

# UNIX<sup>TM</sup> BIBLIOGRAPHY

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# UNIX<sup>TM</sup> OPERATING SYSTEMS BIBLIOGRAPHY

This bibliography lists the current documents on the various UNIX operating systems which are available from the Bell Laboratories Computing Information Libraries. The bibliography contains a subject section, a permuted title/author index, and listings by both UNIX and TM numbers.

The subject bibliography is divided into the following MERCURY categories:

UNED	Editing and Document Preparation
UNGI	General Information
UNHA	Hardware
UNOS	Operating System
UNPL	Programming Languages
UNPM	UNIX User's Manuals
UNSA	Special Applications
UNSD	Standard Documentation
UNSU	Service and Utility Programs

Anyone wishing to automatically receive new or updated technical memoranda in any of the above categories should sign up with MERCURY. The complete memorandum or cover sheet for individual categories or for all categories can be requested. These documents are included in the *Computer Program Index*. Each document in the bibliography is given a "1000 number" by the Murray Hill Computing Information Library. Some PWB related documents also have a special alpha-numeric designation. These numbers can be used when requesting copies from the Computing Information Libraries.

Holmdel	6D-106	X4561
Indian Hill	6E-519	X3514
Murray Hill	2F-128	X4373
Piscataway	2H-210	X7679
Whippany	2A-395	X3363

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A limited number of these documents are approved for release outside the Company. Please refer outside requests for such documents to the Murray Hill Computing Information Library.

*MINI-SYSTEM NEWSLETTER*, issued monthly, is not included in the bibliography. Back issues are available in the Computing Information Libraries. To subscribe to future issues of the *MINI-SYSTEM NEWSLETTER*, contact D. M. Carbone PY X6401.

C. L. Scheiderman    MH X6058  
March 1980

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## **SECTION I**

### **SUBJECT BIBLIOGRAPHY**



## UNED—Editing and Documentation Preparation

### (1000) *A Tutorial Introduction to the UNIX Text Editor*

B. W. Kernighan

February 8, 1979

A good document for first time users.

See also UNED(1108)

### (1010) *A TROFF Tutorial*

B. W. Kernighan

August 4, 1978

This document is an introduction to the most basic use of TROFF. It assumes that the reader is familiar with ROFF on UNIX and GCOS.

### (1011) *Typesetting Mathematics—User's Guide (Second Edition)*

B. W. Kernighan + L. L. Cherry

August 15, 1978

This is the user's guide for a system for typesetting mathematics, using the phototypesetters on the UNIX and GCOS operating systems.

See also UNED(1029)

### (1019) *Computer Detection of Typographical Errors*

R. Morris + L. L. Cherry

TM 73-1271-4      April 3, 1974

### (1028) *Typing Documents on the UNIX System: Using the —ms Macros with Troff and Nroff*

M. E. Lesk

November 13, 1978

This document describes a set of easy to use macros for preparing documents on the UNIX system. It includes the "Guide to Preparing Documents with —ms."

See also UNED(1111)

### (1029) *A System for Typesetting Mathematics*

B. W. Kernighan + L. L. Cherry

January, 1979

This paper describes the design and implementation of a system for typesetting mathematics.

See also UNED(1011)

### (1042) *UNIX For Beginners—Second Edition*

B. W. Kernighan

February 8, 1979

This paper is meant to help new users get started on UNIX.

### (1075) *Typesetting ACS and APS Meeting Abstracts—Issue 2*

D. Edelson

TM 77-1351-1      January 3, 1977

This memo describes how meeting abstracts can now be photocomposed using a convenient package of TROFF commands. This system is implemented on the H6000 and Dept. 127's UNIX.

This memorandum is a revision of MM 75-1352-39.

(1082) *Webster's Second on the Head of a Pin*

R. Morris + K. Thompson

TM 74-1271-13 July 15, 1974

This memo describes a list of words from Webster's Second Unabridged Dictionary (definitions) as a test case for special purpose text compression techniques.

(1083) *An Algorithm For Differential File Comparison*

J. W. Hunt + M. D. McIlroy

TM 75-1271-11 October 1, 1975

The program diff reports differences between two files expressed as a minimal list of lines that bring either file into agreement with the other.

(1085) *Numeric Pattern Recognition Data Base for UNIX Systems*

M. E. Greenberg + C. S. Roberts

TM 76-1353-1 January 5, 1976

This memorandum describes the data base contents and format.

(1089) *Computer Typesetting Of Technical Journals On UNIX*

M. E. Lesk + B. W. Kernighan

TM 76-1274-2, TM 76-1273-1

March 29, 1976

(1091) *A Secretarial Typing System Using UNIX*

E. F. Engelbert

February 27, 1976

Memorandum For File

(1098) *PWB/MM—Programmer's Workbench Memorandum Macros (T.2)*

J. R. Mashey + D. W. Smith

TM 77-9144-5, TM 77-8234-23

October 1977

This memorandum is a user's guide and reference manual for PWB/MM, a general purpose set of text formatting macros for use with the UNIX text formatters NROFF and TROFF.

Supersedes TM 76-9144-1

See also UNED(1190) + UNED(1216)

(1104) *The LEARN Program for Computer Instruction: (2nd Edition)*

B. W. Kernighan + M. E. Lesk

TM 79-1274-6, TM 79-1273-5

May 31, 1979

This paper describes the LEARN program for interpreting CAI scripts on UNIX, and a set of macros which provide a computerized introduction to use of the UNIX operating system.

(1106) *TBL—A Program To Format Tables*

M. E. Lesk

January 16, 1979

TBL is a document formatting preprocessor for TROFF or NROFF which makes even fairly complex tables easy to specify and enter.

(1107) *Programmer's Workbench Papers From The Second International Conference On Software Engineering. (G.4)*

T. A. Dolotta, et al.

TM 76-9141-6, TM 76-9144-3, TM 76-9411-1, TM 76-9421-2 July 30, 1976

Four papers are included in this memo. They consist of four specific PWB facilities and a description of one user group's experience with PWB.

*(1108) Advanced Editing On UNIX*

B. W. Kernighan

September 28, 1979

This paper is meant to help secretaries, typists and programmers to make effective use of the UNIX facilities for preparing and editing text.

*(1109) Programmer's Workbench—Synopsis Of Facilities (G.1)*

T. A. Dolotta + R. C. Haight

TM 77-9144-3, TM 77-8234-17

September 15, 1977

This memorandum gives an overview of the Programmer's Workbench, a program development and text processing facility designed and used with the BISP area at BTL.

Supersedes TM 76-9141-7

*(1111) A Guide To Preparing Documents On UNIX*

M. E. Lesk

April 1977

This card gives some simple examples of document preparation on the UNIX system, emphasizing the use of the —ms macros package. Revision of September 1976

*(1112) New Graphic Symbols For EQN And NEQN (T.8)*

C. Scrocca

TM 76-7133-1

September 15, 1976

This document displays a set of special characters frequently used in technical typing. It shows how to use them and discusses what is involved in making a special character.

*(1115) NROFF/TROFF Formatting Codes For Departmental Organization Directories On PWB/UNIX.*

D. W. Smith

September 1, 1976

Memorandum For File

This memo describes a PWB/UNIX documentation facility for departmental directories.

*(1117) System For Entering Data Through Computer Displayed Forms*

E. W. Stark + H. Lycklama

TM 76-1352-6

October 22, 1976

This document describes two programs which make up a system for managing a data base through the use of computer displayed forms.

*(1119) NROFF/TROFF User's Manual*

J. F. Ossanna

January 1979

NROFF and TROFF are text processors available on UNIX. TROFF is also available on GCOS. NROFF formats text for a variety of typewriter-like terminals. TROFF formats text for printing on a Graphic System phototypesetter.

*(1121) Programmer's Workbench Documentation Roadmap (B.1)*

J. R. Mashey

TM 77-8234-18

September 30, 1977

This document attempts to be a terse up-to-date outline of crucial documents and information sources.

*(1139) Easy Phototypeset View Graphs on UNIX*

G. C. Vogel

MF 77-8234-055

May 18, 1977

A set of TROFF macros has been created to produce phototypeset 7x7 inch view graphs on Dept. 8234 UNIX. A companion set of NROFF macros are also provided. This memorandum is a revision of MF-76-8234-019



*(1148) NROFF Macros For Producing Generic Program Documentation*

S. J. Cunningham

TM 77-5222-1

March 18, 1977

A set of NROFF Macros have developed for producing program applications including Program Specifications (PDs), Input Manuals (IMs) and Output Manuals (OMs). Switching control center.

*(1152) PWB/UNIX Manual Page Macros (I.9)*

E. M. Piskorik

TM 77-9141-7

March 1, 1977

This memorandum is a reference for all who wish to prepare manual pages like those in the Programmer's Manual or the PWB/UNIX User's Manual.

*(1165) Circuit Design Aids On UNIX*

A. G. Fraser + G. G. Riddle

TM 77-1273-5, TM 77-9155-2

March 29, 1977

This memorandum describes programs written in the C language which use a Tektronix terminal. It also includes summary descriptions and explains strategies employed by the programs.

*(1169) An Interactive Computer Controlled Data Acquisition System With A CAMAC Real Time T*

R. A. Boie + M. Robbins + R. Kerr

TM 77-1131-17

May 12, 1977

An interactive computer controlled data acquisition system with a real time cathode ray display is described. Local data analysis functions are provided as well as 2-way transmission to PDP-11/45 running under MERT/UNIX operating system.

*(1170) Formatting Program Generic Documents On Unix*

G. C. Vogel

MF 77-8234-57

May 24, 1977

This memorandum prescribes simple procedures to produce documents consistent with Bell Program Documentation format. A procedure for converting a technical memorandum into format is given and a procedure for preparing formatted permuted indexes.

*(1174) Reference Sheet For PWB/MM Macros*

R. F. Rosin

July 1977

*(1175) Computerized Office Filing System*

R. E. Miller

TM 77-1353-4

May 10, 1977

This memorandum describes an on-line computer system for filing and retrieving documents in an office environment.

*(1177) EDTV—A Display-Oriented Text Editor For UNIX*

J. F. Reiser

TM 77-1353-6

August 1, 1977

This memorandum is a description of the features and commands of edtv, a display-oriented editor which runs under the UNIX operating system. It allows the regular expression editing features of ed, the standard UNIX editor.

*(1179) New Text Formatting Software For The PWB Systems*

D. W. Smith

February 2, 1977

Memorandum For File

A C version of NROFF and TROFF are now available on PWB System A. The latest versions of eqn/neqn which utilize features of the C version NROFF and TROFF are also available.

- (1184) *A Computer Assisted Communication System. (CACS)*  
 M. J. Shannon Jr.  
 TM 77-1352-5      July 22, 1977  
 CACS has been rewritten to run on a DEC LSI-11. Running LSI-UNIX CACS allows severely handicapped Cerebral Palsy victims to communicate with the outside world via a typewriter-like keyboard text on a television screen. Differences between original implementation and future possible improvements are noted.
- (1188) *PWB/UNIX Beginner's Course (B.2)*  
 M. E. Pearlman + S. H. Strauss  
 December 1977  
 An outline with view graphs.
- (1190) *Typing Documents With PWB/MM (T.3)*  
 D. W. Smith + E. M. Piskorik  
 October 1977
- (1191) *PWB/MM Tutorial (T.4)*  
 N. W. Smith  
 December 1977  
 Introduction to PWB/UNIX text processing.
- (1192) *PWB/UNIX View Graph and Slide Macros (T.9)*  
 T. A. Dolotta + D. W. Smith  
 December 1977  
 Greatly eases the task of making transparencies with TROFF.
- (1205) *Cut and Paste—Two UNIX Word Processing Commands*  
 G. W. R. Luderer  
 MF 77-8234-086      September 30, 1977  
 Cut and Paste are two new UNIX word processing commands that complement grep and cat. Cut dissects a file vertically, and Paste is the reverse operation of Cut.
- (1213) *Some Applications of Inverted Indexes on the UNIX System*  
 M. E. Lesk  
 January 1979  
 This memorandum describes a set of programs which make inverted indexes to UNIX text files, and their application to retrieving and formatting citations for documents prepared using TROFF.
- (1216) *Summary of PWB/MM Macros, Strings, and Registers (T.2)*  
 D. W. Smith + J. R. Mashey  
 November 1977  
 This reference card is part of the document UNED(1098) T.2
- (1263) *New Permuted Index Program on UNIX*  
 J. F. Maranzano  
 MF 78-8234-59      May 1, 1978  
 Prompted by requests for enhancements and a need for improved formatting, a new permuted index program, ptx, has been written on UNIX. The memorandum describes the new features of this program as well as the motivation for these improvements.

- (1280) *mview—A Set of Macrocommands For The Generation of View Graphs*  
J. N. Sturman  
TM 78-8231-2 June 21, 1978

This memorandum is a user's reference manual for mview, a general-purpose package for the phototypesetting of view graphs.  
This memorandum supersedes TM 77-8231-6.

- (1292) *Use of Display Editors*

L. C. Ozimek  
August 11, 1978

This memorandum discusses advantages and disadvantages of display editing and describes features and capabilities of the display editors currently available on UNED.

- (1300) *ATS to PWB/MM Converter*

N. W. Smith  
September 29, 1978

This document tells how to run the atsmm converter, describes the PWB/MM commands, each ATS command, explains any action required for the small number of ATS commands directly supported by PWB/MM, and gives pointers to additional PWB/MM features.

- (1301) *A Guide to the of Pseudo-ATS on UNIX*

HO Computer Center  
October 1978

This memorandum explains how to move documents from an ATS system onto UNED.

- (1307) *SED—A Non-interactive Text Editor*

L. E. McMahon  
TM 78-1270-1 August 15, 1978

This memorandum constitutes a manual for users of sed.

