

Prof. H. Farentz Physics Dept. Address Correspondence to
Brooklyn College of CUNY Brooklyn, NY 11210

The next meeting in the East will be October 6 at the City University of New York and the following meetings in early spring at Harvard. By October there should be considerable experience with the new system, and by spring general experience with the Harvard system.

Ken Thompson described some of the features of the new system and some benchmarks run on the 11/70. He estimates the new CPU gives a factor of 2.5 improvement in performance for UNIX, and that with the new peripherals the factor is about 3.0.

NEW SYSTEM AVAILABLE

The Sixth Edition - June 1975 of the UNIX system is now available for distribution to licensees. Commercial users should contact Western Electric for details. Academics can receive the new system for a service fee of \$150.00. Normal distribution is on 800 bpi - 9 track tape. You need not send a tape, just a check for \$150.00 made out to Bell Laboratories, Inc. and sent to:

I. B. Biren, Room 2c-542
Bell Laboratories, Inc.
Computing Information Services Group
Murray Hill, NJ 07974

The tape contains a single file which extracts to 3 RK-packs or equivalent. These contain:

Pack0	The system except for /usr/source
Pack1	/usr/source
Pack2	Documentation in machine readable form

Those who require distribution on RK-packs should send two or three packs along with their checks. The package also includes one hard-copy of each of the 19 documents.

Among the new 'goodies' are:

- 1) Separate I and D space for the resident monitor on 11/45s and 11/70s
- 2) Huge files (up to 16 megabytes)
- 3) A preprocessor for structured Fortran
- 4) TMS
- 5) A preprocessor for DC, with arbitrary precision
- 6) Many fixes and rewrites of system programs from 'as' to 'c'
- 7) Much improved comments embedded in system source
- 8) More graceful death on running out of resources and other crashes

OTHER SOFTWARE AVAILABLE

The UNIX paper which starts on page 4 announces the availability of their system. I have a recent note from Professor Allen saying he expects to have it available in the very near future.

Harvard has announced the availability in the near future of their software. It will be available to other academic institutions for the nominal cost of reproducing it. The system is running in a heavy-use student environment and they expect to have some documentation by the end of the summer. For details write:

Lewis A. Law
 Director of Technical Services
 Science Center, Harvard University
 1 Oxford Street
 Cambridge, Mass. 02138

REQUESTS FOR SOFTWARE

From P. De Souza, Heriot-Watt University:

We are interested in getting in touch with UNIX users who may have developed a BCPL compiler/interpreter, a driver for a Vector General display, or a software link to a PDP-10

INSTALLATION DESCRIPTIONS

University of Saskatchewan

PDP11/40 with 40Kw of core (expanding to 64Kw)
 3 terminals (2 more on order)
 1 DC11 dial-up interface and a CDI Teleterm 1030
 2 RK11 disk drives (1 on order)
 1 DH11 on order to replace current line interfaces

We also have a PDP11/20 with TTY, high speed paper tape and a VT01 display scope. This is currently connected to the PDP11/40 by a DL11-E serial line but will soon be replaced by a DR11-C parallel interface. One current project is to write a monitor for the PDP11/20 so that its peripherals become available to UNIX users.

MUNIX - A Multiprocessor UNIX

B. E. Allen and G. L. Barksdale, Jr.
Computer Science Group
Naval Postgraduate School
Monterey, California 93940

The Naval Postgraduate School Signal Processing and Display Laboratory is a university laboratory engaged in research efforts in computer graphics, signal processing, operating systems, and hybrid computing. The laboratory is used for student instruction as well as for student and faculty research.

The configuration of the Signal Processing and Display Laboratory is shown in Figure 1. The system can be viewed as a three bus ensemble, with the respective functions of data acquisition, signal processing, and display. When bus cycles are not required by real-time processes, the data acquisition and display busses support program development activities. The display system includes a 256K word fixed head disk, a Ramtek color display, a Tektronix 4014 display with enhanced graphics, a Vector General 3D system, a Hughes Conographic console, a data tablet, a Versatek printer/plotter, and an EPC graphic recorder. Peripherals for the Data Acquisition controller include both large (96M words) and small (2.5M words) disk systems, magnetic tapes, a card reader, a line printer, and a sixteen line programmable terminal multiplexer. Dual ported core memory (88K words) is accessible from either UNIBUS. The signal processing subsystem consists of a CSP 125 controller with 4K words of 125 nanosecond memory, an array processor, and two

16K word banks of three ported memory. UNIX compatible device drivers have been developed for each of these peripherals.

