the command:

```
>L LP TEST1 001+DK
```

produces the following line printer listing:

```
24-NOV-75
DIRECTORY LISTING (GEP)
1131 FREE BLKS
5 USER FILES
15 USER BLKS
TEST1 001 10 24-NOV-75
```

} NOTE THAT THE HEADER REMAINS UNCHANGED

DIRECTORY ENTRY OF SELECTED FILE

All files within a directory which have a common filename 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:

```
24-NOV-75
DIRECTORY LISTING (GEP)
1131 FREE BLKS
5 USER FILES
15 USER BLKS
PARTA SRC 1 24-NOV-75
PARTB SRC 1 24-NOV-75
PARTC SRC 1 24-NOV-75
```

} NOTE THAT THE INFORMATION CONTAINED BY THE DIRECTORY HEADER IS UNCHANGED

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

PIP Operations, Detailed Descriptions and Examples of Use

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_001_(P)←DK)
```

produces the following line printer listing:

| | | | | | |
|-------------------------|----|-----------|------|----|-------------------------------------|
| 24-NOV-75 | | | | | NOTE THE ADDITION OF THE FILE FIRST |
| DIRECTORY LISTING (GEP) | | | | | BLOCK NUMBER, PROTECTION CODE, |
| 1131 FREE BLKS | | | | | POINTER TO THE FILE'S RIB AND FIRST |
| 5 USER FILES | | | | | RIB BLOCK. |
| 15 USER BLKS | | | | | |
| TEST1 001 2542(2) | 10 | 24-NOV-75 | 2551 | 10 | |

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:

$$\begin{array}{ccccccc}
 & \text{dest.} & & \text{dest.} & & \text{ext.} & \leftarrow \text{source} \\
 & \text{device;} & & \text{file name} & & & \text{device} \\
 & \text{mnemonic} & & & & & \text{filename} \\
 & & & & & & \text{ext}
 \end{array}$$

For example:

```
>T_DK_DESTFL_BIN<DT1_SOURCE_BIN )
```

PIP Operations, Detailed Descriptions and Examples of Use

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

- a. During transfers between directoried 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, both with the extension SRC. Although an extension ending in a numeric (001, for example) will automatically imply IOPS ASCII, it cannot be used as a common extension for all files in the series by specifying it only once. For example:

```
>T┐DK┐TESTA,TESTB┐DT1┐FILEA,FILEB┐001┐)
```

transfers FILEA SRC to the disk as TESTA SRC and FILEB 001 as TESTB SRC.

- 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 Section 2.3.6. 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 2.3.7.

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

24-NOV-75
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:

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```
>T␣DK←DT1␣SEGA (A)␣  
>T␣DK←DT1␣SEGB (A1)␣  
>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:

```
24-NOV-75  
DIRECTORY LISTING (JAN)  
2260 FREE BLKS  
2 USER FILES  
2 USER BLKS  
SEGA SRC 1313(2) 1 24-NOV-75 1313 56  
SEGB SRC 1312(1) 1 24-NOV-75 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 | <i>transfer file, keep same name and accept system default file protection code.</i> |
| (B) >T DK←DT1 TEST2 002 (1) | <i>transfer file, keep same name but specify desired file protection code.</i> |

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

```
24-NOV-75
DIRECTORY LISTING (GEP)
5717 FREE BLKS
3 USER FILES
33 USER BLKS
TEST1 001 1605(2) 10 24-NOV-75 1650 10
TEST2 002 1652(1) 13 24-NOV-75 1676 66
DESTFL SRC 1700(1) 10 24-NOV-75 1716 10
```

Filename extension Protection code

3.4.4 UFD to UFD File Transfers

Files may be read from:

- a) unprotected UFD's (code 0);

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> FILEEA(B)
```

- c) the current UFD and written into another, unprotected (code 0) 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> OLDFILL(A)
```

NOTE

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

Files may be written into:

- a) unprotected UFD's (code 0);

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)
```

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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:

```
      24-NOV-75
    DIRECTORY LISTING (GEP)
      1500 FREE BLKS
        3 USER FILES
        24 USER BLKS
TEST1  001    5214(2)    10  24-NOV-75    5232    10
TEST2  002    5234(2)    13  24-NOV-75    5257    66
CONTS  SRC    5261(2)     1  24-NOV-75    5212     0
```

The command:

```
XT DK COUNTS SRC+DK CONTS (1)
```

creates a new file "COUNTS SRC" from file "CONTS SRC", giving the new file a protection code of 1.

The operation performed results in the following UFD:

```
      24-NOV-75
    DIRECTORY LISTING (GEP)
      1476 FREE BLKS
        4 USER FILES
        25 USER BLKS
TEST1  001    5214(2)    10  24-NOV-75    5232    10
TEST2  002    5234(2)    13  24-NOV-75    5257    66
CONTS  SRC    5261(2)     1  24-NOV-75    5212     0
COUNTS SRC  5265(1)     1  24-NOV-75    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:

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- a) DECTape 2 to DECTape 1 transfer:

```
>T┐DT1┐NEWFIL┐DT2┐OLDFIL┐(A)┐
```

- b) Papertape Reader to DECTape 1 transfer:

```
>T┐DT1┐NEWFIL┐SRC (A) + PR ┐  
                  (I)
```

NOTE

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

- 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 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):

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>T DK KEYBD←TT (A)

*Keyboard-to-Disk
Transfer 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*

Note the change in the .TITLE line as
compared with the previous example
where rubouts were used.

