

ACSS Brief

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ACADEMIC COMPUTING SERVICES & SYSTEMS Spring Quarter Short Courses 1987

INTRODUCTORY MAINFRAME COURSES

Introductory courses are free.
(Classrooms listed *may* be for the first day of class only.)

Introduction to Computers	(JLM)	Apr 7-17	(TWF)	3:15-5 pm	SciCB 125
FSE (NOS Full-Screen Editor)	(TJA)	Apr 16-23	(TTh)	3:15-5 pm	SciCB 125
Introduction to NOS 2	(SAK)	Apr 20-29	(MWF)	3:15-5 pm	Walter Lib 9
Introduction to UNIX	(JLM/TEK)	Apr 22-May 8	(WF)	3:15-5 pm	SciCB 125
Introduction to VMS	(JHS)	Apr 28-May 12	(TTh)	3:15-5 pm	SciCB 125
Electronic Mail (VAX Mail, BITNET)	(JHS)	May 19-21	(TTh)	3:15-5 pm	SciCB 125
Using Magnetic Tapes in NOS 2	(PJO)	May 27-June 5	(WF)	3:15-5 pm	SciCB 125

INTRODUCTION TO COMPUTERS. FREE. Do you want to learn to speak computer-ese? Do you want to learn about compilers and operating systems? What is involved in text processing? What is telecommunications? Artificial Intelligence? How are computer graphics produced? Do you want to log on to a computer system and try out an editor and some principles of programming? Then try **Introduction to Computers** and get hands-on experience as you learn computer terminology, and the basics of how computers work. ACSS's *Introduction to Computing* manual included. Hands-on computer time available. Six meetings. Instructor: Jill McAllister.

INTRODUCTION TO NOS 2 OPERATING SYSTEM. FREE. Hardware, software, commands, and conceptual background of the CDC Network Operating System, Version 2.4. DAY 1: Introduction; Documentation; File concepts; XEDIT basics. DAY 2-3: Command syntax; File attributes; temporary, permanent, and local files; Moving and positioning files; Displaying/copying files. DAY 4: Subsystems; Running programs interactively. DAY 5: Batch jobs; Magnetic tapes. Five meetings. Instructor: Sharon Krmptich.

INTRODUCTION TO VMS OPERATING SYSTEM. FREE. Overview of the VMS 4.3 operating system running on the DEC VAX 8600. DAY 1: Hard and software; Accounts; Login on and off; Help and mail utilities. DAY 2: Files; Directory structure; Commands & syntax. DAY 3: The EDT editor. DAY 4: Symbols & logical names; Procedure files; Batch jobs. DAY 5: Output; Tapes; File security. Prerequisites: **Introduction to Computers**, or equivalent knowledge. Five meetings. Instructor: Jerry Stearns.

INTRODUCTION TO UNIX OPERATING SYSTEM. FREE. An introduction to the UNIX operating system. DAY 1: Introduction; Logging on & off; Simple utilities. DAY 2: Files & directory structure; Access

permissions; The shell, redirection, Pipes & filters; Metacharacters; More utilities. DAY 3: The UNIX family of editors - ed; Mail, write, talk, mesg, biff. DAY 4: The UNIX family of editors - vi. Day 5: Languages, compilation, linkage, execution (FORTRAN, C, Pascal); Examples; Other important UNIX utilities. DAY 6: Background & foreground; jobs, processors; Shells & subshells; Shell variables & scripts. Six meetings. Instructors: Jill McAllister, Tom Kovarik.

USING MAGNETIC TAPES IN NOS 2. FREE. Using magnetic tapes on the CYBER CA computer. Topics include: receiving or sending tapes outside the CYBER computer, operations to set up tape jobs, tape management, BACKUP facility for disk files, ARCHIVE, EXAMINE, running tapes with program languages, and handling error messages. Computer tapes usage and ACSS's *Guide to Magnetic Tape Usage* provided. Prerequisites: **Introduction to NOS 2 & XEDIT** course, or equivalent knowledge. Four meetings. Instructor: Peter Oberg.

FSE (NOS FULL-SCREEN EDITOR). FREE. A brief orientation on the use and functions of FSE, the CDC Full Screen Editor available on the CYBER CA and MD machines. Learn what kinds of terminals can use FSE, how to set up your terminal to use it, and how to perform text editing functions such as insert, delete, replace, or move text. Two meetings. Instructor: Tim Ampe.

ELECTRONIC MAIL. FREE. Introduction to Electronic Mail and Networks. Mail on the VAX 8600; sending, receiving, and managing mail, parameters. Send, receive, send/file commands. BITNET & GMAIL; Addressing. Prerequisites: **Introduction to VMS** course, or experience using VMS. Two meetings. Instructor: Jerry Stearns.

ELECTIVE MAINFRAME COURSES

FEES: 1) U Students, 2) U Staff/Faculty, 3) Non-University persons

Using SAS (Statistics)	(DLF)	May 4-8	(MWF)	3:15-5 pm	\$10,\$10,\$20
Introduction to INGRES (Data Base)	(PJO)	May 13-15	(WF)	3:15-5 pm	\$10,\$10,\$20
Using SPSS ^X (Statistics)	(DLF)	May 18-22	(MWF)	3:15-5 pm	\$10,\$10,\$20
Programming in 'C' Language	(BMS)	May 18-June 1	(MWF)	2:15-4 pm	\$15,\$15,\$40
Programming in LISP Language	(RAZ)	May 12-28	(TTh)	2:15-4 pm	\$15,\$15,\$40

USING SPSS^X (Statistical Package).
\$10,\$10,\$20. Basic structure, job setup, and required statements; data manipulation and selection, commands that control internal and external files. Prerequisites: Introduction to NOS 2 Operating System and XEDIT, or equivalent knowledge, is required. Three meetings. Instructor: Debbie Felt.

USING SAS (Statistical Analysis System).
\$10,\$10, 20. Basic structure, job setup, and required statements, data manipulation and selection, commands that control internal and external files. Prerequisites: Introduction to VMS Operating System and EDT, or equivalent knowledge, is required. Three sessions. Instructor: Debbie Felt.

INTRODUCTION TO INGRES (VAX Data Base).
\$10,\$10,\$20. Learn to use INGRES on the VAX 8600 computer. Topics include creating data bases, retrieving information using the English-like language QUEL, creating "ad hoc" reports, and using Application-By-Forms to develop data entry, data manipulation, and report generation. Two meetings. Instructor: Pete Oberg.

PROGRAMMING IN 'C' LANGUAGE. \$10,\$10,\$20.
 This course will introduce the 'C' programming style, flow control, statements and operators, program structure, data types, pointers and arrays, standard I/O and the system interface. Students should be thoroughly familiar with the basic concepts of structured programming. No operating system will be taught, however a class account will be available on the ENCORE (UNIX) computer. Six meetings. Instructor: Bryan Senn.

PROGRAMMING IN LISP LANGUAGE.
\$10,\$10,\$20. This introduction is designed to teach people who may not have used a programming language before, how to write programs in LISP. LISP primitives. Programming techniques for developing recursive solutions to problems, and setting up complex solutions from previously defined simpler ones. Class will use VAX 8600 Common LISP to practice what they learn in class. Prerequisites: Introduction to VMS Operating System, or equivalent knowledge. Six meetings. Instructor: Ron Zacharski.

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ACSS SHORT COURSE INFORMATION

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

REGISTRATION: Registration is located at the ACSS Computing Information Center, 128A Lind Hall. (Registration hours: 8:00 am to 4:00 pm, Monday through Friday). We accept mail registrations. Deadline for registering is 4 pm on the last working day *before* the class begins. Please call and give us your name if you plan to attend a free class, so we know how many to expect.

FEES: Fees are listed in order for the following groups: 1) University students, 2) University staff and faculty, and 2) non-University persons. Course fees may be paid by cash or check or with a signed University journal voucher. No refunds will be made after the class has begun.

Note: Monday, May 25, is a University holiday. No classes will be held.

MICROCOMPUTER APPLICATIONS COURSES

FEES: 1) U Students, 2) U Staff/Faculty, 3) Non-University persons.

