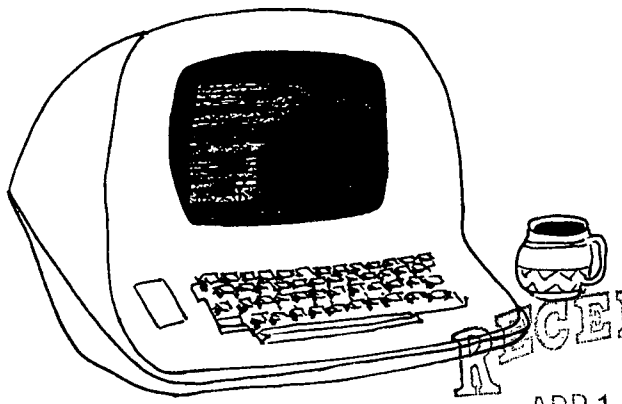
DISCLAIMER



LBL COMPUTING NEWSLETTER

Lawrence Berkeley Laboratory
University of California, Berkeley

Volume 19, Number 4 **April, 1982**

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To get on the mailing list for the LBL Computing Newsletter, contact Dortha Hines, 50A/1148, x6094.

Newsletter Closing Date is the 15th of the month.

Please send all Newsletter correspondence to Maggie Morley, Editor, Bldg. 50B, Rm. 1245A, (415) 486-5529; or **UNIXmail** to login name **mam** on UNX1, TID7, or UNX3.

Publication Number 429

Names and Numbers to Know

From on-site, dial the 4-digit extension given.
From an FTS line, dial 451-<4-digit extension>.
From off-site, dial 486-<4-digit extension>.

Computation Department

Paul Rhodes, Department Head.....50B/2232E, x5224
Howard White, Deputy Department Head.....50B/2232A, x5775
Margaret Yamada, Administrator.....50B/2232B, x6287
Everett Magnuson, Budget Manager.....50B/2232C, x6296
F. Marvin Atchley, Computer Operations.....50B/2262A, x5455
Marjory Simmons, Consulting.....50A/1129A, x6289
Eric Beals, User Relations.....50B/2232D, x5351
Robert Fink, Networks.....50A/1121A, x5692
Jerry Borges, Operating Systems.....50A/1127A, x5568
Jerry Borges, Product Set.....50A/1127A, x5568
John Colonias, Applications.....50/209A, x6019

Departmental Services

Central Office Number.....x5871, x5872
Consultants' Office.....50B/1245, x5981
Computation Department Library: Maggie Morley.....50B/1245A, x5529
Operations.....x6211
Coke/Cope Operator.....x5311
Expediter Services: Irene Bernal.....50B/2249B, x6205
Keypunch Service: Verneice Arnett.....50B/2215A, x6256
PSS (Program Storage System): Tape Services.....50B/2249, x6219
GSS Tape Repair Service; Dortha Hines.....50B/1245, x6094
Sticky Label Service: Dortha Hines.....50B/1245, x6094
Building 90 Remote Job Entry (RJE) Station: Connie Sheldon.....90/3136, x6494
To open or change an account, Fran Permar.....50B/2258, x6310
Guest cards, locker space, & parking permits: Marlene Collins.....50B/2232, x5654
To connect a remote terminal (RJE or interactive): Sig Rogers.....50B/2262C, x6713
For repair of terminals or ports: Electronics Maintenance.....50B/2259, x5354
Introductory seminars: UNIX: Maggie Morley.....50B/1245A, x5529
To sign up for VAX classes: Lisa Long.....50A/1127, x5947
For microfiche sets of WRITEUPS and HANDBOOK: Dortha Hines.....50B/1245, x6094

PUB-429 4-82/1300 Prepared for the U.S. Department of Energy under Contract DE-AC03-76SF00098

FORMATION OF THE LBL COMPUTATION DEPARTMENT

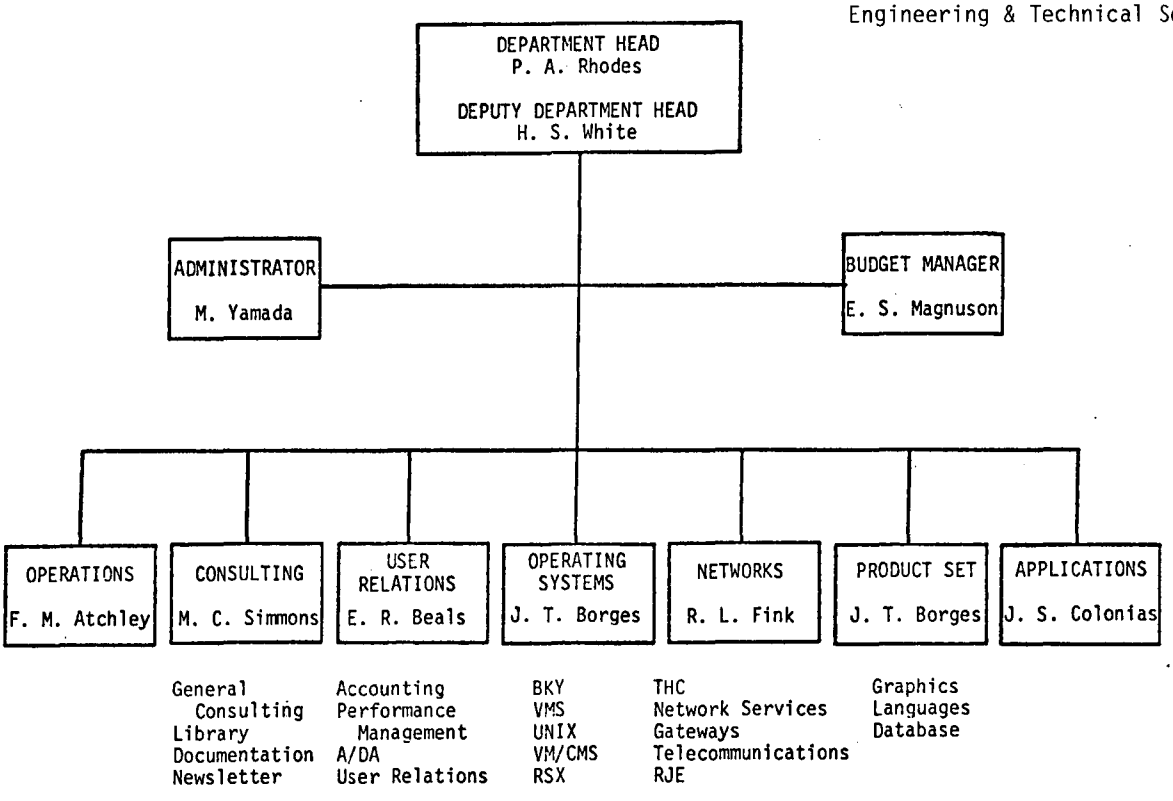
Effective February 1, 1982, the Computer Applications Department and the Computer Center were combined to form a new **LBL Computation Department** within the Engineering and Technical Services Division.

This organizational change is being made to further integrate the Laboratory's computing resources as initiated by Director David Shirley in the reorganization of computing activities announced June 18, 1981. The move is also in line with cost savings measures being implemented in response to recent reductions of Laboratory funds.

Paul Rhodes is Department Head and Howard White is Deputy Department Head of the Computation Department. The Department will report to me through Robert J. Harvey, Deputy for Computing, and is one of the components of the Office of Computing Resources, as defined in Administrative Memo No. 3, Vol. 7, dated 18 June 1981.

On behalf of the Laboratory, I would like to express our appreciation to Leo Vardas and John Colonias for their work and dedication as heads of the Computer Applications Department.

