

The ACSS

# Newsletter

University of Minnesota  
Twin Cities  
October 1988

## Introducing ACSS...

### Microcosm

## University Micro Discount Program

The University of Minnesota's Microcomputer Discount Program enables University students, faculty, and staff to purchase microcomputers, peripherals, and software at significant discounts. The ACSS Microcomputer and Workstation Group supports this program by providing consulting, letting you "test drive" hardware and software in our lab, and helping you in other ways.

### Who's Eligible?

These discounts are available to University departments, full-time faculty and staff, and full-time students. Full-time faculty and staff work at least 75 percent time and are eligible for the University's benefits package. Full-time students are those carrying at least twelve undergraduate credits or eight graduate credits.

Call our Micro HelpLine at 626-4276 for more information, Monday, Tuesday, and Friday from 9 to 12 and 1:30 to 4; and Wednesday and Thursday from 9 to 4.

### What Do I Buy?

To decide what to buy, make use of the several services provided by the ACSS Microcomputer and Workstations Systems group:

**Read the Documents:** Start with our Micro Group's free documents. These contain lists of available micros (Macintosh, IBM, and Zenith), peripheral devices (printers, modems, etc.), and software, with descriptions and current prices. Our documents also include advice on purchasing the right machines and software for your needs, and information on ordering and on our related services.

### Welcome to ACSS . . .

and, to returning readers, patrons, and other friends of **Academic Computing Services and Systems**, welcome back.

The October issue of the *ACSS Newsletter* traditionally introduces new and returning readers to ACSS. This issue features overviews of our computing hardware, software, consulting services, programming languages, and more.

This special issue goes to all University faculty. If you would like to be on our *ACSS Newsletter* mailing list and on our *Microcomputer Newsletter* mailing list, call 625-7397. Subscriptions are free.

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Computing Account.  
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# Help Page

## HELP-LINES

### Central Systems (CA,NV,UX,VX):

626-5592 8 am to 5 pm weekdays

### Artificial Intelligence:

625-8332 3 to 4 pm weekdays

### Data Base:

626-1887 10 to 11 am weekdays

### Graphics:

626-5592 8 am to 5 pm weekdays

### Liberal Arts, Text Analysis:

625-8332 3 to 4 pm weekdays

### LUMINA (Communications questions):

626-2272 8 am to 5 pm weekdays  
7 pm to 10 pm Thursday

### Microcomputer and Workstations:

626-4276 9 am to 4 pm, weekdays  
(Closed 12:00 to 1:30 pm,  
Monday, Tuesday, and Friday.)

### Statistics:

626-1887 1 to 3 pm weekdays

### Text Processing:

625-1391 10 am to noon, Tuesday,  
Wednesday, Friday

## CONSULTING

### Walk-In

#### East Bank:

128C Lind Hall; 10 am to 4 pm, weekdays

#### West Bank:

140 Blegen Hall; 2 to 4 pm, Tuesday;  
11:30 am to 1:30 pm, Wednesday; and  
2 to 4 pm Thursday

#### Microcomputer and Workstations:

125 Shepherd Lab; 9 am to 4 pm, weekdays  
(Closed from 12:00 to 1:30, Monday, Tuesday,  
and Friday.)

## Electronic Mail Consulting

Consulting is now available via the mail facility on all ACSS systems (CA, NV, VX, and UX). Send mail to user name CONSULT for questions after hours and for low-priority questions that are not critical to your immediate computing work. Replies will be sent to your account through the mail facility on your system.

## Instructional Computing Consultant

Department instructors may call 626-0200 for assistance in choosing ACSS systems (CYBER/NOS, CYBER/VE, ENCORE/UNIX, VAX/VMS), software, and for answers to any other inquiries on using computers for instructional computing.

## COMPUTING INFORMATION CENTER

128A Lind Hall, 625-7397, YZE6075@UMNACCA, YZE6075@UMNACUX, or MAD@UMNACVX  
8 to 4:30, Monday through Friday

**Computing account and grant applications** and extensions available for CYBER, ENCORE, and VAX computers.

**Short course enrollment.** Computing short course schedules and class descriptions available.

**Assistance in ordering vendor documentation.** Vendor documentation is not always available in the University bookstores and may be ordered directly from the vendor.

**Complete documentation collection.** Reference copies of vendor and all other documentation for ACSS software.

**Free ACSS documentation.** General information, and mainframe and microcomputer information available.

**Computing Newsletters.** Subscribe to the *ACSS Newsletter* and the *Microcomputer Newsletter*. Newsletters from other computing centers are also available for reference.

**Try One Out:** Go to our Micro Group's lab, in 125 Shepherd Labs, where you can try out the micros and software you're interested in.

**Ask Questions:** Staff in our lab will help you get started and answer your questions. You can also call our Micro HelpLine (see above for hours and phone) for information.

## How Do I Order?

When you've made your decision, you can place your order at the Electronics Desk in the Minnesota Book Center in Williamson Hall. (You may be required to make a down payment when you place your order.) Staff at the Electronics Desk are not prepared to answer technical questions. You will be required to prove your eligibility at the time of your purchase.

When individuals buy items through the discount program, they must sign a Purchase Agreement. This agreement includes an affirmation that the purchaser is a full-time student or staff member and that the equipment is for their personal, educational, and/or research use. This agreement also states that they must not resell the components for a two-year period and that violation of the agreement constitutes misuse and is grounds for appropriate disciplinary action by the University. Faculty and staff who misuse the discount program will be disciplined to the full extent of University rules and regulations and will be required to return the equipment to the bookstore. The bookstore will refund the purchase price of the microcomputer equipment prorated by ten percent for each month since the microcomputer equipment was purchased through the bookstore and will have their microcomputer lab access privileges suspended for one year. Students who violate the Purchase Agreement will have a hold put on their records. The hold can be removed only by returning the microcomputer equipment to the bookstore.

## What Next?

After you get your micro and software, you may want to make use of these ACSS services:

**Warranties and Maintenance:** The ACSS Engineering Services group offers contracts and other maintenance and repair services on all the micros sold through the discount program. Depending on the contract you select, you can bring your micro in for repairs, have Engineering Services come to you, or even arrange for a loaner while your machine is in the shop.

If you don't purchase a contract, you can bring your machine in for work on a fee-for-service basis. Engineering Services also installs security devices on micros.

Our Micro Group's documents list some of the current costs of service contracts. Call Engineering Services at 625-1595 for more information.

**Short Courses:** Everyone who purchases a micro through the discount program can take a free two-hour orientation course, offered by our Micro Group. In this course you'll learn the basics of setting up and using your micro.

Every quarter the Micro Group offers a large number of inexpensive short courses on using the Macintosh, IBM systems, and Zeniths, and some of the most popular software on these systems. We publish the short course schedule in this *Newsletter* and in . . .

**The *Microcomputer Newsletter*:** University micro users find this free monthly publication indispensable. Call 625-7397 to subscribe.

## **A New Location and a Wide Range of Services**

*Don Clark*

ACSS Engineering Services (ES) provides maintenance and other support services for many kinds of computing equipment—including microcomputers and peripheral equipment—for University departments, faculty, staff, and students.

### **We've Moved**

We're now located in the University's **Lauderdale Computer Facility**, 2520 Broadway Drive, at the intersection of Highway 280 and Broadway. This brings us much closer to both campuses. (See the map accompanying this article.) At our new location we provide free parking and handicapped access.

Along with our new location, we have a new phone number: **625-1595**.

Our hours are 8:00 to 4:30, Monday to Friday, excluding holidays.

### **Why ES?**

When you need a computer maintenance service, you'll find it to your advantage to call ACSS Engineering Services:

- We're a non-profit organization with experienced and factory-trained personnel; that means lower rates and more complete services for you.
- We service only University customers, and our services are tailored to the needs of the University community.
- We serve the interests of the University, not those of computer vendors.
- We're now located near the St. Paul and Minneapolis campuses, and we're familiar with the campuses, so we can get to your office quickly.

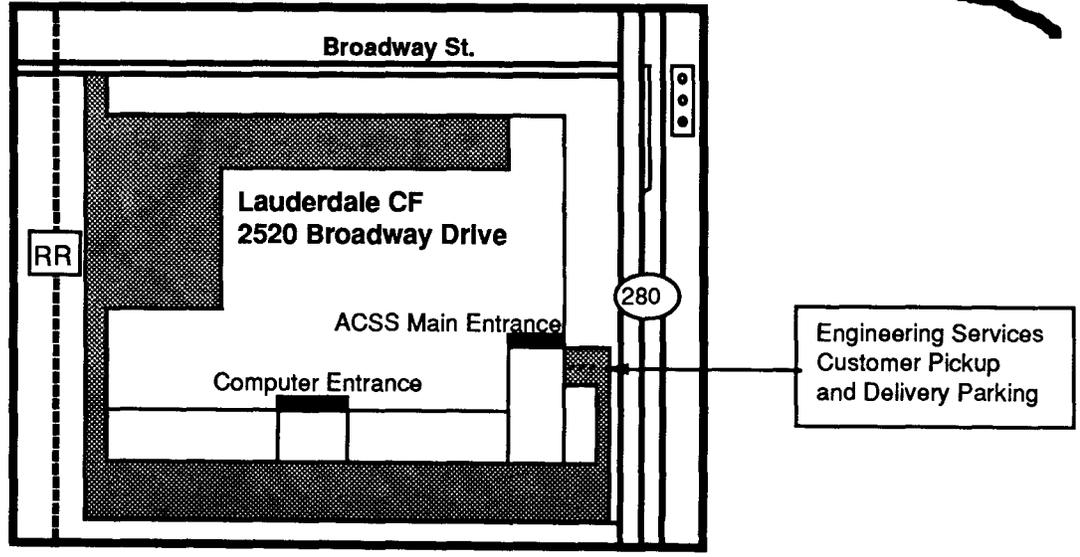
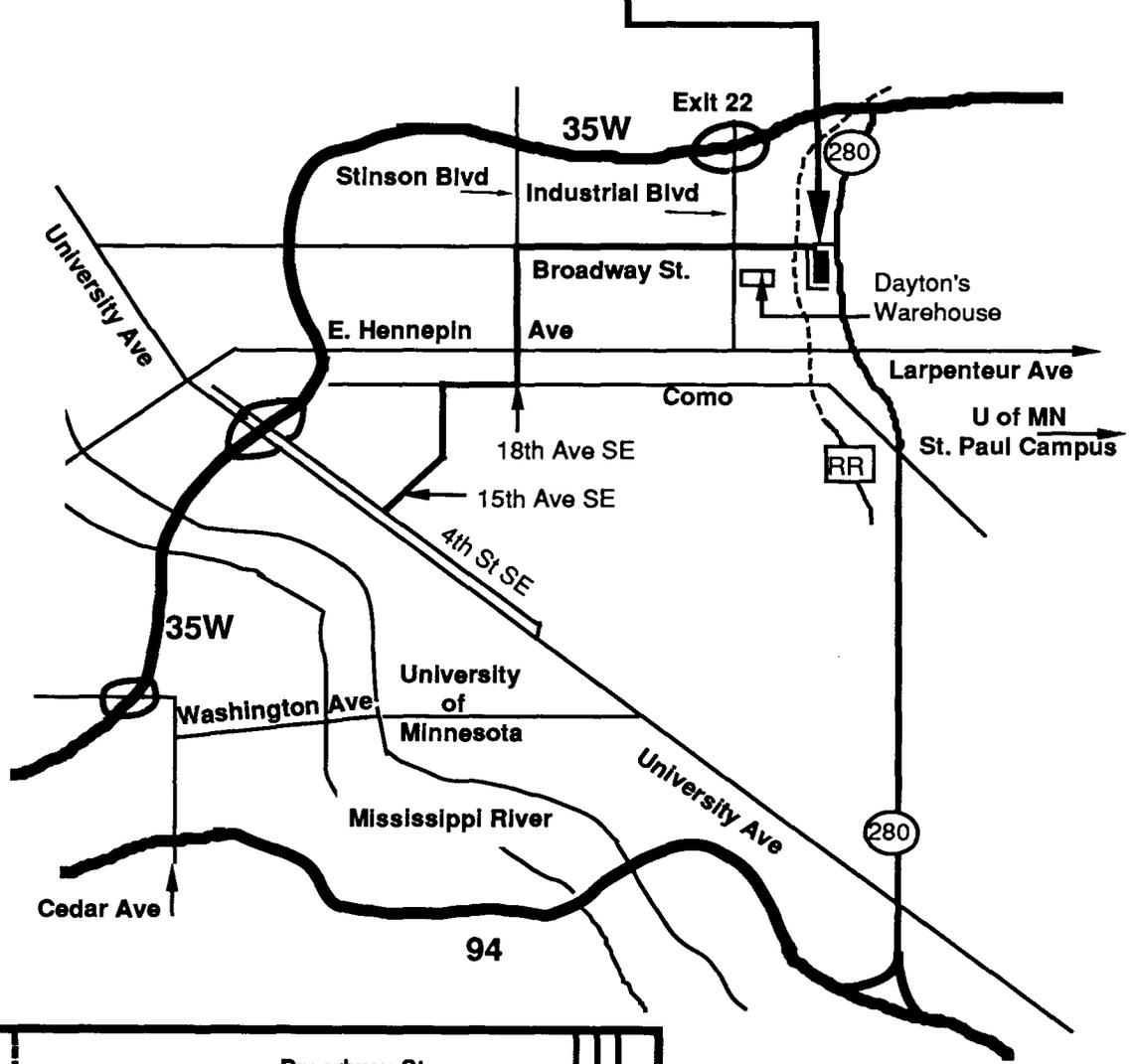
### **Warranty Service and Maintenance Contracts for Micros**

ES is authorized to provide warranty repair service on most microcomputer products manufactured by **Apple, IBM, and Zenith**, and on most printers manufactured by **Epson and Hewlett-Packard**. We work in cooperation with the ACSS Micro Group and the Minnesota Book Center to provide service beginning the day your microcomputer equipment is received. ES provides service under the terms of the manufacturer's warranty.

We encourage you to consider a service contract to keep your equipment in top operating condition, and to protect against expensive repairs; contact us at least three weeks before your warranty period ends.

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# ACSS 2520 Broadway Drive



ES offers three levels of maintenance contracts for your microcomputer:

**Level I:** We respond to your call for maintenance service within an average of four working hours. If we are unable to restore your equipment to operation within a reasonable period of time, we will provide you with a unit to use while your equipment is being repaired. This is our best level of service.

**Level II:** We respond within an average of four working hours. If necessary, we'll take it to our shop for repair. Our goal is to have the equipment returned to you within two working days. This service, which does not include a loaner to use while your unit is repaired, costs less than Level I.

**Carry-In:** You bring your equipment to our shop for repair. Carry-in contract customers have priority over other carry-in work. Our goal is to have your equipment fixed and ready to pick up within one working day. This is our most economical level of service.

We also service Sun workstations and DEC PDP computers.

### Other Services

ES provides a number of other services to University users:

- We install Macintosh upgrades.
- We install and checkout equipment at your office.
- We test and maintain local area network hardware.
- We survey the quality of your power source and provide equipment to protect your computer from power problems.
- We provide and install upgrade products and refurbishment kits to improve the performance and extend the useful life of your computer.

If you want to know more about our services, or have special requests, please call us; we're happy to answer questions and discuss the ways we can help you. We can also send you a brochure describing our services more fully. Our job is to be responsive to the service needs of the University community.

