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PUB-429

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Volume 21, Number 5
June/July, 1984

# L B L COMPUTING NEWSLETTER

## H I G H L I G H T S  I N  J U N E

**7600 DEPARTURE DATE EXTENDED** - TO JUNE 30, 1985

To ensure a smooth transition period from the old system to the new one. (Page 4)

**NFTQ** -- TRACKING YOUR JOB IN THE QUEUE

We activated the system utility **"nftq"** to enable users to track queue status of their UNIX jobs. (Page 5)

THE **HP-110** IS YOURS FOR 24 HOURS.

A sleek, battery-driven computer the size of a small attache case. Take it home it for a short-term trial and evaluation. (Page 4).

**DECnet / ETHERnet CONFIGURATION** -- MORE NODES

This issue's map is part I of a three-phase re-draw. Bill Jaquith introduces Parts II and III in later issues. (Page 10)

**NAG, MARK 10** IS UP ON THE VAXES

Latest Version of the Numerical Algorithms Library, said by many to be Best of Breed. (Page 6)

PUB-429

# NAMES & NUMBERS TO KNOW

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

COMPUTING DIVISION
Head: Leroy Kerth ..... 7474 50B – 2232

OFFICE OF COMPUTING RESOURCES
Head: Ken Wiley ..... 7083 50B – 2258

ADVANCED DEVELOPMENT GROUP
Head: Dennis Hall ..... 6053 50B – 3238

COMPUTING SERVICES
Central Office ..... 5871,2 50B – 2239
Guest Cards & Parking Permits ..... 5947 50B – 2239

COMPUTING SERVICES
**Operating Systems & Product Set**
Head: Jerry Borges ..... 5568 50C – 106

COMPUTING SERVICES
**Applications Group**
Head: John Colonias ..... 6019 50B – 2262B

COMPUTING SERVICES
**User Services**
Head: Eric Beals ..... 5351 50B – 4224C
Accounting ..... 6310 50B – 4224B
Library/Document Sales ..... 6094 50B – 1237
Short Courses, VAX ..... 5947
Short Courses, UNIX ..... 5529 50B – 1245A
GSS Tape Repair Service ..... 6094 50B – 1245
Sticky Label Service ..... 6094 50B – 1245

COMPUTING SERVICES
**Computer Operations & Networks**
Head: F. Marvin Atchley ..... 5455 50B – 2239A
Assistant Mgr: Sandy Merola ..... 4389 50B – 2239B
Operations Area ..... 6211 50B – 1215
Cope/Coke Operator ..... 5311
Connecting a Remote Terminal ..... 7444 50B – 2249A
PSS (Program Storage System) ..... 6219 50B – 2249
Bldg 90 RJE ..... 5450 90 – 3136
Terminal or Port Repair ..... 5354 50B – 2259
Help Desk ..... 5981 50B – 1232
UNIX System Manager ..... 7005 50B – 1232
IGM System Manager ..... 6720 50B – 1232
NMM, PDM System Manager ..... 5234 50B – 2262A
Expediter Services ..... 6205 50B – 2249
Magnetic Tape Library ..... 6219 50B – 2249
Keypunch Service ..... 6256 50B – 2215A

**Dial-up Access to Develcon**
300 BPS ..... 486-4959
1200 BPS ..... 486-4979
VA-3400 & 212A are equivalent

**Operating Hours**
All machines are available 24 hours daily.
With these exceptions.

| | | |
|---|---|---|
| 7600 | M | 5 AM to 8 AM |
| | Th | 6 AM to 8 AM |
| 6600B | T | 5 AM to 8 AM |
| 6400C | M | 5 AM to 8 AM |
| COM | T | 7 AM to 9 AM |
| PSS | W | 6 AM to 8 AM |
| UNX1 | Sat 7/ 7 | 12:30 to 6 AM |
| UNX2 | Thur 7/19 | 12:30 to 6 AM |
| | Fri 7/20 | 12:30 to 6 AM |
| | Sat 7/21 | 12:30 to 6 AM |
| UNX3 | Tues 7/24 | 12:30 to 6 AM |
| IGM | Tue 7/17 | 12:30 to Noon |
| NMM | Sun 7/22 | 12:30 to 8 AM |
| | M 7/23 | 12:30 to 8 AM |
| PDM | Tue 7/10 | 12:30 to 8 AM |

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**Newsletter Closing Date is Monday, July 16, 1984** . . . and no later.

