UPDATE Reference Manual

SR–0013 K

Cray Research, Inc.

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Because of space restrictions, the following abbreviations are used in place of specific system names:

CX/1	Includes all models of CRAY X-MP and CRAY-1 computer systems.
CEA	Includes all models of the Extended Architecture (EA) series, including CRAY Y-MP and CRAY X-MP EA computer systems.
CRAY-2	Includes all models of CRAY-2 computer systems.
CX/CEA	Includes all models of CRAY X-MP computer systems plus all models of CRAY Y-MP and CRAY X-MP EA computer systems. It does not include CRAY-1 computer systems.

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NEW FEATURES

This version of the product introduces another difference between NUPDATE and UPDATE. NUPDATE offers the following ID keywords: %G%, %H%, %I%, %M%, %T%, %V%, %Z%.

This new version also introduces option OS on the control statement which assigns new sequence numbers using the UPDATE 4.0 scheme.

This revision describes how to undefine the default name, UNICOS, under DEFINE in UPDATE and NUPDATE. In UPDATE, use the **-d** option to undefine the default. In NUPDATE, specify **-d** *new_define_name*, -U UNICOS, or *UNDEF UNICOS to undefine the default.

RECORD OF REVISION

CRAY RESEARCH, INC.

PUBLICATION NUMBER SR-0013

Each time this manual is revised and reprinted, all changes issued against the previous version are incorporated into the new version and the new version is assigned an alphabetic level.

Every page changed by a reprint with revision has the revision level in the lower righthand corner. Changes to part of a page are noted by a change bar in the margin directly opposite the change. A change bar in the margin opposite the page number indicates that the entire page is new. If the manual is rewritten, the revision level changes but the manual does not contain change bars.

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Revision	Description
	May 1977 - Original printing.
A	June 1979 - This printing represents a complete rewrite of the manual and brings it into agreement with release 1.06. Changes are not noted by change bars.
A-01	December 1979 - This change packet brings the manual into agreement with release version 1.07. Changes are noted by change bars.
B	December 1979 - This reprint includes change packet A-01. It contains no other changes.
B-01	April 1980 - This change packet brings the manual into agreement with release version 1.08. Changes are noted by change bars.
C	November 1980 - This reprint incorporates change packet B-01. It contains no technical changes. With this printing, the publication number has been changed from 2240013 to SR-0013.
D	June 1981 - This rewrite brings the documentation into agreement with the 1.10 version of the released software. Major changes are the addition of the SQ control statement option, the NOSEQ directive, and the SEQ directive. Changes are not noted by change bars. This printing obsoletes all previous editions.
D-01	May 1982 - This change packet brings the manual into agreement with release version 1.11. Major changes include the addition of the declared modifications option parameter (DC) on the UPDATE control statement, the DECLARE directive, the DC parameter on the IDENT directive, and UPDATE messages. This change packet also includes miscellaneous technical and editorial changes.

D-02 May 1983 - This change packet brings the manual into agreement with release version 1.12. Major changes include adding the YANK and UNYANK directives, UPDATE messages, and the Y and C fields to the identifier table format of the random PL structure. This change packet also includes miscellaneous technical and editorial changes.

E January 1984 - This rewrite brings the manual into agreement with release version 1.13. New directives are COPY, DEFINE, ELSE, ELSEIF, ENDIF, IF, MASTER, PURGE, RESTORE, REWIND, SKIPF, and WIDTH. New control statement parameters are ML and IF; and parameters I, DW, and * were changed. Other changes include reorganization of section 1 and new examples in section 4.

E-01 November 1984 - This change packet brings the manual into agreement with release version 1.14. New additions to the manual include section 5, and appendixes D and E. AUDPL messages have been appended to the end of appendix B changing the name from UPDATE MESSAGES to MESSAGES. NS was added to the output options in section 2 and changes were made to the following directives: REWIND, RESTORE, COPY, and DEFINE.

F February 1986 - This rewrite brings the manual into agreement with UPDATE releases 2.0 and 2.1 operating under the Cray operating systems COS 1.15 release and UNICOS 1.0 release, respectively. The COS release added *COMDECKS external references, the DEF control statement parameter, the conditional directives SKIP and ENDSKIP, and a new program library format (variable length record). UNICOS information was added to sections 1, 2, 3, and 4, and appendixes B and C. Information on the PLCOPY utility program is in appendix D. (Under UNICOS, the SKIPF directive does not function.) Binary Identifier Dataset Format information (formerly appendix D) has been incorporated into section 5. This printing also includes miscellaneous technical and editorial changes. All previous versions are obsolete.

G October 1986 - This reprint with revision brings the manual into agreement with UPDATE releases 3.1 and 4.0 operating under the COS 1.16 release and UNICOS 2.0 release, respectively. References to a "set of files in a directory" have been changed to "filenames." References to IDENT.PL and INFO.PL have been changed to Identifier Table and PL Information Table, respectively. Three UNICOS UPDATE error messages were added, and one was deleted. All trademarks are now documented in the record of revision. All previous versions are obsolete.

H June 1987 - This reprint with revision brings the manual into agreement with UPDATE release 5.0, AUDPL releases 1.16 and 2.0, and MODECKS release 1.0, all operating under the COS 1.16 and UNICOS 3.0 releases. Major changes include the addition of the MODECKS utility and the FILE directive. Miscellaneous technical and editorial changes have also been included.

I June 1988 - This reprint with revision brings the manual into agreement with UPDATE release 5.1, AUDPL releases 1.16 and 2.0, and MODECKS release 1.1, all operating under the COS 1.17 and UNICOS 4.0 releases. Major changes include the addition of several new options to the MODECKS utility. This reprint also includes miscellaneous technical and editorial changes.

J November 1989 - This reprint with revision brings the manual into agreement with UPDATE release 5.0 for COS. It adds information for using NUPDATE under COS and for the new sequence numbering scheme, and it describes the new COS listing extraction program, UPIC.

K November 1990 - This reprint with revision brings the manual into agreement with UPDATE 6.0 release for UNICOS. It adds new options to the NUPDATE command.

PREFACE

This manual describes UPDATE, a program from Cray Research, Inc. (CRI). UPDATE modifies, edits, and updates source language programs operating under the Cray Research operating systems UNICOS and COS on CRAY Y-MP†, CRAY X-MP EA†, and CRAY X-MP computer systems, and under UNICOS on CRAY-2 systems. UPDATE lets you manage and track software changes. UPDATE also allows repeated results and simplifies the integration of separately produced changes into one program.

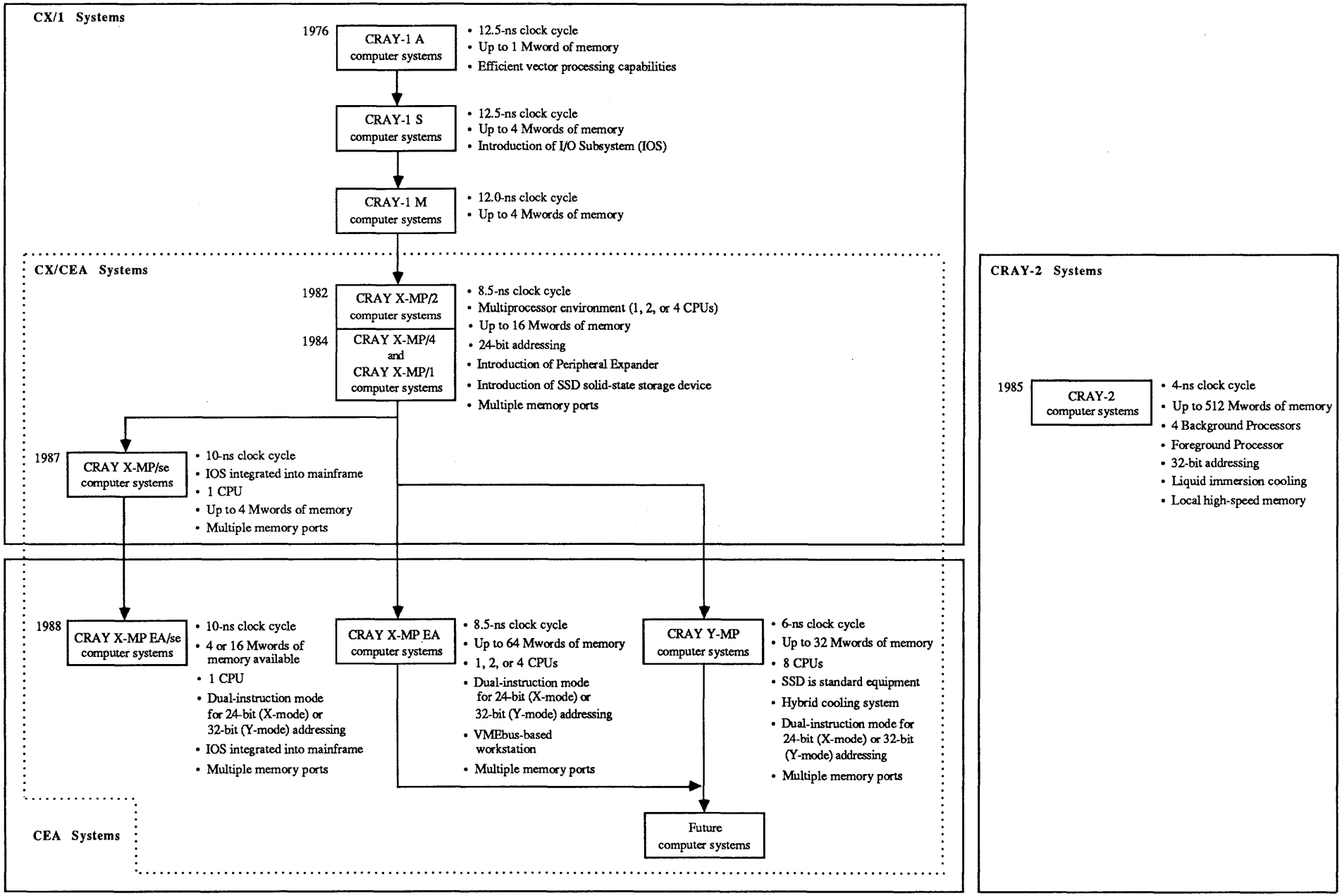
Readers should be familiar with the general features of COS or UNICOS; the manual does not teach the basics of either operating system.

The following CRI publications provide related information:

Publication Number	Description
SR-0009	Fortran (CFT) Reference Manual
SR-0011	COS Reference Manual
SR-0060	Pascal Reference Manual
SR-0066	Segment Loader (SEGLDR) and **ld** Reference Manual
SR-2007	CRAY-2 Fortran (CFT2) Reference Manual
SR-2011	UNICOS User Commands Reference Manual
SR-2024	Cray C Reference Manual (COS only)
SR-2074	Cray Standard C Programmer's Reference Manual (UNICOS only)
SG-2087	Cray Allegro CL User's Guide
SR-3014	Cray Ada Environment Reference Manual
SR-3071	CF77 Compiling System, Volume 1: Fortran Reference Manual

† In X-mode only (24-bit addressing)

Hardware Product Line



The following list defines architecture terms:

Term	Definition
CX/1 systems	This group includes all models of the CRAY X-MP and CRAY-1 computer systems. It is characterized by 24-bit addressing capabilities.
CEA systems	This group includes all models of the Extended Architecture (EA) series, which are the CRAY Y-MP and CRAY X-MP EA computer systems. It is characterized by 32-bit addressing capabilities.
CRAY-2 systems	This group includes all models of the CRAY-2 computer systems. It is characterized by 32-bit addressing capabilities, large common memories, and immersion cooling.
CX/CEA systems	This group designates all models of CRAY X-MP computer systems plus all models of the CRAY Y-MP and CRAY X-MP EA computer systems. It does not include CRAY-1 computer systems.
EAM bit (hardware)	In CX/1 systems, the EAM bit is the Enhanced Addressing Mode bit in the Flag register. When set, it sign-extends certain instructions for memory addressing in 8- and 16-Mword systems. In CEA systems, the EAM bit is the Extended Addressing Mode bit in the Flag register. It is set by the operating system to select either 24- or 32-bit addressing.
EMA feature (software)	In CX/1 systems, EMA is the Extended Memory Addressing feature for 8- or 16-Mword systems.
X-mode	This term refers to the 24-bit addressing mode in CEA systems. The operating systems select this mode with the EAM bit in the Exchange Package.
Y-mode	This term refers to the 32-bit addressing mode in CEA systems. The operating systems select this mode with the EAM bit in the Exchange Package.

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1. INTRODUCTION

UPDATE is a line-oriented text editor for maintaining programs in the form of source code, as well as other types of text data. UPDATE creates and modifies program libraries (PLs) and produces output that you can use as input to other programs, particularly compilers and assemblers.

UPDATE executes on all CRAY Y-MP†, CRAY X-MP EA†, and CRAY X-MP computer systems under control of COS or UNICOS, and under UNICOS on the CRAY-2 computer system. You can invoke UPDATE with the UPDATE COS control statement or UNICOS command line; both are described in section 2, Invoking UPDATE and NUPDATE.

NUPDATE is a derivative of UPDATE with improved functionality and performance. Unless otherwise noted, all UPDATE information also applies to NUPDATE. The principal differences are as follows:

- NUPDATE permits identifiers consisting of up to 240 characters; UPDATE identifiers are limited to 8 characters.
- NUPDATE does not suppport the COS CL= parameter and the UNICOS **-u** option. CL= and **-u** let you specify called common decks not found in the PL being processed.
- NUPDATE contains two additional directives, OLDSEQ and OLDPL, which provide compatibility with the UPDATE sequence number generation scheme used in UNICOS 4.0, COS 1.17, and earlier releases, and with the UPDATE PL format, respectively. When using a variable length PL, NUPDATE lets you have up to 500 characters per line while UPDATE limits you to 250.
- NUPDATE contains other options that apply only to UNICOS. See **nupdate**(1) in the UNICOS User Commands Reference Manual, publication SR-2011.
- NUPDATE also offers the following ID keywords:

ID Keyword	Description
%G%	Date the version was created; in the form *mm/dd/yy*.
%H%	Current date; in the form *mm/dd/yy*.

† In X-mode only

ID Keyword	Description
%I%	USM version identification string (VID) of the retrieved version.
%M%	Module (file) name.
%T%	Current time; in the form *hh*:*mm*:*ss*.
%V%	Time the version was created; in the form *hh*:*mm*:*ss*.
%Z%	A 4-character string @(#) that is used by the **what**(1) command to retrieve information on the file. (See the **what**(1) man page in the UNICOS User Commands Reference Manual, publication SR-2011, for more information.)

Three other products, AUDPL, MODECKS, and UPIC, are also described in this manual. AUDPL, the PL audit utility, provides information about UPDATE PLs. MODECKS compares a modified UPDATE deck and an original deck, and it produces a modification file reflecting the differences. UPIC extracts portions of program listings when you do not want to see the entire program. AUDPL, MODECKS, and UPIC are intended to be used in conjunction with UPDATE.

1.1 OVERVIEW

UPDATE performs three main functions: it can create a new PL, modify an existing PL, and extract source code from an existing PL. Figure 1-1 illustrates two of these functions, showing the data flow that occurs in creation and modification runs.

For a creation run, your input must include source decks, and it can include a source dataset from an earlier UPDATE run, modification sets, and input directives. Output from a creation run can include a new PL, listings, a compile dataset, and/or a source dataset.

For a modification run, your input must include a PL, and it can include new decks, modification sets, and input directives. Output from a modification run can be a selected listing, a compile dataset, source decks, and/or a new PL.

UPDATE also lets you extract source code from an existing PL without creating or modifying one. Examples of UPDATE's extracting capabilities are given in subsections 4.7, Extracting Decks for a Source Dataset, and 4.10, Extracting Decks for Compilation (No Source).

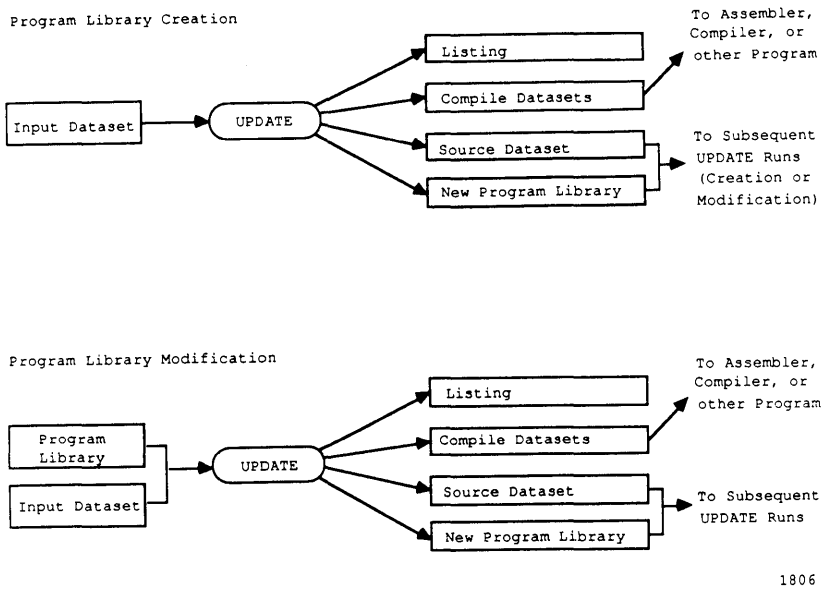

Figure 1-1. UPDATE Data Flow

1.2 CONVENTIONS

This manual uses the following conventions to describe statement and directive syntax:

Convention	Description
UPPERCASE	This identifies a COS command verb, and an UPDATE or AUDPL directive. With UPDATE 5.0, all UPDATE directives can be given in either uppercase or lowercase, but not in mixed case. This applies to both COS and UNICOS.
Bold	Bold identifies UNICOS command names, options, or file names.
Underscore	Underscoring specifies the accepted abbreviation of a verb or parameter.
Italic	Italic identifies generic terms representing the words or symbols to be supplied by the user; all variable entities are presented in italics.
[ ]	Brackets enclose optional portions of a command format.
Choice 1 Choice 2	Stacked items indicate two or more literal parameters when only one choice can be used.

dataset/file Though the terms *dataset* and *file* should be reserved for use with, respectively, COS or UNICOS, this manual occasionally uses them interchangeably for convenience.

. . . Ellipses indicate optional use of a preceding item one or more times in succession.

command(1) The designation (1) following a command name indicates that the command is documented in the UNICOS User Commands Reference Manual, publication SR-2011.

1.3 READER COMMENTS

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1.4 DEFINITIONS

This subsection presents brief definitions for terms used later in this manual. The terms *dataset* and *file* are used interchangeably in these definitions for convenience; strictly speaking, these terms should be reserved for use with, respectively, COS or UNICOS. Unless otherwise noted, these terms are defined in greater detail in subsections 1.4.1 through 1.4.7.

- A *deck* is a contiguous ordered set of lines that can be referenced with a single name.
- A *program library* (PL) is created by UPDATE and contains one or more decks. Under COS, a PL is a dataset, and under UNICOS, it is a file. (Subsection 1.5 discusses PLs.)
- A *source deck* includes all text and directives that were or will become a deck in a PL; it can be derived from a source dataset. A source deck can be input to or output from UPDATE.
- A *directive* is a command to UPDATE from the input or embedded in the PL.
- A *modification set* is a group of changes to be applied to existing decks in a PL.
- A *source dataset* is a file that is a current, edited copy of one or more source decks from a PL. UPDATE writes the source dataset. You can use decks from a source dataset as input to UPDATE.
- A *compile dataset* is produced by UPDATE for use as input to an assembler, compiler, or other program. Under COS, it is a dataset containing one or more files. Under UNICOS, it is one or more distinguishable files.
- An *input dataset* can include source decks, modification sets, and directives.
- A *listing dataset* is output by UPDATE; it contains messages and requested information for you to read. (See subsection 1.10, Listable Output.)

1.4.1 DECKS

A *deck* is a contiguous ordered set of lines that can be referenced with a single name. It can be a program, part of a program, or other data. It serves as input to UPDATE to become part of a PL. UPDATE supports two types of decks: regular and common.

- A *regular deck* begins with the DECK directive; it is placed in the PL (at one location) and in compile and source datasets.

- A *common deck* begins with the COMDECK directive; it is placed in the PL and in the source dataset, but you can copy its contents to any number of locations in the compile dataset. A common deck that is defined in one PL can be called from decks in another PL if the COS CL control statement parameter or the UNICOS **-u** command-line option is used. A common deck call can appear anywhere in a regular or common deck. (See subsection 3.3.3, CALL - Call Common Deck.) A common deck call is replaced by the text of the common deck during compile dataset generation.

1.4.2 SOURCE DECKS

A *source deck* includes all text and directives that will become a new deck in a PL, or lines and embedded directives from a single deck in the source dataset. It begins with a DECK or COMDECK directive and ends with the last line before the next DECK, COMDECK, IDENT, modification directive, or the end of input.

1.4.3 DIRECTIVES

Directives--that is, commands to UPDATE--are in the input to UPDATE or are embedded in the PL. The individual directives are described in section 3. The UPDATE directives are of the following types:

- *Modification* directives change a PL; they are entries to modification sets. The effects of modification directives are saved, and you can yank (undo) them.

- *Input edit* directives change a PL, but they are not saved and cannot be yanked.

- *Run option* directives do not change a PL, and they are not saved; most select I/O options for a run.

- *Compile dataset* directives determine the contents of compile datasets, and they are embedded in the PL.

- DECK and COMDECK directives define decks.

1.4.4 MODIFICATION SETS

A *modification set* is a group of UPDATE modification directives to be applied to existing decks in a PL in either a creation or modification run. You can use the INSERT, BEFORE, DELETE, and RESTORE directives in a modification set. Source decks, input edit directives, and run option directives can be in a modification set, but they are not associated with it. You can remove changes associated with a modification set from the PL, either temporarily or permanently, using the YANK, UNYANK, and PURGE directives.

A modification set begins with a modification identifier, specified by an IDENT directive. It ends with the next IDENT, DECK, or COMDECK directive, or the end of input.

1.4.5 SOURCE DATASETS

A *source dataset* is a file written by UPDATE that is a current, edited copy of one or more decks from a PL. You can use it as input to UPDATE to create a new PL or to add new decks and common decks to an existing PL. It consists of a single file of active text lines, compile dataset directives, and DECK and COMDECK directives from selected decks in the PL. See table 1-1 for the contents of a source dataset.

The DW parameter on the COS control statement or the **-w** option on the UNICOS command line determines the length of each line in the source dataset. If you specify the COS SQ or UNICOS **-o sq** option, you will also receive sequencing information.

Because the source dataset contains UPDATE directives, it is normally not used as input to language processors. (The source dataset always begins with a DECK or COMDECK directive.)

1.4.6 COMPILE DATASETS

A compile dataset contains one or more files of active text lines from selected decks in the PL. Compile dataset directives are not written to the compile dataset, but they are processed as the compile dataset is written. Common decks are expanded, conditional text directives are evaluated, and the dataset is broken into files by the WEOF, CWEOF, and FILE directives. See table 1-1 for the contents of a compile dataset.

The COS DW parameter, UNICOS **-w** option, or the WIDTH directive control the length of each line. Each text line is associated with an identifier and sequence number. The identifier is the name of the deck or common deck for an original line, or the name of the modification set that added the line. Under COS, sequence information appears in the compile dataset

by default. Under UNICOS, you must explicitly request sequence information. You will find the identifier and sequence number printed to the right of the text line, unless the PL has been identified as a variable-length record PL. In this case, no sequence information appears in the compile dataset. You can also turn off sequence information with the COS NS option, UNICOS **-o ns** option, or the NOSEQ directive.

1.4.7 INPUT DATASETS

An input dataset can include source decks, modification sets, and input directives. You can use a source dataset from one UPDATE run as an input dataset for a later UPDATE run. Specify an input dataset with the COS I parameter, UNICOS **-i** option, or the READ directive. Under COS, input datasets containing more than one file must be specified once for each file to be read.

1.5 PROGRAM LIBRARIES

A PL is a dataset (in COS) or a file (in UNICOS) containing one or more decks created by UPDATE. Each deck is specially formatted for use as input to future UPDATE runs. Following the last deck in a PL, UPDATE supplies a directory consisting of tables describing each deck, each modification set identifier, and the entire PL. (See figure 1-2.) These tables differ, depending on whether the PL has random or sequential organization. (See appendix C for information on PL formats.)

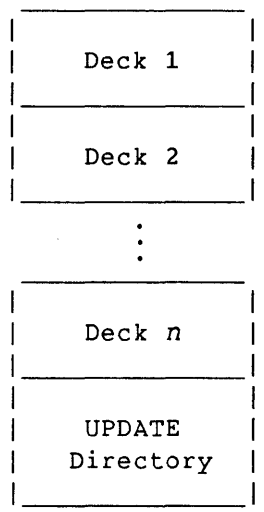


Figure 1-2. Program Library Sequence

A deck begins with a DECK or COMDECK directive; it contains lines of text and can contain compile dataset directives. UPDATE assigns an identifier and sequence number to each text line or directive. The identifier of an original line from the deck is the deck or common deck name; a line added later has as its identifier the name of the modification set that added it. The DECK or COMDECK directive has sequence number 1. UPDATE sequences the remaining lines in the deck, beginning with number 2. Lines added by modification sets begin with sequence number 1.

Deleted lines remain in the PL with an inactive status. A descriptor precedes each text line or directive in the PL, giving the line's identifier, sequence number, and a correction history recording modifications to the line.

1.5.1 PROGRAM LIBRARY RESTRICTIONS

The number of lines within one modification set or one deck cannot exceed 131,071. The number of identifiers (that is, modification set identifiers or deck names) in one PL must not exceed 16,383.

UPDATE cannot read a PL from a magnetic tape dataset.

1.5.2 CREATING A PROGRAM LIBRARY

Create a PL by supplying the following:

- An UPDATE control statement or command line
- UPDATE directives
- Input text

The input text for creation of a new PL consists of one or more source decks you have prepared, or the source dataset from an earlier UPDATE run. Modification sets can also be applied in a creation run. Designate a creation run by specifying P=0 on the COS UPDATE control statement, or by not specifying the UNICOS **-p** option on the command line (see section 2, Invoking UPDATE and NUPDATE, for details on the control statements).

The DECK and COMDECK directives specify whether a new deck is a regular deck or common deck. Other directives within the source decks affect the output listing, call common decks, or write COS end-of-file (EOF) records. (See subsection 3.1.4, Compile Dataset Directives.)

1.5.3 MODIFYING A PROGRAM LIBRARY

You can modify the PL by adding or purging decks or by adding or deleting (deactivating) lines from existing decks. You can apply modifications against an existing PL to produce either a new PL or a current compile or source dataset.

1.5.3.1 Procedure for modifying a PL

Modify a PL by supplying the following:

- An UPDATE control statement or command line directing the computer system to modify that PL
- UPDATE directives specifying the modification set identifier or the deck identifier, the lines to be deleted, and locations of insertions
- Any new lines to be added

Input for a modification run can include new decks or common decks, modification sets, input edit directives, and run option directives. When a PL has been modified, the newly generated PL is known as a *new PL*.