## Get an ACSS Computing Account

You can get an account on an ACSS central computer system simply by completing an application form in our **Computing Information Center (CIC)**, 128A Lind Hall. Or call 625-7397, and we'll send you a form. (See the next page for more information about the CIC.)

At the CIC, you can also apply for **research computing grants** — for an initial \$50 fee, you receive \$1000 of computing services.

If you need help in selecting a central system, call our **HELP-Line** at 626-5592. At the CIC, you can also enroll in **free short courses** that will help you. (And see our short course schedule on page 239.)

## Problems? Contract Services Can Help

*Phil Kachelmyer*

The professional analysts and programmers in ACSS Contract Services help University researchers and others solve their computing problems.

- We can help you define your computing needs.
- We can help you select the hardware and software for your project.
- We can help you write a section of your proposal dealing with applications of computers to your research.
- We can do consulting and custom programming.
- We can teach you beginning programming skills, or teach classes in a specific computing subject for a group.

Some services are free. For others, you must pay a University-subsidized rate.

Contract Services provides services for all ACSS central systems, for microcomputers, and for a wide variety of software packages, including dBase II and III, Lotus 1-2-3, SIR, SPSS, and many others.

If you want to know more about Contract Services, call 625-2303. We will provide, at no cost, an estimate of any costs involved in the work you would like Contract Services to do.

## The Computing Information Center, 128A Lind

*Michael Dunham*

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If you want to

- Open an account on an ACSS central system,
- Get forms to apply for a research computing grant or extension,
- Enroll in a short course,
- Subscribe to free ACSS newsletters,
- Read or order vendor documentation, or
- Learn more about the software and services described in this issue,

visit our Computing Information Center (CIC) in 128A Lind Hall, open from 8 to 4:30 pm Monday through Friday. You can also call 625-7397 for more information.

# ACSS Consulting Services

*John Larsen*

ACSS provides several services for users of our central (or "mainframe") computers and for users of microcomputers.

## Telephone Consulting Services

We have a **general HELP-Line** (626-5592) that is available nine hours a day, from 8 a.m. to 5 p.m. Monday through Friday. When you call the HELP-Line with a question, please try to have information at hand about your problem—a dayfile, a program, or a job stream file—to help us analyze the problem. Most problems you encounter can be handled by general consultants any time consulting is open. Because of the increasing complexity and number of our central systems and software packages, we sometimes have to refer more of your calls to our experts. Occasionally, you may need truly specialized assistance. At those times, consult the other HELP-Lines.

The **Data Base HELP-Line** (626-1887) is available from 10 a.m. to 11 a.m. every week day. This service is for those who need help using data base packages such as SIR, System 2000, or INGRES.

The **Statistics HELP-Line** (626-1887), is available from 1 p.m. to 3 p.m. every weekday, providing consulting on statistical packages such as SPSSX, SAS, or BMDP.

Our consulting services for **Artificial Intelligence** computing and **Humanities** computing (625-8332) are available every weekday from 3 p.m. to 4 p.m.

Our consulting services for **Text Processing** packages (625-1391) such as Scribe and TeX, are available from 10 a.m. to 12 noon Tuesday, Wednesday, and Friday.

The **Instructional Computing** consultant (626-0200) is available daily to assist with a variety of computing services for instruction and research computing.

Our **Microcomputer and Workstation Systems** Group provides our Micro HELP-Line (626-4276) from 9 a.m. to 4 p.m. Monday through Friday except for a break from 12 noon to 1:30 p.m. on Monday, Tuesday, and Friday.

The **LUMINA HELP-Line** (626-2272) provides assistance with access to the Libraries' computerized card catalog through dial-up or Telnet access from VAX/VMS or ENCORE/UNIX operating systems Monday through Friday, 8 a.m. to 5 p.m., and 7 to 10 p.m. on Thursdays.

## On-Campus Services: Walk-in Consulting

We have an **East Bank** walk-in consulting service in 128C Lind Hall. The consultants for this service are available from 10 a.m. to 4 p.m. every weekday and 7 to 9 p.m. one night a week. See "Consulting Schedules" below for more information.

Our **West Bank** walk-in consulting service in 140 Blegen Hall is available from 2 to 4 p.m. Tuesday, 11:30 a.m. to 1:30 p.m. Wednesday, and 2 to 4 p.m. Thursday.

Our **Microcomputer and Workstation Systems Group** provides walk-in consulting at 125 Shepherd Labs at the same hours as its HELP-Line: 9 a.m. to 4 p.m. Wednesday and Thursday, and 9 a.m. to 12 noon and 1:30 to 4 p.m. Monday, Tuesday, and Friday.

### **Consulting Schedules**

Consulting hours are listed in every issue of this *Newsletter*. A *Consulting Schedule Brief*, which also provides hours and numbers, is available free at 128A Lind Hall.

*Instructional Computing*

## **Instructional Computing Consulting**

*Peter Oberg*

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ACSS provides instructional computing consulting to assist faculty and teaching assistants by:

- Helping you determine how to use ACSS systems to meet the current quarter's instructional computing requirements.
- Helping you install your class software on our computers.
- Identifying any training and documentation that students may need (free ACSS documentation, on-line tutorials, and short course offerings).
- Consulting with students on central system computing problems in 128 Lind Hall, Monday through Friday, 10:00 a.m. to 4:00 p.m., and some evenings. Consulting in 140 Blegen is available from 2 to 4 p.m. Tuesday; 11:30 a.m. to 1:30 p.m. Wednesday, and 2 to 4 p.m. Thursday.
- Helping you with administrative software to manage your class accounts.

If you have any questions, please call the Instructional Computing consultant at **626-0200**.

## Statistical Software and Services

Bruce A. Center

BITNET: YZE6028@UMNACVX

ACSS provides a number of statistical packages for research and instructional use. Unless otherwise noted, all of the packages in this article run exclusively on the CYBER CA. We have several statistical packages available on the VAX VX and the ENCORE UX, and we are expanding our research capabilities on these machines. ACSS supports several microcomputer statistical packages as well. We are increasing our micro support as more and better packages become available.

Help for any of our packages can be obtained by calling the Statistical HELP-Line at 626-1893, 1:00 to 3:00, Monday through Friday. Reference copies of all of the documents mentioned here are available in our Computing Information Center, 128A Lind. If there are any packages that you would like us to purchase, don't hesitate to call me at 625-2538.

### General Purpose Packages

**SPSS<sup>x</sup>** is an integrated system of statistical procedures for data analysis. It contains most everything from descriptive statistics to multivariate analysis of variance (MANOVA), factor analysis, nonlinear regression, time series analysis, spectral analysis, multi-dimensional scaling, contingency table analysis and many others. It has excellent data management and data modification capabilities. The *SPSS<sup>x</sup> User's Guide* is quite readable. Also useful are the *Introductory* and *Advanced Statistics Guides*, and a primer called *SPSS<sup>x</sup> Basics*.

**WRITEUP,SPSSX** provides on-line documentation. SPSS<sup>x</sup> is omnipresent; it is available on CA, VX, UX, and IBM compatible microcomputers. The microcomputer version is documented in *SPSS/PC+* and *SPSS/PC+ Advanced Statistics*.

**SPSS<sup>x</sup>/TABLES** produces, during an SPSS<sup>x</sup> job, customized tables suitable for publication or presentation. It is documented in the *SPSS<sup>x</sup> Tables Manual*, and in the *SPSS<sup>x</sup> User's Guide* in an abbreviated form. SPSS<sup>x</sup>/TABLES is available only on VX and UX.

**SAS** has long been the mainstay of IBM statistical computing. It can handle anything from descriptive statistics and analysis of categorical data to nonlinear regression, MANOVA, cluster analysis, survival analysis, etc. It includes a very powerful data manipulation system. Documentation includes the *SAS User's Guide Basics Version 5*, the *SAS User's Guide Statistics Version 5*, and the *SAS Companion for the VMS Operating System*. Also useful is the *SAS Applications Guide* and the *SAS Introductory Guide*. SAS is available only on VX. A microcomputer version is available, but must be purchased from the vendor.

**MINITAB** is an interactive general-purpose statistical system, designed for instructional use, especially for those who have had little previous experience with computers. This package is intended for small data sets. It is documented in the ACSS *MINITAB Reference Manual*, which is also available as **WRITEUP,MINITAB**. An excellent instructional guide, both for statistics and MINITAB use, is available in the *MINITAB Handbook*, second edition. MINITAB is available on CA, VX, and on IBM compatible microcomputers.

**SYSTAT** is a very easy to use, easy to learn, though statistically limited package for microcomputers. It is the only statistical package we support designed specifically for the microcomputer user. SYSTAT can handle only small data sets. The documentation, which is excellent for the PC, can be found in *SYSTAT: The System for Statistics*. SYSTAT is available only for PC-DOS machines and the Apple Macintosh.

**SPSS**, the old version of SPSS<sup>x</sup>, is still available on CA. Customized for the CYBER, it is substantially faster than SPSS<sup>x</sup> on this machine and contains several procedures not available in SPSS<sup>x</sup> (i.e., non-linear regression). Its documentation is somewhat scattered. It includes the maroon *SPSS User's Manual Version 6*, the blue *SPSS Version 7-9 Update*, the CYBER *SPSS Version 9 Update*, and the *CYBER SPSS Support Packet*, which documents the additional procedures. **WRITEUP,SPSS** gives helpful advice for running SPSS at the University of Minnesota.

**SPSS/ONLINE** is an interactive editor designed to work directly with SPSS. It is documented in the *SPSS/ONLINE Manual* and as part of **WRITEUP,SPSS**.

**BMDP** is a group of 40 separate programs linked by a common control language. They include everything from descriptive statistics to a number of analysis of variance programs, nonlinear regression, maximum likelihood estimation, and spectral and time series analyses. It has excellent statistical documentation in the *BMDP85 Statistical Software Manual*.

**WRITEUP,BMDP** explains how to use BMDP at the University of Minnesota.

**S** is an interactive statistical language for data analysis. It contains a very broad variety of numerical and statistical functions and graphical techniques, and provides an interactive Help facility. S is primarily used for statistical instruction. Complete documentation is available in *S: An Interactive Environment for Data Analysis*. S is available only on UX.

### **ANOVA and Regression**

**GLIM** is an interactive program which analyzes a wide range of regression models, performs analysis of variance and covariance, contingency table analysis, and probit analysis. It is designed for the statistically sophisticated user. It is documented in *The GLIM System, Release 3*. GLIM is available on CA and UX. On UX, see also **help statpack glim77**.

**MULTREG** is an easy-to-use interactive package that performs several types of multiple linear regressions. It is documented in the *MULTREG User's Manual*. MULTREG is available on CA and UX. On UX, see **help statpack multreg**.

**IVAN** is an ANOVA package written by the Applied Statistics Department primarily for instructional use. It is documented in the *IVAN User's Manual*.

### **Time Series Analysis**

**SPSS<sup>x</sup>/Trends** is a set of additional procedures completely integrated into SPSS<sup>x</sup>. Trends can perform ARIMA, exponential smoothing, curve fitting, seasonal adjustments using the Census Bureau X-11 procedures, spectral analysis, and enhanced regression facilities including weighted least squares, two stage least squares, and regression with first order autocorrelated errors. SPSS<sup>x</sup>/Trends is documented in *SPSS<sup>x</sup>/Trends*, a surprisingly comprehensible manual. (Time series and English are usually incompatible tongues). SPSS<sup>x</sup>/Trends is available only on VX.

**SAS/ETS** is a set of additional time series procedures completely integrated into SAS. (It is SAS's functional equivalent of SPSS<sup>x</sup>/Trends). ETS can perform ARIMA, (including Akaike's State Space representation), non-linear regression (including two and three stage and "seemingly unrelated nonlinear regression"), spectral analysis, Census Bureau X-11 procedures, financial forecasting and mortgages, enhanced regression including autoregression and distributed lag procedures, 2 and 3 stage least squares, "seemingly unrelated regression" and limited information maximum likelihood. SAS/ETS is documented by the *SAS/ETS User's Guide*. SAS/ETS is available only on VX.

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**SHAZAM** performs econometric and time series analysis including regression, two- and three-stage least squares, generalized least squares, nonlinear regression, ridge regression, maximum likelihood estimates, dynamic models, ARMA models, forecasting, probit, logit and tobit regressions. Its manual can be obtained by typing **WRITEUP,SHAZAM**.

**TSP** is a classic econometric package. It can handle time series by ordinary and two-stage least squares; it also performs graphing, interpolation, and normalization. It is documented in the *TSP Reference Manual* and *TSP User's Guide*.

**RATS** analyzes and forecasts time series by ordinary least squares, weighted least squares, least squares with omitted observations, and two- and three-stage least squares. It can perform "seemingly unrelated regressions," univariate ARIMA estimation and single-equation nonlinear least squares. It also includes instructions for analyzing multivariate time series using vector autoregressions, spectral analysis, and Fast Fourier Transforms. RATS handles only linear models. It is documented in the *RATS User's Manual*.

### **Factor and Cluster Analysis and Multidimensional Scaling**

**LISREL** performs the analysis of linear structural equations using maximum likelihood, ordinary least squares, or generalized least squares. It is useful for confirmatory factor analysis, path analysis, and time series analysis; it handles recursive and non-recursive models of cross-sectional and longitudinal data and covariance structure models. It is designed for the statistically sophisticated user, and is documented in the *LISREL VI User's Guide*. A microcomputer version of LISREL is available; it must be purchased directly from the vendor.

**EQS** has very similar capabilities to LISREL. It uses a fairly simple and straightforward control language, and provides extensive syntax-error checking, designed for the statistically sophisticated user. EQS is documented in the *Theory and Implementation of EQS, a Structural Equation Program*. EQS is available only on VX.

**TRYSYS1** is a comprehensive Cluster Analysis package, an updated version of the BC TRY system. It can provide several types of multiple group factoring, oblique cluster structures, "key-cluster factoring" to select variables that are tightly collinear, and item analysis and scale construction based upon its clusters. Documentation is available in the *TRYSYS Reference Manual*.

**CLUSTER** is an older package that provides a number of subprograms for a wide variety of hierarchical and non-hierarchical cluster analyses. Documentation is obtained by typing **WRITEUP,CLUSTER**.

### **Multidimensional Scaling and Matrix Analysis**

**KYST-2A** is a multidimensional scaling and unfolding program with some limited data management capabilities. Its manual is called *How to Use KYST-2*.

**SINDSCL** is a program that performs individual differences multidimensional scaling. See *How to Use SINDSCL* from Bell Labs.

**MATTER** is an interactive matrix manipulation program written by the Applied Statistics department. Designed originally as an instructional tool, it is very useful for matrix addition, subtraction, multiplication, inversion, and transposition; it also easily computes eigenvalues and eigenvectors, Fourier transforms, auto-regression, and moving averages. It is documented in the *MATTER User's Manual*.

# Artificial Intelligence Software and Services

Ron Zacharski

BITNET: RAZ@UMNACVX

## AI on the VAX VMS and ENCORE UNIX Systems

ACSS provides a number of AI languages that run on the VAX 8650 (VX) and the Encore Multimax (UX). These are available both for instructional and research use. (Research computing grants of \$1000 are available for a fifty dollar fee.)

We briefly describe available languages below. For further information see the associated help entries on the UX or VX systems. The title of the help entry is within parentheses in the following list. For example, to obtain more information on Quintus Prolog, type **help prolog** at the main VX prompt. If you would like further information, please feel free to contact the Special Projects Group at 625-8332.

