MEETING AT HARVARD

The next meeting in the East will be held at Harvard University on April first and second. The letter with details on hotels, which appeared in the last issue, is repeated below.

Thursday, April 1 will be devoted mostly to graphics. The meeting will begin at 1:00 PM on that day so that most people will be able to arrive thursday morning. The Lecture Hall will be available into the evening. We will have access to the Harvard-Radcliffe system on thursday evening and during the day on friday.

The friday session will begin at 10:00 AM and last as long as necessary. In addition to the usual short reports by installations, there will be longer reports by:

Tucker Taft on the IBSTS system.
Bruce Borden on FORTRAN IV PLUS under UNIX
Heinz Lycklama on INERT
The Satellite Processor System
Mini-UNIX and LSI-UNIX.
Dennis Ritchie on the C compiler and the future of UNIX.

The Lecture Hall is equipped for demonstrations. A terminal with large screen display is available and may be used with the IBSTS system or, via dial-up, with your own system. If you are bringing materials to mount at Harvard for demonstration, we remind you that the only transfer medium on the Harvard system is Dectape. If you need to mount from other media, and if you hurry, arrangements can be made to copy your materials to Dectape from IBM or magtape (800 or 1600) in New York. Contact Mel Ferentz (212-789-5569) or Lou Katz (212-579-3591) for details. Another possibility would be to transmit the files, if your UNIX can be made to look like a terminal, to either UNIX or Wylbur. To transmit to UNIX or Wylbur in New York, contact Irn Fuchs (212-977-3000). Call Lew Law (617-495-2627) if you wish to explore the possibility of direct transmission to IBSTS. If you have any special audio-visual needs, contact Lew Law's office.

JOHNS HOPKINS SOFTWARE

The Unix Hotline has on it notices from Johns Hopkins University on the availability of several pieces of software.

A version of BASIC-PLUS (version 5B-24) adapted for Unix is available from Johns Hopkins University, Department of Electrical Engineering. It is fully compatible with RSTS/E BASIC-PLUS; nearly any program run on RSTS/E BASIC will work on this one. The only exceptions are:

1) programs are limited to 12K
2) None of the privileged "sys" calls are available; most of the unprivileged ones are.

All of the I/O facilities of BASIC-PLUS (record I/O, virtual arrays, etc.) work on the Unix version; full pathnames can be specified in OPEN, RUN, NAME-AS statements. A "public library" feature allows one to keep frequently used BASIC programs in a directory which is referenced whenever a 'S' is prefixed to a pathname.

Binary copies are available to those with a RSTS binary license; source is available to those with source license. Distribution is available on Dectape or RK disk.

A UNIXed version of MACRO (PDP-11 assembler) is available from JHU Electrical Engineering. It has "macro library" and "cross reference" capability, and is reasonably efficient. To get binary, you need a DEC MACRO binary license for RT11, RSX11D, or IOS; to get source, a DEC source license. Distribution on RK disks or DECtape.

A UNIXed version of Per Brinch-Hansen's "Sequential Pascal" compiler and interpreter are available from JHU-Electrical Engineering The compiler is written in Pascal, consists of 7 passes, and is rather slow. Output from the compiler is run under a separate Pascal interpreter. Compiled files can call the interpreter automatically; hence Pascal programs can be invoked as commands. The lexical conventions have been improved over Brinch-Hansen's original specification; lowercase and tabs are accepted, and [] are used for array specifiers instead of (. .). Most of the UNIX system entries can be invoked from Pascal; users can easily add their own following the design of those already installed.

Prerequisite software: MACRO assembler (available from JHU for licensees) and Jeff Rottman's Linker (available from Princeton).

Distribution on RK disk or Dectape.

Contact,

Dr. W. H. Huggins
Department of Electrical Engineering
The Johns Hopkins University
Baltimore, MD 21218

A service charge may be involved.

MAILING LIST

The attached mailing list is a major revision of the old list. It is based upon a list of licensees dated February 1976 and is ordered on state and by zip code within the state. It is likely that errors have crept in during the editing. Please check your listing and send in corrections. An area of difficulty is multiple installations under a single license. If you know of facilities other than those listed, please let us know.