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3.5 FILE TRANSFERS WITH OPTIONAL FUNCTIONS

As stated in Section 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 | 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 Sections 3.5.1 through 3.5.8.

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 interrupts the transfer and outputs on the console printer the message:

PARITY ERR

or

CKSUM ERR

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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. Such errors detected during a Transfer without the (G) switch cannot be corrected.

However, 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:

| | |
|------------------------|---------------------------------------|
| >T DK PARITY (AG)←PR | COMMAND; input contents of paper |
| PARITY ERROR | tape to file PARITY of current UFD |
| BEGIN INIT 1,1 BEGIN | and perform parity check with (G) |
| > | functions. |
| PARITY ERROR | ERROR MESSAGE |
| . ENTER ,FILNAM | LINE IN ERROR - user enters a RETURN |
| > | to accept line as is. |
| . ENTER 1,FILNAM | SECOND ERROR MESSAGE |
| PARITY ERROR | LINE IN ERROR |
| TAG .WRITE 1,2,@UF,34 | user enters new line with correction. |
| >TAG .WRITE 1,2,BUF,34 | THIRD ERROR MESSAGE |
| | user enters new line with correction. |

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.

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- a) (E) Switch - the addition of switch (E) to a "T" command string causes all Horizontal 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+DTL 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 Horizontal 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. The file itself is, however, shorter as the spaces have been corrected to tabs, and output should be faster depending on the output device.

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 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+DTL 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.

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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 001 to be present in the current UFD, the command:

```
>T _DK_<XYZ>+DK_ TEST1_001_(N)
```

sets up a new UFD under the UIC "XYZ" and transfers the file TEST1 001 into the new UFD as its first entry as follows:

```
24-NOV-75
DIRECTORY LISTING (XYZ)
1465 FREE BLKS
1 USER FILES
10 USER BLKS
TEST1 001 10 24-NOV-75
```

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

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)
```

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results in the binary files TEST1, TEST2, and TEST3 being written into the file COMST 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:

```
24-NOV-75
DIRECTOPY LISTING (GEP)
  6163 FREE BLKS
    2 USER FILES
    2 USER BLKS
SEGA  SPC          1  24-NOV-75
SEGB  SRC          1  24-NOV-75
```

LISTING OF CURRENT UFD

>T DK EXAMP SRC (AW)←DK SEGA SPC,SEGB SRC *COMBINE FILES COMMAND*

```
24-NOV-75
DIRECTOPY LISTING (GEP)
  6162 FREE BLKS
    3 USER FILES
    3 USER BLKS
SEGA  SPC          1  24-NOV-75
SEGB  SRC          1  24-NOV-75
EXAMP SPC          1  24-NOV-75
```

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

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

LISTING OF FILE "SEGA"

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

LISTING OF FILE "SEGB"

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| | | | |
|-------|-------------------|---|-----------------------------|
| | .TITLE EXAMP | } | LISTING OF NEW FILE "EXAMP" |
| | .IODEV 1,2 | | |
| BEGIN | .INIT 1,1,BEGIN | | |
| | .ENTEP 1,FILNAM | | |
| TAG | .WRITE 1,2,BUF,34 | | |
| | .EOT | | |

In the new file, EXAMP, the .EDT which was at the end of file SEGA has been omitted.

3.5.5 Inputting and Combining Files from Paper Tape: (W) Switch

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: (Q), (C), (T) Switches

The transfer operation may be used to input source 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 the (Q) switch to further modify the contents of files being input or transferred. The following is an example of a T command string:

T DT1 FILEA+DT2 SOURCE (AQT)

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.

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3.5.8 (V) Switch: Vertical Forms Control on Output

The (V) options switch may be added to transfer commands to translate the first character of each record to a special character which, when interpreted by the line printer (LP) handler, the terminal handler (TT) or by the VPl5A handler (VP) will produce forms control functions. The translation will occur according to the FORTRAN conventions shown below:

| <u>Character Found</u> | <u>Translated To</u> | <u>Meaning to LP Handler</u> |
|------------------------|----------------------|------------------------------|
| '1' | FF, 14 ₈ | Ship to top of form |
| '+' | DLE, 20 ₈ | Overprint |
| '0' | DCl, 21 ₈ | Double space |
| anything else | LF, 12 ₈ | Single space |

If, for example, a FORTRAN program writes a listing file to disk rather than to the line printer (which might be temporarily out of service), the file may be transferred at a later time to the printer as follows:

```
→T LP+DK .TMØØ OTS(AV)↵
```

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:

- the V operation control character;
- the mnemonic of the device containing the file to be examined;
- the filename and extension of the file being checked;
- 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. A 3-character extension where the last character is numeric also defaults (A). Note that in multiple file verifications, all files must be of the same data mode (i.e., all IOPS ASCII or all IOPS Binary).

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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 an IOPS 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 W0
PARITY ERROR
      JMP TE
PARITY ERROR
@=1
PARITY ERROR
TELP 0
```

*Lines in the file which
contain a detected error*

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Read Section 3.5.1 for a method of correcting lines with parity errors in IOPS ASCII files.

