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PUB - 429

For Reference

Volume 22, Number 3
March 1985

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L B L
COMPUTING
NEWSLETTER

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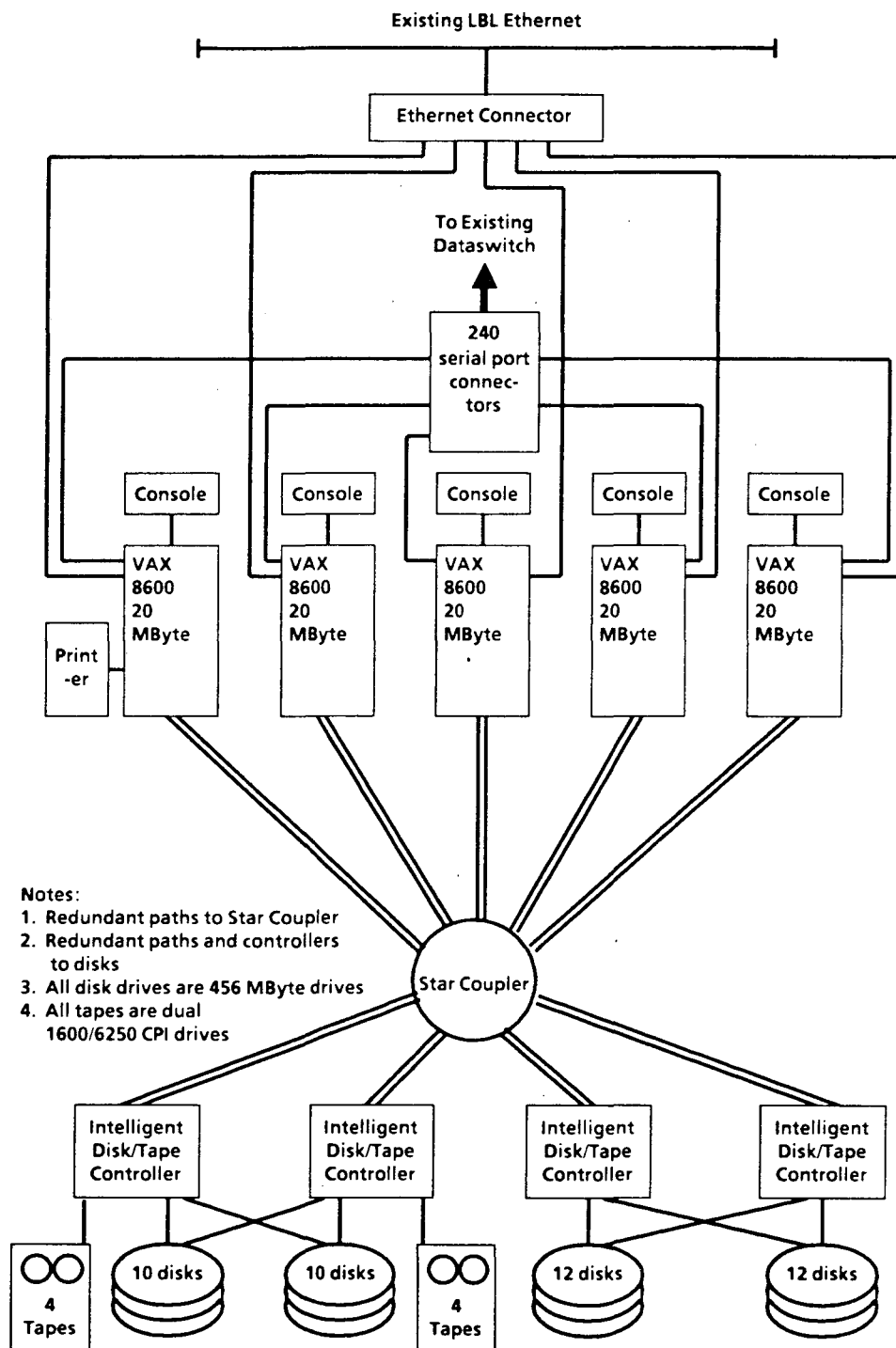


Figure 1

LBL COMPUTING IMPROVEMENT PROJECT: SYSTEM CHOSEN TO REPLACE CDC 7600

Ken Wiley

In the December 1983 issue of the LBL Computing Newsletter, I described the Computing Improvement Project and the plan to replace the existing CDC 7600 computer system.

In the October 1984 issue I summarized the recommendations of the Computing Services Advisory Committee (CSAC) to the project and their incorporation into the Request for Proposal (RFP) issued to vendors in August 1984.

Proposals were received and evaluated during November and December 1984, and in January 1985 the recommended vendor and system configuration were presented to CSAC.

Following their approval a request for clearance to acquire the selected system was sent to, and approved by, the Department of Energy (DOE).

The RFP fully expressed the Laboratory goal of commercial acquisition of a wide range of high-level computing and communications resources along with continuing maintenance and support for the products acquired.

The breadth of these requirements presented a stiff challenge to potential vendors; however, provision of the computing services needed by LBL research programs in the most cost-effective manner is not possible by any means other than acquiring commercial supply and support.

The primary goal of the competitive process was achieved. A system was found that meets all requirements, and it was determined that other potential vendors could not provide all the resources or could not provide the required resources at a competitive price.

The system selected is based on five Digital Equipment Corp. VAX 8600 processors.

The ability of Digital to qualify for this procurement is based on two recent and major developments in computer technology.

First, the recently announced VAX 8600 is large enough to perform the LBL Demonstration of Performance tests specified in the RFP; no previously available CPU in the VAX line could pass these tests.

The 8600 is based on custom ECL¹ logic arrays, which are unique among systems in its price range.

Second, the new, but now widely installed, cluster architecture makes possible the construction of a single logical system by connecting processor and storage resources. This architecture allowed Digital to propose a single system that can serve 200 simultaneous scientific users even though no single processor could support such a large load under the conditions specified in the RFP. The proposed system configuration is illustrated in Figure 1. Information on the performance of the VAX 8600 can be found in **NOTE ON THE PERFORMANCE OF THE DEC VAX 8600** also in this issue.

DOE requires that a procurement of this type be fully competitive based on functional requirements. Competitive procurements provide for fair treatment of all qualified vendors and secure the lowest possible price for the government. In this case, the competitive process secured a substantial reduction in cost. The list and negotiated prices for all selected hardware and software components are:

	Hardware	Software	Totals
List Price	3,913,402	186,814	\$4,100,216
Negotiated Price	2,921,553	130,356	\$3,051,909

Installation of the configuration shown in Figure 1 should begin in March 1985 and all but one 8600 processor should be operational in July. The final 8600 will arrive in September.

Figure 1 shows only one printer. This is because, to a large extent, printing capabilities are being distributed throughout the Laboratory via the newly installed Ethernet. Additionally, a separate competitive procurement is being circulated to obtain a modest amount of integrated printer/plotter equipment that is amenable to self-service operation. These two activities should reduce printing and plotting costs significantly.

¹ Emitter-Coupled Logic

COMPUTER COURSES FOR 1985

Maggie Morley

The amended schedule of computer courses for Fiscal Year '85 is out. These courses, offered through the Computing Division, are held in the Center's Training Room (Bldg. 50B, Rm 1229).

Except for **DATATRIEVE**, attendance in all courses is limited to 15. If you are interested in taking one of these classes, contact your supervisor, who has complete information regarding enrollment procedures.

The Training Room is a multi-purpose terminal room with first priority as a facility for hands-on computer training and seminars. In those periods when classes are not in session, users will have access to the terminals.

If you have any additional questions about what's being offered, or suggestions for other curriculum-oriented topics, contact (Jerry Borges, x5568.) Facilitator is Lisa Long, (x5947.) The current list follows.

DATE	TIME	TITLE	INSTRUCTOR
Feb 5, 7, 12, 14	8:30 - noon	Introduction to ISSCO Graphics	Cammie Howard
March 4, 5, 6, 7, 8	1 to 4:30 PM	Introduction to VAX 11 Datatrieve at LBL	Virginia Sventek
March 20, 22, 27, & 29	10 to noon	Introductory VAX/VMS Course	Noel Brown
April 16, 18, 23, 25	10 to noon	Introductory "C" Programming	Marty Gelbaum
April 25	9 AM to 5 PM	Software Management using DEC/CMS and DEC/MMS	Edgar Whipple
May 6, 7, 8, 9, 10	8:30 to noon	Introduction to VAX 11 Datatrieve at LBL	Virginia Sventek
May 15, 17, 22, & 24	10 AM to noon	Introductory VAX/VMS Course	
July 9, 11, 16, 18	10 AM to noon	Introductory "C" Programming	Marty Gelbaum
July 16, 18, 23 & 25	2 to 4 PM	Introduction to the UNIX System	Marty Gelbaum
July 17, 19, 24 & 26	10 AM to noon	Introductory VAX/VMS Coures	
July 23 & 25	10 AM to noon	Introductory LBL Graphics Course	Carmen Chan Cammie Howard
July 30, Aug 1, 6 & 8	10 AM to noon	Introduction to ISSCO Graphics	Cammie Howard
Aug 5, 6, 7, 8, 9	1 to 4 PM	Introduction to VAX 11 Datatrieve at LBL	Virginia Sventek
Aug 13, 15, 20 & 22	10 AM to noon	Introductory PVI Packages Course	Carmen Chan
Sept 17, 19, 24 & 26	2 to 4 PM	Introduction to the UNIX System	Marty Gelbaum
Sept 18, 20, 25 & 27	10 AM to noon	Introductory VAX/VMS Course	

DECREP at your service . . .