Address all communications for the Newsletter to Maggie Morley, Editor, 50B/1245 (415) 486-5529; or to login **mam** on all machines.

**VOGUE LA GALÉRE**

# 7600 AVAILABILITY EXTENDED

## The 7600 will be available until June 30, 1985 -- at least.

The LBL Computer Improvement Project calls for the acquisition of a new system in February or March of 1985. The CDC 7600 will be available until that time -- as well as for some transition period after it. The length of the transition period has not been defined at present. A decision on the length of the overlap will be made no later than November 1984.

From October 1, 1984 until shut-off date, (> June 30, 1985), users can run on the CDC complex at half the current price. **BACKGROUND** jobs will be charged as if they were **DEFERRED**.

LBL will continue to accept work for the 7600 from non-LBL users as long as the equipment is at LBL.

# DEPARTMENTAL MATTERS

*. . . Time for Spring Cleaning*

## ABOUT INACTIVE TAPES

Marv Atchley

It's time to review your inactive tape lists, and delete those tapes you no longer want. We would appreciate your deleting any unused tapes from your active library as well, especially if the tape numbers are between 16345 and 34000. We will be sending a letter to all group czars as a reminder.

We've received a new ruling from the Federal Records Center in Burlingame, (where Tape Services stashes great numbers of our user tapes). As follows . . . Tapes may be stored in that facility for a maximum of 15 years. And no longer. (The FR Center is presently running out of space, due to the excessive number of tapes being stored there.)

Also, please note a change in our Tape Services' hours. We are now open from 8 AM to 5 PM MONDAY through FRIDAY. For questions, contact Tape Services, x6218, or **smokey** on **unx3**.

*. . . Smaller Than a Breadbox*

## HP PORTABLE COMPUTER AVAILABLE FOR SHORT-TERM LOAN

Richard La Pierre

The Hewlett-Packard 110, a battery-driven portable computer the size of a collegiate dictionary, (13″w × 10″d × 3″h), is available to LBL employees for short-term trial use and evaluation. (Contact the Computing Division Library, x5529 or x6094.) This 8 ½ lb. unit features

- terminal communications (MODEM)
- word processing
- Lotus 1-2-3
- MS-DOS 2.1 software stored in internal ROM

Laboratory employees can purchase the unit for $2160.

Those wishing to borrow the unit should have experience in micro-computer operating systems, word-processors, and/or Lotus 1-2-3-style spreadsheets. For more info and technical assistance, contact Richard LaPierre, x4692.

# SYSTEMS NEWS

## COMMENTS ON KERMIT

Bob Rendler

As announced in the April/May Newsletter, KERMIT has been installed and tested on the three Computer Center VAXes and the two UNIX systems.

**KERMIT** is a family of programs that do reliable file transfer between computers over communication lines. KERMIT can be used to make a microcomputer behave as a terminal for a mainframe, or to transfer files from one computer to another. Kermit was developed at the Columbia University Center for Computing Activities (CUCCA). It is non-proprietary, thoroughly documented, and in wide use.

The locally-written document, "Using Kermit at LBL", and the Columbia University documents, the "Kermit User Guide" and the "Kermit Protocol Handbook" are available at the Computer Division Library, (50B/1245A, x6094). Online information about using KERMIT is also available by entering **man kermit** on UNIX and **help kermit** on VMS.

A two-part article about KERMIT, written by Frank da Cruz and Bill Catchings of CUCCA, will appear in the June and July issues of BYTE magazine. The article discusses the motivation for KERMIT, problems of asynchronous communciation, and will present an overview of the protocol.

We had to install some local modifications to both VAX and UNIX versions of KERMIT in order to let the KERMIT protocol fit into the Computer Center computing environment -- and to ensure user security. (During the testing of KERMIT, we discovered that if a user did not connect back to his remote host computer to log out that computer after a KERMIT session, he left his remote directory vulnerable. The next user initiating a KERMIT session and attempting to connect to a remote host computer would find herself in the previous user's remote directory with all HIS (i.e., previous owner's) permissions (i.e.,

Users porting software from other sites for private use on the Computer Center's computing systems should be aware that similar pitfalls may exist.

For more info, contact Bob Rendler (**ren : unx3**) or Noel Brown, (**nbrown : pdm**).