3.7 S: SEGMENT FILE OPERATION

PIP provides commands which enable a single IOPS ASCII file located on either a directoried device (e.g., DT, DK, DP, RK, MUT) 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 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;

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- 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 .EOT pseudo-op 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            LI-./2*1000+2; 0
                .ASCII 'HEJ! '<175>
LI=.
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
```

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>L TT-DK

LIST CURRENT UFD

24-NOV-75
DIRECTORY LISTING (GEP)
1510 FREE BLKS
4 USER FILES
4 USER BLKS
PARTA SRC 1 24-NOV-75
PARTB SRC 1 24-NOV-75
PARTC SRC 1 24-NOV-75
SEGEX SRC 1 24-NOV-75

>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

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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 Sections 3.7.1 and 3.7.2. The use and format of the S command is the same, but 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 Section 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 except for the last.
- 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 )
```

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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:

```
      24-NOV-75
    DIRECTORY LISTING  (JAN)
      5751 FREE BLKS
        2 USER FILES
      11 USER BLKS
    TEST1  001      10  24-NOV-75
    MIN    SRC      1   24-NOV-75
```

the command

```
>D _DK _TEST1 _001)
```

results in the deletion of the file "TEST1 001" as illustrated in the following listing of JAN:

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```
24-NOV-75
DIRECTORY LISTING (JAN)
5761 FREE BLKS
1 USER FILES
1 USER BLKS
MIN SRC 1 24-NOV-75
```

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

```
24-NOV-75
DIRECTORY LISTING (GEP)
2251 FREE BLKS
10 USER FILES
10 USER BLKS
SEGB SRC 1 24-NOV-75
SEGA SRC 1 24-NOV-75
EXAMP SRC 1 24-NOV-75
TTYFL SRC 1 24-NOV-75
PARTA SRC 1 24-NOV-75
TTYFLB SRC 1 24-NOV-75
PARTB SRC 1 24-NOV-75
PARTC SRC 1 24-NOV-75
```

Original UFD

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

Delete Command

>LTT←DK

```
24-NOV-75
DIRECTORY LISTING (GEP)
2255 FREE BLKS
4 USER FILES
4 USER BLKS
EXAMP SRC 1 24-NOV-75
PARTA SRC 1 24-NOV-75
PARTB SRC 1 24-NOV-75
PARTC SRC 1 24-NOV-75
```

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.

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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, use the command:

```
>D DT1 filename extension)
```

D will also delete (that is make inactive) files on magtape.

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:

```
24-NOV-75
DIRECTORY LISTING (GEP)
5372 FREE BLKS
2 USER FILES
3 USER BLKS
SEGEX SRC 3 24-NOV-75
.TFIL1 EDT* 0 24-NOV-75
```

the command:

```
>D DK(X)
```

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

```
24-NOV-75
DIRECTORY LISTING (GEP)
5436 FREE BLKS
1 USER FILES
3 USER BLKS
SEGEX SRC 3 24-NOV-75
```

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 and magtape directories;

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- 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 backarrow (\leftarrow). 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:

| | | | |
|-------------------|-------|-----------|--|
| 24-NOV-75 | | | |
| DIRECTORY LISTING | (GEP) | | |
| 5436 FREE BLKS | | | |
| 1 USER FILES | | | |
| 3 USER BLKS | | | |
| XMPLE SRC | 3 | 24-NOV-75 | |

} *Original UFD*

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

| | | | |
|---|-------|-----------|--|
| >R DK SEGEX SRC \leftarrow DK XMPLE SRC | | | |
| >L TT \leftarrow DK | | | |
| 24-NOV-75 | | | |
| DIRECTORY LISTING | (GEP) | | |
| 5436 FREE BLKS | | | |
| 1 USER FILES | | | |
| 3 USER BLKS | | | |
| SEGEX SRC | 3 | 24-NOV-75 | |

} *Revised UFD*

Note that the file creation date also changes.

Truncated files cannot be renamed. If an attempt is made to do so, an IOPS 10 error results.

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

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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 Section 2.3.7 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)
      24-NOV-75
  DIRECTORY LISTING (GEP)
    5436 FREE BLKS
      1 USER FILES
      3 USER BLKS
SEGEX1 SRC      2201(1)      3 24-NOV-75      2205      74
```

} UFD listing
showing new
file protec-
tion code and
new file names.