- (1314) *TBL Options Summary*

H. F. Okrent  
December 6, 1978  
See also UNED(1106)

- (1317) *UNIED—A Data File Editor*

J. C. Ward  
November 16, 1978

This memo describes the UNIX version and contains a user tutorial and command guide.

- (1386) *Final Report: Secretarial Word Processing Facility Enhancement*

J. M. Shanahan  
April 30, 1979

This paper discusses the evolution of the word processing operation from the initial configuration having hardcopy terminals at each secretarial station to the current configuration having these stations and having high quality printout produced remotely in the computer room.

- (1441) *A Tutorial Introduction to the Graphical Editor (GED)*

A. R. Feuer  
TM 79-3782-3 July 30, 1979

This memorandum is a tutorial for Ged, an interactive program used to display, edit, and draw line drawings on Tektronix 4010 series display terminals.



*(1456) A Portable Version of the UNIX Text Editor Ed*

M. R. Horton

TM 79-3723-2      September 14, 1979

This paper describes a version of the UNIX text editor, Ed, which has been written to run on UNIX, GCOS, and TSO.

*(1479) An Introduction to the PWB/MM Text Formatter*

K. E. Wendland

August 23, 1979

A tutorial introduction to the PWB/MM text formatter.

*(1497) Writing Tools—The STYLE and DICTION Programs*

L. L. Cherry + W. Vesterman

January 16, 1980

The system of writing tools described in this memo includes programs and a data base to analyze writing style at the word and sentence level.

## UNGI—General Information

(1331) *READ—C Programs For Analyzing Readability*

E. U. Coke + M. E. Koether

TM 78-1222-9 November 22, 1978

This memorandum describes two C programs which are available for analyzing written materials.

(1337) *Report Generation on UNIX*

E. Borison

February 1, 1979

This memorandum demonstrates how awk can be used for the same purpose as the program, REPORT.

(1340) *Minutes, ISCC Common Command Subcommittee*

N-P. Nelson

January 25, 1979

(1396) *UNIX Users Group Meeting—Toronto, June 19-23, 1979*

S. R. Eisen

June 25, 1979

This paper is a TRIP REPORT of the Summer 1979 (East Coast) meeting of the UNIX which took place at the University of Toronto, Ontario.

(1470) *The Evolution of the Unix Time-Sharing System*

D. M. Ritchie

This paper presents a brief history of the early development of the Unix operating system.

(1477) *Experiences with the UNIX Time-Sharing System*

J. Lions

March 1979

(1485) *UNIX/TS Documentation Road Map*

G. A. Snyder + J. R. Mashey

TM 79-3646-1, TM 79-9322-2

The purpose of this document is to provide a guide to UNIX commands and features.

November 9, 1979

## UNHA — Hardware

(1048) *A Continuous Service Real Time Clock for Digital Computers*

J. R. Vollaro

TM 75-1273-4      March 13, 1975

This paper describes continuous service; meaning the clock continues to function during power blackouts, system failures and shutdowns and can be read whenever the computer is operable.

(1058) *C—Language Oriented Microprogram for the HP-21MX*

A. G. Fraser + D. M. Ritchie

TM 75-1273-1      February 25, 1975

This paper proposes an instruction-set architecture designed for implementation on the Hewlett-Packard 21MX Micro-programmed processor.

(1107) *Programmer's Workbench Papers From The Second International Conference On Software Engineering. (G.4)*

T. A. Dolotta, et al.

For complete information, see UNED (G.4)

(1161) *MERT Hardware Configuration*

E. A. Loikits

MF 77-8234-037      April 20, 1977

This memorandum contains two parts: a description of the minimum MERT hardware configuration for a PDP-11/70 or PDP-11/45 ; and a list, by device type, of all peripheral devices for which drivers exist in Center 135.

(1163) *UNIX Error Logging*

R. B. Brandt

For Complete Information, see UNOS

(1181) *UNIX Link To MBS Line Printer and Computer Center Services*

A. L. Shirtz

MF 77-8234-13      August 11, 1977

This memorandum describes the software structures which provide new capabilities to UNIX users in Dept. 3124.

(1182) *Some MERT Performance Measurements in Transaction Oriented Processing.*

D. F. Hayden

MF 77-3124-12      July 28, 1977

These notes describe some measurements recently taken on an 11/70 based MERT System.

(1196) *PWB/UNIX Operations Manual (I.3)*

M. E. Pearlman

September 1977

This manual contains a complete description of console operations, as well as step-by-step instructions for normal operator functions.

(1226) *Description and Analysis of the DEC KMC11 Microprocessor*

L. A. Wehr

TM 77-8234-21      November 15, 1977

This document provides a comprehensive description and analysis of the KMC11 microprocessor, covering the architecture and microinstructions in detail.



- (1240) *Beta Test of the COMM IOP-DUP Synchronous Communications Controller*  
P. F. Long  
TM 78-8234-4 February 23, 1978  
This memorandum discusses the implementation of the driver which controls a and evaluates the COMM IOP for use as a synchronous controller with UNIX
- (1242) *A UNIX Device Driver for the PCL11-A—A Parallel Interprocessor Communication*  
D. M. Ungar  
TM 78-3124-2 January 25, 1978  
The PCL11-A is a new PDP-11 peripheral providing high speed communication 31 computers. A UNIX device driver has been written for this device.
- (1254) *An Array and Switching Processor*  
H. G. Alles  
TM 78-1356-4 February 24, 1978  
This memo describes the general arithmetic and interconnection module which can an array processor or switching processor.
- (1255) *The Teletype DATASPEED 40 Line Printer as a UNIX Peripheral*  
P. G. Dowd  
TM 77-8234-12 May 13, 1977  
The printer may be obtained in an 80 character-per-line model or a 132 print quality is excellent; it has a full ASCII character set (96 characters). successfully installed this software on a MERT/UNIX system.
- (1261) *Experience With Hardware Service Contractors on PDP-11's*  
J. F. Maranzano + R. C. Haight  
TM 78-8234-9 April 10, 1978  
This memorandum is intended to provide some information to the Operating Maintenance Groups concerning the Bell Labs experience with maintenance of
- (1282) *Using a Line Clock to Estimate Mean Disk Access Time*  
B. W. Stuck  
EN 3451 January 18, 1978
- (1284) *Error Logging in UNIX/TS and UNIX/RT*  
R. B. Brandt  
TM 78-8234 June 26, 1978  
This memorandum details the specifications for an improved version of error and UNIX/RT that provides significantly more compatibility between these systems area of the user interface.
- (1299) *Power Supply Controller Using a MAC 8 Micro Processor*  
M. F. Robbins + R. Stensgaard  
TM 78-1131-36 August 23, 1978  
A system has been developed using a MAC 8 micro processor to control a supply.
- (1305) *Proposal for a Microprocessor Based Systems Development Laboratory*  
P. W. Gwozdz  
TM 78-4562-2 September 29, 1978

- (1330) *The Tandem Computer System—A First Look*  
 A. M. Usas  
 TM 78-1352-11      October 23, 1978  
 This report contains in a greatly digested form information gathered from the extensive Tandem documentation and is presented in the form of a brief survey of the features of the system.
- (1347) *Evaluation of Microprocessors Supporting the C Language: LSI-11, MAC-8, Z80*  
 M. H. Bradley + W. E. Sherbon + J. S. Waldhuter  
 TM 78-3323-3      June 5, 1978  
 The purpose of this memorandum is to present a quantitative evaluation of three existing microprocessors which have an available C compiler.
- (1365) *Standard UNIX Configurations—Issue 2*  
 G. C. Vogel  
 March 27, 1979  
 This paper lists recommended processors and peripherals for the purpose of expediting computer acquisition reviews for DEC based UNIX systems. Minimum configuration information is also given for UNIX/TS and UNIX/RT systems.
- (1380) *PDP-11/70 Design Error: Handling Segmentation Violations Different from PDP-11/45 Implementation*  
 E. L. Hedrick + T. M. Raleigh  
 TM 79-4145-3, TM 79-2524-2      April 10, 1979  
 A difference in the operation of the DEC PDP-11/70 Memory Management unit and that of the PDP-11/45 based processors has been found. This memorandum describes the Memory Management problem and suggests an alternative context switching implementation for MERT in the event that DEC cannot make the PDP-11/70 upward compatible with the PDP-11/45.
- (1389) *Formal Specification of X.25 Compatible Link Protocol*  
 R. Ermann  
 TM 79-5251-2      June 21, 1979  
 The purpose of this memorandum is to clearly define a link protocol compatible with the following standard proposals: the latest X.25/LAPB draft, HDLC, and ADCCP. The formal specification presented here completes all those procedural aspects left open by the above candidate standards.
- (1392) *Evaluation of the Remote Diagnostic Console for use on Bell System PDP-11/70 Computer Systems*  
 D. L. Clark  
 May 11, 1979  
 This memo is intended, in part, to dispel some of the mythology and misunderstandings surrounding the Remote Diagnostic Console (RDC).
- (1394) *A Filesystemless UNIX for the Z80 Microprocessor*  
 S. M. Rubin  
 TM 79-1355-5      May 1, 1979  
 This paper describes the implementation of a UNIX subset on the Z80.
- (1417) *An ICE-85 Based 8085 Software Development System*  
 W. Densmore  
 TM 79-3231-1      May 31, 1979  
 An interface between UNIX and an Intel MDS-800 running ISIS-II is described. It includes features for allowing user-to-UNIX communication, MDS-to-UNIX file transfer, and UNIX-to-MDS file transfer.

UNHA

(1418) *Battery Backup for PDP 11/70 MOS Memory*  
J. A. McGuire  
May 2, 1979

(1423) *PWB Hardware Help*  
C. A. Brooks  
August 1, 1979

(1460) *A DATAKIT Network Monitoring System*  
R. J. Elliott  
TM 79-1273-7      October 2, 1979  
This paper describes how to use the Network Monitoring System.

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## UNOS—Operating System

*(1005) The UNIX I/O System*

D. M. Ritchie

This document describes how to write drivers for the UNIX system. It is an important manual for those contemplating driver writing.

*(1008) The UNIX Time-Sharing System*

D. M. Ritchie + K. Thompson

Overview of the UNIX time-sharing system.

*(1043) UNIX Summary*

M. D. McIlroy

*(1045) Emulation of UNIX on Peripheral Processors*

H. Lycklama + C. Christensen

TM 75-1352-2      January 9, 1975

This document describes UNIX Operating System emulation on a peripheral PDP-11 computer.

*(1047) Explanation Of Abnormal Conditions Within The UNIX Operating System.*

T. M. Raleigh

MF 75-8234-28      March 17, 1975

Error messages printed by the UNIX operating system on the system console are discussed with their causes, implications and remedies.

*(1052) A Structured Operating System for a PDP-11/45*

H. Lycklama + D. L. Bayer

TM 75-1352-4      May 6, 1975

This paper provides an overview of the MERT System on which UNIX Time-Sharing has been implemented.

See also UNOS(1062) + UNPM(1070)

*(1062) MERT—A Multi-Environment Real-Time Operating System.*

D. L. Bayer + H. Lycklama

TM 75-1352-7      July 18, 1975

Memorandum for File

*(1065) A Description of the UNIX File System*

J. F. Maranzano

MF 75-8234-32      September 16, 1975

This memorandum describes the structure of the file system as well as the applicable control blocks.

*(1069) Introduction to Scheduling and Switching under UNIX*

T. M. Raleigh

TM 75-8234-7      October 20, 1975

This memorandum discusses process switching and scheduling under UNIX using queuing models as an aid to visualization of the system's operation.

*(1073) UNIX Programming—Second Edition*

B. W. Kernighan + D. M. Ritchie

October 26, 1979

This paper is an introduction to programming on UNIX. The emphasis is on how to write programs that interface to the operating system.



- (1076) *LKOUT—A New UNIX System Call To Suspend And Resume Input From User*  
 R. C. White, Jr.  
 TM 75-4145-2      December 17, 1975
- (1077) *UNIX DH-11 Driver To Support Both Teletypewriter And DATASPEED 40 Times*  
 R. C. White, Jr.  
 TM 75-4145-1      December 17, 1975
- (1087) *Guide to IBM Remote Job Entry for PWB/UNIX Users (B.12)*  
 A. L. Sabsevitz  
 February 1978  
 This document describes the RJE services provided between Programmer's Workbench and the IBM Computer Center.
- (1090) *Proposal For UNIX Interprocess Communication*  
 R. B. Brandt  
 TM 76-8234-4      March 17, 1976  
 This memorandum provides functional design specifications for a comprehensive communications enhancements to UNIX OS.
- (1092) *TCMP—A Program For Comparing Program Text After A System Crash.*  
 T. M. Raleigh  
 MF 76-8234-29      April 27, 1976  
 TCMP is a program which compares the original text (instructions) of a program in a system crash dump.
- (1093) *DEAD—A Program For Analyzing UNIX System Crashes*  
 T. M. Raleigh  
 MF 76-8234-30      April 30, 1976  
 DEAD is a program for quickly summarizing the state of a crashed UNIX System.
- (1094) *Cautions On The Use Of The Alarm Signal*  
 T. G. Lyons  
 April 26, 1976  
 Programmer's Notes  
 Two System calls Alarm (n) and Pause ( ) have been installed on the PWB Dept. 9144. They were coded at MH and are likely to filter down to standard UNIX.
- (1107) *Programmer's Workbench Papers From The Second International Conference Engineering. (G.4)*  
 T. A. Dolotta, et al.  
 For complete information, see UNED (G.4)
- (1113) *UNIX System Call Measurements*  
 C. D. Perez + T. M. Raleigh  
 MF 76-8234-79      September 16, 1976  
 This memorandum is the first of a series which will deal with fundamental UNIX operating system on the PDP-11.
- (1114) *Synthetic Process For UNIX*  
 D. R. Bernstein  
 TM 76-8234-17, TM 76-9156-2      September 24, 1976  
 This memorandum describes the monitor and resource parts of synthetic measurements of system calls comparing different hardware and software illustration.