A modification set begins with an IDENT directive containing a modification set identifier; a new deck begins with a DECK directive containing a deck name. If you wish to insert text at a location specified in the directive, that text must immediately follow the directive. Decks can also contain certain directives such as CALL, CWEOF, and WEOF. (See subsection 3.1.4, Compile Dataset Directives, for a complete listing.)

Following a modification run, the new PL, if generated, consists of modified decks, an updated identifier table, and an updated PL information file. (See subsection C.2, Format 2, Random PL Structure, for details on the format.) The sequence of decks and tables in the new PL is the same as that of the old PL.

Directives can cause lines to be inserted or deleted from the PL. A deletion does not physically remove the line but deactivates it; that is, the line is logically removed and does not appear in compile or source output. UPDATE maintains a record of active and inactive lines (see subsection C.2, Format 2, Random PL Structure). If the line status bit indicates an inactive line, the line is effectively deleted until restored. If the line status is active, the line remains in the deck.

1.5.3.2 Processing PL modifications

UPDATE processes modifications in two passes:

- During the first pass, UPDATE scans the directives and new text and constructs tables for use during the second pass.

- During the second pass, UPDATE modifies each deck on a deck-by-deck basis, deleting lines and sequencing and identifying each new line according to its modification set identifier.

If you want to receive compile output from a modification run, UPDATE creates it during the second pass. At this time, calls for common decks are replaced with current common deck text of the common deck. The calls can be in the original decks, or you can insert them during a modification run. Other embedded directives are also executed at this time.

1.6 COMMON DECK PROGRAM LIBRARIES

Common decks defined with the COMDECK directive in one PL may be called from decks in other PLs. For documentation purposes, this manual labels the PL in which a common deck is defined as a *Common Deck Program Library*. Called common decks defined in PLs other than the one currently being processed are labeled *Externally Defined Common Decks*.

For UPDATE to resolve references to externally defined common decks, the COS CL parameter or UNICOS **-u** option must be used in the control statement (see section 2, Invoking UPDATE and NUPDATE). Externally defined common decks are processed only in a Read mode. You cannot modify them or specify them with the Q parameter or **-q** option or a COMPILE directive, and they do not appear in a source dataset or new PL. The externally defined common deck text is copied to the compile dataset.

1.7 UPDATE MODES

The UPDATE control statement specifies either Full, Quick, or Normal mode. The mode determines the contents of the compile dataset, the source dataset, and the new PL. (See table 1-1.)

Table 1-1. Dataset Contents for Full, Quick, and Normal Modes

Mode	Compile Dataset Contents	Source Dataset Contents	New PL Contents
Full	All decks and called common decks	All decks and all common decks defined in the PL being processed	All decks and all common decks defined in the PL being processed
Quick	Only decks specified by either COMPILE directives or the UPDATE Q parameter or **-q** option, and called common decks	Decks and common decks specified by COMPILE directives, and decks specified by the UPDATE Q parameter or **-q** option	Only decks specified by either COMPILE directives or the UPDATE Q parameter or **-q** option, and all common decks defined in the PL being processed
Normal	Decks specified by COMPILE directives, modified decks, and decks calling modified common decks	Decks and common decks specified by COMPILE directives, modified decks, and decks calling modified common decks	Same as Full mode

In Full mode (F or **-f**), UPDATE writes all active lines in the PL and externally defined common deck texts to the compile dataset. Only the active lines in a PL are written to the source dataset. The PL Identifier table determines the sequence, and no COMPILE directive is necessary.

In Quick mode, UPDATE writes decks specified with the Q parameter or **-q** option and decks specified by a COMPILE directive to the compile dataset or the source dataset, and to the new PL. You cannot name externally defined common decks with the Q parameter, **-q** option, or the COMPILE directive. The PL Identifier table determines the sequence unless the K or **-o k** option is used. Modifications to decks that you did not specify with the Q parameter or **-q** option or by a COMPILE directive are not processed.

In Normal mode (Full and Quick mode parameters omitted), UPDATE writes decks specified by COMPILE directives, modified decks, and decks calling modified common decks to compile or source datasets, and all decks are written to the new PL. Under UNICOS, the **-n** option, naming the new PL file name, must be used. You cannot name externally defined common decks with the COMPILE directive, and UPDATE does not write them to the new PL.

1.8 PROGRAM LIBRARY TYPES

UPDATE distinguishes two types of program libraries: regular and variable-length record formats.

Under COS, UPDATE stores fixed-length "cards" to the PL and writes fixed-length lines of text to the compile and source datasets. Under UNICOS, UPDATE writes fixed-length lines of text to the compile and source datasets. You can specify them with the DW parameter or **-w** option.

Variable-length record PLs store and write variable-length lines of text. You can create these PLs by specifying DW=* or **-w '*'** at the time the PL is created; however, you cannot create new PLs of one type from old PLs of the other type. Variable-length record PLs let you preserve the end of line locations in the original input text, instead of removing trailing blanks from the end of the line. The maximum line length is 256 characters.

Under COS, the storage space required for regular and variable-length record PLs is not significantly different, because blank compression is performed on all UPDATE PLs. Under UNICOS, trailing blanks are trimmed off of input datasets and PLs to save space, and the storage space required for regular and variable-length record PLs is not significantly different. If trailing blanks are significant, you must use a variable-length record format. If the PL is of variable-length record format, UPDATE does not write sequence information to the compile dataset.

1.9 ORGANIZING UPDATE INPUT

This subsection describes aspects of input to UPDATE that must be considered if you are to obtain correct output.

1.9.1 ASSOCIATIVITY OF INPUT

The compile and source files resulting from an UPDATE run will be the same whether input is processed in one UPDATE run or in several. That is, you can group modifications in different ways in a series of runs without affecting the result, as in the associative principle of mathematics. (This does not imply, however, that the order of modifications can be changed without affecting the result.) Directives EDIT, COPY, and DEFINE are exceptions to this principle. In addition, your results will be unpredictable if your input does not begin with an IDENT directive, or if you have used the MASTER directive but not at the beginning of each separate section of input. PURGEDK can follow modifications to the purged deck only if you declare those modifications.

1.9.2 OVERLAPPING MODIFICATIONS

UPDATE can handle modifications to text added earlier in the same UPDATE run, but overlapping or conflicting modifications generate caution and note messages. Messages about overlapping modifications are written to the listing or error datasets if the value given for the ML parameter or **-m** option is less than the default of 3. Caution messages indicate conflicts between directives; these conflicts occur when more than one directive inserts new text in the same place, and for implicit overlaps, when newly inserted text is deleted by a later modification set. Notes appear when a directive explicitly references a line added by an earlier modification set in the same UPDATE run.

1.9.3 DECLARED MODIFICATIONS

A modification declaration specifies the deck to be modified by subsequent directives and is required when the declared modifications option is specified (DC=ON on the COS control statement or the **-o dc** option specified in the UNICOS command line). For a modification declaration, you can use a DECLARE directive or the DC parameter on the IDENT directive. If modification declarations are required, one of these kinds of modification declarations must precede modification of a deck.

Modifications following the DECLARE directive affect only the specified deck or common deck. An UPDATE error is the result for each modification directive that affects any deck other than the declared deck.

If declared modifications are optional (DC=OFF or DC omitted on the COS control statement, or the **-o dc** option omitted from the UNICOS command line), DECLARE directives are optional and honored when they appear. Using an IDENT directive clears the previous modification declaration.

1.10 LISTABLE OUTPUT

UPDATE can produce a listing dataset and an error dataset, as specified on the UPDATE control statement. The error dataset contains only messages. The listing dataset contains these messages plus information requested by the control statement or command-line listing options.

Listable output is divided into pages. Under COS, the LPP parameter on the OPTION control statement controls the number of lines per page (see the COS Reference Manual, publication SR-0011). Under UNICOS, there is no page control.

1.10.1 PAGE HEADER LINES

Each page of output in the listing and error datasets contains two header lines with the following information:

- Job name (COS only)
- UPDATE revision level and compilation date
- Current date and time
- Page number for this UPDATE listing
- A description of the output on this page. For the input listing, this includes the name of the deck, common deck, or modification set being input. For the modification summary, this includes the name of the deck or common deck currently being processed.
- Date when the PL was created
- Name of the last identifier added to the PL

1.10.2 MESSAGES

Listing messages have five levels of severity: COMMENT, NOTE, CAUTION, WARNING, and ERROR. The COS ML parameter or UNICOS **-m** option specifies the highest level to be omitted from a listing or error dataset. The default is to write only error and warning messages. This parameter does not affect log file messages (**stderr** under UNICOS).

1.10.3 LISTING OPTIONS

The UPDATE control statement allows you the following set of options for listable output. Under UNICOS, your first option-argument must be preceded by the **-o** option and a space. Additional options-arguments must be separated by one space.

COS Option	UNICOS Option-argument	Description
CD	**cd**	Writes a list of decks contained in the compile dataset. All compile dataset directives (for example, CALL and WEOF) from those decks and any invoked common decks are also written to the listing dataset when you use this option.
ED	**ed**	Writes a summary to the listing dataset, divided according to decks and common decks, of all modifications to the listing dataset. ED (or **ed**) writes the affected line of text, and the name of the modification set that adds the change or is yanked or purged, to the listing dataset. Each line is accompanied by its identifier and sequence number and the type of change (INSERT, DELETE, RESTORE, or PURGE).
ID	**id**	Lists in the listing dataset all identifiers known at the end of the UPDATE run. A deck name is preceded by a single asterisk (*), a common deck by two asterisks (**), and a yanked identifier by a minus sign (-). This list does not include purged identifiers, because they are no longer known to UPDATE. Identifiers that have been unyanked are the same as identifiers that have never been yanked.
IF	**if**	Writes a list of defined names for the current UPDATE run and a conditional text summary to the listing dataset. The conditional text summary includes a list of all conditional text directives (IF, ELSEIF, ELSE, and ENDIF), along with the nesting level of the directive and the value of the conditional clause (TRUE, FALSE, or SKIP). The IF (or **if**) option also provides you with the number of text lines, including compile dataset directives, that were processed or skipped between each pair of directives.

COS Option	UNICOS Option-argument	Description
IN	**in**	Writes an echo of the input to UPDATE to the listing dataset. The input is divided according to decks, common decks, and modification sets.
UM	**um**	Writes to the listing and error datasets a list of modifications that remain unprocessed at the end of the UPDATE run, either because they refer to nonexistent lines or because they modify decks that were not specified when using Quick mode.
K	**k**	Orders all decks that are written to the compile dataset and to new PL datasets, as directed by the Q parameter values on the control statement and the COMPILE directives. This option is ignored in Full or Normal mode.

NOTE

If a modification set affects two or more decks and the K option is in effect, the sequence numbers of inserted lines can be inconsistent with sequencing that has occurred without the K option.

NA	**na**	Does not abort if directive errors or modification errors occur. All requested datasets are generated.
NR	**na**	Does not rewind the source dataset or compile dataset at the beginning or end of UPDATE execution.
NS	**ns**	Suppresses line sequence information in the source and compile datasets. SEQ and NOSEQ directives are ignored when this option is used. NS is ignored for variable-length record PLs.

OLDSEQ	**oldseq**	Assigns sequence numbers using the old scheme rather than the new (default). See subsection 3.2.1, Line Identification, for a description of the differences between the two. (Applies to NUPDATE only).
OS	**os**	Assigns new sequence numbers using the UPDATE 4.0 scheme
SQ	**sq**	Provides sequence numbers for source and compile output. The defaults are sequence numbers on the compile output and no sequence numbers on the source output.
UM	**um**	Writes unprocessed modifications to the listing dataset and/or the error dataset
SSQ	**ssq**	Provides sequence numbers for source output only, not compile output. (Applies to NUPDATE only).

2. INVOKING UPDATE AND NUPDATE

This section describes the COS control statements to invoke UPDATE and NUPDATE and the UNICOS command line to invoke UPDATE. (Section 1 describes the conventions used in the control statements.)

2.1 UPDATE CONTROL STATEMENT FOR COS

The COS UPDATE control statement loads the UPDATE program into the user field and begins execution. The UPDATE statement is read from the control statement file of a user job deck. Use the parameters on the UPDATE statement to specify the datasets to be used, the contents of the UPDATE listing, and other features of the run.

Format:

```
UPDATE[,P=pdn][,I=idn1:idn2:...:idnn][,C=cdn]
   [,CL=cln1:cln2:...:clnn][,DEF=def1:def2:...:defn][,N=ndn]
   [,L=ldn][,E=edn][,S=sdn][,*=m][,/=c][,DW=dw][,DC=dc][,ML=n]
    ,F
    ,Q[=d1:d2:...:dn]            [,options].
    ,Q='d1,d2,...,dj.dk,...,dn'
```

P=*pdn* Dataset name of the program library (PL)

If omitted or P, the input PL is $PL.
If P=*pdn*, the input PL is *pdn*.
If P=0, no PL is used; this is for only a creation run.

I=idn_1:idn_2:...:idn_n

Names of input datasets; these datasets contain the directives and text for the UPDATE run. UPDATE reads them in the order given. You can specify up to 64.

If I or omitted, the input dataset is the next file of $IN.

If I=*idn*, the input dataset is a dataset with the name *idn*.

If I=0, no input dataset is read (invalid for a creation run).

If I=idn_1:idn_2:...:idn_n, the first input dataset to be read is idn_1, the second is idn_2, and so on.

C=*cdn* Name of the compile dataset; decks that are determined by the UPDATE mode (F, Q, or Normal; see table 1-1) are written on the specified dataset.

If C is omitted, the compile output is written to $CPL. If C=*cdn*, the compile output is written to dataset *cdn*. If C=0, no compile dataset is generated.

CL=cln_1:cln_2:...:cln_n

Called common decks that cannot be found in the PL being processed are searched for in the common deck PLs (cln_n) specified on the CL parameter. The search order is the order in which the libraries are specified. No modifications can be made to a common deck PL, and externally defined common deck text is not written to the source dataset or to the new PL. The common deck text appears in the compile dataset. The maximum number of common deck libraries is 64.

DEF=def_1:def_2:...:def_n

The DEF parameter defines names to be used with an IF directive. You can use names consisting of up to 8 characters; if they are longer, only the first 8 characters are recognized. Defined names need not be different from deck names, common deck names, or modification identifiers, because they are known only in the UPDATE run being processed. You may define up to 64 names with the control statement DEF parameter.

N=*ndn* Name of the new PL dataset. The UPDATE mode determines the contents of the new PL (see table 1-1).

If omitted in a modification run, no new PL is written.

If omitted in a creation run, the new PL is written to $NPL.

If N, the new PL is written to $NPL.

If N=*ndn*, the new PL is *ndn*.

If N=0, no new PL is written.

L=*ldn* Name of the listing dataset; this dataset receives the UPDATE list output.

If omitted or L, the list output is written to $OUT.

If L=*ldn*, the list output is written to the dataset named *ldn*.

If L=0, no list output is generated.

E=*edn* Name of the error listing dataset; this dataset contains ERRORS, WARNINGS, CAUTIONS, NOTES, and COMMENTS as requested by the ML parameter.

If omitted or E, the output is written to $OUT.
If E=*edn*, the output is written to *edn*.
If E=0, errors are written only to the listing dataset.

NOTE

If E and L specify the same dataset, L is honored and E is set to 0.

S=*sdn* Source dataset name; the UPDATE mode determines the contents of this dataset (see table 1-1). You can use this dataset as the input for a subsequent creation run.

If omitted or S=0, no source output is generated.
If S=*sdn*, the source output is written to *sdn*.
If S, the source output is written to $SR.

*=*m* Master character; the first character of directives read from the input file or written to the source file. Invalid master characters are comma, period, colon, equal sign, and space. The keyword alone is invalid.

If omitted in a creation run, the master character for directives is *.

If omitted in a modification run, the master character is that used in the creation run for the PL.

If *=*m*, the master character for directives is *m*.

/=*c* Comment character; indicates a comment. The keyword alone is invalid.

If omitted, the comment character is /.
If /=*c*, the comment character is *c*.

DW=*dw* Data width value; the number of characters of data written to each line in the compile and source datasets. The *dw* range is 1 through 256.

If omitted, or if a DW with no value is specified in a creation run, columns 1 through 72 contain data; otherwise, columns 1 through *dw* contain data.

If DW=* in a creation run, variable-length records are written to the compile and source datasets.

In a modification run, if the PL was created with DW=*, only DW=*, DW, or no DW parameter is accepted, and UPDATE continues to process variable-length text lines for the PL. In a modification run, if no value for DW is specified, or DW is unspecified, columns 1 through *lastdw* contain data; *lastdw* is the DW value specified when the PL was written. If DW=*dw*, columns 1 through *dw* contain data.

The number of characters per line written to the new PL is a maximum of either *dw*, *pldw*, or 80; *pldw* is the number of characters per line in the existing regular PL. For variable-length record PLs, the same number of characters per line appears in the new PL as they did in the old PL.

DW=*dw*
(continued)

NOTE

For regular PLs, sequence information is provided in the source and compile datasets as follows:

When you omit the data width value, when DW is specified alone, or when you specify the data width value as *dw*, the following is true: *dw*+1 through *dw*+8 contain an identifier, right-justified with leading spaces; *dw*+9 contains a period; and *dw*+10 through *dw*+15 contain a sequence number, left-justified with trailing spaces.

When you specify the data width value as L*dw*, the entire sequencing field of the compile output is left-justified.

For variable-length record PLs, no sequence information appears in the compile dataset. Source dataset sequence information, if you request it, appears three spaces to the right of the end of the text line.

Sequence information appears by default in the compile dataset but must be requested in the source dataset.

DC=*dc* Declared modifications option. This ensures that modifications apply to the correct deck or common deck. Declaration of PL modifications may be required (see subsections 1.5.3, Modifying a Program Library, and 3.1.1, Modification Directives).

If DC is omitted or DC=OFF, the mod declaration is not required, but it is enforced if present.

If DC=ON or if DC stands alone, the mod declaration is required.

ML=*n* Message level: highest level of severity for UPDATE listing messages to be suppressed. For example, ML=2 allows CAUTION, WARNING, and ERROR messages to be printed to the listing or error datasets. The default, used when the parameter is omitted or the keyword alone is specified, is 3. (The ML parameter does not affect UPDATE log file messages.) The following levels are available:

Level	Severity	Description
1	COMMENT	Currently unused
2	NOTE	Information not related to errors
3	CAUTION	Possible error
4	WARNING	Probable error
5	ERROR	Fatal error

F, Q, or omitted
Full, Quick, or Normal UPDATE run. This determines the contents of the compile dataset, the source dataset, and the new PL (see table 1-1).

F Full UPDATE mode; all active lines are processed. The PL Identifier table determines the sequence. No COMPILE directive is necessary.

Q[=d_1:d_2:...:d_n]
Q='d_1,d_2,...,d_j.d_k,...,d_n'
Quick UPDATE mode. Decks that are specified with the Q parameter and decks specified by a COMPILE directive are written to the compile dataset and/or the source dataset, and to the new PL. You cannot name externally defined common decks with the Q parameter or the COMPILE directive. The PL Identifier Table determines the sequence unless the K option is used. Corrections to decks that are not specified with the Q parameter or by a COMPILE directive are not included.

In the first method shown, up to 64 decks can be specified. After all the input has been entered, unknown deck names are errors.

Q[=d_1:d_2:...:d_n]

Q='d_1,d_2,...,d_j.d_k,...,d_n'

(continued) In the second method shown, single decks are separated by commas, and ranges of decks are separated by periods. After all the input has been entered, unknown deck names are errors. The maximum size of the string used with the second method is 96 characters. The two methods cannot be combined.

omitted — Normal UPDATE mode. Decks specified by COMPILE directives, modified decks, and decks calling modified common decks are written to compile and/or source datasets. You cannot name externally defined common decks with the COMPILE directive, and they are not written to the source dataset.

options (keyword only) The following output options are available on the control statement. (See subsection 1.10.3, Listing Options, for a more detailed description of CD, ED, ID, IF, IN and UM.)

CD — Writes the generation directives for the compile dataset to *ldn*

ED — Writes the edited line summary to *ldn*

ID — Writes the identifier summary to *ldn*

IF — Writes a conditional text summary to *ldn*

IN — Lists the input to *ldn*

K — Orders all decks that are written to the compile dataset and to new PL datasets, as directed by the Q parameter values on the control statement and the COMPILE directives. This option is ignored in Full or Normal mode.

NOTE

If a modification set affects two or more decks and the K option is in effect, the sequence numbers of inserted lines can be inconsistent with sequencing that has occurred without the K option.

options (continued)	NA	Does not abort if directive errors or modification errors occur. All requested datasets are generated.
	NR	Does not rewind the source dataset or compile dataset at the beginning or end of UPDATE execution.
	NS	Suppresses line sequence information in the source and compile datasets. SEQ and NOSEQ directives are ignored when this option is used. NS is ignored for variable-length record PLs.
	OLDPL	Produces a PL in the old UPDATE format. (Applies only to NUPDATE).
	OS	Assigns new sequence numbers using the UPDATE 4.0 scheme. See subsection 3.2.1, Line Identification, for a description of the differences between the two.
	SQ	Provides sequence numbers for source and compile output. The defaults are sequence numbers on the compile output and no sequence numbers on the source output.
	UM	Writes unprocessed modifications to the listing dataset and/or the error dataset.
	SSQ	Provides sequence numbers for source output only, not compile output. (Applies only to NUPDATE).

2.1.1 EXAMPLES

Following are two examples illustrating the use of the COS control statement. Example 1 shows how a PL is created:

```
UPDATE,P=0,N=NEWPL,I=INPUT.
```

When P=0, no existing PL is specified, and the new PL is written to NEWPL. The input is read from INPUT. The compile output is written to $CPL; all decks are selected.

Example 2 shows how a PL can be modified:

```
UPDATE,P,I=MODS,Q=DECK3:DECK2:DECK4,K,NR,NA.
```

The parameters on this control statement indicate the following:

- P=$PL is implied.
- The input is read from MODS.

- The statement specifies Quick mode (using the Q parameter) with the K output option. If a single COMPILE directive is used (*COMPILE DECK1.DECK4), DECK1 through DECK4 are written to $CPL in the following order:

  DECK3
  DECK2
  DECK4
  DECK1

- UPDATE does not rewind $CPL before or after execution.

- If directive or modification errors occur, UPDATE does not abort.

2.2 NUPDATE CONTROL STATEMENT FOR COS

The COS NUPDATE control statement loads the NUPDATE program into the user field and begins execution. The NUPDATE statement is read from the control statement file of a user job deck. Use the parameters on the NUPDATE statement to specify the datasets to be used, the contents of the NUPDATE listing, and other features of the run.

Format:

```
NUPDATE[,P=pdn][,I=idn1:idn2:...:idnn][,C=cdn]
   [,DEF=def1:def2:...:defn][,N=ndn][,L=ldn][,E=edn][,S=sdn]
   [,*=m][,/=c][,DW=dw][,DC=dc][,ML=n]
    ,F
    ,Q='[d1],[d2],...,[dn]'      [,options].
    ,Q='[d1],[d2],...,[dj].[dk]'
```

P=*pdn* Dataset name of the program library (PL)

If omitted or P, the input PL is $PL.
If P=*pdn*, the input PL is *pdn*.
If P=0, no PL is used; this is for only a creation run.

I=idn_1:idn_2:...:idn_n
Names of input datasets; these datasets contain the directives and text for the NUPDATE run. NUPDATE reads them in the order given. You can specify up to 64.

I=idn_1:idn_2:...:idn_n
(continued) If I or omitted, the input dataset is the next file of $IN.

If I=*idn*, the input dataset is a dataset with the name *idn*.

If I=0, no input dataset is read (invalid for a creation run).

If I=idn_1:idn_2:...:idn_n, the first input dataset to be read is idn_1, the second is idn_2, and so on.

C=*cdn* Name of the compile dataset; decks that are determined by the NUPDATE mode (F, Q, or Normal; see table 1-1) are written on the specified dataset.

If C is omitted, the compile output is written to $CPL.
If C=*cdn*, the compile output is written to dataset *cdn*.
If C=0, no compile dataset is generated.

DEF=def_1:def_2:...:def_n
The DEF parameter defines names to be used with an IF directive. You can use names consisting of up to 240 characters; if they are longer, only the first 240 characters are recognized. Defined names need not be different from deck names, common deck names, or modification identifiers, because they are known only in the NUPDATE run being processed. You may define up to 64 names with the control statement DEF parameter.

N=*ndn* Name of the new PL dataset. The NUPDATE mode determines the contents of the new PL (see table 1-1).

If omitted in a modification run, no new PL is written.

If omitted in a creation run, the new PL is written to $NPL.

If N, the new PL is written to $NPL.

If N=*ndn*, the new PL is *ndn*.

If N=0, no new PL is written.

L=*ldn* Name of the listing dataset; this dataset receives the NUPDATE list output.

If omitted or L, the list output is written to $OUT.

L=*ldn* (continued)

If L=*ldn*, the list output is written to the dataset named *ldn*.

If L=0, no list output is generated.

E=*edn*

Name of the error listing dataset; this dataset contains ERRORS, WARNINGS, CAUTIONS, NOTES, and COMMENTS as requested by the ML parameter.

If omitted or E, the output is written to $OUT.
If E=*edn*, the output is written to *edn*.
If E=0, errors are written only to the listing dataset.

NOTE

If E and L specify the same dataset, L is honored and E is set to 0.

S=*sdn*

Source dataset name; the NUPDATE mode determines the contents of this dataset (see table 1-1). You can use this dataset as the input for a subsequent creation run.

If omitted or S=0, no source output is generated.
If S=*sdn*, the source output is written to *sdn*.
If S, the source output is written to $SR.

*=*m*

Master character; the first character of directives read from the input file or written to the source file. Invalid master characters are comma, period, colon, equal sign, and space. The keyword alone is invalid.

If omitted in a creation run, the master character for directives is *.

If omitted in a modification run, the master character is that used in the creation run for the PL.

If *=*m*, the master character for directives is *m*.

/=*c*

Comment character; indicates a comment. The keyword alone is invalid.

If omitted, the comment character is /.
If /=*c*, the comment character is *c*.

DW=*dw* Data width value; the number of characters of data written to each line in the compile and source datasets. The *dw* range is 1 through 256.

If omitted, or if a DW with no value is specified in a creation run, columns 1 through 72 contain data; otherwise, columns 1 through *dw* contain data.

If DW=* in a creation run, variable-length records are written to the compile and source datasets.

In a modification run, if the PL was created with DW=*, only DW=*, DW, or no DW parameter is accepted, and NUPDATE continues to process variable-length text lines for the PL. In a modification run, if no value for DW is specified, or DW is unspecified, columns 1 through *lastdw* contain data; *lastdw* is the DW value specified when the PL was written. If DW=*dw*, columns 1 through *dw* contain data.

The number of characters per line written to the new PL is a maximum of either *dw*, *pldw*, or 80; *pldw* is the number of characters per line in the existing regular PL. For variable-length record PLs, the same number of characters per line appears in the new PL as they did in the old PL.

NOTE

For regular PLs, sequence information is provided in the source and compile datasets, as follows:

When you omit the data width value, when DW is specified alone, or when you specify the data width value as *dw*, the following is true: *dw*+1 through *dw*+8 contain an identifier, right-justified with leading spaces; *dw*+9 contains a period; and *dw*+10 through *dw*+15 contain a sequence number, left-justified with trailing spaces.