SOFTWARE EXCHANGE

As of a few days ago, there were no user submissions to the software exchange. The exchange does have a new C compiler and a new nr.c. We hope the lack of submissions indicates that everybody is busy putting things in shape to send in.

In setting up the exchange, we are hoping that people will send in "trivial" things as well as significant things. The trivial is often the most duplicated in effort.

MANUALS

Informal discussions indicate that permission might be granted to the Users' Group to allow a single printer to reproduce the manuals and sell them to us in individual or quantity lots. In order to determine whether this is reasonable or desirable, we need an estimate of the number of copies of each of the manuals you might order. If you are interested in this collective venture please contact Lou Katz (see mailing list).

All UNIX NEWS correspondence should be addressed to:

Prof. Melvin Ferentz
Physics Dept.
Brooklyn College of CUNY
Brooklyn, NY 11210

Rand
SANTA MONICA, CA. 90406

10 March 1976

Professor Melvin Ferrantz
Physics Department
Brooklyn College
Brooklyn, New York 11210

Dear Professor Ferrantz:

Enclosed is the Rand report on the second West Coast UNIX User's Meeting. You may want to abbreviate this one as it includes more details than will probably be of interest to the general community.

Sincerely,

Steve

Dr. Steven Zucker
Information Sciences Dept.

SZ:pjf

Enclosure as noted

9 March 1976

TO: LIST

FROM: John Lowry, Carl Sunshine, Steve Zucker

SUBJECT: NOTES ON WEST COAST UNIX USER'S MEETING,
Berkeley, California, February 27-28, 1976

The meeting was attended by about 35 people (half from Berkeley), and hosted by Bob Fabry (Berkeley). (See us for a complete list of participants and addresses.) First there were four major presentations on the UCLA Security Kernel, The INGRES data base system, The Harvard Radcliffe Student Timesharing System (HRSTS), and the Berkeley PDP 11/70 system (Ken Thompson). Then each attendee presented a brief summary of activity at his site. Friday evening and Saturday were devoted to discussing several general topics of interest including interprocess communication, the ARPANET software, multiple-machine UNIX systems, and UNIX development and standards. This note summarizes each of these three areas.

UCLA Security Kernel - Gerry Popek

The object of the UCLA work is to produce a verifiably secure operating system. UCLA has implemented a security kernel in PASCAL (a PASCAL to C translator is available from UCLA) and hope to apply automatic verification to the PASCAL code. The kernel has been designed to be the minimum amount of software that can guarantee data security. The code consists of 4-5K words, including a few drivers, and was initially designed as the basis for a Virtual Machine Monitor (VMM). For the sake of efficiency they have decided to try instead to interface UNIX directly to the security kernel by system calls in the same fashion as MERT, the Bell Labs Multi-environment Real Time System. They plan to run a separate stripped down version of UNIX in supervisor mode as a part of each UNIX "process" with the various UNIXs communicating by means of shared segments and a kernel supplied message facility. No attempt is made to guarantee confinement. The kernel is to provide protection for processes, devices, whole file systems, and segments, so the size of the protected objects is large ("the grain of protection is coarse").

In addition to the UNIX processes, there will be a scheduler process and an initiator, the former providing data to the kernel assigning execution priorties to the various processes, and the latter replacing the UNIX logon process with code that establishes the protection enviornment for the user that signs on.

The main problems anticipated are:

(1) The coordination of use of the shared segments between UNIXs. One shared segment wil be used for the storage of inodes, file table entries, etc. for each file system. Semaphores may be required in addition to the kernel message facility to coordinate access to these segments.
(2) Constructing an ARPANET NCP or TCP. It is likely that some of this will have to be built into the kernel

INGRES Data Base Management System - Eugene Wong (Berkeley)

Eugene Wong described the Interactive Graphics and Retrieval System (INGRES) that runs on a PDP 11/40 under UNIX. The current system uses four large processes that call each other sequentially. Some benefit could be obtained from better interprocess communication so that some of the processes could proceed in parallel.
(See the SJCC '75 for details on INGRES.)