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

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- 3) Z is the protection code to be assigned to the specified UFD: 0 = unprotected; 1 = protected.

For example:

>L TT-DK (M)

24-NOV-75
MFD DIRECTORY LISTING
2255 FREE BLKS
43 USER FILES
515 USER BLKS

}

*Original
MFD indicates
that no un-
protected
UFD's are
in the system*

>R DK <GEP:0>

>L TT-DK (M)

24-NOV-75
MFD DIRECTORY LISTING
2255 FREE BLKS
43 USER FILES
515 USER BLKS
GEP 1003(0) 4 4

}

*Revised MFD
showing the
unprotected
UFD "GEP"*

The standard protection rules apply here: a user cannot change the protection code of a UFD that is protected if that UFD is not current. Note, however, that a non-current unprotected UFD can be changed to protected and thus become inaccessible to the renaming user.

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.

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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:

```
>BDT150,55,60<DT2101,107,200 )
```

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:

```
>BDT150-55<DT2100-105 )
```

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:

```
>BDT11,3-5<DT2 )
```

and

```
>BDT1<DT21,3-5 )
```

specify that blocks 1, 3, 4 and 5 are to be copied from DT2 into blocks 1, 3, 4 and 5 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 block 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 directoried 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. Note that this switch is illegal to magtape.

- b) (S) Initialize with QAREA switch

Initializes the directory of the destination DECTape and establishes a QAREA on the tape 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 be used only between the following like devices: RK to RK, 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 and the copy continues. 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 positive .DAT slots.

PIP Operations, Detailed Descriptions and Examples of Use

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. Truncated files on the disk are not transferred during a copy. The basic copy (i.e., add-on) operation is permitted between:

| <u>DEVICES</u> | <u>OPERATION PERFORMED</u> |
|-----------------------|--|
| a) Tape to Disk | integrates all DEctape or mag-tape files into the current UFD. A typical command is: >C DK+DT1 |
| b) Disk to Tape | integrates all files contained by the current UFD onto the specified mag-tape or 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.

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

| | | | |
|-------------------|---|---|--|
| 24-NOV-75 | | | |
| DIRECTORY LISTING | | | |
| 1066 FREE BLKS | | | |
| 1 USER FILES | | | |
| 10 SYSTEM BLKS | | | |
| EDTST SRC | 1 | 2 | |

} DTØ DIRECTORY BEFORE
COPY OPERATION

>C_LDTØ<DK_L

COPY CONTENTS OF CURRENT
UFD ONTO DTØ

| | | | |
|-------------------|---|---|--|
| 24-NOV-75 | | | |
| DIRECTORY LISTING | | | |
| 1062 FREE BLKS | | | |
| 2 USER FILES | | | |
| 10 SYSTEM BLKS | | | |
| EDTST SRC | 1 | 2 | |
| XMPLED SRC | 2 | 4 | |

} DTØ DIRECTORY AFTER
COPY OPERATION

A technical note on the copy command: all transfers are done in Dump mode regardless of the true mode of the file. Therefore, PIP can transfer, under one copy command, files of different data modes.

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 (illegal to magtape).

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_LDK< JAN>_L(N)<DT1_L

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.

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The (S) switch is permitted only for DECTape copy operations. This switch initializes the directory of the destination DECTape and establishes a QAREA on the tape 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., 4096-word) units the size of the ↑QAREA to be reserved). This size is normally specified in 8K units starting at 24K (minimum XVM/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".

PIP Operations, Detailed Descriptions and Examples of Use

- 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 an octal number which indicates the total number of bad blocks on the disk.

CHAPTER 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 Chapter 3. He is required to specify only 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)
```

If a UFD is not specified, PAG (for page mode systems) or BNK (for bank mode systems) is used.

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, critical system programs are lost which must be restored for successful operation.

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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) -

```
24-NOV-75
MFD DIRECTORY LISTING
5766 FREE BLKS
52 USER FILES
641 USER BLKS
```

b) by the MIC -

```
24-NOV-75
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 all truncated files from all 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 device bit maps and initializes the MFD. Initialization of the MFD sets it to a default state. The contents of the disk are lost. This command is most useful for

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initialization of disk packs. The form of the command is:

>I DPl)

CHAPTER 5

PIP ERROR DETECTION PROCEDURES AND MESSAGES

5.1 INTRODUCTION

This Chapter 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. Note that it is not necessary to type a space after the ?
- Example:

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T DK?FILE SRC+DT1)

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:

```
L TT<WCK> _____ Command String Entry
ILLEGAL DEVICE OR UNIT _____ Error Message
L TT?DK <WCK>
  |
  |_____ Corrections entered by User
PIP reprint to Error Point (?)
```

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:

```
>T DK <GEP> EXAMFB SRC+PP) _____ Command
PARITY ERROR
  |
  |_____ An error was detected on the input
           tape
```