When you specify the data width value as L*dw*, the entire sequencing field of the compile output is left-justified.

For variable-length record PLs, no sequence information appears in the compile dataset. Source dataset sequence information, if you request it, appears three spaces to the right of the end of the text line.

Sequence information appears by default in the compile dataset, but it must be requested in the source dataset.

DC=*dc* Declared modifications option. This parameter ensures that modifications apply to the correct deck or common deck. Declaration of PL modifications may be required (see subsections 1.5.3, Modifying a Program Library, and 3.1.1, Modification Directives).

If DC is omitted or DC=OFF, the mod declaration is not required, but it is enforced if present.

If DC=ON or if DC stands alone, the mod declaration is required.

ML=*n* Message level: highest level of severity for NUPDATE listing messages to be suppressed. For example, ML=2 allows CAUTION, WARNING, and ERROR messages to be printed to the listing or error datasets. If you omit the parameter or specify the keyword alone, the default is 3. (The ML parameter does not affect NUPDATE log file messages.) The following levels are available:

Level	Severity	Description
1	COMMENT	Currently unused
2	NOTE	Information not related to errors
3	CAUTION	Possible error
4	WARNING	Probable error
5	ERROR	Fatal error

F, Q, or omitted
Full, Quick, or Normal NUPDATE run. This parameter determines the contents of the compile dataset, the source dataset, and the new PL (see table 1-1).

F Full NUPDATE mode; all active lines are processed. The PL Identifier Table determines the sequence. No COMPILE directive is necessary.

Q='[d_1],[d_2],...,[d_n]'

Q='[d_1],[d_2],...,[d_j].[d_k]'

Quick NUPDATE mode. Decks that are specified with the Q parameter and decks specified by a COMPILE directive are written to the compile dataset and/or the source dataset, and to the new PL. You cannot name externally defined common decks with the Q parameter or the COMPILE directive. The PL Identifier Table determines the sequence unless the K option is used. Corrections to decks that are not specified with the Q parameter or by a COMPILE directive are not included.

In the first method shown, up to 64 decks can be specified. After all the input has been entered, unknown deck names are errors.

In the second method shown, single decks are separated by commas, and ranges of decks are separated by periods. After all the input has been entered, unknown deck names are errors. The maximum size of the string used with the second method is 96 characters. The two methods cannot be combined.

When using a deck name longer than 8 characters, the name must be enclosed in quotation marks. Further, if you use a deck name containing a period, you must enclose it in brackets. To do a quick NUPDATE run of deck LONGNAME.C, you would enter the following:

```
Q="[LONGNAME.C]"
```

To do a range of two decks with periods in them, you would enter the following:

```
Q="[LONGNAME1.C].[LONGNAME2.C]"
```

omitted

Normal NUPDATE mode. Decks specified by COMPILE directives, modified decks, and decks calling modified common decks are written to compile and/or source datasets. You cannot name externally defined common decks with the COMPILE directive, and they are not written to the source dataset.

options (keyword only)

The following output options are available on the control statement. (See subsection 1.10.3, Listing Options, for a more detailed description.)

CD Writes the generation directives for the compile dataset to *ldn*

ED Writes the edited line summary to *ldn*

ID Writes the identifier summary to *ldn*

IF Writes a conditional text summary to *ldn*

IN Lists the input to *ldn*

K Orders all decks that are written to the compile dataset and to new PL datasets, as directed by the Q parameter values on the control statement and the COMPILE directives. This option is ignored in Full or Normal mode.

NOTE

If a modification set affects two or more decks and the K option is in effect, the sequence numbers of inserted lines may be inconsistent with sequencing that has occurred without the K option.

NA Does not abort if directive errors or modification errors occur. All requested datasets are generated.

NR Does not rewind the source dataset or compile dataset at the beginning or end of NUPDATE execution

NS Suppresses line sequence information in the source and compile datasets. SEQ and NOSEQ directives are ignored when this option is used. NS is ignored for variable-length record PLs.

OLDPL Generates an UPDATE PL rather than an NUPDATE PL

OLDSEQ Assigns sequence numbers using the old scheme rather than the new (default). See subsection 3.2.1, Line Identification, for a description of the differences between the two.

options (continued)

SQ	Provides sequence numbers for source and compile output. The defaults are sequence numbers on the compile output and no sequence numbers on the source output.
UM	Writes unprocessed modifications to the listing dataset and/or the error dataset

2.3 UNICOS COMMAND LINE

Under UNICOS, the following command line executes UPDATE. Options on the UPDATE command line specify the PL file name, the compile file name, the new PL file name, and the source file name. UPDATE error messages go to **sterr**, and the listings go to **stdout**.

Format:

```
update -p pdf -i idf [-c cdf] [-a arguments] [-u udf]
   [-d ifp] [-n ndf] [-s sdf] [-x chr] [-y chr] [-w dwv]
   [-m n] [-f] [-q decks] [-o arguments]
```

-p *pdf* PL file name. This file is the input PL. You must include the file name; **-p** without an argument is invalid.

You can omit **-p** only for a creation run because, when **-p** is missing, the system reads no input PL.

You must specify either the **-p** or the **-i** option or both.

-i *idf* Input file name.

You must specify **-i** for creation runs. The **-i** option without an argument is invalid.

You can specify **-i** - (note the space between the *i* and the second hyphen) to have UPDATE read from standard input.

You must specify either the **-p** or the **-i** option or both.

-c *cdf* Compile file name. For multiple compile files, the file name is appended with a period and a single letter as defined by default (**.f**, **.s**, **.p**, and **.c**) or as specified by the **-a** option. The default suffixes are assigned in the following order:

.f - Fortran
.s - Assembly
.p - Pascal
.c - C

Do not allow the file name and the following period and suffix to exceed 14 characters (the input file name must not exceed 12 characters). The files must not exist because they will be created by UPDATE. If you specify the keyword alone, UPDATE looks for file names in the PL or input files with *FILE directives. See subsection 3.3.16, FILE, for further information.

-a *arguments*
arguments has the form *x1 x2 ... xN*, where each *argument* specifies the appended characters that are to be assigned to multiple compile files. Each character must be unique and must be one of the 62 alphanumeric characters. The **-a** option without an argument is invalid.

-u *udf* User common deck file name. Called common decks that cannot be found in the PL being processed are searched for in the common deck PLs (*udf*) specified on the **-u** option. The search order is the order in which the libraries are specified. No modifications can be made to a common deck PL, and externally defined common deck text is not written to the source file or to the new PL. The common deck text appears in the compile file. You can use a maximum of 20 common deck file names; UPDATE ignores any beyond that number. The **-u** option without an argument is invalid.

-d *ifp* Defines names to be used with an IF directive. Names can consist of up to 8 characters; if they are longer, UPDATE recognizes only the first 8 characters. If you specify more than one defined name, a space (rather than a comma or colon) is the separator character. Defined names need not be different from deck names, common deck names, or modification identifiers, because they are known only in the UPDATE run being processed. You can define up to 64 names with the command-line **-d** option; UPDATE ignores any beyond that number. The **-d** option without an argument is invalid.

-n *ndf* New PL file name. The UPDATE mode determines the contents of the new PL (see table 1-1). If omitted in a modification run or a creation run, no new PL is written. If you specify **-n** *ndf*, the new PL is written to file **ndf**. For a normal UPDATE run, the **-f** and **-q** options must be omitted. The specified file must be empty, because UPDATE will create a new PL in it. The **-n** option without an argument is invalid.

-s *sdf* Source file name. The UPDATE mode determines the contents of this file (see table 1-1). The source file can be the input for a subsequent creation run, but it must not exist on input, because it will be created by UPDATE. The **-s** option without an argument is invalid.

-x *chr* Master character; the first character of directives read from the input file or written to the source file. Invalid master characters are comma, period, colon, equal sign, and space. If the character is a metacharacter (for example, an *****), you must protect it in one of the following ways: *****, **"*"**, or **'*'**. The **-x** option without an argument is invalid.

If omitted in a creation run, the master character for directives is *****.

If omitted in a modification run, the master character is that used in the creation run for the PL.

-y *chr* Comment character that indicates a comment. If the character is a metacharacter (for example, *****), you must represent it in one of the following ways: *****, **"*"**, or **'*'**. The **-y** option without an argument is invalid.

If omitted in a creation run, the comment character is **/**.

If omitted in a modification run, the comment character is that used in the creation run for the PL.

-w *dwv* Data width value; the number of characters of data written to each line in the compile and source file. The *dwv* range is 1 through 256. The keyword alone is invalid.

If omitted in a creation run, columns 1 through 72 contain data; otherwise, columns 1 through *dwv* contain data.

-w *dwv*
(continued) If **-w '*'** is in a creation run, variable-length records are written to the compile and source files. (The asterisk is a special character and must be represented in one of the following ways: *****, **"*"**, or **'*'**).

In a modification run, if the PL was created with **-w '*'**, only **-w '*'** or no **-w** option is accepted, and UPDATE continues to process variable-length text lines for the PL.

In a modification run with **-w** unspecified, columns 1 through *lastdw* contain data; *lastdw* is the **-w** value specified when the PL was written. If you specify **-w** ***dwv***, columns 1 through *dwv* contain data.

The number of characters per line written to the new PL is the maximum of either the **dwv**, **pldw**, or 80; *pldw* is the number of characters per line in the existing regular PL. For variable-length record PLs, the same number of characters per line appears in the new PL as they did in the old PL.

NOTE

For regular PLs, sequence information is provided in the source and compile files as follows:

When you omit the data width value or specify it as *dwv*, *dwv*+1 through *dwv*+8 contain an identifier, right-justified with leading spaces; *dwv*+9 contains a period; and *dwv*+10 through *dwv*+15 contain a sequence number, left-justified with trailing spaces.

When you specify the data width value as L*dwv*, the entire sequencing field of the compile output is left-justified.

For variable-length record PLs, no sequence information appears in the compile dataset. Source dataset sequence information, if you request it, appears three spaces to the right of the end of the text line.

Under UNICOS, sequence information does not appear by default in either the source or compile files; you must request it.

-m *n* Message level: highest level of severity for UPDATE listing messages to be suppressed. For example, **-m** 2 allows CAUTION, WARNING, and ERROR messages to be printed to **stdout**. When **-m** is omitted, the default is 3. The **-m** option without an argument is invalid. The following levels are available:

Level	Severity	Description
1	COMMENT	Currently unused
2	NOTE	Information not related to errors
3	CAUTION	Possible error
4	WARNING	Probable error
5	ERROR	Fatal error

-f, -q *decks*

Full, Quick, or Normal UPDATE run. This determines the compile file contents, the source file, and the new PL contents (see table 1-1).

-f Full UPDATE mode; all active lines are processed. The PL Identifier Table determines the sequence. No COMPILE directive is necessary. The **-f** option must be used without an argument.

-q $qf_1,qf_2,...qf_n$

-q'$d_1,d_2,...,d_j.d_k,...,d_n$'

Quick UPDATE mode. Decks that you specify with the **-q** option and decks specified by a COMPILE directive are written to the compile file and/or the source file, and to the new PL. These decks must be in the same case as they appear in the PL--whether uppercase, lowercase, or mixed. You cannot specify externally defined common decks with the **-q** option or the COMPILE directive. The PL Identifier table determines the sequence unless you employ the **k** option-argument. Corrections to decks that are not specified with the **-q** option or by a COMPILE directive are not included.

In the first method shown, you can specify up to 100 decks. After all the input has been entered, unknown deck names are errors. The **-q** option without an argument is invalid.

-q $qf_1,qf_2,...qf_n$

-q'$d_1,d_2,...,d_j.d_k,...,d_n$'

(continued) In the second method shown, single decks are separated by commas, and ranges of decks are separated by periods. After all the input has been entered, unknown deck names are errors. The maximum size of the string used with the second method is 96 characters. The two methods cannot be combined.

omitted Normal UPDATE mode. Decks specified by COMPILE directives, modified decks, and decks calling modified common decks are written to compile and/or source files. You cannot specify externally defined common decks with the COMPILE directive, and they are not written to the source file.

-o *arguments*

The following output *arguments* are available in the command line. Each *argument* must be separated by a space. (See subsection 1.10.3, Listing Options, for a detailed description.)

cd Writes the generation directives for the compile file to **stdout**

dc Declared modifications option. This argument ensures that modifications apply to the correct deck or common deck. Declaration of PL modifications may be required (see section 1 and subsection 3.3.17, on the IDENT directive).

ed Writes the edited line summary to **stdout**

id Writes the identifier summary to **stdout**

if Writes a conditional text summary to **stdout**

in Lists the input to **stdout**

k Orders all decks that are written to the compile file as directed by the **-q** option values on the command line and the COMPILE directives. This argument is ignored in Full and Normal modes.

-o *arguments*
(continued)

NOTE

If a modification set affects two or more decks and the **k** argument is in effect, the sequence numbers of inserted lines can be inconsistent with sequencing that has occurred without the **k** argument.

na Does not abort if directive errors or modification errors occur. All requested files are generated.

ns Suppresses line sequence information in the compile files. SEQ and NOSEQ directives are ignored when this argument is used. The **ns** argument has no effect on the source file output and is ignored for variable-length record PLs.

op Generates an UPDATE PL rather than an NUPDATE PL.

os Assigns sequence numbers using the old scheme rather than the new (default). See subsection 3.2.1, Line Identification, for a description of the differences between the two.

sq Provides sequence numbers for source and compile output. The default is no sequence numbers. For an example of the output, see subsection 4.17.1, Create a New PL from an Input File.

um Writes unprocessed modifications to **stdout**

2.3.1 EXAMPLES

Following are two examples illustrating the use of the UNICOS command line. Example 1 shows how a PL is created:

```
update -n newpl -i input -c cplfile
```

The omitted **-p** option indicates that there is no existing PL. The new PL is written to file **newpl** and the input is read from **input**. The compile output is written to **cplfile.f**; all decks are selected.

Example 2 shows how a PL can be modified:

```
update -p ./plname -i mods -q DECK3,DECK2,DECK4 -o k na -c cplfile
```

The parameters indicate the following:

- The PL file is **plname** in the current working directory.
- The input is read from the **mods** file in the current directory.
- Quick mode with the **k** output option-argument. If you use a single COMPILE directive (*COMPILE DECK1.DECK4), DECK1 through DECK4 are written to the compile file (-c **cplfile**) in the following order:

  DECK3
  DECK2
  DECK4
  DECK1

- Because of the **na** option-argument, UPDATE does not abort if directive or modification errors occur.
- The compile output is written to **cplfile.f**.

3. UPDATE DIRECTIVES

UPDATE tasks are specified by a set of directives that usually occupy a file of the input dataset, but they can reside on one or more separate datasets.

This section first describes five general categories of UPDATE directives, and then gives the general format and rules for using them. Subsection 3.3 describes the directives in alphabetical order. In this manual, * is used as the master character for directive descriptions (see subsections 2.1 and 2.2 for descriptions of master characters in COS and UNICOS, respectively). See section 1 to review the conventions this manual uses regarding UPDATE directives.

With UPDATE release versions 5.0 and higher, you can issue UPDATE directives in uppercase or lowercase. You cannot, however, issue the directives in mixed case. For example, both of the following are valid:

```
*INSERT
*insert
```

But using mixed case, as follows, is not valid:

```
*Insert
```

3.1 CATEGORIES OF UPDATE DIRECTIVES

The UPDATE directives are grouped into five categories:

- Modification directives
- Input edit directives
- Run option directives
- Compile dataset directives
- Deck definition directives

See figure 3-1 for a summary grouping of all the UPDATE directives.

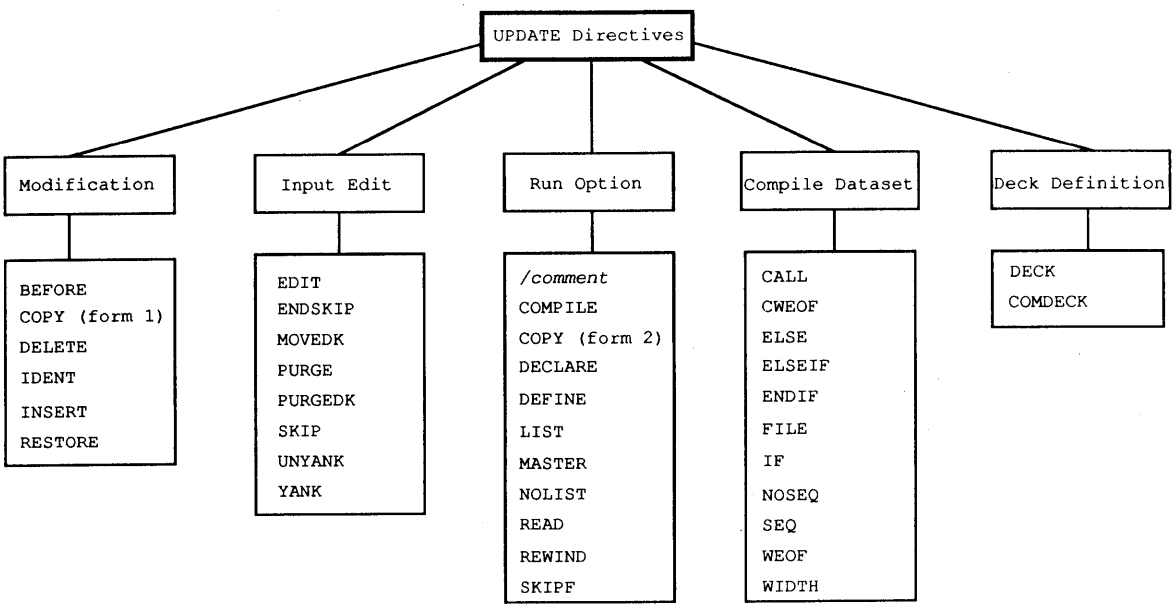


Figure 3-1. UPDATE Directives

3.1.1 MODIFICATION DIRECTIVES

Modification directives modify text in the program library (PL) by adding new lines or changing the active status of existing lines. The changes made by these directives are associated with a modification set, and these are the only changes that a YANK, UNYANK, or PURGE directive will affect. The directives in this category are as follows:

- BEFORE
- COPY (form 1)
- DELETE
- IDENT
- INSERT
- RESTORE

The COPY directive has two forms. Form 1 copies text from a section of the PL to the input stream; and the added text is associated with a modification set if the COPY directive follows an insertion directive (BEFORE, DELETE, INSERT, or RESTORE). Form 2 is a run option directive, described in subsection 3.1.3, Run Option Directives. If a COPY directive follows a DECK or COMDECK directive, the new text is associated with that deck or common deck, but not with a modification set.

3.1.2 INPUT EDIT DIRECTIVES

Input edit directives make changes to a PL dealing with previous modifications and the order of decks. They are processed in the UPDATE run in which they are input, they are not saved in the PL, and they are not associated with a modification set. Directives in this category are as follows:

- EDIT
- ENDSKIP
- MOVEDK
- PURGE
- PURGEDK
- SKIP
- UNYANK
- YANK

3.1.3 RUN OPTION DIRECTIVES

Run option directives are processed in the UPDATE run in which they are input. They do not change the PL, they are not saved in the PL, and they are not associated with a modification set. Most run option directives specify input or output options. The comment is also included in this group. Directives in this category are as follows:

- */comment*
- COMPILE
- COPY (form 2)
- DECLARE
- DEFINE
- LIST
- MASTER
- NOLIST
- READ
- REWIND (applicable only under COS)
- SKIPF (applicable only under COS)
- UNDEF (applicable with NUPDATE)

Form 2 of the COPY directive in this group copies text from the PL to a dataset specified by the user.

3.1.4 COMPILE DATASET DIRECTIVES

Compile dataset directives determine the contents and format of the compile dataset. These directives are embedded in the PL as lines that can be added or deleted just the same as text lines. The compile dataset directives are as follows:

- CALL
- CWEOF
- ELSE
- ELSEIF
- ENDIF
- FILE
- IF
- NOSEQ
- SEQ
- WEOF
- WIDTH

3.1.5 DECK DEFINITION DIRECTIVES

The DECK and COMDECK directives specify whether a new deck is a regular or common deck. These two directives do not fit the categories described in the previous paragraphs. They insert new text into the PL and so are modification directives, but they are not associated with a modification set. DECK and COMDECK directives are stored in the PL. Unlike the compile dataset directives, you cannot delete them like text, and you cannot insert text before them.

3.2 DIRECTIVE FORMAT

A directive has the following syntax:

md,p_1,p_2,p_3,... *comment*

m	Master character (an asterisk [*] in this manual)
d	Directive name or abbreviated name (shown only in uppercase in this manual)
p_i	Parameter, dependent on directive
comment	Optional comment

The first comma can be replaced by one or more spaces. If you use a comment, you must precede it with one or more spaces.

The underlined format of the directives specifies the abbreviation of the directive. With UPDATE 5.0, directives and abbreviations can be either uppercase or lowercase, but not mixed case. Parameters in brackets are optional.

3.2.1 LINE IDENTIFICATION

Each modification set and each deck (or common deck) has a unique identifier. This identifier is the name from the corresponding DECK, COMDECK, or IDENT directive.

The sequence number for a line from the original deck is derived from the line's position in the deck. New lines inserted by a modification set are sequenced in the order in which they will appear in the deck (which is not necessarily the same order in which they appeared in the input dataset).

A given line is uniquely referred to by *id.seq; id* is the deck or modification set identifier name, and *seq* is the line sequence number.

Once a deck (or common deck) or modification set becomes a part of a new PL, *id.seq* is permanent.

Unless you select the *old* sequence number generation scheme by specifying the **-o os** or OLDPL option on the UPDATE command line or control statement, the *new* scheme is used.

The new numbering scheme assigns sequence numbers in the order that the directives are read from the mods file. The old system assigns numbers in the order that the directives are processed.

In the following example, MOD.2 will appear before MOD.1 using the new scheme, but MOD.1 will precede MOD.2 under the old scheme:

```
*IDENT MOD
*I DECK.2
   line2
:
:
*I DECK.1
   line1
```

The text files generated from this example, under both the old scheme and the new scheme, would appear as follows:

Old	New
DECK.1	DECK.1
MOD.1	MOD.2
:	:
:	:
DECK.2	DECK.2
MOD.2	MOD.1

Which scheme you use could become important if you do subsequent updates to these insertions.

3.2.2 IDENTIFIER NAMES

Each identifier (deck, common deck, defined names, or modification set name) is a 1- to 8-character name assigned when the identifier is first used. Names cannot include commas, periods, blanks, colons, or equal signs, but they can include any other character in the ASCII code range of 41_8 through 176_8 (see appendix A, Character Set).

On some directives, you can specify names as an inclusive range. When you specify a range of names, the parameter consists of the first identifier name in the range, a period, and the final identifier in the range.

Format:

deckname$_{first}$.*deckname*$_{last}$

Do not confuse periods as used in the preceding format line with periods that separate line sequence numbers from deck identifiers or from modification set identifiers (as described in subsection 3.2.1, Line Identification). The DELETE, RESTORE, and COPY directives require a comma to separate names that define a range in order to avoid ambiguity about the periods used for line sequence numbers.

3.2.3 DIRECTIVE FORMAT EXAMPLES

Examples of UPDATE directive syntax follow.

Syntax	Description
*BEFORE,X.23	The default master character (*) is used; line 23 of X is specified.
*EDIT DECK1.DECK2	The range from DECK1 through DECK2 is specified.
@D X.76,Y.79	The range from line 76 of X through line 79 of Y is specified; @ is the master character.
$/COMMENT	The master character is $, and / is the comment character.
$$COMMENT	The $ is both the master and comment character.

3.3 DIRECTIVES

The set of directives that UPDATE recognizes follows. In this manual, * is used as the master character for directive descriptions (see subsections 2.1 and 2.2 for descriptions of master characters in COS and UNICOS, respectively).

3.3.1 / - COMMENT

A comment, indicated by the comment character, is copied to the list output.

Format:

```
 _____________
|             |
| */comment   |
|_____________|
```

/ Default comment character; any other comment character is specified on the UPDATE control statement.

3.3.2 BEFORE - INSERT BEFORE A LINE

BEFORE indicates that lines immediately following it are to be inserted before the line specified.

Format:

```
 ___________________
|                   |
| *BEFORE id.seq    |
|___________________|
```

id Deck or modification set identifier name

seq Line sequence number

3.3.3 CALL - CALL COMMON DECK

CALL indicates the location in which the specified common deck is to be placed when the compile dataset is generated. The combination of common decks and CALL directives lets you maintain a single copy of common text and be assured that the most current copy is always used in a deck that calls it.

You can also call common decks defined in a PL other than the one currently being processed if you use the COS CL parameter or UNICOS **-u** option. By doing so, you can maintain text that is common to more than one PL in one location. A common deck can contain CALL directives for other common decks but must not contain a CALL for itself. Indirect recursion is also prohibited; that is, if common deck A calls common deck B, common deck B is not allowed to call common deck A. The CALL directive is embedded in a deck, common deck, or input text, and it is assigned a sequence number accordingly.

Format:

```
*CALL cmdk
```

cmdk Common deck name

3.3.4 COMDECK - INTRODUCE A COMMON DECK

COMDECK introduces a common deck. Lines up to the next DECK, COMDECK, IDENT, INSERT, DELETE, BEFORE, RESTORE, or end of input compose the common deck. Other directives are interpreted but do not terminate the common deck.

The COMDECK directive is the first line of the common deck and is assigned sequence number 1.

Format:

```
*COMDECK cmdk[,NOPROP]
```

cmdk Common deck name

NOPROP No propagation parameter. If you specify NOPROP, this parameter indicates to UPDATE decks calling this deck that they are not to be automatically considered as modified whenever this common deck is modified. If you omit NOPROP, and the common deck is modified, all decks containing CALLS for this common deck are also considered modified.

3.3.5 COMPILE - SPECIFY COMPILE OR SOURCE DATASETS

COMPILE specifies the contents of the compile and/or source datasets. In selecting decks for compile output, you need not specify called common decks. Externally defined common decks cannot be specified. Generating source output requires all desired common decks to be specified.

COMPILE directives can occur anywhere in the input, but they must not refer to unknown decks--such as decks introduced later in the same run or, of course, misspellings.

Parameter order is significant only when the optional COS K parameter or UNICOS **-k** option is selected. Parameter order then specifies deck order for the compile and new PL datasets. The decks are otherwise written in the order in which they appear in the Identifier Table.

Format:

```
*COMPILE p1[,p2,...,pj.pk,...,pn]
```

p_i Single deck name or a common deck name

$p_j.p_k$ Range of deck names and/or common deck names

3.3.6 COPY - COPY TEXT

COPY has two forms for performing two different functions.

Form 1 copies text from the old PL for insertion into the new PL, as if it were in the input stream. In this form, COPY must be used with an insertion directive (INSERT, BEFORE, RESTORE, or DELETE) or be included in a new deck or common deck. Text is copied before any modifications are applied, so you can use this form of COPY to move text from one PL location to another if lines are deleted from their original location.

Form 2 copies text from the old PL into a separate dataset, which is specified on the directive. You can also add sequence information to the copied text if you use the SEQ keyword. The line length is the same as that for the source dataset.

Under UNICOS, **dn** can be a path name. COPY opens but does not remove the file. If **dn** exists, COPY appends information onto the end of it, and does not re-create it; otherwise, it creates file **dn**.

