UNIX PROGRAMMER'S MANUAL

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INTRODUCTION

This manual gives complete descriptions of all the publicly available features of UNIX. It provides neither a general overview (see "The UNIX Time—sharing System" for that) nor details of the implementation of the system (which remain to be disclosed).

Within the area it surveys, this manual attempts to be as complete and timely as possible. A conscious decision was made to describe each program in exactly the state it was in at the time its manual section was prepared. In particular, the desire to describe something as it should be, not as it is, was resisted. Inevitably, this means that many sections will soon be out of date. (The rate of change of the system is so great that a dismayingly large number of early sections had to be modified while the rest were being written. The unbounded effort required to stay up—to—date is best indicated by the fact that several of the programs described were written specifically to aid in preparation of this manual!)

This manual is divided into seven sections:

- I. Commands
- II. System calls
- III. Subroutines
- IV. Special files
- V. File formats
- VI. User—maintained programs
- VII. Miscellaneous

Commands are programs intended to be invoked directly by the user, in contradistinction to subroutines, which are intended to be called by the user's programs. Commands generally reside in directory _/bin_ (for binary programs). This directory is searched automatically by the command line interpreter. Some programs classified as commands are located elsewhere; this fact is indicated in the appropriate sections.

System calls are entries into the UNIX supervisor. In assembly language, they are coded with the use of the opcode _sys_, a synonym for the _trap_ instruction.

The special files section discusses the characteristics of each system "file" which actually refers to an I/O device.

The file formats section documents the structure of particular kinds of files; for example, the form of the output of the loader and assembler is given. Excluded are files used by only one command, for example the assembler's intermediate files.

User—maintained programs are not considered part of the UNIX system, and the principal reason for listing them is to indicate their existence without necessarily giving a complete description. The author should be consulted for information.

The miscellaneous section gathers odds and ends.

Each section consists of a number of independent entries of a page or so each. The name of the entry is in the upper right corner of its pages, its preparation date in the upper left. Entries within each section are alphabetized. It was thought better to avoid page numbers, since it is hoped that the manual will be updated frequently.

All entries have a common format.

The name section repeats the entry name and gives a very short description of its purpose.

The synopsis summarizes the use of the program being described. A few conventions are used, particularly in the Commands section:

Underlined words are considered literals, and are typed just as they appear.

Square brackets ([]) around an argument indicate that the argument is optional. When an argument is given as name , it always refers to a file name.

Ellipses "..." are used to show that the previous argument—prototype may be repeated.

A final convertion is used by the commands themselves. An argument beginning with a minus sign — is often taken to mean some sort of flag argument even if it appears in a position where a file name could appear. Therefore, it is unwise to have files whose names begin with "—".

The description section discusses in detail the subject at hand.

The files section gives the names of files which are built into the program.

A see also section gives pointers to related information.

A diagnostics section discusses the diagnostics that may be produced. This section tends to be as terse as the diagnostics themselves.

The bugs section gives known bugs and sometimes deficiencies. occasionally also the suggested fix is described.

The owner section gives the name of the person or persons to be consulted in case of difficulty. The rule has been that the last one to modify something owns it, so the owner is not necessarily the author. The owner's initials stand for:

ken	K. Thompson
dmr	D. M. Ritchie
jfo	J. F. Ossanna
rhm	R. Morris

These three—character names also happen to be UNIX user ID's, so messages may be transmitted by the mail command or, if the addressee is logged in, by write.

At the beginning of this document is a table of contents, organized by section and alphabetically within each section. There is also a permuted index derived from the table of contents. Within each index entry, the title of the writeup to which it refers is followed by the appropriate section number in parentheses. This fact is important because there is considerable name duplication among the sections, arising principally from commands which exist only to exercise a particular system call.

This manual was prepared using the UNIX text editor ed and the formatting program roff.