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Computing at Lehigh

Lehigh University

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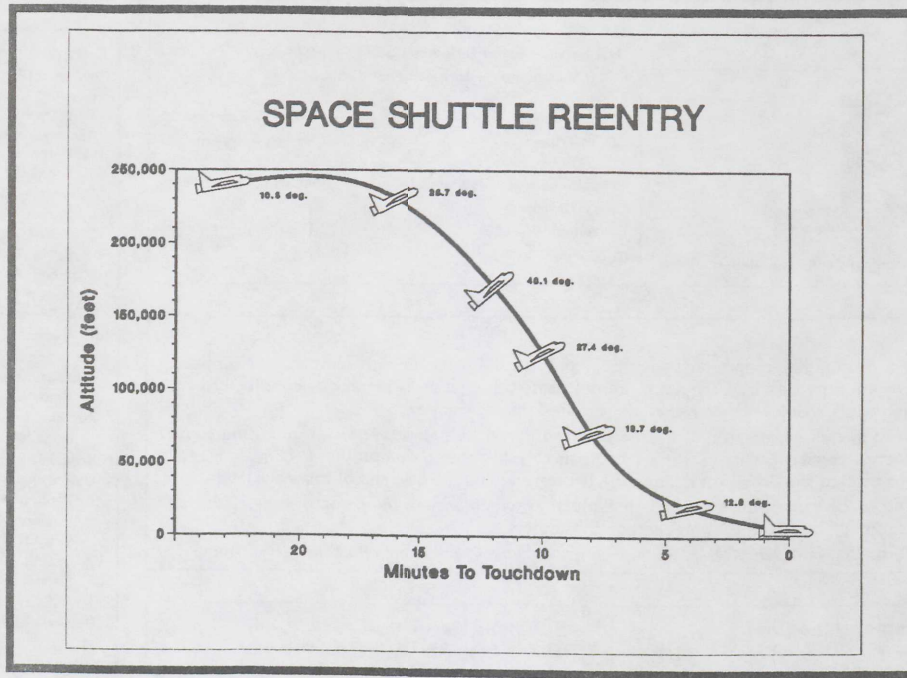
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Computing at Lehigh

Lehigh University's
Computing Center Newsletter

May 1988
Volume XV, Number 5



Graphic image created on the CYBER 850 with DISSPLA

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From the Director

William R. Harris

This month, I will be addressing the accomplishments of the Center with respect to the Planning and Priorities goals written last May. I am happy to report that most goals have been accomplished, some even ahead of schedule. Development of a five year strategic plan for computing is under way. The results of the LUCC survey are discussed in some detail

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CYBER NOS to be Retired

Sandra L. Johnson

Control Data Corporation is phasing out development of NOS in favor of the NOS/VE operating system.

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Borland Software

Program Installation License Implemented

Sandra J. Edmiston

Under the Limited Program Installation License part of Lehigh's agreement with Borland International Inc., faculty and staff may obtain — free of charge, but without documentation — the software listed below, for installa-

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Network Operation

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Using the Network Server's Mail Facility

Doris A. Oravec

Using the Network Server's LUNA mail facility to send and receive electronic mail is a process easily learned and performed by most users. However, not all users are aware of some of the options and editor commands that can assist with, and enhance, the use of this facility.

Maintaining Mail

After choosing the RE option at the LUNA Main Menu to read mail, a user is normally presented with his or her incoming memos list. This in-

See Mail, page 10

Lehigh University Computing Center Hardware

- CDC CYBER 180 Model 850 (32 MBytes Memory, NOS/VE V1.2.3 & NOS V2.5.3)
- IBM 4381 Model 11 (8 MBytes Memory, VSE/SP V2.1.5)—Administrative
- IBM 4381 Model 13 (16 MBytes Memory, VM/SP V1.4, MUSIC/SP V1.2)—Network Server
- VAX 8530 (32 MBytes Memory, VMS V4.7)
- Zenith Z-100 PC Series & Z-200 PC Series (512 KBytes Memory, MS-DOS V3.10 & 3.20)

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Lehigh University's Computing Center Newsletter

User Services External Report (USER) est. 1973
LUCC Microcomputer Newsletter est. 1986

General Editor ----- Blair R. Bernhardt
Copy Editor ----- Monica A. Newman

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Lehigh University
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Carol D. Rauch 758-3989
- Systems Programming Manager
Kevin R. Weiner 758-3991
- Microcomputer Store Manager
Robert R. Kendi 758-4606
- User Services Manager
Monica A. Newman 758-3990

Information About Bills Received

- Administrative Associate
Pamela S. Steigerwalt 758-3825
- Accounting Assistant
Annette L. Ruhe 758-3825

Consulting

- User Consultants
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Frederick W. Chapman 758-3218
Linda S. Orr 758-5152
Joel W. Robertson 758-3985
Kenneth R. van Wyk 758-4988

Information About Software Availability

- Software Librarian
Judith K. Allio 758-3993

Systems Status, Technical Information

- On-duty Consultant
..... 758-4141

General User Information

- Data Processing Assistant
Ann Marie Matusa 758-3990
- Accounts Coordinator
Doris A. Oravec 758-3992

Information About Tapes and Supplies

- Data Processing Tape Librarian
Monica M. Herrera 758-4140

Computer Phone Access

- On-Campus
CYBER 850
(300-19.2K Baud) ..(cdc) Ext. 46800
- IBM 4381
(300-19.2K Baud) ... (ns) Ext. 46000
- VAX 8530
(300-19.2K Baud) ... (vax) Ext. 46400
- Off-Campus
CYBER 850
(300/1200 Baud) 974-6800
- IBM 4381
(300/1200 Baud) 974-6000
- VAX 8530
(300/1200 Baud) 974-6400

General Information

Computing at Lehigh is a bi-monthly report on computing, published by the Lehigh University Computing Center. Article contributions are primarily by Computing Center staff, although users are also encouraged to contribute. Instructions for submitting articles can be found at the end of this newsletter.