To control this diverse hardware suite, we have evolved MUNIX, a tightly-coupled symmetric multiprocessor version of UNIX. A single copy of the system residing in shared memory is executed by both processors independently. P and V operators are used for synchronization. In order to provide the increased address space necessary to support the multiprocessor system, UNIX was modified to separate kernel I and D space. In support of the signal acquisition research, a new process classification, real-time, has been added. When a process is granted real-time status, it is locked in memory, given the highest priority possible, and preemptively allocated a processor whenever it comes ready.

Other completed work includes the development of a dynamic symbolic debugging tool having breakpoint capability, a rather basic PDP 11 virtual machine monitor which executes under MUNIX, several on-line diagnostic packages, a line editor which facilitates correction of typing mistakes, system calls which gracefully stop or bootstrap the system, and enhancements to the text editor, the text processor, the C compiler, and the loader. Work presently underway includes a performance measurement subsystem, several adaptive schedulers, a demand paged memory manager, and a hardened file system.

NPS developed software is available as a nine track tape to any Bell Labs approved site.

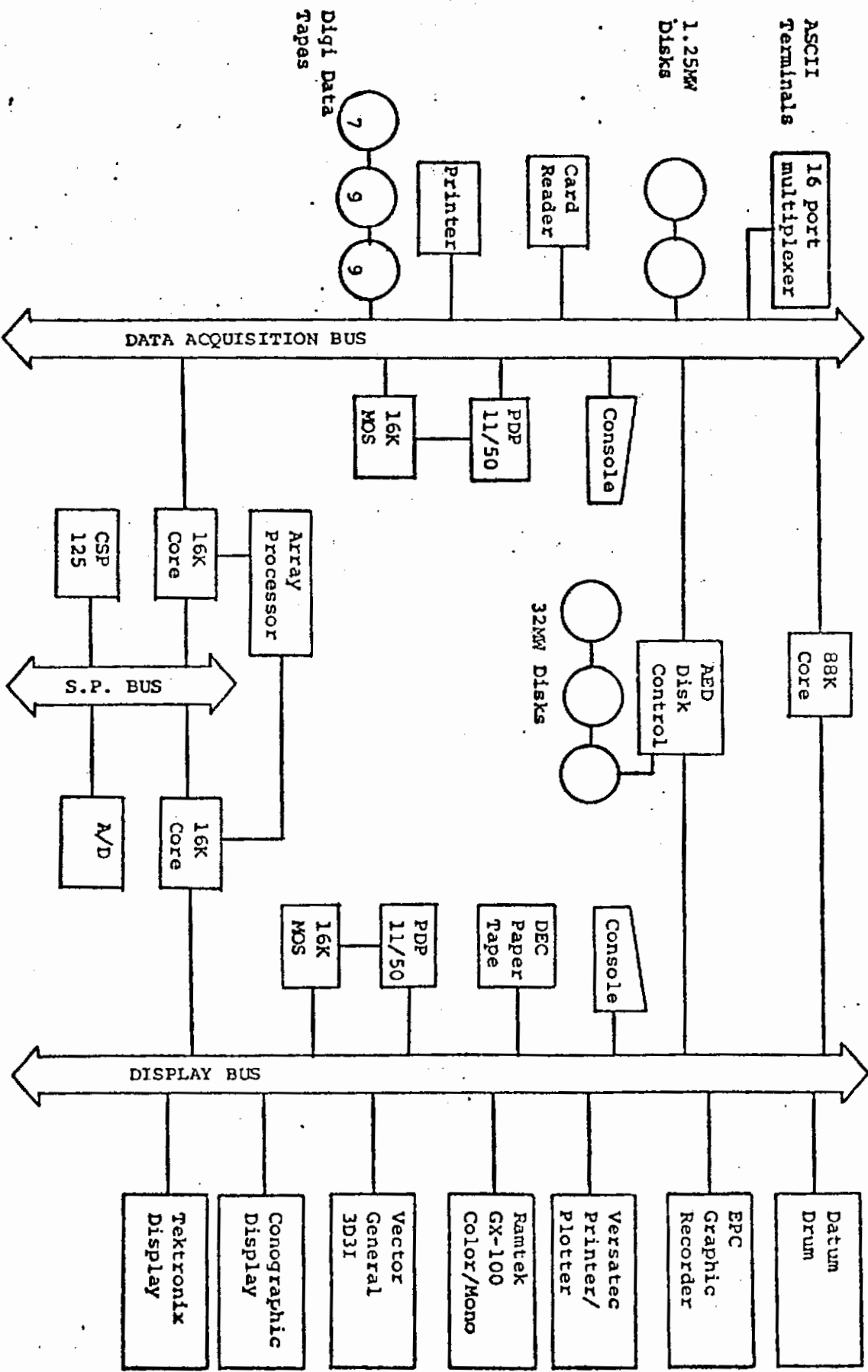


Figure 1. Configuration of the Signal Processing and Display Laboratory

Toronto Unix System

Mail address: *see entry #37
a couple of pages further on.*

1) Hardware

<u>Device</u>	<u>Existence</u>	<u>Driver</u>
a) PDP11/45 - floating point - 80+K core	Yes	
b) SI 9500-I Disk	Soon	No
c) Diva dd14 Disk	Soon	No
d) <u>3-Rivers</u> Graphic Wonder	Yes	Yes and No
e) GT-40	Leaving Soon	Yes
f) Versateck D1200A Printer/Plotter - DMA	Soon	No
g) Colour Video System	Being Built	No
h) Summagraphic Data Tablet	Yes	Yes