**(1116) LSI-UNIX System**

H. Lycklama

TM 76-1352-4      October 6, 1976

A modified version of the UNIX operating system has been written to run on the LSI-11 microcomputer. The main programming language is the structured high level language C.

**(1120) DOS-BATCH To UNIX Conversion**

E. H. Albrecht

September 1, 1976

This memo describes notes and an attachment for the knowledgeable DOS-BATCH programmer with sufficient background to develop programs in a "stand-alone" PDP-11 processor using the UNIX operating system.

**(1122) A Real-Time Time-Shared Operating System For An SEL/86—PDP-11 Configuration**

W. A. Burnette

TM 76-8231-9, TM 76-1228-11      October 29, 1976

The primary purpose of the SEL/86—PDP-11 system is to provide real-time interactive computing for research in speech and graphics.

**(1123) MINI-UNIX Summary**

H. Lycklama

November 1976

**(1124) Setting-Up MINI-UNIX—Sixth Edition**

H. Lycklama

November 1976

This paper describes the procedure for setting up MINI-UNIX on the PDP-11/10, -11/20 or -11/40.

**(1125) MINI-UNIX Regenerating System Software**

H. Lycklama

November 1976

This document discusses how to assemble or compile various parts of the MINI-UNIX system software.

**(1126) Scheduling and Switching Under UNIX Algorithms and Implementation**

T. M. Raleigh

TM 76-8234-18      October 1, 1976

This memorandum is the second of two intended to provide documentation for the Scheduler and Switcher under UNIX OS (USG). A number of changes made by UNIX Research are discussed as a guide to what improvements may be made to the standard system.

**(1127) Shared Memory In UNIX**

D. S. De Jager

TM 76-5223-1      November 19, 1976

This memorandum presents a proposal for a general set of primitives to be used for the set up and administration of shared memory in the UNIX environment.

**1128) UNIX Initialization and Process Control**

C. P. Imagna

TM 76-3412-1      July 23, 1976

This memorandum describes the UNIX initialization program (INIT).

(1129) *LSX Software*

H. Lycklama  
May 1977

(1130) *Setting Up LSI-UNIX—First Edition*

H. Lycklama  
May 1977

This paper describes the procedure for setting up LSI-UNIX on the LSI words of memory and floppy disk for secondary storage.

(1131) *Regenerating LSX Software*

H. Lycklama  
May 1977

(1135) *The MINI-UNIX System*

H. Lycklama  
TM 77-1352-1      January 13, 1977

The MINI-UNIX operating system is basically the UNIX operating system on a PDP-11 processor without a segmentation unit. The system supports all features of UNIX with the exception ptrace, pipe, prog, getgid and setgid. The system requires 16 words of memory and is written in C language.

(1136) *Implementation of Semaphores and Messages in UNIX*

R. B. Brandt  
MF 76-8234-76      September 7, 1976

The design specification for a collection of UNIX interprocess communication primitives.

(1138) *On The Security Of UNIX*

D. M. Ritchie  
January 1979

This paper discusses the degree of security which can be provided under the UNIX system. It contains a number of hints on how to improve security.

(1145) *DEC Factory Acceptance Test*

R. B. Brandt + C. D. Perez  
MF 77-8234-001      January 19, 1977

This memorandum is a description of a UNIX checkout package made available on a DEC basis.

(1146) *Setting-Up MERT—Second Edition*

H. Lycklama  
February, 1977

(1147) *Regenerating MERT Software*

H. Lycklama  
February, 1977

(1154) *UNIX On A Micro-Processor*

H. Lycklama  
May 1977

A modified version of the UNIX Operating System has been written to run on a micro computer with 20K words of primary memory and floppy disk for secondary storage. The configuration permits most of the UNIX user programs to run on the LSI-11 micro processor.

*(1155) Programmer's Manual For the SEL-86 PDP-11/45 Operating System.*

W. A. Burnette + J. R. Remde

TM 77-8231-2 , TM 77-1228-2

February 7, 1977

This programmer's manual is an introduction to the SEL86—PDP-11/45 system, and a reference manual for the commands, system calls, and important subroutines available on the SEL86.

*(1158) LSI-UNIX Summary*

H. Lycklama

May 1977

*(1159) A New Input-Output Package (B.10)*

D. M. Ritchie

May 1977

*(1162) The UNIX Operating System—PG-1C300*

G. C. Vogel

TM 77-8234-02

April 15, 1977

This memorandum describes the standard version of UNIX that has been issued to Western Electric as the the UNIX Operating System Program Generic—PG-1C300. Dept. 8234 provides support for this version of UNIX.

*(1163) UNIX Error Logging*

R. B. Brandt

TM 77-8234-10

May 6, 1977

This memorandum describes the error logging scheme that has been implemented for the UNIX Operating System.

*(1164) File Integrity And Space Accounting For A UNIX Based System.*

A. G. Fraser + R. J. Elliott

TM 77-1273-7

April 4, 1977

This memorandum is concerned primarily with the overall strategy used for file integrity, space accounting and relevant changes to the UNIX Operating System. There is a summary of new commands and an overview of the file dump and recovery programs.

*(1167) CM, A UNIX Driver For The MINITAPE System*

R. E. Swift

TM 77-8234-13

June 13, 1977

CM, is a UNIX driver, written in C to interface a MINITAPE system.

*(1173) Synthesis Of A Half-Duplex Line Control Procedure For UNIX Using State Transition Matrix Techniques*

P. F. Long

TM 77-8234-14

July 19, 1977

A new UNIX terminal interface is described which provides 120 cps access over the DDD network using half-duplex Teletype Model 40/1s and 202s data sets.

*(1176) On Using The UNIX Error Logger*

C. D. Perez

MF 77-8234-82

August 31, 1977

This UNIX error logger is a software tool that collects information from the system about certain block devices at the moment that an I/O error occurs.

- (1180) *A Description of Automatic Dialing Using the UNIX Operating System*  
G. B. Foley  
August 1, 1977  
Memorandum for File  
This memo provides background information on automatic dialing implemented on the UNIX operating system and describes some routines to make it easier.
- (1183) *MERT Release 0 From Department 8234*  
G. W. R. Luderer  
MF 77-8234-067      June 30, 1977  
This purpose of this paper is to announce the contents and orientation of Release 0 and give some early considerations with regard to UNIX/RT.
- (1187) *The UNIX Time-Sharing System—A Retrospective (G.3)*  
D. M. Ritchie  
A more recent discussion.
- (1189) *PWB/UNIX Shell Tutorial (B.5)*  
J. R. Mashey  
September 1977  
Describes the PWB/UNIX command interpreter.
- (1194) *Setting Up PWB/UNIX (I.1)*  
R. C. Haight + W. D. Roome + L. A. Wehr  
September 1977  
Procedures used to install PWB/UNIX on the PDP-11/45 or -11/70 and to regenerate all the PWB/UNIX programs.
- (1195) *Administrative Advice for PWB/UNIX (I.2)*  
R. C. Haight  
October 1977  
Hints for approaching operational serenity.
- (1197) *Repairing Damaged PWB/UNIX File Systems (I.4)*  
P. D. Wandzilak  
November 1977  
Comes in handy after a power failure, etc.
- (1198) *PWB/UNIX RJE Administrator's Guide (I.5)*  
A. L. Sabsevitz  
December 1977  
What to do when it breaks.
- (1201) *Notes on the Selection, Procurement, Installation, and Usage of UNIX by Department 8234*  
J. F. Majernik  
October 21, 1977  
5254-771021.01EN
- (1202) *More Flexible Low Speed I/O for UNIX*  
J. Feder  
TM 77-8234-16      August 15, 1977  
Descriptive material on UNIX I/O operation is given in this memo.

*(1204) C Language Portability*

B. A. Tague + R. C. Haight  
September 22, 1977

*(1212) DA11B Driver in MERT*

J. E. Laur

November 30, 1977

Memorandum for File

The purpose of this memo is to describe the DA driver built to run under the MERT operating system.

*(1214) Lecture on UNIX Scheduler and Switcher Given by T. M. Raleigh at Whippany*

T. M. Raleigh

MF 77-8234-99 November 21, 1977

This memorandum compiles all of the view graphs used for the lecture and should be useful to other teachers lecturing on the same topic and students reviewing materials in the course.

*(1217) Guide to UNIVAC Remote Job Entry for Programmer's Workbench Users*

T. G. Lyons

February 16, 1976

Memorandum for File

This document describes the RJE services provided between Programmer's Workbench Machines and the UNIVAC Computer Center at Raritan River.

*(1218) Software Support For Satellite Processor*

R. J. Elliott

TM 77-1273-16 November 7, 1977

This paper describes how to make free-standing programs for any satellite PDP-11/40 connected to a UNIX system and the interface with the File Store.

*(1230) PORT—A New Inter-process Communication Facility under UNIX*

D. W. Ting + A. L. Glasser

TM 78-3124-1 January 3, 1978

This memorandum describes a mechanism which allows a single process to communicate with an arbitrary number of other processes.

*(1231) Contents of UNIX/RT*

G. W. R. Luderer

MF 78-8234-1 January 10, 1978

UNIX/RT is the successor of MERT Release 0, which it will supersede around the fall of 1978. UNIX/RT will be a MERT operating system that is as compatible as possible with UNIX/TS.

*(1232) UNIX/TS Release 1.0 Plans*

A. S. Cohen + J. F. Maranzano

MF 78-8234-11 January 30, 1978

*(1233) Timing Tests of the UNIGRAPHIX Graphics System Running on a DEC PDP-11/70 Under the UNIX Operating System*

S. T. Schuyler

TM 77-8254-4 September 14, 1977

The UNIGRAPHIX system is a general purpose graphics system fitted with specialized data-base structures and operators for supporting outside plant engineering tasks. The system was written entirely in the C language.



- (1234) *Interprocess Communication Mechanisms in CB-UNIX*  
 J. C. Kaufeld Jr.  
 TM 77-5223-1 June 19, 1978  
 A discussion of interprocess communication mechanisms in CB-UNIX files, pipes, named pipes, signals, semaphores, MAUS and message passing.
- (1235) *Moving System I/O Buffers out of UNIX Data Address Space*  
 D. W. Ting  
 TM 78-3124-4 February 2, 1978  
 We describe a method of removing the UNIX in-core system buffers from direct addressable space, and "windowing" to them as necessary.
- (1236) *Optimizing Process Creation and Termination Mechanisms in UNIX*  
 D. W. Ting  
 TM 78-3124-3 February 4, 1978  
 In this memorandum we consider the optimization of the UNIX process creation and termination.
- (1241) *Asynchronous I/O Facilities for Raw Block Devices under UNIX*  
 D. W. Ting  
 TM 78-3124-9 March 1, 1978  
 In this memo, we describe a way of implementing asynchronous I/O on raw block devices.
- (1244) *Shcvt—A Tool for Shell Conversion*  
 G. A. Snyder  
 MF 78-8234-32 April 7, 1978  
 This document describes the program shcvt, which was developed to convert from the PWB/UNIX Shell to the Bourne Shell. It also describes some of the problems in the conversion process, and possible solutions to these problems.
- (1246) *The MERT Operating System*  
 H. Lycklama + D. L. Bayer  
 TM 78-3114-3, TM 78-1352-3 March 22, 1978  
 This memo discusses some uses of the MERT operating system. A reference system is also offered.
- (1247) *A Minicomputer Satellite Processor System*  
 H. Lycklama + C. Christensen  
 TM 78-3114-2, TM 78-1359-3 March 22, 1978  
 This memo describes a software support system for a network of microcomputers. A powerful time-sharing system on a central computer running, debugging and dumping of programs in the satellite processors.
- (1253) *CNCC UNIX Project Performance Measurements, Projections and Enhancements*  
 E. Arthurs + P. Daily + R. Jakubek + B. W. Stuck  
 MF 78-8234-10 April 24, 1978  
 This report summarizes recent work to determine and enhance performance of the Network Control Center UNIX Application Project.
- (1256) *Standardizing File Types in the Inodes of UNIX Version 7 Descendants*  
 G. W. R. Luderer  
 MF 78-8234-48 April 28, 1978

*(1257) Enlarging PDP-11 UNIX Table Space Using Supervisor Mode*

A. L. Glasser + D. W. Ting

TM 78-3111-1      March 20, 1978

This memo describes a mechanism which greatly increases the address space of the UNIX operating system running on a PDP-11/70. Generated after implementation of the mechanism is a UNIX system capable of running 1023 processes. The performance of this system was measured and results are presented.

*(1258) Writing a MERT Supervisor*

W. A. Burnette

TM 78-9156-1      March 24, 1978

This memo discusses the functions available to supervisor mode programs and describes the basic operating system interactions required to make effective use of the supervisor environment.

*(1259) Password Security: A Case History*

R. Morris + K. Thompson

TM 78-1271-5      April 3, 1978

The history of the design of the password security scheme on a remotely accessed time-sharing system is described in this paper. The present design was the result of countering observed attempts to penetrate the system. The result is a compromise between extreme security and ease of use.

*(1264) A Core-Resident UNIX System for PDP-11's*

A. L. Glasser + D. W. Ting

TM 78-3111-2      May 5, 1978

In this memorandum we describe a UNIX system which, together with a fixed number of user programs, is entirely core-resident. The operating system and its resident user programs are generated on a PWB/UNIX system. This system requires no disk drives, either for swapping or to support a file system.

*(1265) A Faster Terminal Handler for UNIX*

J. Feder

TM 78-8234-7      March 10, 1978

This memo describes a new software package for high-speed character output. The package provides a user interface that is virtually indistinguishable from the standard UNIX terminal handler, but uses different algorithms and internal buffering to run up to 30 times faster.

*(1270) A Revised ERRPT Command*

C. D. Perez

MF 78-8234-60      June 12, 1978

This document describes the new errpt command, options that are available, and any differences from the original version. Samples of the output are provided for the various reports that are available.