Subscriptions to *Computing at Lehigh* are free of charge to those in the Lehigh University Computing Center user community and to other interested parties. Those who wish to subscribe to *Computing at Lehigh* or make changes regarding their subscription should return the mailing list form included at the end of this newsletter.

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Public Site Hours (Summer Schedule)

	Room Hours	Student Consulting Hours
Central Site Users' Area, 180 Fairchild-Martindale		
Mon-Fri	6:30 am - 9:00 pm	9:00 am - 12:00 noon 1:00 pm - 5:00 pm
Sat	9:00 am - 5:00 pm	no consulting
Central Site Microlab, 292 Fairchild-Martindale		
Mon-Fri	6:30 am - 9:00 pm	no consulting
Sat	9:00 am - 5:00 pm	no consulting
Central Site Special Equipment Room, 182 Fairchild-Martindale		
Mon-Fri	9:00 am - 12:00 noon 1:00 pm - 5:00 pm	9:00 am - 12:00 noon 1:00 pm - 5:00 pm
Drown, Room 208		
Mon-Thu	8:00 am - 10:00 pm	no consulting
Fri	8:00 am - 6:00 pm	no consulting
Sat	8:00 am - 1:00 pm	no consulting
Fritz Lab Annex, Room A3		
Mon-Fri	8:00 am - 10:00 pm	no consulting
Grace, Room 28		
Mon-Sun	24 hours	no consulting
Libraries: Fairchild-Martindale, Linderman, & Media Center		
Mon-Thu	8:00 am - 11:00 pm	no consulting
Fri-Sat	8:00 am - 5:00 pm	no consulting
Maginnes, Room 491		
Mon-Fri	8:00 am - 10:00 pm	no consulting
Sat	9:00 am - 1:00 pm	no consulting
Mountaintop Campus, B103, D109, D117 Building A		
Mon-Thu	6:30 am - 10:30 pm	no consulting
Fri	6:30 am - 5:30 pm	no consulting
Packard, Room 502		
Mon-Thu	8:00 am - 10:00 pm	no consulting
Fri	8:00 am - 5:00 pm	no consulting
Sat	8:00 am - 1:00 pm	no consulting
Whitaker, Room 257		
Mon-Thu	8:00 am - 8:00 pm	no consulting
Fri	8:00 am - 5:00 pm	no consulting

Business Hours

Business Office, 394 Fairchild-Martindale	
Mon-Fri	8:15 am - 12:00 noon 1:00 pm - 4:45 pm
User Services, 185/194/196 Fairchild-Martindale	
Mon-Fri	8:00 am - 12:00 noon 1:00 pm - 5:00 pm
Microcomputer Store, Sayre Building #26	
Mon-Wed	9:00 am - 5:00 pm
Thu	9:00 am - 7:00 pm
Fri	9:00 am - 5:00 pm
Operations, 171 Fairchild-Martindale	
Mon-Fri	8:00 am - 11:30 am 1:00 pm - 4:30 pm
Operator Support/Machine Room, 179 Fairchild-Martindale	
Mon-Fri	8:00 am - 9:00 pm
Sat	9:00 am - 5:00 pm

Special Forms Processing Hours

CYBER 850	
Liquid Ink Plots	
Tue, Fri	8:00 am - until done
Network Server	
Talaris	Daily 3:00 pm - 4:00 pm (Except Sun.)
VAX	
/Queue=Talaris	Daily 11:00 am - 1:00 pm (Except Sun.) 6:00 pm - 8:00 pm (Except Sat., Sun.)

Consulting Policy

Consultants are provided to assist users in the use of Lehigh University's computer resources. Consultants are not authorized to interpret course assignments, write code, or debug program logic.

When in need of a consultation, users are requested to contact the LUCC student consultants (present at several of the public sites and at ext. 84141), who are hired to augment the full-time staff consultants.

Computer -----	Network Node Name -----	Network -----
Network Server -----	LEHIGH -----	BITNET -----
CYBER 850 -----	LEHICDC1 -----	BITNET -----
VAX 8530 -----	VAX1.CC.Lehigh.EDU -----	Internet -----

Director, from front cover

elsewhere in this issue; they will assist us in setting objectives and priorities for the coming years.

Most of you are now using the Network Server. Last year at this time, after about four months of system operation, there were approximately 2,500 accounts on the system. Now, slightly over 5,000 people have accounts, and the volume of system activity has doubled. Many small enhancements have been made to make the system easier to use, documentation has been written, and help screens have been made more useful. INFO facility features such as bulletin boards have become very popular. LUCC is now developing specifications for future services in conjunction with the University Library and the Administrative Systems Office.

One of the high priority items for fiscal year 1987-88 was the augmentation of CYBER disk capacity. The additional capacity was necessary to meet growing research usage of the system, and to permit continued development of the NOS/VE operating system. The budget request for the additional disk was approved, and the disk was installed before the 1987-88 fiscal year. This installation allowed us to reach the goal of further NOS/VE development, and led to our reaching the goals of providing more NOS/VE seminars and completing the *NOS/VE User's Guide*. The additional disk storage also allowed us to more fully utilize the Unix (VX/VE) capabilities under the NOS/VE operating system. As you will see in this issue, we are announcing the phase out of the NOS operating system and asking for input regarding your conversion needs.

Another goal was acquisition of a high-volume laser printer for installation in 1988-89. It was decided instead to install a medium-speed laser printer which supports the PostScript page definition language. This printer was installed a full year ahead of schedule on the newly acquired VAX; in addition, the printer has been made available through the high-speed network to users on the Network Server and the CYBER.

In May of last year, we were just beginning to implement the phase out plan for the DEC-20 and to finalize plans for the installation of the VAX 8530. By the time this issue of *Computing at Lehigh* is published, the DEC-20 will be gone and the conversion of applications to other systems completed.

Our goal for this fiscal year was to install two new microcomputer classrooms/labs. By the end of May, we will have installed three new classrooms/labs having a total of 60 microcomputers; each has or soon will have a video projection system. The classroom/lab in Grace Hall was accomplished by converting the lightly used terminal and micro lab. With its 30 micros, it now provides a much needed site for students in such larger classes as Engineering 1, Management 1, and Accounting 111. The site also became our 24 hour site because of its proximity to dormitories. The Grace site has become a most active computing site.