NOTE

Text copied for the COPY directive is from the old PL and does not include any modifications from the current UPDATE run.

Formats:

*COPY $p,id_1.seq_1,id_2.seq_2$	(form 1)
*COPY $p,id_1.seq_1,id_2.seq_2,dn$[,SEQ]	(form 2)

p	Name of the deck or common deck from which text is to be copied
id_i	Deck name or modification set identifier name
seq_i	Line sequence number
$id_1.seq_1$	First line in text range
$id_2.seq_2$	Last line in text range

NOTE

The starting and ending line have no default values; that is, COPY *p* with no line numbers specified is invalid.

dn Under COS, the name of the dataset to which text is to be copied. Under UNICOS, the file name to which text is to be copied. This cannot be a file name already being used by UPDATE, as specified on the control statement.

SEQ Specified if sequence information is to be added to the text or copied to the dataset

3.3.7 CWEOF - CONDITIONALLY WRITE END-OF-FILE

Under COS, CWEOF directs UPDATE to write an end-of-file (EOF) to the compile dataset if the compile dataset was not positioned after an EOF or at the beginning of data. Under UNICOS, it directs UPDATE to close one compile file and open a different one if the file is not at the beginning of data. The new compile file has the same compile file name as the previous compile file, but it is appended with a period and character suffix, as described in subsection 2.2 (UNICOS **-c** and **-a** options).

CWEOF is embedded in a deck, common deck, or input text, and it is assigned an identifier and a sequence number. The CWEOF directive is ignored if you request no compile output. It is also ignored if you specify the **-c** option with no argument.

Format:

```
 _________
|         |
| *CWEOF  |
|_________|
```

3.3.8 DECK - INTRODUCE A DECK

DECK introduces a new deck; it is the first line in the deck and has sequence number 1. The deck is composed of lines up to the next DECK, COMDECK, IDENT, INSERT, DELETE, BEFORE, RESTORE, or end of input. Input edit directives and run option directives are interpreted but do not terminate the deck. The new deck is ordered within the new PL following existing decks, common decks, and new common decks. Decks can contain embedded directives (for example, CALL, CWEOF, or WEOF).

Format:

```
 _____________
|             |
| *DECK deck  |
|_____________|
```

deck New deck name

3.3.9 DECLARE - DECLARE DECK FOR MODIFICATIONS

DECLARE requires that subsequent modifications be applied to the specified deck. This is one of two methods of declaring modifications (see subsection 1.9.3, Declared Modifications).

Format:

```
 _____________
|             |
| *DECLARE p  |
|_____________|
```

p Deck or common deck name

3.3.10 DEFINE - DEFINE NAMES

DEFINE defines a name (1 to 8 characters in length) to be used by an IF directive. Names declared with this directive do not need to be unique from deck or common deck names or modification set identifiers. Defined names are known only in the run in which they are defined; they are not stored in the PL. However, under UNICOS the default is the literal name **UNICOS.**

If you are running UNICOS and are using an UPDATE version released prior to 6.0, use the **-d** option to undefine UNICOS as the default. This does not apply to *DEFINE.

Format:

```
 ___________________________
|                           |
| *DEFINE n1[,n2,...,nn]    |
|___________________________|
```

n_i Defined name

If you are using NUPDATE, specify **-d** *new_define_name*, -U UNICOS, or *UNDEF UNICOS to undefine the default.

3.3.11 DELETE - DELETE LINES

DELETE lets you delete (deactivate) lines or ranges of lines and, optionally, replace them with lines appearing after the DELETE directive.

The DELETE directive copies a deleted line to the new PL. Though the line retains its identification, it is flagged as inactive and is not included in compile and source output. A deletion range must not cross a deck boundary.

Formats:

*DELETE $id_1.seq_1,id_2.seq_2$	(range delete)
*DELETE $id_1.seq_1,seq_2$	(range delete, short form)
*DELETE $id_1.seq_1$	(single line delete)

id_i Deck or modification set identifier name

seq_i Line sequence number

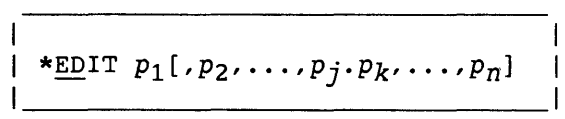
3.3.12 EDIT - EDIT DECKS

EDIT removes both deleted lines and lines made inactive by a YANK directive from the specified decks. When using the EDIT directive, you cannot recover removed lines from the PL. EDIT performs no resequencing. UPDATE edits only those decks noted explicitly on the EDIT directive.

NOTE

EDIT removes all lines that are inactive after all modifications in the current UPDATE run have been applied; this includes lines deleted in modifications that follow the EDIT directive in the input. EDIT does not remove lines in ranges that are restored by modifications following EDIT in the input.

Format:



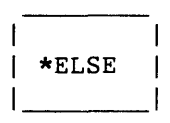
p_i Single deck or common deck

$p_j.p_k$ Range of decks and/or common decks

3.3.13 ELSE - REVERSE CONDITION

ELSE reverses the condition from the previous IF or ELSEIF directive (unless the previous IF or ELSEIF has been skipped), to determine whether the text following it is written to the compile dataset. You cannot use ELSE without an IF. You can only use one ELSE with an IF, and ELSE must follow all ELSEIFs associated with that IF.

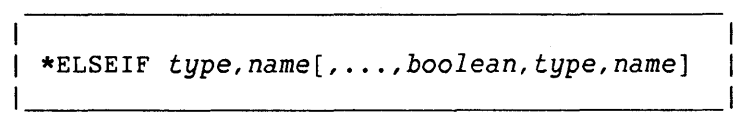
Format:



3.3.14 ELSEIF - TEST CONDITION

ELSEIF specifies a condition for evaluation when no previous condition in the same IF group was true. If the condition is evaluated as true, ELSEIF writes the text following the directive to the compile dataset, and skips the text following all further ELSEIF and ELSE directives in this IF group. If the condition is false or is not evaluated, it ignores all directives up to the next IF, ELSEIF, ELSE, or ENDIF. ELSEIF must have a matching IF, and it cannot follow ELSE; otherwise, an error message is issued.

Format:



type Type of conditional name, either DECK, IDENT, or DEF. If DECK, the name must be a deck or common deck name; if IDENT, the name must be a modification set identifier; and if DEF, the name must have been introduced with the DEFINE directive, or the DEF parameter or **-d** option. A minus sign before the type negates the condition.

name A deck or common deck name, modification set identifier, or defined name, depending on the value of *type*. Each clause of the condition is true if a name of the proper type is known or, when negated, if the name is unknown.

boolean A logical operator: AND, OR, or XOR. AND has precedence over OR and is evaluated first. OR has precedence over XOR.

3.3.15 ENDIF - END CONDITIONAL TEXT

ENDIF ends a conditional text range and an IF group. Each ENDIF must have a matching IF; otherwise, you will get an error message.

Format:

```
 _________
|         |
| *ENDIF  |
|_________|
```

3.3.16 FILE - CLOSE FILE (UNICOS ONLY)

Under UNICOS, FILE directs UPDATE to close the current compile file, if there is one, and open a new one.

FILE is embedded in a deck or input text, and it is assigned an identifier and a sequence number. If you specify the **-c** option alone on the command line, UPDATE looks for file names in the PL or input files with *FILE directives. If you do specify a compile file on the **-c** option, or if you do not request a compile file, UPDATE ignores the FILE directive. If used, a FILE directive must be found in every deck processed before any code is written out. UPDATE aborts if it does not find one.

Under COS, FILE is accepted as a directive, but it has no function and is ignored.

Format:

```
*FILE path
```

path A UNICOS path and file name to be opened. All directories in the path must exist and be accessible by the caller.

3.3.17 IDENT - IDENTIFY MODIFICATION SET

IDENT provides the modification set identifier that is to be associated with all of the changes in a modification set. IDENT is the first line in a modification set. When you are generating no new PL, IDENT is optional; the default identifier is *.NOID.*.

Format:

```
*IDENT [ident][,U=u1:u2:u3:...:un][,K=k1:k2:k3:...:kn][,DC=p]
```

ident Modification set identifier

U=u_i Unknown modification identifier; specifies an identifier dependency. This dependency is met if UPDATE cannot find any of the specified identifiers in its list of identifiers in the PL or among identifiers added earlier in the same UPDATE run. An identifier is unknown if it is not the name of a deck, common deck, or modification set that you already added to the PL.

K=k_i Known modification identifiers; specifies a known identifier dependency. The dependency is met if UPDATE finds all the specified identifiers in its list of identifiers that are already in the PL or were added earlier in the same UPDATE run.

DC=*p* Deck or common deck declared to contain lines referenced by subsequent modifications (see section 1). If all dependencies are met, *p* must be known to UPDATE. DC=. is equivalent to omitting the DC parameter.

The number of dependencies is limited only by what fits on the directive line. If not all dependencies are met, UPDATE skips all input up to the following IDENT directive or end of input, and the modification set identifier remains unknown. UPDATE writes a count of skipped IDENTs to the log file, and writes a warning to the listing and error datasets for each skipped IDENT.

Another way of writing U and K arguments is to include U= or K= for each argument, as follows:

U=u_1,U=u_2,...K=k_1,K=k_2...

The following line provides an example:

```
*IDENT MOD84,K=MOD83,U=MOD85
```

This directive assigns identifier MOD84 to the modification set. UPDATE processes the modification set only if MOD83 is known and MOD85 is unknown.

3.3.18 IF - BEGIN CONDITIONAL TEXT

IF begins a conditional text range and gives the condition under which the range is written to the compile dataset. IF is the beginning of an IF group, which can include ELSEIF and ELSE directives and must end with an ENDIF directive. You can nest IF groups to any level.

If the condition is true, the text following the directive is written to the compile dataset, and the text following all ELSEIF and ELSE directives in the IF group is skipped. If the condition is false, all directives up to the next ELSEIF, ELSE, or ENDIF in the IF group are ignored. Skipped text and directives are written to the new PL and to the source dataset but not to the source dataset.

Format:

```
*IF type,name[,...,boolean,type,name]
```

type Type of conditional name: either DECK, IDENT, or DEF. If DECK, the name must be a deck or common deck name; if IDENT, the name must be a modification set identifier; if DEF, you must have introduced the name with the DEFINE directive, or the DEF parameter or **-d** option. A minus sign before the type negates the condition.

name Deck or common deck name, modification set identifier, or defined name, depending on the value of *type*. Each condition is true if a name of the proper type is known; a negated condition is true if the name is unknown.

boolean A logical operator: AND, OR, or XOR. AND has precedence over OR and is evaluated first; OR has precedence over XOR. The number of clauses is limited only by the length of the directive line.

3.3.19 INSERT - INSERT AFTER A LINE

INSERT indicates that the lines immediately following are to be inserted after the line specified.

Format:

```
 _________________
|                 |
| *INSERT id.seq  |
|_________________|
```

id Deck or modification set identifier name

seq Line sequence number

3.3.20 LIST AND NOLIST - RESUME OR STOP LISTING

LIST and NOLIST resume the listing or stop the listing, respectively, of lines in the input stream. These directives can occur anywhere in the input, and they control the input listing, but they are otherwise ignored.

The L=0 COS UPDATE statement parameter overrides the LIST directive. The NOLIST directive overrides the COS UPDATE control statement option IN.

Formats:

```
 __________
|          |
| *LIST    |
|          |
| *NOLIST  |
|__________|
```

3.3.21 MASTER - CHANGE INPUT MASTER CHARACTER

MASTER changes the master character for directives in the input. Directives stored in the PL use an unprintable code for the master character and are not affected by this directive. It also does not affect the master character for directives written to the source file.

Format:

```
*MASTER m
```

m New master character for directives in the input dataset(s)

3.3.22 MOVEDK - MOVE A DECK

MOVEDK causes UPDATE to move an entire deck from its present location to a point immediately following a specified destination deck. The sequencing information within the moved deck remains unchanged. The moved deck resides at the indicated point immediately after UPDATE has successfully processed this directive.

Format:

```
*MOVEDK dk1: dk2
        dk1: .
```

dk_1 Deck or common deck to be moved

dk_2 Destination deck or common deck; the new position of dk_1 is immediately after dk_2.

. Specifies beginning of the PL

3.3.23 PURGE - REMOVE MODIFICATION SET

PURGE removes all text added in a modification set, restores all lines deleted by that set, and deletes all lines restored by it. PURGE starts with the last modification set listed, working in reverse order. PURGE is similar to YANK, but its effects are permanent; the affected lines and the identifier name are not written to the new PL. You can only purge modification sets added with a version of UPDATE from the COS 1.12 release or later.

Format (the two final periods are not ellipses):

```
*PURGE id1[,id2,...,idj.idk,...,idn..]
```

id_i Modification set identifier

$id_j.id_k$ Inclusive range of modification set identifiers

$id_n..$ Identifier id_n and all identifiers introduced after id_n

3.3.24 PURGEDK - REMOVE DECK

PURGEDK permanently removes the deck from the PL.

Format:

```
*PURGEDK dk
```

dk Name of deck or common deck to be removed

3.3.25 READ - READ ALTERNATIVE INPUT

READ causes UPDATE to begin reading input from the specified dataset starting at its current position. An end-of-file on an input dataset causes UPDATE to resume reading from the previous dataset. READ directives can appear anywhere, but they must not be recursive. There is a limit of 20 levels of files that can be read.

Format:

```
*READ dn
```

dn Name of dataset. (Under UNICOS, it can be a directory path and file name, or just the file name when in the current directory.)

3.3.26 RESTORE - REACTIVATE LINES

RESTORE can add new text and restore (reactivate) lines or ranges of lines that have previously been deleted. The optional new text appears on lines immediately following RESTORE and is inserted following the reactivated line(s). A RESTORE range cannot cross a deck boundary.

Formats:

*RESTORE $id_1.seq_1,id_2.seq_2$	(range restore)
*RESTORE $id_1.seq_1,seq_2$	(range restore, short form)
*RESTORE $id_1.seq_1$	(single line restore)

id_i Deck or modification set identifier name

seq_i Line sequence numbers

3.3.27 REWIND - REWIND LOCAL DATASET

REWIND (applicable only under COS) rewinds a local dataset so that the dataset is repositioned at its initial point. If the dataset is already at its initial point, this directive has no effect.

Format:

```
 _____________
|             |
| *REWIND dn  |
|_____________|
```

dn Name of dataset to be rewound

3.3.28 SEQ AND NOSEQ - START OR STOP SEQUENCE NUMBER WRITING

SEQ and NOSEQ begin writing and stop writing, respectively, sequence numbers to the compile dataset. The compile dataset output contains *dw* data columns per record without sequence numbers or *dw*+15 with sequence numbers. The DW parameter or **-w** option and the WIDTH directive determine the value of *dw*. The SEQ and NOSEQ directives are embedded in a deck, common deck, or input text, and they are assigned a sequence number. The SEQ and NOSEQ directives are ignored if you have not requested compile output, or if you have specified the NS control statement option (or the **ns** option-argument under UNICOS). These directives have no effect on variable-length record PLs.

Formats:

```
 _________
|         |
| *SEQ    |
|         |
| *NOSEQ  |
|_________|
```

3.3.29 SKIP AND ENDSKIP - CONDITIONALLY SKIP A BLOCK OF DIRECTIVES

SKIP and ENDSKIP delimit a block of directives that are to be skipped or not skipped, depending on the conditions that you specified on the SKIP directive. You can nest SKIPs, but each SKIP must have a matching ENDSKIP. If an outer SKIP condition is true, SKIPs nested within that block and all other text and directives are skipped. You must associate SKIPs with a *KNOWN* and/or *UNKNOWN* identifier condition. Unconditional SKIPS result in an UPDATE error.

Format:

```
*SKIP [K=k1:k2:k3:...:kn][,U=u1:u2:u3:.:un]
  conditional directives, text
  *ENDSKIP
```

K=k_i Known modification identifiers; specifies a known identifier dependency. The dependency is met if UPDATE finds all of the specified identifiers in its list of PL identifiers (deck names, common deck names, and previously added modification identifiers).

U=u_i Unknown modification identifiers; specifies an unknown identifier dependency. This dependency is met if UPDATE cannot find any of the specified identifiers in its list of PL identifiers.

The number of dependencies is limited only by what will fit on the directive line.

Another way of writing K and U arguments is to indicate K= or U= for each argument, shown as follows:

K=k_1,K=k_2,...,U=u_1,U=u_2,...

3.3.30 SKIPF - SKIP DATASET FILES

SKIPF (applicable only under COS) skips one or more files in a local dataset.

Format:

```
 _________________
|                 |
| *SKIPF dn[,n]   |
|_________________|
```

dn Name of dataset in which to skip a file

n Number of files to skip; default is 1.

3.3.31 WEOF - WRITE END-OF-FILE

Under COS, WEOF causes UPDATE to write an end-of-file to the compile dataset. Under UNICOS, WEOF directs UPDATE to close one compile file and open a different compile file. The new compile file has the same compile directory path and file name as the previous compile file, but it is appended with a period and character suffix, as described in subsection 2.2 (UNICOS Command Line, **-c** and **-a** options).

UPDATE embeds WEOF in a deck, common deck, or input text, and assigns it a sequence number. WEOF is ignored if you have not requested compile output. It is also ignored if you use the **-c** option with no argument.

Format:

```
 ________
|        |
| *WEOF  |
|________|
```

3.3.32 WIDTH - CHANGE LINE WIDTH IN COMPILE DATASET

WIDTH changes the number of data characters written to each line in the compile dataset.

Until a WIDTH directive is encountered in the PL, the data width you specified with the COS DW parameter, UNICOS **-w** option, or its default is used. The WIDTH directive is ignored if you have requested no compile output, or if a variable-length record PL is being processed.

WIDTH does not affect the number of characters stored for each line in the PL or written to the source dataset. If the value given with the WIDTH directive is greater than the number of characters stored in the PL, each line written to the compile dataset is padded with blanks. If the number is less, each line is truncated at the right.

Format:

```
 _____________
|             |
| *WIDTH dw   |
|_____________|
```

dw Data width; the number of characters of data written to each line in the compile dataset. Columns *dw*+1 through *dw*+15 contain spaces and sequencing information.

3.3.33 YANK AND UNYANK - DELETE OR RESTORE DECKS AND MODIFICATION SETS

YANK temporarily deletes (deactivates) a deck, common deck, or modification set from a PL, but only if the entity to be yanked or unyanked has been created by a version of UPDATE that supported the YANK directive. YANK deactivates all lines in a deck or common deck whether they are original to the deck or added later by a modification set.

UNYANK restores (activates) a deck, common deck, or modification set previously deactivated.

YANK and UNYANK start with the last modification set listed, and they work in reverse order. You can place both directives anywhere in the input. They can be within a modification set started by an IDENT directive, although they are not associated with any modification set.

Formats (the two final periods are not ellipses):

```
*YANK id1[,id2,...,idj.idk,...,idn..]

*UNYANK id1[,id2,...,idj.idk,...,idn..]
```

id_i	Deck, common deck, or modification set identifier name
$id_j.id_k$	Inclusive range of identifiers
$id_n..$	Identifier id_n and all identifiers introduced after id_n

4. EXAMPLES

This section presents examples of UPDATE operating under COS and UNICOS. See subsection 1.4, Definitions, for UPDATE definitions, and review subsection 1.2 on the conventions used in this manual.

4.1 CREATING A PROGRAM LIBRARY (PL)

The examples in this subsection show how to create a PL and a compile file. Examples are also presented to cover reading input from an alternate dataset, creating in the Full UPDATE mode, and calling common decks into user programs.

4.1.1 PL CREATION

This example shows the creation of PL **PRLIB1**. The PL consists of two decks: deck ABC and common deck XYZ. The input file used in the examples follows:

```
*DK ABC
deck ABC
*CDK XYZ
comdeck XYZ
```

COS JCL:

The P=0 entry indicates that there is no existing PL; therefore, the default input file, $IN, is used. The default parameters $IN, $CPL, and $NPL files are assumed (see subsection 2.1, COS Control Statement).

```
UPDATE,P=0.
SAVE,DN=$NPL,PDN=PRLIB1.
```

UNICOS command:

The absence of the **-p** option indicates that there is no existing PL, and that this is a creation run. The input file is **infile1**.

```
update -n prlib1 -i infile1 -c cplfile
cft cplfile.f
segldr cplfile.o
cp infile mod2
```

4.1.2 CREATING A PL AND A COMPILE FILE

This example creates PL **PRLIB1**, and a compile file, which consists of deck ABC. The input file used in this example is as follows:

```
*DK ABC
deck ABC
*CDK XYZ
comdeck XYZ
*C ABC
```

COS JCL:

The default compile dataset ($CPL) is used, and input is read from $IN.

```
UPDATE,P=0.
SAVE,DN=$NPL,PDN=PRLIB1.
CFT,I=$CPL.
```

UNICOS command:

The compile file is indicated as **cplfile**. By default, an **.f** extension is appended to indicate the compile file name. See subsection 2.2, UNICOS Command Line (option **-c**), for detailed information. UPDATE reads input from **infile**.

```
update -n prlib1 -i infile -c cplfile
cft cplfile.f
```

4.1.3 READING INPUT FROM AN ALTERNATE DATASET

In this example, PL **PRLIB3** is created from input that is read from both the regular input file and an alternate dataset. Dataset DS1 (or UNICOS file **source/s3**) is a previously created source dataset, which can contain any number of decks. The contents of the regular input file are as follows:

```
*READ DS1
*DK XYZ
deck XYZ
```

COS JCL:

```
ACCESS,DN=DS1.
UPDATE,P=0.
SAVE,DN=$NPL,PDN=PRLIB3.
```

UNICOS command:

The contents of the regular input file (**infile**) are as follows:

```
*READ source/s3
*DK XYZ
deck XYZ

update -n prlib3 -i infile -c cplfile
```

4.1.4 FULL UPDATE MODE

When creating a new PL, you can make UPDATE processing more efficient if you request Full mode processing. In this example, PL **PRLIB4** is created with two regular decks and two common decks. The contents of the input file are as follows:

```
*CDK CA
common deck CA
*CDK CB
common deck CB
*DK A
deck A
*DK B
deck B
```

COS JCL:

The F parameter indicates that Full mode processing should be used.

```
UPDATE,P=0,N,F.
SAVE,DN=$NPL,PDN=PRLIB4.
```

UNICOS command:

The -f option indicates that Full mode processing should be used.

```
update -i infile -n prlib4 -f -c cplfile
```

4.1.5 CALLING COMMON DECK INTO A USER PROGRAM

This example shows how you can call a common deck into a user program. The common input file consists of the following:

```
*COMDECK    COMxx
                .
                .
                .

*DECK       TEMP
            IDENT TSTPROG
                .
                .
                .
*CALL       COMxx
                .
                .
                .
            END
```

COS JCL:

```
UPDATE,I,P=0.
CAL,I=$CPL.
SEGLDR,GO.
```

UNICOS command:

The compile file is an assembly language program; therefore, it requires an ".s" appended to it by using the **-a** option.

```
update -i infile -n prlib5 -c cplfile -a s
as cplfile.s
segldr cplfile.o
```

The load command (**segldr**) has no defaults; that is, you must specify the files to be loaded, or there will be no output. With CRAY X-MP computer systems, file names to be loaded must end in **.o**.

4.2 MODIFYING A PROGRAM LIBRARY

The examples in this subsection show how to generate a modified PL and how to test a modification set.

4.2.1 GENERATING A MODIFIED PL

The sample job that follows performs three functions:

- First, the job updates a previously generated library.
- Next, it creates a compile dataset containing decks A through C and any common decks they call.
- Finally, it generates an updated version of the PL.

The input file for this example is as follows:

```
*ID MOD1                        Modification set named MOD1
*D A.15,A.20                    Replaces lines 15 through 20 of deck A
                                with new text lines
text lines

*I B.119                        Inserts lines after line 119 of
                                deck B
text lines
*DK C                           Introduces new deck
deck C
*C A.C                          Writes decks A through C and any common
                                decks they call to compile dataset
```

COS JCL:

The highest edition number of **PRLIB2** is accessed. The *C directive determines the compile dataset ($CPL) contents. This library is saved as the next edition of permanent dataset **PRLIB2**.

```
ACCESS,DN=$PL,PDN=PRLIB2.
UPDATE,N.
SAVE,DN=$NPL,PDN=PRLIB2.        Saves as next higher edition number
```

UNICOS command:

Under UNICOS, the new version of **prlib2** is in file name **prlib3**.

```
update -p prlib2 -n prlib3 -i infile -c cplfile
```

4.2.2 TESTING A MODIFICATION SET

The following job tests modification set MOD2. The changes are not permanently incorporated into the library; that is, no new PL is generated and saved. Under COS, the UPDATE list options are turned off. Under UNICOS, the listings go to **stdout**. The *C directive determines the contents of the compile dataset. The input file used in the examples is as follows:

```
*ID MOD2
*D MOD1.2                    Replaces line 2 of MOD1 modifications
text lines
*B C.3                       Inserts lines before line 3 of deck C
text lines
*C A.C                       Writes decks A, B, and C and any common
                             decks they call to compile dataset
                             COMPILE under COS, and cplfile.f
                             under UNICOS
```

COS JCL:

```
ACCESS,DN=$PL,PDN=PRLIB2.    Accesses highest edition number
UPDATE,L=0,C=COMPILE,F.
CFT,I=COMPILE.
SEGLDR,GO.
REWIND,DN=$IN.
COPYF,I=$IN,O=MOD2.
REWIND,DN=MOD2.
SAVE,DN=MOD2.                Saves modification set MOD2
```

UNICOS command:

```
update -p prlib2 -c cplfile -i infile -f
```

4.3 GENERATING AND USING COMMON DECK PROGRAM LIBRARIES

The following examples show how to generate a common deck PL, a PL that calls external common decks, and how to modify the PL consisting of the external common decks.

