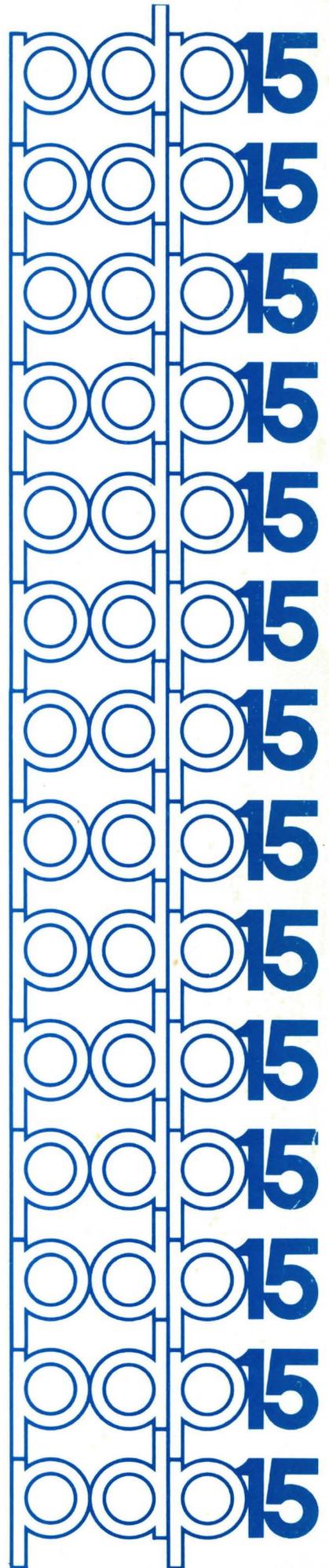


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DEC-15-YWZB-DN7

UPDATE

UTILITY PROGRAM

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PREFACE

This manual describes the operation and use of the UPDATE Utility Program. The UPDATE program may be operated in either the ADVANCED Software System (ADSS) or the Disk Operating System (DOS) environment.

It was assumed in the preparation of this manual that the reader was familiar with the operation of the PDP-15 equipment and the contents of the software manual describing the features of the particular monitor system in which he was operating, that is:

- a) for ADSS users, PDP-15/20/30/40 ADVANCED Monitor Software System Manual, DEC-15-MRZB-D;
- b) for DOS users, DOS Software System User's Manual, DEC-15-MRDA-D.

PDP-15 UTILITY PROGRAMS MANUAL, DEC-15-YWZB-D

The PDP-15 Utility Programs manual is comprised of a set of individual manuals, each of which describes the operation and use of a PDP-15 Utility Program. The manuals which make up the Utility Programs set are listed in the following Application Guide. In addition, the Application Guide also indicates the order number of each manual and the specific PDP-15 Monitor Software Systems in which the program described may be used.

The Utility Manuals may be ordered either individually, by using the title and order number given with each manual, or as a set, by referencing "PDP-15 Utility Programs Manual, DEC-15-YWZB-D".

APPLICATION GUIDE

PDP-15 UTILITY PROGRAM MANUALS

PDP-15 Utility Program Manuals and the Application of Each

Title	Manual Order Number (DEC-15-YWZB_)	Applies to Monitor:		
		DOS	ADV	B/F
DDT Utility Program	DN1	✓	✓	✓
CHAIN & EXECUTE Utility Program	DN2	✓	✓	✓
SGEN ADVANCED Monitor	DN3		✓	
MTDUMP Utility Program	DN4	✓	✓	
PATCH Utility Program	DN5	✓	✓	✓
EDIT Utility Program	DN6	✓	✓	✓
UPDATE Utility Program	DN7	✓	✓	✓
LINKING LOADER	DN8	✓	✓	✓
PIP ADVANCED Monitor	DN9		✓	✓
SRCCOM Utility Program	DN11	✓	✓	✓
SGEN DOS Monitor	DN12	✓		
PIP DOS Monitor	DN13	✓		

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SECTION 1

INTRODUCTION

1.1 GENERAL DESCRIPTION

The UPDATE Program provides users with the ability to create, examine and revise the binary library files of the DOS-15, ADSS (ADVANCED Software System), and Background/Foreground Monitor Systems. A library file is defined as any file containing one or more relocatable binary programs. Some specific examples of library files are:

- a. The DOS-15 Monitor's .LIBR BIN files residing in the BNK and PAG System UFD's, which contain the FORTRAN IV Object Time System (OTS) routines.
- b. The ADVANCED Monitor's .LIBR BIN file which contains the system's I/O device handlers as well as the FORTRAN IV OTS routines.
- c. The Background/Foreground Monitor System's .IOLIB BIN (I/O library) and .F4LIB BIN (OTS routines) files.