NEW DEC ACCOUNT MANAGER

Maggie Morley

Lynn Tarnovsky is Digital Equipment Corporation's new Account Manager for LBL.

She will function as Project Management Coordinator, facilitating the business & technical relationship between DEC and LBL. Full time. She has no other client.

She's a graduate of UC's School of Business, and has been in the computing industry for seven years. A senior Sales Representative III, she has been with Digital for 3 1/2 years, selling and marketing to the technical OEM's in Santa Clara.

Committed to managing all aspects of Digital/LBL business, she wants to establish new ways to serve the entire DEC user community.

"I'll be looking for areas where we could do things differently -- for new and better ways to do standard or new things," she says. Customer satisfaction is her primary aim.

Toward that aim, she's instituted a Direct Line on Electronic Mail (**DECREP on PDM**).

"You will be able to communicate with me, immediately, with requests, suggestions, problems, and I can deal with them right away. . . . I will, in turn, be able to send instant information to you on upcoming products, demos, speakers, policy-changes, etc. No waiting."

(She'll have an *alias* list for distribution of these electronic messages. If you want to be on that list, contact **jake@lbl-gen, x4388**). Her phone number at DEC is (415) 769-3072.

Tarnovsky succeeds Mike Moran, who is now Digital's operative at Sandia Laboratory.

THE COUNTDOWN BEGINS . . .

Marv Atchley

There'll be many major changes & upgrades in our computing hardware & services during the remainder of this fiscal year. Listed below are dates they are expected to take effect. Most of these dates depend upon hardware delivery from various manufacturers and hence may vary from our projected time line. We'll post such schedule modifications as they become known.

DATE	CHANGE
March 11	CDC 6400 will be turned off and removed.
March 25	First increment of 7600 replacement systems will be installed.
April 8	One VMS 780 system will be converted to 4.2 Unix.
April 15	11/70 Unix 1 system will be removed. Ethernet connection to Bldg. 90 completed. Imagen printer installed in Bldg 90.
June 1	Second increment of 7600 replacement system will be installed.
June 8	Second VMS 780 system will be converted to 4.2 Unix.
June 15	11/70 UNIX 3 system will be removed.
July 1	Entire BKY system turned off & removed. This includes CDC 6600, CDC 7600, Automatic Tape Library, Hyperchannel, PSS, GSS, RECC, COKE, BGATE, DGATE, CYBER18 (Bldg. 90 terminal), ADA1, ADA2, and the Datagraphix 4460 COM. The magnetic tape library will be closed down and the tape vault will become user space. Dicomed will be converted to run on-line with a VMS system.
August & September	Hardware in the Bldg. 50B Main Machine Room will be reconfigured and the PDM & GEN moved from Bldg. 50A to Bldg. 50B.
September	Final increment of 7600 replacement system will be installed.

IMSL VERSION 9.2 ON VAX/VMS

Bill Hogan

Version 9.2 of the **IMSL** mathematics and statistics subroutine library is now available on the **GEN**, **IGM**, **NMC**, and **PDM VAX**'s.

At present, you can access **IMSL V9.2** on these machines by using the system logical names "sys_imsl92S" and "sys_imsl92D" on your linker command, as in

```
$ link main,sys_imsl92S/lib
```

or

```
$ link main,sys_imsl92D/lib
```

for the single precision and double precision libraries, respectively (about which more below).

After March 30, 1985, the system logical names "sys_imsl92S" and "sys_imsl92D" will disappear, and the system logical names "sys_imslS" and "sys_imslD" (which now refer to **IMSL** Version 9.1) will refer to Version 9.2.

CHANGES

There are too many changes to summarize here. For details, consult the **IMSL** Library Edition 9.2 Update Set.

DOCUMENTATION

The **IMSL** Library User's Manual, Edition 9.2, explains how to use each of the more than 500 subroutines in the collection.

The **IMSL** Library Edition 9.2 Update Set consists of about 150 pages of changes needed to make an Edition 9.0 User's Manual current. (No Manual pages were changed by the release of **IMSL** Version 9.1.)

IMSL documentation is available in loose-leaf binders and on microfiche.

IMSL documentation can be obtained through the Computing Services Library (50B/1245, X6094/X5529).

One copy of the **IMSL** User's Manual is kept at the **helpdesk** (50B/1275 X5981).

SINGLE & DOUBLE PRECISION LIBRARIES

Instructions for using **IMSL** subroutines are given in the User's Manual with these subheadings:

IMSL Routine Name

Purpose

Usage

Arguments

Precision/Hardware

Req'd **IMSL** Routines

The "Precision/Hardware" specification for an **IMSL** subroutine tells you whether it exists in the single precision library, the double precision library, or both. In the case of **VAX IMSL**, you have the following.

<u>Specification</u>	<u>Which Library?</u>
Single/ALL	Single Precision
Single/H32	Single Precision
Double/ALL	Double Precision
Double/H32	Double Precision
Single and Double/ALL	Both
Single and Double/H32	Both

When using a double precision **IMSL** library on **VAX**, make sure that every non-integer numeric variable or array passed to an **IMSL** subroutine by your program is of type **d_floating** (unless specific instructions to the contrary are given in the **IMSL** documentation).

If your program is written in **VAX Fortran**, any variable or array will be of type **d_floating** if declared **double precision**, and you compile the program using the (default) **nog_floating** compilation option.

Please direct questions about using **IMSL** (or any other math/stat library) to Bill Hogan, (hogan@ux4, X5194), or Elon Close, (X6166).

"Simple pleasures
are the last refuge of the complex"

(Oscar Wilde)

GSS TAPE LIBRARY TO GO AWAY

Marge Hutchinson

When the CDC computers are turned off (July 1, 1985), the GSS tape library will no longer be available. (Read the article on the future of the Tape Library elsewhere in this Newsletter).

We'll provide utilities on the VAX/VMS computers so that you can read datasets from your existing GSS tapes and convert them to comparable VAX forms (9-track, 6250 bpi tapes only). We've provided these conversion options:

- CDC display code to ascii characters
- CDC floating point to VAX D- or F- floating point
- CDC binary integer to VAX 4-byte integer
- CDC word to VAX 8-byte word.¹

The subroutines used in these conversions will also be available to user programs so that users with record structures containing mixtures of conversion types can do their own conversions.

UNIX users can convert their files by having them read on a VMS/VAX and transferring them to the UNIX/VAX using INTERNET. Help will be available for this transfer for those who need it. If you need help making this transfer, contact the HELPDESK, x5981. Forward comments, questions to me (margeh@igm, x4727).

"Man transforms everything
he encounters into a tool;
and in doing so
he himself becomes a tool.

But if he asks *A tool for what?*
there is no answer."

Paul Tillich, 1958

¹ If you'll need other conversion options, let me know ASAP.

THE TAPE VAULT IN YOUR FUTURE

Marv Atchley

The Computing Service Tape Library -- as your now know it -- will be shut off on July 1, 1985, coincident with the departure of the BKY system & associated equipment.

In the November/December issue of this Newsletter, we announced that a smaller library system, compatible with the Class IV replacement system, would replace the present service. However, the majority of present users indicated that they preferred to use their own FETCHing and FILE-ing arrangements; the number of user tapes remaining did not warrant the expense of the sophisticated library system we had envisioned.

So, we are establishing a Tape Storage Vault, with controlled humidity and temperature, on the second floor of Bldg. 50B. Users will have cardkey access to the Vault; additional security measures will be available. Space will be issued **ONLY** for tapes to be used with the 7600 replacement system.

We'll make some of the tape drives on the new system available to users. If an operator tape mount is required, a charge will be made.

We will **NOT** be able to read seven-track tapes.

By July, 1985, users **MUST** arrange for one of the following actions for all of their tapes in the library. They can --

- Release tapes to the blank tape pool
- Archive tapes into the Inactive Library in the Federal Records Center, which will store them for up to 15 years. These tapes can be **FETCHED** back (it takes about a week).
- Release tapes to their own storage area - (not recommended unless storage areas are clean and have controlled temperature & humidity).
- Retain tapes in the new Storage Vault -- **ONLY** if the tapes are to be used with the **BKY** replacement system or existing **VMS** or **UNIX** systems.

Forward comments and questions to me (atchley@ux5, x5455).

AUTOMATIC TIMEOUTS ON NEW UNIXES

Don Zurlinden

Automatic logouts are being instituted on **ux4**, **ux5**, and **ux6**. Effective March 1, you will be logged off the system after

- | | |
|------------|---|
| 90 minutes | (plus 5 minutes grace time) on normal login terminals showing <ul style="list-style-type: none"> • created processes (i.e., eqn, tbl, etc.) going through the system, BUT • no keyboard input, |
| 30 minutes | (plus 5 minutes grace time) on normal login terminals showing <ul style="list-style-type: none"> • no created processes going through the system AND • no keyboard input. |
| 15 minutes | (plus 5 minutes grace time) on quick login terminals - (qx4 , qx5 , and qx6) in ALL cases. |
-

CONSULTING SERVICE FOR MATH SOFTWARE LIBRARIES

Elon Close

Consulting service for the Division's resident numerical and mathematical software packages is available. If you need help deciding which of our various collections best meets your needs; if you are looking for something to handle a very specific application; if you wish to know more about standard libraries; or if you have suggestions or recommendations, contact me **x6166**.

The following mathematical libraries are available on the **PDM**, **NMC**, **IGM**, **GEN**, **UX4**, **UX5** and **UX6** machines.