## "NFTQ" - NEW JOB STATUS TRACKER FOR UNIX USERS

Don Zurlinden

You can now track your UNIX job in the print queue -- using the system utility "**nftq**".

We've installed it on UNIX 1, 2 & 3. It will give a list of queued files, and show you their **RANK** in the queue, **FILENAMES**, their **AGES** in minutes, **PRIORITY**, and **SIZE** in bytes and **LOGIN NAMES**. type in

% **nftq** [**service_key**]

The service_key might be one of the five following characters:

| Service_key | Queue Name |
|---|---|
| a | APS Typesetter Queue* |
| i | IBM Printer Queue |
| q | Qroff Input Queue |
| v | Versatec Print Queue |
| D | "Done" Queue - Completed APS Typesetter Jobs* |

To view the versatec output queue on UNIX 3, for an example, type

% **nftq v**

and you'll get, for an example, the message --

UNX3 - Versatec Print Queue
Mon 14 Jun 84 14:25:14
3 files in queue

| RANK | FILE NAME* | AGE | P | SIZE | LOGIN |
|---|---|---|---|---|---|
| 1 | U15644 | 45 | N | 6870 | alice |
| 2 | U15834 | 11 | N | 31873 | ferd |
| 3 | U15979 | 43 | N | 50750 | root |

---

* Not presently available

To view the versatec output queue on UNIX 3 from UNIX 1 type

% **uhnet nftq v**

Not all queues are available on all machines.

| | |
|---|---|
| On UNIX 1, | you can get Qroff input and IBM printer output. |
| On UNIX 2 | you can get Qroff input and APS Typesetter Print jobs. |
| On UNIX 3 | you can get Qroff Input, Versatec Print jobs, and IBM Print jobs. |

For more info, contact Don Zurlinden (**zurln:unx3**)

## NAG LIBRARY, MARK 10 AVAILABLE ON ALL VAXES

Bill Hogan

The latest release (Mark 10) of the NAG library of mathematical and statistical subroutines is available on the PDM, NMM, and IGM Vaxes. To use it, type

**$ link yourmain,sys_nagd10/lib**[1]

After July 15, 1984, the system logical name "**sys_nagd10**" will disappear and the system logical name "**sys_nagd**" will refer to NAG Mark 10.

### CHANGES

- C05NAF is the only primary ("user-callable") subroutine that was dropped with the release of Mark 10. You can replace C05NAF with either of the two Mark 10 primary subroutines, C05NBF or C05NCF.
- Mark 10 contains 28 new primary subroutines.

### DOCUMENTATION

- "*Fortran MINI MANUAL Mark 10*" explains how the library is organized, and explains exactly how to select the best subroutine to use for given applications.
- "*NAG Library Reference Manual*" gives details about using each of the primary subroutines in NAG Mark 10, and shows an example of using each one. The reference manual is available in loose-leaf binders and on microfiche.

  You can order the minimanual and the reference manual from the Computing Services Library. Also, one copy of each is available for reading at the **HELP DESK**.
- "*NAG FORTRAN MARK 10 LIBRARY CONCISE SUMMARY*" is what the title suggests. You can see it by typing

  **$ type pdm::sys_usr5:[erclib.nag10]summary.doc**

  Substitute "iprint" for "type" in the preceding command to obtain a printed copy (846 lines).

### EXECUTABLE EXAMPLES

On PDM only, you can obtain an executable example of using any of the 492 primary subroutines in NAG Mark 10 by defining this symbol:

**$ getnagtest:==@sys_usr5:[erclib.temp]getnag10.com**

Then, if you type, for example,

**$ getnagtest G13CDF**

A Fortran program that uses NAG subroutine **G13CDF** will be delivered, compiled, linked (using "**sys_nag10**"), and executed. These examples are not fancy, but they work.

### 7600 NAG USERS PLEASE NOTE . . .

NAG Mark 10 has not (yet) been installed on the 7600. In particular, all NAG subroutines present in the CORE Library are from Mark 9.

For further info, contact Bill Hogan, **hogan @ pdm**, or Elon Close, x6166.

[1] instead of "$ link yourmain,sys_nagd/lib"

# GRAPHICS NEWS

## IBM PC AND TELL-A-GRAF ADD A NEW DIMENSION TO PRESENTATION GRAPHICS AT LBL

Claudette Lederer
Cammie Edgington

The IBM PC can now be optioned to run TELL-A-GRAF and easily create presentation graphics which can be . . .