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

| <u>Printed Message</u> | <u>Interpretation</u> |
|---------------------------------|--|
| 1) CHKSUM ERR | An error has occurred in the transfer of data; retry transfer. |
| 2) COMMAND STRING TOO LONG | The command string entered exceeds 72 characters. |
| 3) DATA MODE MISMATCH | The data mode derived from the command string does not match the mode specified in bits 14-17 of the first header word. The transfer is aborted. |
| 4) DEV ILL FOR OPTION FUNCTION | Change function or device. Retype from error. |
| 5) DEVICE NOT IN +.DAT | Return to the monitor and use the A (Assign) command to assign the device involved to any positive .DAT slot. |
| 6) DISK FULL | Device has no further storage available. |
| 7) FILE ALREADY PRESENT | There is already a file present under the new file name and extension supplied in a 'R' function. The operation is aborted. |
| 8) FILE NAME TOO LONG | Filenames are restricted to a maximum of 6 characters plus a 3-character extension: the user has exceeded this limit. Retype from error. |
| 9) FILE NOT ON INPUT DEVICE | There is no file under the specified name on the directed input device. Retype from error. |
| 10) 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. |
| 11) ILL BLK # | Improper block number (i.e., too large, or negative) specified in command. Retype command. |
| 12) ILL CMD STRUCTURE | The command string entered was not properly ordered or structured. Retype the correct command. |

Table 5-1 (Cont)
PIP Error Messages

| <u>Printed Message</u> | <u>Interpretation</u> |
|--|--|
| 13) 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. |
| 14) ILL DEV/UNIT | Illegal device mnemonic specified in command string. Retype from error. |
| 15) ILL FUNCTION | The function specified in the command string entered (i.e., first character) is not a legal PIP function. Retype from error. |
| 16) 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. The requested operation is not performed. |
| 17) 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. Retype from error. |
| 18) ILL SWITCH | An optional switch entered in the command is not permitted in the primary operation being performed. Retype from error. |
| 19) ILL TERMINATOR | Command improperly terminated: only RETURN or ALT MODE is legal. Retype from error. |
| 20) 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 (Cont)
PIP Error Messages

| <u>Printed Message</u> | <u>Interpretation</u> |
|-----------------------------------|--|
| 21) ILL UIC | User has given an improper code; the UIC must be a 3-character code within angle brackets (i.e., <XXX>). Retype from error. |
| 22) INPUT LINE TOO LONG | Input commands are limited to one physical line of 72 characters; the user has attempted to exceed this limitation. |
| 23) NEED BLK # | No block number was given in an UPDATE command; enter required octal number. |
| 24) NEED DATA MODE | User must enter the proper data mode switch. Retype from error. |
| 25) NULL FILE NAME ILL | A filename must be specified; a nullname is not acceptable. Retype from error. |
| 26) P VIOLATION | Current user has attempted an operation which violates the established protection code of a UFD or a file. The operation is aborted. |
| 27) 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). |
| 28) 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. The operation goes to completion. |
| 29) 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 before the T command with the Y switch. |

Table 5-1 (Cont)
PIP Error Messages

| <u>Printed Message</u> | <u>Interpretation</u> |
|-----------------------------------|--|
| 30) 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. |
| 31) SWITCH CONFLICT | Two or more switches entered in the command cannot be used together. Retype from error. |
| 32) SYSBLK NOT ON DEV | Device specified is not the system device. The List operation is aborted. |
| 33) TOO FEW 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. All matching files have been transferred; transfer the rest via a new command. |
| 34) TOO MANY FILES | The limit of 28 ₁₀ in either case was exceeded. Retype the command, giving 28 or fewer block numbers of file names. |
| 35) TOO MANY FILES OR BLOCKS | 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). |
| 36) UIC NOT IN MFD | 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, or that an illegal default protection code was specified at SGEN time. |
| 37) WARNING - FILE HAS ILL P CODE | |

PIP Error Detection Procedures and Messages

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

| <u>To:</u> | <u>Type:</u> | <u>Which is Echoed on the Teleprinter as:</u> |
|--|------------------------|---|
| 1) Delete a character from the command string | RUBOUT | / |
| NOTE Characters are deleted one per entry start- ing from the last entered character and pro- ceeding 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 segmenta- tion 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 |

PIP Error Detection Procedures and Messages

Table 5-2 (Cont)
User Correction and Recovery Commands

| <u>To:</u> | <u>Type</u> | <u>Which is Echoed on the Teleprinter as:</u> |
|--|-------------|---|
| 5) Continue the requested operation after a "DEVICE NOT READY" condition has been corrected for a PDP-15 or XVM device (not needed for a UC15 device). | CTRL R | ↑R |

CHAPTER 6

QUICK REFERENCE TABLES

6.1 INTRODUCTION

This Chapter contains tabularized data intended as an aid to recall for users who are familiar with the contents of Chapters 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 6-1 illustrates the general format of the Destination/Source command strings; Figure 6-2 illustrates the general format of the Single-Device Command Strings.

6.4 PIP USER OPERATION TABLES

Tables 6-2, 6-3, 6-4, 6-5, and 6-6 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.