The software includes:

**Common Lisp:** VAX Common Lisp is available on the VX system (**Lisp**). On UX, Kyoto Common Lisp is available (**kcl**). Both implementations include CLOS, the Common Lisp Object System.

**Prolog Quintus Prolog:** is running on VX, and Waterloo Prolog on UX (**prolog**). Both versions utilize the Edinburgh syntax and are compatible with CProlog. Both support modular design.

**Scheme on the UX system:** Scheme, a lexically scoped, higher-order functional programming language, is available on UX (**scheme**). Scheme is the best known of the Lisp's that treat functions as first class objects. Two new Scheme dialects, T and Mlisp, are also available. T is remarkable primarily for its speed (**xt**). Mlisp, an interpreter for MIT MULTILISP, is an extension of Scheme designed for parallel processing and has very good exception and interrupt handling facilities (**mllisp**). Both are possible replacements for the existing Scheme interpreter on the UX system, and they are currently being supported for evaluation purposes only.

**Franz Lisp (llsp)** on the UX system: This implementation is being phased out. Users who have comments, or who need information about migrating to Common Lisp should send electronic mail to LANG@UX.ACSS.UMN.EDU.

## AI on Microcomputers

Public domain versions of **XLisp** and **PD Prolog** are available for IBM-PC compatibles. XLisp is also available for the Macintosh. Individuals may obtain copies from us at no cost other than providing a blank formatted disk.

The University has a site license for **TI Personal Consultant Plus**, which is an expert system development tool for IBM-AT clones. For more information on this tool, contact the Microcomputer Systems Group, 124 Shepherd Lab, 626-4276.

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We also have a site license for **Smalltalk-80** for the Macintosh. If you are interested in this language, contact the Special Projects Group at 625-8332.

We have worked with a number of language implementations on both IBM compatibles and the Macintosh, including Coral Common Lisp, TI PC Scheme, TI Personal Consultant Plus, MacScheme, MacProlog, Turbo Prolog, AAIS Prolog, and Smalltalk. If you would like to try one of these products, see a demonstration, or, ask any questions, contact us.

## **TCSIGART**

TCSIGART (Twin Cities Special Interest Group for Artificial Intelligence) holds monthly meetings, usually on campus, which feature lectures by people in academia or industry on a topic in AI. The lectures describe current research in AI or commercial products being developed. For information about TCSIGART's next meeting, call the Special Projects Group.

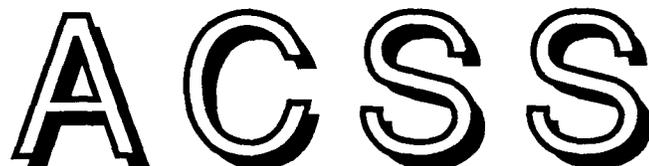
## **AI Consulting**

Special Projects Group provides general consulting on artificial intelligence. We also provide ongoing support throughout a research project, starting at the design phase and continuing to the project's conclusion. Please call us if we can be of any assistance.

## **Additional Information**

An ACSS Brief, "Artificial Intelligence Services," is available at the ACSS Computing Information Center 128A Lind Hall. This brief provides additional information on available languages and services. If you have any questions, contact us at:

Special Projects Group  
M141 Fraser Hall (office)  
128A Lind Hall (campus mailing address)  
(612) 625-8332

The logo for ACSS (Artificial Intelligence Computing Services) consists of the letters A, C, S, and S in a large, bold, stylized font. Each letter is white with a thick black outline, and they are spaced out horizontally.

## Consulting and Software for Liberal Arts Research

Tom Rindflesch

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Our Special Projects Group offers **consulting and software support services** to liberal arts researchers using the computer. If you are interested in analyzing a medieval manuscript, maintaining the data from an archaeological dig, or engaged in any research in the liberal arts, the consultants in this group can help you select the best computational tools for your project from the many resources that we provide and can assist you in using them. If you would like to discuss the needs of your research, call the consultants listed below.

We also provide **contract programming services**. For a fee we can write software tailored to your project. Contact one of the consultants listed below to discuss this service.

### Text Analysis

Computer-assisted scholarly investigation in the liberal arts often involves text analysis. We provide a number of resources to researchers using this technique. If you would like to purchase texts in machine-readable form for your project, two writeups on the VX system contain information on the holdings offered by two of the major machine-readable text archives.

**ACSS\$WRITEUP:OXARCH.LIS** describes the texts held by the Oxford Text Archive and **ACSS\$WRITEUP:NORCOMP.LIS** discusses the texts available from the Norwegian Computing Centre for the Humanities. Type the following VMS command for information on using writeups on VX:

```
$ morehelp writeups
```

Of particular interest are the following text analysis programs that run on the CA and VX machines. Documentation is provided on both machines. On VX you can get further information on these programs by entering the VMS command:

```
$ help text_analysis
```

On the CYBER CA, you can look at the writeup for each program. The writeup name is given in parentheses at the end of the program description. The following NOS command will put the writeup called **NAME** on a local file called **FILENAME**.

```
WRITEUP,NAME/L=FILENAME
```

The software and related writeups include these:

**GENCORD** creates concordances and indexes and provides frequency distribution information for letters and words. (**WRITEUP,GENCORD**)

**LTTRCNT** counts letters in a text and tallies the frequency of occurrence of letters at the major positions in a word: initial, medial, and final. (**WRITEUP,TEXHELP=LTTRCNT**)

**TEXTAL** allows you to specify patterns of words that you want to retrieve from a text. (**WRITEUP,TEXTAL**)

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**WRDSTAT** counts the words in a text and then calculates the total number of tokens and types, and the average length of the tokens and types. It also determines the number of words of each length occurring in the text.  
(WRITEUP,TEXHELP=WRDSTAT)

### For Additional Information

The ACSS publication *Guide to Text Processing and Liberal Arts Computing* is sold in the Minnesota Book Center. It discusses the programs mentioned here, as well as others, in more detail.

The ACSS Brief "Liberal Arts Computing Services" is available free at the Computing Information Center in 128A Lind Hall.

The commercial publication *Bits and Bytes Review* provides a wealth of information pertaining to text processing and text analysis on microcomputers. For more information, contact the editor at 623 N. Iowa Avenue, Whitefish, MT 59937; telephone (406) 862-7280; BITNET: XB.J24@Stanford.

For further information, contact:

Tom Rindflesch  
Ron Zacharski  
M141 Fraser Hall (office)  
128A Lind Hall (campus mail)  
(612) 625-8332

Text Processing

## Text Processing Software and Services

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### Software on VX

ACSS text processing software and services currently focuses on text formatting software and printing options on the VAX 8650 (VX). Staff can answer questions and assist with problems, as well as respond to general inquiries about text processing. See the consulting phone number and hours listed on the Help Page in this issue.

The **SCRIBE** Document Production Software is supported on the VAX VX. Scribe users will want to use the Xerox 8700 laser printer for output. The 8700 is a fast printer, capable of printing from a large number of discrete fonts within font families. Scribe and the 8700 have been used on campus to produce theses and dissertations, manuals, reports, and camera-ready copy for publications.

Scribe formatting is based on an extensive data base of document specifications and formatting controls. It provides such features as hyphenation, footnoting, indexing, table layout, math expressions, bibliographies, and tables of contents. We have added some new fonts, including script characters, to Scribe's font data base for the Xerox 8700 laser printer. Scribe documentation and the ACSS Brief "Xerox 8700 Fonts Available with Scribe" can be found in the ACSS Computing Information Center, 128A Lind Hall.

The **TeX** and **LaTeX** programs are available on the VAX VX and ENCORE UX. TeX is the complex but powerful text formatting program developed by Donald Knuth, emphasizing typographic control and mathematical formatting. TeX documentation is available in the *TeXbook* (Addison-Wesley, 1986) written by Donald Knuth, which is also available in the Computing Information Center.

The LaTeX document preparation system is a special version of the TeX program. It adds a collection of commands to TeX that simplify typesetting by letting the user concentrate on the structure of the text rather than on formatting commands. LaTeX documentation is available in the *LaTeX User's Guide & Reference Manual* (Addison-Wesley, 1986) written by Leslie Lamport, which can be found in the Computing Information Center.

### Software on UX

Writers on our ENCORE UNIX system (UX) can use a set of software tools to analyze and perhaps improve their writing styles. **STYLE** is a program that returns statistics on sentence length and type, word usage, and sentence openers for a document, and gives readability grades on four separate scales. **DICTION** looks for frequently misused phrases, and **EXPLAIN** is a thesaurus that suggests alternative phrases. Documentation for these tools can be found in the ACSS manual *UNIX Text Processing*, available in the Computing Information Center. You may also type **man style** or **man diction** to the main UNIX prompt for on-line documentation for these programs (the **DICTION** entry includes help for **EXPLAIN**).

### Printers

The output device for TeX users on the VAX VX is the Xerox 8700. We are currently working on a device driver to allow users to send output to an Apple LaserWriter from VX. We hope to make this feature available to the public within the next few months. For TeX users on UX, the output device is currently an Apple LaserWriter, a 300 dot-per-inch printer. Users can obtain on-line assistance by typing **help tex** on VX, and **man tex** on UX.

### Kurzweil Document Scanning

We have a Kurzweil 4000 document scanning service in 128B Lind Hall. The Kurzweil can read both typewritten and typeset material and convert it into ASCII code for computer processing. Kurzweil scanning is a much faster and more precise form of text entry than typing. Creating text files for editing and revision of existing documents, library-type storage of printed materials, and literary or linguistic research and analysis are major applications.

Files scanned by the Kurzweil can be output onto a Zenith 150 (IBM PC-compatible) disk or a Macintosh disk. It is also possible to direct the output to a permanent file on a central system account.

Contact Carol Winther at 625-9525 between 10:00 a.m. and 12:00 noon, Monday through Friday, for further information and scheduling. The \$1000 research computing grants can be applied to Kurzweil scanning.

## Data Base Packages: Software and Services

*Peter Oberg*

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ACSS provides the following mainframe data base packages for research and instructional computing. (The packages run on the machines indicated within parentheses.)

**INGRES:** A relational data base structure based on the mathematical concept of a relation, typically used in scientific and business applications. Data is represented in rows and columns called *domains*. Data structures, called *tables*, are manipulated through data manipulation language operations.

You access INGRES data bases through the QUEL or SQL natural language, the EQUQL programming language using Pascal, Fortran, COBOL, and C, or menu-driven facilities for the non-programmer.

Documentation includes a four-volume set of *INGRES Reference Manuals* and **RTINGRES**, an on-line menu facility. (VX)

**SIR:** SIR (the Scientific Information Retrieval system) is a case-oriented, self-contained data base management system that is hierarchical and network-oriented. (A *hierarchy* is a data structure in which one record is said to own may other records in a top-down or tree-like structure.) It is often used in scientific and business applications.

SIR can easily exchange data with SPSS, BMDP, and SAS statistical packages. It also provides report writing and table-generating routines.

Documentation includes the *SIR User's Manual* and **SIRHELP**, an on-line help utility. (CA,VX)

**S2000:** S2000 is a hierarchical data base management system primarily used in business applications. As a general-purpose system, it allows the user to define new data bases, store data, and then update values in these data bases. S2000 contains an easy query language designed to permit non-programmers to perform searches of their data.

Documentation includes the *S2000 Support Manual*. (CA)

### For More Information

All of the documentation referred to above is available in the Computing Information Center, 128A Lind Hall.

If you would like help in choosing a data base package for your project, call the Data Base HELP-Line at 626-1887, Monday to Friday, 10:00 to 11:00 a.m., for more information.

## Micro Data Bases

You can try out the following data base packages, which run on **IBM and compatibles**, at 125 Shepherd Labs:

DBASE III Plus  
R:Base 5000  
R:Base System V  
PFS: Professional file

You can also try out these **Macintosh** data bases:

dBase  
Microsoft File  
Filevision  
FileMaker Plus  
Double Helix  
Omnis 3+  
Professional Bibliographic system  
Reflex Plus  
4th Dimension

The ACSS Microcomputer and Workstations Systems Group provides consulting for these packages and teaches short courses on some of them. See our quarterly short course schedule for more information.

Graphics

## Graphics Software and Services

*Michele Lewis*  
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ACSS offers its users a broad spectrum of software packages for graphics applications. If you want more information about the software listed in this article, you can call the ACSS HELP-Line to speak with our consultants about these packages. You can also read the documentation referred to in this article.

ACSS provides varying levels of support for its packages; therefore, the packages described in this article are separated into groups that reflect the level of support they receive. After each description, we include the mnemonic of the ACSS system on which the package is available: CA for the CYBER NOS system, NV for the CYBER NOS/VE system, and VX for the VAX/VMS system.

### Strong Support

Precision Visuals Inc.'s selection of software packages are highly recommended for ACSS users. The standard metafile that you generate from these packages can be viewed from both CA and VX machines and processed by many ACSS graphics devices.

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For general-purpose applications, ACSS recommends DI-3000, GRAFMAKER, and PICSURE. The packages have been designed to be used by users of different programming abilities and requirements. See **WRITEUP,DI3000** and **WRITEUP,PVI** on CA and **MOREHELP GRAPHICS** on VX for more information on these packages.

**Contour System:** A library of FORTRAN subroutines that allow the user to generate 2D and 3D contour maps and mesh pictures from either gridded or randomly located data. 3D views may be created from any point in space, from above or below the surface. (VX)

**DI-3000:** A graphics software package based on the SIGGRAPH CORE standard. The package is a library of FORTRAN-callable routines in which two- and three-dimensional graphics are supported in both batch and interactive environments. DI-3000 is device-independent and has many features including: full 3D viewing, graphic arts-quality text, dynamic color lookup tables, polygon fill and patterning, retained segments, visibility, highlighting, segment priority control, segment storage data structure save and restore, and full 3D modeling interface. (CA, VX)

**DI-TEXTPRO:** A selection of publication-quality character fonts in two and three dimensions. These fonts may be accessed from any of the other PVI packages. There are ten different typefaces and the characters may be drawn as outlines or solid filled. (VX)

**GRAFMAKER:** A set of FORTRAN subroutines for generating line graphs, bar graphs, needle graphs, and pie charts. Some of the features include drawing multiple charts in a single picture, shading between curves on a graph, exploding pie segments, arbitrary axis positioning, and multiple axes. In addition, GRAFMAKER includes GRAFEASY, a set of subroutine calls that simplify GRAFMAKER even further for quick and easy graphic presentation of data. (VX)

**PICSURE:** An interactive computer graphics software system for generating charts and graphs with a simple sequence of English-like commands. No programming knowledge is necessary. PICSURE can create line graphs, bar charts, pie charts, and text charts; in addition, multicharts can be created by combining two or more basic charts into a single composite chart. The package has an on-line tutorial and HELP facility for first-time users. (VX)

### Intermediate Support

The following Computer Associates product receives intermediate support from ACSS. The package is maintained and updated, but we recommend that new users examine the PVI packages described above for their graphics applications. See **MOREHELP GRAPHICS** for more information on DISSPLA.

**DISSPLA:** An industry-standard library of over 400 FORTRAN subroutines capable of two- and three-dimensional linear plots, pie and bar charts, 3D surface meshes, cartographics (e.g., with over twenty maps of the world viewable with any of twenty projections), color and pattern capability, contouring, elaborate annotations, and more. (VX)

### Minimal Support

These programs have minimal support and are not recommended for new users.