HRSTS - Harvard-Radcliffe Student Timesharing System - Chuck Kreiser (formerly of Harvard, now at Berkeley)

An impressive amount of software has been developed for HRSTS. The following items were mentioned:

1. BASIC: two versions, one based on DEC RT11 BASIC with matrix extensions, another based on DEC HSTS BASIC (which users must first purch from DEC).
2. MACRO
   LINKER - (Version 6 compatible)
   DDT - (Brought to HARD by Bob Greenberg)
3. TECO editor
4. FILCOM - (like diff)
5. HARVARD SHELLS:
   A simplified shell for student use (hand-hold
   Command completion as in TS.EX
6. Terminal driver with several interesting features
   (a) Page mode for graphics terminals
   (b) Settable break characters
   (c) The ability to suspend and restart output
7. PPL and BCL: Extensible languages
   Manuals can be obtained from:
   Center for Research in Computing Techniques
   33 Oxford Street
   Cambridge, Massachusetts 02133

Chuck also spoke of a very good (fast) Fortran that runs under UNIX. It is a modification of DEC Fortran and it is available (after paying DEC a $2500 fee) from:
Dick Shore
CULC (Commercial Union Leasing Corp.)
New York

The Berkeley 11/70 System - Ken Thompson

Berkeley runs a severely core-limited system, having only 64K words of memory to support an average load of 15 users (22-24 users peak). They use four "home-brew" multiplexers, each having 8 lines. Three of the lines are connected to 11/1 machines used for teaching assembly language programming and interrupt I/O. They have 2 RK05 disks, an RJS04 swapping disk, and 2 RP03 compatible DIVA disks (50 megabytes each).

As usual, Ken had a number of interesting things to say:

1) It appears that the group concept is about to disappear from UNIX, in favor of 16-bit user ids. At Berkeley, the 16-bit ids are partitioned as follows (with a major intent to segregate students from each other, and from the rest of the world).

   UID=0: Super-user (no change)
   UID<0: Student. No reference to other student's files, only "own" files and "public" files, those with owner UID between 1 and 255 (to which normal protections apply).
   UID>0: All others. No reference to students' files. Normal access protection applies to all files.

   For class use, the upper 8 bits of the UID is the class number. The teacher has a UID with the low order 8 bits 0, and can access students' files.

2. Disk file quotas: If a directory contains a file named .Q (a quota), then, when the directory inode is in use, the .Q inode is associated with it in the incore inode table. The .Q inode contains the maximum number of blocks that may be used by files in the directory and its decendents, and a count of the number of used blocks. A subdirectory inherits the quota of its ancestors. A new system call was added to make directories with quotas. There were some problems associated with the link operation. It is allowed to exceed quotas temporarily so that the MV operation (rename) cannot cause quotas to be exceeded.

3. A limit was placed on the number of active processes that a user can own. (Enforced in the fork operation: while searching the processor table a count is made.)

4. Ken noted a circumstance under which locks on inodes were not honored within the kernel. He went through the kernel and located a number of other places where the same potential for failure exists. The fixes will appear in the next release.

5. An interesting technique for measuring disk activity was devised. It involves keeping a software busy bit for each of n devices (major or minor) in the low order bits of a word. The word is used as an index into a "time" table of 2**n 32 bit integers. Each time a clock ("uncorrelated" with the scheduling clock) interrupts, the selected "time" entry is incremented. As a result, the "time" entries record the busy time for each combination of devices. By also counting the number of words transferred and the number of transactions on each device, the seek times (including latency and transfer times) can be obtained.

6. Using the technique in 5, Ken determined that for the Berkeley system it was more efficient to use the RJS04 "swapping" disk for the "root" file system (/usr, /tmp, ...) and an RK05 for swapping.

7. A bottleneck was eliminated by allocating two swap buffer headers to avoid putting a process to sleep only to wake it up again to be swapped out.

8. Bell Labs is working on a C-oriented microprocessor. Get in touch with Sandy Fraser at Bell for information.

9. We learned several things that may improve our response.

   a. Allocate more buffers. Berkeley uses 30, and we are certainly underallocated. A measurement technique for determining buffer utilization was suggested.
   b. The terminal output high and low water marks were set for the 300 baud terminals in use at Bell. With our 9600 baud terminals we should greatly increase these parameters, and the number of character queue elements.