Quick Reference Tables

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 Chapters 2 and 3 of this manual.

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

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

Quick Reference Tables

Table 6-1
Available Options Versus Primary Operations

| PRIMARY OPERATIONS | | | | | | | | | | | | DESCRIPTIONS |
|--------------------|---------------|-------------|--------------|-----------|--------------------|------------------|------------------|-----------|-----------------|------------------------------|-------------|---------------------------------|
| SWITCHES | TRANSFER T | VERIFY V | SEGMENT S | LIST L | NEW DIRECTORY N | DELETE FILE D | RENAME FILE R | COPY C | BLOCK COPY B | INITIALIZE I ² | UPDATE U | |
| (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 |
| (V) | X | | | | | | | | | | | Vertical Forms Control |
| (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 |

¹Legal only with DEctape, Disk Pack or Disk cartridge copy operations.

²Legal only when the current password is the MIC.

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

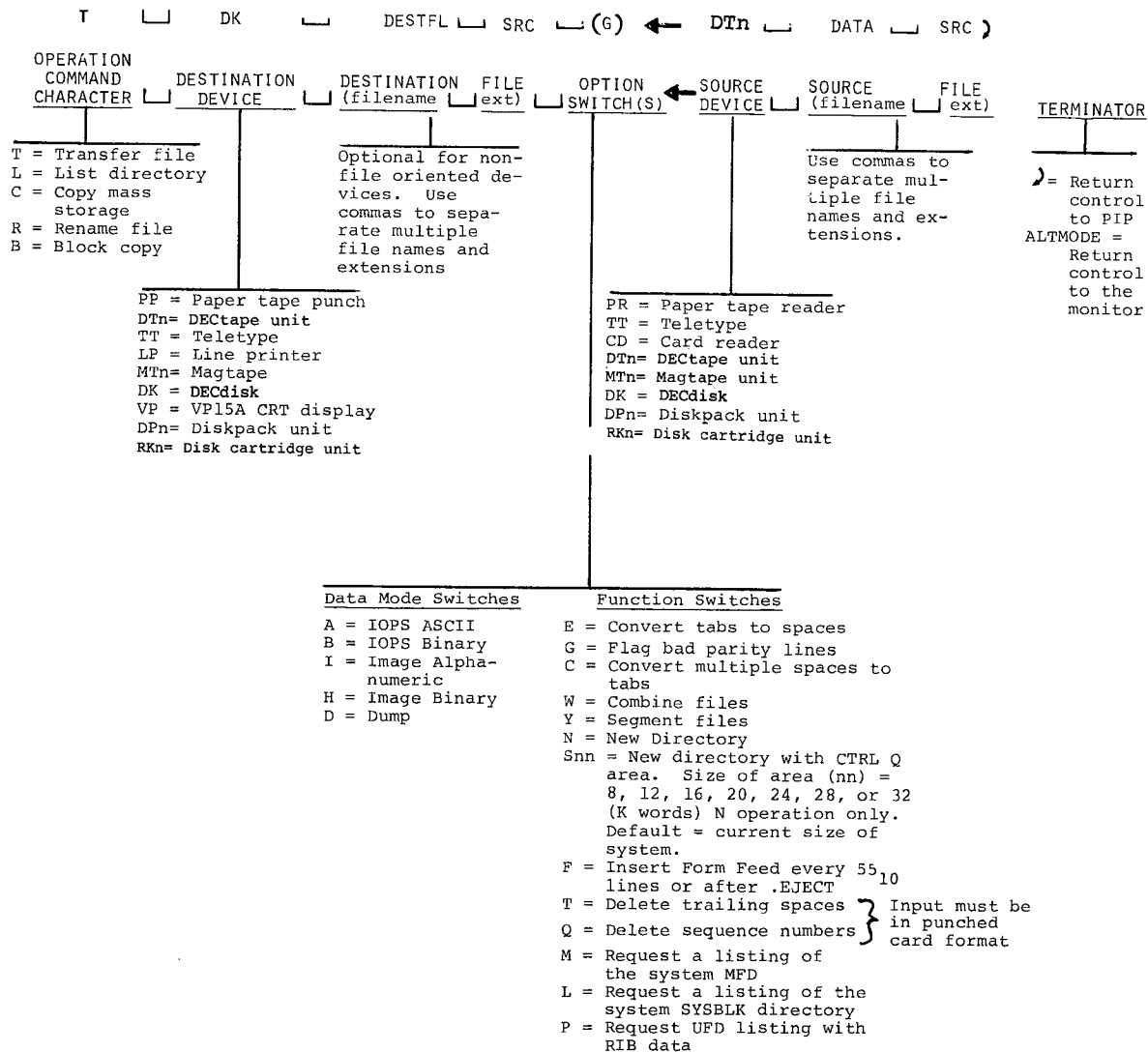


Figure 6-1 Destination/Source Command String Format

Quick Reference Tables

| <u>V</u> | <u>DT1</u> | <u>FILEA,FILEB</u> | <u>(A)</u> |) |
|--|--|---|---|---|
| OPERATION COMMAND CHARACTER | DEVICE MNEMONIC | FILE(S) INVOLVED Filename | OPTION SWITCH(S) | TERMINATOR |
| N=new directory V=verify file D=delete I=initialize U=update | PR=Paper Tape reader DTn=DECTape unit DK=DECdisk DPn=Diskpack unit MTn=Magtape unit RKn=Disk cartridge unit | Use commas to separate multiple filenames and extensions. | A = IOPS ASCII Data mode B = IOPS Binary Data Mode S = new directory with a core- sized ↑QAREA Snn = new directory with a user-specified sized ↑QAREA K = delete UFD X = delete all truncated files |)=Return control to PIP ALT MODE = Return control to DOS Monitor |

Figure 6-2
PIP Single Device Commands, General Format

Table 6-2
Directory Operations

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

Table 6-2 (Cont)
Directory Operations

| <u>IN ORDER TO:</u> | <u>USE OPERATIONS:</u> | <u>AND OPTIONS:</u> | <u>IN THIS MANNER:</u> |
|--|------------------------|---------------------|--|
| 8) Initialize the directory of a directoried device | N, New directory | None | >N _U PTL) Note: illegal to magtape |
| 9) Initialize DEC-tape directory and set up a †QAREA of: | N, New directory | | |