IBM AND PC COMPATIBLE COURSES

(Limited to 10 per class.)

Introduction to Micros: MS-DOS	section 1	Apr 6-10	(MWF)	1:30-3:30 pm	\$40,\$50,\$80
	section 2	Apr 21-23	(TWTh)	9:30-11:30 am	\$40,\$50,\$80
	section 3	May 4-8	(MWF)	1:30-3:30 pm	\$40,\$50,\$80
	section 4	May 27-29	(WThF)	9:30-11:30 am	\$40,\$50,\$80

(Introduction to Micros or equivalent knowledge is required for IBM courses below.)

Introduction to Word Perfect	section 1	Apr 7	(T)	1:30-4 pm	\$25,\$35,\$60
	section 2	Apr 24	(F)	9:30-noon	\$25,\$35,\$60
	section 3	May 14	(Th)	1:30-4 pm	\$25,\$35,\$60
	section 4	May 26	(T)	9:30-noon	\$25,\$35,\$60
Beginning Lotus 1-2-3	section 1	Apr 9	(Th)	1:30-4 pm	\$25,\$35,\$60
	section 2	May 12	(T)	1:30-4 pm	\$25,\$35,\$60
Intermediate Lotus 1-2-3		May 29	(F)	1:30-4 pm	\$25,\$35,\$60
Introduction to dBase III	section 1	Apr 14-16	(TWTh)	1:30-3:30 pm	\$40,\$50,\$80
	section 2	May 11-15	(MWF)	9:30-11:30 am	\$40,\$50,\$80
Programming with dBase III		June 2-3	(TW)	1:30-4 pm	\$40,\$50,\$80
		Apr 28-30	(TTh)	1:30-4 pm	\$40,\$50,\$80
Introduction to Microsoft Word		Apr 27-29	(MW)	1:30-3:30 pm	\$40,\$50,\$80
		May 27-28	(WTh)	1:30-3:30 pm	\$40,\$50,\$80
Managing Your Hard Disk	section 1				
	section 2				

INTRODUCTION TO MICROCOMPUTERS: - DOS. \$40,\$50,\$80. A 6-hour introduction to microcomputers for the new user. This course offers background information on hardware and software for microcomputers, as well as a practical (hands-on) introduction to basic MS-DOS and PC- required for registration in other IBM-compatible courses below. Three meetings. Limited to 10 people.

INTERMEDIATE LOTUS 1-2-3. \$25,\$35,\$60. This 2.5-hour hands-on workshop covers three of the more advanced features of Lotus 1-2-3: data base queries, look-up tables, and macros. Prerequisite: a working knowledge of Lotus 1-2-3. The Beginning Lotus 1-2-3 course by itself is NOT sufficient. Limited to 10 people. One meeting.

INTRODUCTION TO WordPerfect. \$25,\$35,\$60. This 2.5-hour hands-on course is for the new WordPerfect user. You will learn to use simple line and page formatting commands (such as set margins and headers), how to manipulate blocks of text, use search and replace, change initial (default) values, and how to install a printer. One meeting. Limited to 10 people.

INTRODUCTION TO dBASE III. \$40,\$50,\$80. This 6-hour hands-on course will discuss basic concepts of data base management. You will create several data bases and learn how to enter data, modify it, and retrieve it. This class covers only interactive commands of dBase III. Three meetings. Limited to 10 people.

INTRODUCTION TO MS (Microsoft) WORD. \$40,\$50,\$80. This is a 5-hour course for new MS Word users. You will learn to use keyboard commands to format characters and paragraphs, to move text, to use search and replace, multiple windows, and a glossary, and to create headers and footers. You will install a printer and change printer fonts. We will give a short demonstration on how to use a mouse with MS Word. Two meetings.

PROGRAMMING WITH dBASE III. \$40,\$50,\$80. A 5-hour course in which you will write and run several simple dBASE III programs while learning some basic programming concepts. Prerequisite: a working knowledge of dBASE III is required. Two meetings.

BEGINNING LOTUS 1-2-3. \$25,\$35,\$60. This 2.5-hour hands-on course will familiarize users with basic Lotus 1-2-3 spreadsheet concepts. You will be introduced to beginning level commands by entering a sample spreadsheet. You will set up your own spreadsheet, enter data and formulae, use spreadsheet commands, functions, formats, and create several charts. Two meetings. Limited to 10 people.

MANAGING YOUR HARD DISK IN -DOS. \$25,\$35,\$60. In this 4-hour course we demonstrate the DOS commands involved in organizing a hard disk. Some of the concepts covered are creating directories and batch files, backing up a hard disk, and transferring data between subdirectories. Two meetings. Limited to 10 people.

MACINTOSH OVERVIEWS

(No hands-on. Limited to 12 people.)

Preparing Dissertation On a Macintosh	May 5	(Tu)	9:30-noon	\$15,\$25,\$40
MS (Microsoft) Works	May 7	(Th)	1:30-4 pm	\$15,\$25,\$40
Developing Software in Turbo Pascal	May 11-13	(MW)	1:30-4 pm	\$25,\$35,\$60
Microsoft Word for the Macintosh	June 1	(M)	1:30-4 pm	\$15,\$25,\$40
Omnis 3	June 3	(W)	1:30-4 pm	\$15,\$25,\$40
Networking Macintoshes with AppleShare	June 4	(Th)	1:30-4 pm	\$15,\$25,\$40
Desktop Publishing with PageMaker	June 5	(F)	9:30-noon	\$15,\$25,\$40

(The following two classes are hands-on workshops. Limited to 10 people.)

Introduction to EXCEL	Apr 14-15	(TW)	9:30-noon	\$40,\$50,\$80
Intermediate EXCEL	May 27	(W)	9:30-noon	\$40,\$50,\$80

MS (Microsoft) WORD. \$15,\$25,\$40. This 2.5-hour course will include a discussion and demonstration of the basic and advanced features of the current version of MS Word word-processing program, and of how these features work together. One meeting. Limited to 12 people.

PREPARING A DISSERTATION ON THE MACINTOSH. \$15,\$25,\$40. In this 2.5-hour overview we will demonstrate and discuss the advantages and disadvantages of several word-processing and graphics programs currently available for the Macintosh, including: MacWrite, MS Word, MacDraw, MacDraft, MS Chart, and others. We will discuss organizing bibliographies, graphing and organizing data, placing graphs and illustrations into your document, and using the Apple LaserWriter printer. One meeting.

OMNIS 3. \$15,\$25,\$40. This 2.5-hour course is an introduction to Omnis 3, a data management program designed for very large data bases which require custom-designed data entry forms. You will design and implement a data base application. Prerequisites: A working knowledge of the Macintosh and prior familiarity with a programming language, including loops and IF statements. Limited to 12 people. One meeting.

DESKTOP PUBLISHING WITH PAGEMAKER. \$15,\$25,\$40. In this 2.5-hour overview we will demonstrate how to use PageMaker to lay out a publication, such as a newsletter. Time will be reserved for questions from attendees. One meeting.

DEVELOPING SOFTWARE IN TURBO PASCAL. \$25, \$35,\$60. This 5-hour overview covers the fundamentals of writing Mac programs with Turbo Pascal: it discusses writing multi-window applications, using MEWS in

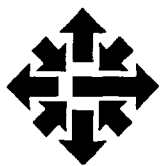
detail, and strategies for writing (and debugging) programs. NOTE: This is NOT a course in how to program in Pascal. It is for people who already know Pascal and want to write Mac applications. You must bring *Inside Macintosh* to class. Two meetings.

NETWORKING MACINTOSHES WITH APPLESHARE. \$15,\$25,\$40. This 2.5-hour course is a basic overview on using an AppleTalk network with AppleShare server software, to interconnect the Macintoshes in your office. One meeting.

MS (Microsoft) WORKS. \$15, \$25, \$40. This 2.5-hour overview demonstrates MS Works' word processing, spreadsheet, data base, and communications software and how to transfer data between these four application. One meeting.

MS (Microsoft) EXCEL. \$40,\$50,\$80. In this 5-hour hands-on course you will set up several spreadsheets and use Excel's format and paste functions as well as absolute and relative addressing. You will move data between Excel and MacWrite and create charts. Prerequisites: Prior hands-on experience with the Macintosh. Two meetings. Limited to 10 per class.