Site Activity Summaries

Steve Holmgren
Center for Adv Comp. - Illinois.

Runs an 11/45 with 128k, RP04, RK's, magtape.
Does text processing.
Developed NCP (currently has no server).
Also doing work on local networking.

Mike O'Malley - Berkeley

11/40 system
Runs the Illinois NCP.
Does real time speech processing.
Has added contiguous files.

John Bass - Cal Poly San Luis Obispo

Runs UNIX on an 11/35 (the OEM version of the 40)
Does graphics, data entry, 3-D display for architecture, and language processing.

Dave Farber - UCLA

Has a PASCAL to C translator.
has made changes to ed (e.g., warnings, writeout on hangup).

Jeff Scribman - UCB 11/70

Currently has RP03 type disks, DEC RJS04 and RK05's. The RK05 will leave shortly.
Machine connected to CDC 6400.
Runs a RJE station

Harvey Weinstein - Survey Research Center, UCB

Working on computer assisted telephone interviews.

Bill Bridge - Data Disk

Runs an 11/35 with LSI-11 hardware to control terminals.
Developing an automated newspaper production system to run on 11/70's with LSI-11's.

Oliver Roubine - SRI

Has developed a better C debugger.

Art Wilson - UCSD

Has a Fortran which uses 11/40 floating point from Illinois.
Has an 8080 cross assembler
They use the machine for various chemistry applications.

Mike Ubell - UCB

Has GT-40 debugger and Fortran editor.

John Lowry, Carl Sunshine, Steve Zucker - Rand

Runs UNIX on 11/45 with 128K, RP04, RK05's.
Doing intelligent terminal research.
Have developed a 2 dimensional editor, currently being recoded to use ed as a subroutine.
Interested in improved interprocess communication -- passed out paper with ideas concerning how this might be accomplished.
Has remind a better version of CROJ.
Has file compression routines (25-40% storage savings on typical program and text files).
Runs the Rand NCP (including server).

Mark Kampe - UCLA

Is rewriting tty.c.
Is doing security research.
Has PDSAL, PASCAL, and EUCLID translators.
Has a TJ/EX compatible NROFF written in C.
Has send message, many new drivers, limited server ftp for the Illinois NCP.
Is connected with coordinated distribution of UNIX software

TOVAR - Berkeley

Has worked on Dijkstra's primitives (semaphores).
Knows about the GT40.
Has implemented very distant host ARPANET protocol.
Has implemented contiguous files.
Has RK05 dump code for rk5.s and dump-interpreting software
Interested in network graphics program.

Oliver Whitby - SRI

Considering UNIX for scientific communication (Technical Journal Production).

Gary Raetz - Naval Postgraduate School

Working with a variety of display devices.
Has 8080 assembler.
Has a DDT and line editor.

Ira Fuchs - C.U.N.Y.

GT40 system
Runs as text editor front end for 370.
Reported that April 1 of the East Coast Meeting will emphasize graphics.

Discussion Topics

Interprocess Communication (IPC):

Steve Zucker and Carl Sunshine presented the shortcomings of current UNIX IPC facilities. Steve outlined his Port and mpipe implementation. (The two Rand papers had been passed out the day before, but few attendees had had a chance to read them.) The was agreement from several other sites that an ability to wait fo multiple inputs would be very desirable, and that mpipes seemed a good way to do this. Bob Fabry was unhappy with the different interface mpipes provided to the reader (the presence of headers)

Other suggestions to facilitate waiting for multiple inputs concentrated on the synchronization problem. Mark Kampe advocated a sleep/wakeup facility for user processes. Steve mentioned the problems of access control, assigning unique wakeup numbers, spurrious wakeups, and implementation with this. Others suggested a more specific facility to "wait" on a specified set of file descriptors and return when the first of them had data available to read. There is also the problem of testing for input (e.g., with EMPTY) and then doing the WAIT, with input arriving between the test and the wait. This requires the standard "hyperawake" state kind of resolution when a wakeup to a running process leaves it "hyperawake" so a wait does not block it.

The major implementation problem in current UNIX for both of these suggestions is the difficulty of associating an inode with those processes (readers) "waiting" when a writer writes the inode.