| a) System core size | | (S) | >N _U PTL _U (S)) |
| b) Specified size | | (Snn) | >N _U PTL _U (S32)) |
| 10) List contents of directories: | | | |
| a) MFD | L, List | (M) | >L _U TT+DK _U (M)) |
| b) UFD | L, List | None | >L _U TT+DK) Note: illegal from magtape |
| c) DECTape | L, List | None | >L _U TT _U PTL) |
| 11) List contents of unprotected, non-current UFD | L, List | None | >L _U TT+DK _U <JOE>) |

Table 6-3
List Operations

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

Table 6-3 (Cont)
List Operations

| <u>IN ORDER TO:</u> | <u>USE OPERATIONS:</u> | <u>AND OPTIONS:</u> | <u>IN THIS MANNER:</u> |
|---|------------------------|---------------------|----------------------------------|
| 9) List all file entries having the same 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

| <u>IN ORDER TO:</u> | <u>USE OPERATION:</u> | <u>AND OPTIONS:</u> | <u>IN THIS MANNER:</u> |
|---|-----------------------|---------------------|---|
| 1) Rename a file | R, Rename | None | >R,DK,NEWNAM,_,BIN<DK,OLDNAM,_,BIN) Note: Filename extension is required. |
| 2) Rename and set the protection code for a file | R, Rename | None | >R,DK,NEWNAM,_,BIN<DK,OLDNAM,_,BIN,(3)) Note: Filename extension is required. |
| 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) Note: Filename extension is required. |
| c) from mass storage device directory | D, Delete | None | >D,DTL,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,JP,DESTFL<DTL,SOURCE,_(CA)) |
| 6) Convert tabs to spaces | T, Transfer | (E), (EA) | >T,JP,DESTFL<DTL,SOURCE,_(EA)) |
| 7) Detect and Correct File Parity and Checksum errors | T, Transfer | (G), (GA) | >T,DK,DESTFL<DTL,SOURCE,_(GA)) |
| 8) Delete Trailing Spaces from file contents | T, Transfer | (T), (TA) | >T,DK,DESTFL<DTL,SOURCE,_(TA)) |

Table 6-4 (Cont)
File Modification Operations

| 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_PTL_DESTFL_001_ (Q) <CD) |
| 10) Combine separate files into one file | T, Transfer | (W), (B), (A) | >T_PTL_LIBR_ (WB) <DT2_FILA_BIN, FILB_BIN) |
| 11) Segment a file into 2 to 16 separate: | | | |
| a) files | S, Segment + T, Transfer | None (Y), (YA) | >S_TAG, TAGB, TAGC) >T_PTL_FILA, FILB, FILC, FILD_ (YA) <DT2_SOURCE) |
| b) papertapes | S, Segment + T, Transfer | None (Y), (YA) | >S_TAGA, TAGB, TAGC) >T_PP_ , , (YA) <DT1_SOURCE) |
| 12) Verify a file for parity and/or checksum errors | V, Verify | (A), (B) | >V_PK_FILEA_ (A)) |