INTERMEDIATE EXCEL. \$25,\$35,\$60. In this 2.5-hour workshop you will create your own format and function macros, and use the Macro recorder functions to set up command macros. You will link spreadsheets and extract data from an Excel data base. Prerequisite: prior experience using Excel is required. Limited to 10 people. One meeting.



ACSS Brief

The ACSS Central Configuration

Our configuration diagram, illustrating the present ACSS *central configuration*—our mainframe computers with attached disk storage and communication devices. (Although not shown on this diagram, each ACSS central system also has 9-track, 1600 and 6250 magnetic tape units for user files and disk storage backup.) Note that each ACSS system provides research, instructional, and public service computing.

The **Key** in the upper right of the diagram explains the content of the four large rectangles representing four mainframe systems: our two CYBER systems, the VAX 8600, and the ENCORE Multimax system. Briefly, each system rectangle contains the following information:

At the **bottom center**, in bold type, is a two-letter **mnemonic ID**. These mnemonics — **MD**, **CA**, **VX**, and **UX** — are commonly used to refer to each system.

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. Reading the diagram from the left:

- The first two systems (MD and CA) are Control Data Corporation (CDC) CYBERs running the NOS 2 operating system.
- MD, managed by ACSS for IT, emphasizes CAD/CAM (Computer-Aided Design and Manufacturing) NOS 2 service for University research and instructional use.
- VX, the next 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 8 processors running UMAX 4.2, a UNIX 4.2 bsd 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** (PPUs) is given. PPU's are auxiliary computers on CYBERs that perform input/output and "bookkeeping" operations besides job control flow.

To the **right**, 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 **bottom** figure on the right gives the size of each system's central (or main) **memory** in millions of units — megacharacters or megabytes as appropriate for each system.

Other parts of the diagram represent devices attached to our central mainframes. The **circles** above the system rectangles represent disk storage and paths attached to each system. The disk capacity is given in megacharacters or megabytes as appropriate.

The **smaller rectangles** under the system rectangles represent **communication devices** that enable central systems to interact with users. The maximum number, *max.n* of simultaneous users for a communication device is given as *max.n* Ports in the rectangle to the right of the manufacturer's name for the device. Each of these communication devices is connected to the ACSS - NET network of TELLABs multiplexers that interconnect all of ACSS's campus public labs and other Information System computer centers. In addition, each communication device is connected to a separate dial-in rotary on the University's digital Intecom IBX phone switch.

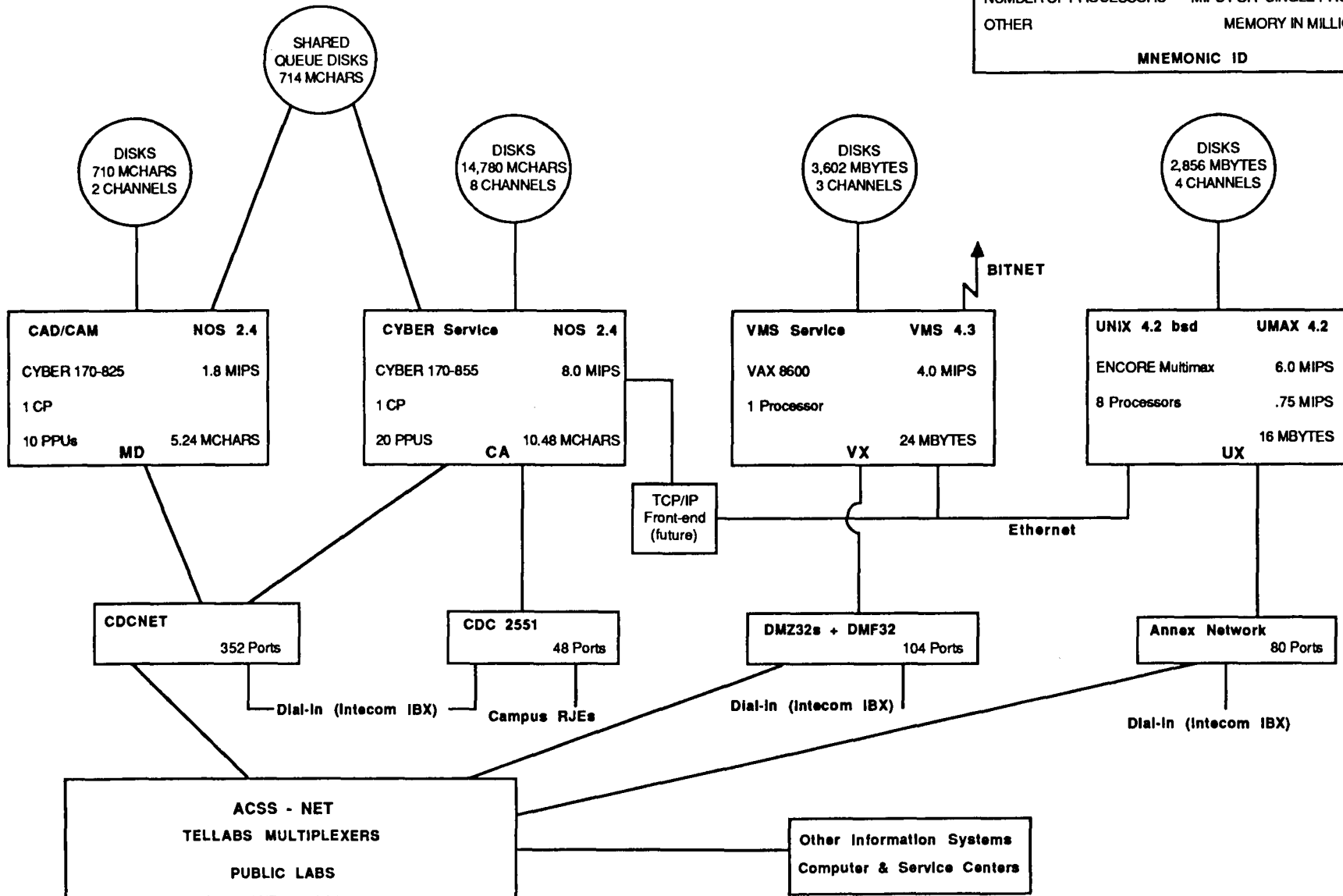
Other communication features in the diagram include the planned **TCP/IP** front-end service that will interconnect **CA**, **VX**, and **UX**, and permit, among other things, file transfer from one system to another. The connection to the national **BITNET** network is shown by the communication arrow extending above the **VX** system.

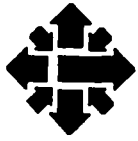
ACSS Central Configuration

Academic Computing Services and Systems
University of Minnesota

KEY

SERVICE	OPERATING SYSTEM + LEVEL
SYSTEM MODEL NUMBER	TOTAL MIPS FOR SYSTEM
NUMBER OF PROCESSORS	MIPS FOR SINGLE PROCESSOR
OTHER	MEMORY IN MILLION UNITS
MNEMONIC ID	





ACSS BRIEF

The ACSS Central Configuration

The diagram on the other side of this page illustrates the present ACSS central configuration—our mainframe computers with storage and communications devices—plus some planned additions.

The **key** in the upper right of the diagram explains the content of the five large rectangles representing five mainframe systems: our three CYBER computers, the recently installed VAX 8600 and a UNIX system we plan to add in the future. (The UNIX machine will be the VAX-11/780 that once provided our VMS service.)

Briefly, each rectangle contains the following information:

At the *bottom center*, in bold type, is a two-letter **mnemonic ID**—**MD**, **ME**, **CA**, **VX**, and **UX**—by which each system is identified.

At the *top left*, in bold, is a brief indication of the **service** provided by each system. At the *top right*, also in bold type, is the operating system. Reading the diagram from the left:

- The first three systems (the MD, ME, and CA) are Control Data Corporation (CDC) CYBER systems running the NOS 2 operating system. The **MD** provides CAD/CAM (computer-aided design and manufacture) service for the MERITSS instructional computing service. The **ME**, the main MERITSS computer, provides general instructional computing service. The **CA** provides computing for researchers.
- The next two systems (VX and UX) are Digital Equipment Corporation (DEC) VAX systems running, respectively, the VMS 4.2 and UNIX 4.2 operating systems. They will provide both research and instructional computing services.