The idea of asynchronous, independent I/O channel type operation came up, but this was fairly generally denounced as a tremendous change and undesirable anyway.

Ken Thompson agreed that the current signal facility had a number of problems (but noted that interrupts did not abort pending disk I/O since the process would be sleeping at a negative priority). Signals had been designed primarily for error or exception condition handling, and not for general interprocess synchronization which Ken was not convinced was a very significant need. By the end of the session he seemed more disposed toward accepting improved IPC as a legitimate concern, and even willing to consider system changes or additions to provide it.

ARPANET:

Steve Holmgren outlined the ARPANET software design at the University of Illinois. The connection establishment (ICP) code for the NCP has been largely placed in a user process, requiring only 3.5K words (plus buffers) for the remainder of the NCP in the kernel. There is a separate minor device for each network host, and the open command to these network devices defaults to give a Telnet connection. By specifying different options, processes can also get particular sockets, LISTEN mode, or other special actions from the NCP. The server Telent is still being designed, but will probably feed incoming characters through the TTY drivers.

Multiple-Machine UNIX:

Ken Thompson outlined the dual machine UNIX system he develop at Bell Labs last year using a DR11-C. The basic communication level provides 256 logical channels between two machines. Each data byte is prefixed with a channel number on transmission, and acknowledged by the channel number being received. For more efficient and reliable communication over low bandwidth or long delay lines, the characters on a channel may be buffered into a message with the channel number appearing only once in the header and a checksum for error detection.

Connections are established between machines by sending contr data over channel zero which essentially associates files with channel numbers in each machine. A daemon process which always h a read pending handles the initial connections.

At the user level, commands are interpreted by a Master Shell that looks for a special character (!) in the normal UNIX command syntax which indicates an operation to be performed on the remote machine. Thus !cat rfile > lfile would copy remote file rfile to local file lfile. The Master Shell creates a slave shell process in the remote machine, and all other local and remote processes needed, and sets up all the connections between the local and remote processes.

UNIX Development and Standards:

Because of the consent decree and other intricacies of the UNIX license, Bell is not able or willing to "support" UNIX in the traditional sense of standard releases, updates, fixes to discover bugs, documentation, etc. There has been talk of ARPA support for UNIX maintenance and standards project, but this is still uncertai

There is a strong feeling that sites are going to continue dei their own development in different and sometimes even conflicting directions. There is also a strong frustration with efforts to use each others improvements which often seem to depend on other aspects of the system which are incompatible. A "standard" versio of UNIX for reference purposes could make it easier to describe where changes had been made when sites trade software. The clearing house at Chicago Circle mentioned in the February UNIX News may provide this service by sticking a version number on some recent UNIX system and distributing it. But sites currently have widely differing versions of the system (version 5 to version so picking the initial standard is problematic.

Conditional compilation exists (undocumented) in version 6 (plus?) of C, which may help the situation if people "if out" changed standard code rather than deleting it, and "if in" their changes.

Ken Thompson described the way a new version of UNIX gets create at Bell. The system is constantly undergoing changes. When the become numerous enough, it is agreed that the new

to reflect the new facilities. In the process of rewriting the manual, everyone remembers all the other things they wanted to do to a particular area of code, and an escalating "frenzy" of activity ensues for a couple of weeks. Finally the manual gets closed and mailed one day, after which activity tapers off (but doesn't cease) because people realize the new changes won't be known until the next manual rewrite.

THE UNIVERSITY OF NEW SOUTH WALES

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EXTN.

DEPT. OF COMPUTER SCIENCE
SCHOOL OF ELECTRICAL ENGINEERING

PLEASE QUOTE

10th October 1975

Professor M. Ferentz,
Physics Department,
Brooklyn College,
City University of New York,
Brooklyn,
New York, N.Y. 11210,.
U.S.A.-

Dear Professor Ferentz,

We have only recently seen copies of your first two UNIX Newsletters and hence have not been in a position to contribute earlier. However we do appreciate your effort in starting the Newsletter and hope it will be successful. A description of our experiences with UNIX at the University of New South Wales is given below, which you may find suitable for inclusion, in whole or in part in the Newsletter.