**CALCOMP:** A library of FORTRAN subroutines using PLOTPAC and MNCORE to plot calendar, linear, logarithmic, and polar axes; grids; smoothed and dashed lines; arrows; arcs; spirals; ellipses; equilateral polygons; shaded bars; annotations; and special characters. (CA)

**CNTOUR:** A FORTRAN subroutine referencing PLOTPAC and MNCORE to produce contour plots with simple annotation. (CA)

**MNCORE:** ACSS's implementation of the CORE standard. This library of FORTRAN subroutines has the basic graphics subroutines for two- and three-dimensional, full-color graphics composed of lines, text, and polygons. (CA)

**PASPLOT:** A library of Pascal subroutines for two-dimensional linear plots, with lines, special symbols, scaling, and windowing. (CA)

**PLOTPAC:** An elementary FORTRAN plotting package that provides higher-level routines and uses MNCORE routines to scale and draw two-dimensional plots with axes. (CA)

**PLOT3D:** A FORTRAN subroutine that creates perspective plots of three-dimensional surfaces with hidden lines removed. (CA)

**PLTSCL:** An easy-to-use FORTRAN subroutine used with PLOTPAC to generate scaled, two-dimensional linear plots. (CA)

**PRNPLO:** A FORTRAN subroutine, more sophisticated than SCLPLT, that is used for plotting grids, axes, titles, and lines on standard printers. (CA)

**PRNTPLT:** An easy Pascal subroutine that uses PASPLOT to plot simple two-dimensional linear plots for a printer. (CA)

**SCLPLT:** An easy FORTRAN subroutine for generating scaled two-dimensional linear plots for a printer. (CA)

**SURFACE II:** A program with 62 commands for plotting contours, surface meshes, and posting (scatter) diagrams. (CA)

**SYMAP:** A program used to generate density plots of spatial data that are output on a printer. (CA)

**TEKLIB:** A library of FORTRAN routines for drawing text, graphs with annotation, and other elementary figures. This library is also known as the PLOT-10 system consisting of the Terminal Control System (TCS), Advanced Graphing II (AG2), and the Character Generating System (CGS). (CA, NV)

If you'd like more information about the software listed in this article, you can refer to the documentation referred to or call the ACSS HELP-Line (626-5592) and speak with ACSS consultants. User's guides for all packages published by a vendor can be ordered directly from the vendor. The Computing Information Center in 128A Lind Hall will help you prepare vendor orders and has copies of all documentation available for you to examine.

# Math and Engineering Software and Services

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ACSS provides an extensive collection of software tools for mathematics and engineering computing. Packages and subprogram libraries described in this article that run on our CYBER computer, running the NOS operating system, are indicated by **(CA)**. Some of the packages and DOUBLE PRECISION versions of most of the subprogram libraries are also available on the VAX computer, running VMS, as indicated by **(VX)**. Packages and libraries on the EN-CORE UNIX computer are indicated by **(UX)** and those on the CYBER computer running NOS/VE are indicated by **(NV)**.

All packages and libraries on the ACSS machines are well documented. Vendor manuals for these packages are available for reference in our Computing Information Center, 128A Lind Hall.

## Packages

**DYNAMO** runs continuous simulation models described by a set of ordinary differential equations. Documentation is in the *DYNAMO User's Manual*. (CA)

**FORSIM** is an ordinary and partial differential equations package documented in the manual *FORSIM VI Simulation Package*. (CA)

**LINDO** solves small to medium-size linear, quadratic, integer and mixed integer programming problems under interactive control. The package is documented in the *LINDO User's Manual*. (CA, NV, UX, VX)

**MACSYMA** is another algebraic manipulation package for symbolic calculations. For documentation use the command **TYPE ACSS\$WRITEUP:MACSYMA** (VX)

**MATLAB** is a matrix instructional package based on software from the LINPACK and EISPACK projects. Documentation is in **WRITEUP, MATLAB**. (CA, VX)

**REDUCE** is an algebraic manipulation package for symbolic calculations. For documentation, use the command **TYPE ACSS\$WRITEUP:REDUCE** (VX)

**SPICE2** simulates the electrical performance of semiconductor electronic circuits. The *SPICE2 Manual* or the 75-page **WRITEUP, SPICE2** documents the package. (CA; on VX, the package is named SPICE.)

## Libraries

**BESPACK** is a library of routines for Bessel and Airy functions. For copies of the BESPACK documentation, contact the ACSS Computing Information Center. (CA, VX)

**BSPLINE** uses B-splines (piece-wise polynomial functions) to solve various interpolation and approximation problems. *A Practical Guide to Splines*, on reserve in the ACSS Computing Information Center, describes the library. (CA, VX)

**CALGOPL** is a special file containing the Association for Computing Machinery Collected Algorithms, published in *Transactions of Mathematical Software*. Documentation is in **WRITEUP,CALGOPL** and in the *Collected Algorithms* publication. (CA)

**EISPACK** is an eigenvalue-eigenvector library. Documentation is available on-line in **WRITEUP,EISPACK** and in two books, *Matrix Eigensystem Routines: EISPACK Guide* and *Matrix Eigensystem Routines: EISPACK Guide Extension*. (CA, VX)

**EPISODE**, **LSODE**, and **LSODI** are libraries to solve initial value problems for stiff or nonstiff systems of first-order, ordinary differential equations. Their documentation is in the *EPISODE User's Manual*, **WRITEUP,LSODE**, and **WRITEUP,LSODI**. (CA, VX)

**GRG2** is a comprehensive nonlinear programming library of subroutines to solve constrained nonlinear optimization problems. For copies of the *GRG2 User's Guide*, contact the ACSS Computing Information Center. (CA, VX)

**IMSL**, the International Mathematics and Statistics Library, is the most comprehensive of our subprogram libraries, providing routines for many purposes. You can get help with ordering IMSL Edition 9 manuals and updates and also use reserve copies in the ACSS Computing Information Center, 128A Lind Hall. The calling sequence for IMSL routines is given in **WRITEUP,IMSL**. (CA, VX, NV [Version 10])

**LINPACK** is a library of subprograms that analyze and solve various types of linear equations. **LINPACK** is documented in the on-line **WRITEUP,LINPACK** and the *LINPACK User's Guide*. (CA, VX)

**MINNLIB**, the Minnesota Subprogram Library, contains subprograms for operations on matrices, vectors, and linear equations; integration and solution of differential equations, polynomials and special functions; interpolation and approximation; and statistical analysis. **MINNLIB** is documented in the on-line **WRITEUP,MINNLIB**. (CA)

**MINPACK** is a library for solving problems that involve unconstrained minimization and nonlinear least squares. It is documented in **WRITEUP,MINPACK** and the *MINPACK User's Guide*. (CA, VX)

**MIN5LIB** is a library for solving problems in linear programming, unconstrained optimization, and linearly and nonlinearly constrained optimization. Documentation is in **WRITEUP,MIN5LIB** and the *MINOS 5.0 User's Guide*. (CA, VX)

**PCGPAK** solves sparse non-symmetric systems of equations by iterative methods. Documentation is the *PCGPAK User's Guide* or use the command **TYPE ACSS\$WRITEUP:PCGPAK** (VX)

**QUADPAK** is a library for numerical integration (quadrature) of single definite integrals. Documentation is in the book *QUADPACK: A Subroutine Package for Automatic Integration* and in **WRITEUP,QUADPAK**, or use the command **TYPE ACSS\$WRITEUP\_: [QUADPAK] INDEX** (CA,VX)

**SPARSPK** solves sparse symmetric positive definite systems of equations and sparse least squares problems by direct methods. Documentation is in the *SPARSPAK: Waterloo Sparse Matrix Package User's Guide for SPARSPAK-A and SPARSPAK-B* or use the command **TYPE ACSS\$WRITEUP: SPARSPK** (VX)

**YSMPLIB**, the Yale Sparse Matrix Library, solves sparse symmetric and non-symmetric systems of equations by direct methods. For copies of the **YSMPLIB** manuals, contact the ACSS Computing Information Center, 128A Lind Hall. (CA, VX)

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## Documents

This software is described in greater detail in two ACSS manuals that can be ordered through the Electronics Desk in the Minnesota Book Center (Williamson Hall): the *Guide to Applications Packages: Mathematics and Engineering*, and the *Guide to Subprogram Libraries*.

The *Guide to Applications Packages: Mathematics and Engineering* describes packages on our CYBER CA computer in these areas:

- mathematics: linear and nonlinear programming, ordinary and partial differential equations, and algebraic manipulation
- simulation: discrete and continuous simulation
- engineering: electronic applications

The description of each package includes sample jobs for the CYBER, sample output, and information on acquiring documentation for the package.

When searching through the *Guide to Subprogram Libraries* for the subprograms you need on the CYBER CA or VAX VX machines, you should first refer to the back of the *Guide* in its "Keyword in Context Index." The *Guide* also gives details on how to access each library on the CYBERs. On the VX machine, the interactive command **HELP LIBS** gives details on how to access libraries there.

You will find both these *Guides* and documentation for the software described above on reserve in the ACSS Computing Information Center, 128A Lind Hall (625-7397). You can also obtain your own copies of the documentation from the software suppliers and in some cases (as indicated above) from us. In particular, the *Guides* are available as the on-line **WRITEUP,MATHPAC** and **WRITEUP,LIBINDEX**.

Short help files on VAX VX applications packages are available using the command **MOREHELP APPLICATIONS**

For more information about these and other software packages for mathematics and engineering computing, call Mike Frisch, the Scientific Programs Librarian (625-5830).

### **MATH AND ENGINEERING SOFTWARE SHORT COURSE**

A free two-day short course on Math and Engineering Software is being offered Monday, October 31, and Wednesday, November 2, 2:15 to 4 pm. The course will cover use of packages and libraries: access, capabilities, examples and using the most common routines. The class is co-sponsored by the Minnesota Supercomputer Center and will also include details on their software offerings in these areas. Contact the ACSS Computing Information Center (625-7397) for registration details.

# ACSS Language Processors

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The following table lists and briefly describes the many programming-language processors available on our four central systems: NOS 2 (CA), NOS/VE (NV), UNIX (UX), and VMS (VX).

During the last year, we added support for BASIC, FORTH, Icon, Common LISP, and Scheme on our UNIX system (UX) and for APL, C, COBOL, on our NOS/VE system (NV). We also extended our support of Pascal on the NOS system (CA): the ASCII Pascal library (APASCAL/APASLIB) now includes an interface to the NOS Permanent File Manager (PFM).

Our language processors are also described in the ACSS *Software Brief*, distributed free at our Computing Information Center, 128A Lind Hall.

Language	Machine	Description of the language Name	Version	Description (Source)
<b>Ada</b>		General purpose, structured language.		
	UX	adaed	1.7.1	educational ANSI Ada interpreter/translator (New York U)
	VX	Ada	1.4	ANSI 1983 Standard Ada compiler (DEC)
<b>APL</b>		A Programming Language. Numerical + operator oriented language.		
	CA	APL	2.1	APL interpreter (CDC + U of Massachusetts)
	NV	APL	1.1	APL interpreter (CDC)
<b>BASIC</b>		Beginners All purpose Symbolic Instruction Code.		
	CA	BASIC	3.5	BASIC compiler (CDC)
	NV	BASIC	1.2	BASIC compiler (CDC)
	UX	basic	1.8	Dartmouth Basic
<b>C</b>		C Programming Language.		
	NV	C		C compiler (CDC)
	UX	cc	2.00 R88	C compiler (Encore)
	VX	CC	2.3	C compiler (DEC)
<b>C++</b>		Extended C Programming Language.		
	UX	CC	1.2.1	C++ compiler (AT&T)
<b>COBOL</b>		COmmon Business-Oriented Language.		
	CA	COBOL5	5.3	COBOL-74 compiler (CDC)
	NV	COBOL	1.5	COBOL-85 compiler (CDC)
	VX	COBOL	3.4	COBOL-74 compiler (DEC)
<b>Emulators</b>		Assembly Language Simulators for another computer.		
	CA	EMULATE	1.0	CDC 3200 computer (U of Minnesota)
	CA	MACRO11	2.0	DEC PDP-11 emulator (U of Minnesota)
	CA	MIXAL	2.0	Knuth MIX computer (U of Minnesota)
	CA	MIXBYTE	1.0	MIX decimal machine language simulator
	UX	bsim	3.0	iPSC — Intel Hypercube simulator (Intel)
	VX	ISPS		Instruction Set Processor Simulator
<b>FORTH</b>		FORTH-83 Programming Language and Environment		
	UX	forth	1.2	very close to FORTH-83 (Mitch Bradley at SUN)

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Language	Machine	Description of the language Name	Version	Description (Source)
<b>Fortran IV</b>		ANSI 1966 FORmula TRANslation language - numerical language.		
	CA	MNF	5.4	MINnesota Fortran compiler (Use not recommended).
	CA	FTN	4.8	ForTraN compiler (CDC) (Use not recommended).
<b>Fortran-77</b>		ANSI 1977 FORmula TRANslation language - extended numerical.		
	CA	M77	2.7	Minnesota Fortran-77 (U of Minnesota)
	CA	FTN5	5.1	Fortran-77 compiler (CDC)
	NV	FORTTRAN	1.4	Fortran-77 compiler (CDC)
	UX	f77	2.00 R51	Fortran-77 compiler (Encore)
	VX	FORTTRAN	4.6	Fortran-77 compiler (DEC)
<b>GPSS</b>		General Purpose Simulation System. Discrete event simulation.		
	CA	GPSS	2.0	GPSS compiler (Northwestern U)
<b>Icon</b>		String and List Processing Language		
	UX	icon	5.9	ICON (University of Arizona)
<b>LISP</b>		LIST Processing language - symbolic-expression.		
	CA	LISP	4.1	LISP interpreter (U of Texas)
	CA	ALISP	3.2	LISP interpreter (U of Mass. at Amherst)
	UX	kcl	1.25	Kyoto Common LISP (Kyoto R.I.M.S.)
	UX	lisp	1.0	Franz LISP (Encore)
	UX	xt	3.1	T interp./compiler (Yale Scheme Superset)
	UX	scheme	9.8	MIT Scheme
	UX	mlisp	1.7	MIT Multilisp (Parallel Scheme)
	VX	LISP	2.2	VAX Common LISP (DEC)
<b>MODULA-2</b>		Modula-2 Programming Language		
	UX	mc	2.0	modula (IIT)
<b>OPS5</b>		General Purpose Expert System Language.		
	VX	OPS5	2.1	(DEC)
<b>Pascal</b>		ISO 7185 Standard Pascal. General-purpose, structured language.		
	CA	PASCAL	4.2	Pascal compiler (U of Minn)
	CA	APASCAL	4.2	Full ASCII Pascal compiler (U of Minn)
	NV	PASCAL	1.3	Pascal compiler (CDC)
	UX	pc	2.1	Pascal compiler (Encore)
	VX	PASCAL	3.5	Pascal compiler (DEC)
<b>PROLOG</b>		Logic programming language.		
	UX	wup	2.0	Waterloo Prolog Environment (U of Waterloo)
	VX	Prolog	2.0	Prolog compiler (Quintus)
<b>RPG-II</b>		Report Program Generator II- business-oriented language.		
	CA	RPGII	1.0	RPG-II translator (U of Minnesota + CDC)
<b>SIMSCRIPT</b>		SIMulation tranSCRIPT language - discrete event simulation.		
	CA	SIMI5	4.6	SIMSCRIPT II.5 compiler (CACI)
<b>Smalltalk</b>		Object-oriented Language		
	UX	st	2.0	Little Smalltalk (U of Arizona)
<b>SNOBOL4</b>		StriNg Oriented and symBOlic Language - non-numeric language.		
	CA	SNOBOLC	3.3	SNOBOL4 interpreter (UC Berkeley + Minn.)
	CA	SNOBOL	3.10	SNOBOL4 interpreter (U of Colorado)
<b>System-Implementation Languages</b>		Machine-dependent, medium level.		
	CA	SYMPL	1.4	SYsteMs Programming Language compiler (CDC)
	NV	CYBIL	1.0	Cybil compiler (CDC)

## **New Manuals, Free Documentation**

*Steven Brehe*

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### ***New Introduction to UNIX Computing — Now Free***

We are distributing the new edition of ACSS's *Introduction to UNIX Computing* to researchers free of charge this year. Faculty who open new accounts on the ENCORE UX system receive a copy free. Any faculty member with an existing UX account can obtain a free copy for their research by calling Fran Howard at 626-1869, sending campus mail to Fran Howard at 100 Lauderdale, or sending electronic mail to FJH@UMNACUX.