- **IMSL**, the International Mathematical Statistical Library (Edition 9.2) a large, systematized, well-documented and tested collection of **FORTTRAN**-callable mathematical and statistical subroutines.
- **NAG**, the Numerical Algorithms Group library,

from Oxford, England, is a large, systematized, well-documented and tested collection of **FORTTRAN**-callable mathematical and statistical subroutines, similar to **IMSL**, but differs in areas of strength.

Running on **UX4** and the **GEN** machine is

- **MACSYMA**, Project **MAC**'s **SY**mbolic **MA**nipulation system from M. I. T. (See our Nov./Dec. Newsletter). Our latest acquisition; an interactive programming system used to derive & evaluate exact formal solutions to mathematical problems.

* * * * *

The **LINPACK** and **MINPACK** collections are presently running on the **IGM**, **PDM**, **GEN** and **NMC**. The tasks that they do are also, for the most part, done by routines in the **IMSL** and **NAG** libraries and users should consider using them instead.

* * * * *

The following software packages are **GOING AWAY** when the **CDC 7600** shuts down on July 1, 1985. We suggest that you

- (1) try to find an equivalent replacement for them in the **IMSL** & **NAG** libraries, or
- (2) if you cannot find such a replacement, consult with us.

Most of the software is replaceable by routines in **IMSL/NAG** if you look carefully.

The following packages will go away on July 1.

- **AMOSLIB**
- **BLAS**
- **BMDP**
- **BSPLINE**
- **CERN**
- **CORE** Library
- **EISPACK**
- **FISHPACK**
- **FUNPACK**
- the **NPL** Optimization Library,
- **SANDIA** Mathematical Program Library
- **SOURCE**
- **SPSS** - the Statistical Package for the Social Sciences.

"TROUBLE" FACILITY ON THE VAXES

William Jaquith

Users can get speedy response to their VMS/UNIX questions/problems by using the "trouble" facility now up on the Computing Division's VAX computers. When you use it, your message will go to our system managers and programmers. They'll make sure you receive a swift response via electronic mail.

• ON UNIX

If you've got a problem or question on one of the VAX UNIX computers (ux4, ux5 or ux6), send your message to **trouble**.¹ Here you can enter your message interactively. As follows. Type after the UNIX prompt (ux5 >)

```
ux5 > trouble < cr >
```

It will respond

"Type <CONTROL> d on a line by itself when you are done and want to send your message"

Enter the text of your message. (No prompt).

message message message < cr >

more message more message < cr >

<CONTROL> D — or

"." (a period at the beginning of a line)

sends the message.

OTHER OPTIONS²

To scan UNIX MAIL options, type
~? (tilde question mark).

You can also include a file in your message. Type
~r otherfile

Note that the UNIX MAIL system has no prompt. To read your message before you send it, type

~p (tilde p).

and the message will be printed on the screen.

• ON VMS

When you've got a problem or question on one of the VAX VMS computers (GEN, PDM, NMC, or IGM), send your message to **trouble** using *Software Tools Mail*. As follows.

Type, after the VMS prompt ("\$\$")

\$ msg

You'll get a *tools mail* prompt ("<-"). Type

<- s

It will respond

<- "sndmsg [type SPACE to confirm]"

Hit the SPACE bar. — and proceed

To: **trouble**

To:

cc:

Bcc:

Subject: **My problem**

Do you want a return receipt? [y/n] y

(If you need help, type h)

After the **send mail** prompt ("sm>"), type

sm> a (for *append*) — or i (for *insert*)

You are now in the *input* mode.

Enter the text of your message.

message message message < cr >

more message more message < cr >

Then, to get OUT of the input mode, type

<CONTROL> Z — or

"." (a period at the beginning of a line.)

To send your message, type

sm> s < cr >

It will respond

Are you sure? [y/n] — You type y < cr >

It will respond

"Submitting mail to MAILER"

To exit from *tools mail*, type

<- e

It will respond

<- "exit [type SPACE to confirm]"

Hit the SPACE bar. It will respond with a VMS prompt.

\$

The message is sent.

OTHER OPTIONS

If you want to read a file into the message, type

sm> r otherfile

and "otherfile" will be read in.

Forward questions and comments to me (jake@lbl-gen, jake@lbl-ux5, x4388).

¹ Refer to MAN TROUBLE on UNIX.

² For still more options, refer to *Mail on UNIX* by Maggie Morley

WORKSTATION NEWS

• HP LASERJET PRINTER

Hewlett Packard has loaned the Workstation Group an HP LaserJet Printer with two font-cartridges. It is available for demonstration and evaluation. Many commercial word-processing programs now support this printer. (We use an updated *Volkswriter DeLuxe*, V2.1) We will gladly give you a brief demonstration and show how to print out your *Lotus* worksheets with it. To arrange a demonstration, contact Richard LaPierre, (x4692).

[22.3.1].....

• HP PRESENTATION: THE NEW INTEGRAL PERSONAL COMPUTER.

On Tuesday, March 5, Hewlett Packard will be demonstrating its new Integral Personal Computer -- a UNIX-based transportable workstation.

A formal presentation will be conducted at 9:30 AM in the Bldg. 70A Conference Room (Rm. 3377).

The speaker will be Kermit Yensen, the IPC's Product Manager from Corvallis, Oregon. Mr. Yensen has been a member of the development team since this computer's inception.

Hewlett Packard will also be demonstrating Lotus graphics on the HP 7550 eight-color plotter and on the HP LaserJet printer.

For further information contact Richard LaPierre (x4692).

[22.3.2].....

• PC/DOS CLASSES AT UCB

Two classes on IBM PC-DOS for LBL employees will be held in March and April on the University of California Berkeley campus. Fee (\$90.68 per student for a minimum of 6 attendees) is approximately one-half the cost of comparable classes from commercial vendors.

Two such classes held earlier this year were enthusiastically received.

Contact Bernice Moore (x7371) for enrollment information.

[22.3.3].....

• IBM PC/AT SYSTEM INTEGRATION UPDATE

As mentioned in last month's Newsletter, the Workstation Group has been overseeing the upgrade of a standard PC/AT to an Enhanced model with a 32-Megabyte fixed disk and 512 Kbytes of memory.

We now have a total of three systems on-line. To date, we've encountered disk motor start-up problems on one of the systems, which has subsequently been exchanged by the supplier for another unit.

In the next couple of months we will have more meaningful reliability data as there are at least eight additional systems on order.

A copy of a sample requisition with part numbers and estimated cost may be obtained from the Computing Services Library. (50B/1245, x6094). A system of this configuration costs approximately \$300 more than the standard GSA price from IBM -- assuming we could get delivery on an Enhanced version of the IBM PC/AT. For this additional cost you get a hard disk with 60 per cent more capacity. Think about it.

The actual installation of the hard disk -- with the additional 256 Kbytes of memory -- was performed by the RTSG technical support group (x6411).

[22.3.4].....

• CAMPUS IBM PC USER GROUP MEETING

The University campus IBM PC user group meets regularly on the second and fourth Wednesdays of the month at 5:30 PM at 10 Evans Hall. The next meeting is on March 13. The speaker is announced a few days before the meeting. Call Lisa Gertzis at 642-1023 for more details.

[22.3.5].....

• CAI'S AVAILABLE

Computer Aided Instruction diskettes for IBM PC/DOS and Lotus 1-2-3 (beginning and advanced) are available for loan. Contact Dan Van Zile (x5589).

These training programs have been favorably reviewed by many users.

[22.3.6].....

• A HARD DISK FOR YOUR PC

The Workstation group has been looking into alternatives for users who wish to add a 10 Mbyte hard disk to their PC system equipped with two floppy drives. The normal solution has been to purchase an IBM PC Expansion Unit (IBM part #5161001), which costs approximately \$2000.

However, we are evaluating a \$795 alternative for users who want only a hard disk unit. The system, which measures 4" wide $\times$ 7 1/2" high $\times$ 16" deep, is external to the PC, has a self-contained power supply, and initializes like a standard disk system running DOS 2.0 or DOS 2.1.

The IBM expansion unit, which is the same size as the PC, offers the advantage of providing seven additional expansion card slots plus mounting space for two hard disks.

For further information contact Workstation Members R. LaPierre ($\times$ 4692) or Dan Van Zile ($\times$ 5589).

[22.3.7].....

• NEW ACCESS TO MICRO INFORMATION DIRECTORIES

We've modified access calls to the Micro Information Directories to conserve time. Users can now access the directories on any of the Computer Services VAX/VMS computers (PDM, GEN, NMC, & IGM).

• • Info-Kermit Digest • •

old command	new command
INFO_KERMIT	SET DEFAULT KERMITNEWS

• • IBM PC Newsletters • •

old command	new command
IBM_PCNEWS	SET DEFAULT IBMPCNEWS

• • IBM PC Public Domain Software • •

old command	new command
IBM_PCSOFTWARE	SET DEFAULT IBMPCSOFTWARE

The method of accessing the Micro information directories on the UNIX machines (UX1, UX3, UX4) has not changed. As before:

COMMAND	INFORMATION
cd /usr/micro/info-kermit	Info-Kermit Digest
cd /usr/micro/ibm/pcnewsletter	IBM PC newsletters
cd /usr/micro/ibm/pcsoftware	IBM PC public domain software

[22.3.8].....

• WANG PRINTER SOUND ENCLOSURES

Two sound enclosures are presently available from LBL's EXCESS Section.. These cloches fit Wang printers - Model#'s DW/OS-20, 6581W, 5581W, 5541W, and 9220W. If you can use one, call Buck Koonce ($\times$ 5739)

[22.3.9].....

THE MICRO COMPUTER CORNER

QUESTION: Do I need two different floppy diskette drives on my PC/AT? I get conflicting advice when I talk to folks about buying an AT. . .help!