*(1274) Pre-Release UNIX/TS*

R. C. Haight

MF 78-8234-57      June 4, 1978

The pre-release version of UNIX/TS is meant for a few friendly customers who would otherwise go to Research for Version 7. The only thing we guarantee about the pre-release is the presence of bugs, especially in the documentation and commands (the operating system should be solid). The final TS will contain additional feature; some current features may likewise be dropped.

- (1276) *File System Structures for Real-Time Applications*  
 H. Lycklama  
 TM 78-3114-5 April 20, 1978  
 A new version of the file system structure was done for version 7 UNIX pointer to achieve very large files and file systems. The new file system which make it efficient for both time-sharing and real-time applications.
- (1277) *UNIX Courses*  
 R. B. Brandt + J. F. Maranzano + G. C. Vogel  
 MF 78-8234-3 January 9, 1978  
 Contains syllabuses of courses which cover the majority of the needs of the Bell Laboratories.
- (1278) *The MERT/UNIX Supervisor*  
 H. Lycklama  
 TM 78-3114-4 April 20, 1978  
 This paper describes the implementation and capabilities of the UNIX-File implemented as an environment in the MERT system.
- (1281) *A PROM Writer Facility for UNIX Improved Version*  
 H. Marcus  
 August 15, 1978  
 Memorandum for File  
 This memorandum describes a Programmable Read Only Memory (PROM) currently installed on the Holmdel Computation Center UNIX System. The previous Memorandum for File dated May 16, 1978, by D. Muir.
- (1287) *Upgrading MERT Release 0 with Modification 0.1 to MERT Release 0.1*  
 T. M. Raleigh  
 MF 78-8234-56 May 6, 1978  
 This memo is intended to correct a few bugs on the Release 0 source and to bug fixes that were not ready for Release 0 or which have been found since Release 0.
- (1288) *Interprocess Communication Performance Trade-offs in CB-UNIX and UNIX*  
 D. S. DeJager  
 TM 78-5223-1 July 18, 1978  
 A discussion of interprocess communication performance trade-offs is presented.
- (1289) *A Peripheral Processor Interactive Control and Data Acquisition System*  
 J. S. Kraus  
 TM 78-1131-22 May 23, 1978  
 A computer hardware and software system has been developed in support of Collision Research Laboratory.
- (1290) *Activity Profile of the PWB/UNIX Operating System*  
 W. W. Everett  
 TM 78-9441-2 May 15, 1978  
 An exploratory study of PWX/UNIX performance.
- (1297) *A UNIX Operating System for the DEC VAX-11/780 Computer*  
 T. B. London + J. F. Reiser  
 TM 78-1353-4 July 7, 1978  
 This memorandum describes the VAX-11/780 hardware and the UNIX programming language software implementation, records some observations and speculates ways in which the operating system overhead can be significantly reduced.

**(1302) Exercises in Repairing PWB/UNIX File Systems**

P. D. Wandzilak

October 19, 1978

This document describes a tool that generates a series of self- instructional exercises.

See also UNOS (1197)

**(1303) Inter-Process Communications Facility for Transaction Oriented UNIX Systems**

D. W. Ting

TM 78-3111-4      September 14, 1978

This memorandum presents a philosophy and design of an inter- process communication facility.

**(1306) Audio Response Unit (ARU) Subsystem Design for Real-Time Retrieval (RTLRL)/ARU Prototype System**

J. W. Hooker

TM 78-9156-4      September 15, 1978

This paper describes an example of a MERT kernel process developed to implement a real-time application with with performance requirements not achievable with user processes.

**(1309) KW11-P Clock Driver**

R. R. Babu

TM 78-3112-1      September 22, 1978

This document describes the DEC KW11-P programmable clock driver and how use it.

**(1310) UNIX/370—A Proposal**

B. G. Prieve

September 28, 1978

This paper proposes that an experiment be undertaken to see if UNIX scales when moved to a maxi-computer.

**(1312) A New DV-11 Driver for Use With LEAP**

M. B. Mueller

TM 78-3112-2      September 22, 1978

This memorandum presents a DV-11 hardware overview, user interface specifications, and the impact of driver usage on PWB/UNIX.

**(1316) Terminal Handling Under UNIX and MERT/UNIX**

J. Feder

TM 78-8234-11      September 1, 1978

This memorandum gives a tutorial overview of terminal handling for the UNIX and MERT/UNIX operating systems.

**(1319) UNIX File System Conversion**

R. C. Haight

MF 78-8234-83      September 30, 1978

This memorandum describes procedures developed for converting UNIX file systems from the "Version 6" format (includes USG/UNIX, PWB/UNIX, etc.) to the "Version 7" format (Research, UNIX/TS).

**320) Setting Up UNIX/TS**

R. C. Haight + L. A. Wehr

MF 78-8234-98      September 30, 1978

This document describes programming steps for generating a UNIX/TS operating system along with administrative detail on configuration, setting up file systems, and installation/recompilation of command software.



(1321) *UNIX/TS Release 1.0*

R. C. Haight

MF 78-8234-82

September 30, 1978

This document is an attempt to describe new features of UNIX/TS.

(1325) *On the Inconsistencies of UNIX Commands*

S. B. Olsson

October 26, 1978

An examination of the source code for some 120 UNIX commands and inconsistencies noted.

(1327) *Shell Subprogram Facility*

J. Lions

December 8, 1978

This paper describes a general shell command that allows a group of programs to be packaged as a single file and invoked conveniently.

(1329) *Effects On UNIX Host CPU Resources By The Use of Intelligent Terminal*

J. F. Maranzano

December 13, 1978

This memorandum shows that with the current UNIX hardware/software the execution of programs to an intelligent terminal does not significantly increase host CPU resources.

(1334) *A Fast Software Encryption Algorithm*

R. Morris

TM 79-1271-1

January 5, 1979

This paper describes the design of the file encryption scheme on a time-sharing system.

(1335) *UNIX File Security*

R. Morris

TM 79-1271-3

January 19, 1979

This paper describes the history of the design of the file encryption and sharing system.

(1336) *A Workshop on Rebooting the UNIX Time-Sharing System*

B. C. Wonsiewicz + A. R. Storm

TM 78-1523-30

November 29, 1978

This memo documents a two hour workshop on rebooting the UNIX system who wished to be able to restart the machine when the system administrator was unavailable.

(1343) *Virtual File Systems on MERT*

L. L. Hamilton

TM 78-5522-9

August 22, 1978

This memorandum is meant to be both a user's guide and a brief overview of the system.

(1345) *An Essay in Computer Security: Decrypting A Former UNIX crypt*

P. J. Weinberger

TM 78-1271-20

December 29, 1978

See also UNOS(1335)



*(1349) UNIX/RT as an Application System for BOS/LMOS Development*

C. P. Imagna

February 2, 1979

This memorandum presents some ideas on how to upgrade the BOS-11 operating system to run in the LMOS.NEXT system which is currently being planned.

*(1351) Implementation of the Large Argument List Feature in UNIX/RT's Exec. System Call*

E. Loikits

2524-790110.01MF January 10, 1979

The MERT/UNIX system call exec has been modified for UNIX/RT. This paper describes these modifications.

*(1352) UNIX/370: A Feasibility Study*

W. A. Felton

TM 79-8224-1 January 23, 1979

This paper is a feasibility study for UNIX/370, a version of UNIX operating system adapted to the System/370 environment. It also describes the nature and structure of the system, and examines several areas relevant to its feasibility.

*(1358) UNIX Command Syntax*

A. S. Cohen + S. B. Olsson + G. C. Vogel

February 16, 1979

This paper proposes command-syntax rules and a library routine for achieving consistent syntax.

*(1359) UNIX/TS Alarm Facility*

G. C. Vogel

March 7, 1979

A general purpose alarm facility for the UNIX/TS operating system is described.

*(1360) RCMAS/MERT Performance Study and General Design Guidelines*

E. L. Hedrick, et al

TM 79-4145-1, TM 79-2524-1, TM 79-3451-1

February 20, 1979

This document describes the results of a recent effort to improve the performance of the RCMAS system. Based on this experience, a set of guidelines for designers of MERT and UNIX based applications is presented.

*(1361) Use of the Revised UNIX-to-UNIX Copy Command for Lab 323*

R. B. Lyon

January 17, 1979

The uucp (UNIX-to-UNIX copy) command facilitates communication of data between UNIX machines, much as the copy (cp) command permits transfer of files within a UNIX machine. This memo explains how to use the newly-implemented version of uucp.

*(1364) Update Files for the C Standard Library*

A. Koenig

March 6, 1979

The C Standard Library definition has been extended to include update files—files that can be both read and written. This memorandum describes that definition and its implementation under the UNIX operating system.

*(1367) Source Code Control System User's Guide*

L. E. Bonanni + C. A. Salemi

TM 79-9441-4, TM 79-9442-1

April 1, 1979

A description of the Programmer's Workbench Source Code Control System.

(1368) *DIRECT II Interprocess Communication*

J. P. Linderman

TM 79-9156-3 March 30, 1979

This memo describes a collection of subroutines which were written to handle of arbitrary data between two cooperating processes.

(1369) *Sdb: A Symbolic Debugger*

H. P. Katseff

December 1979

This document describes a symbolic debugger, sdb, as implemented in UNIX/32V Operating System. Sdb is useful both for examining core images for providing an environment in which execution of a program can be monitored.

(1370) *Using UNIX Capabilities More Effectively*

W. J. Mayer

January 30, 1979

A new UNIX program is introduced in this memo that allows convenient use of UNIX and non-UNIX time shared systems.

(1371) *DPD: Unix—Honeywell Interface Programs*

M. R. Wagner

April 6, 1979

This document describes a set of programs that interface between Unix and computer at Murray Hill.

(1372) *UNIX/RT on a DEC VAX-11/780 Project Contract*

R. L. Klein + J. F. Maranzano

March 20, 1979

This memorandum describes the commitments and expectations in this project.

(1375) *A 32-Bit Processor Design*

S. C. Johnson

TM 79-1273-3 April 2, 1979

This paper describes a user-level instruction set for a 32-bit processor.

(1379) *COSNIX File Management (FM) Command-Software Development and Control*

R. E. Rogan

TM 79-4552-3 May 15, 1979

This paper describes COSNIX, the operating system that File Management provides the user with a complete workbench of master file management services.

(1382) *UNIX/TS Augmented Task Force Report*

R. A. Faulkner + D. S. DeJager + J. A. McGuire + A. L. Sabsevitiz

March 19, 1979

This report discusses common needs of current and potential users and recommendations for the UNIX/TS support organization.

(1385) *Checking File Access Permissions in UNIX Systems*

J. Lions

June 28, 1979

This memo discusses some proposed changes to the way file access permissions are checked in the UNIX Time-sharing System.

*(1391) Preliminary Considerations for Exploratory UNIX Operating System Work*

G. W. R. Luderer

May 11, 1979

This memorandum discusses some preliminary thoughts about the possible course of action for work that would lead towards adapting UNIX to future hardware.

*(1395) Department 3621 MAXIUNIX Workplan*

J. T. Hall

June 1, 1979

This paper contains the work plan for the MAXIUNIX project which is being undertaken by the "Software and Computing Technology" department of Laboratory 362.

*(1403) PWB/UNIX Edition 2.0 Preparation*

M. J. Petrella + A. L. Sabsevitz

April 1, 1978

This memorandum recommends a plan to facilitate the conversion to PWB/UNIX Edition 2.0.

*(1411) A Remote File System Driver for UNIX*

A. L. Glasser + D. W. Ting

TM 79-3111-3 May 31, 1979

This memorandum describes the concept of remote file systems. It describes an implementation for a read-only remote file system facility, and proposes some possible applications of this implementation.

*(1422) DIRECT II VAX Performance Improvement Estimates*

D. J. Huber + W. D. Roome

July 30, 1979

This memo is an evaluation of the potential performance improvement of moving DIRECT II from a PDP-11/70 to a VAX-11/780.

*(1424) Character Device Driver Development for CB-UNIX Operating System*

S. Michael

TM 79-5252-2 June 15, 1979

This memorandum describes the general characteristics of character device control utilized in the Columbus version of the UNIX operating system (CB-UNIX) and four character device drivers written to support the Hotel Billing Information System (HOBIS).

*(1429) Division 56 UNIX Course*

K. E. Wendland

November 20, 1979

This paper contains the class notes from an introductory UNIX course. The notes are written in a tutorial format, which is ideal for the novice; they are also thoroughly indexed, which makes them a good index for experienced UNIX users.

*(1432) A Database Transaction Backout and Crash Recovery System*

W. A. Burnette

TM 79-9457-1 July 16, 1979

This memo describes the system for database backout, backup, and recovery, including a description of the UNIX/RT system level implementation.

*(1434) Adding Remote Files to UNIX—A Progress Report on the File Server Project*

J. P. Haggerty + P. A. Kirslis

August 7, 1979

It has been proposed that the UNIX operating system be split into two parts: a file server that contains the part of UNIX that does file management, and a stripped UNIX that contains the rest of the code and runs user processes. This paper presents a design for such a partitioning of UNIX which is transparent to the user and allows the same operations on remote files that are presently permitted on local ones.

(1435) *Department 3624's Workplan for Networking in 1979/80*

G. W. R. Luderer  
July 16, 1979

(1436) *Load Characterization for SDS/UNIX*

V. P. Holmes + B. J. B. Lax + P. M. Lu + J. L. Pappas  
June 27, 1979

This study examines four PDP 11/70's running PWB/UNIX 1.2 in existing SDS environments characterizes the load on these machines.

(1437) *A Dail-Up Network of UNIX Systems*

D. A. Nowitz + M. E. Lesk  
TM 79-3782-2, TM 79-1274-7                      June 1, 1979

This memorandum describes a network of over eighty UNIX computer systems using the telep system as its primary communication medium.