- ⊙ routed to high-resolution hardcopy devices
- ⊙ viewed or saved on the IBM PC
- ⊙ used in a slide projector mode, as a stand-alone exhibit or demonstration.

Any IGM VAX user with a suitably equipped IBM PC can purchase ISSCO's IBM PC Graphics Interface to create presentation-quality graphs which can be routed to high-resolution hardcopy devices at the Computer Center. In addition, the ISSCO Graphics Interface enables the IBM PC to do local review and local storage of graphs, and with such graphs properly ordered on the IBM diskette, the IBM PC can be put in a Slide Projector mode to do either manual or user-timed selected viewing of the stored graphs.

To support this ISSCO IBM PC Graphics Interface the IBM PC must be equipped as follows:

- ⊙ IBM PC with at least 96K memory
- ⊙ IBM color/graphics monitor adapter (also called "color display controller card"). The color/graphics monitor adapter is required whether or not a color display is being used.
- ⊙ IBM 5 1/4" diskette drive (single- or double-sided)
- ⊙ IBM asynchronous communications adapter (also called "RS232 communications card")
- ⊙ IBM DOS (Disk Operating System) version 1.10, 1.2 or 2.0.

To produce the presentation-quality graphs, the user must establish communication with the IGM VAX using the IBM PC and his ISSCO Graphics Interface and run TELL-A-GRAF to produce graphs on the IGM VAX. The low- to medium-resolution IBM PC display is excellent for previewing plots before routing to hardcopy devices supported by the Computer Center; or they may be viewed and printed at the PC, and/or even stored on the PC's diskette.

The following is a itemized summary of the features offered by the ISSCO IBM PC Graphics Interface:

- ⊙ Use of the IBM PC as a remote alphanumeric terminal. (The software isn't emulating any other brand of terminal, but it is tailored to the IBM PC.)
- ⊙ Use of the IBM PC as a graphics terminal to create and display plots generated by TELL-A-GRAF on the IGM VAX.
- ⊙ Save plots on diskette for later display.
- ⊙ Generate printed copies of plots, if you have the optional IBM parallel printer adapter (also called the "printer card") and the IBM matrix printer (or Epson MX80 printer) with GRAFTRAX-80 (also called IBM 80 CPS dot matrix printer with graphics).
- ⊙ Use of IBM PC as a "slide projector" to view plots that have previously been generated and stored on diskette.

To purchase ISSCO's IBM PC Graphics Interface, ($245), contact the LBL Computer Center Library (50B/1245, x6094).

## NEW LINKING PROCESS FOR DI-3000

Vivian Morgan

A new linking process is required for the test version (4.05) of the DI-3000 graphics system (See the April/ May Computing Newsletter for a description of the new features and organization of DI-3000) . You will need to modify any of your command procedures which link DI-3000 modules *BEFORE JULY 11*, when the test version becomes the production version.

To aid the user, PVI (P recision Visuals, Inc.) has provided command procedure **DI3LOAD**.

$ **DI3** Define DI3000 symbols
(Use TDI3 until July 11)
$ **FORTRAN** < Your program >
$ **DI3LOAD** P1 P2 P3 ... Pn
$ **RUN** < Your program >
**P1** = < Your program >
**P2** = Device driver code

The Device Driver Code is one of the following three character codes:

| | |
|---|---|
| **T14** | Tektronix 4014 ( ADM3A with Retrographics) terminal |
| **405** | Tektronix 4105 terminal |
| **AED** | AED 512 terminal |
| **IML** | IMLAC Series II terminal |
| **125** | VT125 terminal |
| **HP2** | HP2647/8 terminal |
| **ZTQ** | ZETA 1453 4-pen plotter |
| **CAL** | CALCOMP 84 8-pen plotter |
| **721** | HP721 8-pen plotter |
| **DIC** | DICOMED D48 film recorder |
| **LPR** | Printer |

**P3 = X** - if DI3000 EXTENDED is desired

**P3..Pn** = MF, CN, EZ, GK, or a LINK parameter such as / DEBUG/EXE=ABC (MF=Metafile driver, CN=Contouring, EZ=Grafeasy, GK=Grafmaker)