Faculty using the ENCORE in their classes can obtain copies for their students by contacting Ms. Howard. Whenever possible, faculty in the same department should consolidate orders.

Copies will also be available at a minimal charge in the Minnesota Book Center (in Williamson Hall), the H. D. Smith Bookstore, and the Student Book Store (310 15th Ave. S.E., in the Dinkytown Dome building).

### **Other UNIX Manuals**

ACSS has reprinted portions from the Berkeley UNIX Reference Set. Our reprints include these five volumes:

*UNIX Beginners Guide*  
*UNIX Beginners Reference*  
*UNIX Programmers Guide*  
*UNIX Programmers Reference*  
*UNIX Text Processing*

All these volumes are available through the Minnesota Book Center and the Student Book Store.

### ***New Edition of the Introduction to CYBER Computing***

The fourth edition of ACSS's *Introduction to CYBER NOS Computing* is now available: You can buy copies at the Electronics Desk in the Minnesota Book Center and in the Student Book Store. Other University bookstores will also order our manuals for you. All users of the CYBER CA should be familiar with the information in this new *Introduction*.

### ***The Guide to Text Processing and Liberal Arts Computing***

The second edition of the *Guide to Text Processing and Liberal Arts Computing* is available at the Electronics Desk in the Minnesota Book Center. This manual contains information on text processing, text analysis, statistics, graphics, and data bases for the the liberal arts user on the CYBER CA, ENCORE UX, or VAX VX.

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### **Academic Computing at Minnesota**

The booklet *Academic Computing at Minnesota* has information on University computing services and facilities at Academic Computing Services and Systems (ACSS), Health Sciences Computing Services (HSCS), and St. Paul Computing Services (SPCS). Free copies are available from those computer centers or by calling Fran Howard at 626-1869.

### **Free Documentation for Microcomputers**

The ACSS Microcomputer and Workstation Systems Group provides a number of free documents on the micro hardware and software available through the University discount program.

These documents provide descriptions, advice, and prices on micro hardware:

- Apple Macintosh Plus, SE, and II
- IBM and Zenith Microcomputers
- Printers, Plotter, Mice, and Modems

These documents provide titles and prices on micro software:

- Macintosh Software
- IBM and Compatibles Software

These free documents are available at 125 Shepherd Lab.

### **Free Documentation for Central Systems**

ACSS publishes a number of shorter free documents. They include the *Twin Cities Computing Facilities* map, which displays the locations of all campus computing labs and lists the equipment therein. Among our other free documents are the *Software Brief*, which briefly describes application packages and language processors on all our systems, and the *Central and Network Configuration Diagram*, which describes our central systems computers and attached devices.

These free documents are available at the ACSS Computing Information Center in 128A Lind Hall. You can obtain multiple copies of the *XEDIT 3.1 Reference Summary* and *Twin Cities Computing Facilities* map by calling Paula Goblirsch at 626-1093.

Among the *Briefs* available this quarter are:

#### **General Information Briefs**

**Artificial Intelligence Services:** Describes artificial intelligence packages currently available on ACSS's central system computers and on microcomputers.

**Central and Network Configuration Diagram:** Describes ACSS's central system computers with their attached storage, communications, and network devices.

**Computing Facilities, Twin Cities Campus:** Shows locations of campus computing facilities.

**Computing Information Center and Documentation Services:** Lists information and services available from the ACSS Computing Information Center.

**Consulting Schedule:** Lists hours, locations, and phone numbers for ACSS consulting services.

**Documentation Directory:** Lists basic documentation available from ACSS.

**Getting Started at ACSS:** Provides basic information on research and instructional computing at ACSS.

**Graphics Packages:** Describes the graphics application software packages available on ACSS's CYBER and VAX computers.

**Liberal Arts Computing Services:** Describes software and services available for liberal arts research on ACSS's central systems computers and for microcomputers.

**Math, Engineering, and Statistics Software:** Lists math, engineering, and statistics packages available on ACSS's computers.

**Phone Numbers:** Lists important and frequently called ACSS phone numbers.

**Short Course Schedule and Descriptions:** Lists topics, descriptions, times, and fees for short courses available during the current quarter.

**Software on the CA, NV, UX, and VX:** Lists most of the software packages available on ACSS's CYBER, ENCORE, and VAX computers.

**Terminal Access Brief:** Explains how to use the new dial-in system and its special features.

**Using the Electronic Postmaster:** Explains how to use software that provides information about electronic mail users and their addresses at the University of Minnesota.

**Xerox 8700 Fonts Available with Scribe:** Describes the fonts for computerized text files that are available on the Xerox 8700 high-speed laser printer for the Scribe text processing program.

### **CA Central System Briefs**

**CA WRITEUP Information:** Provides information about an on-line documentation utility on the CYBER CA.

**CYBER/NOS Access:** Provides basic information for using the CYBER CA system.

**Full Screen Editor (FSE):** Explains how to use the CYBER CA full-screen editor.

**Using MAIL on the CYBER CA:** Explains how to send and receive messages on CYBER CA.

**XEDIT 3.1 Reference Summary:** Lists important commands and parameters for the XEDIT line editor.

### **NV Central System Briefs**

**CYBER/VE Access:** Provides basic information for using the CYBER NV system.

**Getting Output From the CYBER NV:** Explains how to get printed output from CYBER NV.

**NOS/VE Command Format:** Presents information about using commands on the CYBER NV system.

**NOS/VE Equivalents to NOS Commands:** Lists NOS 2 commands and the equivalent NOS/VE commands.

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**NOS/VE On-line Documentation:** Shows how to use EXPLAIN, DISCI, and HELP on the NV system.

**NV WRITEUP Information:** Provides information about a CYBER NV on-line documentation utility.

**Using the EDIT\_File Editor:** Explains how to use the editor on the CYBER NV system.

### **UX Central System Briefs**

**ENCORE/UNIX Access:** Provides basic information for using the ENCORE UX system.

**Using MAIL on the ENCORE:** Explains how to send and receive messages on the ENCORE UX system.

See also the free *Introduction to UNIX Computing*.

### **VX Central System Briefs**

**Tools for Administrators of VX Instructional Users:** Provides information for administrators of VAX VX instructional accounts.

**Using MAIL on the VAX:** Explains how to send and receive messages on the VAX VX system.

**VAX/VMS Access:** Provides basic information for using the VAX VX system.

**VX WRITEUP Information:** Provides information about an on-line documentation utility on the VAX VX system.

## **Subscribe to Our Free Newsletters**

For subscriptions to our free monthly newsletters, the *ACSS Newsletter* and our *Microcomputer Newsletter*, call 625-7397. Campus subscribers: Please provide your department's name and departmental address.

# Academic Computing Services and Systems

## Fall Quarter Short Courses

### 1988

#### CENTRAL SYSTEMS COURSES

Central systems courses are *free*. To register call 625-7397.  
Some classes have size limitations: Register early.

#### Introductory

Introduction to VAX/VMS Operating System	Oct 10-19	MW	2:15-4 pm
Introduction to NOS 2 Operating System	Oct 11-25	TTh	2:30-4:30 pm
Introduction to NOS/VE Operating System	Oct 24-28	MWF	2:15-5 pm

#### Elective

INGRES (Data Base Mgmt)	Oct 27-Nov 10	Th-T	2:15-4 pm
Using SAS (Statistics)	Oct 31-Nov 4	MWF	3:30-5 pm
Math and Engineering Software	Oct 31-Nov 2	MW	2:15-4 pm
Using SPSSx (Statistics)	Nov 14-18	MWF	3:30-5 pm
Electronic Mail (VAX & BITNET)	Nov 15-17	TTh	2:15-4 pm

#### MICROCOMPUTER COURSES

Fees: 1) U of M students, 2) U. staff/faculty, 3) Non-University persons.

#### General

Overview; no hands-on. Limited enrollment.

Strategies for Networking Microcomputers and Workstations			
Section 1	Nov 29	T	1:30-4 pm
			Free

#### IBM and IBM-compatible Courses

Hands on. Limited to 10 per class.

Introduction to Microcomputers DOS				
Section 3	Nov 29-Dec 1	TWTh	1:30-3:30 pm	\$40,\$50,\$80
Managing Your Hard Disk				
Section 2	Nov 8-10	TTh	9:30-noon	\$40,\$50,\$80
Orientation for Campus Network Users, IBM				
Section 3	Oct 17	M	2:00-3:30 pm	Free
Section 4	Oct 31	M	2:00-3:30 pm	Free
Section 5	Nov 7	M	2:00-3:30 pm	Free
Section 6	Nov 21	M	2:00-3:30 pm	Free
Section 7	Dec 5	M	2:00-3:30 pm	Free

(1) (2) (3)

Introduction to dBase III	Section 2	Nov 7-11	MWF	10:00-noon	\$40,\$50,\$80
Programming in dBase III	Section 1	Oct 25-26	TW	1:30-4 pm	\$40,\$50,\$80
Introduction to Paradox	Section 1	Nov 28-30	MTW	10:00-noon	\$40,\$50,\$80
Beginning Lotus 1-2-3	Section 2	Nov 10-11	ThF	1:30-4 pm	\$25,\$35,\$60
Intermediate Lotus 1-2-3	Section 1	Dec 2	F	1:30-4 pm	\$25,\$35,\$60
Introduction to Microsoft Word on IBM	Section 1	Oct 11-13	TTh	1:30-4 pm	\$35,\$45,\$85

### Macintosh Courses

Hands-on. Limited to 10.

Macintosh Fundamentals	Section 3	Oct 25	T	12:15-1 pm	Free
	Section 4	Nov 9	W	12:15-1 pm	Free
	Section 5	Nov 22	T	12:15-1 pm	Free
Orientation for Campus Network Users, Macintosh	Section 3	Oct 24	M	2:00-3:30 pm	Free
	Section 4	Nov 14	M	2:00-3:30 pm	Free
	Section 5	Nov 28	M	2:00-3:30 pm	Free
	Section 6	Dec 12	M	2:00-3:30 pm	Free
Introduction to Microsoft Word on Macintosh	Section 4	Nov 15-17	TTh	9:30-noon	\$35,\$45,\$85
Using Hypercard	Section 2	Nov 1-2	TW	9:30-11:30 am	\$25,\$35,\$60
	Section 3	Nov 21-22	MT	10:00-noon	\$25,\$35,\$60
Using Hypertalk	Section 1	Nov 1-2	TW	1:30-3:30 pm	\$25,\$35,\$60
Developing Instructional Software Using Hypercard	Section 1	Oct 12-14	WF	1:30-3:30 pm	\$25,\$35,\$60
Developing Applications for the Macintosh Using Pascal	Section 1	Nov 14-18	MWF	10:00-noon	\$25,\$35,\$85

The following Macintosh classes are demonstration only! No hands-on.  
Limited to 15.

Preparing a Dissertation on the Mac	Section 1	Nov 17	Th	1:30-4 pm	\$15,\$25,NA
Object Pascal and McApp	Section 1	Nov 30	W	1:30-4 pm	Free

## SHORT COURSE INFORMATION

**Prerequisites:** Please note prerequisites for the class you are interested in. Instructors will not be able to review any prerequisite requirements. If you need information on short course prerequisites, call the Computing Information Center at 625-7397.

Please call and give us your name if you plan to attend a free class; also call to cancel if you decide later not to attend, so we know how many to expect. We reserve the right to cancel a course if registration is insufficient. For registration information call 625-7397.

**Limits:** All microcomputer classes and many central system classes have limits to class size. Please try to register early to be sure of getting a place. If you decide to withdraw from a class, please do so as soon as possible, so that we may make the space available to others.

**Fees:** Fees following microcomputer courses above are for 1) University students, 2) University staff and faculty, and 3) non-University persons. Course fees may be paid by check, or by a signed University journal voucher included with registration information. No cash, please. Fees must be paid at the time of registration.

**Registration:** Registration began September 15. Registration is located at the ACSS Computing Information Center, 128A Lind Hall. (Hours: 8:00 am to 4:30 p.m., Monday through Friday.) Fees must accompany registration. Mail registrations will be accepted. Deadline for registering is 4:00 p.m. on the last working day before the class begins.

*No refunds* will be made after the class has begun. A penalty—reduction of the refund—will be assessed if you withdraw from a class within three days of the beginning of the class.



# St. Paul Computing Services

## Fall Quarter Short Courses

<b>SAS</b> (Presentation of the SAS system for statistical analysis, graphics, and programming.)	<b>Oct. 12,17,19</b>	<b>W,M,W</b>	<b>2:00 - 4:00</b>
<b>TinCan Demo</b> (Demo of TinCan, a terminal emulation and file transfer package for the Macintosh.)	<b>Oct. 13</b>	<b>Th</b>	<b>3:00 - 4:00</b>
<b>PROCOMM Demo</b> (Demo of PROCOMM, a terminal emulation and file transfer package for the IBM PC.)	<b>Oct. 18</b>	<b>T</b>	<b>3:00 - 4:00</b>
<b>CMS, Advanced Topics I</b> (Presentation of CMS tape management facilities and various other CMS topics.)	<b>Oct. 20</b>	<b>Th</b>	<b>2:00 - 5:00</b>
<b>Intro to SAS/GRAPH</b> (Introduction to SAS graphics capabilities.)	<b>Oct. 24</b>	<b>M</b>	<b>2:00 - 4:00</b>
<b>CMS, Advanced Topics II</b> (Introduction to writing macros in CMS programming languages REXX and EXEC 2.)	<b>Oct. 26</b>	<b>W</b>	<b>2:00 - 4:00</b>
<b>PC SAS Overview</b> (Introduction to the PC version of the SAS system.)	<b>Oct. 27</b>	<b>Th</b>	<b>3:00 - 5:00</b>
<b>Intro to NOMAD2</b> (Introduces NOMAD2, a data base management system with powerful report writing and programming features.)	<b>Nov. 11</b>	<b>F</b>	<b>3:00 - 5:00</b>
<b>Intro to CMS</b> (CMS is the operating system on the IBM 4381. Learn to edit and submit programs and communicate with other computer users.)	<b>Oct. 18,20,25,27</b>	<b>T,Th,T,Th</b>	<b>3:00 - 5:00</b>
<b>SAS</b> (Presentation of the SAS system for statistical analysis, graphics, and programming.)	<b>Nov. 1,3,8</b>	<b>T,Th,T</b>	<b>10:00 - 12:00</b>

**Registration:** To register for short courses, please obtain and complete a registration form from SPCS (624-7788; 50 Coffey Hall). Return it to the Main Office, prior to the start of the class. Many short courses have a small fee associated with them and require full payment with registration. Sorry, no refunds are made after the class begins. Call 624-7788 for information about the classes. Additional classes will be scheduled, depending upon user demand.