(1439) *Program Testing—Work to be Done*

F. T. Grampp  
May 14, 1979

This document describes work in program testing to be done by Department 3624.

(1447) *The UNIX Programming Environment*

B. W. Kernighan + J. R. Mashey  
July 1978

This paper presents a variety of examples to illustrate methodology, focusing on those aspects of system and supporting software which make it possible.

(1449) *Engineering and Data Acquisition System/Network Management (EADAS/NM) Capacity Estimation—Methodology and Data Requirements*

B. W. Stuck  
July 17, 1978

An overview of the current status of work on estimating the capacity of the Engineering and Acquisition System /Network Management (EADAS/NM) is presented.

(1450) *Performance Assessment of Customer Service and Administrative Control Center System (CSACCS)*

E. Arthurs + J. L. Haase + C. Perea + B. W. Stuck  
July 25, 1979

This report summarizes recent work to determine and enhance performance of the Customer Service and Administrative Control Center System (CSACCS).

(1451) *A Virtual Terminal Protocol for UNIX*

L. D. Goldsmith  
TM 79-5412-1                      August 6, 1979

This memorandum describes a Virtual Terminal Protocol for the use in UNIX systems.

(1457) *LSX Performance*

J. N. Sturman  
TM 79-9323-2                      September 24, 1979

This paper describes a number of experiments which were conducted to measure the operational characteristics of a Digital Equipment Corporation LSI-11, a 16 bit microcomputer under control of LSX, a modified subset of the UNIX operating system.

*(1458) An Augmented Version of Make*

E. G. Bradford

TM 79-5255-1      July 1, 1979

This paper describes an augmented version of the make command supplied with UNIX/TS. It describes and gives examples only of additional features.

See also UNSU(1078)

*(1459) Synchronous Terminals for MERT*

J. E. Laur

TM 79-9457-4      July 27, 1979

Describes software which has been developed to allow synchronous terminals to interface with the MERT operating system.

*(1462) The DIRECT II Scheduler*

H. E. Cato

TM 79-9456-3      August 30, 1979

This document describes the capabilities of the Scheduler and the internal processing that it performs.

*(1463) FSCK—The UNIX/TS File System Check Program*

T. J. Kowalski

TM 79-3624-4      July 1, 1979

This paper describes the normal updating of the file system, discusses the possible causes of file system corruption, and presents the corrective actions implemented by FSCK.

*(1466) Terminal Handling for UNIX/370 Using a Front End Processor*

S. J. Buroff

TM 79-3628-2      September 18, 1979

This document describes the terminal support facilities which must be provided by a front end processor for UNIX/370. The description is divided into two parts: required features and optional features.

*(1469) SPS Protocol Implemented for DZ11 Under MERT Release 0.1*

M. J. Shannon

TM 79-3624-1      June 1, 1979

This document describes the protocol, the DZ11, The implementation of the DZ11 driver, and its relation to the former DH11 driver.

*(1472) Multi-Processor DMERT*

E. P. Schan

November 8, 1979

This paper outlines a basic plan for a multi-processor DMERT exploratory effort based on a shared memory architecture.

*(1473) The Logical File System—A Fast-Access File System Using UNIX Raw I/O*

J. R. McSkimin

TM 79-9471-1      September 14, 1979

This memorandum describes LFS (Logical File System) design and implementation, and also serves as a user guide.

*(1474) Tools for the Extraction and Reduction of PWB/UNIX Software Monitor Data*

L. E. Bonanni

TM 79-3781-7      September 15, 1979

Data reduction functions have been developed into two prototype PWB/UNIX commands, BAY and SLICE. This memorandum serves as a user's guide for BAY and SLICE, and is their general design document.



(1475) *A Stand-Alone Input/Output Library*

S. R. Eisen

TM 79-3624-3 September 4, 1979

A complete guide to the stand-alone I/O library. The software described will be supported in UNIX/TS Release 1.2 and will be available from the USG Stockroom.

(1476) *Guidelines for Converting MERT Software to UNIX/RT*

R. S. Kaplan

November 14, 1979

A set of guidelines are presented to assist DMERT developers and DMERT based applications in the conversion of their existing MERT-based software to UNIX/RT.

(1480) *Relative CPU Performance on C Language Programs*

J. Feder

TM 79-3624-5 September 28, 1979

This memorandum compares a variety of CPUs with respect to execution speed and object code size using seven benchmark programs written in C.

(1481) *UNIX Line Discipline for IBM 2740-1 Protocol*

D. J. Huber

TM 79-3781-3 August 28, 1979

This memo describes the protocol of a remote console line and the code modifications which were made to USG UNIX to make it support that protocol.

(1482) *UNIX Assembler for the Intel 804X Microprocessors*

L.E. Miller

TM 79-3231-2 August 1, 1979

This document is a users manual on a UNIX assembler for the 8048/8041 series of microprocessors. It describes the usage, input and output of that assembler.

(1483) *UNIX/86: UNIX on the Intel 8086*

T. P. Blumer + R. Muha

November 1, 1979

The basic implementation strategies are discussed and changes to the source code (necessitated by differences in hardware) are described.

(1484) *UNIX/TS Development Plan*

R. C. Haight

December 10, 1979

Major additions and changes to the UNIX/TS operating system for the next three releases are described.

(1487) *Preliminary Performance Evaluation of Univac UNIX*

D. A. De Graaf + J. Feder

December 4, 1979

This memorandum gives the results obtained in preliminary benchmark testing of the Univac UNIX system.

(1488) *A Mechanism of Starting a Program in a UNIX Based Operating System*

D. S. Lo

TM 79-3114-1 August 24, 1979

A different mechanism of creating a new process and executing a program has been implemented in a special purpose operating system which evolved from UNIX.

**(1490) UUCP Administrators' File and the UUNAME Command**

H. Che

October 31, 1979

To help administering the Bell Labs UUCP network, a file containing data on the administrator of each UUCP member system has been created on the USG machine.

**(1491) Uustat—A UUCP Status Inquiry Program**

H. Che

October 31, 1979

This paper gives a detailed description and implementation of the uustat command.

**(1492) A Send-only UUCP Facility**

H. Che

October 31, 1979

This paper discusses the usage as well as some design considerations of a send-only uucp mechanism.

**(1493) UNIX Specification—File System Related System Calls**

G. C. Vogel

January 10, 1979

New descriptions for the file system related system calls.

**(1494) A Subroutine Package to do Process Cleanup**

T. J. Dwyer

TM 79-9457-7 December 14, 1979

This memo describes a subroutine package, implemented in C under the UNIX/RT operating system, which provides for the orderly termination of a set of cooperating processes.

**(1495) UNIX Specification—Process Related System Calls**

P. E. Cannata

January 28, 1980

New descriptions for the process related system calls.

**(1499) A Shell Operator for Inter-Machine Communication**

C. A. Witschorik

TM 79-5425-2 August 2, 1979

An inter-shell transfer operator is proposed as a useful extension to the syntax of the Bourne shell. The language of a shell for a utility test system is given as an example application of the extended notation.

**(1500) Some Timing Measurements of Emts, Message Transfers and Context Switches for UNIX/RT**

T. M. Raleigh

January 25, 1980

This memorandum provides some timing measurements of important operating system functions for UNIX/RT.

## UNPL—Programming Languages

- (1001) *Programming in C—A Tutorial (B.9)*  
B. W. Kernighan  
TM 74-1273-12 May 5, 1974  
See also UNPL(1002)
- (1002) *The C Programming Language—Reference Manual*  
D. M. Ritchie  
January, 1979  
See also UNPL(1001)
- (1009) *A Manual For the TMG Compiler-Writing Language*  
M. D. McIlroy  
September 13, 1972  
MM 72-1271-8
- (1012) *UNIX Assembler Reference Manual*  
D. M. Ritchie
- (1013) *YACC—Yet Another Compiler Compiler*  
S. C. Johnson  
TM 78-1273-4 July 31, 1978  
Converts a BNF specification of a language and semantic action written in C into a compiler for that language.
- (1018) *GRAFPAC/FR80—A C Version Of Deferred GRAFPAC Under the UNIX Time-Sharing System*  
G. K. Swanson  
TM 74-1353-6 September 23, 1974
- (1053) *BC—An Arbitrary Precision Desk Calculator Language*  
L. Cherry + R. Morris  
November 12, 1978  
BC is a language and a compiler for doing arbitrary precision arithmetic on the PDP-11 under the UNIX Time-Sharing System.
- (1056) *DC—An Interactive Desk Calculator*  
L. Cherry + R. Morris  
November 15, 1978  
DC is an interactive desk calculator program implemented on the UNIX Time-Sharing System for doing arbitrary-precision integer arithmetic.
- (1061) *Lex—A Lexical Analyzer Generator*  
M. E. Lesk + E. Schmidt  
January 1979  
LEX helps write programs whose control flow is directed by instances of regular expressions on the input stream.
- (1063) *A Description of How UNIX Fortran Works*  
I. A. Winheim  
TM 75-8234-3 April 10, 1975  
This memorandum describes the main differences between C and Fortran and how to interface Fortran with the operating system.

*(1064) AGEN—An Associated Memory Generator*

M. E. Lesk

TM 75-1274-18      September 2, 1975

Agen is a program generator for table searches. It also writes programs to store and retrieve information.

*(1074) A Library of Reference Standard Mathematical Subroutines*

R. Morris

TM 75-1271-6      May 1, 1975

This memo describes a set of mathematical library functions to use arbitrary accuracy. Relevant error analysis and subroutines listings are given.

*(1079) BLOSIM—A Discrete Time Block Simulator*

G. Roylance (MIT) + M. T. Dolan + J. F. Kaiser

TM 75-1352-6      July 15, 1975

This memorandum describes the language, variable precision, implementation, and general use of BLOSIM.

*(1080) UNIX Facilities For The Development Of Programs Written In Macro-11.*

P. D. Jensen

TM 75-8234-14      December 5, 1975

This memo describes the initial set of facilities available under UNIX for use in developing programs written in DOS Macro-11, and BOS & BOS application programs in particular.

*(1084) Struct—A Program Which Structures Fortran*

B. S. Baker

TM 75-1271-12      December 22, 1975

Struct is a program which rewrites Fortran programs using Ratfor control constructs, such as WHILE and IF ELSE statements. These constructs are used by Struct to make loops and branching apparent.

See also UNPL(1103)

*(1097) SIM—A Language For Simulating Computers*

L. L. Cherry

TM 76-1271-2      May 5, 1976

SIM is a language and compiler for writing computer and microprocessor simulators. SIM currently runs under UNIX and will soon be available under GCOS.

*(1101) A Regular Expression Matcher For The C Language*

A. L. Sabsevitz

TM 76-9141-5      June 2, 1976

This memorandum describes a primitive regular expression matching facility written for language C. Routines have been provided to compile regular expressions and to apply such compiled expressions to string subjects.

*(1102) Some Statistics On The Usage Of The C Language*

H. Gajewska + S. C. Johnson

TM 75-1273-13      November 24, 1975

This paper describes a program that analyses programs written in the C language.

*(1103) An Algorithm For Structuring Flowgraphs*

B. S. Baker

TM 76-1271-3      May 14, 1976

This paper describes an algorithm which transforms a flowgraph into a program containing IF THEN ELSE and REPEAT (DO FOREVER) statements. The algorithm has been implemented in a program called Struct.

See also UNPL(1084)

(1105) *An Interactive Control Language For SIM*

L. L. Cherry

TM 76-1271-8 June 28, 1976

This paper is intended to be a reference manual and assumes familiarity with SIM.

(1107) *Programmer's Workbench Papers From The Second International Conference On Software Engineering. (G.4)*

T. A. Dolotta, et al.

For complete information, see UNED (G.4)

(1143) *A Style Sheet For C Programming, Issue 1*

A. L. Glasser

February 28, 1977

Memorandum For File

The "style sheet" describes the recommended style (physical layout and appearance) for writing C programs in Center 914.

(1149) *UNIX Assembler for the Intel 8080 Microprocessor*

J. J. Molinelli

TM 77-3233-4 March 17, 1977

This document describes the usage, input, and output of an assembler for the Intel 8000 series microprocessors.

(1150) *Reissue No. 1 of MAC-8 Assembler User's Manual*

D. B. Kirby

TM 77-2265-2 May 20, 1977

This manual describes the MAC-8 assembly language. It does not describe the MAC-8 machine. It summarizes all of the machine instructions, all addressing modes, and all testable machine conditions.

This is a revision of TM 76-4393-16

(1157) *A General-Purpose Subroutine Library for PWB/UNIX (B.11)*

A. L. Glasser

TM 77-9144-2 April 27, 1977

This library was designed to be upwardly compatible with two previous libraries and to complement the functions provided by D. Ritchie's "A New Input-Output Package".

(1160) *The M4 Macro Processor*

B. W. Kernighan + D. M. Ritchie

July 1, 1977

M4 is a macro processor available on UNIX and GCOS. M4 is particularly suited for functional languages like Fortran, PL/1 and C since macros are specified in a functional notation. This paper is a user's manual for M4.

(1166) *MAC-8 C For Beginners*

H. D. Rovegno

TM 77-4393-2 April 1, 1977

This memorandum will serve as a tutorial for the C Language with emphasis on those features which are most useful to the microprocessor user and special to the MAC-8.

(1185) *A Tutorial Introduction to ADB*

J. F. Maranzano + S. R. Bourne

TM 77-8234-11, TM 77-1273-10

May 5, 1977

ADB is an indispensable but complex tool for debugging crashed systems and/or programs. This document provides an introduction to ADB with examples of its use.



**(1193) *RATFOR—A Preprocessor for a Rational Fortran***

B. W. Kernighan

January 1979

This paper discusses design criteria for a Fortran preprocessor, the Ratfor language and its implementation, and user experience.