Examples:

To link your program (P1) to the Standard DI-3000, the Tektronix 4014 device driver (P2), Grafmaker (P3) and the Metafile driver (P4) :

$ **DI3LOAD** < Your program > **T14 GK MF**

To link your program (P1) to DI-3000 Extended (P3), the IMLAC device driver (P2), and the Metafile driver (P4) with the LINK parameter / EXE=TEST (P5):

$ **DI3LOAD** < Your program > **IML X MF / EXE=TEST**

To link your program (P1) to DI-3000 Extended (P3) with the Metafile driver (P4) and no device driver -- the NULL driver DUM (P2) (DUM may only be used for P2.):

$ **DI3LOAD** < Your program > **DUM X MF**

To postprocess a Metafile, you specify the device driver in a different way. A symbol that includes the three-character device-driver code has been defined for the Metafile Translator of each device.

For example, to RUN the Metafile Translator on the Tektronix 4105 terminal --

$ **DI3** (Define DI3000 symbols - Use **TDI3** until July 11)

$ **RUN 'MTR405'**0 (MTR for Metafile Translator and 405 for the Tektronix 4105 driver. Single quotes *are* necessary for a symbol)

Similarly, to RUN the Metafile Translator on the AED 512 terminal --

$ **DI3**
$ **RUN 'MTRAED'**

Other device driver codes will be defined when new drivers are acquired. Six new drivers are expected soon. They are --

Versatec V-80 12 inch plotter
Versatec F-8000 36 inch plotter
Trilog TIP-300 printer
Tektronix 4114 terminal
VT240 terminal
IBM PC

For additional information, type

$ **HELP @GRAFHELP DI3000** (Use **TDI3000** until July 11).

# CLASSES & SEMINARS

Computing courses are now being offered through the Employee Training and Development (known hereafter as "ET&D") Office of the Laboratory's Personnel Department. Enrollment is limited to 15 participants for each course. All courses will be held in the Computing Services Training Rm, 50B/1229 from 10 AM to noon.

For detailed course descriptions, contact your division office. If you have any additional questions regarding these courses, contact the ET&D Office, (Eleni Yatar) x5411.

**TO REGISTER:**

*LBL EMPLOYEES*: As with all on-site training courses, obtain supervisory approval and submit the **ON-SITE ENROLLMENT APPLICATION** form to the ET&D Office.

*Non-LBL EMPLOYEES*: Contact Lisa Long or Peggy Yamada in the Computing Services Office, 50B/2239, x5871. They will submit the **ON-SITE ENROLLMENT APPLICATION** form to the ET&D Office.

A list of upcoming summer courses follows.