# Part 1: Networking and Central Systems

Dr. Roger L. Gulbranson

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In what is becoming an annual tradition, I have the privilege of telling you about the improvements and other changes in the networks that ACSS operated over the course of this last year.

## **CYBER Internet Software**

One of our major disappointments in the last two versions of this article was the lack of Internet software on the CDC CYBER computers. Well, I'm happy to say this has changed. **ftp** and **telnet** applications exist for both our CA system running the NOS operating system and for our NV system running the NOS/VE operating system. While the packages are not as elaborate as their UNIX and VMS cousins, they do perform several much needed functions.

## **Unified Printing**

One of the first major applications to take advantage of the new CYBER software is our unified printing software. It is now possible to print on most of our printers from any of our computer systems. This includes the large Xerox 8700 printer located at our Lauderdale facility and the many Apple LaserWriter printers that we are installing around campus. Several of our older dot-matrix printers are being connected to our ENCORE UNIX system to allow them to accept output from any of our central systems. While most of the necessary changes are not readily apparent to users, they will now be able to get printed output at a number of conveniently located printers on campus.

## **New Networked Services**

We want to expand the set of software that provides the printing functions to offer unified plotting service using our Versatec plotter server. We will inform you when these changes occur.

An additional new service that will be announced via a newsletter article in the next few months is the AppleShare file server that is now operational on our Encore Multimax computer system.

## **New Dial-In Access**

Now that we have telnet access available on all of our systems, we are revising our dial-in access to take advantage of this feature. A new dial-in rotary will be in place for fall quarter testing. This rotary uses terminal servers, which allows a user to access all of our systems and permits simultaneous sessions if desired. The new terminal servers offer several new features. Future articles in this *Newsletter* will inform you about these new features.

The new unified dial-in phone number is **626-1630**. For more information, see the related article in our September issue, or see our new *Terminal Access Brief*.

## Connections to External Networks

The University of Minnesota is a member of two regional networks. The first of these is MRnet, the Minnesota Regional Network. This network connects the University to several area institutions, including corporations such as Control Data, Cray Research, ETA, and 3M, and educational and research institutions such as the Mayo Foundation and St. Olaf and Carleton Colleges. The Minnesota Supercomputer Center is also a member. MRnet is currently operational and has a 56k bps (bits per second) connection to the NSFnet backbone network.

The second network is CICnet, the Committee on Institutional Cooperation Network. This network, when operational, will connect the University to ten of its peer institutions. The institutions are: the University of Chicago, the University of Illinois at Urbana-Champaign, the University of Illinois at Chicago, Indiana University, the University of Iowa, the University of Michigan, Michigan State University, Northwestern University, the Ohio State University, and the University of Wisconsin at Madison. Because this network is still being planned complete details are not available. Portions of the network are expected to be operational by the first of the year, providing T1 connectivity between the institutions. T1 lines operate at 1.544M bps. If it keeps to its schedule, CICnet will be the first regional network with bandwidth of this magnitude.

Earlier this year we experienced several long periods of outage on our BITNET connection. To remedy this problem our connection through the University of Wisconsin was revised, and the University is now only one hop away from the CUNYVM root system.

## Campus Internet Expansion

ACSS continues to be involved with several activities that are expanding and improving the campus Internet backbone. As this article is going to press, we are installing a connection to the campus fiber-optic backbone network. The connection between our internal Ethernet network and the two backbone networks, LANmark and fiber, is made via an IP (Internet Protocol) router, which optimizes the path taken to any given computer.

Over the course of last year, ACSS was involved in an Information Systems project to ensure that each coordinate campus has an Internet connection. The project improved the connection to the Duluth campus and installed new connections to the Crookston and Morris campuses. The connection to the Waseca campus is still being planned. A priority project for this coming year is to improve the bandwidth of the connections to each of the coordinate campuses.

## Part 2: Networking and Microcomputing

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Networking for microcomputer and workstation users on campus has made significant strides in the last year. Improved network hardware and software has made it easier to connect microcomputers and Local Area Networks (LANs) to the campus backbone network. At the same time, commercial network and file-server software for stand-alone departmental LANs has become more varied and robust. We have applied these improvements in network technology to several areas at the University over the last year.

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## **AppleTalk Internet**

The campus backbone network can be thought of as the "highway system" that makes it possible to interconnect departmental LANs into a large network (an *internet*). Since computers can be communication tools, there are very good reasons to interconnect departmental LANs.

The best example of this is the AppleTalk Internet. During the last year, the AppleTalk Internet has grown into a collection of more than 26 departmental AppleTalk networks linked together through the campus backbone network. The AppleTalk internet includes departments in the Twin Cities as well as in Duluth and Morris. Because the AppleTalk internet appears to the users to be one large network, it is possible for people anywhere on the AppleTalk Internet to access information located elsewhere on the internet. More importantly, it is possible to control access to the information on file servers, so that only people with appropriate access privileges can view or change information. The advantages of this scenario are obvious for departments that are located in over several buildings or are on different campuses.

## **Mac Information Server**

One instance of using the AppleTalk Internet to distribute information is the Macintosh Information Server. For almost a year now, the Microcomputer Group has maintained an AppleShare file server that contains public domain software, technical notes, and system software updates for Macintosh users. This makes it possible for individuals connected to the AppleTalk Internet to access this information without visiting the Micro HelpLine; instead they can access the information from anywhere on the AppleTalk Internet.

## **LANs as a Vehicle for Teaching**

The Rhetoric department's collaborative writing classes use a network of Macs with an AppleShare file server that allows students to work on group writing assignments. Since the Rhetoric department's AppleTalk LAN is a part of the AppleTalk Internet, students can access their files from labs on the East and West Bank campuses as well as from the Rhetoric Department's lab in St. Paul. This makes it easier for students to do their assignments. This scenario (departmental file servers interconnected with public teaching labs) presents interesting educational opportunities for a variety of fields.

## **Telnet Software for Mac and PC**

Microcomputer users who want to transfer files and have terminal sessions with central computers on the campus network are now using improved versions of NCSA's telnet program. The versions of telnet for both the Macintosh and the IBM PC support ftp for file transfer and VT100 and Tektronix terminal emulation. The Macintosh version of telnet supports multiple simultaneous sessions. The current versions of telnet are available through the Microcomputer HelpLine.

## **IP Gateway for IBM Token Ring**

If your department already has an IBM Token Ring LAN, it is now possible to connect the Token Ring LAN to the campus backbone network. This allows PCs on the Token Ring to transfer files (via ftp) and run terminal sessions (via telnet) with central computer systems. Those who are interested can see a demonstration of this at the Microcomputer HelpLine.

## Public Access to the Network

If you have large files to transfer between a microcomputer and one of the central computer systems, you should consider using the campus network since network speeds are 100 to 1000 times faster than the fastest modem. What if you do not have a connection to the campus network? No problem. We recently connected two machines (a Macintosh and a PC) in the Microcomputer HelpLine directly to the campus network providing a vehicle for high-speed file transfer.

West Bank

## ACSS West Bank Services

ACSS West Bank Computing Services provides computing support for University students, staff, and faculty. Emphasis is placed upon, but not limited to, users located on the West Bank Campus.

We provide a number of different levels of support:

General consulting assistance to help users assess their computer needs, and aid in determining which hardware and/or software will best meet those needs.

Specific consulting assistance to answer questions relating to supported packages.

User training and classes in a variety of hardware and software packages.

Assistance to users in developing computer based applications, especially instructional applications.

### Services

**Microcomputer classes:** We offer microcomputer classes upon demand instead of setting a specific schedule in advance. When there is a group of six or more interested in the same software, a class schedule is arranged to meet the timetable of those wishing to register. There will be no makeup sessions or refunds for missed classes. Classes usually consist of one session lasting 2 1/2 hours.

To register for a class or for more information, stop by the micro lab in 170 Anderson Hall or call 624-6526. A micro access card is not required to enroll in a class. Courses are taught hands-on; students have access to microcomputers during class time.

**Individual or small group instruction:** Individuals or small groups (less than five) can arrange for instruction in any of the hardware or software packages supported by WBCS. The cost is \$25 per hour per person. To arrange for instruction, stop into the micro lab or call 624-6526.

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**New software requests:** Faculty members will find a form in the Anderson Hall micro lab that they can fill out to request software that they would like the WBCS lab to carry and/or support for class use. The form asks for the number of students who will use the software as well as handouts needed, assignment due dates, etc. that will help us prepare for class use.

**Class support in WBCS micro labs:** WBCS micro labs support classes by handling software, provided by instructors, that students may use in the microcomputer facilities. WBCS will not be responsible for updating, replacing, or making copies of software or data disks used by the class and will refer related problems to the instructor(s).

**Mainframe access:** In addition to our microcomputer facilities, terminal access to ACSS and SPCS mainframes is available in our interactive labs (140 Blegen and B2 Wilson) during the following hours:

Monday - Thursday	8 a.m. to 11:30 p.m.
Friday	8 a.m. to 9:30 p.m.
Saturday	12 p.m. to 5:30 p.m.
Sunday	4 p.m. to 11:30 p.m.

Printed output may be directed to local impact printers or to a laser printer, with output bins located in 170 Anderson.

### **For More Information**

If you have questions about ACSS West Bank Computing Services, you can call the following numbers:

Micro lab (170 Anderson)	624-6526
WBCS offices (93 Blegen)	624-0877

# **ACSS**

# Welcome: An Introduction to the VX System

*Marisa Riviere*

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DECNET: ACSSVX::MARISA

**Welcome** is a new VAX VX writeup that introduces new and inexperienced VMS users to particular aspects of the VX system that are not well known, but, nevertheless, are important to all users.

If you need to know more about VMS and you did not take one of our free introductory VMS classes, have not explored the system at length, do not have a friend familiar with VMS to explain things to you, you'll find **Welcome** helpful.

**Welcome** answers such questions as:

- What is your VMS user name? What are its restrictions and privileges in utilizing system resources?
- What is the meaning of VMS validations?
- Are you a member of a group in which other individuals may have control of your sessions or your files?
- How can you observe and control your file space?
- How should you organize your file structure for easy searches and maintenance?
- How do you share the information in your files with others?
- What are all the possible printing capabilities on VX?
- How do you find out more about VX applications, network connections, and mail systems? And about unsupported software?
- How do you create a login environment that can simplify your work?
- How do you use procedure files, symbols, and logical names?
- What are batch jobs and how do you run them? How can you observe and control them?
- What VMS commands may be more helpful to you as a beginning user?

To display **Welcome** at your terminal, type:

```
$ Type/Page ACSS$Writeup:Welcome
```

or

```
$ Edit/Read ACSS$Writeup:Welcome.lis
```

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I hope that the information in Welcome will help you become more familiar with VMS and help make your work with this system easier and more productive. Please let me know of any additions or changes to Welcome that you think would be helpful to you or to others.

## ACSS Supports DEC Software and Hardware

*Marisa Riviere*

BITNET: MARISA@UMNACVX

DECNET: ACSSVX::MARISA

In April of 1986, ACSS began operating a multi-user multi-function VMS production system on a VAX 8600, manufactured by Digital Equipment Corporation (DEC). This system, which ACSS calls VX, was later upgraded to a VAX 8650, and serves the research, instructional, and administrative computing needs of the University community.

To support VX, ACSS formed the VMS System Programmers Group. In addition to maintaining the VX system, the VMS System Group coordinates the DECnet network on campus, provides technical support for VMS and Ultrix system management, and actively participates in the University of Minnesota VMS Managers Group.

Operating VMS led ACSS to new activities in the VMS-DEC field that strengthened its relations with DEC and with other University sites that operate VMS systems. Some of the results of the new VMS activities are a number of contracts that ACSS has negotiated with DEC on behalf of the University.

In the February issue of this Newsletter, Janet Eberhart published an article describing several programs that offer discounts on hardware purchases, software acquisitions, and maintenance for DEC systems. The network, the ACSS trained personnel, and the U of M VMS Managers Group support and complement the hardware and software acquisition programs for a variety of DEC users on campus. ACSS now provides guidance to DEC users for hardware and software acquisition and maintenance services from the workstation owner to the mainframe manager.

### Discount Programs

Discounts are available through a university consortium agreement that DEC has established with several universities, among them the University of Minnesota. Besides lower consortium prices that apply to a certain number of DEC products, there are additional educational discounts for software and grants for hardware acquisitions for which University departments may be eligible. These are:

**1) DEC University Consortium, grants, and other discounts:** Consortium prices apply for VAX Stations 2000, VAX Stations II/GPX, VAX Stations 3200 and 3600, and VAX Servers 100 and 3000. Several options are available for these systems. In some cases, consortium prices may be as low as 40 or 50 percent of the list price. A one-year guarantee and a 1-to 8-user license for a large number of the most commonly used VMS and Ultrix products comes with the workstations.

For larger systems, DEC offers educational discount grants. Packages that qualify for educational grants include VAX 8550, VAX 6200 Series, VAX 8800 Series MicroVax 3500, and MicroVax 3600.

A 20 percent reduction, negotiated by ACSS last December, applies to many other DEC products. The discount covers hardware, software, training, services, and documentation. There are additional discounts for documentation ordered in large numbers.

**2) Right-to-copy program for large systems:** The right-to-copy contract entitles any participating VMS systems at the University to obtain several VMS products at reduced prices.

ACSS negotiates the right-to-copy contracts with DEC for the interested sites and handles the distribution of the software.

In addition to supporting general VMS users through the ACSS Help-Line, the ACSS VMS System Programming Group provides consulting for software installation and other system management issues for participating sites.

ACSS also works on handling umbrella contracts for third-party vendors of VMS products for central systems.

**3) Educational Software Library for small and medium-size systems:** Membership in the Educational Software Library entitles owners of DEC systems—ranging from workstations supporting up to 8 simultaneous users to the Micro VAX 3600 series that can support more than 40 users—to use a large number of VMS and Ultrix products for a yearly membership fee. This fee is no more than the yearly maintenance costs of one or two software products. ACSS handles the distribution of software to subscribers.

The ACSS HELP-Line and the Microcomputer HELP-Line provide general user support and help with basic software installation and maintenance for small systems. The VMS Programmers Group provides additional support for more complex system management issues.

ACSS also works on handling umbrella contracts for third-party vendors of VMS products for the small systems.

**4) DEC's Educational Market Basket and additional discounts:** Systems that do not qualify for the Educational Software Library, require additional software that ACSS does not distribute under the Right-to-copy contracts, or that need updated licenses to enter into the contract, can benefit from DEC's Educational Market Basket. This program offers software licenses for DEC systems to universities at discounted prices, which may be as low as 50 percent of the regular list prices.

**5) Plans for the future:** We are negotiating with DEC to extend the Educational Software Library to all VAXes at the Universities that are members of the Consortium. Plans are also underway for hardware maintenance programs for small systems at reduced costs. When these negotiations are concluded, ACSS will offer the required support.

Also, an extension of the discounted hardware prices program to full-time faculty, staff, and students is under consideration.

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### As Things Change

Available third-party software, DEC's discount offers, maintenance programs, and Consortium projects change day to day and, generally, for the benefit of DEC users. A few sample prices and savings "for a taste" are listed in the table below. We encourage you to consult the on-line **DEC\_Systems** document on **ACSS\$Writeup**: on VX for a fully updated list.