. . . Walter D. Hartsough
Associate Director
Engineering & Technical Services



CHANGES IN COMPUTATION DEPARTMENT CONSULTING SERVICES

The Computation Department Consultants Group has recently had changes in personnel -- a result of the Reduction in Force in the E T & S Divison. The following people constitute the present staff:

Uzi Arkadir
Noel Brown
Tom Clements
Terry Edington
Jim Miller
Ed Rosenthal
Marjory Simmons

The new people in the group are experienced programmers, but it will be some time before everyone is up to speed in all the areas that a Consultant needs to be acquainted with in order to do an efficient job. We ask the indulgence of the user community during this period of adjustment.

. . . Marjory Simmons, x6289

>> LIBRARY MATTERS <<

NEW LIBRARY DOCUMENT AVAILABLE

WRITEUPS subset **LIBRARY**, the document which lists all the mathematical and statistical software available at the LBL Computation Department, has recently been expanded and updated. It presently includes four additional libraries, more detailed contents of existing libraries, instructions on how to use the IMSL and NAG libraries on the VAX computers, and a more detailed index. You can obtain a copy by executing ...

```
FETCHPS,WRITEUPS,LIBRARY,LIBRARY.
DISPOSE,LIBRARY=PR,DT=I,PA=1F.  ...   (Use PA=1F only if printed at BKY)
```

. . . John Bolstad, x6006

MINPACK-1 NOW AVAILABLE

MINPACK-1, a package of eleven Fortran programs for the numerical solution of systems of nonlinear equations and nonlinear least squares problems, is available for use on the 7600 and VAXes. These programs, from Argonne National Laboratory's National Energy Software Center, were designed to be reliable, efficient, easy-to-use and transportable.

Each problem area contains several versions of each algorithm. Included are a core subroutine and an "easy-to-use" driver with simplified calling sequence made possible by assuming default settings for certain parameters and by returning a limited amount of information. In addition, each program exists in versions that either do or do not require the user to supply the Jacobian matrix of first partial derivatives. There are facilities for systems of nonlinear equations with banded Jacobians, and for nonlinear least squares problems with a large amount of data.

In the following, **Fcn** will mean that the routine requires function values only; **Der** signifies that both function values and (analytic) derivatives are required. The contents of MINPACK are then:

Systems of Nonlinear Equations

	Easy-to-Use	More Flexibility
Fcn	HYBRD1	HYBRD
Der	HYBRJ1	HYBRJ

Nonlinear Least Squares

Fcn	LMDIF1	LMDIF
Der	LMDER1	LMDER

Limited Storage

Der	LMSTR1	LMSTR

In addition, MINPACK contains a routine, CHKDER, to check that the analytic derivatives supplied by the user are correct.

To obtain a document for the 7600 (single precision version), execute ...

```
FETCHGS,MINPACK/SINGLE/DOC,13214.
UPDATE,P=DOC,D,8.
DISPOSE,COMPILE=PR,DT=I,PA=1F.  (Use "PA=1F"at BKY only)
<7/8/9>
*COMPILE <NAME>
```

where <NAME> is one of the names above.

To load and execute the object versions on the 7600, execute ...

```
FETCHGS,MINPACK/ULIB,13214.
FTN4,OPT=2.
          . . .
LINK,X,P=ULIB,RF.
<7/8/9>
 <user calling program>
```

To list the source of routines <NAME1>, <NAME2>, ..., <NAMEN>, execute ...

```
FETCHGS,MINPACK/SINGLE/OLDPL,13214.
UPDATE,8.
DISPOSE,COMPILE=PR,DT=I.
<7/8/9>
*COMPILE <NAME1>,<NAME2>,...,<NAMEN>
```

Double precision versions exist for the VAX, but are stored on the 7600. The VAX versions use the above commands, but with "SINGLE" replaced everywhere by "DOUBLE". First obtain the document for the routine. (This can be done either from the 6600 or by using BKYSUBMIT and BKYCLAIM on the VAX.) It will list all the routines called by the desired routine. Then obtain the source by inserting the appropriate names in the above procedure, and adding "SC=<Site Code>" to the DISPOSE card. The Site Code is **NM** for the Numerical Modeling VAX and **PD** for the Program Development VAX.

. . . John Bolstad, x6006

CHANGES TO CORE LIBRARY

The **CORE** library is a collection of state-of-the-art mathematical software encompassing the areas of systems of linear equations, eigenvalues and eigenvectors, numerical integration (quadrature), special functions, ordinary differential equations, interpolation and approximation, solution of nonlinear equations, and optimization.

In an attempt to keep this library up-to-date, three changes are being made:

HYBRD1, a MINPACK routine, will replace **ZSYSTM** (systems of nonlinear equations). HYBRD1 is more efficient and reliable.

D01BCF, a NAG routine, will replace **GB**, (Gaussian quadrature). D01BCF is no more efficient, but has a more convenient user interface.

D01AJF, a QUADPACK/NAG routine, will replace **DCADRE**, (adaptive quadrature). D01AJF can integrate a wider class of functions, including those with some singularities.

The new routines may be executed from the **CORE** library by using the MATHLIB control card. However, the documents for these routines are not yet available in the **CORE** library. The HYBRD1 document can be obtained from MINPACK (see article elsewhere in this issue); and the D01AJF and D01BCF documents can be obtained from the NAG library.

The old routines will be available from the **CORE** library until one month after we announce the installation of the new documents. Then these routines will be removed from the **CORE** library. However, DCADRE and ZSYSTM will still be available from the IMSL library, and GB will be available from the SOURCE library.

. . . John Bolstad, x6006

>> PROGRESS REPORT <<

GRAPHICS NEWS

The purpose of the Interactive Graphics Machine (a VAX 11/780 running VMS) is to provide up to 16 simultaneous users with the tools to do high-quality interactive graphics. Since the IGM is connected to the BKY network, the user can transfer data files, graphics files and printout to other nodes -- such as the CDC machines.

A production version (Release #2, April 1981) of Precision Visuals' DI-3000 graphics software package is up on the IGM. Some of the important features of DI-3000 are:

- o Graphic-arts-quality text
- o Polygon fill and patterning
- o Full 3D viewing, window clipping and depth clipping
- o Orthographic, oblique and perspective projections
- o Retained segments
- o Many virtual graphics input functions
- o Multi-level debugging and detailed error reporting
- o Metafile Generator (output) and Translator (input).

Precision Visuals has provided us with a set of demonstration programs, which will run on the following devices:

- **AED512** -- a color raster display terminal
- **IMLAC SERIES II** -- a vector display terminal with a list processor. It is equipped with a light pen, bit pad (tablet) and a shared hardcopy unit.
- **TEKTRONIX 4014** -- running at 1200 baud.
- **ADM3A** -- The demonstration programs also can be run on any **ADM3A** with retrographics.

These devices are located in the Interactive Graphics Room, Bldg. 50B, Rm. 2267. Simple operating instructions for the **AED512** and the **IMLAC** are posted.

The Demonstration Program Set includes:

```
Test1  -- Simple 2D Drawing
Test2  -- Shows hardware attributes
Test3  -- Polygon fill 2D and 3D
Test4  -- 2D graph with markers
Test5  -- Pie chart and text
Test6  -- Text attributes; produces 10 pictures
Test7  -- Text qualities and fonts in 3D
Test8  -- Multiple windows; 4 pictures
Test11 -- Uses locator input
Test12 -- Modeling 3D cube - interactive
Test13 -- Retained segments; 4 pictures
Test15 -- Similar to Test12
Test16 -- Image transformation; 4 pictures
Test17 -- Modeling transformation
Test18 -- Multi-menus and common display area
```

Users are encouraged to run these programs on the various devices to compare device features and to see what DI-3000 can do. To run the demonstration programs:

(1) Establish an account on the VAX IGM. Contact Fran Permar, 50B/2258, x6310.