UPDATE alters files by performing replacement, deletion, or insertion operations. It can also be used to create new library files, list the contents of libraries, and copy programs out of libraries for use as individual files. Figure 1-1 shows the functional relationship of UPDATE to its input and output files. Library creating and updating functions are performed by the creation of a new file from programs copied, on command, from either primary (original file) or secondary (new programs) input devices to the output device. The original file on the primary input device is never altered. A listing of the programs contained in a library can also be obtained.

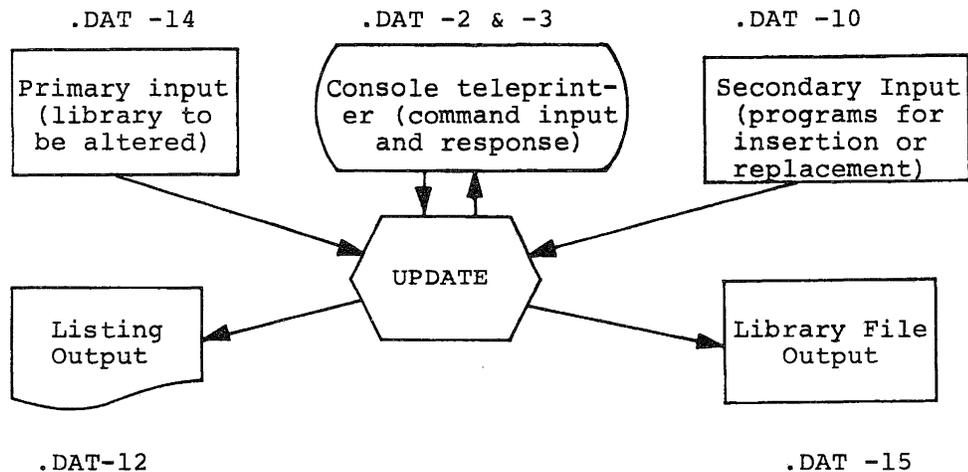


Figure 1-1

UPDATE's I/O Devices and Files

1.2 REFERENCE MATERIAL

The following manuals also contain information useful in understanding and using UPDATE:

- a) DOS Users:
 - 1) DOS Users Manual, DEC-15-MRDA-D
 - 2) DOS-15 Keyboard Command Guide, DEC-15-NGKA-D
 - 3) Linking Loader Utility Program Manual, DEC-15-YWZA-DN8
- b) ADSS Users:
 - 1) ADVANCED Monitor Software System for PDP-15/20/30/40, DEC-15-MR2B-D
 - 2) PDP-15/20 Users Guide, DEC-15-MG2B-D
 - 3) Linking Loader Utility Program Manual, DEC-15-YWZA-DN8
- c) Background/Foreground Users
 - PDP 15/30, 15/40 Background/Foreground Manual DEC-15-MR3Z-D

1.3 SPECIAL SYMBOLS

Special symbols, when used in this manual are defined as follows:

<u>SYMBOL</u>	<u>REPRESENTS</u>
↵	Carriage RETURN - LINE FEED operation
→	TAB
└	SPACE
[]	Optional Command String elements

SECTION 2

UPDATE COMMANDS AND OPERATIONS

2.1 LOADING PROCEDURE

2.1.1 I/O Device Assignments

As shown in Figure 1-1, UPDATE uses up to six .DAT slots. .DAT slots -2 and -3 are used by the console teleprinter and cannot be reassigned. The .DAT slots required by UPDATE vary with the type of operation being performed. For example, if a new library is to be created, only .DAT slots -10 (secondary input) and -15 (library file output) need be assigned. If a listing is also desired, then .DAT -12 must also be assigned. Similarly, if an update operation is to be performed where no programs are added and no listing is desired, then only .DAT -14 (primary input) and .DAT -15 (library file output) need be considered.

2.1.2 Calling UPDATE

Once proper .DAT slot assignments have been made, UPDATE can be called simply by typing UPDATE after the Monitor's \$. When loaded, UPDATE identifies itself on the console teleprinter as follows:

```
UPDATE Vnn  
>
```

and waits for a command from the user as described below.

2.1.3 CTRL Character Commands

UPDATE can be restarted at any time by typing CTRL P. The current operation, of course, is aborted. CTRL C also unconditionally terminates UPDATE operations but returns the user to Monitor control.