4.3.1 GENERATING A PL WITH COMMON DECKS

The following job generates a PL that contains common deck definitions that are accessed later by other PLs. The input file used in this example is as follows:

```
*COMDECK COM1
com1 text
*COMDECK COM2
com2 text
```

COS JCL:

```
UPDATE,P=0,N=COMPL.
SAVE,DN=COMPL.
```

UNICOS command:

```
update -n compl -i infile
```

4.3.2 GENERATING A PL WITH EXTERNAL COMMON DECKS

The following job creates a PL containing decks that call externally defined common decks from PL **COMPL**. The input file used in the examples is as follows:

```
*DECK D1
D1 text
*CALL COM1
D1 text
*DECK D2
D2 text
*CALL PLCOM
D2 text
*COMDECK PLCOM
PLCOM text
*CALL COM2
```

COS JCL:

```
ACCESS,DN=COMPL.
UPDATE,P=0,N=PL1,CL=COMPL.
SAVE,DN=PL1.
```

UNICOS command:

```
update -n pl1 -u compl -i infile -c cplfile
```

4.3.3 MODIFYING A PL WITH EXTERNAL COMMON DECKS

The following job modifies the PL generated in the last example. The input file used in the examples is as follows:

```
*ID MOD,DC=D2
*D D2.3
new text to be inserted
```

COS JCL:

```
ACCESS,DN=COMPL.
ACCESS,DN=PL1.
UPDATE,P=PL1,N=PL2,CL=COMPL.
SAVE,DN=PL2.
```

UNICOS command:

```
update -p pl1 -n pl2 -u compl -i infile -c cplfile
```

4.4 READ FROM ALTERNATIVE DATASETS

The following job reads from alternate datasets MOD2 and DECK (**mod2** and **deck**) as well as the regular input file. The input file for this example is as follows:

```
*READ MOD2 (mod2)              Dataset MOD2 contains modification set
                               MOD2 from the previous example
*READ DECK (deck)              Contents of dataset DECK:
                                   *DK D
                                   deck D
                                   *CDK CC
                                   common deck CC
*D C.12,C.16                   Deletes lines 12 through 16 of deck C
*B B.17                        Inserts lines before line 17 in
                               deck B
text lines
*CDK CD
common deck CD
```

COS JCL:

The Q parameter on the control statement determines the compile dataset contents.

```
ACCESS,DN=MOD2,PDN=MOD2.
ACCESS,DN=DECK,PDN=DECK.
ACCESS,DN=$PL,PDN=PRLIB1.          Accesses latest edition number
UPDATE,Q=A:B:C:D,N.
CAL,I=$CPL.
SEGLDR,GO.
SAVE,DN=$NPL,PDN=PRLIB1.           Saves next higher edition
```

UNICOS command:

The **-q** option on the UPDATE command line determines the compile dataset contents. The **-a** parameter identifies the compile file contents as assembly language and appends character ***s*** (**cplfile.s**). The compile file is then input to the assembler (as).

```
update -q A,B,C,D -c cplfile -p pllib -n npllib -i infile -a s
as cplfile.s                       Assembles compile file
segldr cplfile.o                   Loads program
```

You must follow the load command (**segldr**) with the name of the program or file to be loaded, or there will be no output. With CRAY X-MP computer systems, the name of the program or file to be loaded must end in **.o**.

4.5 INPUT DATASET NOT $IN

The following example is specific to COS. The job adds to the PL a common deck named CE and replaces lines of code in an existing deck with a call to CE. The input stream is on dataset UPIN. No compile dataset is generated.

```
ACCESS,DN=$PL,PDN=MYUPDATEPL.
ACCESS,DN=UPIN,PDN=MYUPIN.
UPDATE,N,C=0,I=UPIN.
SAVE,DN=$NPL,PDN=MYUPDATEPL.
```

The following are contents of directives dataset MYUPIN:

```
*ID MOD3
*CDK CE                          Adds common deck CE
common deck CE
*D C.25,C.463
*CALL CE                         CALL directive inserted as text in
                                 place of deleted lines
```

4.6 MULTIPLE INPUT DATASETS

The following jobs use multiple input datasets. All of the runs have the equivalent effect on the PL.

4.6.1 COS INPUT DATASET

You can use both the COS I control statement parameter and the READ directive to specify multiple input datasets. They can be used alone or together.

1.
```
ACCESS,DN=MOD1.
ACCESS,DN=MOD2.
ACCESS,DN=MOD3.
UPDATE,P=PL,I=MOD1:MOD2:MOD3.
```

2.
```
ACCESS,DN=MOD1.
ACCESS,DN=MOD2.
ACCESS,DN=MOD3.
UPDATE,P=PL.
/EOF
*READ MOD1
*READ MOD2
*READ MOD3
```

3.
```
ACCESS,DN=MOD1.
ACCESS,DN=MOD2.
ACCESS,DN=MOD3.
UPDATE,P=PL,I=$IN:MOD3.
/EOF
*READ MOD1
*READ MOD2
```

4.6.2 UNICOS INPUT DATASET

You can use both the UNICOS **-i** command line option and the READ directive to specify multiple input datasets.

1.
```
cat mod1 mod2 mod3 | update -p plfile -i - -n nplfile -c cplfile
```

2.
```
update -p plfile -i infile2 -n nplfile -c cplfile
  infile2 contains:          *READ /usr/dir/mod1
                             *READ /usr/dir/mod2
                             *READ /usr/dir/mod3
```

3.
```
cat infile3 /usr/dir/mod3 | update -p plfile -i - -n nplfile -c
cplfile
  infile3 contains:          *READ /usr/dir/mod1
                             *READ /usr/dir/mod2
```

4.7 EXTRACTING DECKS FOR A SOURCE DATASET

The following job does not change the PL but extracts selected decks, and any decks they call, for compilation and inclusion on a source dataset. The master character is specified as $, which was used when PL FPL was created.

COS JCL:

```
ACCESS,DN=FPL.
UPDATE,P=FPL,*=$,S,Q=SQRT:TANH:SIN,I=0.
CAL,I=$CPL.
SAVE,DN=$SR,PDN=SRFILE.
```

UNICOS command:

The source file is indicated as **srfile.** You must specify the PL master character within single quotation marks because it is a UNICOS special character. The assembly language compile file is created in **cplfile.s.**

```
update -p plfile -x '$' -s srfile -q SQRT,TANH,SIN -c cplfile -a s
as cplfile.s
```

4.8 GENERATING A COMPILE DATASET FROM SOURCE

UPDATE generates compile datasets from source datasets without writing a PL. This can be useful when you need common information in several places and UPDATE is being used to expand common decks.

COS JCL:

```
ACCESS,DN=SRFILE.
UPDATE,I=SRFILE,C=COMPILE,P=0,N=0,F.
SAVE,DN=COMPILE.
```

UNICOS command:

Because the **-n** option is omitted, no new PL is written.

```
update -i srfile -c cplfile -f
```

4.9 COMPILE DATASET FROM A COMMON DECK

A common deck is not written to the compile dataset unless it is called by a deck written to the compile dataset. If you add a dummy deck that calls the common deck, you can include a common deck that would not otherwise be written to the compile dataset. The input file used in this example is as follows:

```
*DECK DUMMY
*CALL COM01
```

COS JCL:

```
ACCESS,DN=MYPL.
UPDATE,P=MYPL,C=COM01,F.
SAVE,DN=COM01.
```

UNICOS command:

```
update -p mypl -c com01 -i infile -f
```

4.10 EXTRACTING DECKS FOR COMPILATION (NO SOURCE)

Generating a compile dataset that is a subset of the PL decks is a common task. You do not need an input dataset. The following jobs show the easiest way to perform the task. Decks ST, CT, E, J, and S are written to the compile file ($CPL with COS, or **cplfile.s** with UNICOS) and are ready for assembly.

COS JCL:

```
ACCESS,DN=$PL,PDN=COSPL.
UPDATE,I=0,Q=ST:CT:E:J:S.
          .
          .
          .
```

UNICOS command:

```
update -p plfile -q ST,CT,E,J,S -c cplfile -a s
```

4.11 USING *FILE (UNICOS ONLY)

FILE can operate only under UNICOS. The following example shows the use of FILE. Note that on the UNICOS command line, the **-c** option is not given a file name. Because a file was not specified, UPDATE assumes that the input contains file directives, and it proceeds to open file **comp1.f**. (If there had been a compile file specified on the **-c** option, UPDATE would have ignored the FILE directive.) It closes file **comp1.f** when it encounters a new one--in this case, file **comp2.s**.

```
input:
  *dk comp1
  *file comp1.f
  deck comp1
  *DK comp2
  *FILE comp2.s
  deck comp2

UNICOS command:
update -i input -c -f
cft comp1.f
as comp2.s
```

4.12 RESEQUENCING A PL

You can resequence a PL by first generating a source dataset from a full update of the old PL, and then using it as input to an UPDATE creation run. The new PL has the same decks and common decks as the old PL, but all modification history information is gone.

COS JCL:

```
ACCESS,DN=$PL,PDN=OLDPL.
UPDATE,F,S,I=0.
UPDATE,P=0,I=$SR.
SAVE,DN=$NPL,PDN=NEWPL.
```

UNICOS command:

```
update -f -s srfile -p plfile
update -i srfile -n nplfile
```

4.13 DECK REMOVAL AND POSITIONING

The following job shows the PURGEDK and MOVEDK directives in a typical application. The jobs replace deck B with a new version in the same position relative to decks A and C. The COS PL MYUPDATEPL and the UNICOS PL **myupdatepl** currently consist of the following decks:

```
CDK  CA
CDK  CB
DK   A
DK   B
DK   C
CDK  CC
CDK  CD
DK   D
CDK  CE
```

The contents of the input file consist of the following:

```
*PURGEDK B
*DK B
text lines
*MOVEDK B:A
```

COS JCL:

```
ACCESS,DN=$PL,PDN=MYUPDATEPL.
UPDATE,L=0,C=0,N,F.
SAVE,DN=$NPL,PDN=MYUPDATEPL.
```

UNICOS command:

```
update -p myupdatepl -n nplfile -i infile -f
```

4.14 PL EDITING

As modifications to a PL accumulate, you can reduce the size of the PL by permanently removing deactivated lines from one or more decks. This process is known as editing. The EDIT directive specifies a deck or group of decks to be edited. The input file used in this example follows:

```
*EDIT A.D                          Edits decks A through D
*EDIT CA.CD                        Edits common decks CA through CD
```

COS JCL:

```
ACCESS,DN=$PL,PDN=MYUPDATEPL.
UPDATE,C=0,N.
SAVE,DN=$NPL,PDN=MYUPDATEPL.
```

UNICOS command:

```
update -p myupdatepl -n nplfile -i infile
```

4.15 CHANGING THE DATA WIDTH

The following UPDATE runs first create a PL and then build several new versions of that PL with varying data widths. The number of characters stored for each line in the new PL is never less than the number of characters per line in the old PL. Therefore, if the data width is decreased later, no characters are lost. You can change the data width of the compile dataset by using the WIDTH directive, the COS DW parameter, or the UNICOS **-w** option.

COS Control Statement	Characters per Line	
	Compile Dataset:	New PL:
UPDATE,P=0,N=PL1.	72	80
UPDATE,P=PL1,N=PL2,DW=80.	80	80
UPDATE,P=PL2,N=0.	80	N/A
UPDATE,P=PL2,N=PL3,DW=116.	116	116
UPDATE,P=PL3,N=PL4,DW=112	112	116
UPDATE,P=PL4,N=PL5.	112	116

UNICOS Command Line	Characters per Line	
	Compile Dataset:	New PL:
update -n plfile1 -i -	72	80
update -p plfile1 -n plfile2 -w 80	80	80
update -p plfile2 -f	80	N/A
update -p plfile2 -n plfile3 -w 116	116	116
update -p plfile3 -n plfile4 -w 112	112	116
update -p plfile4 -n plfile5	112	116

4.16 CONDITIONAL TEXT

Conditional text directives are used for text and directives that are always in the PL, but they are not always used to generate the compile dataset. The conditions that are tested can be either permanent or temporary. They are permanent if they test the existence of decks or modification set identifiers in the PL, and they are temporary if they check for defined names that are known only in the UPDATE run in which they are defined.

In the following example, deck SUBX contains text that is written to the compile dataset only if one of the names STACK and MULTI has been defined in that UPDATE run.

```
*DECK SUBX
unconditional text
*IF DEF,STACK,OR,DEF,MULTI
conditional text if either STACK or MULTI is defined
*IF DEF,MULTI
conditional text only if MULTI is defined
*ENDIF
conditional text if either STACK or MULTI is defined
*ELSE
conditional text if neither STACK nor MULTI is defined
*ENDIF
unconditional text
```

When neither STACK nor MULTI is defined, the following compile dataset is written:

```
unconditional text                                  SUBX.2
conditional text if neither STACK nor MULTI is defined      SUBX.10
unconditional text                                  SUBX.12
```

When STACK is defined, the following compile dataset is written:

```
    unconditional text                                              SUBX.2
    conditional text if either STACK or MULTI is defined            SUBX.4
    conditional text if either STACK or MULTI is defined            SUBX.8
    unconditional text                                              SUBX.12
```

When MULTI is defined, the following compile dataset is written:

```
    unconditional text                                              SUBX.2
    conditional text if either STACK or MULTI is defined            SUBX.4
    conditional text only if MULTI is defined                       SUBX.6
    conditional text if either STACK or MULTI is defined            SUBX.8
    unconditional text                                              SUBX.12
```

You can use conditional text directives to surround compile dataset directives whose use is conditional. For example, if you do not want sequencing information for some decks in the compile datasets for a PL, you can use directives in conditional text ranges to turn off the sequencing.

The following is the source dataset for such a PL:

```
    *DECK A
    *IF -DEF,SEQ
    *NOSEQ
    *ENDIF
    text for deck A
    *SEQ
    *DECK B
    text for deck B
    *DECK C
    *IF -DEF,SEQ
    *NOSEQ
    *ENDIF
    text for deck C
    *SEQ
```

If the name SEQ is not defined in an UPDATE run, the following compile dataset is written:

```
    text for deck A
    text for deck B                                                 B.2
    text for deck C
```

The name SEQ is defined by adding directive *DEFINE SEQ to the input or specifying DEF=SEQ on the COS control statement, or **-d** SEQ on the UNICOS command line. When the name SEQ is defined, the following compile dataset is written:

```
    text for deck A                                                 A.5
    text for deck B                                                 B.2
    text for deck C                                                 C.5
```

4.17 EXAMPLES SHOWING DATASET CONTENT

The following examples show the contents of the input, compile, and source datasets for several typical UPDATE runs.

4.17.1 CREATE A NEW PL FROM AN INPUT FILE

This example creates a new PL from text and directives in $IN or **infile.**

COS JCL:

```
UPDATE,P=0,N=PL1.
```

UNICOS command:

```
update -i infile -n pl1 -c cplfile1 -o sq
```

The compile dataset ($CPL under COS, and **cplfile1.f** under UNICOS) consists of the following:

```
      PROGRAM EXAMPLE          EXAMPLE.2
      REAL A(10),B(10)          BLOCK1.2
      COMMON /BLOCK1/ A,B       BLOCK1.3
      READ *,A,B               EXAMPLE.4
      CALL DIVIDE              EXAMPLE.5
      WRITE *,A,B              EXAMPLE.6
      STOP                     EXAMPLE.7
      END                      EXAMPLE.8
      SUBROUTINE DIVIDE         DIVIDE.2
      REAL A(10),B(10)          BLOCK1.2
      COMMON /BLOCK1/ A,B       BLOCK1.3
      DO 100 I=1,10             DIVIDE.4
         A(I)=A(I)/B(I)         DIVIDE.5
  100 CONTINUE                  DIVIDE.6
      RETURN                    DIVIDE.7
      END                       DIVIDE.8
```

4.17.2 PL MODIFICATION

You can modify the PL in dataset PL1 with the following statements:

COS JCL:

```
UPDATE,P=PL1,N=PL2,F.
```

UNICOS command:

```
update -p pl1 -n pl2 -f -c cplfile2 -i infile2
```

The following input dataset is read from the next COS file of $IN or from the UNICOS file **infile2**:

```
*IDENT MOD1,DC=DIVIDE
*/
*/       - Modifies subroutine DIVIDE in deck DIVIDE
*/
*BEFORE DIVIDE.5
         IF (B(I).NE.0) THEN
*INSERT DIVIDE.5
         ELSE
            A(I)=0
         ENDIF
*/
*IDENT MOD2A,DC=BLOCK1
*/
*/       - Modifies common deck BLOCK1 in common deck BLOCK1
*/
*DELETE BLOCK1.2
         PARAMETER (SIZE=5)
         REAL A(SIZE),B(SIZE)
*/
*IDENT MOD2B,DC=DIVIDE
*/
*/       - Modifies subroutine DIVIDE in deck DIVIDE
*/
*DELETE DIVIDE.4
         DO 100 I=1,SIZE
*IDENT MOD3A,DC=EXAMPLE
*I EXAMPLE.2
         LOGICAL IA
```

```
*B EXAMPLE.4
         IF (IA()) WRITE *,'Enter ',SIZE,' values for X and Y:'
*IDENT MOD3B,DC=.
*/
*/       - Adds a new subroutine written in CAL
*/
*DECK EOF1
*CWEOF
*DECK IA
         IDENT     IA
*
*        Returns true if interactive, false if batch
*
IA       ENTER     NP=0
         GET,S1    S6&S7,JCIA,A0
         S1        S1<D'63
         EXIT
         END
```

Under COS, the following compile dataset is again in $CPL. Under UNICOS, there are two new compile files. The first file generated (**cplfile2.f**) contains the Fortran source code that has the default suffix of **.f**. The second file generated is appended with suffix **.s** for assembly language.

```
      PROGRAM EXAMPLE                                              EXAMPLE.2
      LOGICAL IA                                                     MOD3A.1
      PARAMETER (SIZE=5)                                             MOD2A.1
      REAL A(SIZE),B(SIZE)                                           MOD2A.2
      COMMON /BLOCK1/ A,B                                           BLOCK1.3
      IF (IA()) WRITE *,'Enter ',SIZE,' values for X and Y:'         MOD3A.2
      READ *,A,B                                                   EXAMPLE.4
      CALL DIVIDE                                                  EXAMPLE.5
      WRITE *,A,B                                                  EXAMPLE.6
      STOP                                                         EXAMPLE.7
      END                                                          EXAMPLE.8
      SUBROUTINE DIVIDE                                             DIVIDE.2
      PARAMETER (SIZE=5)                                             MOD2A.1
      REAL A(SIZE),B(SIZE)                                           MOD2A.2
      COMMON /BLOCK1/ A,B                                           BLOCK1.3
      DO 100 I=1,SIZE                                                MOD2B.1
      IF (B(I).NE.0) THEN                                             MOD1.1
         A(I)=A(I)/B(I)                                             DIVIDE.5
      ELSE                                                            MOD1.2
         A(I)=0                                                       MOD1.3
      ENDIF                                                           MOD1.4
  100 CONTINUE                                                      DIVIDE.6
      RETURN                                                        DIVIDE.7
      END                                                           DIVIDE.8
eof (COS) or start of file cplfile2.s (UNICOS)
```

```
        IDENT     IA                                                IA.2
*                                                                   IA.3
*       Returns true if interactive, false if batch                 IA.4
*                                                                   IA.5
IA      ENTER     NP=0                                              IA.6
        GET,S1    S6&S7,JCIA,A0                                     IA.7
        S1        S1<D'63                                           IA.8
        EXIT                                                        IA.9
        END                                                         IA.10
```

4.17.3 GENERATING AN EXECUTABLE PROGRAM

Having the compile dataset divided into more than one file is useful when a single PL contains subroutines written in more than one language. You can use a single UPDATE to generate input to more than one language processor.

COS JCL:

```
UPDATE,P=PL2,I=0,F.
CFT,I=$CPL,L=0.
CAL,I=$CPL,L=0.
SEGLDR,GO.
```

UNICOS command:

The first compile file would contain Cray Fortran (CFT) subroutines and be named **cplfile3.f**. The second file would contain assembly subroutines and be named **cplfile3.s**. The UNICOS generation job for program EXAMPLE follows:

```
update -p plfile2 -f -c cplfile3
cft cplfile3.f
as cplfile3.s
segldr cplfile3.o
```

4.17.4 PL RESEQUENCED VERSION

You can create a resequenced version of the PL by generating a source dataset from PL2 and using that as input to UPDATE in a creation run.

The contents of the source dataset used in this example are as follows:

```
*COMDECK BLOCK1
         PARAMETER (SIZE=5)
         REAL A(SIZE),B(SIZE)
         COMMON /BLOCK1/ A,B
*DECK EXAMPLE
         PROGRAM EXAMPLE
         LOGICAL IA
*CALL BLOCK1
         IF (IA()) WRITE *,'Enter ',SIZE,' values for X and Y:'
         READ *,A,B
         CALL DIVIDE
         WRITE *,A,B
         STOP
         END
*DECK DIVIDE
         SUBROUTINE DIVIDE
*CALL BLOCK1
         DO 100 I=1,SIZE
         IF (B(I).NE.0) THEN
            A(I)=A(I)/B(I)
         ELSE
            A(I)=0
         ENDIF
100      CONTINUE
         RETURN
         END
*DECK EOF1
*CWEOF
*DECK IA
         IDENT     IA
*
*        Returns true if interactive, false if batch
*
IA       ENTER     NP=0
         GET,S1    S6&S7,JCIA,A0
         S1        S1<D'63
         EXIT
         END
```

COS JCL:

```
    UPDATE,P=PL2,F,I=0,S=SOURCE.
    UPDATE,P=0,N=PL3,I=SOURCE.
```

UNICOS command:

```
    update -p plfile2 -f -s source
    update -n plfile3 -c cplfile4 -i source
```

The compile dataset from the resequenced PL is as follows:

```
    PROGRAM EXAMPLE                                                  EXAMPLE.2
    LOGICAL IA                                                       EXAMPLE.3
    PARAMETER (SIZE=5)                                                BLOCK1.2
    REAL A(SIZE),B(SIZE)                                              BLOCK1.3
    COMMON /BLOCK1/ A,B                                               BLOCK1.4
    IF (IA()) WRITE *,'Enter ',SIZE,' values for X and Y:'           EXAMPLE.5
    READ *,A,B                                                       EXAMPLE.6
    CALL DIVIDE                                                      EXAMPLE.7
    WRITE *,A,B                                                      EXAMPLE.8
    STOP                                                             EXAMPLE.9
    END                                                              EXAMPLE.10
    SUBROUTINE DIVIDE                                                 DIVIDE.2
    PARAMETER (SIZE=5)                                                BLOCK1.2
    REAL A(SIZE),B(SIZE)                                              BLOCK1.3
    COMMON /BLOCK1/ A,B                                               BLOCK1.4
    DO 100 I=1,SIZE                                                   DIVIDE.4
    IF (B(I).NE.0) THEN                                               DIVIDE.5
       A(I)=A(I)/B(I)                                                 DIVIDE.6
    ELSE                                                              DIVIDE.7
       A(I)=0                                                         DIVIDE.8
    ENDIF                                                             DIVIDE.9
100 CONTINUE                                                          DIVIDE.10
RETURN                                                                DIVIDE.11
END                                                                   DIVIDE.12
```

eof start of cplfile4.s

```
IDENT     IA                                                          IA.2
*                                                                     IA.3
*        Returns true if interactive, false if batch                  IA.4
*                                                                     IA.5
IA        ENTER     NP=0                                              IA.6
          GET,S1    S6&S7,JCIA,A0                                     IA.7
          S1        S1<D'63                                           IA.8
          EXIT                                                        IA.9
          END                                                         IA.10
```

5. AUDPL - PROGRAM LIBRARY AUDIT UTILITY

If you want information about program libraries (PLs) written by UPDATE, use the program library audit utility (AUDPL). From an input PL dataset, AUDPL lists specified text lines from decks and common decks, lists changes made to text lines, gives a summary of specified aspects of a PL, and writes reconstructed modification sets to a modification sets dataset. AUDPL makes no changes to a PL.

5.1 RESTRICTIONS

You can use AUDPL to process PLs written by a version of UPDATE from release 1.13 or higher. PLs written by an earlier UPDATE must be rewritten by a new version of UPDATE before they can be processed by AUDPL.

The PULLMOD directive and PM control statement parameter work correctly only for modification sets added by an UPDATE from release 1.12 or higher. Earlier modification sets do not have valid modification histories in the PL. Insertions can be reconstructed for these modification sets, but not deletions.

AUDPL cannot read a PL from a magnetic tape dataset.

If an UPDATE EDIT directive has removed lines deleted by the modification set, reconstructed modification sets will not be complete.

Modification sets that you added before a PL was resequenced cannot be reconstructed.

5.2 AUDPL CONTROL STATEMENT (COS)

The AUDPL control statement loads the AUDPL program into the user field and begins execution. The AUDPL statement is put in the control statement file of a user job. Parameters on the AUDPL statement specify the datasets to be used, contents of the AUDPL listing, and other features of the run.

Format:

```
AUDPL [,P=pdn][,I=idn][,L=ldn][,M=mdn][,B=bdn][,*=m] [,/=c]

   [,DW=dw][,LW=lw][,JU=ju]  ,DK=dk1:dk2:...:dkn
                             ,DK='dk1,dk2,...,dkj.dkk,...,dkn'

    ,PM=id1:id2:...:idn                  [,LO=string][,CM][,NA][,NR].
    ,PM='id1,id2,...,idj.idk,...,idn'
```

P=*pdn* Program library dataset name

If omitted or P, the PL is $PL.
If P=*pdn*, the PL is *pdn*.
P=0 is invalid.

I=*idn* Input dataset name; this dataset contains the directives for the AUDPL run.

If I, the input dataset is the next file of $IN.
If I=*idn*, the input dataset is *idn*.
If omitted or I=0, no input dataset is read.

L=*ldn* Listing dataset name; this dataset receives the AUDPL list output.

If omitted or L, the list output is written to $OUT.
If L=*ldn*, the list output is written to *ldn*.
If L=0, no list output is generated.

M=*mdn* Modifications dataset name; this dataset receives reconstructed modification sets as selected by the PM control statement option or the PULLMOD directive.

If omitted or M, the modifications dataset is $MODS.
If M=*mdn*, the modification sets are written to *mdn*.
If M=0, no modifications dataset is written.

B=*bdn* Binary identifier list dataset name; this dataset receives a list of identifier names from the PL.

If B, the identifier dataset is $BID.
If B=*bdn*, the identifier dataset is *bdn*.
If omitted or B=0, no binary identifier list dataset is written.

*=*m* Master character for directives written to the listing and modifications datasets. Invalid master characters are comma, period, colon, equal sign, and space.

If omitted, the master character is read from the PL.

If *=*m*, *m* is used as the master character. The keyword alone is invalid.

/=*c* Comment character for comments written to the modifications dataset. (The comment character for AUDPL comments is always /.)

If the option is omitted, the comment character for the comment directive is /.

If /=*c*, the comment character for the comment directive is *c*. The keyword alone is invalid.

DW=*dw* Data width value; the number of characters of data written to each line in the modifications dataset.

If DW=*dw*, columns 1 through *dw* contain data. The DW range is 1 through 256.

If omitted or if the DW keyword stands alone, columns 1 through *lastdw* contain data; *lastdw* was the DW value on the UPDATE statement when the PL was written.

If it is a variable-length record PL, only DW=*, DW alone, or DW omitted, are allowed.

LW=*lw* Listing width; the length of each line written to the listing dataset.

If LW=*lw*, the width of the listing dataset is *lw* characters. Valid values are 80 and 132.

When the listing width is specified as C*lw*, the listing is continuous; that is, it is not divided into pages.

If omitted or LW, the width of the listing dataset is 132 characters and the listing is divided into pages.

JU=*ju* Justification; how the identifier name and sequence number of each line are justified.

The identifier and sequence number are printed at the right of the AUDPL listing, regardless of the value of DW.

If the option is omitted, the JU keyword stands alone, or JU=C is employed, the identifier name is right-justified, and the sequence number is preceded by a period and left-justified.

If JU=N, the identifier name is left-justified and the sequence number right-justified, with no period in between. If JU=L, the entire sequencing field is left-justified, with a period between the identifier and sequence number.

DK=dk_1:dk_2:...:dk_n
DK='dk_1,dk_2,...,dk_j.dk_k,...,dk_n'
Decks to which text line list options A, C, D, H, and I and the PM parameter apply. The DK control statement parameter has no effect on directives.

In the first method shown, you can specify up to 64 decks.

In the second method shown, single decks are separated by commas, and ranges of decks are separated by periods. The maximum size of the string is 87 characters. You cannot, however, combine the two methods.