Table 6-5
File Transfer Operations

| <u>IN ORDER TO:</u> | <u>USE OPERATION:</u> | <u>AND OPTIONS:</u> | <u>IN THIS MANNER:</u> |
|---|-----------------------|---------------------|---|
| 1) Transfer a file to the current UFD | T, Transfer | (A) or (B) | >T _{DP} DESTFL+DTL _{DP} SOURCE _{DP} (A) |
| 2) Transfer a file to a selected non-current UFD when protection code permits | T, Transfer | (A) or (B) | >T _{DP} JOE>DESTFL+DTL _{DP} SOURCE _{DP} (A) |
| 3) Transfer a file from a current UFD to a specified, non-current unprotected UFD | T, Transfer | (A) or (B) | >T _{DP} JOE>DESTFL+DK _{DP} SOURCE _{DP} (A) |
| 4) Transfer console keyboard entries, line-by-line, to a system output device | T, Transfer | (A) only | >T _{DP} IP _{DP} (A)+TT Note: cmd input with a +D |
| 5) Transfer file and: | | | |
| a) Convert spaces to tabs | T, Transfer | (C) or (CA) only | >T _{DP} TT+DTL _{DP} SOURCE _{DP} (CA) |
| b) Convert tabs to spaces | T, Transfer | (E) or (EA) only | >T _{DP} TT+DTL _{DP} SOURCE _{DP} (EA) |
| c) Enable parity or checksum error to be detected | T, Transfer | (G) or (GA) only | >T _{DP} DTL _{DP} +DT2 _{DP} SOURCE _{DP} (GA) |

Table 6-5 (Cont)
File Transfer Operations

| <u>IN ORDER TO:</u> | <u>USE OPERATION:</u> | <u>AND OPTIONS:</u> | <u>IN THIS MANNER:</u> |
|---|-----------------------|---|-------------------------------|
| d) Initialize the directory of a directoried device | T, Transfer | (N) or (NA) or (NB) Note: illegal to magtape | >T_DTL_DESTFL←DT2_SOURCE_(NA) |
| e) initialize or create a UFD for the current UIC | T, Transfer | (N) or (NA) or (NB) Note: illegal to magtape | >T_PK_DESTFL←DT1_SOURCE_(NA) |
| f) Combine two or more files into one file | T, Transfer | (W) or (WA) or (WB) | >T_PK_DESTFL←DT2_A,B,C_(WA) |
| g) Delete sequence numbers from card reader inputs | T, Transfer | (Q) or (QA) (QAC) (QAT) | >T_DTL_DESTFL_(QA)←CD |

Table 6-6
COPY Operations

| <u>IN ORDER TO:</u> | <u>USE OPERATION:</u> | <u>AND OPTIONS:</u> | <u>IN THIS MANNER:</u> |
|--|-----------------------|---------------------|---|
| 1) Copy the contents of a specific device storage block | B, Block copy | None | >B _{DT1} 50,51←DT2 ₁ 101,102 |
| 2) Copy the contents of a specific series (i.e., range) of device storage blocks | B, Block copy | None | >B _{DT1} 50-55←DT2 ₁ 100-105 |
| 3) Copy the contents of one or more blocks and: | | | |
| a) initialize the directory of the destination device | B, Block copy | (N) | >B _{DT1} 50-55(N)←DT2 ₁ 100-105 |
| b) initialize the DECTape directory and reserve a QSAVE area equal to core size | B, Block copy | (S) | >B _{DT1} 5,6,7 _(S) ←DT2 ₁ 50,51,52 |
| c) initialize DECTape directory and specify size of QSAVE area to be reserved | B, Block copy | (Snn) | >B _{DT1} 5,6,7 _(S32) ←DT2 ₁ 50,51,52 |
| 4) Add (copy) the files on one device to those of a second device | C, Copy | None | >C _{PK} ←DT1 |
| 5) Copy and add files from one device to another device and: | | | |

APPENDIX A
USE OF VT15 GRAPHICS DISPLAY SYSTEM

PIP users may employ the VT15 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 VT15 Display screen, the user must actuate the rightmost display control pushbutton (see CONTROLS) and enter a RETURN at the keyboard.
- e) To turn the VT15 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} ↵

VT15 CONTROLS AND DISPLAY MODES

CONTROLS

The VT15 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.

APPENDIX B
USE OF VP15A DISPLAY DEVICE

In XVM/DOS systems which have a VP15A Storage Tube Display, the PIP user may use the display device as a listing device. He 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 001 on the VP, the user would issue the command:

>T┐VP┐DK┐TEST1 001┐

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.

Use of VP15A Display Device

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 VP15A¹.

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 version of the handler is installed in the operating 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.

¹The 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
XVM/DOS TERMS AND ACRONYMS

Terms unique to the XVM/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 XVM/DOS Users Manual.

| <u>TERM</u> | <u>ACRONYM</u> | <u>DEFINITION</u> |
|-----------------------------|----------------|--|
| 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 Director | 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). |

XVM/DOS Terms and Acronyms

| <u>TERM</u> | <u>ACRONYM</u> | <u>DEFINITION</u> |
|--------------------------|----------------|---|
| 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. |

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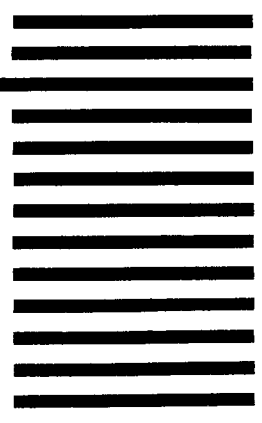
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