ANSWER: The PC/AT comes "factory equipped" with a 1.2 Mb 5 1/4" diskette drive. The standard IBM PC and PC/XT comes

equipped with a 360 Kbyte 5 1/4" diskette drive. Another way of saying it is the AT drive can store four times more data on a 5 1/4" disk than can a PC. (A 33-rpm record contains more listening moments than a 78-rpm record). Your AT is capable of reading disks made for or on a PC: however — a PC is not capable of reading disks produced on the AT's 1.2 Mbyte drive. So if you must exchange data disks with your PC neighbors then you will need two types of floppy diskette drives. Otherwise, we recommend keeping the space open for future development; in a few months you will be able to put another 32 Mbyte drive there.

.....[MARCH.85 1]

QUESTION: Do you know where I can find a listing of Engineering Programs available for the IBM PC?

ANSWER: We have a paperback published by IBM (July 1984) that lists Engineering and Scientific Programs for IBM Personal Computers available from third-party developers. This 400-page booklet will obviously not contain the most current industry offerings, but it should point you in the right direction. You might also glance at the PC Annual Software Review for application packages in your area of interest. Both of these documents may be checked out for a short term loan by contacting the Computing Services Library ($\times$ 6094)

[MARCH.85 2]

QUESTION: Most Micro Computer literature I've seen is downright user-**UN**friendly or just plain unintelligible. Where can I find more accessible reading material on PC communications?

ANSWER: The **Osborne/McGraw Hill Guide to IBM PC Communications**¹ by David Kruglinski (Gesundheit!) has the enthusiastic endorsement

of a very wide range of micro-users. Says Critic John Dvorak, "[This book] gives the best general overview of communications theory from the days of the telegraph to the days of the geosynchronous satellite transmitter. It talks intelligently about modems, on-line databases, user tricks — you name it. . . . Without being boring . . . It swiftly brings any reader up to speed."

[MARCH.85 3]

TIMELY TIP: The Hewlett-Packard 110, a battery-driven portable the size of a bread-box, is still available for short-term trial use and

evaluation (up to a week). Contact the Computer Center Library, (50B/1245A, x5529) or Dan Van Zile (50B/1245 x5589) if you're interested.

This 8 1/2 lb unit features:

- (1) Terminal communications (MODEM),
- (2) Word processing,
- (3) Lotus 1-2-3, and
- (4) MS-DOS software stored in internal ROM.

[MARCH.85 4]

QUESTION: Does the Computing Division have any other computers available for loan besides the HP portable?

ANSWER: Yes. We have a **DEC PRO 350** with the **VENIX** operating system currently available for short-term trial use and evaluation. The 10-Megabyte hard disk system comes with a C compiler. Contact Dan Van Zile, (x5589).

[MARCH.85 5]

TIMELY TIP: . . . Quadram Memory Board users — check your batteries. Older models of the Quadram multi-function boards often have corrosive leakage around the battery terminal due to overcharging of the battery.

The next time you or your service technician is under the hood of your PC, check for signs of corrosion around the battery on your Quadram board.

If there *are* signs of leakage, you should have it exchanged for a free replacement — available from RTSG technical support group (x6411).

(You know you have a Quadram board if, when you turn on your system, you see the message "**pwrupclk**" on your screen just before the time and date.

[MARCH.85 6]

QUESTION: I have Lotus 1-2-3, but entering large amounts of data takes a long time. I can't use the number pad to enter numbers and use

the cursor keys to change cells without hitting **<NumLock>** in between. Is there a way to move down to the next cell and enter large amounts of data quickly?

ANSWER: Yes. Use of 1-2-3's keyboard macro feature can remedy the problem.

Follow this procedure:

- (1) Move the cursor to an unused portion of the worksheet
- (2) Enter the following string

```
'{?}{down}/xg\n~<cr>
```

DON'T MOVE THE CURSOR!!

now type

```
/rnc
```

lotus responds

Enter name:

type

```
\n
```

on the same line lotus responds

Enter range xx.xx

hit

```
< cr >
```

Now, to use this tool, move to the cell where you're going to start entering numbers and press

```
<NumLock>
```

then

```
<Alt> n
```

enter a number on the numeric keypad and hit

```
< cr >
```

The cursor will move down to the next cell and await your input. To move around to other columns on your worksheet turn off the

¹This book is NOT specific to the IBM PC: don't be fooled by the title.

<NumLock> mode.

when you wish to go back to entering labels, formulae, etc. turn off the <NumLock> mode; then type

<Control> <Break>

.....[MARCH.85 7]

QUESTION: Is there an easy way to embed printer control codes in my Lotus worksheet.

There are times when I would like to use such Epson printer features as *EMPHASIZE*, *DOUBLE-STRIKE*, *UNDERLINE*, etc.

ANSWER: Yes. The Workstation Group has a copy of a user-supported utility that allows you to embed printer control commands anywhere

in our spreadsheet. It's a neat way to highlight a cell or group of cells on your spreadsheet. The utility requires the user to enter a macro in an unused area of your worksheet. If you are not familiar with macros, don't worry; we've produced a canned procedure for you to follow. Check with Dan Van Zile (x5589) or Richard LaPierre, (x4692).

.....[MARCH.85 8]

We hope you'll use this Corner to trade useful information, problems, opinions, and horror stories concerning your PC. You can also forward questions and comments to the Workstation Wizards on staff.

If you want feedback on your question or comment, drop a line to

THE MICRO COMPUTER CORNER,

c/o HELP DESK (UX3 or PDM)

50B/1232, or

The Computer Center Library (mam on UX4)
50B/1245.

MACINTOSH NEWS

Van Jacobson

One of the three Macintosh programs promised in the January newsletter have been completed and installed on the Computer Center VAX/UNIX machines.

(1) WRITE 2 TROFF

"Write2troff" is a similar program that converts MacWrite documents to troff input files. It serves

two purposes:

- It produces high-quality output, printing MacWrite documents on the Versatec, Imagen or Phototypesetter.
- It turns MacWrite & the Macintosh into "user friendly" front-ends to troff. Write2troff allows *tbl*, *eqn* & *pic* commands to be embedded in the MacWrite file. Anything that is difficult to do in MacWrite, such as equations, can simply be passed through to more sophisticated UNIX processors — like *eqn*.

A typical use of write2troff might be:

```
macget -d - | write2troff | itroff -me
```

For more information type

```
man write2troff
```

A short document describing write2troff is available at the Computer Center library (50B/1245, x5529, x6094). Ask for a copy of "Using Write2troff from your Macintosh". At the same time, you might want to get a copy of the new document "Uploading & Downloading files with macget/macput".

• IN LATE MARCH - WRITE 2 TEX

"Write2TEX" is a program similar to write2troff that converts MacWrite files to TEX input files, should be available in late March.

That publicly-accessible archive of Mac materiel (described in the January Newsletter) is now available. There are about 100 files and programs in it but a "TABLE OF CONTENTS" document describing what's there has yet to be written. To access the archive from VMS use the filename

```
RTSGVX::MAC:file
```

where file is the name of the file you want. Do a

```
DIR RTSGVX::MAC:
```

to see what's there. To access the archive from UNIX, and to get more information on downloading files from it to your Mac, see the document "Uploading & Downloading files with macget/macput".

• COMING ATTRACTIONS

In next month's newsletter I'll report on some exciting projects that are just getting started.

- (1) We're working on ways to connect Macs to the Lab's Internet using Apple's new "AppleTalk" network.

- (2) We're also looking at how to integrate Apple's impressive (and inexpensive) new laser printer, the **LaserWriter**, with the network and the LBL typesetting environment.

If there are questions or comments about anything described here, it's possible to reach me via computer mail by sending to:

van@lbl-rtsg (from UNIX)
rtsgvx::van (from VMS)

MIGRATING FROM UX1 & UX3: CONSIDER TAR TAPES

Sandy Merola

As you have read elsewhere in this Newsletter and in the UNIX messages of the day, our PDP 11/70 UNIXes (ux1 and ux3) are scheduled for shutdown soon. (April 15 for ux1 and June 15 for ux3). You should be moving files residing there to the VAX/UNIXes (ux4, ux5, & ux6). We hope our on-line HELP UX1MOVE article outlining that transfer procedure will facilitate the move.

NOTA BENE: You do NOT have to move all your files to other systems. You can keep seldom-used or low-priority files on TAR² tapes.

In fact, when the 11/70 UNIX systems are shut down, we will write ALL remaining user files thereon to TAR tapes. Should you ever need data from these TAR tapes, we will install the files you need on the VAX/UNIX system of your choice for a pitance (current charge is \$18 per hour for the operator labor involved in the restore). The less data you move to the VAX/UNIX disks, the less expensive your storage charges will be, and the less disks we will have to buy in the future.

Forward comments, questions to me (merola@ux5, x4389).

² Tape ARchiver

DISSPLA GRAPHICS SOFTWARE NOW UP ON THE IGM

Claudette Lederer

DISSPLA,¹ an easy-to-use, flexible, device-independent graphics software system from ISSCO², is now available on the IGM.

It's a high-level Fortran-callable subroutine-plotting language for both scientific and business programmers, which has international popularity. Graphic Fortran programs which use **DISSPLA** are especially portable to other National Laboratories.

TELL-A-GRAF, ("TAG"), another ISSCO product, is a software tool for nonprogrammers allowing them to generate presentation graphics using simple English statements. It has an expanding user base on the IGM and the GEN. While **DISSPLA** is presently available only on the IGM, its graphic arts features allow the user to produce plots at the Fortran level with the same professional quality as **TELL-A-GRAF**.