i) Calcomp Microfilm Plotter	Yes	No
j) line printer	Yes	Yes
k) card reader	Yes	No
l) 1600 BPI tape drive	Yes	Yes

2) Software Already Developed

a) GT-40 driver

b) New improved mag tape driver
- allows seeks in raw mode
- knows about files
- crashes less frequently

Mike Tilson

(416) 978-4800

c) C paragrapher

d) "grabcore" - a system routine to free up and reserve a specific piece of core for double-port devices

Boston Children's Museum

UNIX at the Children's Museum has been fully operational since August, 1974. Development work jointly with Harvard University began the previous winter, making us one of the first non-Bell users.

Our hardware configuration includes :

- *PDP11/40 processor with EIS
- *48K core memory (MH/MF11-L)
- *KW11L line clock
- *2 RK03 (a.k.a. Diablo) disk drives on RK11-c controller
- *6 VT05 terminals operating at 600 and 2400 baud on DL11-E controllers
- *1 LA30 DECwriter at 300 baud on DL11-A
- *1 ASR33 teletype on DL11-A
- *1 ComData modem on dialup line, 110 baud on DL11-E
- *1 LP11-HA upper/lower case 60-column line printer
- *1 VOTRAX VS-5 voice synthesizer on DL11-E
- *1 QUME Q30 high-quality 30-cps printer
- (a.k.a. Diablo HyType, or the guts of the GSI etc. terminal) on DR11-C

Further, we are designing and will begin construction soon on several new hardware devices and interfaces, including a dirt-cheap DR11-C equivalent that is capable of driving our scaled-down elchease versions of things like the LOGO Project's 'turtle'.

Our hardware and software is extensively kidproofed, and modifications have been made to the UNIX terminal driver to include modes whereby newline characters are ignored on 'empty' or 'null' lines, and whereby all characters typed by the user are thrown away if the system is in the midst of typing on the terminal. Attractive rubout handling (backspace-erase line) has also been added for VT05 terminals.