Examples of savings with the Educational Consortium:

	<u>List Price</u>	<u>Consortium Price</u>
<b>VAX Station 2000, 19" monitor, diskless Ethernet interface, mouse, and keyboard</b>	\$ 5,415	\$ 3,240
<b>159MB Disk</b>	\$ 6,000	\$ 4,485
<b>Expansion adapter</b>	\$ 1,200	\$ 600

Examples of savings on Right-to-copy contracts for a VAX 8600:

	<u>Standard DEC Service (Monthly Charges)</u>	<u>ACSS RTC Distribution (Monthly Charges)</u>
<b>VMS</b>	\$525.00	\$140.00
<b>Fortran</b>	72.00	26.60
<b>VAX Set</b>	359.00	134.40

Examples of savings with the Educational Software Library for a MicroVAX II using Fortran and Pascal:

	<u>License</u>	<u>Media</u>	<u>Basic Yearly Support</u>
<b>VMS</b>	\$6,300	\$1,575	\$2,880
<b>Fortran</b>	3,255	630	564
<b>Pascal</b>	2,977	630	564

This amounts to a yearly fee of \$4,008, plus the initial licenses and distribution costs. In contrast, the ACSS yearly subscription to the Educational Software Library is \$2,300. The subscription entitles the system to use a variety of additional products.

See the on-line document **DEC\_Systems** for a full list of the eligible systems and the products in the library.

### Why VMS? Why Ultrix?

VMS provides an integrated solution for your computer needs. If you are a workstation owner, for example, and for special large projects you need the power of a larger system, you do not need to become acquainted with a new operating system to use it. Also, if you want to use more sophisticated printing or graphics equipment available on another system, you can easily transfer your files through the University networks for final processing. The ACSS VMS system, VX, is available to you for this type of integration.

If you are already familiar with UNIX, the Ultrix system will be familiar to you and, in addition,

will let you communicate easily with other Ultrix and VMS systems on campus through networks, and to create local clusters. Ultrix is based on the Berkeley 4.2/4.3 UNIX implementation.

## Evaluating and Maintaining Ultrix and VMS

If you would like to become acquainted with VMS or Ultrix system management tasks, you are welcome to contact the ACSS VMS System Group for help. Call 626-0268. We can make arrangements for you to use one of ACSS's MicroVAXes, where we can help you become familiar with software installation and maintenance.

I also encourage you to attend a meeting of the U of M VMS Managers Group, where you will be able to evaluate the VMS support that, in addition to the ACSS official programs, will be available to you as a VMS "owner" from other VMS administrators. This group meets regularly every second Thursday of each month, from 3 to 5 p.m. The group generally meets in 105 Shepherd Labs, but the location is subject to change. Call me at 626-0268 to arrange for a MicroVAX test session or to find out about the place and time of the meetings.

The success that VMS, Ultrix, and other DEC products have enjoyed at other universities makes us believe that the same trend will continue at the University of Minnesota. We at ACSS want to lead and support our community in this activities. If you already own a DEC system that you want to expand, if you are planning to purchase one, or if you would like more information about one, please let us know how we can help you. Or call Michelle Hannum, the University's DEC sales representative (825-2183). She will be glad to help you with information, current prices, and purchase contracts.

System Notes

## ACSS Central and Network Configuration

*Lawrence Liddiard*

ACSS's configuration diagram (on page 253) illustrates the present ACSS *central and network configuration*, our central computers with their attached disk storage and network devices. (Although not shown on this diagram, each ACSS central system also has nine-track, dual 1600 and 6250 density magnetic tape units for user files and disk storage backup.) Each ACSS system provides research, instructional, and public service computing.

The **Processor Key** in the upper right of the diagram explains the content of the four large rectangles, which represent four central systems: the two CYBER systems, the VAX 8650, and the ENCORE Multimax system. Briefly, each processor rectangle contains the following information:

Above the top-left corner of each processor rectangle, in bold type, is a two-letter **mnemonic ID**. These mnemonics — **NV**, **CA**, **VX**, and **UX** — are commonly used to refer to each system. Inside the boxes at the *top left*, in bold type, is a brief indication of the service provided by each system. At the *top right*, also in bold type, is the operating system name and numeric level.

*continued on page 252*

Reading the diagram from the left:

- **NV**, managed by ACSS for the Institute of Technology, emphasizes CAD/CAM (Computer-Aided Design and Manufacturing) software, running the NOS/VE operating system as a Control Data Engineering Center.
- **CA**, the second system, is a Control Data Corporation (CDC) CYBER running the NOS 2 operating system.
- **VX**, the third system, is a Digital Equipment Corporation (DEC) VAX running the VMS 4 operating system.
- **UX**, the fourth system, is an Encore Computer Corporation Multimax system with 6 processors running UMAX 4.2, a UNIX compatible system.

To the *left* in each system rectangle, beneath the service description, is the **name and model number** of the central system. Under the name and model number, the current **number of central processors** for the system is given. Also to the *left* for CYBER systems, beneath the current number of central processors, the number of **peripheral processing units** is given. These are auxiliary computers on CYBERs that perform input/output and "bookkeeping" operations besides controlling job flow. The bottom **network name** is the standard internet address for the processor in the form of system.dept.university.educational-network. For VX the DECnet address is listed beneath it, with the VX Internet address.

To the *right* in each system rectangle, beneath the operating system name and numeric level, is a figure indicating the approximate total **central processing speed** of the entire system, measured in million instructions per second (**MIPS**). For multiple central processor systems we add a second line giving the processing speed in MIPS for a single processor. The *next* figure on the right gives the size of each system's central (or main) **memory** in millions of units — megacharacters (MCHARS) or megabytes (MBYTES) as appropriate for each system. The bottom **network address** is that for BITNET mail and file transfers.

Other items in the diagram represent devices attached to ACSS's central systems. The *circles* above the processor rectangles represent **disk storage** and paths attached to each system. The **disk capacity** is given in megacharacters or megabytes as appropriate. *Rounded rectangles* represent **input/output** and **network servers**.

The smaller rectangles under the system rectangles represent **communication and network devices** that enable central systems to interact with users. The maximum number, *max.n*, of simultaneous users for a communication device is given as **the number of Ports** in the rectangle to the right. Each of these communication devices is currently connected to the ACSS-net network of TELLABs multiplexers that interconnect all of ACSS's campus public labs and other University computer centers. In addition, each communication device is connected to a separate dial-in rotary on the University's digital Intecom IBX phone system. The older ACSS-net multiplexer technology, carrying information at 9600 bits per second, will be replaced over the next two years with telnet servers. At the bottom of the diagram is the unified **Ethernet-based network**, interconnecting all of ACSS's central systems and providing IBX LANmark and fiber gateways to campus, outstate (Duluth, Morris, Crookston), and national networks (NSFNet, and the future CInet). TCP/IP is the standard protocol, but we also support DECnet.

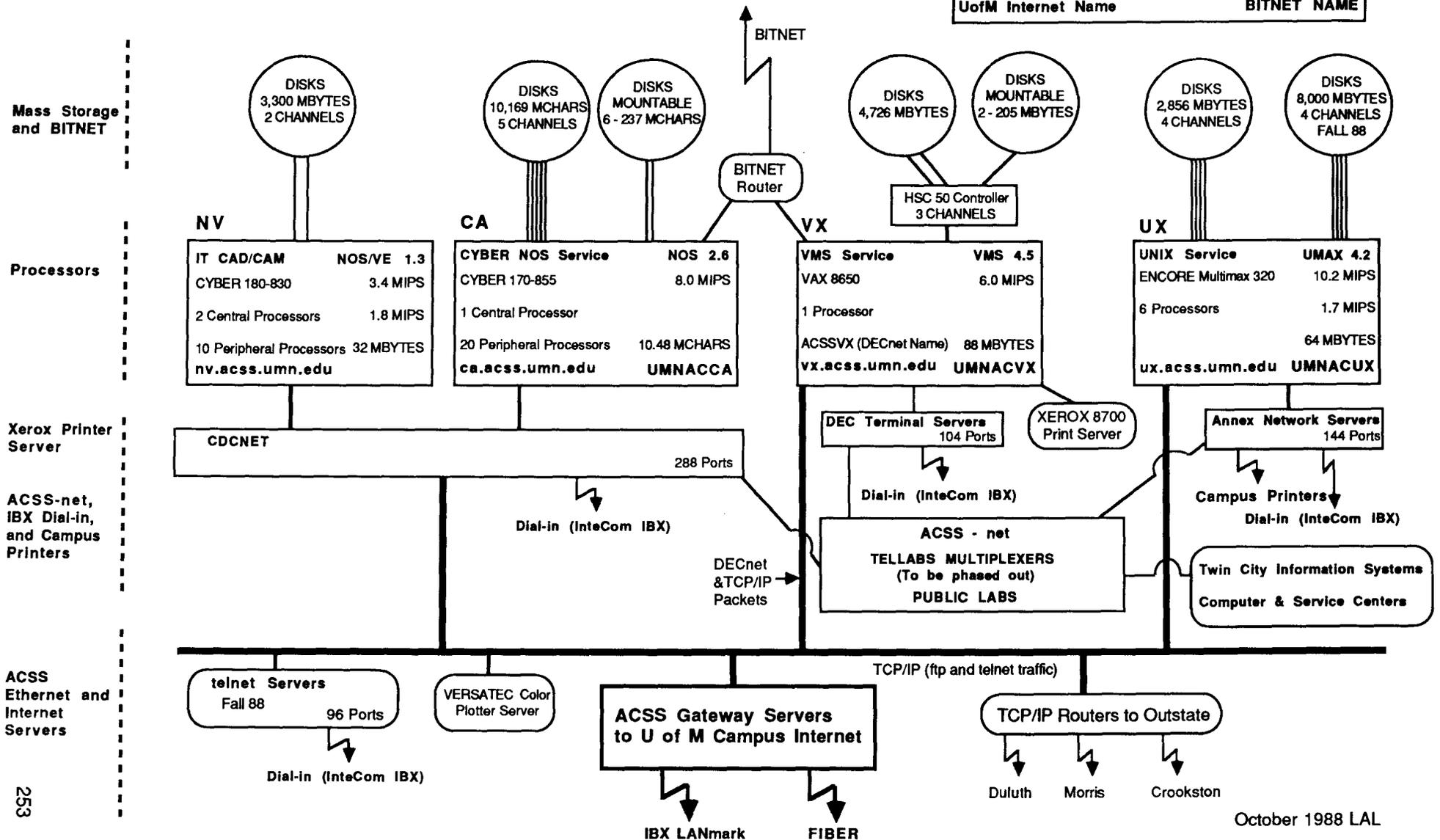
# ACSS Central and Network Configuration

Academic Computing Services and Systems  
University of Minnesota

## Processor Key

### MNEMONIC ID

Service	Operating System + Level
System Model Number	Total MIPS for System
Number of Processors	MIPS for Single Processor
Other	Memory in Million Units
UofM Internet Name	BITNET NAME



10/88

October 1988 LAL

## **A Review of Recent Changes**

*Steven Brehe*

BITNET: SKB@UMNACVX

ACSS made several changes during the summer; this article helps you catch up by summarizing changes that will affect many of you.

Some subjects discussed here were reported on in greater detail in issues of the *ACSS Newsletter* from June through September. These issues are available for reference in the Computing Information Center, 128A Lind Hall. You can also get your own copies of back issues by calling 626-1093.

### **New Dial-In Access**

ACSS has installed new hardware that changes the way you access ACSS systems if you use a modem and phone. This equipment enables you to access any of our systems by dialing a single phone number—**626-1630**—instead of dialing a different number for each system. The new equipment also enables you to establish “concurrent multiple connections”—that is, you can be logged on to two or more systems at the same time.

The same terminal and communications software settings that you've used with the old system will work with this new arrangement.

During fall quarter, both the old and new dial-in access methods are available to give our users an opportunity to learn the new system.

For more information, you can refer to the article in our September issue or see our new *Terminal Access Brief*, available free in the Computing Information Center, 128A Lind.

### **LUMINA**

You can now use LUMINA, the University Library's computerized card catalog, from your office or home through dial-up access, using a terminal and modem or a personal computer and communications software with a modem. Dial **626-2206**. See our June issue for more information.

If you have an account on ACSS's UX or VX central systems, you can use LUMINA from your account. This means that, with a UX or VX account, you can now use any networked terminal in campus computing labs, or any other networked terminal on campus, to search the LUMINA card catalog. See our August issue for details.

### **Charges for Instructional Time Sharing**

In July Dr. V. Rama Murthy, Vice Provost and Associate VP for Academic Affairs, announced to deans and department heads that charging for instructional time sharing will be discontinued on an experimental basis.

## Printing Files

ACSS has installed Apple LaserWriter printers in a number of labs on campus. You can now print files on these printers from our CYBER CA, CYBER NV, ENCORE UX, and VAX VX systems. See the related articles in our June and August issues and in this issue.

## CYBER CA File Archiving

In April we introduced a file archiving system on the CYBER CA that makes it easier for you to know which of your files have been archived and to reload archived files. An article in our June issue provided more details.

## System Upgrades

We upgraded the CYBER CA operating system to NOS 2.6, and upgraded the CYBER NV system to NOS/VE 1.3.1. See our June and August issues.

Graphics

# Announcing DISSPLA 10.5

*Michele Lewis*

BITNET: MAL@UMNACVX

ACSS has recently installed Version 10.5 of DISSPLA on the VX system. This new version offers many new enhancements that make DISSPLA more capable and flexible. Computer Associates' Version 10.5 can provide up to a 30 percent reduction in program computation time, depending upon the complexity of the plot. In addition, ACSS is offering new output devices with DISSPLA 10.5.

## DISSPLA Version 10.5

- Contains several new routines that allow enhancements in mapping, metafile naming and retrieval, message alignment positioning, page borders, transformation of 3-D surface points and unlimited color control.
- Calculates rounded linear and logarithmic axes limits based on your data.
- Enables you to increase the thickness of vectors and their arrowheads.
- Permits you to access your own map data files, in addition to those supplied by Computer Associates.
- Improves performance of the landblanking function.

We can now provide several hardcopy output devices to DISSPLA users that were not available with the previous version. The Xerox laser printer is available to produce publication-

*continued on page 256*

quality plots with 300 dots per inch resolution on 8.5 by 11-inch paper. The Versatec electrostatic plotter provides two modes of hard-copy output for DISSPLA users. The Versatec can produce 11 by 17-inch color plots or long (up to 163 inches) black and white plots. In addition, the Calcomp four-pen plotter is still available for DISSPLA plots.

### Running DISSPLA 10.5

Access DISSPLA 10.5 with the command:

```
$ LIBS DISSPLA10P5
```

This call will locate the new DISSPLA library and allow you to link your Fortran program as usual.

One of the major differences in the new version of DISSPLA is that the call to MNPLOT from within a DISSPLA program is no longer supported. MNPLOT was a locally-produced modification that allowed DISSPLA to create metafiles. These metafiles permitted users to view their plots at a later time without having to rerun their program and to produce plots on the Calcomp.

The new version of DISSPLA contains its own subroutines to create metafiles. The call

```
CALL COMPRS
```

will create a metafile named POPFIL.DAT on your current directory. You can rename this file and send it to the Calcomp to be plotted with the command:

```
$ ENQUEUE/NAME=site.bin CALCOMP filename
```

See the on-line document **ACSS\$WRITEUP\_[GRAPHICS]DISSPLA10P5.LIS** for information on viewing POPFIL.DAT files on your graphics terminal.