To the *left* in each rectangle, beneath the service description, is the name and model number of each machine's **central processing unit**, or CPU. Also to the *left*, beneath the CPU entry, is space for other information: Here we provide the number of **peripheral processing units**, or PPU's, for each CYBER.

To the *right*, beneath the operating system, is a line indicating the approximate **speed** of the central processor, measured in millions of instructions per second (or **MIPS**). For multiple processor systems we add a second line for total processing speed, also in MIPS. The *bottom* line on the right gives the size of each machine's **central memory** in millions of units—megacharacters or megabytes, as appropriate for each system.

Other parts of the diagram represent devices attached to our mainframes:

The *circles* represent **disk drives** attached to each computer, giving total capacity in millions of units.

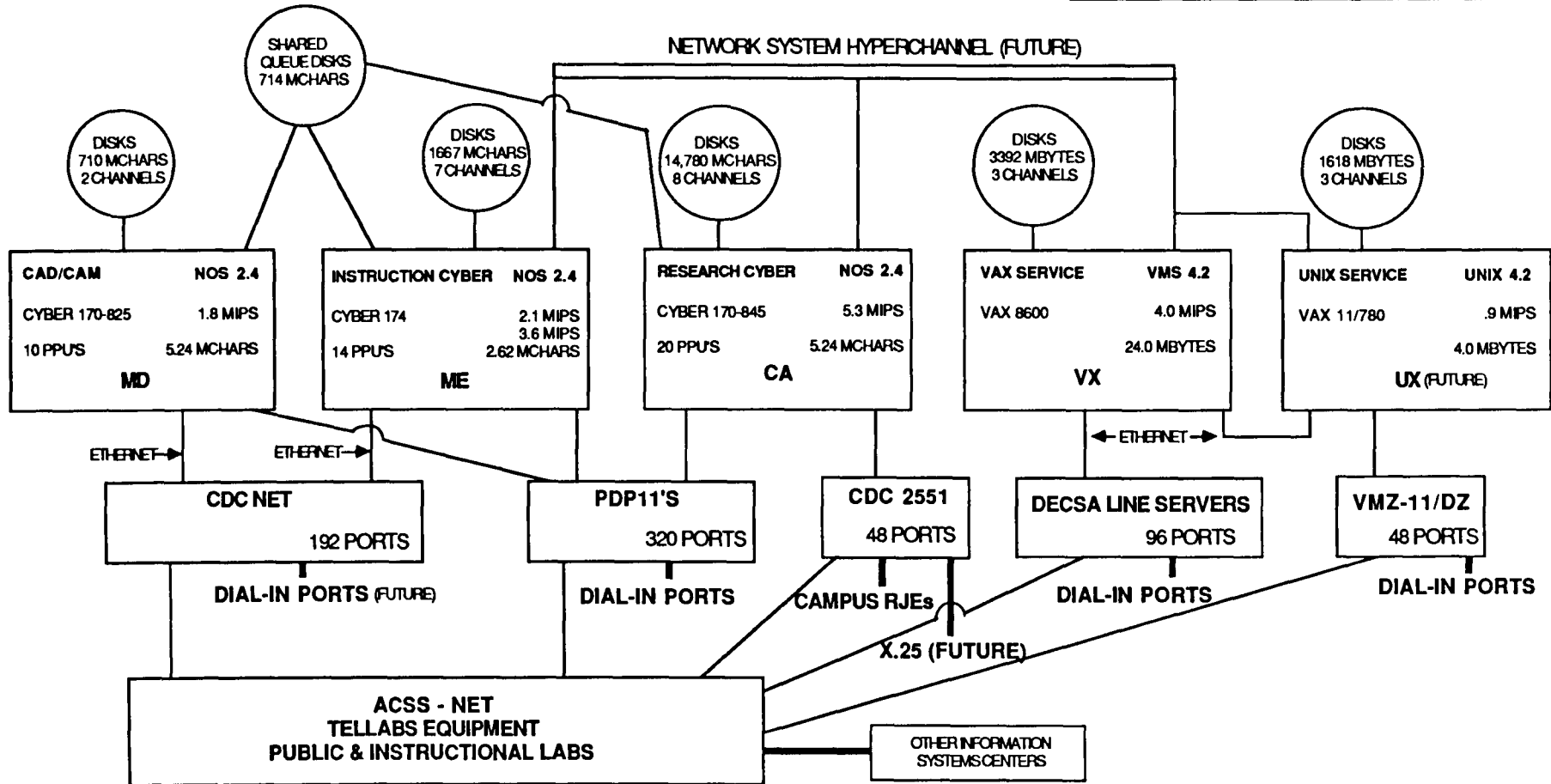
The *smaller rectangles* represent **communications controllers** that enable users to communicate with the central systems. As shown in the diagram, all these devices are connected to the ACSS-net network (represented at the bottom of the diagram) and our campus labs.

ACSS Central Configuration

Academic Computing Services and Systems
University of Minnesota

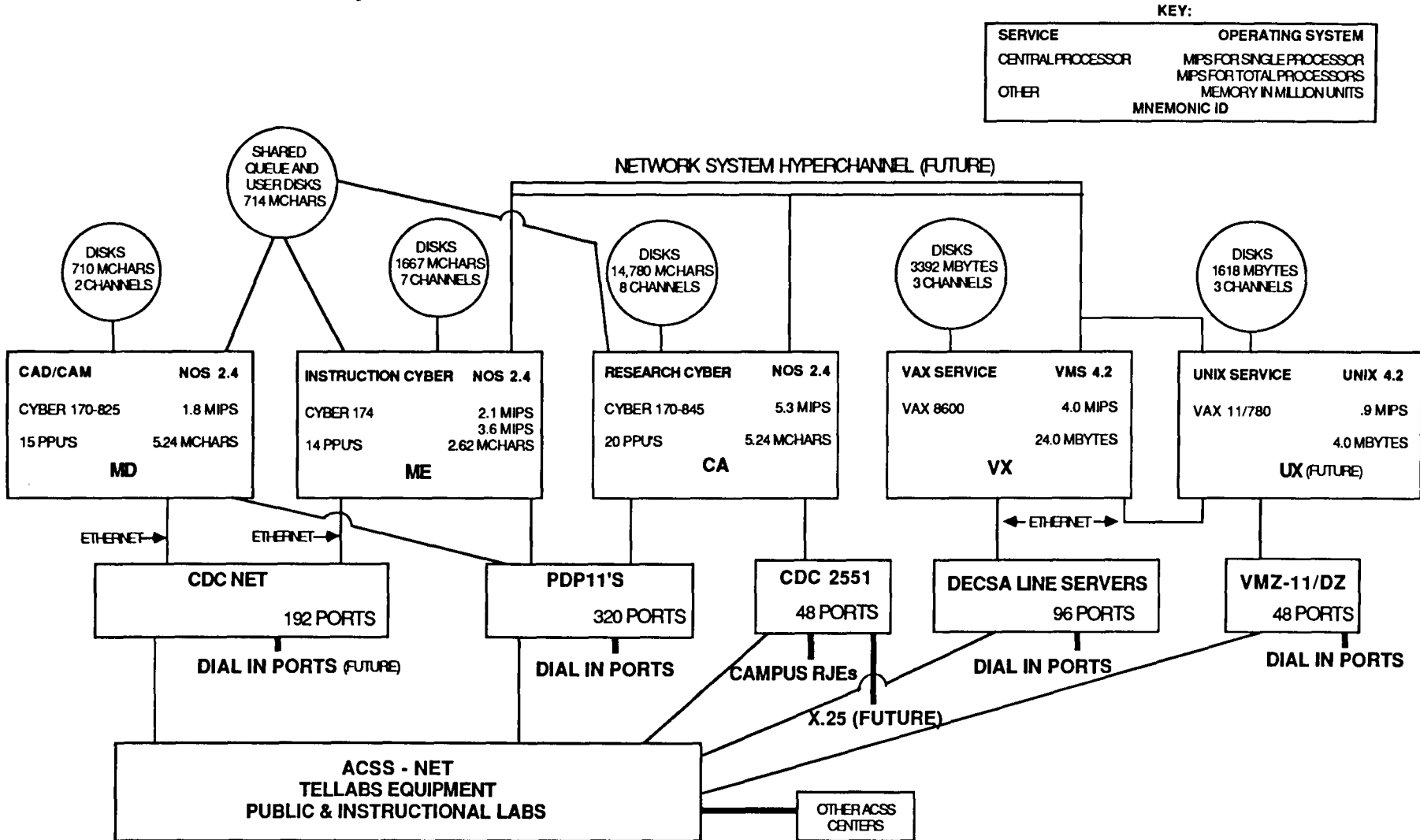
KEY:

SERVICE	OPERATING SYSTEM
CENTRAL PROCESSOR	MIPS FOR SINGLE PROCESSOR
OTHER	MIPS FOR TOTAL PROCESSORS
	MEMORY IN MILLION UNITS
	MNEMONIC ID

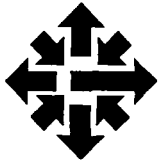


ACSS Central Configuration

Academic Computing Services and Systems
University of Minnesota







ACSS Brief

ACADEMIC COMPUTING SYSTEMS & SERVICES Summer Session Short Courses 1986

INTRODUCTORY COURSES

Introduction to Computers	McAllister	June 24-July 10	(TTh)	2:15-4 pm	\$15,\$25,\$35
Introduction to VAX/VMS	Stearns	June 23-July 2	(MWF)	2:15-4 pm	\$15,\$25,\$35

ELECTIVE COURSES

Beginning FORTRAN Programming	McAllister /Kovarik	July 14-25	(MWF)	2:15-4 pm	\$35,\$45,\$75
Beginning Pascal Programming	Brodie	July 21-August 1	(MWF)	2:15-4 pm	\$35,\$45,\$75
EDT (VMS Editor)	McAllister	July 22-31	(TTh)	2:15-4 pm	\$25,\$35,\$60
SPSS-X (Statistics Package)	Center	July 28-August 1	(MWF)	2:15-4 pm	\$25,\$35,\$60

MICROCOMPUTER APPLICATIONS COURSES (Limited to 10 per class, unless otherwise specified.)

Introduction to Micros: MS-DOS		June 30-July 2	(MW)	1:30-4 pm	\$25,\$35,\$60
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(Introduction to Micros or equivalent knowledge is required for courses listed below.)

Beginning Lotus 1-2-3		July 9	(W)	1:30-4 pm	\$25,\$35,\$60
Introduction to Word Perfect		July 10	(Th)	1:30-4 pm	\$25,\$35,\$60
Introduction to dBase II & III		July 15-17	(TTh)	9:30-noon	\$40,\$50,\$80
Advanced Lotus 1-2-3		July 22	(Tu)	9:30-noon	\$25,\$35,\$60
Intermediate Word Perfect for Authors		July 23	(W)	1:30-4 pm	\$25,\$35,\$60

(The courses listed below are overviews only for the Apple Macintosh. Limited to 20.)

Microsoft Word for the Macintosh		July 16	(W)	1:30-4 pm	\$15,\$25,\$40
Preparing Dissertations Using a Macintosh		July 24	(Th)	9:30-noon	\$15,\$25,\$40
Microsoft Excel (Spreadsheet)		July 25	(F)	9:30-noon	\$15,\$25,\$40

GRAPHICS SHORT COURSES: During the past year enrollment has been insufficient to hold these classes. Starting this summer ACSS will be maintaining a list of people interested in specific graphics short courses. To have your name included on the list, call the Short Course Coordinator at 625-1543. When a list for an individual class has eight people on it, the class will be scheduled to run approximately four weeks later. The list of potential graphics course offerings includes:

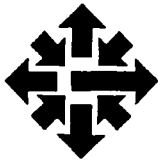
Graphics Packages at ACSS
PicSure
DI-3000 (including Grafmaker & Contouring System)

Registration Information

REGISTRATION: Registration is located at the ACSS Reference Room, 128A Lind Hall. (Hours: 8:00 am to 4:30 pm, Monday through Friday). Mail registrations will be accepted. Deadline for registering is 4:15 pm on the last working day *before* the class begins. If you need more information on short courses, call Jerry Stearns at 625-1543.

FEES: Fees are listed in order for the following groups: 1) University students, 2) faculty and staff, and 3) non-University persons. Course fees may be paid by cash or check or with a signed University journal voucher. Short courses can no longer be charged to ACSS user accounts. No refunds will be made after the class has begun.

NOTE: Friday, July 4, is a University holiday. No classes will be held.



ACSS Brief

Artificial Intelligence Services

This *Brief* describes Artificial Intelligence (AI) languages that are currently available on Academic Computing Systems and Services (ACSS) mainframe computers and also includes those that are available on microcomputers. If you would like additional information, feel free to contact the Special Projects Group at the phone number and address listed below. This group also provides general AI consulting.

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

LISP

One of the most common programming languages used in AI research is LISP. The two most common LISP dialects in use today are Scheme LISP and Common LISP.

LISP on the VAX: VAX Common LISP is available on ACSS's VAX/VMS (VX) system. This implementation provides a very good environment for LISP programming. It includes a language-specific, full-screen editor which you can invoke from a LISP session. When you exit the editor you return to the LISP session where you last worked. In addition to editing files, you can edit functions and change the value of a symbol (variable) while in the editor. You can also edit more than one file at a time through the use of windows. The implementation also includes an incremental compiler and debugging aids (including break loop, debugger, stepper, and tracer). To access VAX LISP, type `LISP` at the main VMS prompt.

For documentation, three manuals are available.

VAX LISP Volume 1: User's Guide. This manual describes the interpreter, the compiler, and the debugging facilities, as well as the "pretty" printer.

VAX LISP Volume 2: Editor Manual

Steele, Guy Jr. *Common LISP: The Language.* Burlington, Massachusetts: Digital Press, 1984.

The ACSS Computing Information Center, 128A Lind Hall, has a copy of each of these and also can provide you with information on how to order documentation directly from the Digital Equipment Corporation (DEC).

LISP on the ENCORE: Franz LISP and the Massachusetts Institute of Technology (MIT) Scheme are available on the ENCORE/UNIX (UX) system. MIT Scheme is a more elegant and technically superior implementation of LISP in comparison to Franz LISP.

The manual for Franz LISP is available in the directory `/usr/lib/lisp/manual`. It also is available from the help facility within LISP. This is an on-line version of

Foderaro, John. *The Franz LISP Manual.* Berkeley: University of California, 1983.

The manual for MIT Scheme is *The Revised Resvised Revised Report on Scheme or an UnCommon LISP*, which is available as *AI Memo 848a* for \$6 from

Elizabeth Heepe
 Publications, Room NE43-818
 MIT Artificial Intelligence Laboratory
 545 Technology Square
 Cambridge, MA 02139

MIT Scheme can be used with the EMACS editor; this combination becomes a powerful programming environment. To use Scheme under EMACS, simply enter Scheme, then from the Scheme prompt type (emacs "filename"). The EMACS manual is available on line as /usr/lib/emacs/manual.

ACSS plans to provide additional LISP processors in the future. Eventually, a version of Common LISP may be installed. Articles in the *ACSS Newsletter* will announce any new language installation. For information about the current status of LISP on the ENCORE, contact the ACSS HELP-Line (626-5592) or the Special Projects Group.

LISP on the CYBER: On ACSS's CYBER/NOS systems (CA and MD) two LISP interpreters are available: (1) University of Texas LISP (UTLISP) and (2) University of Massachusetts at Amherst LISP version (ALISP). Neither is as powerful as VAX LISP. Writeups are available for both: type **WRITEUP**, **ALISP** for ALISP and **WRITEUP**, **LISP** for UTLISP. The ALISP writeup is an on-line version of

Hudson, Richard. *ALISP User's Manual.* Amherst: University of Massachusetts, 1975.

The UTLISP writeup is an on-line version of

Greenwalt, E.M. *U.T. LISP Reference Manual.* Austin: University of Texas, 1975.