(2) Go to the Interactive Graphics Room (50B/2267) and log on to the IGM using either the AED512, the IMLAC, or the TEKTONIX 4014 (set to 1200 baud). Then execute

```
$ DI3000DEF
```

(3) Next ...

For the AED512

```
$ DEMO_AED
$ RUN TESTn    ...   (any key will return to $ prompt)
```

For the IMLAC

```
$ DEMO_IMLAC
$ RUN TESTn    ...   (any key will return to $ prompt)
```

For the TEKTRONIX 4018 or the ADM3A with retrographs

```
$ DEMO_T14
$ RUN TESTn    ...   (any key will return to $ prompt)
```

More information about DI-3000, the AED512, the IMLAC, and the demonstration programs can be obtained from the IGM by executing

```
$ SYS_DI3000
$ BKYPRINT INTRO.INFO
```

User's manuals are available at the Computation Department Library, 50B/1245A (x5529).

. . . Shirley Dawson, x4386

Words to Compute By ..

"In addition to **hardware**, which is the computer, and **software**, which is the program, computer scientists have lately begun talking about "**wetware**," which is the human brain."

. . . Lee Dembart, New York Times, May 8, 1977

VAX REFRESHER AND UPDATE

The Computation Department now offers the User Community three VAX-11/780 "supermini's," all running the VAX/VMS (**V**irtual **M**emory **S**ystem) operating system. All three VAXes are directly connected to the hyperchannel -- the local high-speed network that connects our machines to one another. In addition, the VAXes are also connected to each other through the DECNET native network that provides a versatile "in-family" communication and data transfer. The result is an excellent environment for interactive or batch computing within either of the VAXes, convenient communication via Remote Job Entry Service (RJE) with the 6000/7600 complex, as well other nodes (machines) on the hyperchannel (PDP 11/70's running UNIX, other VAXes, etc.).

Although running the same operating system, each VAX has its own special flavor, and thus is an efficient agent for a specific service. Each of the three is described as follows:

PDM -- The Program Development Machine

The primary purpose of this VAX is to provide fast response for typical interactive processes. It has **4 million** bytes of physical memory (more than the combined small and large core memory of the 7600) and almost 2 **billion** bytes of disk storage. Once a file has been created, no action is needed to store it permanently -- it is there to stay. Ports are supported for over 50 interactive terminals with various baud rates. File manipulation and program development and debugging are easy and efficient: VAX/VMS employs a hierarchical file system, a number of text editors, ANSI 77 FORTRAN and BASIC compilers, and an interactive symbolic debugger for both languages. Submission of batch jobs to the 7600 will result in automatic migration of your output back to the directory of origin in the VAX, so no action is needed to claim your job.

Those of you who are accustomed to the UNIX operating system can still operate within a limited UNIX-like environment by using the Software Tools package.

We support two mathematical libraries on the VAXes -- 2 versions of IMSL for single and double precision, and the double precision version of NAG.

Single and double-density floppy disks of various formats, as well as 9-track 800/1600 BPI magnetic tapes, can be read directly on this VAX. In addition, you can always access any tape on the BKY system through the RJE service from the CDC 6000 machines.

NMM -- The Numerical Modeling Machine

This VAX is primarily intended to accommodate programs that require a very large address space. Being a virtual memory system, one can run programs that far exceed the 4 megabytes of physical memory available on this VAX, and do it in a completely transparent fashion with no modification to the source code. The total address space is over **4 billion** bytes, half of which could be made available to a program.

Computing costs also reflect the difference between PDM and NMM. Connect time for NMM is twice that of PDM. The opposite holds true for CPU cost.

IGM -- The Interactive Graphics Machine

In addition to standard graphics software that exists on all 3 VAXes (GRAFPAC, a limited version of IDDS, and others), this VAX supports specialized equipment for high-quality interactive graphics. IGM also has 4 megabytes of memory, and its computing costs are the same as for the PDM.

To set up an account on the VAX, contact Fran Permar, (520B/2258, x6310).

A VAX user class will be given during the second half of April. See article next page for details.

. . . Uzi Arkadir, x5194

VAX CLASSES IN APRIL

Another VAX user class will be given during the second half of April in the NRCC Conference Room (50D/116). (50D is located on the "porch" just south of the 3rd floor of Bldg. 50B). There will be four two-hour sessions:

Tuesday	April	20	--	10 AM to noon
Thursday	"	22	--	"
Tuesday	"	27	--	"
Thursday	"	29	--	"

The number of participants is limited and advance registration is required. To register, please contact Lisa Long, x5947.

. . . Uzi Arkadir, x5194

INFORMAL RSX-11M[+] USER GROUP AT LBL

In recent months, many individuals have told me of their interest in forming an informal user group at LBL to discuss the RSX-11M and RSX-11M+ operating systems used on PDP-11 hardware. We'd like to know haw many users would participate in regular user group meeting. (We envision getting started with bi-monthly or monthly lunch meetings (12:00 to 1 PM) much as for the RT-11 group.) Those folks interested in participating in such a group should contact me and let me know their preferences, as follow:

(1) Preferred frequency of meeting[s] (once, twice, or more -- per month)

(2) Preferred meeting week[s] of the month (first? second? etc)

(3) Preferred meeting day, regardless of the week[s] selected

Armed with this information, I will attempt to set up the first meeting subject to the boundary condition of maximal possible attendance. Prompt responses will be appreciated.

. . . Joe Sventek, x5205
Bldg. 50B, Rm. 3238

RT-11 NEWS FEBRUARY-APRIL 1982

The following are current news items for LBL RT-11 users. For more information on any of these items, contact Randy Michelson, x6411, unless otherwise noted. To get on the mailing list for LBL RT-11 information, please send your name, LBL mailcode, and phone number to Randy at **MAILCODE 46A.**

*** * * ATTENTION!! Please use my new LBL mailcode above, and send me your new mailcode! * * ***

Not one person has sent me a new mailcode address yet! I need your new mailcode to update the RT-11 users mailing list! Please note that the LBL RT-11 mailing list is used sporadically to distribute RT-11 technical information informally within LBL (including associated campus groups); the information is **not** intended for distribution outside LBL (and associated campus groups).

(1) RT-11 consulting hours are Monday through Friday from 1300 TO 1700 IN BLDG. 46A RM. 1150, X6411.

(2) RT-11 users who have not previously received the LBL Computing Newsletter (or its prior incarnation, the Computer Center Newsletter) should contact Maggie Morley, 50B-1245, x5529 to obtain copies of Vol. 18, #8, #10, #11, & #12, and Vol. 19, #1 (August, October, November, & December, 1981, and January, 1982) for previous RT-11 news items. This issue includes both April 1982 items and items originally submitted for the unpublished February and March 1982 issues of the LBL Computing Newsletter.

(3) **REMINDER! RT-11 is a licensed software product.**
Licensing costs and legal issues should be discussed with Ken Wiley, LBL Software Manager, Office of Computing Resources, x7083 or x6411. LBL policy explicitly forbids illegal copying of licensed software. See **POLICY & PROCEDURE MEMOS** - VOLs VI, #49 and VII, #26.