If DK is omitted, the text line list options apply to all decks in the PL. The keyword alone is invalid.

PM=id_1:id_2:...:id_n
PM='id_1,id_2,...,id_j.id_k,...,id_n'
Pulled modification sets; reconstructs modification sets for the identifiers in the list. The scope of the search for text modified by the specified identifiers consists of the decks specified with the DK control statement parameter.

In the first method shown, you can specify up to 64 identifiers.

In the second method shown, single identifiers are separated by commas, and ranges of identifiers are separated by periods. The maximum size of the string is 87 characters. You cannot, however, combine the two methods. The keyword alone is invalid.

LO=*string*

Listing options. The string contains characters representing options; the default is no list options. The following summarizes the options. See subsection 5.5.1, Listing File or Dataset, for descriptions.

Options A, C, D, H, and I are text line options and, if a DK parameter has been given, apply only to the decks specified with the DK parameter.

- A Writes active lines to *ldn*
- C Writes conditional text directives to *ldn*; the output is a subset of the output of option D.
- D Writes dataset directives to *ldn*; the output is a subset of the output of option A.
- H Writes modification histories to *ldn*, along with active and inactive text lines
- I Writes inactive lines to *ldn*

Options K, L, M, N, O, P, S, and X are summary options and apply to the entire PL.

- K Writes deck line counts to *ldn*
- L Writes identifier list to *ldn*
- M Writes modification set cross-reference to *ldn*
- N Writes identifier list in ASCII collation order to *ldn*
- O Writes overlapping modification set list to *ldn*
- P Writes a short summary of the PL to *ldn*
- S Writes the status of modification sets
- X Writes a common deck cross-reference to *ldn*

CM Copy modifications; writes the reconstructed modification sets to *ldn* as well as to *mdn*. Keyword only.

NA No abort; if nonfatal errors are detected, AUDPL does not abort until all processing has been completed. Keyword only.

NR No rewind; does not rewind modifications dataset or binary identifier list dataset at beginning or end of AUDPL execution. Keyword only.

5.3 AUDPL COMMAND LINE (UNICOS)

Under UNICOS, the following command line executes AUDPL. Use the parameters on the command line to specify the files to be used, the contents of the AUDPL listing, and other features of the run.

Format:

```
audpl -p plfile [-i infile] [-l lstfile] [-m modfile]
   [-b [idfile]] [-x mc] [-y cc] [-j ju] [-d decks]
   [-P modsets] [-O arguments]
```

-p *plfile*
: Program library file name; required there is no default.

-i *infile*
: Input file name. If you specify **-i -**, the input file is **stdin**. If you specify **-i in**, the input file is **in**. If omitted, there is no input file.

-l *lstfile*
: The listing file name. If **-l** is omitted, the default listing file is **stdout**. If you specify **-l list**, the listing file is **list**.

-m *modfile*
: The modifications file name. This file receives reconstructed modification sets as selected by the **-P** control statement option. If omitted, the modification file is **stdout**. If you specify **-m modf**, the modification file is **modf**.

-b [*idfile*]
: This file receives a list of identifier names from the PL. If you specify **-b** with no argument, the identifier file is **stdout**. If you specify **-b idn**, the identifier file is **idn**. If you omit the **-b** option, there is no identifier file.

-x *mc*
: The master character for directives written to the listing and modification files. Invalid master characters are the comma, period, colon, equal sign, and space.

  If omitted, the master character is read from the PL. If you specify **-x mc**, **mc** is used as the master character. The **-x** option alone is invalid.

-y *cc* The comment character for comments written to the modifications file. (The comment character for AUDPL comments is always /.)

If you omit this option, the comment character is /. If you specify **-y cc**, the comment character is **cc**. The **-y** option alone is invalid.

-j *ju* Justification; how the identifier name and sequence number of each line are justified.

The identifier and sequence number are printed to the right of the AUDPL listing.

If you omit the **-j** option, or specify **-j c**, the identifier name is right-justified, and the sequence number is preceded by a period and is left-justified.

If you specify **-j n**, the identifier name is left-justified and the sequence number right-justified, with no period in between. If you specify **-j l**, the entire sequencing field is left-justified, with a period between the identifier and sequence number.

The **-j** option alone is invalid.

-d *decks* Decks to which text line list option-arguments **a**, **c**, **d**, **h**, and **i** and the **-P** option apply. The **-d** option has no effect on directives. The two valid formats are as follows (where *dk* represents a deck):

$dk_1,dk_2,...dk_n$
$'dk_1,dk_2,...,dk_j.dk_k,...,dk_n'$

In the first method shown, you can specify up to 64 decks.

In the second method shown, single decks are separated by commas, and ranges of decks are separated by periods. The maximum size of the string is 96 characters. You cannot, however, combine the two methods.

If **-d** is omitted, the text line list options apply to all decks in the PL. The **-d** option alone is invalid.

The syntax using the **-d** option is nonstandard.

-P *modsets*

Pulled modification sets; reconstructs modification sets for the identifiers in the list. The scope of the search for text modified by the named identifiers consists of the decks specified with the **-d** option.

'$id_1,id_2,\ldots,id_j.id_k,\ldots,id_n$'

Single identifiers are separated by commas, and ranges of identifiers are separated by periods. The maximum size of the string is 96 characters.

The **-P** option alone is invalid.

The syntax using the **-P** option is nonstandard.

-O *arguments*

Listing *arguments*. The *arguments* contain characters representing options; the default is no list *arguments*. The following summarizes the *arguments* that are available. The *arguments* must be separated by a space. See subsection 5.5.1, Listing File or Dataset, for descriptions.

Arguments **a**, **c**, **d**, **h**, and **i** are text line options and, if a **-d** option has been given, apply only to the decks named with the **-d** option.

- **a** Writes active lines to **lf**
- **c** Writes conditional text directives to **lf**; the output is a subset of the output of option **d**.
- **d** Writes file directives to **lf**; the output is a subset of the output of option **a**.
- **h** Writes modification histories to **lf**, along with active and inactive text lines
- **i** Writes inactive lines to **lf**

Arguments **k**, **l**, **m**, **n**, **o**, **p**, **s**, and **x** are summary *arguments* and apply to the entire PL.

- **k** Writes deck line counts to **lf**
- **l** Writes identifier list to **lf**
- **m** Writes modification set cross-reference to **lf**
- **n** Writes identifier list in ASCII collation order to **lf**
- **o** Writes overlapping modification set list to **lf**
- **p** Writes a short summary of the PL to **lf**
- **s** Writes the status of modification sets
- **x** Writes a common deck cross-reference to **lf**

5.4 INPUT DIRECTIVES

In addition to responding to the list options and other parameters in the control statement, AUDPL recognizes a set of directives read from the input dataset or file. These directives specify a more limited part of the PL than do the list options in the control statement.

The format of the AUDPL directives is the same as that for the UPDATE directives described in subsection 3.2, Directive Format (see this subsection for format description).

With AUDPL versions 2.0 and higher, all input directives can be issued in either uppercase or lowercase; however, you cannot issue the directives in mixed case.

The following subsections describe the AUDPL directives.

5.4.1 / - COMMENT

A comment appears only in the input dataset or file and is ignored by AUDPL.

Format:

```
 _____________
|             |
| */comment   |
|_____________|
```

/ Comment character followed by desired *comments*

5.4.2 ACTIVE - ACTIVE LINES

ACTIVE writes to the listing file or dataset all active text lines in a text range or an entire deck.

Format:

```
*ACTIVE id1.seq1,id2.seq2[,DK=deck]

*ACTIVE deck
```

$id_1.seq_1$ First line in text range

$id_2.seq_2$ Last line in text range

DK=*deck* Deck or common deck containing the text range

deck Deck or common deck name; specifies entire deck.

5.4.3 COND - CONDITIONAL TEXT DIRECTIVES

You can use COND to write to the listing file or dataset all active text lines that contain the conditional text directives IF, ELSEIF, ELSE, and ENDIF.

Format:

```
*COND id1.seq1,id2.seq2[,DK=deck]

*COND deck
```

$id_1.seq_1$ First line in the text range

$id_2.seq_2$ Last line in the text range

DK=*deck* Deck or common deck containing the text range

deck Deck or common deck name; specifies entire deck.

5.4.4 DIR - DATASET OR FILE DIRECTIVES

Use DIR to write to the listing file or dataset all active text lines that contain dataset directives.

Format:

```
*DIR id1.seq1,id2.seq2[,DK=deck]

  *DIR deck
```

$id_1.seq_1$ First line in the text range

$id_2.seq_2$ Last line in the text range

DK=*deck* Deck or common deck containing the text range

deck Deck or common deck name; specifies entire deck.

5.4.5 HISTORY - MODIFICATION HISTORY

HISTORY writes the modification history for a single line or a text range. The modification history for a line identifies the modification sets that have deleted and restored the line. Yanked modification sets that have affected the line are flagged. All active and inactive lines in the range are listed.

Format:

```
*HISTORY id1.seq1,id2.seq2[,DK=deck]

  *HISTORY deck
```

$id_1.seq_1$ First line in the text range

$id_2.seq_2$ Last line in the text range

DK=*deck* Deck or common deck containing the text range

deck Deck or common deck name; specifies entire deck.

5.4.6 INACTIV - INACTIVE LINES

With INACTIV, you can write inactive text lines in a text range or an entire deck.

Format:

```
*INACTIV id1.seq1,id2.seq2[,DK=deck]

  *INACTIV deck
```

$id_1.seq_1$ First line in the text range

$id_2.seq_2$ Last line in the text range

DK=*deck* Deck or common deck containing the text range

deck Deck or common deck name; specifies entire deck.

5.4.7 PULLMOD - PULLED MODIFICATION SETS OR DECKS

PULLMOD allows you to reconstruct one or more modification sets or decks. The output is written to the modifications file or dataset, which has the same format as an UPDATE input file. It is then echoed to the listing file or dataset if you use the CM control statement option.

PULLMOD works correctly only for modification sets added with a version of UPDATE from release 1.12 or higher. You cannot reconstruct deletions from earlier modification sets, because those modification sets do not have valid modification histories in the PL.

Format (all on one line):

```
*PULLMOD

  id1,id2,...,idj.idk,...,p:,...,idn[,DK=deck]
```

id_i Single identifier

$id_j.id_k$ Range of identifiers

p: Prefix representing all modification sets or decks whose identifiers begin with the specified characters. The prefix is followed by a colon.

DK=*deck* The deck for which the modification set is to be reconstructed

5.5 OUTPUT

You can use AUDPL to generate one, two, or three forms of output datasets: (1) a listing file or dataset, (2) a modifications file or dataset, and/or (3) a binary-identifier list file or dataset. The following subsections describe the contents of the files and the commands that control their content and format.

5.5.1 LISTING FILE OR DATASET

The listing file or dataset contains PL text lines, reconstructed modification sets, and other information written in response to parameters in the AUDPL control statement and directives in the input file.

Under COS, the listing dataset is divided into pages by default. The LPP parameter in the OPTION control statement controls the number of lines per page (see the COS Reference Manual, publication SR-0011). Use the LW control statement parameter to control the width of the listing. It can also be used to inhibit the division of the listing dataset into pages.

Under UNICOS, the listing file comes out as raw text with no headers and no page breaks. You can make your listing output more readable by using a pipe together with the **pg** command. (For information on using pipes and on **pg**, see the UNICOS Primer, publication SG-2010.) The output for a text line is preceded by the name of the deck to which it belongs and a flag that gives special attributes of the line. It is also followed by the line's identifier and sequence number.

A text line continues for as many output lines as are needed to write all significant characters. Text lines are written according to their positions in the PL, with active and inactive lines interspersed. The order of decks and common decks in the listing is determined by their order in the PL, which is the same as their order in the identifier list.

5.5.1.1 Text line listing options

The AUDPL control statement allows the following set of options for text-line listable output:

COS Option	UNICOS Option-argument	Description
A	**a**	Writes active lines from decks and common decks specified with the DK parameter. The ACTIVE directive also writes active lines from decks and common decks to the listing.
I	**i**	Writes inactive lines from the decks and common decks specified with the DK parameter. The INACTIV directive also writes inactive lines to the listing. Inactive lines are flagged with '<i>' between the deck name and the text for the line.
D	**d**	Lists all active text lines containing file or dataset directives for each deck and common deck specified with the DK parameter. The DIR directive writes these lines for directives in decks or ranges named in the DIR directive. Directives are flagged with '<d>' in the flag field of the output for the line.
C	**c**	Writes all active text lines containing the conditional text directives IF, ELSEIF, ELSE, and ENDIF for each deck and common deck specified with the DK parameter. The COND directive writes these lines for directives in decks or ranges specified in the COND directive. The nesting level of the directive appears in the flag field of the output for the line (for example, '<0>' for the outer level).
H	**h**	Along with the HISTORY directive, writes modification histories. The listing of each text line, either active or inactive, is followed by a list of the changes made to the line. This list tells you which modifications have deleted and restored the line, and whether the modifications that made the changes have been yanked.

5.5.1.2 Summary listing options

The AUDPL control statement allows you the following output options in the listing dataset:

COS Option	UNICOS Option-argument	Description
P	p	Writes general information about the PL. The summary consists of the following: • The name of the dataset containing the PL (under COS only) • The date the PL was written • The last identifier added to the PL • The default master character • The default data width for the compile and source files or datasets written by UPDATE. The data width is determined by the UPDATE DW parameter that was specified when the PL was built. • The number of characters of data stored for each line in the PL. This may be more than the number written to the compile and source files or datasets. • The number of decks, common decks, and modification set identifiers in the PL.
L	l	Lists all identifiers in the PL (the same function as the ID option in UPDATE). In the output, a deck name is preceded by a single asterisk (*), a common deck by two asterisks (**), and a yanked identifier by a minus sign (-). Purged identifiers are not included in this list, because they are no longer in the PL. Identifiers that have been unyanked are the same as identifiers that were never yanked.

COS Option	UNICOS Option-argument	Description
N	**n**	Writes an ASCII collation order list of all identifiers in the PL to the listing file or dataset. The list is divided into separate sections for common decks, decks, and modification sets.
K	**k**	Writes the number of active and inactive text lines in each deck and common deck in the PL to the listing file or dataset.
M	**m**	Writes a modification set cross-reference to the listing file or dataset. The cross-reference consists of the following: • A list of decks changed by each modification set • A list of modification sets that changed each deck
O	**o**	Writes a list of overlapping modification sets in each deck. The list shows, for each modification set, the modification sets that overlap it and the modification sets it overlaps. A modification set overlaps an earlier modification set if it changes the status of text lines changed by the earlier modification set.
S	**s**	Separates the modification set identifiers into the following groups: • Active modification sets; active if at least one change remains unaffected by subsequent modifications. • Inactive (or dormant) modification sets; inactive if every change has been superseded by a subsequent modification. • Dead modification sets; dead if no longer listed in the modification history of any line, active or inactive, in the PL.

COS Option	UNICOS Option-argument	Description
X	x	Writes a common deck cross-reference. The cross-reference lists the following: • Common decks called from each deck • Decks calling each common deck • Uncalled common decks The output indicates the number of times a common deck is called from each deck. Common decks using the no-propagation option on the COMDECK directive are flagged with a plus sign (+) in the cross-reference listing. Common decks defined in another PL and referenced in the PL being processed are flagged with a pound sign (#) in the cross-reference listing.

5.5.2 RECONSTRUCTED MODIFICATION SETS

You can use the CM option to generate a copy of the reconstructed modification sets written to the modifications dataset for the PULLMOD directive and PM parameter. If the data width for the reconstructed modification sets is greater than the listing width, the reconstructed modifications are truncated.

Comments written to the reconstructed modification set give the following:

- The name(s) of the deck(s) to which the modification set applies
- A list of earlier modification sets upon which the reconstructed one depends; that is, modification sets directly referenced by one or more directives.
- A list of earlier modification sets that the reconstructed modification set overlaps--that is, modifications sets that had already modified one or more lines that were deleted or restored by the reconstructed modification set.
- A list of later modification sets that overlap the reconstructed one

A reconstructed modification set may differ from the original set. It produces the same results, however, when applied to a PL from which the reconstructed modification set and all later modification sets have been purged. It also produces the same results when applied to the PL before the original modification set has been added.

The following examples, one each for COS and UNICOS, show the use of AUDPL to reconstruct a modification set:

Under COS, the procedure is as follows:

```
UPDATE,P=PL1,N=PL2,F,I=MOD1,S=S1,C=C1.
AUDPL,P=PL2,PM=MOD1,M=MOD1P.
UPDATE,P=PL1,N=PL2P,F,I=MOD1P,S=S1P,C=C1P.
```

Under UNICOS, the same procedure looks as follows:

```
update -p PL1 -n PL2 -f -i mod1 -s S1 -c C1
audpl -p PL2 -P mod1 -m mod1P
update -p PL1 -n PL2P -f -i mod1P -s S1P -c C1P
```

The following discussion applies to both the COS and the UNICOS examples.

In line 1 of these examples, UPDATE modifies the program library PL1 with the modification set MOD1 (**mod1** under UNICOS) and writes a new program library PL2, a source file/dataset S1, and a compile file/dataset C1 (**c1.f** under UNICOS).

In line 2, AUDPL uses PL2 to reconstruct MOD1 on the file/dataset MOD1P (**mod1** and **mod1P**, respectively, under UNICOS).

In line 3, UPDATE modifies the original program library, PL1, with the reconstructed modification set MOD1P (**mod1P** under UNICOS) and writes PL2P, S1P, and C1P (**c1p.f** under UNICOS).

As long as modifications from program library PL1 have not been purged from PL2, and as long as no EDIT directive has been used after MOD1 was added, the following relationships will hold:

- Modifications dataset MOD1P (**mod1P** under UNICOS) is equivalent to input file/dataset MOD1 (**mod1** in UNICOS) in that it inserts and deletes the same text lines (although it may use different sequences of directives to do so).
- Program library PL2P is identical to program library PL2.
- Source file/dataset S1P is identical to source file/dataset S1.
- Compile file/dataset C1P is identical to compile file/dataset C1.

5.5.3 MODIFICATIONS FILE OR DATASET

UPDATE writes the modification sets reconstructed by the PULLMOD directive and the PM control statement parameter to the modifications file or dataset. You can use the modifications file or dataset as input to a subsequent UPDATE run.

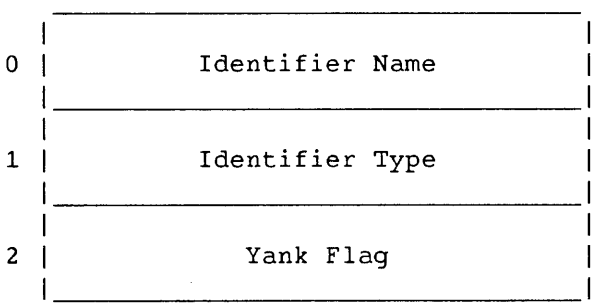
The DW parameter on the control statement determines the length of each line in the modifications file or dataset. No end-of-file (EOF) is written between modification sets, so the modifications file is a single file. If you specify the NR control statement option, no EOF is written at the end of the modifications file or dataset.

5.5.4 BINARY-IDENTIFIER LIST FILE OR DATASET AND IDENTIFIER LIST

The file or dataset that receives a list of identifiers from the PL is called a binary-identifier list dataset under COS and an identifier list under UNICOS. Under COS, this dataset includes the name of each identifier and information about whether the identifier is a deck, common deck, or modification set identifier, and whether it has been yanked.

The COS binary identifier list dataset has one file. Each 3-word record in the dataset has information about one identifier in the PL.

Record format for the COS binary-identifier list dataset:



The identifier name is left-justified and zero-filled.

The identifier type is as follows:

0 For modification set identifiers
1 For decks
2 For regular common decks
3 For common decks with the NOPROP option

The Yank flag is 1 for identifiers that are yanked; otherwise, it is 0.

Under UNICOS, the identifier list contains the name of each identifier and information about whether the identifier is a deck, common deck, or modification set identifier, and whether it has been yanked.

The format of the identifier list is as follows:

```
 _____________________________________
|                                     |
|  NAME. TYPE.  .NOPROP   .YANKED     |
|_____________________________________|
```

The types possible are deck, comdeck, and modification. If the type is comdeck, and if the common deck is a NOPROP common deck, .NOPROP is listed on that line. You will receive one of the following results:

- NAME.DECK
- NAME.MODIFICATION
- NAME.COMDECK
- NAME.COMDECK.NOPROP
- NAME.MODIFICATION.YANKED

5.6 AUDPL SAMPLE LISTING

This subsection provides an example of an AUDPL program listing. See subsection 4.17, Examples Showing Dataset Content, for the generation of program library PL2, which is used in this example. Under COS, the job control statement that generates this example is as follows:

```
AUDPL,P=PL2,PM=MOD2A:MOD2B:EXAMPLE,LO=AIKLMNOPSX.
COPYF, I=$MOD.
```

Under UNICOS, the command line that generates this example is as follows:

```
audpl -p PL2 -P mod2a mod2b example -O a i k l m n o p s x
```

The AUDPL sample listing is as follows:

```
***** Program library summary

    Dataset containing the program library
    (COS only):                                PL2

    Date the dataset was written:           07/16/84

    Last identifier added to the PL:              IA
```

```
    Default master character for directives
    read from the input and written to a
    source dataset:                          *

    Default data width for compile and
    source datasets:                        72

    Data width of text stored in the PL:    80

    Number of decks:                         4

    Number of common decks:                  1

    Number of modification set identifiers:  5


***** Identifier list

*EXAMPLE  **BLOCK1  *DIVIDE  MOD1  MOD2A  MOD2B  MOD3A  MOD3B  *EOF1  *IA

***   4 decks   1 common deck   5 modification set identifiers

***** Common decks

    BLOCK1

***** Decks

    DIVIDE     EOF1     EXAMPLE     IA


***** Modification set identifiers

    MOD1       MOD2A    MOD2B       MOD3A     MOD3B

***   4 decks   1 common deck   5 modification set identifiers

***** Text line listings

EXAMPLE <d>   *DECK EXAMPLE                                          EXAMPLE.1
EXAMPLE             PROGRAM EXAMPLE                                  EXAMPLE.2
EXAMPLE             LOGICAL IA                                         MOD3A.1
EXAMPLE <d>   *CALL BLOCK1                                           EXAMPLE.3
EXAMPLE             IF (IA())WRITE*,'Enter',SIZE,'values for X and Y:'  MOD3A.2
EXAMPLE             READ *,A,B                                       EXAMPLE.4
EXAMPLE             CALL DIVIDE                                      EXAMPLE.5
EXAMPLE             WRITE *,A,B                                      EXAMPLE.6
EXAMPLE             STOP                                             EXAMPLE.7
EXAMPLE             END                                              EXAMPLE.8
```

```
Deck EXAMPLE          has   10 active lines,    0 inactive lines

BLOCK1 <d< *COMDECK BLOCK1                                        BLOCK1.1
BLOCK1 <i>          REAL A(10),B(10)                              BLOCK1.2
            deleted by MOD2A
BLOCK1              PARAMETER (SIZE=100)                          MOD2A.1
BLOCK1              REAL A(SIZE),B(SIZE)                          MOD2A.2
BLOCK1              COMMON /BLOCK/ A,B                            BLOCK1.3

Common deck BLOCK1    has    4 active lines,    1 inactive lines

DIVIDE <d> *DECK DIVIDE                                           DIVIDE.1
DIVIDE              SUBROUTINE DIVIDE                             DIVIDE.2
DIVIDE <d> *CALL BLOCK1                                           DIVIDE.3
DIVIDE <i>          DO 100 I = 1,10                               DIVIDE.4
           deleted by MOD2B
DIVIDE              DO 100 I = 1,SIZE                             MOD2B.1
DIVIDE              IF (B(I).NE.0) THEN                           MOD1.1
DIVIDE                A(I) = A(I)/B(I)                            DIVIDE.5
DIVIDE              ELSE                                          MOD1.2
DIVIDE                A(I) = 0                                    MOD1.3
DIVIDE              ENDIF                                         MOD1.4
DIVIDE       100    CONTINUE                                      DIVIDE.6
DIVIDE              RETURN                                        DIVIDE.7
DIVIDE              END                                           DIVIDE.8

Deck DIVIDE           has   12 active lines,    1 inactive line

EOF1 <d>   *DECK EOF1                                             EOF1.1
EOF1 <d>   *CWEOF                                                 EOF1.2

Deck EOF1             has    2 active lines,    0 inactive lines

IA   <d>   *DECK IA                                               IA.1
IA                  IDENT IA                                      IA.2
IA         *                                                      IA.3
IA         *        Return true if interactive, false if batch    IA.4
IA         *                                                      IA.5
IA         IA       ENTER    NP=0                                 IA.6
IA                  GET,S1   S6&S7,JCIA,A0                        IA.7
IA                  S1       S1<D'63                              IA.8
IA                  EXIT                                          IA.9
IA                  END                                           IA.10

Deck IA               has   10 active lines,    0 inactive lines

The entire PL         has   38 active lines,    2 inactive lines
```

```
Deck type     deck name      active lines   inactive lines

common deck   BLOCK1                   4               1
deck          DIVIDE                 12               1
deck          EOF1                    2               0
deck          EXAMPLE                10               0
deck          IA                     10               0

The entire PL        has   38 active lines,    2 inactive lines,
     4 decks and           1 common deck.

***** Common decks called by each deck

Deck DIVIDE  calls:                      BLOCK1

Deck EXAMPLE calls:                      BLOCK1

***** Decks calling each common deck

BLOCK1 is called by:                     DIVIDE          EXAMPLE

***** Active modification sets (last modification to at least one line)

   MOD1   MOD2A   MOD2B   MOD3A

***** Dead modification sets (not in the modification history of any line)

   MOD3B

***** Modification sets that changed each deck and common deck

BLOCK1        is modified by:            MOD2A

DIVIDE        is modified by:            MOD1            MOD2B

EXAMPLE       is modified by:            MOD3A

***** Decks and common decks changed by each modification set

MOD1          modifies decks:            DIVIDE

MOD2A         modifies decks:            BLOCK1

MOD2B         modifies decks:            DIVIDE

MOD3A         modifies decks:            EXAMPLE
```

```
***** Overlapping mods in deck EXAMPLE

EXAMPLE is overlapped by:                EXAMPLE

EXAMPLE overlaps mod(s):                 EXAMPLE
/EOF

ID MOD 2A
*/
*/            - MOD2A modifies deck(s):  BLOCK1
*/
*DC BLOCK1
*D BLOCK1.2
              PARAMETER (SIZE=100)
              REAL A(SIZE),B(SIZE)
*/
*/            - End of MOD2A
*/


*ID MOD2B
*/
*/            - MOD2B modifies deck(s):  DIVIDE
*/
*DC DIVIDE
*D DIVIDE.4
              DO 100 I = 1,SIZE
*/
*/            - End of MOD2B
*/
/EOF


*DECK EXAMPLE
              PROGRAM EXAMPLE
*CALL BLOCK1
              READ *,A,B
              CALL DIVIDE
              WRITE *,A,B
              STOP
              END
```

6. MODECKS

The MODECKS utility compares two sets of UPDATE decks and creates a modification file (mod). MODECKS compares a modified deck (an edit file or dataset) and an original deck (a source file or dataset) and creates the modification file necessary to create the edit file from the source file.