**(1199) *"Introduction to Software"—A Videotape Course***

R. F. Rosin

TM 77-3233-9      October 3, 1977

This memorandum describes the context in which lectures of 32 hours were prepared and suggested ways in which videotapes and associated computer files might be used in future courses.

**(1200) *Interactive Graphics System for a UNIX Environment***

J. H. Jackson

TM 77-5221-2      September 29, 1977

This memorandum describes a system of interactive graphic subroutines which has been implemented under the UNIX time-sharing system.

**(1203) *Inter-UNIX Portability***

T. L. Lyon + D. M. Ritchie

TM 77-1273-13      September 16, 1977

This paper gives details of problems encountered in porting programs, guidelines for writing or rewriting programs to be portable, and some statistics about the advantages and disadvantages of portable programming.

See also UNPL(1204)

**(1204) *C Language Portability***

B. A. Tague + R. C. Haight

September 22, 1977

This paper consists of 3 attachments (I) Library Routines, (II) A Style Sheet for C Programming, Issue 1 UNPL(1143) and (III) Inter- UNIX Portability UNPL(1203).

**(1206) *Awk—A Pattern Scanning and Processing Language (Second Edition)***

A. V. Aho + B. W. Kernighan + P. J. Weinberger

TM 78-1271-12, TM 78-1273-6      September 1, 1978

Awk is a programming language designed to solve some common information retrieval problems. This memorandum supersedes TM 77-1271-5 dated September 8, 1977.

**(1207) *The C Language Calling Sequence***

S. C. Johnson + D. M. Ritchie + M. E. Lesk

TM 77-1273-15, TM 77-1274-13      September 26, 1977

This document attempts to set forth the major issues, and discusses experience with the PDP-11, GCOS, and IBM C environments. An appendix discusses the calling sequence for the Interdata 8/32 C compiler.

**(1208) *Character String Manipulation in the C Language***

R. G. Carr

October 31, 1977

5161-771031.01EN

This document describes the C language features and the available subroutines. It is intended to complement the C tutorial UNPL(1001) with emphasis on strings.

(1211) *String Manipulation and Conversion Library for Switching Control Center*

B. C. Hoalst

TM 77-5222-2      October 20, 1977

This library provides a number of basic mechanisms for implementation of complex string format tasks from C programs.

(1220) *MICA—A General Purpose Microassembler: Functional Specification/User's Manual—Issue II*

S. W. Ng

TM 77-5514-2      November 15, 1977

MICA is a UNIX based program written in C. It combines the salient features of several commercially available microassemblers such as AMDASM and RAPID, and also provides features not available elsewhere.

(1221) *MAC-8 Assembly Language Programming Manual*

J. Angelo

December 8, 1977

Part 1 of this manual gives an introduction to programming MAC-8 in assembly language. Part 2 is written for people who have reached the intermediate ability to program microprocessors.

(1225) *Assembler for the DEC KMC11 Microprocessor*

L. A. Wehr

TM 77-8234-22      November 15, 1977

This document is a reference manual for an assembler for the DEC KMC11 microprocessor. It describes the usage, input syntax, and output format of the assembler.

(1228) *Extended Shell—A Potential Real Time Interpreter*

N. J. Kolettis

TM 77-4145-01      October 25, 1977

The extended shell has the potential of a genuine real time interpreter that can be used to fashion shell procedures in real time environments which perform essentially as fast as C programs and are very simple to write and maintain.

(1229) *Guidelines for C Compiler Distribution*

S. B. Olsson

TM 78-8234-2      January 3, 1978

This memorandum outlines a set of procedures for C compiler distribution that has been developed in order to minimize distribution, installation and transition problems.

(1237) *A C Compiler for the SEL Computer*

J. R. Remde

TM 78-1228-1      January 13, 1978

This memorandum describes the implementation process including the changes made to the portable C compiler and the construction of the SEL C library. It also includes a user's guide, explaining the usage and features of the compiler.

(1239) *An Introduction to the UNIX Shell*

S. R. Bourne

November 12, 1978

The shell is a command programming language that provides an interface to the UNIX operating system. Its features include control flow primitives, parameter passing, variables and string substitution.

- (1248) *A Portable Fortran 77 Compiler*  
 S. I. Feldman + P. J. Weinberger  
 August 1, 1978  
 The Fortran language has just been revised, and a new standard for the language, known as "Fortran 77". This paper describes the language compiled, interfaces between procedures, and file formats assumed by the I/O system. An appendix describes the Fortran 77 language.
- (1249) *A Version of Ratfor for the PDP-11's RT-11 Operating System*  
 R. L. Maybach  
 TM 78-4392-2      May 10, 1978  
 This memo describes the input/output routines and the RT-11 version of Ratfor.
- (1250) *8080/Z80 Assembler Reference Manual*  
 G. C. Vogel  
 TM 78-8234-6      March 21, 1978  
 This document is the reference manual for as80, an assembler for the Intel 8080 and Zilog Z80 microprocessors. It describes the usage, input syntax and output format of as80. This assembler is written in C and runs under the UNIX operating system. This document supersedes previous as80 documentation.
- (1260) *Comnd -- A Routine to Handle Command Line Parsing*  
 S. A. Uhler  
 TM 78-3231-1      May 10, 1978  
 Comnd is designed to provide a uniform method for parsing command lines from the terminal. It frees the programmer from the problems involved in dealing with command input, and allows him to concentrate on the application.
- (1267) *A C Library Performance Problem*  
 A. Koenig  
 MF 78-8234-61      June 8, 1978  
 Most of the commands in UNIX are written as C programs. Most of these programs, in turn, are being rewritten to use Ritchie's input-output library. One characteristic of this library is that it does not normally buffer the standard output of a program when that file is directed to a terminal. We show that this causes a significant performance degradation and point out some ways to alleviate the problem.
- (1268) *Variable Length Argument Lists in C*  
 A. Koenig  
 MF 78-8234-64      June 12, 1978  
 A major problem with the C language is that printf cannot be written in C. This is because different invocations of printf may appear with different numbers of arguments, and the same argument position may be occupied by arguments of different types from one invocation to another. This paper describes an interface to variable length argument lists.
- (1269) *On Understanding the Support of the Portable C Compiler*  
 J. F. Maranzano  
 MF 78-8234-49      April 26, 1978  
 In order to understand how to support the portable C compiler, it is important to know the functions of the various pieces and the process of building a C compiler for some machine. This memorandum tries to explain these pieces in a high level functional way without getting into too much detail.

- (1271) *Parse( )—A C Language Routine to Parse a String into Words*  
 R. B. Freeman  
 Programmer's Notes  
 June 15, 1978  
 These notes document `parse( )`, a C language routine that parses an input string and returns the words and the number of words in the string.
- (1323) *Changes in the C Environment for UNIX/TS Edition 1.0*  
 A. Koenig  
 MF 78-8234-84      September 27, 1978  
 This document describes differences users may encounter when changing to UNIX/TS Edition 1.0 from the last release of the C compiler shipped for Generic 3.
- (1348) *Support for C on IBM Computers*  
 F. T. Grampp  
 January 25, 1979
- (1353) *Semantics of the C Programming Language, Part 0: Prelude*  
 R. Sethi  
 TM 79-1271-2      January 2, 1979  
 In this paper, a very simple language with assignments and while loops are used to illustrate the semantic method.  
 See also UNPL(1376) + UNPL(1427)
- (1354) *Implementation of a Portable Fortran 77 Compiler Using Modern Tools*  
 S. I. Feldman  
 TM 79-1273-1      February 1, 1979  
 This paper discusses the approach taken, the ways in which the tools had to be bent to do the job, the properties of Fortran that seem to cause the most trouble, and the cost of writing a portable compiler.
- (1356) *Indian Hill C Style and Coding Standards*  
 L. W. Cannon, et al  
 TM 78-5512-1, TM 78-5514-1, TM 78-5522-3, TM 78-5326-1, TM 78-5521-3      March 29, 1978  
 This document is a result of a committee formed at Indian Hill to establish a common set of coding standards and recommendations for the Indian Hill community.
- (1376) *Semantics of the C Programming Language, Part 1: Statements*  
 R. Sethi  
 TM 79-1271-4      February 2, 1979  
 This is one of a series of papers defining the semantics of the C programming language. It provides a brief introduction to the semantic method, and semantic statements are given.  
 See also UNPL(1353) + UNPL(1427)
- (1377) *An Interactive Interface for C Language Programs*  
 M. K. Radnik  
 TM 79-8224-2      March 14, 1979  
 This memorandum describes and illustrates how to use a set of C Language I/O routines and parsing routines which may serve diverse programming systems having the common need for a sophisticated dialogue or user interface.

(1384) *Macros for Analyzing C Program Arguments*

J. Lions

June 28, 1979

This paper describes two sets of macros for use in the analysis of the arguments to C programs. The advantage of their use should be a considerable reduction of programmer effort and improved comprehensibility of programs.

(1388) *C Language Routines for Multi-Thread Computations*

A. G. Fraser

TM 79-1273-4      May 7, 1979

This memorandum describes subroutines which provide the basic mechanisms needed to support multiple tasks within one C language program.

(1408) *A Tour Through the UNIX C Compiler*

D. M. Ritchie

January 1979

(1409) *A Tour Through the Portable C Compiler*

S. C. Johnson

January 1979

(1410) *The Programming Language EFL*

S. I. Feldman

TM 79-1273-6      June 4, 1979

This paper describes EFL, a clean, general purpose computer language intended to encourage portable programming.

(1413) *SDMP—A Debugging Aid for UNIX C Programmers*

A. L. Glasser

MF 79-3116-8      June 28, 1979

This memorandum describes a tool that provides the UNIX C programmer access to structure symbols with adb.

(1426) *cq—A Program for Testing C Compilers*

F. T. Grampp

TM 79-2524-3      May 14, 1979

cq is a C program that performs a coarse check on the quality of a C compiler by comparing the behavior of the compiler to that which is advertised in the C Reference Manual. This memorandum describes cq from a designer's point of view.

(1427) *Semantics of the C Programming Language, Part 2: Declarations*

R. Sethi

TM 79-1271-6      March 2, 1979

See also UNPL(1353) + UNPL(1376)

(1430) *The Second Pass of the Portable C Compiler*

J. Lions

June 1979

This document attempts a detailed examination of the source code for the second pass of the Portable C compiler.



(1446) *A Guide to the C Library for UNIX Users*

C. D. Perez

August 15, 1979

This paper describes some commonly used functions of the C Library.

(1452) *Using a Command Language as the Primary Programming Tool*

T. A. Dolotta + J. R. Mashey

TM 79-3624-2, TM 79-9322-1

August 15, 1979

In this paper, a brief discussion of the capabilities and evolution of the shell is followed by an analysis of patterns of shell usage by people who use the "Programmer's Workbench" version of the UNIX system in a variety of work environments.

(1465) *A Comparison of the Programming Languages C and Pascal—Part One: Language Concepts*

A. R. Feuer + N. H. Gehani

TM 79-3782-7

September 12, 1979

This is the first of two papers comparing the programming languages C and Pascal. It provides a basis on which to make a selection between C and Pascal for a particular application.

(1467) *Changes to C and the Portable C Compiler—Issue 1*

B. R. Rowland

October 2, 1979

This document is the first in what will become a series of notifications to implementors of a version of the Portable C Compiler in Bell Laboratories.

(1468) *SE—A Structure Editor Program for Accessing C Program Structures*

P. A. Fargo

TM 79-5354-2

September 17, 1979

This memorandum describes a program which uses the standard UNIX editor to create and modify program structure data. The Structure Editor (SE) performs various data base management functions on a structure file.

(1486) *Thoughts on Debugging C Programs*

A. Koenig

December 6, 1979

Some C programs violate language rules in ways that can only be detected during execution. This document gives examples of these errors and discusses design alternatives for a C implementation capable of detecting them.

(1498) *Recent Changes to C*

B. R. Rowland

TM 79-3621-2

October 2, 1979

This memo describes recent enhancements to the C language that are not currently documented.

## UNPM—UNIX User's Manuals

### UNPM

(1021) *UNIX Reference Card—Second Edition*

L. L. Cherry

March 1979

A handy guide to UNIX commands and syntax.

(1073) *UNIX Programming—Second Edition*

B. W. Kernighan + D. M. Ritchie

October 26, 1979

This paper is an introduction to programming on UNIX. The emphasis is on how to write programs that interface to the operating system.

(1107) *Programmer's Workbench Papers From The Second International Conference On Software Engineering. (G.4)*

T. A. Dolotta, et al.

For complete information, see UNED (G.4)

(1110) *Instructions For GRAPH, TEK, TEKSTARE and GSIP Graphics Packages.*

A. R. Storm

TM 76-1527-35      June 30, 1976

(1178) *QUEST Administration Handbook*

E. H. Albrecht

August 24, 1977

5161-770824.02 MF

The purpose of this memorandum is to provide the background information needed to administer the QUEST System.

(1224) *8080 SIMULATOR (i80sim) USER MANUAL*

B. B. Hofmann

TM 77-2265-8      November 1, 1977

This memorandum takes the user thru all commands and features of i80sim, and provides a summary at the end.

(1402) *UNIX/32V Time-Sharing System: UNIX Programmer's Manual, Version 1.0, Volume 1*

Bell Laboratories

February 1979

Contains descriptions of the use of all commands and calls of the UNIX/32V system.

(1440) *UNIX/TS User's Manual—Edition 1.1*

Department 3624

January 1979

This manual describes the features of UNIX/TS.

### UNPMGS

(1088) *UNIX Programmer's Manual—PG-1C300 Issue 3*

Published by the UNIX Support Group (USG) February, 1977

Contains descriptions of the use of all commands and system calls.

## UNPMMT

(1070) *UNIX/RT User's Manual—Release 1*

Bell Laboratories

March 1979

This manual describes the features of UNIX/TS and UNIX/RT. UNIX/RT supersedes ME  
Release 0.