For site-dependent info on linking, device calls, and sample programs for **DISSPLA**, type
DISSPLA_HELP on the IGM.

The following resources for **DISSPLA** users are available from the Computer Center Library (50B/1245, x6094 & x5529).

- "**DISSPLA's First Facts**" This booklet is for the Fortran programmer who wants to produce a simple plot quickly, and who wants to read a reasonably sized document to learn **DISSPLA**. (The sample programs are not available for copy on the IGM.)

- "**DISSPLA User's Manual**" This large, "friendly" technical manual is an in-depth study of each **DISSPLA** feature, and the first small section describes the basic structure of **DISSPLA** and all you need to know to make simple plots. The sample programs listed therein are available for copy into a users directory. See site-dependent information below.

- "**DISSPLA Pocket Guide**" This is a reference booklet for the experienced **DISSPLA** user. It is organized in the same manner as the User's Manual.

- Videocassettes (3) of "Intro to **DISSPLA**"

¹ Display Integrated Software System and Plotting Language

² Integrated Software Systems Corporation

Forward comments and questions to me
(claudette@igm, x6945).

GRAPHICS ON UNIX 4 UP FOR 6-MONTH TRIAL

Cammie Howard

Three graphic packages from Visual Engineering of San Jose are now available on **ux4** for a 6-month trial. They are

- (1) *Visual:ProChart*: an easy to use, menu-driven presentation graphics package.
- (2) *Visual:C-chart*: a set of **UNIX**TM function calls which allows programmers to integrate charts and graphs with an application program.
- (3) *Visual:GKS*: (**G**raphic **K**ernel **S**ystem) a "C" implementation of the **ANSI**⁴ **GKS** standard. This standard provides a means of producing device-independent graphs.

Each of these packages was designed to operate in the **UNIX**⁵ environment, and takes advantage of the features available in that operating system.

VISUAL:PROCHART

Visual:ProChart is designed with non-programmers in mind. It uses menus to allow you to

- create simple or complex charts and graphs and
- choose the type of chart (Pie, Bar, or Line) you want to create.

To display data, you can use *Visual:ProChart's* default settings or specify your own.

- There are menus for each of these chart types so that you can define specific details.
- There is also a menu to input titles and various labels.

Some of the details that you can specify are:

PIE CHARTS

- The size and position of the pie chart or of each slice
- Explosion of individual slices or groups of slices
- Annotation of each slice

³ Graphics Kernel System

⁴ American National Standards Institute

⁵ UNIX is a trademark of Bell Laboratories

- Color and pattern shading of each slice.

BAR CHARTS

- Multiple axes
- Vertical or horizontal bars
- Stacked, clustered or hidden bars
- Variety of axes scaling methods
- Color and pattern shading

LINE GRAPHS

- Variety of line types and colors
- Shading below, above or between lines
- Variety of axes scaling methods
- Variety of marker types and colors
- You can also combine more than one chart on a page.
- You can input data from a keyboard or from a file.
- You can edit your data file while in *Visual:ProChart* using the editor of your choice (default editor is *vi*).
- *Visual:ProChart* has five viewing levels so that you can get the basic layout of your graph set quickly.

VISUAL:C-CHART

Visual:C-chart is a library of "C" language functions designed to incorporate graphics and application programs. There are two basic categories of functions:

- action* calls which draw objects and
- attribute* calls which modify the appearance of the graph after following *action* calls.

Visual:C-chart provides a wide variety of standard chart types, along with approximately 300 function calls that allow you to control the details of a graph. *Visual:C-chart* is an interface to *Visual:GKS* (described below), and provides higher-level functions specific to presentation graphics that are not available in *GKS*.

VISUAL:GKS

Visual:GKS is a full implementation of the **0b** level of the **ANSI** standard. It is written in "C" and designed for **UNIX**. It provides device and machine independence. It includes a large group of drawing primitives such as

- line
- polyline
- marker
- polygon
- generalized drawing primitive.

Attribute sets for each primitive include

- color,
- line width
- line type
- fill pattern
- marker type.

Visual:GKS has many text features and attributes, including

- multiple fonts,
- text size,
- angle,
- spacing,
- placement.

It also provides multiple normalization transformations & five input functions:

1. Locator,
2. Valuator,
3. String,
4. Choice,
5. Stroke.

USING THE VISUAL ENGINEERING GRAPHIC PRODUCTS

Visual Engineering provides the following drivers for use with its products:

- Tektronix 4010
- Tektronix 4014
- Tektronix 4105
- Convergent-GT
- Envision 215
- Envision 220
- Qume 211 / Cito 414
- HP 7475a / 7470 plotters
- Imagen 8/300

A debugging driver is also available.

Nota bene: The Tektronix 4010 and 4014 have only a limited use in *ProChart*. Please see the box below for details.

You must set an environmental variable for all of the Visual Engineering graphic packages.

C shell users: add

```
setenv VEC /usr/local/vec
```

to your `.login` file

Bourne shell users: add

```
VEC = /usr/local/vec
```

to your `.profile` file

This tells *ProChart* the location of the menu file, etc. and tells **c-chart** and **GKS** the location of workstation descriptor files, error files, etc.

To use *ProChart*, type

```
UX4> pc <cr>
```

The first time you call it, *ProChart* will display a setup menu. You should use it to tell *ProChart*

- your terminal ident
- the hardcopy device you want to use.

You can also use this menu to specify the editor you want to use. A handout is available at the **HELP DESK** showing you how to use the setup menu.

NOTA BENE: if you want to use the Tektronix 4010 or 4014 device you should specify that the output to those devices be directed to a file (call it, say, "outfile") in the *ProChart* SetUp Menu.. You can then use the **UNIX** command *cat* to draw the graph on the screen. For example,

```
UX4 > cat outfile
```

Several example files and graphs are available on-line (call **VEC/pcdemo**). These are

```
Chart1  Chart2  Chart3
Chart5  *.grf.
```

You can copy them to your directory. These files are used in the **ProChart Guidebook** to introduce you to *ProChart*.

To use c-chart and *Visual:GKS*

Since **c-chart** is a library of C functions, you must include the appropriate header files.

```
#include <cchart.h>
```

And since **c-chart** uses *Visual:GKS* calls

```
#include <gks.h>
```

Visual:GKS has several **include** files (listed in the **GKS** manual) which can be used in **GKS** programs.

Because **c-chart** is a **GKS** interface to *Visual:GKS*, it is important to link the libraries in the correct order. For example, if you have a file named *prog1*, the link

command would be

```
cc prog1.o -lcchart -lgks0b -lm -lg o prog1
```

Use the same command line to compile and link a *Visual:GKS* program except, of course, you'd omit the **-lcchart**.

Example programs (in `/usr/local/vec/appl`) will help you get started with **c-chart**. You can copy them into your directory and execute them. By changing the programs, you can get a better understanding of **c-chart**.

Example programs (in `/usr/local/vec/test`) will help you get started with **GKS**. You can copy them into your directory and execute them.

To execute one of the example programs or your own program, first compile and link it. Then use the command:

```
programname /dev/tty (or "outfilename~") devicename preview level
```

(e.g., `a.out /dev/tty Tektronix-4010 3`)

The device name can be any of those on the device list at the beginning of this article. The preview level is an integer between 0 and 4.

- 0 = Data representation & chart positioning
- 1 = Above, plus simple text & numerals
- 2 = Black & white image of high-quality text
- 3 = Colors. Solids are represented with hatches for fast drawing. High-quality text.
- 4 = Solid colors. High-quality text.

Forward comments or questions to me (cammie@igm, x4748).

DGATE GOING AWAY

William Jaquith

Dgate, an LBL **DECnet** gateway machine, will go away as part of the Computing Division Class IV changeover. Most of the computers now using **Dgate** will have access to the hill-wide Ethernet. Those computers that do not have access to the Ethernet will be relocated to another node in the central facility.

More about this in the April newsletter.

MFE NEWS

REPORT ON RECENT NMFEC User Group Meetings

Sandy Merola
Marty Gelbaum

Two meetings were held during the week of January 21 at the National Magnetic Fusion Energy Computer Center (NMFEC) in Livermore, California.

We¹ attended both meetings. LBL users with Office of Energy Research (OER) computing grants at that facility may find some of the discussed topics of interest.

NMFEC has been the site for nationwide supercomputing in support of national fusion programs since 1974. In that time, two user groups developed: the User Service Center - Special Interest Group (USC-SIG) and the Computer Users Advisory Committee (CUAC). These groups have been meeting once or twice each year.

The NMFEC facility is currently providing supercomputing to the nationwide Energy Research community as well. In light of this, representatives of the facilitating computer centers at Argonne National Laboratory and Lawrence Berkeley Laboratory were invited to join the above groups.

Highlights of USC-SIG Meeting Jan 22-23, 1985

- NMFEC TYMNET usage and costs are steadily increasing. Users are encouraged to use NAP access wherever possible. Users who must use TYMNET are asked to reduce their connect time.

- In support of international fusion research, a network link is being developed between NMFEC and the Institute for Plasma Physics at Nagoya University in Japan.

- While MFE is currently supporting the use of IBM/PCs at user sites, suggestions to support Apple's Macintosh were assigned a low priority by the NMFEC management. (Budget constraints and limited staffing). Their Networking Group gives higher priority to improving remote VAX to NMFEC services.

- Increasing numbers of NMFEC user sites are replacing their PDP-10s with VAX 11/780s and/or

plans for 8600s. Users at most sites are also switching from impact printers to the new laser printing devices.