Part of the delay in our receipt of the Newsletters has been administrative at this end. The official licensee is the U.N.S.W. Computing Services Unit. However all usage, support and development of UNIX has been undertaken by the Department of Computer Science.

For administrative purposes it has now been agreed that the U.N.S.W. official contact should be the undersigned, namely

Dr. John Lions
Department of Computer Science
School of Electrical Engineering
University of New South Wales
KENSINGTON, N.S.W. 2033,
AUSTRALIA.

and I would be grateful if you would amend your records accordingly.

Hardware

As mentioned below, UNIX is used regularly here at three sites, and is also used at other sites within the University on occasions. The basic hardware configuration we have consists of

PDP-11/40 processor
Extended Instruction Set
Floating Point Instruction Set
Memory Management
64K words of memory
KW11 line frequency clock (in this part of the world 50 cycles)

Various peripherals are attached to different machines and I assume the exact disposition is of little interest. The peripherals include

RK05 disk
TU10 tapes
TA11 cassettes
PC11 paper tape reader/punch
DP11 synchronous communications interface with 4800 band line to central Cyber 72
DJ11 16 port terminal multiplexor
DL11 terminal interface
Versatec LVII dot matrix printer
CDC 9322 line printer
CDC 9352 line printer
CR-11 Card reader
CDC 9228 card reader
(line printer and card reader interfaces are locally produced to conform to DEC standards)

Interactive Terminals include
DEC VT05
DEC LA36
DEC GT40
Hazeltine 2000
Transdata VDU (local product; implements APL character set)
Lear-Siegler VTE5

Software

We are willing to distribute software which we have developed locally so far, though none of it has been formally packaged yet. I assume that you will have discussed some of the problems of software distribution at your recent meeting in New York. For the time being we will be more than happy to answer direct enquiries from other users.

Software we have developed includes:

- device handlers for
  - card reader
  - DJ-11 multiplexor
  - TA-11 Cassette
  - DMA access to PDP-11/10
- CDC User 200 terminal emulator
- Local Batch Processing Subsystem
- Various "security" patches
- Core dump analyser for batch processing

Questions

(a) We have experienced some difficulty in making effective use of floating point on the 11-40. We haven't really pursued this problem too intensively as yet. Do any other users have "fixes" for this?

(b) Where did the name "UNIX" come from?

UNIX at UNSW

At the University of New South Wales, there are currently three sites using UNIX (two in the School of Electrical Engineering and one in the Faculty of Commerce). We are in the (possibly unusual) position that the University has

central Cyber 72 computer, but also with a view to providing a local processing capability. The intention was to use RSX-11D but our initial experiences with this were far from favourable. (To be fair we understand that some of the problems have been cured in later releases.) The only site still firmly committed to RSX-11D is the School of Mathematics which is using a proprietary Fortran package, and even that we hope, may be converted to run under UNIX soon.

The situation when we received our copy of UNIX was that the Electrical Engineering batch station which is the most heavily loaded in the university was performing rather badly under RSX-11D and a locally written emulator for the CDC U-200 batch station. Rated performance levels were not being obtained, and severe congestion was being experienced. The only way we could get PDP-11 time to run UNIX was to make it the basis of the whole load station operation. Accordingly a group of postgraduate students led by Ian Johnstone embarked upon a crash program to develop the initial software (including device drivers for the DJ-11 multiplexor and the card reader) to provide the U-200 emulator. An initial version of the emulator was in use within less than two weeks, and with subsequent rapid development, the UNIX emulator soon outstripped the RSX-11D emulator in all respects. The takeover of the batch station by UNIX was thus achieved via a bloodless coup (though it has upset the planning projections of some managers in the university hierarchy).

The ultimate constraint on our PDP-11's performance as a load station is the 4800 baud line which connects it to the Cyber. (The U-200 signalling protocol doesn't help much here either). With only a limited number of interactive terminals to connect to the PDP-11 (without going into details, the number was usually 3 or 4) we still had some excess capacity. A decision was taken that all teaching of assembly language programming should be via the UNIX assembler under batch processing. A local batch processing subsystem has been written for this purpose (with control cards beginning with a "%"), and this is now being developed to provide a range of facilities. (Local and remote batch jobs may be freely mixed via a single card reader).