To access UTLISP, type **LISP** at the system prompt. To access ALISP, type **ALISP** at the system prompt.

A Comparison of Commands for Selected LISP Dialects

For your information these are some of the differences among the available LISP dialects:

How to / dialect	Common	Franz	UTLISP	ALISP	Scheme
Enter LISP	lisp	lisp	lisp	alisp	scheme
Exit LISP	(exit)	(exit)	fin	(exit)	(exit)
Enter editor	(ed arg)	(editl arg)	(edit arg)	(edit arg)	use any editor
Exit Editor	exit	ok, stop, save	ok, save	end	use any editor
Enter debugger	(debug)	(debug)	*	*	(debug)
Exit debugger	quit or CTRL-C	(reset) or ok			CTRL-G
On-line help	(help)	(help)	none	none	CTRL-A, then H

*UTLISP and ALISP do not have a debugger that can be directly entered; error messages are given interactively. Trace and break functions are available. For a description of these functions, refer to the *University of Texas Reference Manual* (UTLISP) and *ALISP User's Manual*.

LISP on Microcomputers: Public domain versions of LISP (XLISP and PC Franz LISP) are available for International Business Machines (IBM) PC compatibles. XLISP is also available for the Macintosh. Individuals may obtain copies of this software from the ACSS Special Projects Group at no cost other than providing a blank, formatted disk. For individuals who wish to purchase a more powerful implementation, Texas Instruments (TI) PC Scheme and Golden Hill Common LISP for IBM-PC compatibles and MacScheme for the Macintosh are recommended. TI-PC Scheme can be purchased at the Electronics Desk in the Minnesota Book Center (Williamson Hall) for around \$60. Golden Hill Common LISP and MacScheme can be purchased directly from the companies listed below.

Golden Hill Common LISP
 Golden Hill Computers
 163 Harvard Street
 Cambridge, MA 02139
 (617) 492-2071
 cost: \$350

MacScheme
 Semantic Microsystems
 4470 SW Hall Street, Suite 340
 Beaverton, OR 97005
 (503) 643-4539
 cost: \$125

A Comparison of Execution Times for Selected Implementations of LISP

		Tak	TakI	Iterative Div2	Recursive Div2	Derivative
MacScheme		0:01:09.33	0:09:58.11	0:01:03.13	0:02:25.83	0:04:03.22
XLISP on Mac*		0:10:50.00	1:34:20.00	-	0:19:15.00	0:19:10.00
XLISP on PC		0:45:24.81	5:32:37.79	1:25:29.69	1:56:21.98	0:58:59.29
PC-Franz LISP on PC		0:43:58.68	2:06:23.51	1:40:38.93	0:37:04.98	0:29:11.08
TI Scheme on PC		0:00:54.98	0:05:30.50	0:01:57.21	0:04:19.14	0:06:24.87
TI Scheme on AT		0:00:19.38	0:01:55.51	0:00:39.60	0:01:29.59	0:02:10.83
VAX LISP Compiled	run	0:00:01.41	0:00:10.24	0:00:02.90	0:00:04.26	0:00:15.90
	real	0:00:01.46	0:00:11.20	0:00:03.35	0:00:04.57	0:00:20.70

Figure 1: Execution times of benchmark tests
 (hours:minutesseconds.hundreths)

* XLISP on the Macintosh benchmarks supplied by Semantic Microsystems

The Tak and TakI functions (variants of the Takeuchi function) as well as the division by two and the derivative benchmarks are often used LISP benchmarks. A discussion of these tests as well as Common LISP code for the benchmarks can be found in *Performance and Evaluation of LISP Systems* by Richard P. Gabriel. All timings include time used in garbage collection.

Prolog

Prolog is a logic programming language developed in 1972 at the University of Marseille. Prolog is used in artificial intelligence applications such as natural language processing and expert systems development.

Quintus Prolog on the VAX: This is considered one of the best implementations of Prolog. It features an EMACS editor (Unipress version), a debugger, and an on-line help system and manual. It offers a high degree of compatibility with DEC10 Prolog, Prolog-20 and CProlog. To enter Prolog with EMACS type `prolog +`. Notice that there is a space between the word *prolog* and the `+`. To enter Prolog without EMACS, type `prolog`. To gain access to the on-line manual type `manual.` (note the period) at the main Prolog prompt. To exit Prolog with EMACS type `[Escape] Ctrl-C`. To exit Prolog type `Ctrl-z`.

Waterloo UNIX Prolog on the ENCORE: Wup is a Prolog programming environment from the Logic Programming Group at the University of Waterloo. To use Waterloo Prolog, type `wup`. Among wup's features are an on-line help facility, debugging aids, and the ability to compile, edit, and load modules within the system. Typing `man wup` gives details on the use of the wup system. Type `quit;` to exit wup.

Prolog on Microcomputers: A public domain version of Prolog is available for MS-DOS microcomputers including IBM-PC compatibles. Individuals may obtain copies of this software from the ACSS Special Projects Group at no cost other than providing a blank, formatted disk.

OPS5

OPS5 is a general purpose, rule-based language typically used to build expert systems. It supports forward and backward chaining and a quite powerful pattern-matching capability. Although it has some debugging aids, OPS5 lacks the sophisticated programming environment found in other systems.

OPS5 on the VAX: OPS5, with compiler and run-time system, on the VAX/VMS (VX) system is an extended implementation of the OPS5 language. To invoke one of the VAX/VMS editors, type `EDIT[/editor]filename.ops`. Then, to compile the format, type `OPS5[/qualifier...],...` Refer to the *VAX OPS5 User's Guide* for more information on the run-time system and the compiler. Also, help is available on line by typing `help OPS5`. A good introduction to OPS5 is

Brownston, Lee. *Programming Expert Systems is OPS5*. Reading, Massachusetts: Addison-Wesley, 1985.

The ACSS Computing Information Center, 128A Lind Hall, has a copy of this book.

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 the next meeting, contact the Special Projects Group. TCSIGART is not affiliated with ACSS.

REFERENCES

Abelson, Harold, and Gerald Sussman. *Structure and Interpretation of Computer Programs*. Cambridge: The MIT Press, 1985. This is a challenging and valuable introduction to programming using the Scheme dialect of LISP.

Clocksin, William F., and Christopher F. Mellish. *Programming in Prolog*. Berlin: Springer-Verlag, 1984. This is the standard reference for Prolog.

Friedman, Daniel P., and Matthias Felleisen. *The Little LISPer*. Chicago: Science Research Associates, 1986. This is an introductory-level text to teach LISP concepts that deal with how to think recursively. It uses Scheme in the examples; the differences between Scheme and Common LISP are described in footnotes. Good for the absolute beginner.

Sterling, Leon, and Ehud Shapiro. *The Art of Prolog*. Cambridge: The MIT Press, 1986. This is a graduate-level textbook on Prolog and is rapidly gaining a reputation as the best of its kind.

Winston, Patrick, and Berthold Horn. *LISP*. Reading, Massachusetts: Addison-Wesley, 1984. Using the Common LISP dialect, Winston and Horn provide an excellent introduction to LISP with the examples gradually increasing in complexity.

Central Configuration Diagram

ACSS's configuration diagram, illustrates the present ACSS *central configuration*, mainframe computers with attached disk storage and communication devices. (Although not shown on this diagram, each ACSS central system also has 9-track, dual 1600 and 6250 density magnetic tape units for user files and disk storage backup.) Note that each ACSS system provides research, instructional, and public service computing.

The **Key** in the upper right of the diagram explains the content of the four large rectangles representing four mainframe systems: the two CYBER systems, the VAX 8600, and the ENCORE Multimax system. Briefly, each system rectangle contains the following information:

At the bottom center, in bold type, is a two-letter **mnemonic ID**. These mnemonics — NV, CA, VX, and UX — are commonly used to refer to each system.

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. Reading the diagram from the left:

- NV, managed by ACSS for IT, emphasizes CAD/CAM (Computer-Aided Design and Manufacturing) NOS/VE service for University research and instructional use 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 (PPUs)** is given. PPU's are auxiliary computers on CYBERs that perform input/output and "bookkeeping" operations besides job control flow.