(4) **BEFORE YOU BUY -- CHECK HARDWARE FLEA MARKET.** Folks on LBL projects wanting to trade or exchange hardware (new or used) should contact Randy Michelson, LSI-11/PDP-11 flea market coordinator, (x6411). Those items currently available are --

2 x KD11-HD LSI-11/2 CPU + 32kw memory;
2 x KD11-HA LSI-11/2 CPU + KEV-11 EIS/FIS chip;
10 or more 3M RK05 cartridges used 10 hours or less
(will trade four RK05 cartridges for each R102 cartridge; Nashua ok; smaller deals ok);

1 x COMPLETE LSI-11/23 SYSTEM including all of the following:
KDF-11-HF LSI-11/23 CPU + 128kw memory + KEF-11 FPU chip;
DSD 440 floppy disc system; NETCOM HV-1123-RL chassis;
DLV-11-J serial interface; and ZENITH Z-19 CRT terminal;
1 x COMPLETE SYSTEM as above less CPU, FPU, and memory.
(portions also available separately.)
1 x MSV-11-DD equivalent 32kw memory;
1 box VERBATIM MD550-16-18206 5.25" double-sided double-density 16 sector hard-sectored mini-floppy diskette.

The following items are not DOE property and can be sold to any interested party within or outside LBL:

1 x TM-11 magtape controller (UNIBUS);
2 x TU-10 magtape drives;
1 x TEKTRONIX 611 storage scope;
1 x AA-11 D/A converter (UNIBUS);
1 x PC-11 high-speed papertape reader/punch system (UNIBUS);
1 x AED 8000 SMD disk interface (UNIBUS);
2 x CDC 9762 SMD 80MB disk drives;
2 x DL-11-E (UNIBUS);
1 x Diablo disk drive configured as RK05-J equivalent.

(5) RT-11 users met on Thursday, March 11, 1982. Unfortunately, very few users attended. In the absence of other volunteers, Frank Robben agreed to continue to serve temporarily as RT-11 User Committee Chairperson. The RT-11 User Committee is still seeking volunteers from each division. If you're interested, contact Frank Robben, Chairperson, Trailer 29C, x4420.

(6) Those present at the RT-11 users meeting also discussed user feedback for setting priorities for RT-11 support and the consolidation of these RT-11 News items with the RT-11 I/O Page Engineering Notes.

(7) RT-11 V4.0 and FORTRAN V2.5 patched through October, 1981 Software Dispatch (AUTOPATCH D) are available for distribution. Licensed LBL RT-11 users should contact Randy to get in the queue for distribution. BASIC V2.0 has not been modified since AUTOPATCH C; the AUTOPATCH C version is available.

(8) The new releases of the Scientific Subroutines (QJ960 V1.3) and Laboratory Subroutines (QJ624 V1.2) are now available for distribution. Licensed SSP and LSP users should contact Randy to get in the queue for distribution, and should contact Ken Wiley, x7083, about obtaining the required upgrade licenses.

(9) DEC has announced sharp reductions on the RL02 disk drive and RLV21 disk controller plus drive package. The LBL prices for these units are:

RL02-AK (10MB drive, removable cartridge)	$1890
RLV21-AK (18-bit addressing controller, two quad boards plus cables, including one RL02 drive)	$3588
RLV22-AK (22-bit addressing controller, one quad board plus cables, including one RL02 drive	$3588
RLV12 (22-bit addressing controller, single quad board, excluding drive)	$2457
RL01-AK (5 MB drive, removable cartridge)	$1890
RLV11-AK (18-bit addressing controller, two quad boards plus cables, including one RL01 drive)	$3328

Because of these price reductions, it may be cheaper to buy a new RL02 than to convert an RL01 to an RL02; users should get a cost estimate before ordering. see RT-11 news item 7, Vol. 18 #11 (November, 1981), LBL Computing Newsletter for details.

(10) GPIB users:

a. National Instruments has announced a new release (Rev. C) of their GPIB software package for their GPIB interfaces (both UNIBUS and Q-BUS; Q-BUS interface is LLL stock number 5975-65713). This release corrects many problems listed in their announcement. (the RTSG RT-11 Support folks have just received the new release.)

b. National Instruments has also announced a series of ECO's for their GPIB interfaces. The RTSG RT-11 Support folks have a complete set of these ECO's.

c. National Instruments has started a newsletter for IEEE 488 bus users; the items above were discussed in the first issue. Contact Randy for a xerox copy of the IBUG Newsletter.

(11) RT-11 users with the Digital Pathways TCU-50D calendar clock must remember to edit, reassemble, and relink the SETDAT program for 1982. Change the 81 to 82 at label **"YEAR:"**.

(12) A series of tests run on an LSI-11/23 with DSD 440 floppy disk drives demonstrates that the DSD interleaved sector format is significantly slower than sequential format for double-density diskettes. Speed differences ranged from a factor of 1.5 to a factor of 6 depending upon the type of operation. Still to be tested: single-density diskettes, LSI-11/2 CPU, and RX01-mode controller. Preliminary conclusion: **don't use interleaved format with LSI-11/23 and double-density diskettes.**

(13) Part of an article in the November, 1981 RT-11 Minitasker (Vol. 7 #4, pp. 7-9) describes how to access FORTRAN virtual arrays from MACRO subroutines. (The first portion of the article describes patches to the FORTRAN OTS to permit both the FG and the BG to use virtual arrays under the FB monitor. The RTSG RT-11 Support folks recommend AGAINST the use of this dangerous technique! Use the XM monitor instead!)

(14) The LLL SCUL version of TEKTRONIX PLOT10 has a bug in the routine IOWAIT. If called from HDCOPY with a baud rate of 180 characters per second or higher (1800 baud or higher), the routine will cause an integer overflow error if the PLOT10 library was compiled for threaded code (including LSI-11/23 FPU or no-hardware PDP-11 versions). If the PLOT10 library was compiled for any form of inline code, the error is not detected, though it will still occur! This bug might also occur when outputting to the 4662 pen plotter. For a patch to correct this, contact Randy.

(15) Mark Rivers, x6436, has available a new version of his RTNET program which allows communication and bidirectional file transfer between an RT-11 system and nearly any remote computer system. Version 2.0 can operate at speeds up to 9600 baud even while storing data on floppy disks. See RT-11 News item 7, Vol. 19, #1 (January, 1982) issue of the LBL Computing Newsletter for more information. (RTNET V2.0 is also available from RTSG RT-11 Support folks.)

(16) Joel Ryan, x4701, has available a writeup on recovering files from a floppy disk with a corrupted directory. The writeup is clear and includes examples.

(17) RUNOFF, a text-formatting (word processing) program for RT-11, is now available! The RTSG RT-11 Support folks have obtained a copy of the DECUS RT-11 RUNOFF program (from LLL SCUL); this is the version M02.2 RUNOFF from the Spring 1981 RT-11 DECUS tape. (Actually, it was last modified 15-Oct-80, but this version is newer than the existing M01 version which is floating around LBL.) Send a blank floppy (or other media) to Randy for your own free copy.

(18) The RTSG RT-11 Support folks have obtained a copy of the DECUS RT-11 spelling program (from LLL SCUL). The program is written in assembly language, requires minimal disk space, and runs 25 times faster than Pam Wiedenbeck's spelling program! (see RT-11 news item 13, Vol. 18, #10 [October, 1981], LBL Computing Newsletter.) DECUS SPELL checked a 122 block file in 88 seconds; Pam's SPELL checked 73 blocks in 22 minutes. Send a blank floppy (or other media) to Randy for your own free copy.

(19) RTSG RT-11 Support folks have obtained a copy of the DECUS RT-11 version of the "C" compiler (from LLL SCUL). The RTSG RT-11 Support folks do NOT support this compiler! Send one blank double-density floppy or two blank single-density floppies (or other media) to Randy for your own free copy.