- NMFEC CAD/CAM users are relying more and more on the use of Computer Vision graphic workstations. There are now 5 remote computing sites with Computer Vision model 4001 CPU's. These workstations operate best when networked via a VAX/NAP. Users were pleased with improvement in CAD/CAM performance since the workstations were installed. The discounted list price is \$385,000 per installation.

PROJECTED IMPROVEMENTS

By the end of 1985, NMFEC hopes to make the following improvements (among others) in its software for connecting VAXes to its Crays:

- **Cluster Support**

If one VAX in a cluster is connected to NMFEC via a NAP,

- users on ANY VAX in the cluster will be able to "netty" to NMFEC
- users on ANY VAX in the cluster will be able to "netout" files from the NMFEC machines to his/her "home" machine.

- **DECnet support:**

If a VAX is connected via DECnet to a VAX with a NAP,

- users on the "NAP-less" VAX will still be able to "netty" to NMFEC
- users on the "NAP-less" VAX will be able to receive files via "netout" from the NMFEC machines.

- **Direct Access to Cray Batch Queues**

Users will be able to "netout" files from a VAX directly into the the CRAY batch queues.

- **"Pulling" Files from the Cray to the VAX**

Users will be able to "pull" files from the NMFEC mainframes to their VAXes, without having to login to the mainframe. This will be somewhat like using DECnet "copy" or our BKYclaim.

- There was some early discussion about integrating MFE protocols into user site local area networks, implementing DECNET, TCP/IP, or some other MFE developed network.

- MFE expects to install a Cray-2 in late April. (It is being acquired this fiscal year on a 5-year

¹Merola is the Assistant Manager for Operations and Networking; Gelbaum is Systems Programmer for VMS/NAP access to MFE

lease-to-ownership agreement.) It installed a Cray-2 simulator on its E machine in early February to support users who wish to generate codes taking advantage of its multiprocessing ability,

- Major continuing hardware problems at NMFECC are attributed to the poor quality of disk maintenance and the continuing unreliability of their ATL.

Highlights of the CUAC Meeting, January 24, 25

- It was announced that a second VAX would be connected to the NAP at LBL early in March. (This has been done. See article below).

- The current operating budget of NMFECC is \$21,000,000. It is supporting 3500 users, thru 258 investigators, at 95 different geographic sites.

- OER supercomputing needs during 1984 were 10,000 hours, during 1985 are 24,000 hours, and are anticipated to be 50,000 hours during 1986.

- OER computing constituted 5% of the use of NMFECC during fiscal year 1984 and is predicted to rise to 30% this fiscal year. (LBL is now the largest OER user of NMFECC; Argonne National Laboratory is a close second.)

- The usage levels of the NMFECC machines so far this fiscal year have resulted in costs of \$896 per CPU-hour for the fusion community and \$596 per CPU-hour for the OER community. The cost differential is a result of the low level of OER use early in this fiscal year. Major increases in OER computing were noted during December.

- The Cray-2 to be installed at NMFECC in April will be turned over to MFE during day shift ONLY. Full-time turnover is forecast for August.

- In fiscal year 1987, OER will initiate the process for the competitive procurement of a Class VII computer.

- MFE, Fusion and OER management noted major budget cuts throughout DOE. These cuts will affect the ability of MFE staff to respond to changing user needs.

- Reduced budget levels may bring about some cost-cutting procedures. For instance, (1) 24 hour notice for operator tape-hang requests; (2) Reduced operations coverage (3) Running some shifts (Sundays for example) without any operator coverage.²

FILEM, NMFECC's long-term storage facility, is being occupied by a large number of old files, 70% of which are never accessed. To discourage unneeded use of FILEM, a new charging algorithm is being developed. (As LBL is a relative newcomer to NMFECC, and we therefore are using much less storage per CPU-hour than the fusion sites, such an algorithm will be beneficial for our site).

- NMFECC has been the site of a security audit, which produced the following findings:

- There are insufficient backups of critical user data.
- A set of criteria determining whether or not a user's data is critical needs to be established.
- Some policy statements about backups need to be established.

Where should the backups be performed?
(NMFECC or facilitating computer centers),

How is this process funded?

Where are the backup tapes stored, etc.?

A CUAC subcommittee was formed to recommend solutions to this problem at the next CUAC meeting. LBL is representing the OER interests here.

- A DOE blue book, "The Role of Supercomputers In Energy Research Programs" has been sent to the publishers and will be available soon. (We'll give you further word on how to get a copy when it is available).

FUTURE MEETINGS

We will continue to participate as members of USC-SIG and CUAC. The next meetings will likely be held in September, probably hosted by the the NYU User Computer Center.

In addition to soliciting your continued comments via electronic mail and telephone, we intend to coordinate a meeting of the LBL NMFECC users in late summer. At that meeting, we can decide jointly on what input we wish to provide to the NMFECC management.

² Because of problems with equipment safety, NMFECC management will probably choose not to exercise this option.

LBL CONNECTION TO MFE : SOME UPDATES

Marty Gelbaum

A new version of the software connecting the **GEN & IGM VAXes** to the **National Magnetic Fusion Energy Computer Center**, ("NMFECC") is up and running. This software has been revised to run under **VMS 4.0** and **LBL** is the very first site in the country to run it outside the **NMFECC**.

This new software connecting our **VAXes** to the **NMFECC** is very similar externally to its earlier versions.

On March 1, the **IGM VAX** was connected to the **NAP**. You can now access the **MFE** computers from either the **GEN** or the **IGM**. **LBL** is the first **VAX**-cluster site with two **VAXes** connected to a **NAP**.

NMFECC users now have access to a line printer in Building 50B (First Floor). If you are working on an **NMFECC** mainframe and wish to print a file (say, "myfile") here at **LBL**, type:

```
netout myfile si=lbv
```

"myfile" will be printed on this lineprinter; you can pick it up at the I/O desk.

You can print Tektronix output from the **NMFECC** on the Imagen Laser Printer, (Bldg. 50B, 3rd Floor DumbWaiter Room). Type

```
help mfetek
```

on the **GEN & IGM** for details and instructions.

Please remember that on the **GEN & IGM**, you need to have a disk quota large enough to store the files you **netout** from the **NMFECC**.

Forward questions, comments, suggestions to me (**martyg@gen**, x4749).

THE EUROPEAN CONNECTION VIA TYMNET

William Jaquith

The Computing Division is providing Lawrence Berkeley Lab computer users access to an international gateway to Europe. This is a Tymnet gateway and it provides access to the European public data networks. **LBL** users must obtain a **Data Network Identification Code (DNIC)** number, an account number, and a password from their colleagues overseas to use this service.

Service to the Tymnet international gateway is available through direct dial to Tymnet local access numbers or through the **LBL Develcon** switch.

LBL users who have terminals that can be set to 1200 baud and whose terminals are autobauding can log on to Tymnet and use Tymnet's long distance trunk lines to reach the international gateway. This service is remote terminal only. It is not possible to transfer files using our Tymnet setup.

The following is an example of a session using **Develcon** to connect to the European gateway.

- (1) You must set your terminal speed to be 1200 baud.
- (2) Your terminal must also "autobaud", that is, after the **TSB** goes to green you must enter a carriage return <cr> to get the "Request:" prompt. Get the green light on your **TSB** (the blue Terminal Support Box) and ask for Tymnet.

Proceed as follows . . .

Request: **tymnet** <cr>³

###xx####xx####

a <cr>

-4175-010-
please log in:**t.blab01**

password

;

:me

:ls

these unintelligible characters are the usual response. On a 300 baud modem you can read the statement "please type your terminal identifier".

This is the most common terminal identifier. You're telling Tymnet that you're using a generic terminal, and allowing it to set the line speed automatically to 300 or 1200 baud. Tymnet responds . . .

t.blab01 will get you to the international gateway.⁴ . Tymnet will ask you for the . .

You can find out this password at the **HELP DESK**. Enter it, (then a carriage return). You'll get a . . .

The semicolon is the Tymnet gateway response. It is normally echoed on the same line as the "password:" prompt (it overwrites the line "password:"). At the semicolon prompt you must enter the **DNIC** (**Data Network Identification Code**) that has been provided by the people that you are contacting in Europe. This **DNIC** will be an 8-12 digit number which will specify the country and the destination host. (The **DNIC** for people in Europe coming to LBL is 3106000179.) At the end of the number you may have to type **:me** or **:ls**.

means that you want connection to the remote site in Europe at **medium** (i.e., greater than 300 baud) speed means that you want a low-speed connection.

user%site.bitnet@wiscvm.arpa

Proceed with a normal login. You may now run an interactive terminal session. When you are finished, log off in the normal manner.

• TYMNET CHARGES

Tymnet charges are figured per minute and per character. We have seen bills that indicate the charges can run to \$40 per hour. The Computing Division will pay all of the charges. If the service is abused, it may become necessary to get separate accounts for all individual users at greater cost to everyone. Please use this service but be aware of its costs.

There are several ways to send mail to European sites. One is to use Tymnet and log on to the remote computer and leave your message. This service can be expensive because of the per-minute and per-character charges.

A second mail path is available to European Bitnet sites. It is possible to use a Milnet/ARPA gateway to get Bitnet nodes. Use software tools mail from GEN, PDM, or NMC. The address form is:

The costs of this mail connection are fixed monthly Milnet charges. There are no per-minute or per-character charges.

Forward comments and questions to me (**jake@lbl-gen, x4388**).

⁴ If you want/need some "other" information first, type after the Tymnet prompt

please log in: **information**

Tymnet will give you a list of options to go through.

Follow the Tymnet prompts to use the menu. Use When you've scanned the information sector, leave normally by typing

exit

To abort before you've run through all the options, type the command "exit" to leave information normally or

<CONTROL>C

³What you type in is in **boldface**.