Software that we have developed that may be of interest to other users includes:

- *FOCAL, written in C and modeled after PDP-8 FOCAL by a high-school student
- *a PDP-8 simulator (simple memory-and-a-single-terminal machines only at this time), also in C, by the same student (interrupts are not currently being supported but are being worked on)
- *a rewritten standard UNIX shell (pipelines not yet implemented) with user-settable prompts, a 'change to default directory' command, standard accounting options, a monitor option that copies all typein to a hidden file (for keeping tabs on potentially malicious users), and others
- *a new more-conversational PS command that displays critical process data in English (SWAPPED/IN CORE, SLEEP/WAIT/RUN, etc.)
- *an RK disk driver that optimizes seeking through queue-diddling. *

Under development and scheduled for imminent completion is a general-purpose information storage and retrieval system. A license fee will probably be made for this package, but all of the other items listed above are available free to nonprofits on request. Please contact me to discuss media conversion; we can supply RK disk, DECtape, or paper (sbk) tape.

Bill Mayhew, The Children's Museum, Jamaica Way, Boston MA 02130

01-502-2374 R. NER THOMPSON DOH 20523 ELL TELEPHONE LABORATORIES MURRAY HILL, N.J. 07974	0.1	301-366-3300X251 PROF. W.H. HUBBINS DEPT. OF ELECTRICAL ENGINEERING THE JOHNS HOPKINS UNIVERSITY BALTIMORE, MD. 21218	8
01-949-6948 MR. CLYDE P. IMAGNA ELL TELEPHONE LABORATORIES DRAFFORD-CORNERS RD. COLMDEL, N.J. 07746 ROOM #1C-406A	0.2	617-495-2627 MR. LEWIS A. LAW DIRECTOR OF TECHNICAL SERVICES SCIENCE CENTER DIRECTOR'S OFFICE 1 OXFORD STREET CAMBRIDGE, MASS. 02138	9
212-260-5517 MR. REIDAR BORNHOLDT DEPT. OF BIOLOGICAL SCIENCES 553 SCHERMERSHORN HALL COLUMBIA UNIVERSITY NEW YORK, N. Y. 10027	1	212-780-5569 PROF. MELVIN FERENTZ PHYSICS DEPT. BROOKLYN COLLEGE OF CUNY BROOKLYN, NEW YORK 11210	11.1
403-432-3971 R. OF. T. A. KARSLAND DEPT. OF COMPUTING SCIENCE UNIV. OF ALBERTA EDMONTON, ALBERTA CANADA T6G 2E1	2	212-977-8008 MR. IRA FUCHS, DIRECTOR CUNY UNIVERSITY COMPUTING CENTER 305 WEST 37 STREET NEW YORK, NEW YORK 10019	11.2
617-522-4800 MR. BILL MAYHEW THE CHILDRENS MUSEUM THE JAMAICAWAY BOSTON, MASS. 02130	3	212-579-3501 DR. LOU KATZ COLUMBIA UNIVERSITY COLLEGE OF PHYSICIANS AND SURGEONS 630 WEST 160 STREET NEW YORK, N.Y. 10032	12
609-452-4640 PROF. BRUCE W. ARDEN DEPT. OF ELECTRICAL ENGINEERING BRACKETT HALL PRINCETON UNIVERSITY PRINCETON, N.J. 08540	4	503-249-5923 MR. BARRY SMITH COMPUTER CENTER OREGON MUSEUM OF SCIENCE & INDUSTRY 4015 S.W. CANYON RD. PORTLAND, ORE. 97221	13
608-262-1204 MR. E. J. DESAUTELS COMPUTER SCIENCE DEPT. UNIVERSITY OF WISCONSIN 1210 W DAYTON ST MADISON, WIS. 53706	5	02-30211X605 MR. GIDEON YUVAL COMPUTER SCIENCE DEPARTMENT THE HEBREW UNIVERSITY OF JERUSALEM JERUSALEM, ISRAEL	14
216-791-7300X2900 MR. GARY H. GOINS UNIVERSITY HOSPITALS WEARN RESEARCH BUILDING CHRS / BICHMETRY CLEVELAND, OHIO 44103	7	516-694-5500 MR. GEORGE KULL POLYTECHNIC INSTITUTE OF NEW YORK LONG ISLAND CENTER ROUTE 110 FARMINGDALE, L.I. N.Y. 11735	17