**SUMMER COURSES**

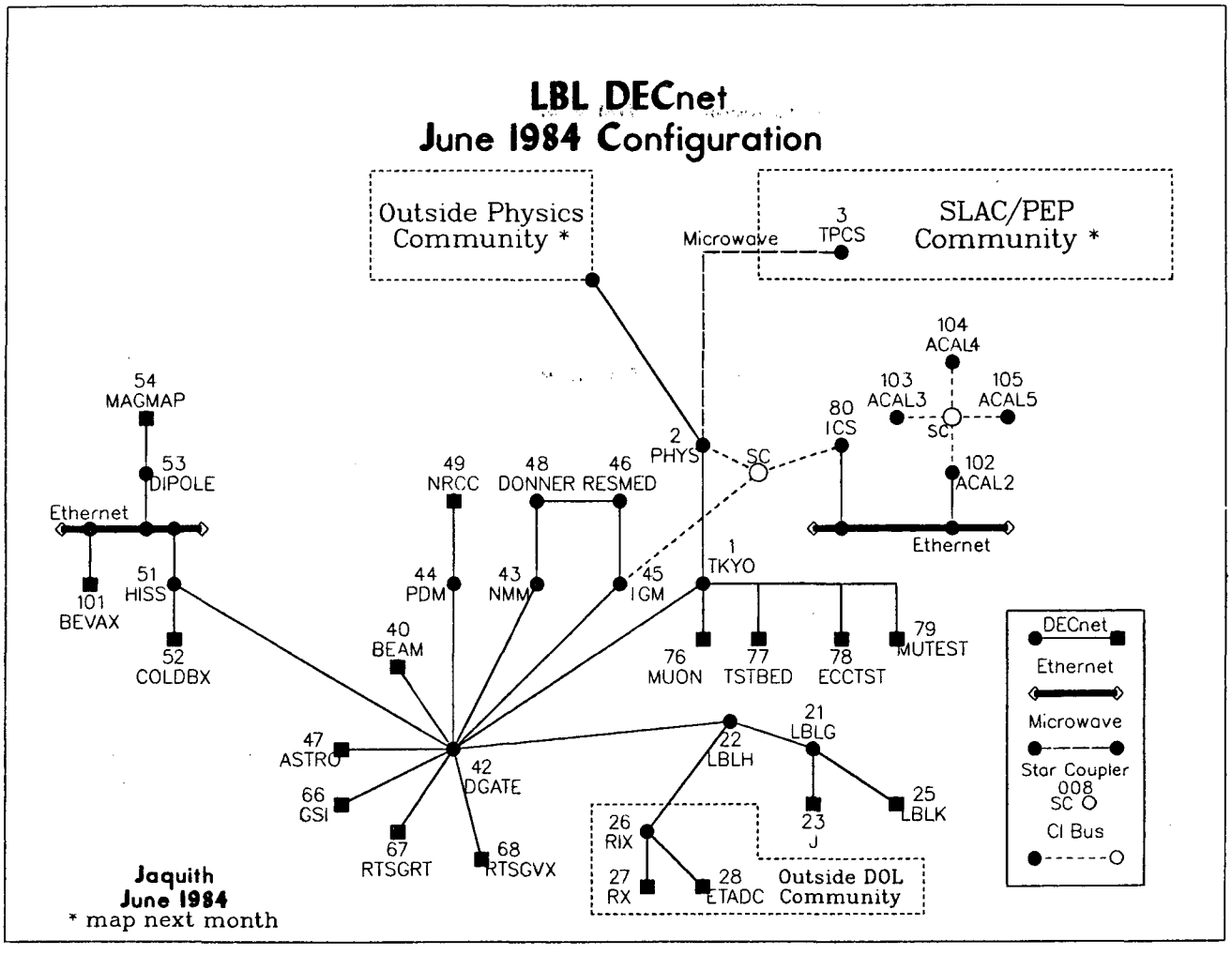
| COURSE TITLE | DATES | TEACHER(S) |
|---|---|---|
| INTRODUCTORY GRAPHICS COURSE | July 24 & 26 | Cammie Edgington & Yee Chan |
| INTRODUCTION TO ISSCO GRAPHICS | July 31, Aug 2, 7, & 9 | Cammie Edgington |
| INTRODUCTORY PVI PACKAGES | Aug 14, 16, 21, 23 | Yee Chan |
| INTRODUCTORY VAX COURSE | Aug 15, 17, 22, 24 | Noel Brown |
| INTRODUCTION TO MOVIE.BYU SYSTEM | Aug 28 & 30 | Cammie Edgington |
| INTRODUCTORY "C" PROGRAMMING | Oct 16, 18, 23, 25 | Marty Gelbaum |

As of July 24, all classes will administered thru the ET&D Office. All such [Laboratory-offered] courses will require an on-site Training form signed off by a Supervisor, Department Head, and Division head.

## SUMMER SCHEDULE FOR LOCAL USER GROUPS

Lab folks who are interested in establishing a Local User Interest Group on site should contact Dennis Hall, x6053.

| Interest Area | Contact | Meeting Time | Meeting Place | Speaker | Program |
|---|---|---|---|---|---|
| DATATRIEVE | Valerie Sherriffe x4460 | 2:30 PM Wed July 11 | 50B/4205 | Virginia Sventek | Upcoming Classes |
| VAX | Nancy Travis, x6411 | 2 PM Tues July 10 | Call | | General Discussion |
| UNIX | Maggie Morley x5529 | 1:30 PM Mon July 23 | 50A/5132 | | Selected Topics |
| TYPESETTING | Ed Whipple, x7167 | Call | | | |
| RT-11 | Mike I. Green x4607 | Noon 1st Thur/mo | Bldg. 46A Conf. Rm | Call | |
| RSX-11 | Everett Harvey x6411 | 2 PM 4th Thur/mo | Bldg. 46A Conf. Rm | Call | |




This map represents projected vision of the DECnet/Ethernet configuration by summer. As we install more of the Ethernet, we will update the map to reflect the changes. The Ethernet we are currently installing is an example of a bus or multidrop network.