2.2 COMMAND DESCRIPTIONS

UPDATE's keyboard commands are divided into three functional categories as follows:

- a. File Specification Commands
- b. Manipulative Commands
- c. Termination Commands

2.2.1 File Specification Commands

The first command to UPDATE each time it is loaded or restarted must be a File Specification Command. These commands specify the type of operations to be performed and the name of the file to be examined, modified, or created. The general form of the Command String format is:



The paragraphs below describe the command string elements.

2.2.1.1 Options - The following paragraphs describe the options provided by UPDATE. Each option is specified in the command string by a single letter designator. Table 2-1 shows legal Option/Command combinations.

Table 2-1
Legal Option/Command Combinations

Options ¹	Commands						
	INSERT	DELETE	REPLACE	FREE	END	CLOSE	KILL
U[LS]	X	X	X		X	X	X
N[LS]	X					X	X
G[LS]				X	X	X	X
L					X	X	X

¹The S command is not logically useful by itself.

U Option This option permits the updating of an existing library file by the deletion, insertion and replacement of the programs within it. The file to be updated resides on the device assigned to .DAT -14; programs to be inserted must be on .DAT -10; and the updated file is output to .DAT -15.

- N Option This option permits a new library file to be created from programs residing on the .DAT -10 device. The new library is output to .DAT -15.
- S Option The S Option causes UPDATE to remove the local symbol table from each program placed in the output file. This process shortens the length of a file by as much as 40%, thus conserving storage space and reducing library search time during loading. Non-library programs will occupy less core when loaded with DDT, since there will be no symbol table to load. (This is irrelevant for library programs because the Linking Loader and DDT do not load their local symbol tables. The single disadvantage of this option is that the removal of the symbol table precludes symbolic debugging with DDT and DDT's operation is then similar to DDTNS.
- L Option This option lists the contents of the new or updated library output to .DAT -15 on the device assigned to .DAT-12. If no other options are selected, a listing of the named library residing on the primary input device (.DAT -14) can be obtained. The format of the listing is shown in Figure 2-1. The first column of the listing contains the program name. The second column contains the source extension and is output only for programs assembled under the DOS-15 MACRO Assembler (which outputs loader code (33) for this purpose). No extension is output for programs assembled either under the ADVANCED or the Background/Foreground Monitor system. The third column specifies the size (in octal) of each program. The last column contains the command line echo of all Manipulative Commands issued, thus providing a complete log of the current updating operations.

G Option This option primes UPDATE to accept the FREE Manipulative Command which allows individual programs to be extracted from libraries as separate files.

LIBRARY FILE LISTING FOR file name			PAGE n
PROGRAM NAME	SOURCE EXTENSION	PROGRAM SIZE	ACTION
NAME2	EXT2	34	REPLACE NAME1,NAME2
NAME2	EXT2	104	
NAME4	EXT4	423	INSERT NAME4

Figure 2-1

Format of Listing File Output

2.2.1.2 File Name - A file name consists of any combination of from 1 to 6 alphanumeric characters. The file name extension is always assumed to be BIN. If no file name is specified, the name .LIBR BIN is assumed by the program.

2.2.1.3 Command Terminator - Either a carriage RETURN (↵) or an ALT MODE keyboard entry is used to terminate the file specification command. If a ↵ terminator is used, control is returned to the UPDATE program when work on the named file is complete. If an ALT MODE terminator is used, control is returned to the Monitor when updating of the named file is complete.

2.2.2 Manipulative Commands

After acceptance of a File Specification Command, UPDATE indicates its readiness to accept commands for the manipulation of the contents of the named file by typing a >.

In responding to the commands described below, UPDATE operates on library files in a sequential, program-by-program manner. Processing

always begins at the beginning of the file (prior to the issuance of the first Manipulative Command). All programs in a file, which are not deleted or replaced, are copied into the output file automatically. The input file is never altered. The user should exercise care in issuing these commands, since UPDATE has no provision for "backing up" in a file to manipulate a program already passed by. The user, therefore, should first obtain a listing (L option followed by a CLOSE) of the file before he attempts to modify it.

There are five Manipulative Commands, DELETE, REPLACE, INSERT, FREE and END, each of which is described in the following paragraphs.

2.2.2.1 DELETE (D) Command - The D command causes the deletion of a named routine or a series of routines from the specified file. A series is specified by typing the names of the first and last routines of the series. The deletion is carried out by copying all the routine or file elements in the file up to the deleted routines into the output file and then positioning the input file just before the program which follows the last routine deleted.

Form: D[DELETE]␣prog1[,prog2]

The DELETE command may be used only when the U option has been requested in a File Specification Command.