MODECKS currently works on all PLs of any data width, including variable length PLs. However, the maximum line length of any card in the PL is 128 for space and speed reasons.

This section provides, first, the COS control statement and its parameters, then the UNICOS command line and parameters, and then gives an example illustrating the use of MODECKS with each operating system.

6.1 MODECKS CONTROL STATEMENT (COS)

You can load and execute MODECKS with the control statement that follows:

Format:

```
MODECKS[,E=edn],S=sdn[,M=mdn][,LOCATE][,Q]
   [,IDENTS=id1:id2:...idn]
   [,ORDER='dk1.dk2,dk3.dk4,...,dk-1.dkn'][,NP][,NN][,NM]
   [,NH][,PREFIX='x1,x2,...xn'][,DESC=ddn].
```

E=*edn* Edit file dataset name. This is a file that has been edited and changed by the user. If omitted or E, the edit file is $IN. If E=*edn*, the edit file is *edn*. E=0 is invalid.

S=*sdn* Source file dataset name. This is a file that has been created by UPDATE with sequence numbers attached. If omitted or S, the source file is $SR. If S=*sdn*, the source file is *sdn*. S=0 is invalid.

M=*mdn* Mod file dataset name. This file receives the modification file that MODECKS creates. If omitted or M, the mod file is $OUT. If M=*mdn*, the mod file is *mdn*. M=0 is invalid.

LOCATE Tells MODECKS to generate additional comments for certain INSERT and DELETE directives. If the line being referenced by the INSERT or DELETE directive does not have the deck name as part of its sequence number, MODECKS identifies the nearest line that does contain the deck name, and generates a comment on the INSERT or DELETE directive.

The following is an example of using LOCATE with MODECKS. Assume that your source file (SDN) reads as follows:

```
*DECK SAMPLE              SAMPLE.1
Line 1                    SAMPLE.2
Line 2                    SAMPLE.3
Line 2a                     MOD1.1
Line 2b                     MOD1.2
Line 2c                     MOD1.3
Line 2d                     MOD1.4
Line 3                    SAMPLE.4
Line 4                    SAMPLE.5
Line 4a                     MOD1.5
Line 4b                     MOD1.6
```

Now, assume that your edit dataset (EDN) reads as follows:

```
*DECK SAMPLE
Line 0a
Line 1
Line 2
Line 2b
Line 2c
Line 2d
Line 3
Line 4
Line 4a
Line 5
```

Your edit dataset calls for the deletion of two lines (lines 2a and 4b in the SDN) and the insertion of two lines (new line 0a and line 5 in the EDN). To perform this operation, you would enter the following control statement:

```
MODECKS, E=EDN,S=SDN,LOCATE.
```

The resulting output from MODECKS would look like this:

```
*I SAMPLE.1
Line0a
*D MOD1.1                          1 LINE BELOW:  SAMPLE.3
*D MOD1.6                         2 LINES BELOW:  SAMPLE.5
Line 5
```

The use of LOCATE lets MODECKS tell you where the change was made in relation to the other identifiers (column 2 in the output). When you add a new line, MODECKS prints out the insertion text (the last line of the preceding sample output).

Q
Tells MODECKS to compare only the decks that are present in both the edit and the source files. The default is to purge decks in the source file but not in the edit file, to add decks that are in the edit file but not in the source file, and to produce MOVEDK directives needed to put the decks in the PL in the same order as they appear in the Edit file. Keyword only.

IDENTS=*id1:id2:...idn*
These are identifiers (from 1 to 7 characters) that appear in the *ID directives of the modifications. You may specify up to 64 identifiers. For the first 26 *ID directives, *id1* is used with the characters "A-Z" appended, one for each *ID directive. For the 27th to the 52nd *ID directives, *id2* is used, and so on. If IDENTS is omitted, no *ID directives is produced. If you specify the keyword alone, the identifier defaults to MODIDNT.

ORDER='*dk1.dk2,dk3.dk4,...,dk-1.dkn*'

These are the ranges of decks that are to be alphabetized. You can provide up to 32 ranges. MODECKS produces MOVEDK directives needed to put the edit decks into alphabetical order within each range of decks specified. The range of decks is noninclusive by default. You can enclose the decks by brackets or parentheses, mixed freely, to aid in visual clarity; however, the system ignores parentheses. A left bracket, [, means that the first deck in the range is included in the alphabetizing scheme; a right bracket,], means that the second deck in the range is included in the alphabetizing scheme.

There are two decks predefined in MODECKS: $$FIRST and $$LAST that match the first and last decks in the file, respectively. The default is to generate MOVEDK directives that will move the source file decks into the same order as the edit file decks. The keyword alone alphabetizes the entire range of decks; that is, ORDER='[$$FIRST.$$LAST]'.

NP Tells MODECKS not to generate PURGEDK directives. The default is to generate PURGEDK directives for decks that are found in the source dataset but not in the edit dataset. NM is implied.

NN Tells MODECKS not to generate any *DECK directives. The default is to generate *DECK directives for decks that are found in the edit dataset but not in the source dataset. NM is implied.

NM Tells MODECKS not to generate any *MOVEDK directives. The default is to generate the *MOVEDK directives needed to put the decks in the ordering scheme specified.

NH Tells MODECKS not to generate a mod header. The default is to generate a mod header for each identifier dataset as supplied with the IDENTS option.

PREFIX= '*x1,x2,...,xn*'

Tells MODECKS the prefixes that are to be used when computing mod dependencies, which is any line being inserted or deleted and having a standard MODID format; that is, one consisting of 8 characters and not matching the deck name. Then MODECKS determines any UPDATE dependencies that the mod has. The default prefix is the same as the one specified in the IDENT directives.

DESC=*ddn*

Specifies the file containing the mod description to be inserted into the mod header. If omitted, no description file is read. If DESC=*ddn*, the description file is *ddn*.

6.2 MODECKS COMMAND LINE (UNICOS)

Under UNICOS, you can load and execute MODECKS with the following command line:

Format:

```
modecks [-e ef] -s sf [-m mf] [-l] [-q] [-i id1 id2 ... idn]
   [-o range] [-p] [-n] [-v] [-h] [-x x1 x2 ... xn] [-d df]
```

-e *ef* The edit file name. This is a file that has been edited and changed by the user. If omitted, the edit file is **stdin**. If you specify **-e page**, the edit file is **page**.

-s *sf* The source file name. This is a file that has been created by UPDATE with sequence numbers attached. If you specify **-s skb**, the source file is **skb**. This is a required option.

-m *mf* The mod file name. This file receives the modification file that MODECKS creates. If you do not specify a file, the mod file is **stdout**. If you specify **-m modf**, the mod file is **modf**.

-l The -l option tells MODECKS to generate additional comments for certain INSERT and DELETE directives. If the line being referenced by the INSERT or DELETE directive does not have the deck name as part of its sequence number, MODECKS identifies the nearest line that does contain a deck name, and generates a comment on the INSERT or DELETE directive.

The following is an example of using the -l option with MODECKS. Assume that your source file reads as follows:

```
*deck sample            sample.1
Line 1                  sample.2
Line 2                  sample.3
Line 2a                   mod1.1
Line 2b                   mod1.2
Line 2c                   mod1.3
Line 2d                   mod1.4
Line 3                  sample.4
Line 4                  sample.5
Line 4a                   mod1.5
Line 4b                   mod1.6
```

Now, assume that your edit file (**page**) reads as follows:

```
*deck sample
Line 0a
Line 1
Line 2
Line 2b
Line 2c
Line 2d
Line 3
Line 4
Line 4a
Line 5
```

Your edit file calls for the deletion of two lines (lines 2a and 4b in **skb**) and the insertion of another two lines (new line 0a and line 5 in **page**). To perform this operation, you would enter the following command line:

```
modecks -e page -s skb -l
```

The resulting output from **modecks** looks like this:

```
*I sample.1
Line 0a
*D mod1.1              1 LINE BELOW:  sample.3
*D mod1.6             2 LINES BELOW:  sample.5
Line 5
```

The use of the **-l** option lets MODECKS tell you where the change was made in relation to the other identifiers (column 2 in the output). When you add a new line, MODECKS prints out the insertion text (the last line is the preceding sample output).

-q The **-q** option tells MODECKS to compare only the decks that are present in both the edit file and the source file. The default is to purge decks in the source file but not in the edit file, to add decks that are in the edit file but not in the source file, and to produce MOVEDK directives needed to put the decks in the PL in the same order as they appear in the edit file. The **-q** option takes no arguments.

-i *id1 id2 ... idn*
These are identifiers will appear in the *ID directives of the modifications. You may specify up to 64 identifiers. For the first 26 *IDENT directives, **id1** is used with the characters "A-Z" appended, one for each *IDENT directive. For the 27th to the 52nd *IDENT directives, **id2** is used, and so on. If you omit **-i**, no *ID directives are produced. If you specify the **-i** option alone, the identifier defaults to MODIDNT.

-o *range* The **-o** option defines the ranges of decks that are to be alphabetized. The format is as follows (*rng* has the format *deck*1.*deckj*):

rng1,rng2, ... rngn

-o *range* (continued)
You can provide up to 32 ranges, and MODECKS will produce MOVEDK directives needed to put the edit decks into alphabetical order within each range of decks specified. The range of decks is noninclusive by default. You can surround the decks by brackets or parentheses, mixed freely, to aid in visual clarity; however, the system ignores parentheses. A left bracket, [, means that the first deck in the range is included in the alphabetizing scheme; a right bracket,], means that the second deck in the range is included in the alphabetizing scheme.

There are two decks predefined in MODECKS: $$FIRST and $$LAST to match the first and last decks in the file, respectively. The default is to generate MOVEDK directives that will move the source file decks into the same order as the edit file decks. The **-o** option alone alphabetizes the entire range of decks; that is, **-o'[$$FIRST.$$LAST]'**.

-p
The **-p** option tells MODECKS not to generate PURGEDK directives. The default is to generate PURGEDK directives for decks that are found in the source file but not in the edit file. The **-v** option is implied.

-n
The **-n** option tells MODECKS not to generate any *DECK directives. The default is to generate *DECK directives for decks that are found in the edit file but not in the source file. The **-v** option is implied.

-v
The **-v** option tells MODECKS not to generate any *MOVEDK directives. The default is to generate the *MOVEDK directives needed to put the decks in the ordering scheme given.

-h
The **-h** option tells MODECKS not to generate a mod header. The default is to generate a mod header for each identifier file as supplied with the **-i** option.

-x x_1 x_2 ... x_n
The **-x** option tells MODECKS the prefixes that are to be used when computing mod dependencies. A mod dependency is defined as any line that is being inserted or deleted and has a standard MODID format; that is, it has 8 characters and does not match the deck name. Then MODECKS determines any UPDATE dependencies that the mod has. The default prefix is the same as the one specified in the **-i** directives.

-d *df*
The **-d** option tells MODECKS which file contains the mod description that will be inserted into the mod header.

6.3 USING MODECKS UNDER COS

The following example illustrates the use of MODECKS under COS. A MODECKS session can be broken down into three stages. First you transfer the original deck from COS to the front end, as follows:

```
ACCESS,DN=PL,ID=MYPL.
UPDATE,P=PL,Q=DECK1,NS,S=DECK1,C=0,N=0.
DISPOSE,DN=DECK1,TEXT='~mydir/tmp/d.edit'.
```

This example assumes you are running a UNIX front-end system; if you are not using a UNIX system, change only the TEXT entry. For a full discussion of the UPDATE parameters, see section 2, Invoking Update. In this example, the original deck is accessed without sequence numbers (the NS on the UPDATE line).

Second, you use the front end to make changes to the deck--in this case, using a UNIX editor:

```
vi d.edit
```

Third, you run MODECKS under COS to compare decks:

```
ACCESS,DN=PL,ID=MYPL.
UPDATE,P=PL,Q=DECK1,SQ,S=DECK1,C=0,N=0.
FETCH,DN=EDIT,TEXT='~mydir/tmp/d.edit'.
MODECKS,E=EDIT,S=DECK1,IDENTS=MODID,M=MODOUT.
UPDATE,P=PL,N=NEWPL,I=MODOUT,F,S=0,C=0.
DISPOSE,DN=MODOUT,TEXT='~mydir/tmp/modout'.
```

On the MODECKS line, MODECKS compares the EDIT file and the DECK1 file and creates a mod file, MODOUT, to reflect the changes made. UPDATE then applies the mod to a PL and creates a new PL. Finally, the mod is saved to the front end using the DISPOSE control statement. There are, of course, other methods possible. For example, if the deck was on the front end rather than on Cray disk, you could use FETCH rather than ACCESS. And if you wanted the mod to be saved to Cray disk rather than to the front end, you could use SAVE rather than DISPOSE.

6.4 USING MODECKS UNDER UNICOS

The following example illustrates the use of MODECKS under UNICOS. A MODECKS session can be broken down into three stages. First, you transfer the original deck, as follows:

```
update -p PL -s d.edit -o ns -q deck1
```

The source file in this example is named **d.edit**. The original deck is accessed without sequence numbers (the **ns** on the command line). (For a full discussion of the UPDATE parameters, see section 2, Invoking UPDATE.)

Second, you make whatever changes are desired using the editor:

```
vi d.edit
```

Third, you run MODECKS, as follows:

```
update -p PL -s d.src -o sq -q deck1
modecks -e d.edit -s d.src -m modoutput -i MODID
update -p PL -i modoutput -n NPL -f
```

In this example, UPDATE gets the original deck with sequence numbers (using **sq** on the command line). Then, MODECKS compares **d.edit** and **d.src** and creates a mod to reflect the changes made. Finally, UPDATE applies the mod to PL and gives a new PL.

APPENDIX SECTION

A. CHARACTER SET

Appendix A contains characters used by UPDATE. Code values are octal. Codes 000 through 037 (NUL through US) and 177 (DEL) are not recognized. Separators are invalid for name, master, and comment characters. The symbol (s) identifies separators in the following table.

Character	ASCII Code	Character	ASCII Code
Space	040 (s)	1	061
!	041	2	062
"	042	3	063
#	043	4	064
$	044	5	065
%	045	6	066
&	046	7	067
'	047	8	070
(	050	9	071
)	051	:	072 (s)
*	052	;	073
+	053	<	074
,	054 (s)	=	075 (s)
-	055	>	076
.	056 (s)	?	077
/	057	@	100
0	060	A	101

Character	ASCII Code	Character	ASCII Code
B	102	Y	131
C	103	Z	132
D	104	[	133
E	105	\	134
F	106	]	135
G	107	^	136
H	110	_	137
I	111	`	140
J	112	a	141
K	113	b	142
L	114	c	143
M	115	d	144
N	116	e	145
O	117	f	146
P	120	g	147
Q	121	h	150
R	122	i	151
S	123	j	152
T	124	k	153
U	125	l	154
V	126	m	155
W	127	n	156
X	130	o	157

Character	ASCII Code	Character	ASCII Code
p	160	x	170
q	161	y	171
r	162	z	172
s	163		173
t	164		174
u	165		175
v	166		176
w	167		

B. MESSAGES

This section contains UPDATE, AUDPL, and MODECKS log file messages that are generated by UPDATE. There are three categories: UPDATE, AUDPL, and MODECKS.

B.1 UPDATE MESSAGES

The UPDATE program generates three types of log file messages:

- Informative: No action is taken.
- Error: Job aborts when UPDATE execution is finished, unless the UPDATE NA statement parameter is selected.
- Fatal error: Aborts execution immediately.

Under UNICOS, these messages are written to **stderr**. A code identifier, as shown, precedes messages, and they are listed numerically by this code. An explanation follows each message.

UD001 - PL: *dn* PL DATE: *m/d/y* LAST ID: *id*
The name of the dataset containing the PL is *dn*, *m/d/y* is the creation date of this PL version, and *id* is the name of the last identifier added to the PL. Class: informative.

UD002 - *n* UPDATE WARNINGS
UPDATE detected *n* probable user errors. If ML<4, E≠0, and L=0, warning messages are written to the listing and error datasets. Class: informative.

UD003 - EMPTY INPUT FILE, DN = *dn* (with COS)
UD003 - EMPTY INPUT FILE, FILENAME = *file* (with UNICOS)
The next file in COS dataset *dn* or UNICOS file *file*, specified as an input dataset/file for UPDATE, is empty. Determine whether the primary input file or READ datasets are nonnull or need to be rewound. Class: informative.

UD004 - DATASET NOT LOCAL, DN = *dn* (COS only)
The dataset indicated was not accessed before UPDATE execution. It was the PL, an input dataset, or was specified by a READ directive. Class: fatal error.

UD005 - RECURSIVE READ OF DN = *dn*
An attempt was made to read dataset *dn* recursively with the READ directive. Class: error.

UD006 - INVALID READ DATASET NAME, DN = *dn*
A READ directive encountered by UPDATE while reading input contains an invalid dataset name. Class: error.

UD007 - ERROR IN UPDATE CONTROL STATEMENT
One or more of the following control statement errors exist:

- Both the new PL and the old PL datasets have the same name
- Both F and Q were specified
- P=0 and I=0 (PL creation mode and no input)
- Invalid comment and/or master character
- Invalid DW value

Class: fatal error.

UD008 - MODS WITHOUT IDENTIFIER, NEW PL SUPPRESSED
A new PL cannot be generated with modifications that are not identified with an IDENT directive. Generation of a new PL has been suppressed. This occurs only when the N parameter specifies creation of a new PL, or in creation runs. Class: error.

UD010 - INVALID PROGRAM LIBRARY, DN = *dn* (with COS)
UD010 - INVALID PROGRAM LIBRARY, FILENAME = *file* (with UNICOS)
The *dn/file* is not in a PL format recognized by UPDATE. Class: fatal error.

UD011 - *n* FATAL UPDATE ERRORS
Update detected *n* fatal errors. Error messages are written to the listing and error datasets. Class: informative.

UD012 - PL FORMAT CONVERSION COMPLETE
A sequential format PL has been internally rewritten as a random format PL. Class: informative.

UD013 - SEQUENCE NUMBER EXCEEDS 131071 FOR ID = *id*
An attempt was made to add more than 131,071 lines with one identifier. The insertion must be split over two or more identifiers or decks. Class: fatal error.

UD014 - NUMBER OF IDENTIFIERS EXCEEDS 16383
Too many deck, common deck, and modification set identifiers are defined for this PL. Before any new identifiers can be added, you must resequence the PL by creating a new PL from the source dataset. Class: fatal error.

UD015 - DECK SPECIFIED BY Q PARAMETER NOT FOUND, DECK = *dkname*
The listed value for the Q control statement parameter was *dkname*, but it is not a deck or common deck in this PL, and it was not introduced by the input datasets. Class: error.

UD016 - PL MASTER CHARACTER IS: *m*
m is the master character recorded when the PL was created. It is the default for the master character used in the input and source datasets. This is written only if the master character is not the default (*). Class: informative.

UD017 - *n* MODIFICATION SETS SKIPPED
Because of unsatisfied IDENT directive dependency conditions, *n* modification sets were skipped. Use ML=1 on the UPDATE control statement to get a NOTE message written to the listing and error datasets for each skipped IDENT. Class: informative.

UD018 - *n* UNPROCESSED MODIFICATION DIRECTIVES
When UPDATE finished execution, *n* modification directives were left unprocessed, either because they modified decks and common decks that were not specified in a Quick mode UPDATE run, or because they referenced lines that were not found in the PL. Use the UM option on the UPDATE control statement to get a list of unprocessed modifications. Class: informative.

UD019 - *n* INPUT LINES TRUNCATED TO *pldw* CHARACTERS
n input lines longer than *pldw* characters were truncated to *pldw* characters. *pldw* is the number of characters per line stored in the PL, and it is defined by the DW control statement parameter. The minimum value, and default, for *pldw* is 80. Class: informative.

UD020 - MORE THAN 100 FATAL INPUT ERRORS
More than 100 fatal input errors were detected and UPDATE aborted. A DECK or COMDECK directive may be missing, or the wrong master character may have been specified. Class: error.

UD021 - *n* OVERLAPPING MODIFICATIONS
There were *n* directives that either referenced lines that were inserted earlier in the same UPDATE run or deleted a range of text that included newly inserted lines. Use ML=1 on the UPDATE control statement to get NOTE and CAUTION messages about overlaps to determine whether the overlaps were proper and expected. Class: informative.

UD022 - INVALID DC PARAMETER VALUE
The DC parameter on the UPDATE control statement is equated to an invalid value. Valid values are ON and OFF. Class: fatal error.

UD023 - INTERNAL UPDATE ERROR: ID NOT IN SEQUENCE TABLE
An UPDATE internal logic error caused the current identifier name not to be found in the Sequence Table. Class: fatal error.

UD024 - INTERNAL UPDATE ERROR: INVALID DIRECTIVE KEY
An UPDATE internal logic error caused an invalid directive key to be assigned. Class: fatal error.

UD025 - INTERNAL UPDATE ERROR: PL I/O STATUS ERROR
An UPDATE internal logic error caused an I/O status error to occur during a read of the PL. Class: fatal error.

UD026 - INTERNAL UPDATE ERROR: $UDT1 I/O STATUS ERROR
An UPDATE internal logic error caused an I/O status error in a character read of temporary dataset $UDT1. Class: fatal error.

UD027 - INTERNAL UPDATE ERROR: $UDT2 I/O STATUS ERROR
An UPDATE internal logic error caused a count exhaustion during a character read of temporary dataset $UDT2. Class: fatal error.

UD028 - INTERNAL UPDATE ERROR: ID NAME NOT IN IDENTIFIER TABLE
An UPDATE internal logic error caused an identifier name to be omitted from the Identifier Table. Class: fatal error.

UD029 - INTERNAL UPDATE ERROR: DECK NAME NOT IN IDENTIFIER TABLE
An UPDATE internal logic error caused an identifier name to be missing from the Identifier Table; thus, it was not found when UPDATE tried to get the name of the next deck to process. Class: fatal error.

UD030 - INTERNAL UPDATE ERROR: ID NUMBER NOT IN IDENTIFIER TABLE
An UPDATE internal logic error caused an identifier to be missing from the Identifier Table. Class: fatal error.

UD031 - INTERNAL UPDATE ERROR: ERROR IN ID LIST IN OLD FORMAT PL
UPDATE was unable to read the identifier list in an old PL format. Class: fatal error.

UD032 - INTERNAL UPDATE ERROR: OLD FORMAT PL IS UNREADABLE
UPDATE was unable to read an old PL format. Class: fatal error.

UD033 - INTERNAL UPDATE ERROR: PL INFORMATION FILE READ ERROR
UPDATE had a read error on a partial record read of the PL information file. Class: fatal error.

UD034 - INTERNAL UPDATE ERROR: UNKNOWN PROCESS TYPE
An UPDATE internal logic error caused an invalid process type (INSERT, BEFORE, DELETE, or RESTORE) to be returned from a Modification Table entry. Class: fatal error.

UD035 - INTERNAL UPDATE ERROR: DECK DIRECTIVE IN COMDECK
An UPDATE internal logic error caused a DECK directive to be placed in a common deck instead of starting a new deck. Class: fatal error.

UD036 - INTERNAL UPDATE ERROR: COMDECK DIRECTIVE IN DECK
An UPDATE internal logic error caused a COMDECK directive to be placed in a common deck instead of starting a new common deck. Class: fatal error.

UD037 - LIST CONTROL STATEMENT PARAMETER IGNORED
The LIST control statement parameter is not supported and is ignored. Class: informative.

UD038 - INTERNAL UPDATE ERROR: NEW PL TABLE IS UNSORTED
A call to library routine ORDERS failed; the new PL is ordered as specified by the K option, but PLs built from it will revert to the old ordering. Class: informative.

UD039 - INTERNAL UPDATE ERROR: NO SECOND DELETE ENTRY
An UPDATE internal logic error caused the second entry in the Modification Table for a DELETE or RESTORE range to be missing. Class: fatal error.

UD040 - INTERNAL UPDATE ERROR: BAD HDC IN PL LINE
When handling deleted lines with bad correction histories, an active line was found with a header descriptor count of 0. Class: fatal error.

UD041 - *n* MULTIPLE INSERTIONS
There were *n* locations in which new text was inserted by directives in more than one modification set. Use ML=2 on the UPDATE control statement to write CAUTION messages to the listing dataset for each multiple insertion. Class: informative.

UD042 - INVALID ML PARAMETER VALUE; MUST BE 0-4
An invalid value was specified for the ML parameter on the UPDATE control statement. Class: fatal error.

00043 - INTERNAL UPDATE ERROR: DELETE TABLE ENTRY NOT FOUND
An UPDATE internal logic error caused an entry to be missing from the Delete Table. Class: fatal error.

UD044 - DATASET *dsname* USED FOR MORE THAN ONE PURPOSE
Dataset *dsname* was specified by more than one control statement parameter (for example, both C and S). Class: fatal error.

UD045 - DW=* CANNOT BE APPLIED TO A FIXED LENGTH RECORD PL
A regular PL has been specified with a variable-length record specifier. This conversion is not allowed. Class: fatal error.

UD046 - INVALID DW VALUE FOR A VARIABLE LENGTH RECORD PL
A variable-length record PL was specified with a DW value other than "*". This is not allowed. Class: fatal error.

UD047 - INTERNAL UPDATE ERROR: INCONSISTENT CC AND DW, PLDW
An inconsistency was detected in the PL information file. Class: fatal error.

UD048 - NUMBER OF COMPILE FILES EXCEEDED. APPENDED IS A: *numcpl* (with UNICOS only)
The number of created compile files exceeds the number specified by the **-a** option or the default value of 4; *numcpl* is the number given to the exceeded compile file. This additional file is appended with *numcpl* (starting with 1 and incrementing until all files are labeled). Check the UNICOS command line options **-c** and **-a**. Class: caution.

UD050 - ATTEMPT TO *act* FILE FAILED. *type* FILENAME = *file* (with UNICOS only)
The reason for failure is provided in the following *act* descriptions:

OPEN — UPDATE tried to open either a *type* PL or NPL (new PL) file. The type specified is either PL FILE or NPL FILE. (If NPL is the type, the new PL must have write access. If PL is the type, the PL must have read access.) This message is followed by the name of the file UPDATE is trying to open. If the type is PL FILE, check the **-p** option on the command line and ensure that the file name is an existing UPDATE PL. If the type is NPL FILE, UPDATE cannot create the file specified by the **-n** option. You may not have permission to create this file, or the file name may be invalid.

WRITE — UPDATE tried to write to the NPL FILE (*type*). The file name (*file*) indicates the specific deck, or comdeck, or UPDATE directory in which this write occurred. TIDENT and PLINFO names mean that these tables, in the UPDATE directory, could not be written to the NPL. The NPL file name may be in error and cannot be used. This error may be caused by an empty input file. There was an attempt to write the UPDATE directory, but no decks or comdecks were written first. (There must be decks or comdecks to which the write is directed.) This message is followed by the name of the file to which UPDATE is writing.

SEEK — UPDATE tried to position a PL or NPL file to a specific deck, comdeck, or UPDATE directory. The *type* indicates the location this seek occurred. TIDENT and PLINFO names mean that UPDATE was unable to locate this directory table. This message is followed by the name of the file to which UPDATE is trying to position.

CLOSE — UPDATE tried to close either the PL or NPL file. The type given is either PL FILE or NPL FILE. The name of the file UPDATE is trying to close follows.