(20) Floppy disk owners: RTSG duty technicians, x6411, can now check your floppy drive head alignment painlessly with the SA1-25 diagnostic diskette. The test is very quick, but there is a service charge for the service call. It is a good preventative maintenance check; it's worth the money!

(21) The RTSG RT-11 Support folks have a complete set of DSD Service Notes covering the DSD 210, 440, 480, 880, 4140 (430/470 controller) and general notes covering all DSD products. Call for a xerox copy.

(22) Only three users have ordered the DSD 440 automatic powerdown option through RTSG RT-11 Support's quantity order. Anyone else who requires this option must order it through LBL Purchasing directly from DSD. Specific ordering information is listed in RT-11 news items #5, Vol. 18, #11 (November, 1981); #4, Vol. 18, #12 (December, 1981); and #4, Vol. 19, #1 (January, 1982), LBL Computing Newsletter.

(23) Notes from 17 December 1981 LLL microcomputer user group meeting:

a. The redesigned power-fail module for the Livermore LSI-11 chassis (LLL stock number 5975-63707) contained a simple design error which has been fixed. If you have a Livermore LSI-11 chassis, you should replace the power-fail card ($50-$100) or modify it to the latest revision level. Contact the RTSG duty technician, x6411, for an appointment to have the modifications done for you. See RT-11 News items 15A, Vol. 18, #11 (November, 1981), and 8K, Vol. 19, #1, (January 1982), LBL Computing Newsletter.

b. 32kw memories (5975-64865) are **not** all guaranteed compatible with 22-bit addressing. 128kw memories (5975-66521) are all guaranteed compatible with 22-bit addressing, and have on-board parity.

c. Users have complained about the poor quality of currently stocked floppy disks (WABASH); Steve Mick, L-121, 181-2-7400, requests that users with complaints contact him directly. [see item (26) d. below.]

1 x COMPLETE LSI-11/23 SYSTEM including all of the following:
KDF-11-HF LSI-11/23 CPU + 128kw memory + KEF-11 FPU chip;
DSD 440 floppy disc system; NETCOM HV-1123-RL chassis;
DLV-11-J serial interface; and ZENITH Z-19 CRT terminal;
1 x COMPLETE SYSTEM as above less CPU, FPU, and memory.
(portions also available separately.)
1 x MSV-11-DD equivalent 32kw memory;
1 box VERBATIM MD550-16-18206 5.25" double-sided double-density 16 sector hard-sectored mini-floppy diskette.

The following items are not DOE property and can be sold to any interested party within or outside LBL:

1 x TM-11 magtape controller (UNIBUS);
2 x TU-10 magtape drives;
1 x TEKTRONIX 611 storage scope;
1 x AA-11 D/A converter (UNIBUS);
1 x PC-11 high-speed papertape reader/punch system (UNIBUS);
1 x AED 8000 SMD disk interface (UNIBUS);
2 x CDC 9762 SMD 80MB disk drives;
2 x DL-11-E (UNIBUS);
1 x Diablo disk drive configured as RK05-J equivalent.

(5) RT-11 users met on Thursday, March 11, 1982. Unfortunately, very few users attended. In the absence of other volunteers, Frank Robben agreed to continue to serve temporarily as RT-11 User Committee Chairperson. The RT-11 User Committee is still seeking volunteers from each division. If you're interested, contact Frank Robben, Chairperson, Trailer 29C, x4420.

(6) Those present at the RT-11 users meeting also discussed user feedback for setting priorities for RT-11 support and the consolidation of these RT-11 News items with the RT-11 I/O Page Engineering Notes.

(7) RT-11 V4.0 and FORTRAN V2.5 patched through October, 1981 Software Dispatch (AUTOPATCH D) are available for distribution. Licensed LBL RT-11 users should contact Randy to get in the queue for distribution. BASIC V2.0 has not been modified since AUTOPATCH C; the AUTOPATCH C version is available.

(8) The new releases of the Scientific Subroutines (QJ960 V1.3) and Laboratory Subroutines (QJ624 V1.2) are now available for distribution. Licensed SSP and LSP users should contact Randy to get in the queue for distribution, and should contact Ken Wiley, x7083, about obtaining the required upgrade licenses.

(9) DEC has announced sharp reductions on the RL02 disk drive and RLV21 disk controller plus drive package. The LBL prices for these units are:

RL02-AK (10MB drive, removable cartridge) $1890

RLV21-AK (18-bit addressing controller, two quad boards plus cables, including one RL02 drive) $3588

RLV22-AK (22-bit addressing controller, one quad board plus cables, including one RL02 drive $3588

RLV12 (22-bit addressing controller, single quad board, excluding drive) $2457

RL01-AK (5 MB drive, removable cartridge) $1890

RLV11-AK (18-bit addressing controller, two quad boards plus cables, including one RL01 drive) $3328

Because of these price reductions, it may be cheaper to buy a new RL02 than to convert an RL01 to an RL02; users should get a cost estimate before ordering. see RT-11 news item 7, Vol. 18 #11 (November, 1981), LBL Computing Newsletter for details.

(10) GPIB users:

a. National Instruments has announced a new release (Rev. C) of their GPIB software package for their GPIB interfaces (both UNIBUS and Q-BUS; Q-BUS interface is LLL stock number 5975-65713). This release corrects many problems listed in their announcement. (the RTSG RT-11 Support folks have just received the new release.)

b. National Instruments has also announced a series of ECO's for their GPIB interfaces. The RTSG RT-11 Support folks have a complete set of these ECO's.

c. National Instruments has started a newsletter for IEEE 488 bus users; the items above were discussed in the first issue. Contact Randy for a xerox copy of the IBUG Newsletter.

(11) RT-11 users with the Digital Pathways TCU-50D calendar clock must remember to edit, reassemble, and relink the SETDAT program for 1982. Change the 81 to 82 at label **"YEAR:"**.

(12) A series of tests run on an LSI-11/23 with DSD 440 floppy disk drives demonstrates that the DSD interleaved sector format is significantly slower than sequential format for double-density diskettes. Speed differences ranged from a factor of 1.5 to a factor of 6 depending upon the type of operation. Still to be tested: single-density diskettes, LSI-11/2 CPU, and RX01-mode controller. Preliminary conclusion: **don't use interleaved format with LSI-11/23 and double-density diskettes.**

(13) Part of an article in the November, 1981 RT-11 Minitasker (Vol. 7 #4, pp. 7-9) describes how to access FORTRAN virtual arrays from MACRO subroutines. (The first portion of the article describes patches to the FORTRAN OTS to permit both the FG and the BG to use virtual arrays under the FB monitor. The RTSG RT-11 Support folks recommend AGAINST the use of this dangerous technique! Use the XM monitor instead!)

(14) The LLL SCUL version of TEKTRONIX PLOT10 has a bug in the routine IOWAIT. If called from HDCOPY with a baud rate of 180 characters per second or higher (1800 baud or higher), the routine will cause an integer overflow error if the PLOT10 library was compiled for threaded code (including LSI-11/23 FPU or no-hardware PDP-11 versions). If the PLOT10 library was compiled for any form of inline code, the error is not detected, though it will still occur! This bug might also occur when outputting to the 4662 pen plotter. For a patch to correct this, contact Randy.

(15) Mark Rivers, x6436, has available a new version of his RTNET program which allows communication and bidirectional file transfer between an RT-11 system and nearly any remote computer system. Version 2.0 can operate at speeds up to 9600 baud even while storing data on floppy disks. See RT-11 News item 7, Vol. 19, #1 (January, 1982) issue of the LBL Computing Newsletter for more information. (RTNET V2.0 is also available from RTSG RT-11 Support folks.)