### Plotting on the Xerox Laser Printer

Xerox graphics files may be created from DISSPLA to send to the Xerox laser printer. You must access the Xerox library (in addition to the DISSPLA library) with the command:

```
$ LIBS CAEPIC
```

In addition, a call to create the Xerox graphics file must be placed in your Fortran program.

```
CALL EPIC (300.0,0,0.0,0.0)
```

When you run the program, a file named PLOT.XER will be created in your directory. This file should be renamed and sent to the Xerox laser printer with the following command:

```
$ PRINT/CHAR=IMAGE/NAME=site.bin filename
```

### Plotting on the Versatec Electrostatic Plotter

Versatec graphics files are created from DISSPLA in a similar manner to the Xerox laser printer. Color plots may be produced after accessing the color Versatec library in combination with the DISSPLA library.

## \$ LIBS CACOLORVERS

Place the following call in your Fortran program:

```
CALL VRSECP (2552)
```

The Versatec graphics file created in your directory will be named PLOT.VER. You should rename this file and then send it to the Versatec plotter with the following command:

```
$ PRINT/QUEUE=VERSATEC/NAME=site.bin filename
```

You can create black and white plots by accessing the Versatec black and white library in combination with the DISSPLA library.

## \$ LIBS CABWVERS

Two calls within DISSPLA are needed to produce black and white plots:

```
CALL PAPER (0.0,163.0,0.0,10.56)  
CALL VRSTEC (1200,0,0)
```

The file PLOT.VER will be created and may be plotted as mentioned above.

### For More Information

The *DISSPLA User's Manual* may be examined at the Computing Information Center in 128A Lind Hall. Staff at the Center will assist you in ordering the manual from Computer Associates if you would like your own copy. If you have any questions or problems with DISSPLA 10.5, please call Michele Lewis at 626-0314.

## Change in Laser Printer Device Driver

*Michael Frisch*

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BITNET: MJFRISCH@UMNACVX

On September 19, we changed the Precision Visuals and DISSPLA device driver for the Xerox 8700 laser printer/plotter to give an expanded error message when the rare situation occurred that the user exceeded the VMS byte limit while plotting.

The earlier version printed a cryptic message which gave no clue to the cause. The new version displays an error number that can be looked up by our systems staff. We don't have the driver display the complete error message because we suspect there are other possible rare errors that could occur, so the error number is more useful.

If you have questions about this, please contact the ACSS HELP-Line at 626-5592.

# Symbolic Algebra System: MACSYMA on VX

Michael J. Frisch

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We have installed the Common Lisp MACSYMA version 412.61 system for symbolic algebraic manipulation on the VAX VMS system.

MACSYMA is a system for carrying out algebraic operations accurately, no matter how complicated the expressions become. MACSYMA can:

- simplify and factor expressions
- solve algebraic equations, and systems of linear and nonlinear equations
- manipulate matrices and tensors
- compute limits, differentiate expressions, expand functions in Taylor series
- compute definite and indefinite integrals
- solve differential equations analytically, and
- generate Fortran expressions automatically.

Run MACSYMA interactively with the VMS command:

```
$ macsyma
```

and run it in batch using the **SUBMIT** command.

## Documentation and HELP File

A nine-page user's guide is available when you enter:

```
$ TYPE ACSS$WRITEUP:MACSYMA
```

or

```
$ EDIT/READONLY ACSS$WRITEUP:MACSYMA.LIS
```

To obtain a printed copy on the VAX, enter:

```
$ PRINT/CHAR=PSTD/NAME=xx.nnn ACSS$WRITEUP:MACSYMA
```

where **xx** is the site code and **nnn** is the bin number where the output should be delivered. For example, **EA.425** is a bin number in Lind Hall. The user's guide explains how to order the *Macsyma Reference Manual*. It also tells how to run an interactive primer program to learn elementary MACSYMA commands.

The information in this article is reproduced as a HELP file in:

\$ MOREHELP APPLICATIONS MACSYMA

## An Example Using MACSYMA

The following simple example computes the derivative of the function

$x^x$   
 $x^x$   
 $x^x$

The mathematical definition of this function requires that we express it in MACSYMA as  $x^{(x^x)}$  where ^ means exponentiation. For this example, the user input is in lower case following the (C1) prompt and the MACSYMA outputs are in upper case following the (D1) prompt. To check the results, the derivative is integrated to show that the original function is computed (although in a different but equivalent form).

\$ macsyms

THIS IS MACSYMA 412.61 FOR DEC VAX 8650 COMPUTERS.  
COPYRIGHT (C) 1982 MASSACHUSETTS INSTITUTE OF TECHNOLOGY.  
ALL RIGHTS RESERVED.  
ENHANCEMENTS (C) 1982, 1988 SYMBOLICS, INC. ALL RIGHTS RESERVED.  
TYPE "DESCRIBE(TRADE\_SECRET);" TO SEE IMPORTANT LEGAL NOTICES  
TYPE "HELP();" FOR MORE INFORMATION.

CHECKING PASSWORD FILE:

MACSYMA\$ROOT\_: [SYSTEM]PASSWD-ACSSVX-412.TEXT  
INIT FILE NOT FOUND: USERB:[YOUR-USERNAME]MACSYMA-INIT.MAC

(C1) diff(x^(x^x), x);

(D1) 
$$\frac{x^x}{x} (x \log(x) (\log(x) + 1) + x^{x-1})$$

(C2) integrate(% , x);

(D2) 
$$\frac{\log(x) x^x}{x}$$

(C3) quit();

## Comparison With the REDUCE Symbolic Algebra System

MACSYMA has more features than REDUCE and so is often a more useful package. It is somewhat different, so REDUCE users will have to learn some new ways to solve equivalent problems. MACSYMA is also a much larger package in its use of virtual memory and as a result may take longer to run in real time than REDUCE. Generating Fortran code in MACSYMA is not as easy to do as in REDUCE. The documentation for MACSYMA is more expensive but is also more thorough. This version of MACSYMA has a graphics capability which is not available in REDUCE.

# SPSS<sup>x</sup> 3.0 Now Default on VX

Bruce A. Center

We have made the latest version of SPSS<sup>x</sup> (SPSS<sup>x</sup> 3.0), the default version on VX. You can access SPSS<sup>x</sup>, as before, by typing:

```
$ SPSSX/OUTPUT=outfile.ext inputfile.ext
```

You can also access SPSS<sup>x</sup> 3.0 interactively if you don't specify an input file. Type

```
$ SPSSX
```

or

```
$ SPSSX/OUTPUT=outfile.ext
```

for interactive usage. The second command sends the output both to your output file *and* to your terminal.

Interaction will be turned off any time an input file is designated in the command line or the **/NOINTERACTIVE** qualifier is used. (i.e., **SPSSX3/NOINTERACTIVE** turns off the interactive features and will run the same way as SPSS<sup>x</sup> 2.2.)

You can continue to use the older version (SPSS<sup>x</sup> 2.2) by specifying:

```
$ SPSSX22/OUTPUT=outfile.ext inputfile.ext
```

The ancient SPSS<sup>x</sup> 2.1 has been removed from the system.

## Improvements

There are several notable improvements to SPSS<sup>x</sup> in this version, including these new procedures:

- **SPSS<sup>x</sup>/Trends** is a set of econometric procedures, including ARIMA, curve fitting and forecasting of time series data, spectral analysis, exponential smoothing, and enhanced regression analysis including weighted least squares, two stage least squares, and regression with first order autocorrelated errors.

These procedures are documented in the surprisingly readable manual: *SPSS<sup>x</sup> Trends*, published by SPSS Inc. The manual is available for perusal in the Computing Information Center, 128A Lind Hall.

- Two nonlinear regression procedures **CNLR** and **NLR** have been added.
- **MATRIX DATA** creates an active file from matrix input. You may enter data interactively or from an external file.

You can run SPSS<sup>x</sup> 3.0 interactively. Interactive features include:

- Command lines that can be recalled and edited.
- Extensive on-line help. Use the standard VMS HELP conventions to access SPSSx Help from within SPSSx.
- A journal file that can store commands as they are entered during an SPSSx job. These can later be resubmitted as an SPSSx batch job or as an SPSSx **INCLUDE** file.
- SPSSx output that can be sent to a file at the same time it appears at your terminal. (See the description of interactive use above).

Other improvements include the following:

- SPSSx 3.0 runs significantly faster for most jobs.
- **FILE HANDLEs** are no longer required because commands such as **DATA LIST**, **GET** and **SAVE** can recognize VMS file names in quotes (i.e., 'FRED.DAT').
- **REPORT** is easier to use and provides more control over the report layout. Improvements include automatic page formatting, automatic line wrapping, under-scoring of columns and headings, and spacing control.
- **VECTOR** accepts string variables as well as numeric variables.
- Several procedures have been renamed:

**BREAKDOWN** is now called **MEANS**.  
**CONDESCRIPTIVE** is now called **DESCRIPTIVES**.  
**PEARSON CORR** is now called **CORRELATIONS**.  
**SCATTERGRAM** has been dropped. Use **PLOT**.

The old names are still recognized, except in interactive mode.

## Documentation

SPSS Inc. has published a new user manual: *SPSSx User's Guide*, third edition. The VX file **ACSS\$WRITEUP:SPSSX3**, about 120 pages long, contains information about SPSSx changes, features, and how to use SPSSx at the University of Minnesota.

UNIX News

## Xerox Laser Printer Connected to UX

Thomas E. Kovarik  
 BITNET: TEK@UMNACUX

The Xerox 8700 laser printer at Lauderdale is now available to UX user's, ACSS's UNIX computer. You can send output to the laser printer using the new **xerox** command. It is simple to use this command. For example, to print a file named **tom**, simply type

## **xerox tom**

By default the output is kept at Lauderdale, where the laser printer is located. However, the output can be delivered by van, free of charge, to the East Bank, the West Bank, or the St. Paul campus, several times per day. To do this, use the **-C** parameter. For example,

<b>xerox -Cea.441 filename</b>	{Have output delivered to the East Bank, 128 Lind Hall, bin 441}
<b>xerox -Ceb.537 filename</b>	{Have output delivered to the West Bank, 170 Anderson Hall, bin 537}
<b>xerox -Cr70 filename</b>	{Have output delivered to the St. Paul campus, Classroom Office Building}

Select color paper with the **-A** option. For example, to select pink paper, use the following command:

```
xerox -A PINK filename
```

The available paper types are:

<b>BLUE</b>	<b>CANARY</b>	<b>DEFAULT</b>	<b>GOLD</b>
<b>PINK</b>	<b>GREEN</b>	<b>SPECIAL</b>	<b>COTTON</b>

The cotton paper is a fine 100 percent cotton paper. The **DEFAULT** (which need not be specified) is plain white stock paper. The green is a tad anemic, but the other colors are most pleasing to the eye.

Output sent to the laser printer can sport a host of new features. For example, such output can be reduced (on regular size paper), printed on paper with or without three hole pre-punch, with or without lines (bars) on the page. Simplex or duplex (double-sided) printing is possible. Landscape (8.5 by 11 inches) or Portrait mode (11 by 8.5 inches) can be selected, as can multiple copies.

The laser printer is fast, so it is well suited for large or very large jobs.

You can use your own special paper, using the **-A** option **SPECIAL**. Bring your own paper type to Lauderdale or send it to us through our shuttle service or Campus Mail. Then, for example, to print 425 copies on your own letterhead stationery, which you have supplied, in simplex mode, just type:

```
xerox -#425 -s -A SPECIAL -np filename
```

University departmental letterhead stationary comes out looking superb on the Xerox.

Other special features are available, such as 66 or 88 or 132 (super-reduced) lines per page, or even preprocessing with the pre-filter **pr(1)**. To learn more about these and other features and their exact parameter syntax, please refer to **man xerox**, or call the HELP-Line at (612) 625-5592.

For details on these and other features, please consult **man xerox**. Output from the laser printer can be delivered to the output stations on the East Bank, the West Bank, and the St. Paul campus.

# Phones/Hours/Labs

## ACSS PHONE NUMBERS

Administrative Office: 626-1600

HELP-Line 626-5592

**Access:**

<b>New number (all systems)</b>	<b>626-1630</b>
CYBER (CA)	626-1620
CYBER (NV)	626-1622
ENCORE (UX)	626-1681
VAX (VX)	626-1641

**Accounts:**

CYBERs, ENCORE, VAX	625-1511
Computer Hours (recorded message)	626-1819
Computing Information Center	625-7397
Contract Services	625-2303
East Bank I/O, 128B Lind Hall	625-5082
Engineering Services	625-1595
Equipment Maintenance/Repair	625-1595
Graphics Software	626-5592
Information, Lauderdale	626-1600
Lauderdale Computer Room	626-0550
Lauderdale Services	626-1838
LUMINA	626-2206
LUMINA Consultant	626-2272
Magnetic Tape Librarian	626-1838
Math and Engineering Packages	625-5830
Microcomputer HelpLine	626-4276
Newsletter Subscription	625-7397
Permanent File Restoration	626-0595
Project Assist	626-1090
<b>Public Labs (Managed by ACSS)</b>	
170 Anderson Hall	624-6526
140 Blegen Hall	624-5278
14 Folwell Hall	625-4896
306B Lind Hall	625-9032
B2 OMWL	624-6526
130 Physics	625-6820
9 Walter Library	626-1899
Lab Manager (14 Folwell Hall)	625-7850
Publications Information	626-1093
Short Course Registration	625-7397
Shuttle Bus Service	625-9525
System Status (recorded message)	626-1819
West Bank Computing Services	624-0877

For the phone numbers of consulting services, see the Help Page.

## PUBLIC LABS TWIN CITIES CAMPUS

Location	Mainframe Printing	Interactive	Micro
<i>East Bank</i>			
ApH 204	Closed for remodeling		
Arch 148			X
CenH		X	
ComH		X	
DiehH 207, 270	2	X	X
EddyH Annex 54			X
EltH 121, 124	Closed for remodeling		
FolH 14, 14a	1,2	X	X
FronH		X	
LindH 26	Closed for remodeling		
LindH 128B	2	X	
LindH 306B			X
MasCanCtr M39		X	
MechE 308		X	
MoosT 8-425			X
Nich 109			X
Phys 130	2	X	X
PioH		X	
SanH		X	
TerrH		X	
VinH 4		X	
VinH 203			X
WaLib 9	2	X	X
<i>West Bank</i>			
AndH 170	2		X
BlegH 140	1	X	
MdbH		X	
OMWL B2			X
<i>St. Paul</i>			
BaH		X	
CentLib B40	1	X	
CentLib B50			X
ClaOff 125E	Closed for remodeling		
ClaOff B22			X
McNH 69	2		X
Vet 43b			X

- 1 - Dot-matrix line printers allow printing from CYBER CA only.
- 2 - Laser printing available from CYBER CA, CYBER NV, ENCORE UX, and VAX VX.

## SYSTEM OPERATING HOURS

The CYBER CA, the CYBER NV, the ENCORE UX, and the VAX VX run continuously from 6 pm Sunday until 6 am the following Sunday.

The systems are in unattended production mode each night from 2:45 am until 6 am. It is unlikely that any tape requests or printing will be processed during these hours. Normal opera-

tions resume at 6 am each day except Sunday.

On the first and third Fridays of each month from 5 am to 7 am, the CYBER CA and NV are unavailable.

Low rates hours are from 8 pm to 8 am Monday through Friday, and all operating hours on Saturday and Sunday.

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**Editors:** *Steven Brähe, Paula Goblirsch*

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