2.2.2.2 REPLACE (R) Command - The R command causes programs in the original file to be replaced by new programs on the secondary input device. All of the programs in the original file, up to the element or routine to be replaced, are copied onto the output device. The new program(s) (replacement) is then copied onto the output file from a secondary input device. Upon completion, the output file is positioned immediately after the replaced routine.

If one program name is specified, UPDATE replaces the named program with a new program having the same name. If two program names are specified, the program with "name1" is replaced by the program with "name2".

Form: R[REPLACE]␣name1[,name2]

The REPLACE (R) command may be used only when the U option has been specified in a file specification command.

2.2.2.3 INSERT (I) Command - The I command directs UPDATE to insert programs contained on the secondary input device, at any point, into the original file as it is copied onto the output file device. On completion of an insert operation, the output file is positioned at a point immediately after the inserted program. If one name is used in the command, the named program is inserted into the file at the current position. If two name are specified, the "name1" program is inserted into the file after the program specified by "name2".

Form: I[NSERT]name1[,name2]

The I command with two names is used only when the U option has been previously specified in a file specification command. The I command with only one name can be used when either the U or N option has been given.

2.2.2.4 FREE (F) Command - The F command directs UPDATE to free or extract a named program from the library file named in a G option File Specification Command. The extracted program is transferred to the output device as a file of the same name.

Form: F[REE]name

The F command is legal only when a G option has been previously specified in a file specification command.

2.2.2.5 END (E) Command - The END command causes the output file to be positioned at the end of the final routine of the original file. All remaining programs in the original file, beginning its current position, are copied into the output file. The END command is a convenient method of positioning the file to be modified in order that new routines from the secondary input may be appended to the file via the INSERT (I) command.

Form: E[ND]

The END command is logically useful only when the U option has been specified.

2.2.3 UPDATE Termination Commands

2.2.3.1 CLOSE (C) Command - The C command is the normal terminator for any of UPDATE's operations. When used with the U option, it causes all of the remaining programs in the primary input file to be copied onto the output file starting at the current position of the file. When used with the N and L options, the C command permits normal ou-put file closing operations to be performed and initiates the output of the listing file. If a file name is not specified with this command the output file is given the name originally specified in the last File Specification Command.

Form: C[LOSE] [filename]

2.2.3.2 KILL (K) Command - This command unconditionally aborts the current operation and restarts UPDATE.

Form: K[ILL]

SECTION 3

ERROR CONDITIONS AND RECOVERY

UPDATE performs comprehensive error checking to assure the integrity of the input and output files as well as correctness of operator command strings. The program contains a large repertoire of messages to specifically identify the nature of the error. Table 3-1 below lists all of UPDATE's error messages accompanied by an explanation of each and appropriate recovery procedures. The general rule for recovery particularly when an incorrect option was selected or an unintentional end of library file occurred is to type CTRL P to restart UPDATE; then issue a new command string.

TABLE 3-1
UPDATE ERROR MESSAGES

<u>Message</u>	<u>Meaning</u>	<u>Recovery</u>
FILE NOT FOUND-COMMAND IGNORED	The file named in an R or I command could not be found on the directoried device assigned to .DAT -10.	Check that the device is properly assigned and that the desired file is contained therein.
EOF REACHED BY SEARCH-COMMAND IGNORED	The program named in an F command was not found in the library.	Check that the name specified in the F command is correct and that the library does indeed contain the desired program (use L command to examine library).
END OF FILE FOUND	The program named in an F command did not contain a .END statement. The library is contaminated.	Obtain another copy of the library file and try again.
END OF FILE FOUND FILE POSITIONING COMPLETE, UNIT NOT INSERTED	An End-of-File or End-of-Medium record was the first record read from the non-directoried device assigned to .DAT -10.	Reload the device and try again.
UNRECOVERABLE READ ERROR ON .DAT -10 -14 COMMAND IGNORED	A checksum, parity or buffer overflow error was detected (via the logical record header word 1) while reading from the specified input device.	Obtain another version of the offending file and try again.
NAMED FILE ALREADY ON OUTPUT DEVICE DO YOU WISH TO CONTINUE (Y/N)	The program name specified in an F or C command is the same as that of a file residing on the .DAT -15 (output) device.	If a Y is typed, UPDATE replaces the file on the output device with the current file. If N is typed, the F command is ignored.