(16) Joel Ryan, x4701, has available a writeup on recovering files from a floppy disk with a corrupted directory. The writeup is clear and includes examples.

(17) RUNOFF, a text-formatting (word processing) program for RT-11, is now available! The RTSG RT-11 Support folks have obtained a copy of the DECUS RT-11 RUNOFF program (from LLL SCUL); this is the version M02.2 RUNOFF from the Spring 1981 RT-11 DECUS tape. (Actually, it was last modified 15-Oct-80, but this version is newer than the existing M01 version which is floating around LBL.) Send a blank floppy (or other media) to Randy for your own free copy.

(18) The RTSG RT-11 Support folks have obtained a copy of the DECUS RT-11 spelling program (from LLL SCUL). The program is written in assembly language, requires minimal disk space, and runs 25 times faster than Pam Wiedenbeck's spelling program! (see RT-11 news item 13, Vol. 18, #10 [October, 1981], LBL Computing Newsletter.) DECUS SPELL checked a 122 block file in 88 seconds; Pam's SPELL checked 73 blocks in 22 minutes. Send a blank floppy (or other media) to Randy for your own free copy.

(19) RTSG RT-11 Support folks have obtained a copy of the DECUS RT-11 version of the "C" compiler (from LLL SCUL). The RTSG RT-11 Support folks do NOT support this compiler! Send one blank double-density floppy or two blank single-density floppies (or other media) to Randy for your own free copy.

(20) Floppy disk owners: RTSG duty technicians, x6411, can now check your floppy drive head alignment painlessly with the SA1-25 diagnostic diskette. The test is very quick, but there is a service charge for the service call. It is a good preventative maintenance check; it's worth the money!

(21) The RTSG RT-11 Support folks have a complete set of DSD Service Notes covering the DSD 210, 440, 480, 880, 4140 (430/470 controller) and general notes covering all DSD products. Call for a xerox copy.

(22) Only three users have ordered the DSD 440 automatic powerdown option through RTSG RT-11 Support's quantity order. Anyone else who requires this option must order it through LBL Purchasing directly from DSD. Specific ordering information is listed in RT-11 news items #5, Vol. 18, #11 (November, 1981); #4, Vol. 18, #12 (December, 1981); and #4, Vol. 19, #1 (January, 1982), LBL Computing Newsletter.

(23) Notes from 17 December 1981 LLL microcomputer user group meeting:

a. The redesigned power-fail module for the Livermore LSI-11 chassis (LLL stock number 5975-63707) contained a simple design error which has been fixed. If you have a Livermore LSI-11 chassis, you should replace the power-fail card ($50-$100) or modify it to the latest revision level. Contact the RTSG duty technician, x6411, for an appointment to have the modifications done for you. See RT-11 News items 15A, Vol. 18, #11 (November, 1981), and 8K, Vol. 19, #1, (January 1982), LBL Computing Newsletter.

b. 32kw memories (5975-64865) are **not** all guaranteed compatible with 22-bit addressing. 128kw memories (5975-66521) are all guaranteed compatible with 22-bit addressing, and have on-board parity.

c. Users have complained about the poor quality of currently stocked floppy disks (WABASH); Steve Mick, L-121, 181-2-7400, requests that users with complaints contact him directly. [see item (26) d. below.]

d. Users have complained that some Digital Pathways calendar clock cards behave erratically, including running too fast and setting the date one or two days too far forward.

e. LLL stock will replace double-sided single-density floppies with double-sided double-density floppies under the old stock number (7544-66518).

f. Tests of switching power supplies for the Livermore chassis revealed some problems, so the regular linear supplies should continue to be used. One user reported that the 23 amp supply fails when loaded continuously with only 19 amps.

g. Mike Allen, L-126, 181-2-8326, discussed the SBC-11 "FALCON" CPU and micropower PASCAL. (See RT-11 News item (9) f., Vol. 19, #1 [January 1982], LBL Computing Newsletter, for a terse description.) The FALCON may go into LLL stock, but it is ONLY suitable for DEDICATED controller applications!

h. Hal Goldwire, 181-3-0160, discussed 22-bit hardware and software from Fall 1981 DECUS:

1. The LSI-11/23B is a quad board with 22-bit addressing, 2 serial lines, boot ROM, and line clock. The board is presently only available as part of a packaged system (list price about $20K).

2. DEC announced a hardware floating point quad board for the LSI-11/23B with about 5 times the speed of the KEF-11 FPU chip. (no information about whether it is compatible with older 11/23'S; list price about $3.3K.)

4. DEC announced two new memory boards: a 256kb dual and a 512kb quad, both with on-board parity.

5. DEC announced a new single-quad RIO2 controller, the RLV-12, with 22-bit addressing (list price about $1.9k); not yet available. it does not need the C-D interconnect in backplane.

6. RT-11 Version 5 will not be available until after June, 1983. **It is intended to be the last release of RT-11;** DEC is taking suggestions from users now for any changes. RT-11 VERSION 5 will support 22-bit addressing!

7. Hal also discussed a wide variety of other hardware and RSX-11M software, and incompatibilities between older devices and 22-bit addressing systems. Randy Michelson has a copy of Hal's transparencies.

(24) The LLL January meeting of the Microcomputer Users Group was cancelled. The 1982 meetings will be held on the **third Tuesday** of each month. Contact Gene Fisher, 181-2-7782 to get on the LLL MUG/SDE mailing list.

(25) Items of interest from the January, 1982 SDE Newsletter (Vol. 4, #1) excluding items previously reported here:

a. LLL has received an ECO from DEC dated August, 1980 which corrects a problem for LSI-11/23's (both Rev. A and Rev. C) concerning DMA operations with non-DEC peripherals. (The RTSG RT-11 Support folks have a copy of the ECO.)

b. The LLL SCUL has a bootable version of the VM handler. This handler makes the memory above 28kw available as a very fast disk for RT-11 SB or FB (not for XM!!), 376 blocks long for 128KW machines. VM: provides impressive speed improvements for FORTRAN compilations and linking with SYSLIB if the system is booted from VM:. Unfortunately, VM: is volatile; all contents disappear when power is shut off (with normal RAM memories). VM: is also available at LBL from the RTSG RT-11 Support folks.

c. The Chrislin 128kw memory takes much less power than 4 DEC 32kw memory boards (MSV-11-DD). The DEC memories together take four times as much power as the Chrislin memory when running, and **TEN** times the power when on battery backup (CPU powered off).

d. LEN 22351 by Ken Neufeld describes a method for extending the LSI-11 bus to another chassis. LEN 22351 is available from LLL EE Technical Publications (and from the RTSG RT-11 Support folks at LBL).