19-885-1211X2810 PROF. R.O. PEEBLES COMPUTER COMM. NETWORK GROUP UNIVERSITY OF WATERLOO WATERLOO, ONTARIO, CANADA N2L 3G1	18.1	010-417231 PROF. E. NILORON UNITE D'INFORMATIQUE UNIVERSITE CATHOLIQUE DE LOUVAIN CHEMIN DU CYCLOTRON 2 1348 LOUVAIN-LA-NEUVE, BELGIUM	29
17-885-1211X3400\!X3293 ERNEST CHANG COMPUTER SCIENCE DEPT. UNIVERSITY OF WATERLOO WATERLOO, ONTARIO CANADA N2L 3G1	18.2	415-497-7228 PROF. C. J. KARZMARK DEPT. OF RADIOLOGY STANFORD UNIV. SCHOOL OF MEDICINE 300 PASTEUR DRIVE STANFORD, CALIFORNIA 94305	30
301-581-8224 MR. MARTIN E. NEWELL COMPUTER SCIENCE DEPT. UNIV. OF UTAH SALT LAKE CITY, UTAH 84112	19	309-343-0112X414 MR. WM. C. RIPPERGER COMPUTER CENTER DIRECTOR KNOX COLLEGE GALESBURG, ILLINOIS 61401	32
107-863-3096 PROF. RALPH H. BJORK SCIENCE BUILDING OLAF COLLEGE NORTHFIELD, MINN. 55057	21	*** NO PHONE NUMBER MR. J. TANSLEY MEDICAL COMPUTING GROUP UNIV. OF EDINBURGH MEDICAL SCHOOL TEVIOT PLACE EDINBURGH EH8 9AG, SCOTLAND	33
919-884-6804 PROF. C. FRANK STARNER BOX 3181 DUKE MEDICAL CENTER DURHAM, N.C. 27710	22	408-646-2449 MR. BELTON E. ALLEN CODE 720H COMPUTER SCIENCE GROUP NAVAL POSTGRADUATE SCHOOL MONTEREY, CALIFORNIA 93940	34
415-642-2714 PROF. R.S. FABRY COMPUTER SCIENCE UNIVERSITY OF CALIFORNIA BERKELEY, CAL. 94720	23	919-933-7339 PROF. JAMES D. FOLEY DEPT. OF COMPUTER SCIENCE NEW WEST HALL UNIVERSITY OF NORTH CAROLINA CHAPEL HILL, N.C. 27514	35
213-393-6411X240 MR. JOHN LOWRY INFORMATION SCIENCES DEPT. THE RAND CORPORATION 1700 MAIN STREET SANTA MONICA, CALIF. 90406	26	212-289-5940 MR. DUSTIN H. HEUSTON THE SPENCE SCHOOL 22 EAST 91ST STREET NEW YORK, N. Y. 10028	36
214-690-2211 L. W. CANHAM, JR., ASST. DIRECTOR CENTER FOR ADVANCED STUDIES UNIV. OF TEXAS AT DALLAS P. O. BOX 688 RICHARDSON, TEXAS 75080	29	(416) 978-4800 416-928-4800 MR. DENNIS SMITH MANAGER COMPUTER RESEARCH FACILITY 10 KING'S COLLEGE ROAD. M5S 1A1 TORONTO, CANADA	37

306-343-5301 38

PETER HADDIE
DEPT. OF COMPUTATIONAL SCIENCE
UNIVERSITY OF SASKATCHEWAN
SASKATOON, SASKATCHEWAN
CANADA S7N 0W0

507-645-4431X504 43

CARL HENDY
COMPUTER CENTER
CARLETON COLLEGE
NORTHFIELD, MINN. 55057

201-257-8300X250 45

S. BRODBSTEIN
EAST BRUNSWICK HIGH SCHOOL
CRANBURY ROAD
EAST BRUNSWICK, N. J. 08816

031-225-6432X102 50

OF. F. G. HEATH
DEPT. OF ELECTRICAL ENGINEERING
CHRIST-MAFF UNIVERSITY
21-25 BRASSBARKET
EDINBURGH EH1 2HT SCOTLAND

204-474-0165 51

DR. R. COLLENS
COMPUTER SCIENCE DEPT.
UNIVERSITY OF MANITOBA
WINNIPEG, MANITOBA
CANADA R3T2N2