## PWB/UNIX

(1407) *PWB/UNIX User's Manual—Release 2.0*

Department 3782

June 1979

Describes all commands, subroutines, and system calls of the PWB (Programmer's Workbench) version of UNIX from Division 37 (PY). Maintenance for this document is distributed by the Computing Information Libraries using specific codes for specific machines.

## UNPMRS

(1014) *UNIX Programmer's Manual—Sixth Edition*

K. Thompson + D. M. Ritchie

May, 1975

Contains descriptions of the use of all commands and calls on the "Research" version of UNIX.

(1400) *UNIX Programmer's Manual—Seventh Edition, Volume 1*

Bell Laboratories

January 1979

Contains descriptions of the use of all commands and calls on the "Research" version of UNIX.

(1401) *UNIX Programmer's Manual—Seventh Edition, Volumes 2A & 2B*

Bell Laboratories

January 1979

Contains documents for use with the Seventh Edition of the "Research" version of UNIX.

## UNSA—Special Applications

- ) *Computer Assisted Communication System*  
H. N. Dorris + D. W. Hagelbarger + M. J. Shannon  
TM 78-1356-7, TM 78-1352-7      May 1, 1978  
This memorandum describes a continuing series of experiments aimed at providing improved communications for non-vocal, motion-impaired people.
- 11) *ACS LEAP User's Guide*  
J. P. Marione  
TM 78-3112-3      September 25, 1978  
This is a modified version of LEAP which will be used to system test the Advanced Communication Service.
- 13) *Basic-16 Prospectus*  
C. Scussel  
TM 78-2522-1      October 6, 1978  
Basic-16 is a C language software development system (SDS) being developed by Laboratory 252 for 16-bit microprocessors in controller applications.
- 5) *Application Planning Guide, Release 0 of Basic-16*  
J. Arnold  
TM 78-2522-2      November 15, 1978  
This paper describes Basic-16's hardware and software requirements.
- 8) *Preliminary Report on RCMAS and MERT Performance Problems*  
E. L. Hedrick + T. M. Raleigh  
October 10, 1978  
This memorandum summarizes the performance and reliability problems that the Recent Change Memory Administration System experienced at their Chicago field site.
- 2) *Functional Operation of the Recent Change Memory Administration(RCMAS)*  
D. G. Korn + M. A. Pilla + N. M. Scribner + B. W. Stuck  
February 1, 1979  
This memo describes the hardware and software architecture, as well as the data and control flow associated with processing recent change order transactions, in the Recent Change Memory Administration System (RCMAS) as 1 August 1978.
- 4) *Modifications to the Trouble Reporting System*  
J. Dean  
MF 78-8234-77      August 30, 1978  
This document describes the usage and the internal structure of the new system for trouble reporting.  
See also UNSA(1326)
- 326) *New Trouble Reporting Procedures*  
J. F. Maranzano  
November 2, 1978  
This paper describes several changes which have been made to the trouble reporting system.  
see also UNSA(1324)

*(1333) A Traffic Generating System*

S. L. Arnold + B. E. Redman

TM 78-4533-1 December 29, 1978

The Traffic Generating System (TGS) provides the environment for multiple channel simulation testing of SLC-96. Users may specify as many independent simulations as real time and memory permit.

*(1341) An Intelligent Fast Color Display*

N. Weste

TM 78-1354-15 December 28, 1978

A color display has been built primarily for use in an integrated circuit design environment. This paper documents the hardware and progress to date.

*(1342) A Software Architecture for Providing a Graphics System Development Workbench*

S. T. Schuyler + M. M. Chodrow

TM 78-8254-5 December 1, 1978

The purpose of this document is to describe the software architecture of the UNIGRAPHIX System, and to discuss the appropriateness of this architecture for a range of interactive graphics applications.

*(1344) REDAS—A Relational Data Access System For Real-Time Applications*

J. R. McSkimin

TM 78-5221-1 October 9, 1978

REDAS is a data retrieval software package designed to provide convenient access to a database containing real-time as well as more static types of data.

*(1350) A Micro-DBMS for a Distributed Data Base*

P. D. Ting + D. C. Tsichritzis

TM 79-1712-2 January 29, 1979

This memorandum contains the text, slightly revised and updated, of a paper published in the Proceedings of the Fourth International Conference on Very Large Data Bases, West Berlin, Germany, September 13-15, 1978.

*(1355) Real Time Listing Retrieval (RTLRL)/Audio Response Unit (ARU) Prototype System—Performance Measurements*

J. W. Hooker

TM 79-9156-2 February 10, 1979

This paper describes the mechanized driver capability and the methods used to obtain the measurements, which include CPU and disc utilization, service time, and overall response time.

*(1357) A General Purpose Assembler*

J. S. Thompson

TM 79-1365-1 January 12, 1979

This paper describes a general purpose assembler which has been written to provide a symbolic programming facility for custom built programmable and microprogrammable hardware.

*(1362) A Capacity Study for the Service Evaluation Center—A UNIX-Based Real-Time System*

S.-J. Chang

TM 79-5223-1 February 9, 1979

This memorandum presents a report on the capacity study for the Service Evaluation Center (SEC) which is a UNIX-based Real-Time System.



(1366) *Craft Access System Software Standards*

E. K. Evenson + N. R. Fildes  
TM 79-4563-1 March 8, 1979

This memorandum contains the programming standards for the Craft Access project.

(1373) *Porting the ADAPT Data Translation System to the IBM 370*

M. J. Bach + B. L. Smith  
TM 79-9157-1 March 8, 1979

The ADAPT Data Translation System is a high-level user-friendly system intended to meet most file re-structuring requirements, including those involving transfers to different machine configurations. This paper describes the porting of the ADAPT system to the IBM 370/168 computer.

(1374) *A Data-base Management System under MERT*

A. C. Ting  
TM 79-4145-2 April 4, 1979

This paper describes the features of RCDBMS(Recent Change Memory Data Base Management System), a real-time database management system written in C under MERT.

(1378) *Implementation of a Boolean Data Analysis Technique for PWB/UNIX*

L. E. Bonanni  
TM 79-9441-5 March 21, 1979

This memorandum presents the simplified "possibly meaningful relationships" (PMR) technique and serves as a user's guide to its PWB/UNIX implementation.

(1381) *The USG UNIX Stockroom*

V. H. Rosenthal  
April 23, 1979

The USG Stockroom is a facility on the USG UNIX/TS system that allows Bell Labs UNIX users to obtain programs for installation on their systems. This paper describes the organization of the Stockroom and the commands available to Stockroom users.

(1383) *An INTEL Compatible 8048-49 Cross Assembler*

T. J. Mulrooney  
TM 79-2211-10 November 29, 1979

This report describes the implementation of an Intel 8048-49 assembler on the Unix operating system. The usage, advantages, disadvantages, and examples are given.

(1387) *SYSTID on F4P-UNIX—User's Guide*

B. G. Haskell + O. C. Yue  
TM 79-1343-7 April 4, 1979

A user's guide for SYSTID, a set of programs to be used for simulation and transient analysis of linear and non-linear systems.

(1390) *Hi—An Interactive Hierarchical Data Management System for UNIX*

R. G. Kayel  
TM 79-3444-3 April 30, 1979

This memorandum describes a hierarchical data management system that runs under the UNIX operating system. It is designed to be used for managing a small to moderate sized hierarchical data base.

(1397) *UNIX Based TSPS Hotel-Motel Traffic Simulator*

S. Michael  
TM 79-5252-1 May 18, 1979

This memorandum describes a message generator that simulates the messages transmitted from a Traffic Service Position System (TSPS) to the No. 1 Hotel Billing Information System(HOBIS) for sent-paid calls originating from a hotel or motel.

(1398) *PWB/Graphics Overview*

A. R. Feuer

TM 79-3782-1 June 11, 1979

This memorandum will help you get started using graphics and show you where to find more information.

(1399) *Conversion of SICPPR Files From UNIX to RAMIS II*

M. B. Ellington

TM 79-2174-1 May 21, 1979

This memorandum documents the transfer of the Silicon Integrated Circuit Project Planning Report (SICPPR) data base from the UNIX file structure to the RAMIS II data base system.

(1406) *Computer Buffered Information Exchange User's Guide*

B. I. Strom

TM 79-5133-1 June 11, 1979

This paper is the complete user's guide to the Computer Buffered Information Exchange (CBIE) system which facilitates asynchronous communication among a group of individuals.

(1412) *DIRECT II In-Core Tables: User's Guide*

W. D. Roome

TM 79-9156-5 June 7, 1979

The DIRECT II In-Core Tables (ITBL) package allows user processes to quickly search small subsets, or cross-sections, of tables in the DIRECT II Tables Data Base (TDB).

(1414) *Directory Assistance Operator Work Time Exploratory Data Analysis*

E. Arthurs + N. Sharko + B. W. Stuck

July 6, 1979

This paper summarizes recent work in characterizing directory assistance operator work times, which is a major component of the total time required to handle one transaction, for current directory assistance operators.

(1415) *Preliminary Real Time Listing Retrieval (RTLRL) Field Study Performance Analysis*

E. Arthurs + D. W. Cragun + B. W. Stuck

July 9, 1979

This paper summarizes an analytic study plus some experimental data from a field study concerning performance limitations of a prototype of RTLRL.

(1416) *The Craft Access Voice Editing System (CAVES)*

N. R. Fildes

TM 79-9314-1 June 20, 1979

This memorandum describes the voice editing software tools used to develop and maintain a collection of files containing the digitized speech vocabulary.

(1419) *The Nspeak Program*

M. O. Harris

TM 79-1227-18 June 3, 1979

(1421) *Experimental Office Communications Services—Message System*

R. E. Hoffman

June 13, 1979

This memorandum describes an online experimental Office Communication System (OCS) Message System through which users can communicate in a deferred mode.

*(1425) DIRECT II Service Dispatcher*

C. W. Chang + J. P. Linderman  
TM 79-9156-6      June 12, 1979

A DIRECT II service dispatcher was developed to manage a number of service processes in the system. This document specifies the functional capabilities of the service dispatcher and the communication channels between it and the customer processes.

*(1428) Documentation of Minicomputer Product Trials*

R. E. Swift  
April 27, 1979

This memorandum defines the constituents of a product trial report and the minimum information which the report must convey.

*(1433) An Interface Between a Stand Alone Operating System (ISIS) and a Time Shared Computer System (UNIX)*

T. J. Mulrooney  
TM 79-2211-4      May 15, 1979

An interface between a Microcomputer Development System (MDS) and a time shared system (UNIX) is described in detail. A complete description of all operating procedures, complete documentation package for all programs discussed, applications and examples of usage are also given.

*(1438) UNITY—A Small DBMS for a UNIX Environment*

P. D. Ting  
TM 79-1712-2      September 4, 1979

This memorandum describes a Data Base Management System called UNITY, which is operational on DEC's PDP-11 minicomputers and LSI-11 microcomputers.

*(1445) INTEL 8048 Simulator (SIM48) User Manual*

T. J. Mulrooney  
TM 79-2211-7      August 15, 1979

The 8048-8049 Microprocessor Simulator running under the UNIX Operating System, provides software simulation of the 8048-8049 microcomputer. This report is a detailed user's manual describing the various commands.

*(1448) Spooler and Daemon Software for a Printer Network*

J. E. Laur  
TM 79-9457-3      July 27, 1979

Printer and spooler software to handle a single Dataspeed 40 printer has been taken from the MERT support group Dept (3624) and modified to provide support for a network of printers of any type. This paper describes several features which have been added to the software to make more robust.

*(1453) Implementing and Testing New Versions of a Good 48-bit Pseudo-random Number Generator*

C. S. Roberts  
TM 79-1353-5      September 4, 1979

This paper describes the design, implementation, testing, and use of drand48—a good pseudo-random number generator based on the linear congruential algorithm and 48-bit integer arithmetic.

*(1454) DIRECT II Sort Utilities*

J. P. Linderman  
TM 79-9456-2      August 31, 1979

This memorandum has four main parts. The first describes how a list of multi-valued fields induces an ordering on records. The second section specifies an algorithm for constructing a sort key given a record and a list fields. The third section describes a general purpose sort utility capable of sorting records into lexicographical order on a single key. A final section describes a collection of tools which constituted the DIRECT II sort utilities.

(1455) *DIRECT II Data Representation and Manipulation*

J. P. Linderman

TM 79-9456-1 August 8, 1979

This memorandum describes the representation used in DIRECT II.

(1461) *YADS—Yet Another Database System*

M. J. Rochkind

TM 79-9323-1 October 1, 1979

YADS is yet another database that stores data, provides a way to update it, and generates reports. This memo contains a tutorial on setting up a YADS application and manual pages for reference.

(1464) *Version 3 of the GR-Z Graphical System*

R. A. Becker

TM 79-1215-12 September 4, 1979

This memorandum describes Version 3 of the GR-Z Graphical System. It assumes familiarity with GR-Z Version 2, and describes the changes from Version 2 to Version 3. It also provides details of the UNIX implementation.

(1471) *A Graphics Language for Typesetting*

C. J. Van Wyk + B. W. Kernighan

TM 79-1274-10 September 13, 1979

This paper reports some steps toward the design of a language in which a useful class of figures can be expressed.

(1478) *Development of a Program for Parts Inventory Control*

A. M. Gopin

TM 79-3237-2 October 19, 1979

A program has been developed to aid in the keeping of inventories of parts for prototype model production. This program is written in C and runs under UNIX.

(1489) *A UNIX Based System for Automated Testing of Asynchronous Terminals and Hosts*

M. B. Mueller

TM 79-3162-1 September 10, 1979

The PATHOS (Programmable Asynchronous Terminal and Host Simulator) facility has recently been implemented to support automated testing of asynchronous terminals and hosts. An overview of PATHOS capabilities and architecture is presented in this paper.

(1496) *TERSE—A Technique for Reporting on Small Data Bases*

N. H. Petschenik + R. P. Woodall

TM 79-9252-1 August 31, 1979

This memorandum applies TERSE to a specific data base example and then the technique is presented in general. Complete user information is provided as well as a description of the implementation.