(26) Notes from 23 February 1982 LLL Microcomputer Users Group meeting

a. Mike Allen, L-126, 181-2-8326, discussed his evaluation of the AED and Corvus Winchester disk systems. Generally, he rated the AED system favorably, but felt it was expensive relative to the DSD 880/30. (LLL prices $8.7K/20MB vs. $6.5K/30MB.) there was also some question about deliveries. He gave the Corvus Winchester an **unfavorable** rating due to lack of a DMA throttle and intermittent erratic operation. The Corvus system also lacked the AED's ECC feature.

b. Gary Berry, L-126, 181-3-0602, discussed the PROM programmer facilities in the Red Badge user's center. They can burn PROM's from RT-11 RX01-format diskettes from .LDA files. (But it's a long drive if you've got any bugs in your code!) They are converting to RX02-format diskettes soon.

c. Gary Willett, L-126, 181-2-8880, has put a new version of the GPIB configuration utility into LLL SCUL in conjunction with the National Instruments GPIB Software Revision B. (since Rev. B is already obsolete (see item (10) a. above), users should wait until Gary can modify Rev. C to work with the configuration utility.]

d. Steve Mick, L-121, 181-2-7400 announced that WABASH has been **removed** from the approved sources list for floppy diskettes. Higher-quality single-sided single-density diskettes will be in stock soon under the old stock number, 7544-63784. Double-sided double-density diskettes will now be stocked under 7544-66783.

e. Steve Mick also announced prices for several CAMAC modules being added to stock:

stock #	**description**	**price**
5975-66705	KSC 3291 dataway display	$550
5975-66706	KSC 3296 dataway display controller	$485
5975-66707	KSC rigid extender	$300
5975-66708	std. eng. flexible extender	$270

f. Steve Mick also announced the start of an LLL LSI-11 flea market with two categories of hardware:

(1) outright donations (which will probably be held by instrument loan) ... and
(2) items for sale or trade (which will be put in a database).

g. Someone announced that there is a missing pullup in the Kinetic Systems 3920 CAMAC Crate Controller. Steve Mick may remember who to contact about this.

(27) Pam Wiedenbeck, x6331, has available a FORTRAN program for the BORER 1533A CAMAC Crate Controller that simulates the immediate mode found in LBL BASIC. (You can issue CAMAC commands one at a time to a crate.)

(28) The AUTOPATCH D version of the RT-11 LINKER does not link OMSI PASCAL programs correctly (because the transfer address comes from a library rather than the main program). A patch in the November 1981 RT-11 Software Dispatch corrects this problem.

(29) Pam Wiedenbeck, x6331, has available a copy of the January, 1982 issue of Digital Design, which has a directory of FORTH products. The directory includes descriptions of FORTH for various microprocessors, additional WORD definitions, and lists of available manuals and tutorials.

(30) An RT-11 V4.0 Video tape course from LLL is available in Bldg. 41. The course consists of ten one-hour lessons, and is intended for inexperienced users. Keys must be signed out from Randy Michelson, x6411, or Joe Katz, x5636. This course was obtained courtesy of Mike I. Green and Joe Katz.

(31) RT-11 users interested in bi-weekly informal lunch gatherings to discuss each other's systems, and to exchange advice and solutions to problems should contact Mike Green, x4607. The meetings are generally scheduled for the **second and fourth Thursdays of each month at noon.**

(32) RT-11 users who become members of DECUS can sign up to receive copies of the RT-11 Special Interest Group Newsletter (the Minitasker) and the LSI-11 SIG Newsletter. For an application, write directly to

DECUS, US Chapter,
Membership Processing folks,
One Iron Way, MR2-3/E55,
Marlboro, MA 01752.

Membership is free, and is open to all users of DEC computers.

. . . Randy Michelson, x6411

A WORD OR TWO ...*

For lo, the winter is past, the rain is over and gone; the flowers appear on the earth; the time of the singing of birds is come, and the voice of the Consultant is heard in our land ...

The Computation Department maintains a staff of Consultants to assist users in penetrating the intricacies of the Computation Department computer systems, to aid in solving programming problems, to help in pinpointing bugs, and to disseminate information about all aspects of using the our computers. We feel that perhaps not all users have a clear idea of what they can expect of the Consultants and therefore we set forth here some guidelines for interacting with the Consultants. This is in the interest of improving customer satisfaction with our service and also to save the Consultants from a certain level of abuse which tends to downgrade their service to everybody.

The Consultants will extend themselves very far to help the novice user, but do not feel so kindly disposed toward the experienced user who tears his job off the user printer, glances at the dayfile and notes that the job failed, and walks directly across the hall to toss it on the Consultants' desk for analysis and explanation. We offer a vast array of documentation which is available from PSS and other sources to anyone with an account number, and copies of which are on racks in all the users' local areas. We work constantly to improve the clarity and comprehensiveness of this documentation. For instance, one of the documents is an index (HANDBOOK subset INDEX) into the rest of the documentation. Another (WRITEUPS subset CCARD) is a comprehensive list of all BKY control commands, and yet another (HANDBOOK subset DAYFILE) serves to shed light on the mysteries of the user's dayfile messages. We realize that many users do not wish or simply cannot take the time to master ALL aspects of using our system, and merely need results so they can go away and do something else with them. But on the other hand, the computer is a complex and powerful tool and it is in the user's best interest and to some extent his responsibility, if he is to use this tool to further his research, to TAKE the time to learn to apply this tool efficiently and economically.

What follows are some of the characteristics of what may be described as the parfit gentil user ... (We realize that many users already observe these guidelines and we thank them for their conscientiousness.)

The Parfit, Gentil user --

- o will acquire and read those sections of the documentation which apply to his use. The Consultants will be glad to advise any user on the choice of documents. The Librarian purveys microfiches of our internal documentation which is very convenient if there is access to a fiche-viewer.
- o will take advantage of any classes offered or make an appointment with a Consultant for briefing on a particular subject.
- o will learn to understand the BKY dayfile and to gain information from a memory dump and/or a GRUMP dump.
- o will check the output for simple goofs before approaching the Consultant.
- o will prepare his questions and sit down and take the time to explain the problem clearly to the Consultants.
- o will pay attention to how the Consultant is solving the problem and work with the Consultant.
- o will bring complete and accurate information to the Consultant when he finds that he cannot crack the problem himself. For instance, the Consultant can rarely solve a problem which has caused a job to abort without having a FORTRAN listing of the program. Nor is an outdated listing of any help.

... And further ...

The P. G. user --

- o will NEVER expect the Consultant to design the whole job set-up from scratch. Some outside preparation is necessary.
- o will NEVER expect instant answers to complex programming problems from the Consulants.
- o will NEVER ask the Consultant to write out one or more control commands for him when he knows where to look them up and wants to save 30 seconds.
- o will NEVER expect the Consultant always to be able to tell him why his program gives incorrect numerical results, unless he has convincing proof that the errors come from a library subroutine and not from his own program design.
- o will NEVER engage the Consultant in a long description of the user's own research in the Office. We are expected to get on with our work in between customers.
- o will NEVER be angry when sent away by the Consultant to procure listings and memory dumps; (he should, best yet, bring them on his own!)
- o will NEVER expect elaborate and unsuccessful analysis of a memory dump over the telephone; we've been known to solve problems this way, but it is frequently a futile exercise and a waste of everybody's time.
- o will NEVER transfer anger or frustration with hardware breakdown or software failure to the Consultant -- it is extremely unlikely that it is the Consultant's fault.

And we, the Consultants, will endeavor to do the following:

- o We will listen carefully to the user's presentation of his problem.
- o We will question the user judiciously to be sure the whole situation is understood.
- o We will attempt to ascertain the user's level of expertise so as to reply to him in terms he can understand.
- o We will try to make suggestions to improve the user's job set-up or program when deficiencies are observed.
- o We will keep our training impeccably up-to-date.

... And further ...

- o We will NEVER do a snow job on the user.
- o We will NEVER ignore the user for no reason.
- o We will NEVER fail to return a call or respond when we have promised to do so.
- o We will NEVER fail to verify our answers when there is ANY doubt in our minds of their accuracy.