At present, our PDP/11-40 with RK05 discs is starting to run out of "puff". On our best day to date the machine handled

450 remote batch jobs (limited to 30 pages of output)
240 remote batch jobs (limited to 30 seconds real time)
60,000 cards read
4,500 pages printed

while handling a large, uncounted number of terminal jobs. With local batch running, the printer has become a frequent bottleneck, but we hope to trade up from a 400 lpm to a 600 lpm printer shortly.

This year a phenomenon has reappeared which has been notably absent on our campus for several years: a band of "computniks", mainly second year undergraduate students. Having penetrated the Kronos security system with relative ease, they turned their attention to UNIX, with a great deal less success. Finally security was breached via an unguarded password, and the system rapidly deteriorated under the influence of "improvements" produced by enthusiastic but uncoordinated helpers. Finally the whistle was blown, the system was "sanitized", and the root password was disclosed to three of the students who are expected to guard their privileges jealously. No further security breaches have been experienced. However we do have some program patches which may be of interest to other security conscious users.

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PJO'C/CB

13th November 1975

Prof. Melvin Ferentz,
Physics Department,
Brooklyn College of CUNY,
Brooklyn,
N.Y. 11210,
United States.

Dear Prof. Ferentz,

My department has recently received a copy of UNIX Version 6 and is presently considering whether to make it our standard operating system. There are, however, several points we would like to clear up and I would be grateful if you could pass them on to someone who might be able to help. They are as follows:

We are anxious to run BCPL under UNIX in the interests of preserving already-written software. Has anyone done this?

We want to drive a Vector General display device, which has no display buffer of its own. Some of our researchers are also interested in sampled-data control systems and require real-time control of analogue devices. Both these applications would seem to require that tasks be locked in core for the whole period of their activation. Is there any way to do this by some simple change to the scheduler or must we run such tasks on a satellite computer?

Some of these points have already been passed to the User's Group newsletter (issue No. 1) but without any feedback so far. We would appreciate an expert opinion.

Our configuration is: PDP 11/45 with 40K words (ultimately 56 or 64K), no floating-point, 3 RK05 disks, some DL-11's, two DC-11's, Vector General graphics display, tektronix 4013 and, eventually, a line-printer (probably LA 180)

Yours sincerely,

P. O'Callaghan.

Patrick J. O'Callaghan.

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CAMBRIDGE, MASSACHUSETTS 02138

Office of the Director
1 Oxford Street
617 495-2627

January 28, 1976

Prof. Mel Ferentz
Department of Physics
Brooklyn College of CUNY
Brooklyn, New York 11210

Dear Mel:

This letter is to confirm that the UNIX Users' Meeting will be held at the Science Center, 1 Oxford Street, Cambridge, Mass. in Lecture Hall D on the first floor on Thursday and Friday, April 1 and 2, 1976. Enclosed is a map and a sketch of the first floor of the Science Center showing the hall location.

For people flying to Boston, the quickest route to Harvard Square is to take the airport bus to the airport subway station, take a Blue Line train to Government Center, change to the Green Line and go to Park Street, then change to the Red Line to Harvard Square. Time: 20 to 30 minutes. The alternative is to take a cab at a cost of about $7.00.

Accommodations: Sheraton Commander Hotel, 16 Garden St, Cambridge
617-547-4800
Holiday Inn, 1651 Mass. Ave., Cambridge
617-491-1000
Harvard Motor Hotel, 110 Mt. Auburn St., Cambridge
617-864-5200