To the *right*, 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 *bottom* figure on the right gives the size of each system's central (or main) **memory** in millions of units — megacharacters or megabytes as appropriate for each system.

Other parts of the diagram represent devices attached to ACSS's central mainframes. The *circles* above the system rectangles represent disk storage and paths attached to each system. The disk capacity is given in megacharacters or megabytes as appropriate. The rounded rectangles describe input/output servers for the entire complex.

The *smaller rectangles* under the system rectangles represent **communication 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 of the manufacturer's name for the device. Each of these communication devices is connected to the ACSS-net network of TELLABs multiplexers that interconnect all of ACSS's campus public labs and other Information System's computer centers. In addition, each communication device is connected to a separate dial-in rotary on the University's digital Intecom IBX phone system. Finally, there is the IBX LANmark Ethernet connection for TCP/IP and DECNET high-speed protocols.

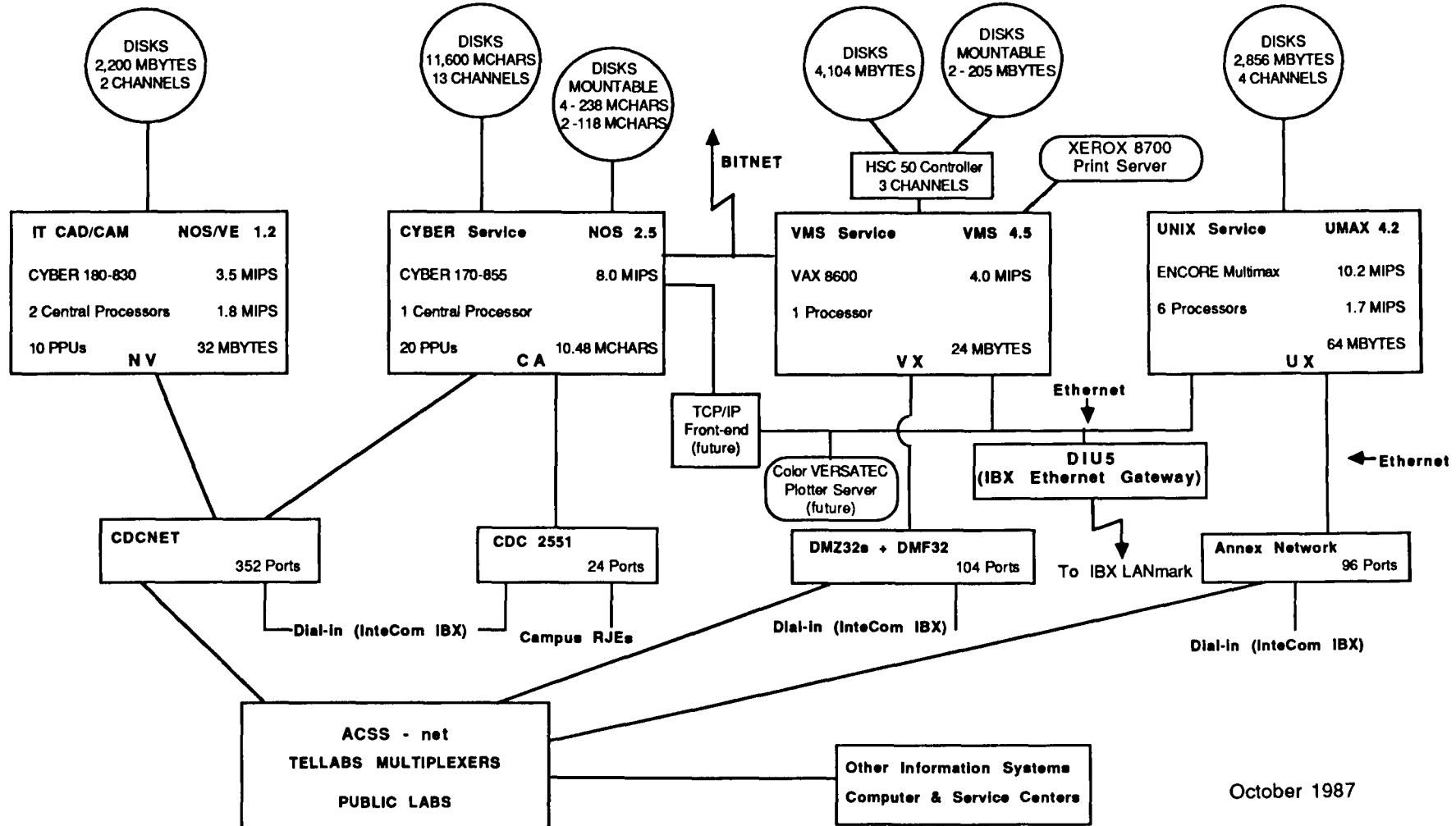
Other communication features in the diagram include the **TCP/IP** front-end service that interconnects CA (**future**), VX, and UX, and permits electronic mail and file transfer from one system to another. Connection to the national BITNET network is shown by the communication arrow extending from the CA and VX systems.

ACSS Central Configuration

Academic Computing Services and Systems
University of Minnesota

KEY

SERVICE	OPERATING SYSTEM + LEVEL
SYSTEM MODEL NUMBER	TOTAL MIPS FOR SYSTEM
NUMBER OF PROCESSORS	MIPS FOR SINGLE PROCESSOR
OTHER	MEMORY IN MILLION UNITS
MNEMONIC ID	



ADDITIONAL DOCUMENTS

All the documents are available for review in the Computing Information Center. Systems refer to—CA: CYBER/NOS; NV: CYBER/VE; UX: ENCORE/UNIX; VX: VAX/VMS.
The staff in the Computing Information Center can also assist you in placing orders for documentation from vendors.

LOCATION SYSTEM TITLE

Basic Guides

CIC	All	BRIEF: ACSS Central Configuration Diagram
CIC	CA,UX,VX	BRIEF: Artificial Intelligence Services
CIC	All	BRIEF: Computing Facilities Map, Twin Cities
CIC	All	BRIEF: Computing Information Center
CIC	All	BRIEF: Consulting Schedule
CIC	CA	BRIEF: CYBER/NOS Access
CIC	NV	BRIEF: CYBER NOS/VE Access
CIC	UX	BRIEF: ENCORE/UNIX Access
CIC	CA	BRIEF: EXPLAIN Information
CIC	CA	BRIEF: Full Screen Editor (FSE)
CIC	CA,VX	BRIEF: Liberal Arts Computing
CIC	CA,UX,VX	BRIEF: Mathematics, Engineering, and Statistics Software
CIC	All	BRIEF: Phone Numbers
CIC	All	BRIEF: Short Course Schedule
CIC	CAN,LX,VX	BRIEF: Software
CIC	UX	BRIEF: UNIX Software
CIC	CA	BRIEF: Using Mail on the CYBER CA
CIC	UX	BRIEF: Using Mail on the ENCORE UX
CIC	VX	BRIEF: VAX/VMS Access
CIC	CA	BRIEF: CA WRITEUP Information
CIC	VX	BRIEF: VX WRITEUP Information
CIC	All	ACSS Newsletter
Bookstores	CA	A Guide to Using CYBER NOS Magnetic Tapes

Operating Systems

Vendor,CIC	UX	ENCORE UNIX Documentation
Bookstores	CA	Introduction to CYBER NOS Computing
Vendor,CIC	NV	Introduction to NOS/VE: Tutorial
Vendor,CIC	VX	Introduction to VAX/VMS
Vendor,CIC	CA	NOS Version 2 Reference Set (Vols. 1-4)
Vendor,CIC	NV	SCL for NOS/VE: Quick Reference (2 vols.)
Bookstores	UX	UNIX: Beginner's Guide and Beginner's Reference
Bookstores	UX	UNIX: Programmer's Guide and Programmer's Reference
Vendor,CIC	VX	VAX/VMS Reference Set
On-lineVX	VX	VMS2CAI

Language Processors

Vendor,CIC	CA,VX	COBOL Reference Manuals
Vendor,CIC	CA,NV,UX,VX	Fortran Reference Manuals
Vendor,CIC	CA,UX,VX	LISP Reference Manuals
Bookstores	CA	M77 Reference Manual
WRITEUPCA	CA	Pascal