The Microcomputer Store has greatly improved its maintenance services this past year, with repairs taking place in one working day in most cases. The variety of equipment and software offered have expanded. Additional consulting services, such as on desktop publishing, have been added. Customized packets of documentation and software were made available for sale to students of some of the larger courses.

Although the studies for the rollover of the aging Zenith micros have not formally started, much activity has taken place in regard to our relationship with that vendor. Discussions with other potential vendors have taken place in preparation for the end of our present Zenith contract in 1989. We are considering the feasibility of offering a number of micro vendors as well as the sale of more powerful workstation systems.

The software library for microcomputers and mainframes has greatly expanded. Some of the most notable additions include the line of Borland software, available free of charge for University-owned machines and at nominal prices at the Microcomputer Store for students and employees who would like to use the software on their own machines. In addition, WordPerfect is available at a greatly reduced price, providing an alternative to the general purpose word processing package, Freestyle. For the mainframes, we were able to acquire three software packages which have been requested for years, but which could not be installed because of their unavailability for the operating systems we were running. The statistical system SAS was installed early last Fall on the LUCC VAX, and TELLAGRAF and DISSPLA have been acquired for NOS/VE on the CYBER as well as for the LUCC and ME CAD Lab VAX computers.

The January issue of *Computing at Lehigh* addressed the progress in establishing a high-speed computer-to-computer network. A more complete analysis of need for this capability is desired. This project will progress as funds become available.

As you may be aware, the LUCC organization is changing to allow LUCC to respond to the University's changing computing needs. Tim Foley was promoted to Associate Director of Computing Consulting Services in February 1988, and Carol Rauch will assume the position of Associate Director of Computing Facilities in July. Tim is responsible for the User Services and Microcomputer Store functions, and Carol has operational responsibility for the LUCC and ME CAD Lab facilities as well as for the planning and operation of the high-speed network.

This is a very brief summary of the accomplishments over this past year. I feel it has been a productive year, but many challenges face us all (University community and LUCC) in the coming years as we strive to provide quality computing services. I would like to thank the University community for its assistance this past year, and look forward to another year of progress next school year. Have a good summer. ♦

Mainframe Computing

NOS, from front cover

LUCC has been running NOS/VE in parallel with NOS on the CYBER 850 for over two years, and now plans a full scale migration that will move users to NOS/VE while gradually phasing out NOS. Phasing out essentially means reducing the function and resources of the NOS system over the duration of the migration (a year or so).

There are many compelling reasons to migrate to VE, as it offers several advantages over NOS. Some of the more important reasons are:

- The VE file system is hierarchical; files are organized in a logical and meaningful manner using directories and subdirectories.
- Virtual memory allocation allows the execution of very large jobs (8 trillion bytes).
- Special debugging hardware and software work together to produce a superior source code debugger.
- VE uses the ASCII character set, unlike NOS which uses non-standard character sets.
- CYBIL, a high level Pascal-like programming language, replaces difficult to use assembler languages.
- VE works in conjunction with CDCNET and provides quality, vendor-supported communications functions. VE supports TCP/IP, Kermit, X-MODEM and CONNECT file transfer protocols.
- VE offers line and screen mode interfaces, UNIX and VMS shells, and an elegant graphical interface that runs on the Macintosh. LUCC even supplies MS-DOS look-alike commands.
- The System Command Language (SCL) used by VE is very descriptive, simple to use, and powerful.
- There is a common user interface among all system and user commands. Identical techniques are used to work in any utility.
- VE supports third-party applications such as Patran, Nastran, Dataplot, DISSPLA and TELLAGRAF which could never run on NOS.
- The Programming Environment application integrates, in one package: full screen editing, full screen help and full screen debugging, all of which are driven by function keys.
- The on-line help in VE is excellent; almost every manual is available for examination at the terminal. VE also offers the DISPLAY_COMMAND_INFORMATION (DISCI) command which lists all the parameters and their possible values for ANY command.
- Programs in VE generally run faster than their NOS counterparts, and VE supplies utilities that assist in optimization of user programs.
- The VE utilities that manage source and object libraries are very easy to use.

There are many reasons why a migration to VE is desirable, but for some users there will be a few obstacles. Some applications are not available on VE, and in that case a conversion to another product is required. Here are the areas of concern:

- VE does not have a FORTRAN 66 compiler (FTN4 on NOS); its only FORTRAN compiler is FORTRAN 77. A conversion utility is available under NOS.
- COMPASS code must be converted to a high level language, such as FORTRAN or CYBIL.
- NOS Update program libraries must be converted to SCU (Source_Code_Utility) format using a conversion utility under NOS/VE.
- All CCL procedures must be converted by hand to equivalent SCL procedures.
- NOS SPSS jobs must be converted to SPSS^X.
- NOS object code and libraries will not be usable in VE. If the source code is unavailable, migration is impossible.
- SIR is not yet available for VE, but is expected in Fall '88.
- TWODEPEP users will have to convert to PDE/PROTRAN.

Persons impacted by the above problems should contact Sandra Johnson (x83981) as soon as possible so the alternatives can be discussed.

Current CYBER users should have received a letter requesting information about their CYBER NOS usage; those NOS users who have not received such a letter should request one from User Services at x83990.

Most migrations from NOS to NOS/VE can be accomplished fairly easily by the user with help from a user consultant and/or systems programmer. Now is a good time to begin the migration, because plenty of help will be available this summer.

To aid in the migration:

- Individualized assistance is available for those who want to get started right away. Those users should contact Sandra Johnson at x83981 to make an appointment for migration assistance, and be prepared to describe their major areas of CYBER usage at that time.
- Generalized migration workshops will be held this summer and throughout the duration of the migration. Dates and times for the workshops will be available on the Network Server (under INFO topic VE) as well as mailed to all CYBER users.
- A *NOS to NOS/VE Migration Guide* is being written.
- The *NOS/VE User's Guide* is available at the University Bookstore.