NEW VAX/VMS KERMIT NOW UP AND RUNNING

Noel Brown

A new **VAX/VMS KERMIT** (Version 3.0.052), recently released from Columbia has been installed on the Computer Services **VAX/VMS** computers (PDM, GEN, NMC, & IGM).

KERMIT is a popular file transfer protocol developed at Columbia for downloading files from mainframes to micro-computers. Users have written implementations of **KERMIT** on a wide range of computers and Columbia distributes the implementations.

Tests were made on the new **KERMIT** by transferring text and binary files between the IBM PC and the **VAX/VMS** machines. Successful transfers of large text files (1.5 megabytes) and large binary files (60 kilobytes) were made.

Several problems have been corrected in the new version of **KERMIT**. Large files now seem to be transferred properly. Previously, some **FORTRAN** formatted files would cause infinite loops. This has been corrected. In fact, the documentation states that "file processing should now handle the transmission of any type of file".

However, **VAX/VMS** text files of record attribute "**FORTRAN CARRIAGE CONTROL**" have "column one" stripped when they are downloaded. If they are changed to record attribute "**CARRIAGE RETURN CARRIAGE CONTROL**", the files will be transferred intact.

Another article in this newsletter entitled "**VAX/VMS** locally defined tools" describes the one-line command to effect this change.

Documentation for this new **KERMIT** can be obtained from the Computing Services Library (50B/1245, ×5529 & ×6094). Two writeups are available:

- a. *VAX/VMS KERMIT* and
- b. *New features & changes to VAX/VMS KERMIT-32*

There is an on-line **HELP** article on **KERMIT** (type "help kermit") as well as a **HELP** facility within **KERMIT**.

You can run the new version of **KERMIT** by typing
\$ **KERMIT**.

The initial prompt will include the new version number. If you are transferring binary files to the **VAX/VMS** system, be sure to issue the **KERMIT** command "set file type binary".

For further information contact Noel Brown (×4387).

VAX/VMS LOCALLY-DEFINED TOOLS

Noel Brown

Periodically, a **VAX/VMS** user needs to perform a software task for which the proper DCL commands are not available or difficult to find. Frequently a system programmer or a user has come up with a solution. We wish to publicize the most useful of these commands, tools, or programs and place them in a common area with convenient access to users.

For instance, many users have wondered how to change the record attribute of a **VAX/VMS** file from "**FORTRAN CARRIAGE CONTROL**" to "carriage return carriage control". This change is useful when printing the file and when using Kermit so that "column one" is not stripped off in the file transfer.

Under the new **VAX/VMS** (4.0) system, the one-line command to change the file record attribute is:

convert/fdl = st_usr:fixcc.fdl <input file> <output file>

Where **convert** is a Digital Command Language utility and accepts as parameters:

<input file> The file with record attribute "**FORTRAN CARRIAGE CONTROL**".

<output file> The output file produced by the utility which will be identical to the input file but will have record attribute "**CARRIAGE RETURN CARRIAGE CONTROL**".

If you have suggestions for new tools or if you have existing tools you would like to publicize, please call me. Noel Brown (×4387).

We don't know a millionth
of one per cent
about anything.

... Thomas Alva Edison
(1847-1931)

NOTE ON THE PERFORMANCE OF THE DEC VAX 8600

Debbie Cahn
William Johnston

Computing Division
Lawrence Berkeley Laboratory

As a result of benchmarks done for an LBL Computing Improvement Project procurement, we have gained some insight into the performance of the VAX 8600. This note will summarize these findings.

Our benchmarks can be divided into three categories;

- (1) the batch performance of the VAX 8600 with a CDC 7600,
- (2) comparison of batch performance of the VAX 8600 with the VAX 11/780, and
- (3) comparison of the interactive performance of the VAX 8600 and VAX 11/780.

In general the comparison with the CDC 7600 is probably the most accurate due to the simple environment of the CDC machine. The results were that the VAX 8600 is approximately 25% of a CDC 7600 for compute-bound codes.

The comparison of the VAX 8600 with the VAX 11/780 for batch jobs indicated that the VAX 8600 is between 2.5 and 4 times the VAX 11/780. The variation is due to a number of things. To cite two: The binary file I/O is approximately equivalent on the two machines (since they both use the same disks and controllers), so codes doing a lot of I/O will not show the same differences as those which do a small amount of I/O. (Binary I/O is cited since coded I/O involves a substantial amount of CPU processing.) The memory cache on the VAX 8600 is substantially larger than the VAX 11/780, a feature whose value is code-dependent.

The comparison of the interactive capability of the two systems is very difficult, the main difficulty being in designing reasonable tests to simulate the interactive environment. The comparisons which were done indicate that

The results of specific comparisons are given below. In addition the VAX 8600 is ranked relative to a large number of other computers in the section titled *Linpac Results*, below.

Comparison Results for CDC 7600 Codes

The following CDC 7600 programs were converted and run as benchmarks.

- *rpw* -- a Real Plane Wave program to calculate electronic band structures and electronic-phonon matrix elements, from MMRD.
- *tough* -- a linear equation solver developed for Earth Sciences Division by K. Preuss.
- *wdb2c* -- a data conversion benchmark. A large 7600 binary data base, World Data Bank II, is searched for values falling within a particular window. The file contains mixed data types in 7600 binary format. The 7600 binary to VAX binary format conversion costs are included in the timings.

The following table compares CPU usage on the CDC 7600 and the VAX 8600. CDC 7600 programs were required to use the *g_floating* double precision format on the VAX 8600. All VAX 8600 timings were for a single program on a single 8600 processor.

Inclusion

	7600 CPU min	8600 CPU min	Ratio 7600/8600
rpw	18.3	71.9	0.25
tough	1.3	6.3	0.16
wdb2c ¹	2.1	34.8	0.06

Comparison Results for VAX 11/780 Batch Codes

VAX 11/780 programs required no conversion. The following VAX 11/780 programs were run as benchmarks:

- *memex* -- a synthetic benchmark designed to exercise memory management and demonstrate the presence of 32M of physical memory.
- *ioex* -- a synthetic benchmark which writes very large files using Fortran sequential, unformatted write statements.
- *rioex* -- a synthetic benchmark which writes large files using Fortran direct-access, unformatted write statements.
- *float* -- a synthetic benchmark testing floating point arithmetic, run in both Fortran and C versions.
- *linpack* -- a standard linear equation benchmark from Jack Dongarra of Argonne National Laboratory.
- *sieve* -- a synthetic benchmark, computing prime numbers, run in Fortran and C versions.
- *wdb2a* -- a data conversion benchmark. A large ASCII data base, World Data Bank II, is searched for values falling within a particular window. The file contains mixed data types encoded in standard ASCII.
- *doe2* -- a large Fortran code for the simulation of energy use in buildings, from Jeff Hirsch of Applied Sciences Division.
- *loc* -- a representative Fortran code from MMRD which solves the electronic wave functions in a localized orbital basis.

	11/780 CPU min	8600 CPU min	Ratio ² 11/780/8600
memex	99.0	28.8	3.4
ioex	41.8	12.0	3.5
rioex	11.9	4.2	2.8
float	25.5	7.9	3.2
linpack	14.9	4.2	3.5
sieve	7.7	2.0	3.9
wdb2a	3.2	1.0	3.2
doe2	241.9	87.4	2.8
loc	284.4	75.1	3.8

Comparison Results for VAX 11/780 Interactive Scenarios

The interactive comparisons were done by using editor scripts to "find and replace strings" globally - in large files, by running the Fortran compiler and by listing file attributes in a single directory (a *dir* command). The data collected was the *turnaround* time for certain operations in a larger scenario. The turnaround time is the time from typing *return*, after entering a command, until the computer is ready for the next input.

Roughly, our measurements showed that for editor searches and directory listing (a prototypical smallest operation) the VAX 8600 running 50 users corresponded to an LBL VAX 11/780 running 15 users. The Fortran compiler

¹ Note that the timing for *wdb2c* includes the substantial cost of converting CDC 7600 binary data to VAX format.

² The VAX 11/780 codes were run using the VAX *d_floating* floating point format, the VAX 8600 codes were run using *g_floating* format, which the 8600 supports in hardware.

is apparently so much faster on the VAX 8600 than the VAX 11/780 that comparisons are difficult. The data we analyzed indicated that several hundred users on a VAX 8600 would do better than even a few users on a VAX 11/780. Probably not true.

Interactive results were difficult to analyze, but, in addition to the ratios indicated above, it was apparent that the VAX 8600 degrades more gracefully than the VAX 11/780. That is, the standard deviations in the measured turnaround times were consistently smaller, and increased at a much slower rate for the VAX 8600 as compared to the VAX 11/780.

The Linpack Results

The following is excerpted from the indicated paper, with the VAX 8600 results inserted in boldface by us. (The complete paper, which includes many CPUs not listed here, may be obtained from Maggie Morley, x5529).

Performance of Various Computers Using Standard Linear Equations Software in a Fortran Environment

Jack J. Dongarra

Mathematics and Computer Science Division

Argonne National Laboratory

Argonne, Illinois 60439

August 22, 1984

The timing information presented here should in no way be used to judge the overall performance of a computer system. The results reflect only one problem area: solving dense systems of equations using the LINPACK programs in a Fortran environment. LINPACK programs can be characterized as having a high percentage of floating point arithmetic operations.

The following table reports timing results using LINPACK to solve a system of linear equations of order 100. It should be noted that no changes were made to the LINPACK software, and no attempt was made to use special hardware features on certain machines, or to exploit vector capabilities or multiple processors. (The compilers on some machines may, of course, generate optimized code that itself accesses special features.)