<u>Message</u>	<u>Meaning</u>	<u>Recovery</u>
NOT A COMMAND	Unrecognizable command.	Retype command.
VALID ONLY IN U MODE - COMMAND IGNORED	A DELETE or REPLACE or an INSERT command (with 2 arguments) was issued prior to selecting the U option.	Issue a new command string and select the U option.
VALID ONLY WITH U OR N MODE - COMMAND IGNORED	An INSERT command was issued but neither the U nor the N option had been selected.	Issue a new command string and select either U or N option as desired.
VALID ONLY IN GET MODE	A FREE command was issued but the G option had not been selected.	Issue a new command string and select the G option.
BUFFER OVERFLOW - DYNAMIC KILL	The current operation caused an overflow of UPDATE's internal (free core) buffer.	Return to the Monitor and assign smaller device handlers to provide more free core.
ILLEGAL COMMAND STRUCTURE - COMMAND IGNORED	No program name specified after INSERT, DELETE, REPLACE, or FREE command.	Retype command using program name.
BAD SECONDARY INPUT - DYNAMIC KILL	A data error was detected during input from .DAT -10.	Locate and correct the error; then try again.
BAD DATA - NO PROGRAM NAME	The file being read from the .DAT -10 device does not contain a program name (loader code 23).	Check that the .DAT -10 device is the correct device and that the desired input file is there. If the above checks correctly, the file must be reassembled.
PROGRAM NAME MISSING - DYNAMIC KILL	In performing a search through the library on the .DAT -14 device, the end of file was reached but no program name (loader code 23) could be found.	Check that the .DAT -14 device is correctly assigned and that the desired input file is there. If the above checks correctly, then the library file is contaminated and must be reconstructed.

<u>Message</u>	<u>Meaning</u>	<u>Recovery</u>
PROGRAM NAME DISCREPANCY FILENAME -- program name PROGRAM NAME -- program name SOURCE EXT -- source extension DO YOU WISH TO CHANGE INPUT (Y/N)	The file named in an I or R command, when the secondary input is from a <u>non-directoried device</u> , is not the same as the program name (loader code 23).	If a Y is typed, UPDATE's response "CHANGE INPUT AND ↑P". If N is typed, UPDATE responds with: "DO YOU WISH TO USE FILENAME (Y/N)". If Y is typed, the file name is used, otherwise the program name is used.
PROGRAM NAME DISCREPANCY FILENAME -- filename PROGRAM NAME -- program name SOURCE EXT -- source extension DO YOU WISH TO ACCEPT COMMAND (Y/N)	The file named in an I or R command when the secondary input is from a <u>directoried device</u> , is not the same as the program name (loader code 23).	If anything other than Y is typed, UPDATE responds: "COMMAND IGNORED". If Y is typed, UPDATE replies: "DO YOU WISH TO USE FILENAME (Y/N)". If a Y is typed the filename is used, otherwise the program name is used. In either case, UPDATE asks: "SOURCE EXT WANTED". The user may type Ø - 3 characters followed by a Carriage RETURN.

SECTION 4

UPDATE EXAMPLES

The following examples demonstrate typical command sequences using the various options and commands provided by UPDATE. User responses are underlined.

Example 1

To update user created library called USRLIB:

```
UPDATE Vnn
>U+USRLIB ) /File specifying command must be first
>I NAME2, NAME3 ) /Insert routine NAME2 after NAME3
>R NAME4, NAME5 ) /Replace routine NAME4 with NAME5
>D NAME1 ) /Delete routine NAME1 from file
>C ) /Close USRLIB
UPDATE Vnn /Returns to UPDATE since
> /file specifying command above
/was terminated with a
```

Example 2

To create an updated version of the system library (.LIBR by replacing the BCDIO routine:

```
$A PR -10 ) /Assign papertape reader to
/secondary INPUT
$UPDATE ) /Call UPDATE
UPDATE Vnn
>U+ ) /Specify UPDATE function (note:
/.LIBR BIN assumed)
>R BCDIO ) /Replace BCDIO with new version from
/paper tape reader
>C ) /Close the file
UPDATE Vnn /New .LIBR on .DAT slot -15
>
```

To complete the update of a library file, generally it is necessary to use the PIP Utility Program to delete the old library file from the .DAT -14 device and to transfer the new library from the .DAT -15 device to the .DAT -14 device.

Example 3

To remove all local symbol tables from the programs in an existing library and also obtain a listing:

```
UPDATE Vnn                /Select options
>LS+MYNAM                /Close to complete operations
>C
UPDATE Vnn
>
```

Example 4

To create a new library called LIB13, deleting all local symbol tables and obtaining a listing:

```
UPDATE Vnn
>NLS+LIB13
>I PROG1
>I PROG2
>I PROG3
:
>C
UPDATE Vnn
>
```

Example 5

To obtain copies of the BCDIO and AUXIO routines:

```
UPDATE Vnn
>G+
>F BCDIO
>F AUXIO
>C
UPDATE Vnn
>
```

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