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A list of software available on NOS/VE will be kept up-to-date on the Network Server. It may be viewed by typing IN VE at the LUNA Main Menu. ♦

Interfacing a Symbolics Lisp Machine with the CYBER

Vassilios Tzouanas and Stephen O. Lidie

Note: Vassilios Tzouanas is a graduate student in the Chemical Engineering Department.

The purpose of this article is to report a problem (and its solution) encountered at the Process Modeling and Control Center during the development of a controller using expert systems techniques.

Recent advances in artificial intelligence and expert systems make possible the creation of control systems where algorithmic knowledge and human experience can interact in a combined environment. From a process control point of view, this may lead to more efficient and reliable control systems.

Of particular interest is the creation of a controller, called Expert Multivariable Controller (EMC), which provides safe and effective operation for chemical processes under a wide range of abnormal operating conditions such as sensor failure, valve saturation and process constraints. This controller, which will be applied to the control of distillation columns, is being developed using expert systems programming techniques.

The EMC can be regarded as working on three levels:

- **Diagnosis**, in which the qualitative and quantitative descriptions of the process are used to identify process abnormalities.
- **Control structure determination**, in which the control loops are reconfigured, the type of the controllers is changed, and the controllers are retuned in response to process abnormalities.
- **Implementation**, in which the control structures previously determined are applied to the controlled process.

The EMC is a hybrid expert system which employs shallow (heuristics) and deep (algorithmic) knowledge during its reasoning. Currently, its knowledge base contains more than 220 rules for decision making.

The programming of the EMC was initially done on a Symbolics 3620 Lisp machine using the Automated Reasoning Tool (ART) expert system shell. From the very early stages of the implementation of the EMC on the Symbolics, it became apparent that the system was running very slowly. This is particularly unacceptable for closed loop control studies where decisions must be made within certain time constraints. The main reason for the slow execution of the program was the inefficiency of the Symbolics machine in performing heavy numerical calculations (process simulation, control algorithms and criteria).

Efforts were made to connect the Symbolics with NOS/VE on the CYBER mainframe computer in collaboration with the Lehigh University Computing Center. The objective was to have the EMC's logic execute on the Symbolics and the numerical calculations done by the CYBER. The successful outcome of this joint effort led to program-to-program communication between the two computers.

The EMC controller is initialized from the Symbolics terminal. Upon configuration of the control loops (done on the Symbolics), the EMC instructs NOS/VE to begin execution of the process simulation and control algorithms. Periodically, the EMC observes the state of the controlled process by requesting data from NOS/VE. These data are analyzed (on the Symbolics) to detect the presence of possible process abnormalities. In the case of process abnormalities, the EMC, like an expert operator, decides what must be done. Its decisions are forwarded to the CYBER and the process simulation continues according to the EMC's new instructions. This bidirectional communication between the computers is done using an RS-232 serial port at 9600 or 19200 baud. On the Symbolics terminal, the EMC explains its decisions in the form of graphics and text reports. On a Tektronix terminal, connected to the CYBER, the evolution with time of important process variables is displayed.

Using this interface between the two computers, the speed of executing the EMC's programs has been improved by a factor of 30. This allows the performance of the EMC to be tested using more rigorous process simulations and complicated control techniques.

This work has been supervised by Professors W. L. Luyben and C. Georgakis of the Chemical Engineering Department. ♦

CYBER Software Library

NOS/VE PRINT Command Modified

The PRINT command on NOS/VE now dispatches files to output devices on various host computers. The devices supported are the CYBER's high-speed line printer, the Network Server's IBM 3820 laser printer, and the VAX's dot matrix printer as well as its PS40 and Talaris laser printers. An account on the Network Server or VAX is not needed to dispatch a file to its output device using PRINT on NOS/VE.

The banner page for output printed from NOS/VE will contain the NOS/VE username.

The destination output device is specified using the QUEUE parameter of the PRINT command, as is the case with the VAX PRINT command. Indeed, the names of these queues were chosen to be consistent with those for the VAX. So, for instance, to print a file on the Talaris, enter:

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```
PRINT filename QUEUE=TALARIS
```

or, the equivalent:

```
PRINT filename TALARIS
```

Here is a list of the supported queues:

Queue	Printer
VE	CYBER's line printer
IBM	Network Server's 3820 laser printer
SYS\$PRINT	VAX's dot matrix line printer
POST	VAX's PS40 laser printer, PostScript file
ANSI	VAX's PS40 laser printer, ASCII file
TALARIS	VAX's Talaris laser printer

If a queue is not specified, the VE queue is normally selected and the command acts like the NOS/VE PRINT_FILE (PRIF) command. However, if the file is a PostScript plot file produced by the NOS/VE plotting routines, it will be routed to the POST queue automatically.

The following is a list of other parameters available for the NOS/VE PRINT command, although not all parameters are applicable to all output devices.

Parameter	Values
ORIENTATION or O	LANDSCAPE or L, PORTRAIT or P

SIDES or S	1 or 2 (2 only for queue IBM)
LINES_PER_PAGE or LPP	60 or 80
UP or U	an integer 1 through 100 (1 or 2 for queue IBM)
FONT or FO	CE12, CI10, CR10, GC15, GFC, GI12, GT10, GT12, GT15, SI12, SI10, SR12, ST10, ST12, ST15 (all only for queue IBM)
CARRIAGE_CONTROL or CC	YES or NO

Examples of the NOS/VE PRINT command follow:

```
PRINT $LOCAL.PLOT_PS
```

Print the PostScript file \$LOCAL.PLOT_PS on the PS40.

```
PRINT FORTRAN_PROGRAM ANSI UP=4
```

Print the FORTRAN source file FORTRAN_PROGRAM on the PS40 laser printer, placing four "pages" of code on one physical page of paper.

```
PRINT PROG_LIST IBM O=L FONT=ST15
```

Print a program's compilation listing file PROG_LIST on the Network Server laser printer, using landscape orientation and the ST15 font.