UD051 - Expected *FILE or *CFILE AT SEQUENCE: identifier (UNICOS only). UPDATE is attempting to write output to the compile file, **-c** was specified with no argument, and no *FILE or *CFILE directive was encountered. Class: fatal.

B.2 AUDPL LOG FILE MESSAGES

AUDPL generates three classes of log file messages:

- Informative: No action is taken.
- Error: If the NA option was used, AUDPL continues processing, using defaults where necessary, and aborts when it is done. Otherwise, it aborts immediately when the error is detected.
- Fatal error: AUDPL aborts immediately when the error is detected.

Log file messages are preceded by a code identifier as shown, and they are listed numerically by this code identifier. An explanation follows each message.

PL001 - PROGRAM LIBRARY REQUIRED; SPECIFY P OR ACCESS $PL
You cannot use AUDPL without a PL for input. P=0 was specified on the control statement, or the P parameter was not used and dataset $PL is not local. Class: fatal error.

PL002 - LISTING OPTION *k* USED MORE THAN ONCE
One of the listing options for the LO parameter was used twice. Class: error.

PL003 - KEYWORD *k* MUST BE EQUATED
Keyword *k* on the control statement was used without being equated to a value. Class: error.

PL004 - INVALID DATA WIDTH, VALID RANGE IS 1-256
The value used with the DW control statement parameter was not in the range 1 through 256. Class: error.

PL005 - INVALID LISTING WIDTH, LW MUST BE 80 OR 132
The value used with the LW control statement parameter was not 80 or 132, optionally preceded by 'C'. Class: error.

PL006 - *k* IS NOT A VALID LIST OPTION
One of the letters in the string for the LO control statement parameter was not a valid list option. Class: error.

PL007 - INVALID JUSTIFICATION VALUE, MUST BE C, L, OR U
The value specified for the JU control statement option was not C, L, or U. Class: error.

PL008 - DATASET *dsname* USED FOR MORE THAN ONE PURPOSE
The same dataset name was equated to more than one of the control statement parameters that specify datasets used by AUDPL. Class: fatal error.

PL009 - PROGRAM LIBRARY NOT LOCAL
The dataset specified with the P control statement parameter was not local to the job. Class: fatal error.

PL010 - INPUT DATASET NOT LOCAL
The dataset specified with the I control statement parameter was not local to the job. Class: fatal error.

PL011 - OLD PL; RUN THROUGH UPDATE FIRST
The PL in the dataset specified with the P control statement parameter was written by an UPDATE from before UPDATE release 1.13. Write a new PL from the old one with an UPDATE from release 1.13 or higher, and use the new PL as input to AUDPL. Class: fatal error.

PL012 - PROBLEM READING PL
AUDPL is unable to read the PL in the dataset specified with the P control statement parameter. Check to see that the dataset contains a valid PL, and if so, report the problem to a system programmer. Class: fatal error.

PL013 - NAME IN DK LIST NOT IN PL, ID = *idname*
One of the names in the list for the DK control statement parameter was not in the identifier directory for the PL. Check the spelling of the name listed. Class: error.

PL014 - IDENTIFIER IN DK LIST IS NOT A DECK, ID = *idname*
One of the identifiers in the list for the DK control statement parameter is a modification set, not a deck or common deck. Class: error.

PL015 - BACKWARD RANGE IN DK LIST: *idname*1 TO *idname*2
In the identifier range specified in the message, the second identifier comes before the first identifier in the identifier directory for the PL. Check the identifier list from the L list option for the order of identifiers in the PL. Class: error.

PL016 - SYNTAX ERROR IN DK LIST
The list of identifiers given for the DK control statement parameter contains a syntax error, possibly because the two list types were combined. Class: error.

PL017 - NAME IN PM LIST NOT IN PL, ID = *idname*
One of the identifiers in the list for the PM control statement parameter is not in the identifier directory for the PL. Class: error.

PL018 - BACKWARD RANGE IN PM LIST: *idname*1 TO *idname*2
In the identifier range specified in the message, the second identifier comes before the first identifier in the identifier directory for the PL. Check the identifier list from the L list option for the order of identifiers in the PL. Class: error.

PL019 - SYNTAX ERROR IN PM LIST
The list of identifiers given for the PM control statement parameter contains a syntax error, possibly because the two list types were combined. Class: error.

PL020 - *n* INPUT DIRECTIVE ERRORS
There were *n* errors detected in the AUDPL input directives. Error messages for input errors are written to the listing dataset. Class: error.

PL021 - WARNING, NO ACTION REQUESTED OF AUDPL; USE I, LO, PM, OR B
The AUDPL control statement did not specify any actions to be taken through the LO, PM, or B parameter, and no input dataset was specified. Class: informative.

PL101 - INTERNAL AUDPL ERROR: INVALID IDENTIFIER NUMBER
An AUDPL internal logic error caused an invalid identifier number to be used as the identifier for a text line. Report the problem to a system programmer. Class: fatal error.

PL102 - INTERNAL AUDPL ERROR: ORDERS ROUTINE FAILED
An AUDPL internal logic error caused the return status of $SCILIB routine ORDERS indicating that it was unable to sort the table passed to it by AUDPL. Report the problem to a system programmer. Class: fatal error.

B.3 MODECKS ERROR MESSAGES

MODECKS error messages are preceded by a code identifier as shown, and they are listed numerically by this code identifier. An explanation follows each message.

MD001 - SOURCE DATASET NOT SPECIFIED
The source dataset was not specified. Class: fatal error.

MD002 - EMPTY DATA FILE. DN=_____
The specified file was empty. Class: informative.

MD003 - NO SEQUENCE NUMBERS FOUND. DN=_____
The specified source file did not contain sequence numbers in UPDATE format. Class: fatal error.

MD004 - NO UPDATE DIRECTIVE. DN=_____
The specified file did not contain a recognized UPDATE directive as the first line in the file; that is, a DECK or COMDECK directive. Class: fatal error.

MD005 - DECK TOO LARGE, DN=_____
The specified deck was too large (more than 500,000 lines) to fit into the tables. Class: fatal error.

MD006 - MODECKS WILL NOT SUPPORT DW GREATER THAN 128
Because of lack of space, a maximum of 128 characters can be on one line in the edit or source dataset. Class: fatal error.

MD007 - _____ IS A DUPLICATE DECK
Two decks were encountered with the same name. Class: fatal error.

MD008 - INTERNAL MODECKS ERROR, TABLES CORRUPTED
Because of a logic error, the tables have become corrupted. Class: fatal error.

MD009 - INTERNAL MODECKS ERROR _____ NOT FOUND IN TABLES
Because of a logic error, the specified deck name was not found in the table. Class: fatal error.

MD010 - NO MORE IDENTIFIERS SPECIFIED, USING _____ AGAIN
The identifiers specified were not enough to cover all decks that have been changed in this mod. The specified identifier is duplicated. Class: caution.

MD011 - DECK IN RANGE NOT FOUND; DECK = _____
The deck specified in the ordering range was not found in the edit file. Class: fatal error.

MD012 - _____ FOLLOWS _____
The decks given in the ordering range were specified in the incorrect order. Class: fatal error.

MD013 - ERROR IN ORDER SYNTAX
There was an error in the ordering syntax specified. Class: fatal error.

MD014 - UNABLE TO OPEN FILE. DN= _____
An error was encountered when attempting to open the specified file. Class: fatal error.

MD015 - IDENTIFIER _____ TRUNCATED TO 7 CHARACTERS
The specified identifier was longer than 7 characters; therefore, it is truncated to 7 characters. Class: caution.

MD016 - MORE THAN 64 IDENTIFIERS SPECIFIED.
Too many identifiers were specified on the command line. The usage is printed out. Class: fatal error.

MD017 - PREMATURE END OF FILE ON TEMPORARY FILE.
When creating the mod header, the temporary file was incorrect. Class: internal fatal error.

MD018 - INTERNAL MODECKS ERROR, NO CHANGED DECKS.
While creating the mod header, no changed decks were detected. Class: internal fatal error.

MD019 - MORE THAN 500 DEPENDENCIES. NONE WRITTEN.
There were more than 500 dependencies in the generated mod; none were written. Class: informative.

B.4 UPIC LOG FILE MESSAGES

UPIC messages are coded messages in the range UP000 through UP099. They include general messages, messages on control statement errors, and internal error messages. UPIC runs only under COS.

B.4.1 GENERAL MESSAGES

UP001 - UPIC Version *n.nn*
This gives the UPIC release version number. Class: informative.

UP002 - Page size is *nnnnnn*
This gives the page size UPIC is using for the output dataset. Class: informative.

UP003 - *nnnnnnn* lines read, *nnnnnnn* lines written to *xxxxxxx*
UPIC prints this message when it has completed processing. *xxxxxxx* is the output dataset name. Class: informative.

UP004 - *nnnnnnn* unrecognized lines read
UPIC failed to recognize one or more lines in the input dataset. The lines could be from an unsupported language processor, or they could contain any other text sandwiched between listings. This message is always preceded by one or more UP006/UP007 message pairs. Class: informative.

UP005 - *nnnn.nnn* seconds processing time
UPIC completed scanning the input dataset in *nnnn.nnn* seconds. Class: informative.

UP006 - Unknown listing page, begins ...
UPIC failed to recognize one or more lines in the input dataset. The lines could be from an unsupported language processor or any other text sandwiched between listings. This message is always followed by a UP007 message, which contains the first 72 characters of the unrecognized line. Up to 10 UP006/UP007 message pairs may be printed. Once UPIC has completed processing, it gives a count of unrecognized lines in the UP004 message. Class: informative.

UP007 - ‹first 72 characters of unrecognized line›
This is the companion message to UP006. See UP006 for a complete discussion. Class: informative.

B.4.2 CONTROL STATEMENT ERROR MESSAGES

UP011 - CL parameter out of range 1 - *nnn*
Check your UPIC control statement to ensure you have specified a legal value for this parameter. Class: fatal.

UP012 - PD option must be 6 or 8 if specified
Check your UPIC control statement to ensure you have specified a legal value for this parameter. Class: fatal.

UP013 - PS parameter must be positive
Check your UPIC control statement to ensure you have specified a legal value for this parameter. Class: fatal.

UP014 - * may only be set to a 1-character value
Check your UPIC control statement to ensure you have specified a legal value for this parameter. Class: fatal.

B.4.3 UPIC INTERNAL ERROR MESSAGES

UP021 - Unknown processor type: *xxxxxxxx*
UPIC internal error. Routine PRNT does not recognize the noted type of language processor. Have your systems programmer verify that the main program (UPIC), and subroutines CKPROC and PRNT, all support the named processor type. Class: fatal.

UP022 - UPDATE ID table overflow. Maximum is *nnnnn*.
Probable error in specifying ID and NOID parameters, too many wildcard character combinations. If you need more Identifier table space, recompile UPIC with parameter MAXID set to a larger value. MAXID is declared in common deck UPICBLK. Class: fatal.

UP023 - Debug (ckproc): Processor type is *xxxxxxxx*
Routine CKPROC produces this message every time UPIC detects a new listing page. UPIC issues this message only if you have specified the DEBUG control statement option. Class: informative.

C. UPDATE PROGRAM LIBRARY FORMATS

UPDATE accepts two program library (PL) formats. Format 1 PLs can be read only. These libraries were created with UPDATE 1.05 or earlier, but they are still available to you. As a preliminary step, UPDATE always internally converts PL format 1 to PL format 2. When new PLs are written, the format 2 structure is always used. UPDATE completely controls the format of the PLs.

C.1 FORMAT 1 - SEQUENTIAL PL STRUCTURE (COS ONLY)

Format 1 (figure C-1) is a sequential PL structure and applies only to COS operation. Each section of a sequential PL (decks and lists) is separated by an end-of-file (EOF). Decks consist of individual line images that, in a sequential PL, are not separated by an end-of-record (EOR). Details of each format follow.

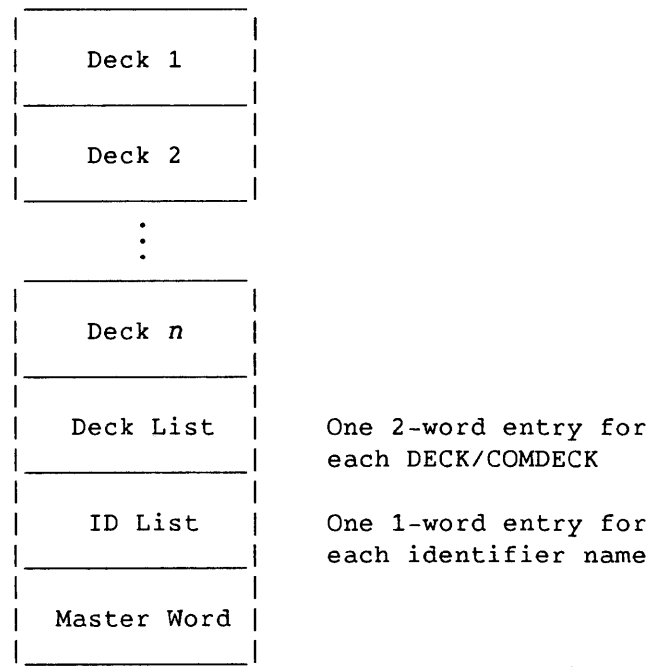
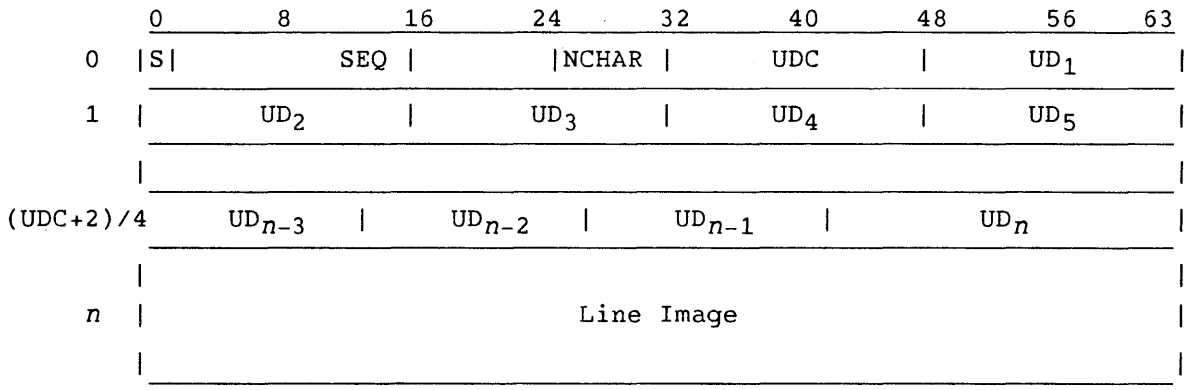


Figure C-1. PL Format 1

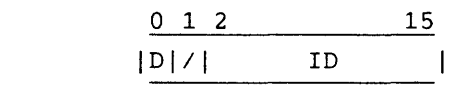
PL line format:



Field	Word	Bits	Description
S	0	0	Line status bit: 0 Inactive 1 Active
SEQ	0	1-24	Sequence number
NCHAR	0	25-31	Number of characters in line text
UDC	0	32-47	Descriptor count
UD_1	0	48-63	First UPDATE descriptor (identifies name that introduces the line)
UD_i-UD_n	1-(UDC+2)/4		Modification descriptors giving deletion identifier names

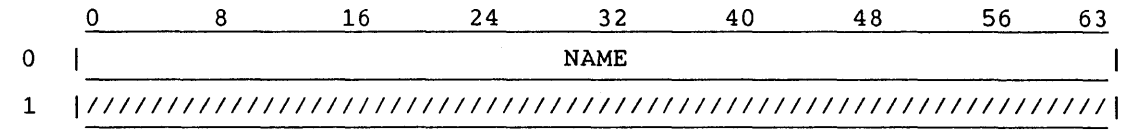
The length of the line image is NCHAR bytes.

Descriptor format:



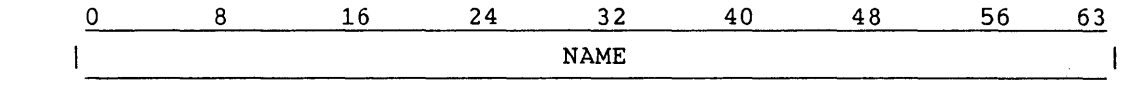
Field	Bits	Description
D	0	Descriptor status: 0 Deactivated line 1 Activated line
	1	Reserved
ID	2-15	Identifier number or name

Deck list entry format:



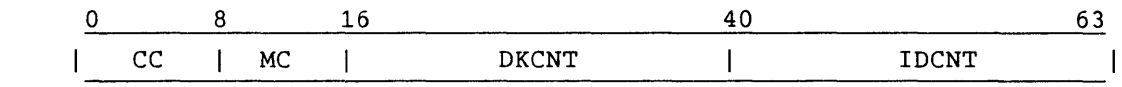
Field	Word	Bits	Description
NAME	0	0-63	Name of DECK or COMDECK (left-justified, zero-filled)
	1		Reserved

ID list entry format:



Field	Bits	Description
NAME	0-63	Identifier name (left-justified, zero-filled)

Master word format:



Field	Bits	Description
CC	0-7	PL check character (141_8=lowercase A)
MC	8-15	PL master character
DKCNT	16-39	Length of the deck list
IDCNT	40-63	Length of the ID list

C.2 FORMAT 2 - RANDOM PL STRUCTURE

Format 2 (figure C-2) is a random PL structure. Each section of a random PL is separated by an EOF record, and line images within each deck are separated by EOR. However, the identifier table and PL information contain no EOR. Details of each format follow.

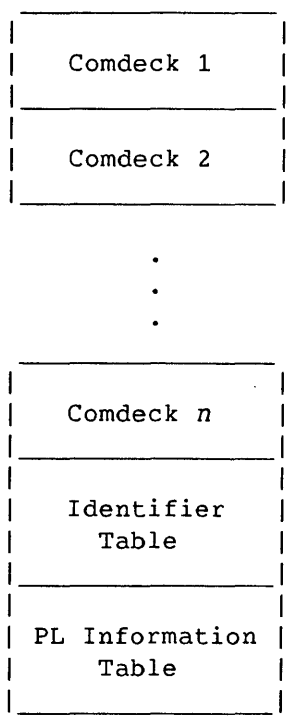
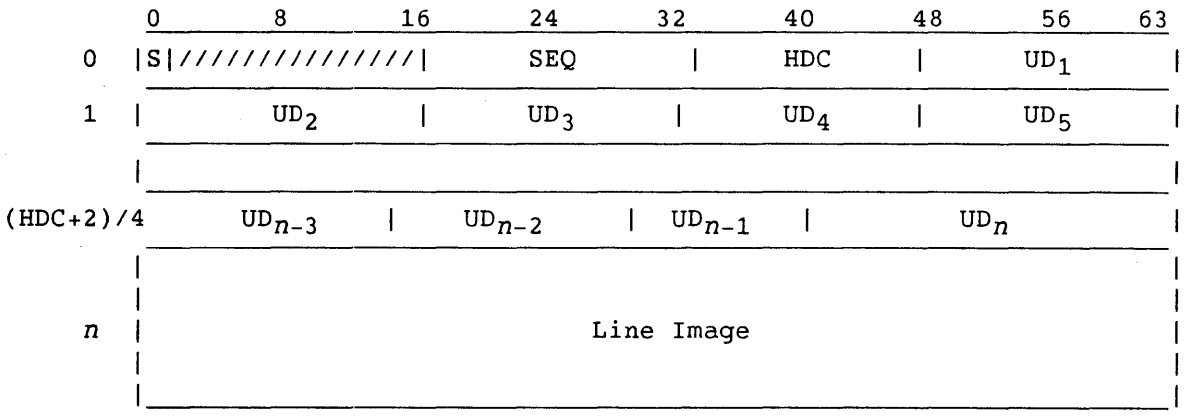


Figure C-2. PL Format 2

PL line format:

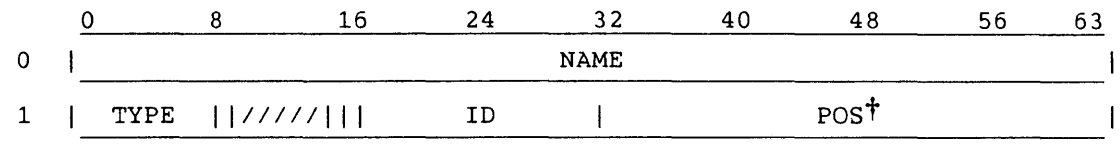


Field	Word	Bits	Description
S	0	0	Line status: 0 Inactive 1 Active
	0	1-16	Reserved

Field	Word	Bits	Description
SEQ	0	17-33	Line sequence number
HDC	0	34-47	Header descriptor count
UD_1	0	48-63	First UPDATE descriptor (specifies name introducing the line)
UD_i-UD_n	1-(HDC+2)/4		Modification descriptors

The format of each descriptor is identical to the corresponding descriptor fields in the PLs of format 1.

Identifier Table format:

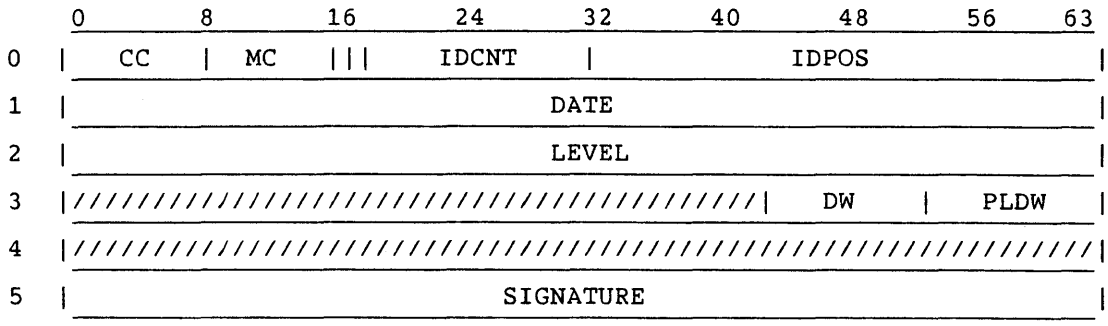


Field	Word	Bits	Description
NAME	0	0-63	Identifier name (left-justified, zero-filled)
TYPE	1	0-7	Identifier type: 0 Modification 1 Deck 2 Common deck 3 Common deck/no propagation
T	1	8-9	Temporary flag (used internally, always 0 in PL)
	1	10-15	Reserved
Y	1	16	Yank flag: 0 Mod, deck, or common deck not deactivated 1 Mod, deck, or common deck deactivated

† Field is not used under UNICOS.

Field	Word	Bits	Description
C	1	17	Correction History Good flag: 0 Correction history information not attached to deleted line 1 Correction history present in PL for this modification
ID	1	18-31	Identifier number
POS	1	32-63	Position of deck within PL (0 if TYPE=0)

PL Information Table format:



Field	Word	Bits	Description
CC	0	0-7	PL check character: (142_8=b - fixed-length record) (143_8=c - variable-length record)
MC	0	8-15	Default master character for input and source datasets

NOTE

UPDATE 1.13 and higher use 252_8 internally to represent the PL master character, thereby allowing the master character for input directives to be changed. Because of this change, previous UPDATE releases cannot process input directives for PLs created by UPDATE 1.13 and higher.

Field	Word	Bits	Description
PLMC	0	16	Master Character flag. If set, master character on directives in PL is 252_8; otherwise, MC is used.
	0	17	Reserved
IDCNT	0	18-31	Number of Identifier Table entries
IDPOS	0	32-63	PL position of start of Identifier Table
DATE	1	0-63	ASCII date of PL creation
LEVEL	2	0-63	Name of last identifier added to PL
	3	0-43	Reserved
DW	3	44-53	Default data width for compile and source datasets. If 0, 72 is used; if variable-length record PL, all bits are set (1777b).
PLDW	3	54-63	Number of characters saved for each line in the PL. If 0, 80 is used; if variable length record PL, all bits set (1777b).
	4	0-63	Reserved
SIGNATURE	5	0-63	'HIST OK' if bad correction histories were removed

D. PLCOPY UTILITY PROGRAM†

You can use the utility program **plcopy** to convert blocked, single-filed COS program libraries (PLs) into multifiled, unblocked UNICOS PLs. The COS PLs must have been created with PL format 2 (UPDATE version 1.06 or higher). However, if the blank compression character in the PL is changed, **plcopy** does not work.

Format:

```
plcopy -i inpath [-o outpath]
```

-i *inpath* Path and file name of the COS PL to be converted

-o *outpath* Path of an empty UNICOS directory that receives the converted PL. If the directory you specified is not empty, **plcopy** aborts and no conversion occurs. If you do not specify a directory, the current working directory path is taken.

† UNICOS only

E. UPDATE DIRECTIVE SUMMARY

This appendix contains a summary of the UPDATE directives and their accepted abbreviations. A detailed description can be found on the referenced pages of this manual.

Directive	Abbreviation	Description	Page
/comment	None	Indicates documentation directive	3-7
BEFORE	B	Inserts text before specified line	3-7
CALL	CA	Calls common deck	3-8
COMDECK	CDK	Defines common text sequence	3-8
COMPILE	C	Specifies compile dataset contents	3-9
COPY	CY	Copies text into new PL or dataset	3-10
CWEOF	None	Conditionally writes end of file to compile dataset	3-11
DECK	DK	Defines text sequence	3-12
DECLARE	DC	Declares deck for modifications	3-12
DEFINE	DEF	Defines name used by IF	3-12
DELETE	D	Deletes line or text range	3-13
EDIT	ED	Removes inactive lines from deck	3-13
ELSE	None	Determines whether following text is written to compile dataset	3-14

Directive	Abbreviation	Description	Page
ELSEIF	None	Specifies a condition for evaluation when no condition in the same IF group was true	3-14
ENDIF	None	Ends an IF group	3-15
FILE	None	Closes current compile dataset and opens new one (UNICOS only)	3-15
ENDSKIP	None	Ends a list of directives that are to be skipped	3-23
IDENT	ID	Defines modification set identifier	3-16
IF	None	Begins conditional text range and determines whether following text is written to compile dataset	3-17
INSERT	I	Inserts text after specified line	3-18
LIST	None	Starts input listing	3-18
MASTER	None	Changes the master character for input directives	3-19
MOVEDK	None	Alters deck position	3-19
NOLIST	None	Stops input listing	3-18
NOSEQ	None	Stops sequence number writing to compile dataset	3-22
PURGE	None	Removes a modification set permanently from the PL	3-20
PURGEDK	None	Removes a deck or common deck permanently from the PL	3-20
READ	RD	Reads input from alternate dataset	3-21
RESTORE	R	Reactivates deleted lines	3-21

Directive	Abbreviation	Description	Page
REWIND	None	Rewinds a local dataset	3-22
SEQ	None	Begins sequence number writing to compile dataset	3-22
SKIP	None	Begins a list of directives that are to be SKIPPED	3-23
SKIPF	None	Skips over files in dataset (COS only)	3-24
UNYANK	None	Restores yanked deck or modification set	3-26
WEOF	None	Writes an EOF to the compile dataset	3-24
WIDTH	None	Changes line length in compile dataset	3-25
YANK	None	Temporarily removes a deck or modification set from a PL	3-26

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