## UNSD—Standard Documentation

- ) *Referencing Standard UNIX Documentation*  
G. C. Vogel  
August 23, 1974  
Memorandum For File
- ) *UNIX Support Classifications For PG-1C300—Issue 2*  
G. C. Vogel  
MF 76-8234-9      January 30, 1976  
The purpose of this memorandum is to define levels of support and to assign pidents to these classifications.
- ) *Program Generic Control And Documentation On UNIX*  
G. C. Vogel  
TM 76-8234-13      May 17, 1976  
This memorandum describes a general set of program generic control and documentation procedures which has been developed to Bell System format.
- 107) *Programmer's Workbench Papers From The Second International Conference On Software Engineering. (G.4)*  
T. A. Dolotta, et al.  
For complete information, see UNED (G.4)
- 162) *The UNIX Operating System—PG-1C300*  
G. C. Vogel  
For Complete Information, see UNOS
- 1291) *Recommendations for A Company-Wide UNIX Education Program*  
R. M. Coben, et al.  
June 6, 1978  
This report presents an overview of the use of UNIX at Bell Laboratories, our view of the challenge for UNIX education, and our specific recommendations.
- 1296) *Title Listings for UNIX Memoranda*  
T. R. Crowley  
MF 78-8234-79      September 7, 1978  
A shell program, tlist, has been written to produce high quality listings of the titles and authors of UNIX memoranda for the Computing Information Library.
- 1363) *A Public Library Facility for the UNIX Time-Sharing System*  
D. W. Ting + A. L. Glasser  
TM 79-3111-1      February 21, 1979  
A public library in a computer is an area of memory loaded with frequently used subroutines. This memorandum describes an implementation of this facility for UNIX.
- (1420) *Supported Structure for Local Modifications to UNIX*  
A. S. Cohen  
July 26, 1979  
This paper proposes ways to improve the separation of local and centrally-supported software to promote discussion on this subject.



## UNSU—Service and Utility Programs

*(1003) Implementation of Large Contiguous Files and Asynchronous I/O in UNIX*

H. Lycklama

TM 74-1352-1 January 4, 1974

This document describes physical I/O for the UNIX—A (assembler ) based system.

*(1025) Synthetic English Speech by Rule*

M. D. McIlroy

TM 73-1271-7 December 7, 1973

*(1068) UNIXLIST—An IBM/370 Utility Program to List a UNIX File Stored on a 9-Track Magnetic Tape.*

C. S. Roberts

January 29, 1975

Memorandum For Record

*(1078) Make—A Program For Maintaining Computer Programs*

S. I. Feldman

August 15, 1978

This memo describes a program called MAKE that provides a simple mechanism for maintaining up-to-date versions of programs that result from many operations on a number of files.

*(1081) A Tape Back-Up System For The Network File Store*

R. J. Elliott

TM 75-1273-12 November 24, 1975

This paper describes a system which maintains a complete copy on tape of all files on the file store of the Spider Network.

*(1107) Programmer's Workbench Papers From The Second International Conference On Software Engineering. (G.4)*

T. A. Dolotta, et al.

For complete information, see UNED (G.4)

*(1118) UNIX-INTELLEC MDS Interface*

Joseph E. Lencoski + Stuart A. Tartarone

TM 76-3141-1, TM 76-3142-1

September 1, 1976

This memorandum describes the interface including a synopsis of the new UNIX commands to access these features and provides a program listings of the new software developed.

*(1140) Description of MKCONF*

I. A. Hahner + T. M. Raleigh

MF 77-8234-5 January 17, 1977

The purpose of this document is to describe the program MKCONF, which is an interactive program that generates two configuration dependent files.

*(1149) UNIX Assembler For The Intel 8080 Microprocessor*

J. J. Molinelli

For Complete Information, see UNPL

*(1153) An Integrated System For Microprocessor Support*

D. H. Copp + R. J. Council + D. J. Hunsberger + J. J. Mollinelli + J. H. VanOrnum

TM 77-8234-1, TM 77-3233-6, TM 77-3231-1

March 17, 1977

This memorandum describes a set of tools, referred to as the Microprocessor Support (MS) system, designed to reduce firmware development cost through efficient usage of the human resource.

(1156) *A Generalized Data Entry System*

M. J. Rochkind

TM 77-9156-1 April 1, 1977

The human and programming interfaces to the system are described and instructions are given for building the driving tables.

(1168) *A Console Controlled Interface Between an INTELLEC MDS And A Time-Shared Computer System.*

J. E. Lencoski + S. A. Tartarone + J. E. Wilkes Jr.

TM 77-3141-2, TM 77-3142-2 May 31, 1977

This memorandum describes two different approaches for modifying INTELLEC hardware, a SMAL2 monitor program and information including command sequences and instruction for local configuration.

(1171) *A Record Manager For Random Access To Variable Length Records Under UNIX.*

J. D. Beyer

TM 77-1353-5 June 1, 1977

This memorandum describes a Random Record Manager for UNIX disk file. It is meant to be both a user's guide and a brief overview of the workings of the system.

(1172) *QUEST—A Computer System To Collect Questionnaire Data*

E. H. Albrecht

May 16, 1977

Memorandum For File

QUEST can be used to issue a questionnaire, collect the answers to the questionnaire and prepare the resulting data for analyzation.

(1186) *Lint, a C Program Checker*

S. C. Johnson

July 26, 1978

Lint is a command which examines C source programs to detect and report about a number of bugs and obscurities. This document discusses the use of lint, gives an overview of the implementation, and gives some hints on the writing of machine independent C code.

(1209) *A Lexicographic Multikey Sort Program ZSORT*

H. Zucker

October 31, 1977

This memorandum describes the features of an efficient C Language sort program (ZSORT) and the characteristics of the sorting algorithms which were employed.

(1210) *Examples of Converting USG Shell Command Files for the New Shell*

M. A. Csaszar

MF 77-8234-100 November 22, 1977

This memorandum describes examples of converting USG shell command files for the new Center 127 shell written by S. R. Bourne. Examples of Center 323 files conversion of shell programs are shown.

(1215) *RXD-11D: Two Programs to Generate UNIX-Compatible Magnetic Tapes*

G. K. Swanson

November 17, 1977

Two programs to write source files to 9 track, 800 BPI magnetic tapes have been written for the PDP-11/45 and run under the RSX-11D Real-Time operating system.

(1219) *UNIX Microcomputer Control of Apparatus, Machinery, and Experiments*

B. C. Wonsiewicz + A. R. Storm + J. D. Siever

TM 77-1523-28, TM 77-1527-114

October 21, 1977

This paper describes a system for laboratory automation using the UNIX time-sharing system which has permitted experiments to be automated in hours rather than years.

(1222) *Gf—A Graphical Data Analysis Program for the MERT-UNIX Operating System*

E. Shapiro + M. F. Robbins

TM 77-1131-44

October 21, 1977

Gf is written in C language and the interactive terminal is a Tektronix 4014-1. Hard copy prints may be obtained via MH H6070 STARE device.

(1223) *An Interactive LEAP Script Generator (ILSG)*

H. M. Cykiert + B. E. Hess

TM 77-9423-3

December 2, 1977

This memorandum describes a newly developed tool which significantly reduces the cost of LEAP scripts.

(1227) *Gex—An Interactive Graphics Program*

D. J. Jackowski

TM 77-8254-3

December 7, 1977

This memo includes user information and a discussion of the software. Gex is designed to run on the PDP-11 under UNIX with a Tektronix terminal.

(1238) *A System Testing Technique Using a Universal LEAP Script*

N. H. Petschenik + R. P. Woodall

TM 77-9426-2

August 31, 1977

LEAP, a BTL developed test driver written for the PWB/UNIX system, supports the preparation and execution of such repeatable test by sending, receiving and processing the signal between simulated terminals and an interactive system under test.

(1243) *CLIO—A Relational Data Base System*

P. S. Para

TM 78-5522-2

February 9, 1978

This memo describes CLIO which includes general programming language capabilities as well as facilities for use as a data base-driven command language.

(1245) *QUIK: A Novel Approach to Computerized Directory Assistance Services*

J. D. Gabbe + C. N. Judice + T. B. London + J. D. Beyer

December 12, 1977

This paper gives an overview of an experimental directory assistance system, QUIK (Querying Interactively by Keywords), currently being used as a tool for research in information storage, retrieval, and people-computer interactions.

(1251) *Decentralized Transaction Control and Crash Recovery*

P. J. Weinberger

TM 78-3444-3

April 4, 1978

This paper contains algorithms for transaction control and crash recovery in a data base system.

(1252) *STAT: A Tool for Analyzing Data*

A. R. Feuer

TM 78-9442-4

March 21, 1978

Stat is an emerging collection of numerical programs under the UNIX operating system that can be interconnected using shell to form processing networks.

(1262) *User's Guide to the SMAL2 Language for the Zilog Z80 Microprocessor*

J. W. Farrell

TM 78-8234-8 March 21, 1978

SMAL2 is a structured assembly level language originally developed for the Intel 8080 microprocessor. It has recently been expanded for use with the Zilog Z80 microprocessor. The Language features control structures like those of the C programming language but otherwise has a one-to-one relationship to the Z80 machine instructions.

(1266) *Interactive Design Aid For General-Purpose Artwork Production*

V. A. Fasciano

TM 78-8254-3 June 1, 1978

This group of computer programs has been prepared for use with PDP-11 computers which are intended to assist in the creation and modification of general-purpose artwork such as flowcharts, illustrations, simple logic diagrams, and office furniture layouts. All programs are written in the C language.

(1273) *UNIX/TS File System Backup*

R. C. Haight

MF 78-8234-42 May 11, 1978

The dump/restor, Volcopy, Cpio/find backup systems will be distributed with the first release of UNIX/TS.

(1275) *8080/Z80 Simulator SM80 User Manual*

K. L. Regelson

TM 78-8234-1 January 15, 1978

The 8080/Z80 Microprocessor Simulator, running under the UNIX operating system, provides software simulation of the Intel 8080 and the Zilog Z80 CPUs. This memo has two main parts: a tutorial and a reference manual.

(1279) *UNIX Software Distribution by Communication Link*

M. E. Lesk + A. S. Cohen

TM 78-1274-3, TM 78-8234-5 February 24, 1978

This document discusses the operation of the UUCP (UNIX to UNIX copy) and related programs; their usage over the last year; and plans for the future.

(1285) *Proposed Structure for UNIX/TS and UNIX/RT Makefiles*

A. L. Chellis

MF 78-8234-73 July 26, 1978

This memo illustrates the minimum requirements for future makefiles. It should make file maintenance easier and more efficient.

(1286) *Cumulative Program Profiling*

J. F. Reiser

TM 78-1353-2 July 1, 1978

An automatic accumulation method is described for programs written in C and run under the UNIX\* operating system.

(1293) *Uucp—Implementation Description*

D. A. Nowitz

October 31, 1978

Uucp is a series of programs designed to permit communication between UNIX systems. This document is for use by an administrator of the system.

(1294) *UNIX Standardization Subcommittee Proposed Archiving Facility*

G. C. Vogel  
MF 78-8234-99 September 27, 1978

UNIX archiving proposals were discussed at several meetings of the USS. This memorandum summarizes the points discussed and outlines the proposal reached.

(1295) *Regression Testing for C Compilers*

T. R. Crowley  
MF 78-8234-78 August 10, 1978

This memorandum discusses the facility for regression testing of a C compiler which has been set up.

(1298) *Implementation of GR-Z Graphics on UNIX*

B. G. Haskell  
September 8, 1978

The purpose of this memorandum is to describe the programs and procedures necessary for the running of GR-Z programs on UNIX.

(1304) *The Evolution of a Source Code Control System*

A. L. Glasser  
TM 78-3111-3 September 12, 1978

This paper describes the facilities provided by SCCS, and the changes that were made to scss. See also UNPM(1086)

(1308) *MRCS and the MRCS 2 Data Base System*

H. S. Gellis  
TM 78-9442-7 July 26, 1978

This paper discusses both MRCS and the M2 system which has evolved to implement it and other data base systems.

(1328) *Sdiff, a Side-by-side Difference Program*

J. F. Maranzano  
December 13, 1978

The sdiff command has been written to provide a convenient display of the differences of two files and a facility for interactive merging of the two files.

(1332) *Monitor terminals under the UNIX operating system*

T. B. Muenzer  
TM 78-9442-6 July 24, 1978

This memorandum describes a primitive implementation suitable for many uses, and describes several possible extensions of the implementation.

(1338) *Enhancements to the USG Trouble Reporting System*

L. W. Cannon  
January 19, 1979

This paper describes a trouble reporting mechanism which was developed for use by the Processor Applications Group of Department 2512.

(1339) *VM/CMS-UNIX File Transfer Facility*

R. A. Norden  
January 10, 1979

A file transfer facility has been implemented which allows files to be transferred over the DDN network between any UNIX machine with appropriate automatic dialing equipment and AT&T VM/CMS systems at Piscataway, New Jersey. This memorandum is a brief guide for potential users.



(1346) *NFTS: Tools For Processing Data With Named Fields*

M. J. Rochkind

TM 78-4565-1

December 1, 1978

This memo describes an abstract data type, called a packet, for connecting named-field tools.

(1442) *BANCS Facility for MERT/UNIX*

J. S. Licwinko

TM 79-9156-7

April 11, 1979

This document describes software that supports connection of a MERT/UNIX machine to a BANCS network.

(1443) *Record Handling under MERT/UNIX—The Queue Facility*

J. S. Licwinko

TM 79-9156-4

May 25, 1979

This document describes a record handling facility developed for MERT/UNIX. It describes the need for this facility, the format of Queues, the subroutines, the integrity mechanisms, the checkpoint strategy, and the utilities. User documentation is attached.