```
PRI PROG_LIST
```

Print the listing on the CYBER line printer. ♦

VAX Software Library

CAYLEY Algebraic Computation Package Installed on VAX

Frederick W. Chapman

Version 3.5-2 of CAYLEY has been installed on LUCC's VAX 8530 mainframe. CAYLEY is an algebraic computation package particularly well-suited to calculations involving abstract groups. CAYLEY supports a variety of algebraic structures including groups of permutations on a finite set (hence any finite group), finitely-presented groups, finite-dimensional vector spaces over an arbitrary finite field, finitely generated free modules over the ring of integers or over the integers modulo m , and the ring of $n \times n$ matrices over a finite field, over the integers, or over the integers modulo m , as well as subgroups of the multiplicative group of this matrix ring. Sets, sequences, and mappings are also supported by CAYLEY.

Although a variety of mathematical objects are supported by CAYLEY, the package is intended primarily for working with groups. CAYLEY provides a computationally efficient, interactive facility for performing calculations with various groups and for investigating their structure; for example, CAYLEY can find the conjugacy classes of a group as well as the lattice of normal subgroups. The action of a permutation or matrix group on a set can also be investigated; one can compute orbits, stabilizer subgroups, and (for permutation groups) inves-

tigate questions concerning transitivity and primitivity. CAYLEY is not only an interactive environment, but a full-featured programming language as well.

In order to make CAYLEY accessible from an account on the LUCC VAX, enter:

```
USE CAYLEY
```

at the VMS prompt. (Frequent users of CAYLEY may wish to include this command in their LOGIN.COM file.) Enter:

```
CAYLEY
```

at the VMS prompt in order to start the package. Note that every command entered at the CAYLEY prompt must be terminated by a semicolon. Enter:

```
HELP;
```

at the CAYLEY prompt in order to access a rather brief on-line help facility (intended primarily for students). To exit from CAYLEY and return to VMS, enter one of the following:

```
QUIT;
```

or:

```
BYE;
```

The CAYLEY software package includes a number of special-purpose libraries. There is a library of problems for teaching group theory at the undergraduate level. There are a num-

continued on next page

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ber of research libraries which contain useful CAYLEY procedures and catalogs of groups; for example, one library contains all non-abelian simple groups of order less than one million (with the exception of PSL(2, p)). LUCC has developed a command, CAYLIB, which simplifies working with CAYLEY libraries. To list the names of available CAYLEY libraries and to obtain further instructions on how to use these libraries, enter:

```
CAYLIB
```

at the VMS prompt.

In addition to the on-line help available within CAYLEY and the on-line instructions provided by CAYLIB, there is a third source of on-line information which can be accessed by entering:

```
HELP @TUTHELP
```

at the VMS prompt. The bulk of this information concerns maintaining and adding to CAYLEY's help files and problem libraries. Note that none of this on-line help material is accessible unless the VMS command USE CAYLEY has been issued. Printed documentation for CAYLEY consists of a manual entitled *A Language for Group Theory*. The first chapter of this manual contains an extended example illustrating the use of CAYLEY; the rest of the document serves as a comprehensive reference. This manual is available for reference at the central site users' area and is on one-day reserve at the Fairchild-Martindale campus library.

Questions concerning CAYLEY may be directed to Professor Bruce A. Dodson (Campus Phone: 8-3753; Network Server ID: BAD0) or Professor Clifford S. Queen (8-3752; CSQ0) of the Department of Mathematics, or to Frederick W. Chapman (8-3218; FC03) of LUCC's User Services. ♦

REDUCE Now Available on the VAX

Judith K. Allio and Frederick W. Chapman

REDUCE Version 3.3 is now available on the VAX 8530. REDUCE is a program designed for general algebraic computations of interest to mathematicians, physicists, and engineers. REDUCE supports exact rational arithmetic, automatic expansion and simplification of algebraic expressions, symbolic differentiation and integration of functions defined by formulas, the exact solution of some kinds of algebraic equations, as well as various kinds of matrix calculations.

Note that Version 3.3 of REDUCE is more current than the release which had been available on the DEC-20, namely Version 3.2. Under Version 3.3, the REDUCE user can save a REDUCE session and resume this session at a later time, as though no interruption had taken place; this feature was not available under Version 3.2. Also new to Version 3.3 of REDUCE is a library of user-contributed packages. The names of these special-purpose packages and a brief description of each are listed below.

Name	Description of Package
ALGINT	Symbolically integrates algebraic expressions containing square roots.
ANUM	Performs calculations with algebraic number fields.
EXCALC	Performs exterior calculus and other calculations of interest in differential geometry.
GENTRAN	Generates FORTRAN or C code for complete numerical programs given the necessary symbolic expressions.
GROEBNER	Performs calculations with Groebner bases.
SPDE	Computes the symmetries of partial differential equations.

Each package (unsupported) comes with its own documentation, test file, and source code. Documentation for these packages can be found in the directory "RDOC:"; details on how to read or copy files in "RDOC:" are described at the end of this article.

Use of REDUCE is described in three documents: the *REDUCE User's Manual Version 3.3*, the *REDUCE User's Guide for VAX/VMS*, and *Known Bugs and Problems in REDUCE 3.3*, all of which are available in one of the documentation racks in the central site users' area. VAX-dependent features of Version 3.3 of REDUCE are discussed in the *REDUCE User's Guide for VAX/VMS*; these implementation notes are available on-line in the directory "RDOC:" as a file named "OPER.DOC". *Known Bugs and Problems in REDUCE 3.3* can also be found in the "RDOC:" directory, in the file "BUGS33.DOC".

To access and run REDUCE, enter:

```
USE REDUCE
REDUCE
```

at the VMS prompt. Note that every command issued at the REDUCE prompt must be terminated with a semicolon. To exit from REDUCE and return to VMS, enter:

```
BYE;
```

at the REDUCE prompt, except in the following special circumstance. If one wishes to temporarily leave REDUCE, execute a few VMS commands, and then resume the REDUCE session at the point of interruption,