One further note: The information in the tables was compiled over a period of time. Subsequent systems software and hardware changes may alter the timings to some extent.

Solving a System of Linear Equations with LINPACK * in Full Precision ^b

Computer	OS/Compiler	Ratio ^d	MFLOPS ^c	Time secs
CRAY-1S	CFT (Rolled BLAS)	1	12	.056
CDC Cyber 205	FTN (Rolled BLAS)	1.5	8.4	.082
NAS 9060	VS opt=2	2.3	5.3	.130
CDC Cyber 875	FTN 5 opt=3	2.6	4.8	.143
CDC Cyber 176	FTN 5.1 opt=2	2.6	4.6	.148
Amdahl 5860 HSFPF	H enhanced opt=3	3.1	3.9	.176
CDC 7600	FTN	3.8	3.3	.210
CDC Cyber 760	FTN 5, opt=3	4.7	2.6	.260
IBM 370/195	H enhanced opt=3	4.9	2.5	.275
IBM 3081 K	H enhanced opt=3	5.7	2.1	.321
CDC Cyber 175	FTN 5 opt=2	5.8	2.1	.322

Inclusion

IBM 3081 K	VS opt=3	6.2	2.0	.346
CDC 7600	Local	6.4	2.0	.359
IBM 3033	H enhanced opt=3	7.0	1.8	.390
IBM 3081 D	VS opt=3	7.4	1.7	.415
Amdahl 470 V/8	H enhanced opt=3	7.7	1.6	.429
FPS-164	D, opt=3	9.5	1.3	.529
IBM 370/168 Fast Mult	H Ext	10	1.2	.579
Amdahl 470 V/6	H opt=2	11	1.1	.631
IBM 4381	VS opt=3	13	.96	.718
IBM 370/165 Fast Mult	H Ext	16	.77	.890
VAX 8600	VMS for/opt/G_FLOAT 25.7	.48	1.44	
CDC 6600	FTN 4.6 opt=2	26	.48	1.44
CDC Cyber 170-835	FTN 5 opt=2	26	.47	1.45
ELXSI	EMBOS, F77	28	.43	1.60
Harris H1000	VOS 3.3 opt g	30	.41	1.67
UNIVAC 1100/81	ASCII opt=ZEO	32	.38	1.80
CONCEPT 32/8750	UTX/32	34	.36	1.88
Data General MV/10000	f77 opt level 2	40	.30	2.26
IBM 4361	VS opt=3	41	.30	2.31
Harris 800	Fortran 77	53	.23	2.99
IBM 370/158	H opt=3	53	.23	2.99
IBM 370/158	VS opt=3	56	.22	3.15
CDC Cyber 170-720	FTN 5, opt=2	62	.20	3.47
CDC Cyber 170-825	FTN 5, opt=2	65	.19	3.63
IBM 4341 MG10	VS opt=3	66	.19	3.70
VAX 11/785 FPA	VMS	68	.18	3.79
ICL 2988	f77 OPT=2	85	.14	4.78
VAX 11/780 FPA	VMS	94	.13	5.28
CONCEPT 32/6750	UTX/32	99	.17	5.53
VAX 11/780 FPA	UNIX 4.2 BSD f77	101	.12	5.67
Denelcor HEP	f77	107	.11	5.98
Prime 750	Primos f77 v19.1	107	.11	6.00
VAX 11/750 FPA	VMS v3.4	113	.10	6.87
VAX 11/750 FPA	UNIX 4.2 bsd f77	128	.096	7.15
UNIVAC 1100/62	ASCII opt=ZEO	132	.093	7.38
Data General MV/8000	f77 opt level 2	157	.078	8.80
Ridge 32	f77	179	.068	10.0
Apollo DN 460	FTN opt	208	.059	11.6
VAX 11/750	VMS v3.4	215	.057	12.1
HP 9000 Series 500	Fortran 1.7	285	.043	16.0
IBM 4331	H opt=3	326	.038	18.3
VAX 11/730 FPA	VMS	348	.036	19.5
VAX 11/725 FPA	VMS	348	.036	19.5
IBM PC-XT/370	H opt=3	391	.031	21.9
VAX 11/750	UNIX 4.2 bsd f77	422	.029	23.7
Masscomp MC500 w/FP	UNIX, f77 opt	452	.027	25.3
SUN 2 + SKY board	UNIX, f77 opt	557	.022	31.2

Solving a System of Linear Equations
with LINPACK ^a in Half Precision ^b

Computer	OS/Compiler	Ratio ^d	MFLOPS ^e	Time secs
IBM 3081 D	VS opt=3	6.7	1.8	.376
IBM 4381	VS opt=3	14	.86	.801
VAX 8600	VMS for/opt	14	.85	.81
Harris H1000	VOS 3.3 opt g	22	.57	1.21
CONCEPT 32/8750	UTX/32	23	.54	1.27
ELXSI	EMBOS, F77	23	.51	1.35
UNIVAC 1100/81	ASCII opt=ZEO	24	.52	1.32
IBM 4361	VS opt=3	29	.42	1.65
Data General MV/10000	f77 opt level 2	31	.39	1.75
VAX 11/785 FPA	VMS	36	.34	2.01
IBM 370/158	H opt=3	42	.29	2.35
DEC KL-20	F20	46	.27	2.59
IBM 370/158	VS opt=3	46	.26	2.60
IBM PC-XT/370	H opt=3	303	.040	17.0
DEC KA-10	F40	305	.040	17.1
SUN 2 + SKY board	UNIX, f77 opt	314	.039	17.6
Apollo PEB	4.1	334	.037	18.7
SUN 2	UNIX, f77 opt	966	.013	54.1
Masscomp MC500	UNIX, f77 opt	1015	.012	56.8
IBM PC/8087	Microsoft 3.1	1071	.011	60.0
HP 9000 Series 200	HP-UX	1196	.010	67.0
SUN	UNIX, f77 no opt	1298	.0094	72.7
IBM PC	Microsoft 3.1	21875	.00056	1225.

Notes

^a LINPACK routines *SGEFA* and *SGESL* were used for single precision and routines *DGEFA* and *DGESL* were used for double precision. These routines perform standard *LU* decomposition with partial pivoting and backsubstitution.

^b *Full Precision* implies the use of (approximately) 64 bit arithmetic, e.g. CDC single precision or IBM double precision. *Half Precision* implies the use of (approximately) 32 bit arithmetic, e.g. IBM single precision.

^d *Ratio* is the number of times faster or slower a particular machine configuration is when compared to the CRAY-1S using a Fortran coding for the BLAS.

^e *MFLOPS* is a rate of execution, the number of million floating point operations completed per second. For solving a system of n equations, approximately $2/3n^3 + 2n^2$ operations are performed (we count both additions and multiplications).

March 12, 1985

NAMES & NUMBERS TO KNOW

From on-site, dial <xxxx> From off-site, dial (415) 486-<xxxx> From FTS line, dial 451-<xxxx>

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DEVELCON IDENTIS

COMPUTER	DEVELCON DIRECTORY NAME
PDP 11/70 (UNIX1).....	UX1
PDP 11/70 (UNIX3).....	UX3
VAX 11/780 (UNIX4).....	UX4
VAX 11/750 (UNIX5).....	UX5
VAX 11/750 (UNIX6).....	UX6
VAX 11/780 (VMS).....	GEN
VAX 11/780 (VMS).....	PDM
VAX 11/780 (VMS).....	NMC
VAX 11/780 (VMS).....	IGM
CDC 6600B, 6400C.....	RECC
IBM 3081 (UCB).....	CCDB

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Concord	682-3851	Vallejo	707-557-0333
Pleasanton	462-8900	Fremont	490-7366
San Francisco	974-1300	Antioch	778-3420

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Assistant: Sandy Merola4389 50B - 2239B
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Coke Operator5311 50B - 1275
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UX4/UX5/UX6 System Manager6720 50B - 1232
UX1/UX3 System Manager7005 50B - 1232
IGM/GEN System Manager5610 50B - 2245
NMC/PDM System Manager5234 50B - 2262A
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With these exceptions.

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	Th.....	7 AM to 9 AM
6600B.....	T.....	7 AM to 9 AM
6400C.....	M.....	7 AM to 9 AM
UX1 - PDP 11/70.....	Thur 3/07.....	12:30 to 6 AM*
UX2 - PDP 11/70.....	Sat 3/16.....	12:30 to 6 AM*
UX3 - PDP 11/70.....	Tue 3/19.....	12:30 to 6 AM*
	Wed 3/20.....	12:30 to 6 AM*
UX4 - VAX 11/780.....	- - - - -	- - - - -
UX5 - VAX 11/750.....	- - - - -	- - - - -
UX6 - VAX 11/750.....	- - - - -	- - - - -
IGM - VAX 11/780.....	Mon 3/04.....	12:30 to 8 AM*
NMC - VAX 11/780.....	Mon 3/18.....	12:30 to 8 AM*
GEN - VAX 11/780.....	Mon 3/11.....	12:30 to 8 AM*
PDM - VAX11/780.....	Mon 3/25.....	12:30 to 8 AM*
DICOMED - PDP 11/34.....	Sun 3/03.....	8:30 AM to 4 PM

* Subject to Additional Maintenance Periods

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 • All machines - 1200 BPS .. 486-4979
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 UX3 Direct Line - 300 BPS 486-7020
 RECC : 110 BPS 486-6351
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Address all communications for the Newsletter to Maggie Morley, Editor,
50B/1245 (415) 486-5529; or to login **mam** on UX4

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