The main point of this diatribe is that everyone will benefit if people use the Consultants' service more judiciously. In no way do we present all this as a rigid code of behavior -- every single item will have an exception at one time or another, and generally we are prepared to deal with these in an amicable way. The Consultant's job involves a good deal of stress and one qualification for the job is the ability to handle that stress. BUT the Consultant is only human, our memories fail us, our reasoning powers occasionally slip a cog, the degree of expertise of a particular consultant on a particular subject will vary. We walk a tightrope between the indignation or the user sitting with us whose words are interrupted by the phone's ringing, and the fury of the customer on 'hold' in Kansas City.

We really want to help users solve their problems. We really want to know about and to eliminate bugs in the system. We really want to know about and implement users' suggestions which will improve our computing environment. Most of all, we want to feel that we are using OUR time -- and YOURS -- efficiently and this perforce involves the cooperation of the user community.

. . . Marjory Simmons, x6289

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* Reprinted seasonally

COMPUTER CENTER STATISTICS

SYSTEM PERFORMANCE IN **DEC/1981**	7600	6600	6400	UNIX1	UNIX3	VMS1	VMS2	PHYS
System Availability	93.90%	95.50%	95.90%	93.30%	81.34%	99.97%	100.00%	100.00%
Median Service Interval (hrs)	19.78	28.00	65.22	50.00	15.75	371.88	744.00	744.00

Jobs Processed: 36,805 on 7600; 17,567 on 6000's; 54,372 total

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7600 TURNAROUND TIME	20 min	2 hrs	4 hrs
% of RUSH jobs returned	93.58	99.31	99.94
% of ALL jobs returned	86.04	94.78	97.19
% returned, CU limit = 100	87.50	97.50	98.33
% returned, CU limit = 500	79.73	97.97	99.32
% returned, CU limit $\geq$ 1000	39.83	69.86	77.88

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SYSTEM PERFORMANCE IN **JAN/82**	7600	6600	6400	UNIX1	UNIX3	VMS1	VMS2	PHYS
System Availability	94.69%	98.37%	98.68%	89.39%	84.68%	100.00%	99.69%	100.00%
Median Service Interval (hrs)	19.78	28.00	65.22	50.00	15.75	371.88	744.00	744.00

Jobs Processed: 41,242 on 7600; 21,810 on 6000's; 63,052 total

- -

7600 TURNAROUND TIME	20 min	2 hrs	4 hrs
% of RUSH jobs returned	93.33	99.05	99.79
% of ALL jobs returned	84.29	93.83	96.52
% returned, CU limit = 100	84.67	96.93	99.23
% returned, CU limit = 500	93.01	99.30	100.00
% returned, CU limit $\geq$ 1000	31.43	57.96	67.26

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SYSTEM PERFORMANCE IN **FEBRUARY**	7600	6600	6400	UNIX1	UNIX3	VMS1	VMS2	PHYS
System Availability	95.22%	97.76%	98.96%	99.21%	96.01%	99.99%	100.00%	100.00%
Median Service Interval (hrs)	14.75	32.58	79.93	67.82	40.87	335.97	672.00	672.00

Jobs Processed: 38,672 on 7600; 20,828 on 6000's; 59,500 total

- -

7600 TURNAROUND TIME	20 min	2 hrs	4 hrs
% of RUSH jobs returned	92.30	98.89	99.81
% of ALL jobs returned	83.36	92.98	96.05
% returned, CU limit = 100	86.29	94.92	98.48
% returned, CU limit = 500	81.73	97.60	99.52
% returned, CU limit $\geq$ 1000	31.47	56.83	67.59

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SYSTEM PERFORMANCE IN **MARCH**	7600	6600	6400	UNIX1	UNIX3	VMS1	VMS2	PHYS
System Availability	96.67%	96.00%	98.31%	94.45%	99.04%	99.68%	99.95%	100.00%
Median Service Interval (hrs)	19.62	30.00	65.58	14.00	27.78	145.05	196.83	744.00

Jobs Processed: 44,486 on 7600; 23,977 on 6000's; 68,463 total

- -

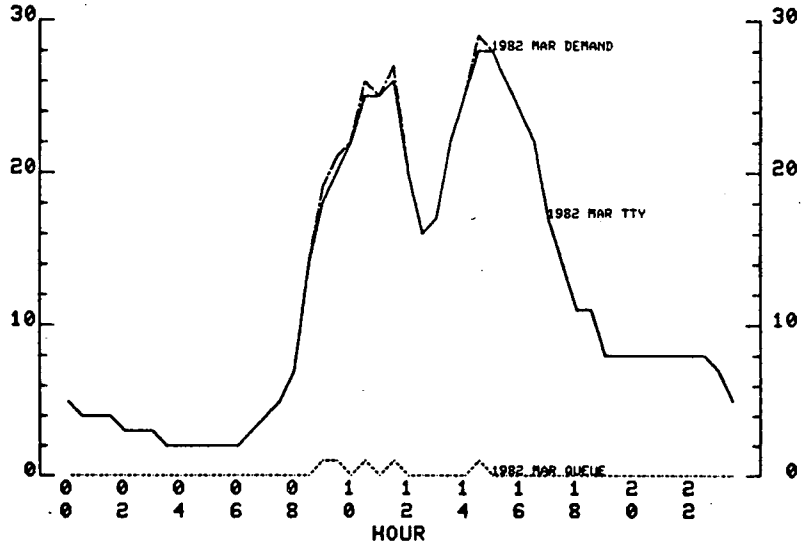
7600 TURNAROUND TIME	20 min	2 hrs	4 hrs
% of RUSH jobs returned	92.83	98.28	99.91
% of ALL jobs returned	84.25	94.08	96.85
% returned, CU limit = 100	81.94	97.92	98.61
% returned, CU limit = 500	83.47	95.56	98.79
% returned, CU limit $\geq$ 1000	37.10	64.75	75.90

INTERACTIVE STATISTICS

LBL COMPUTER CENTER
PERFORMANCE MEASURES

RECC CONNECTIONS AND UNSATISFIED DEMAND
6600 AND 6400 COMPUTERS

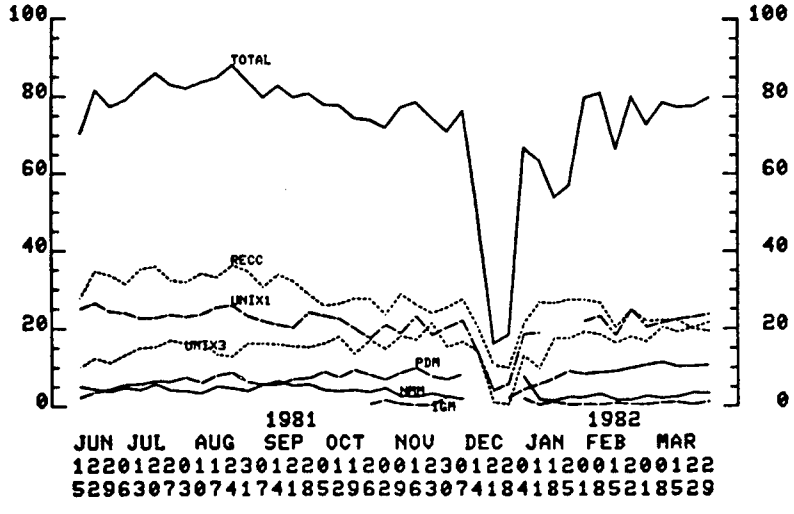
MARCH 1982 WORKDAYS



LBL COMPUTER CENTER
PERFORMANCE MEASURES

INTERACTIVE TERMINAL ACTIVITY

AVERAGE NUMBER OF TERMINALS CONNECTED
SAMPLED AT HOURLY INTERVALS, PRIME USE PERIODS, WORKDAYS



Howard White, x5775

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