```
QUIT;
```

should be entered at the REDUCE prompt instead. In order to resume a REDUCE session interrupted via "QUIT;", simply enter:

```
REDUCE
```

at the VMS prompt.

A REDUCE session interrupted via "QUIT;" will not be kept beyond the end of the current VAX session; a REDUCE session terminated in this way is lost when the user logs out of the VAX. In order to save a REDUCE session so that it can be resumed in a later VAX session, issue the command:

```
SAVESESSION "filename";
```

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Quick Reference Guide, and the Microsoft FORTRAN Optimizing Compiler CodeView manual. These manuals are available at the locations listed above. ♦

WordPerfect (V4.2) Available at Some Public Sites

WordPerfect, Version 4.2, is now available on the local area network at 491 Maginnes. WordPerfect disks, configured for

use with HP LaserJet printers, are available at the central site circulation window and the Fairchild-Martindale campus library. LUCC plans to install WordPerfect on the local area network at 292 Fairchild-Martindale after that facility is upgraded.

Use of WordPerfect is described in the *WordPerfect* manual to be available at the locations listed above. ♦

Network Operation

Mail, from front cover

coming mail list may contain previously read and/or new memos. The number of memos retained on this list should be kept to a minimum. If too many are retained, a user may receive an error message after choosing LUNA's RE option. Once read, memos should be saved in a file and/or purged (i.e., deleted) from the list of incoming memos.

To save a memo in a file: display the memo, tab to the field "File Name", enter a file name, and press the F6 key. A copy of the displayed memo will be written in the new or existing file specified, or in file "OLDMEMO" if no file was specified before the F6 key was pressed. (In this situation, existing files, including "OLDMEMO", are added to, not written over.) Typically, a user will save memos on a given topic, or from a particular user, in the same file.

One way to access a file in which a memo was saved is by using the LUNA File Operations option. At the LUNA Main Menu, enter FI to access this option. At the File Operations menu, select the L (List File) option, and then enter the name of the file to be listed. (Alternatively, FI L filename may be entered at the LUNA Main Menu.

The BMAINT utility, which is used by bulletin board administrators, is useful for maintaining files of old memos. This utility can be used to review and/or delete memos. To access this utility, enter the following at the LUNA Main Menu:

```
/BMAINT
```

(for memos saved in file "OLDMEMO") or:

```
/BMAINT filename
```

where *filename* is the name of a file in which some memos have been saved. After accessing BMAINT, further information on its use can be obtained by pressing the F1 key.

Sending Mail

After choosing the SE option at the LUNA Main Menu, a user is presented with the send memo screen. This screen has

several fields, for such information as the intended recipient(s) and the subject of the memo. After pressing the Return key at this screen, the user is placed into the MUSIC editor. The editor commands SAVE and MERGE can be very helpful when sending a memo.

Two common situations where the SAVE command is helpful are: when a user does not have time to finish a memo being composed, and when a user decides to save a copy of the memo being sent. To utilize this command, press the F2 key to place the cursor on the "Command" line, and then type:

```
SAVE filename
```

and press the Return key. The current contents of the memo will be saved in the specified file. After saving the memo, either press Ctrl-F3 (by pressing the F3 key while depressing the "Ctrl" key) to quit and not send the memo, or press the F3 key to send the memo.

To resume sending the memo at a later time, do the following: choose the SE option at the LUNA Main Menu, fill out the send memo screen again, press Return to enter the editor, press the F2 key to get to the "Command" line and, finally, type:

```
MERGE filename
```

and press the Return key. MERGE loads a copy of the file specified into the current file. Since the "***MEMO TO:", etc. lines had been SAVED along with the memo text, those lines should now be deleted.

BITNET Mail

BITNET is an international, academic communications network of which the Network Server is a part. Users who wish to send BITNET mail should begin by typing SE B at the LUNA Main Menu. Further information on the use of this BITNET mail facility is available on-line; press the F1 key after accessing the facility to obtain the help text. A *BITNET User's Guide* is available from User Services, x83990. ♦

General Interest

LUCC User Survey Results

Note: This is the first of a two part series on the results of LUCC's User Survey.

Who Responded

Of the 609 survey respondents, 57.8% were students, 16.9% were faculty, 14.6% were professional staff, and 10.7% were support staff. Approximately two-thirds (65.8%) of those responding were male. While 45.8% of the surveys were taken on-line on the Network Server, the remaining ones were filled out on paper.

In terms of the populations represented, 26.5% of the faculty responded (with the Engineering and Education colleges having the highest percentages of their faculty responding and the Business college having the lowest). Further, 23.7% of the professional staff, 14.9% of the support staff, 8.2% of the graduate students, and 4.2% of the undergraduates responded.

The majority (72.4%) of the respondents had three or more years of computer experience. While 56.8% of the respondents indicated that their computer expertise was mainly on microcomputers, 6.9% indicated that their expertise was mainly on mainframes; the remaining 36.3% characterized their expertise as being on both micros and mainframes. Also, 95.2% of the respondents indicated that they used a computer at least once a week, and 61.1% of the respondents indicated that they used a computer daily.

Almost two-thirds (63.7%) of the respondents stated that they own a microcomputer or terminal, with 45.5% of the respondents stating that they own Zeniths or other IBM PC compatibles. PC compatible micros are owned by 68.9% of the faculty respondents, 47.4% of the undergraduate respondents, 44.9% of the professional staff respondents, 34.8% of the graduate student respondents and 29.2% of the support staff respondents.

Six and four-tenths percent of the respondents reported that they own Apple microcomputers, with 3.6% owning a Macintosh and 2.8% owning an Apple II. Figures for ownership of Macs vs Apple II's within various groups of respondents are 3.1% vs 6.2% for the undergraduates, 5.7% vs 0.6% for the graduate students, 3.9% vs 1% for the faculty, and 3.4% vs 2.2% for the professional staff. No member of the support staff reported owning a Mac but one reported owning an Apple II.

Priorities

While 40.9% of the Engineering college faculty respondents agreed that Supercomputing Support should receive a high priority, 9.1% of them disagreed. Further, 34.1% of this same group agreed that High Performance Workstations should

have a high priority, while 18.2% of them disagreed. About 30% of the respondents of the Arts & Science college felt that Supercomputing Support should have a high priority, and about 30% of that same group and of the professional staff felt that High Performance Workstations should have a high priority. About one-third of the group composed of students in the Engineering and Arts & Science colleges agreed that Supercomputing Support, High Performance Workstations, and Video Technology should have a high priority, while about 10% of that group disagreed. On a whole, student respondents seemed more enthusiastic about technology than did faculty respondents.

Of the activities listed on the survey, Software Acquisition was the one which the greatest percentage of faculty (69.9%) felt should have a high priority; this activity was tied for first (with consulting) for the student population (67.1%) and was second for the staff population (55.2%). Regarding Software Development, about half of the student respondents and about 40% of both the faculty and staff respondents felt that Software Development should have a high priority.

As to High-speed Networking, over half (56.2%) of the student respondents agreed that it should receive a high priority, while less than 10% of them disagreed. Half of the Engineering faculty respondents and about one-quarter of both the Arts & Science and Education faculty respondents agreed that it should be a high priority.

The database area had the fewest respondents considering it a high priority for LUCC. Less than one-quarter of the respondents indicated that Database Software should receive a high priority, while an even lower percentage felt that the Availability of Specialized Databases should have a high priority.

Public Sites

Almost all of the faculty respondents (98.1%) do most of their computing at either their offices or residences, as do 65.8% of the graduate student respondents. The majority of the undergraduates (75.8%) indicated that they do most of their computing at their place of residence. However, 16.5% of the undergraduate respondents and 15.2% of the graduate student respondents do most of their computing at public sites. This may account for the fact that, while only about one-third of the faculty respondents felt that LUCC should place a high priority on having More Public Microcomputers, over half (56.3%) of the students felt this way.

Of the professional and support staff respondents, 89.9% and 84.6% respectively do most of their computing in their of-

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fices. None of the support staff respondents and only 2.2% of the professional staff respondents indicated that they do most of their computing at a public site.

Almost half of all respondents agreed that LUCC should place a high priority on having More Microcomputer Classrooms. Of the 32 undergraduate respondents in the Business college, 18 felt that having More Microcomputer Classrooms should have a high priority.

Use of LUCC Consulting

The majority (65.5%) of respondents indicated that the Computing Center should place a high priority on consulting, while only 6.6% of them disagreed. The Computing Center provides consulting in various ways, which include the professional staff consultants, User Services student consultants, Microcomputer Store consultants, and the Hotline.

When respondents were asked where "a good place to go for help when you have a computing question" was, the highest percentage (82.8%) indicated "colleagues and friends". This may be because oftentimes colleagues may have done whatever it was that the respondents were trying to do. The order in which the LUCC options were chosen, in decreasing frequency, follows: the professional consultants, the Hotline (which is staffed by student consultants), the User Services student consultants, and the Microcomputer Store.

More people disagreed than agreed that the Microcomputer Store was a good place to go for help with a computing question. Since the Store staff are instructed to direct any questions they cannot answer to User Services, and since many questions are mainframe-oriented, it may have appeared to many respondents that they were being given the runaround.

Most of the faculty respondents (84.5%) use LUCC consulting services at least occasionally throughout the year. A smaller percentage of graduate student respondents (65.8%) and undergraduate respondents (55.2%) utilize these services at least occasionally. This suggests that the consulting services are being used in the manner in which they are intended, which is that the Computing Center assist the faculty who in turn pass along the information to the students. A large percentage of both the professional staff and support staff respondents (75.3% and 67.7%, respectively) also use LUCC consulting services at least occasionally throughout the year.

LUCC Seminars

About two-thirds of the graduate students, of the professional staff, and of the support staff indicated that the Computing Center should place a high priority on Seminars. Fur-

ther, about 44% of the undergraduates and of the faculty felt that Seminars should have a high priority. The colleges having the highest percentage of student respondents who felt that Seminars should have a high priority are the Education college (66.7%) and the Business college (63%).

About two-thirds of the faculty, of the professional staff, and of the support staff felt that the seminars are useful; 56.3% of the graduate students felt similarly. About one-third of the undergraduates thought that the seminars are useful, while 8.3% thought that they were not; 58.8% stated that they were neutral, perhaps because they had never attended a seminar. A large percentage of the graduate students in the Arts & Science college (63.6%) and of the students in the Business college (55.6%) felt that seminars should be held more often, as did about 50% of both the professional and support staffs. About 40% of both the graduate students and professional staff felt that seminars covering more advanced topics should be offered, as did about 30% of both the faculty and support staff and about 25% of the undergraduates. Graduate students in the Arts & Science college (54.6%) and Business college (50%) agreed that seminars should be given at more convenient times, as did 36.1% of the undergraduates. ♦

New Mountaintop Sites

A new microcomputer classroom has been installed on the Mountaintop Campus in Building A, Room D117. A new public site has been installed at Room D109; the site replaces the Whitaker Room 439 site which closed May 20th.

The classroom contains twelve ZF-286 microcomputers, each with 512k, an 80287, a color monitor, a 5.25 inch 360k floppy drive, and a 3.5 inch 1.44m floppy drive. The instructor's station has EGA capability and a Star SR-10 dot matrix printer. A projection system will be installed, probably in July. To reserve this classroom, call User Services at x83990.

The public site has two ZF-286's (configured the same as those in the classroom), two Tektronix 4205 graphics terminals, three ZF-158's, an LA-120 printing terminal, an HP LaserJet Plus, and a Star SR10 dot matrix printer.

All of the above micros are on one local area network which uses a ZW-241 as the file server. All stations also have an ADI for communications with the InteCom system.

These sites will be open 6:30 am to 10:30 pm Monday to Thursday, and 6:30 am to 5:30 pm Friday. Those having access to the building beyond these hours will also have access to these facilities. ♦

Consultant's Corner

Sharing a Scribe Bibliography File

Ryan Monaghan

The following procedure describes how to access a Scribe bibliographic database file that is stored in a different VAX account.

For the purposes of this example, the directory [UJDOE.MISC] contains the bibliographic database file CHEM.BIB while the directory [UMSMITH] contains the bibliographic database file REFREN.BIB as well as the manuscript file THESIS.MSS which utilizes these database files.

The initial lines of the manuscript file THESIS.MSS would look similar to the following:

```
@Device (PostScript)
@Make (LuThesis)
@Style (FontFamily "TimesRoman",
       Hyphenation On)
@LibraryFile (Mathematics10)
. . . .
@Style (References IEEE)
@Use (Bibliography "REFREN.BIB")
@Use (Bibliography "[UJDOE.MISC]CHEM.BIB")
. . . .
Beginning of text
```

The three underlined commands provide Scribe with information for use in generating citations and a bibliography. The first bibliography command:

```
@Style (References IEEE)
```

specifies the reference format that Scribe should employ for citations to literature and the bibliography. IEEE format is but one of many bibliographic formats. NewAPA, an American Psychological Association format, is another. The command:

```
@Use (Bibliography "REFREN.BIB")
```

instructs Scribe to consult the database file REFREN.BIB when it encounters citation codewords within the text of THESIS.MSS. Finally, the third underlined command:

```
@Use (Bibliography "[UJDOE.MISC]CHEM.BIB")
```

specifies the name of another database file, which resides in an account of another user. In this case, Scribe will search both bibliographic database files if necessary when it encounters citation codewords in THESIS.MSS.

However, before Scribe can access the file in the other account, the owner of that account must manually set the bibliographic database file's "protection" so that other accounts may access (read) the information that the file contains. By default, the account [UMSMITH], and all other VAX accounts, have no access to the account [UJDOE] or the file

[UJDOE.MISC]CHEM.BIB. As paraphrased from the January 1988 issue of *Computing at Lehigh*, the user UJDOE should enter the following at the VAX system prompt:

```
Set Protection=(W:E) [000000]UJDOE.DIR
```

to allow the "world" access to files in the root directory, [UJDOE];

```
Set Protection=(W:E) [UJDOE]MISC.DIR
```

to allow the world access to files in the subdirectory MISC within [UJDOE]; and,

```
Set Protection=(W:R) [UJDOE.MISC]CHEM.BIB
```

to enable the world read access to the file CHEM.BIB within [UJDOE.MISC].

For further information on building a Scribe bibliographic database file, users may refer to chapter 12 of the *Scribe Document Production Software User Manual*. When actually creating the database, users should consider employing the VAX program BIBLIO, accessible after issuing a USE BIBLIO command. As to VAX/VMS file protections, users may consult the "Setting VAX/VMS File Protections" article in Consultant's Corner of the January 1988 *Computing at Lehigh* as well as the vendor manual *Introduction to VAX/VMS*. ♦

Q and A

Question: How can a user drop a VAX print job?

Answer: First, a user must be logged into the VAX account from which the job was queued. Then, the user must determine the entry number which had been assigned to the print job by entering the command:

```
SHOW QUEUE queuename
```

or, if the user does not remember to which queue it was sent:

```
SHOW QUEUE
```

If the name of the file which had been queued is not listed, the job has probably already printed. If the file is still in the queue, note its entry number and enter the command:

```
DELETE /QUEUE queuename /ENTRY=entrynumber
```

to drop the job.

Question: What is the easiest way to answer an incoming memo on the Network Server?

Answer: While displaying the memo, press the F10 function key (which is the Answer key) to enter the editor where a response may be typed. To send the response, press the F3 function key. The subject field of the memo being answered will be retained in the reply.

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Question: How does one debug a FORTRAN program under NOS/VE on the CYBER?

Answer: Assuming the FORTRAN source code is in the file called **TEST** and the binary file is to be written to the file **LGO**, compile the program with the following command:

```
FORTRAN TEST B=LGO OL=DEBUG DA=ALL RC=ALL
```

This command sets the **OPTIMIZATION_LEVEL (OL)** to **DEBUG**, and turns on all **DEBUG_AIDS (DA)** as well as **RANGE_CHECKING (RC)** for arrays. To execute the binary

file **LGO**, use the following **EXECUTE_TASK (EXET)** command:

```
EXET LGO DM=ON
```

where **DM=ON** turns on **DEBUG_MODE**.

This will place one into the full screen debugger. For help on using the debugger, either press the **Help** function key (F4 when using Kermit), press the **Home** key and enter the command **HELP** on the home line, or reference the *NOS/VE User's Guide* which is available at various sites as well as at the University Bookstore. ♦

Staff Changes

Joseph P. Holzer has retired from his position of Administrative Associate. Pamela S. Steigerwalt has been promoted to Administrative Associate from her position of Coordinator:

Administrative. Christine A. Hartzell joins the Computing Center as Coordinator: Administrative from her previous position in the Controller's Office. ♦

Computing at Lehigh Contribution Information

Computing at Lehigh encourages contributions for articles and *Consultant's Corner*.

We prefer that contributions either be submitted electronically via VAX 8530 mail to user EDITOR, be provided on a MS-DOS formatted 5.25 inch or 3.5 inch floppy disk, or be provided on a 3.5 inch floppy disk in Macintosh (MacWrite) format. Contributions sent via VAX mail must be in ASCII format (i.e., be plain text). Acceptable MS-DOS document formats are:

- ASCII (not word-processed)
- EXP
- Freestyle
- WordStar

Printed copy is welcomed, but please also accompany the printed copy with the text in one of the above formats (especially for articles and other long contributions). All mailed contributions (whether on diskette or printed) should be sent to the following address:

Editor, *Computing at Lehigh*
 194 Fairchild-Martindale #8b
 Computing Center
 Lehigh University
 Bethlehem, PA 18015

Articles by users are included at the Computing Center's discretion. The Computing Center reserves the right to edit all contributions.

Article submissions should be completed by the 1st of even-numbered months. Be sure to include your name, mailing address, and phone number.

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