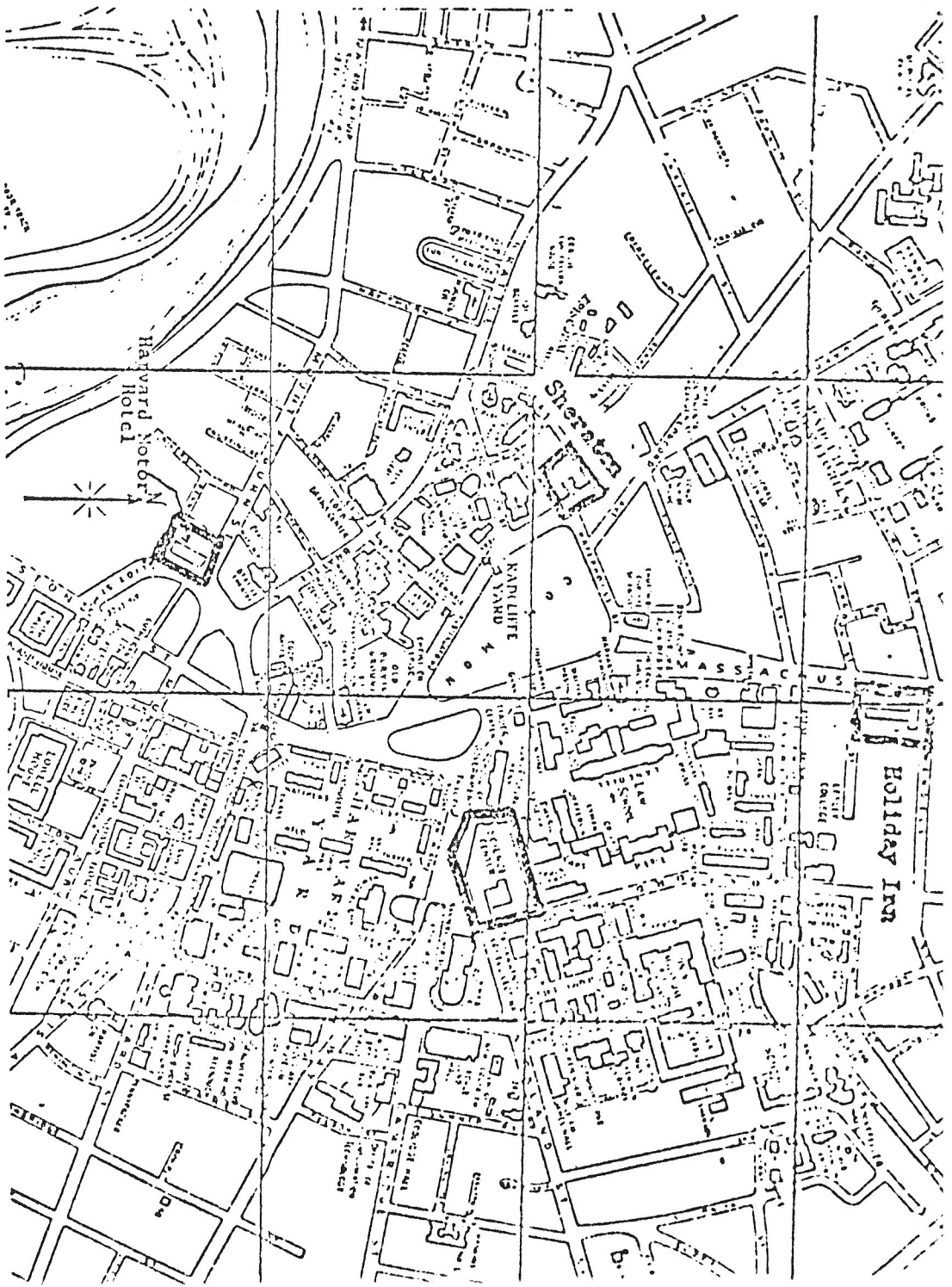
All of these are within easy walking distance of the Center.

Feel free to call me if you want any other information.

Sincerely,

Lewis A. Law
Director of Technical Services

Encs.
LALinda



A FOR CORRECTION

The line on page 1 bottom which reads

/jmp/i

should read

/clr/e

The complete edited text follows:

```
/ pipe -- C library

/       pipe(f)
/       int f[2];

.globl  _pipe, cerror

pipe = 42.

_pipe:
        mov     r5,-(sp)
        mov     sp,r5
        sys     pipe
        bec     1f
        jmp     cerror
1:
        mov     r2,-(sp)        /** fix
        mov     4(r5),r2
        mov     r0,(r2)+
        mov     r1,(r2)
        clr     r0
        mov     (sp)+,r2        /** fix
        mov     (sp)+,r5
        rts     pc
```