The Digital Equipment Corporation network at the Laboratory is changing as LBL moves from DECnet, Phase III to DECnet, Phase IV/Ethernet. Phase IV allows for bus-type topologies. Two reasons for the change to Phase IV/Ethernet are (1) higher data transmission speeds and (2) decreased reliance on central routing nodes.

The number of nodes on the network is increasing. The map in this issue shows nodes at LBL primarily. In later issues of this Newsletter, we will show additional maps representing the nodes at SLAC/PEP and sites of the outside physics community as well as depictions of other sectors of the now-emerging Central Research Facilities Ethernet of which DECnet or Ethernet is only a part.

Users can continue to utilize the network exactly as they always have. (References to nodes will not change.) All of these configuration changes will be transparent to users.

Please address comments to **Jake @ NMM**.

# SYSTEM MANAGER'S NOTES

## VAX DATATRIEVE V2.2

Software for the **VAX DATATRIEVE** Version 2.2 Updates is here and has been installed on the three Computer Center VAXes. Associated documentation can be ordered by request to the Computer Center Library.

**Nota bene**: Availability of documentation always depends upon **promptness of delivery** from DEC.

| PART NO. | PART TITLE |
|---|---|
| AV-L770D-TE | *"Before you install VAX-11 Datatrieve Version 2"* |
| AD-P860B-T1 | VAX Datatrieve Reference Manual Update #1 |
| AD-K080B-T1 | VAX Datatrieve User's Guide Update #1 |
| AD-L631B-T1 | VAX Datatrieve Guide to Using Graphics Update #1 |
| AD-P860A-T2 | VAX Datatrieve Summary Description Update #2 |
| AA-AJ56A-TE | VAX-11 Datatrieve Installation Guide and Release Notes. |

- - - - -

## VAX/VMS V3.6

Software for the **VAX-VMS** Version 3.6 Update has arrived and is ready to be installed. The following associated documents can be ordered by special request to the Computer Center Library.

| PART NO. | PART TITLE |
|---|---|
| AE-V230Y-TE | Cross reference table SPD 25.99.24 |
| AA-V332A-TE | VAX/VMS Release Notes V3.6 |

A set of microfiche is on file in the Computer Center Library if needed. If you wish to have a set of fiche, you may make arrangements with Maggie Morley, x5529.

## VAX PASCAL V2.4

Software for the **VAX-VMS** Version 3.6 Update has arrived and has been installed. The following document is available by special request to the Computer Center Library.

| PART NO. | PART TITLE |
|---|---|
| AV-R581-TE | Cover letter |

- - - - -

## VAX CDD V2.3 SUPPLEMENT

The VAX CDD V2.3 supplement consists of one document, as follows:

| PART NO. | PART TITLE |
|---|---|
| AD-R351-T1 | VAX/Information Directory Master Index Update |

- - - - -

## VAX-11 DEC FORTRAN V3.5 UPDATE FOR VAX-11/730 & VAX-11/750

Software for the VAX-11 DEC Fortran V3.5 Update for VAX-11/730 and VAX-11/750 is here. The following document is available by special request to the Computer Center Library.

| PART NO. | PART TITLE |
|---|---|
| AA-H953C-TE | VAX-11 Fortran Installation Guide/Release Notes |

- - - - -

## RT-11 V5.1

Software for **RT-11** Version 5.1 has arrived and is now available from Randy Michelson (x6411) at the cost indicated.

| SOFTWARE UPDATE | COST |
|---|---|
| RT-11 Version 5.1 | $188.00 |

- - - - -

The following software, available since Version 5.0 of RT-11, may still be ordered.

| SOFTWARE UPDATE | COST |
|---|---|
| FORTRAN Version 2.6 | $104.00 |
| BASIC Version 2.1 | 74.00 |

Update licenses may only be ordered for currently-licensed CPU's, and each CPU requires an update license. (New licenses must be purchased separately.)

For further info, contact the Office of Computing Relations, x5458.

- - - - -

The Computing Newsletter, published monthly, provides much useful current information to our users and is mailed to them free, upon request.

Computing Services Library
Bldg. 50B, Rm. 1245
Lawrence Berkeley Laboratory
Berkeley CA 94720