Data Base Systems

Vendor,CIC	VX	INGRES User's Manual
Vendor,CIC	CA,VX	SIR, Scientific Information Retrieval User's Manual
Vendor,CIC	VX	System 2000 User's Guide

LOCATION SYSTEM TITLE

Graphics Programs

Vendor,WVX	VX	Contouring System User's Guide
Vendor,WCA/WVX	VX	DISSPLA User's Manual, Pocket Guide
Vendor,WVX	CA,VX	DI-3000 User's Guide, Quick Reference Guide
Vendor,WVX	VX	GRAFMAKER User's Guide
Vendor,WVX	VX	Metafile Translator User's Guide
Vendor,WVX	VX	PicSure User's Guide
Vendor,WCA/WVX	VX	TELL-A-GRAF User's Manual, Pocket Guide

Text Processors

Vendor,CIC	VX	EDT Editor Manual
On-lineVX	VX	EDT2CAI
WRITEUPCA	CA	GENCORD
Vendor,CIC	VX	Guide to Text Processing on VAX/VMS
Bookstores,CIC	VX	LaTEX, A Document Preparation System
Vendor,CIC	CA,NV	NOS Full Screen Editor User's Guide
Bookstores	CA	PROSE Instruction Manual
Bookstores	VX	SCRIBE at ACSS
Vendor,CIC	VX	SCRIBE User Manual, User Manual Supplement Version 5
Bookstores,CIC	VX	The TEXbook
Bookstores	VX	Theses in Scribe
Bookstores	UX	UNIX: Text Processing
Bookstores	CA	XEDIT User's Guide
CIC	CA	XEDIT 3.1 Summary

Statistical Packages

Bookstores,WCA	CA	BMDP85 Statistical Software
Bookstores	CA,VX	Guide to Applications Packages: Statistics
Bookstores,CIC	CA,VX	MINITAB Handbook
Vendor,CIC,	VX	MINITAB 5.1 Reference Manual
Bookstores,WCA	CA	MINITAB 82 Reference Manual
Vendor,CIC	UX	S: An Interactive Environment for Data Analysis
Vendor,CIC	VX	SAS User's Guide: Basics
WRITEUPVX	VX	ACSS\$WRITEUP-SAS
Bookstores,CIC	CA	SPSS Second Edition
Bookstores,CIC	CA,VX	SPSS Update 7-9
Bookstores,CIC	CA,VX	SPSSX Basics
Bookstores,CIC	CA,VX	SPSSX User's Guide

Math/Engineering Packages

Bookstores	CA,VX	Guide to Applications Packages: Math and Engineering
Bookstores	CA,VX	Guide to Subprogram Libraries
WRITEUPCA,CIC	CA,NV,VX	IMSL
WRITEUPCA	CA	MATHPAC
WRITEUPCA	CA,NV	MINNLIB

IF YOU HAVE:

THEN YOU SHOULD BEGIN WITH THESE DOCUMENTS:

NEVER USED A COMPUTER BEFORE



General Information	Document Locations*
ACSS Briefs**: CYBER/NOS Access CYBER/VE Access ENCORE/UNIX Access VAX/VMS Access Computing Information Center CA WRITEUP Information VX WRITEUP Information EXPLAIN Information Introduction to CYBER NOS Computing Introduction to UNIX Computing VAX/VMS User's Introduction WRITEUP, CLASSES	CIC Bookstores Bookstores Bookstores WRITEUPCA

and continue with

USED A COMPUTER, BUT NOT AT ACSS



NOS Introduction to CYBER NOS Computing and other NOS Operating System Ref. Documents A Guide to Using CYBER NOS Magnetic Tapes	Bookstores Vendor,CIC Bookstores
NOS/VE Introduction to NOS/VE: Tutorial and other NOS/VE Operating System Ref. Documents	Vendor,CIC Vendor,CIC
UNIX Getting Started with UMAX 4.2 UNIX Beginner's Guide Introduction to UNIX Computing and other UNIX Operating System Ref. Documents	Vendor,CIC Bookstores Bookstores Bookstores,Vendor,CIC
VMS VAX/VMS User's Introduction Introduction to VAX/VMS and other VMS Operating System Ref. Documents	Vendor,CIC Vendor,CIC Vendor,CIC
All ACSS Newsletter** Guide to Applications Packages: Math and Engineering Guide to Subprogram Libraries WRITEUP,CLASSES WRITEUP,SERVICE	CIC Bookstores Bookstores WRITEUPCA WRITEUPCA

and continue with

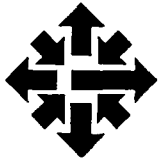
USED ACSS'S SYSTEMS AND JUST NEED A REFRESHER



NOS Introduction to CYBER NOS Computing	Bookstores
NOS/VE Introduction to NOS/VE: Tutorial	Vendor,CIC
UNIX Getting Started with UMAX 4.2	Vendor,CIC
VMS Introduction to VAX/VMS	Vendor,CIC
ALL ACSS Newsletter** Guide to Applications Packages: Math and Engineering Compiler Manuals WRITEUPS (CA,VX) and EXPLAIN (CA) HELP and MOREHELP (VX)	CIC Bookstores Vendors,CIC System command System command

*Location Codes: Bookstores = H. D. Smith Bookstore (West Bank); Minnesota Book Center, Williamson Hall (East Bank)
 CIC= ACSS Computing Information Center, 128A Lind Hall, 625-7397
 WRITEUPCA/WCA= machine-retrievable information through the WRITEUP command on the CYBER CA.
 WRITEUPVX/WVX= machine-retrievable information through the TYPE ACSS\$WRITEUP:name command on the VAX VX
 On-lineVX= on-line training packages on the VAX VX through RUN SOFTWARE NAME command

**Available in the Computing Information Center free of charge



ACSS Brief

Computing Information Center

The ACSS Computing Information Center (formerly the Reference Room), 128A Lind Hall, supports ACSS general consulting services in 128C Lind with a complete set of documentation for the hardware, software, and applications packages that ACSS provides. The collection is available to the University community on a *non-circulating* basis.

Complete Documentation Collection: The Computing Information Center holds complete sets of reference manuals for the various operating systems (NOS for the CYBERs, VMS for the VAX 8600, and UNIX for the ENCORE). Programming language reference manuals for the various compilers (FORTRAN, COBOL, Ada, Pascal) also are available. The collection contains documentation for all publicly available application packages on ACSS's systems including the following areas:

Statistics: BMDP, SAS, and SPSS

Data Bases: INGRES, SIR, and System 2000

Graphics: Precision Visuals software, DI-3000, DISSPLA, and TELLAGRAF

This is only a small sampling of the many products, for which there is documentation, available to ACSS users. A small supporting collection of computer-related books, technical reports, and periodicals is also maintained.

Data Base Catalog: This data base contains entries for all of the Computing Information Center's holdings and is maintained by the reference librarian. Printed catalogs are produced regularly, and custom searches of the data base can be performed.

Free Documentation: The Computing Information Center is a distribution point for *Briefs*, free ACSS documentation that describes ACSS's services and systems in more detail and explains basic procedures on the system. *Briefs* of general interest include:

ACSS Central Configuration Diagram
Computing Facilities Map, Twin Cities Campus
Computing Information Center
Consulting Schedule: Hours, locations, and phone numbers
Documentation Directory
EXPLAIN Information
Full Screen Editor (FSE)
Getting Started at ACSS
Liberal Arts Computing
Math and Statistics Routines
NEC Spinwriter Typewheels
Phone Numbers
Short Course Schedule
Software
Using MAIL on the CYBERs
VAX/VMS Access
WRITEUP Information
XEDIT 3.1 Reference Summary
Xerox 8700 Fonts Available with Scribe

Assistance in Ordering Vendor-Published Documentation: Documents and manuals printed by computer vendors, such as Control Data Corporation and Digital Equipment Corporation, are sometimes not available at University bookstores and need to be ordered from the company, or vendor, that publishes the manual. Staff at the Computing Information Center can provide information on how to place an order.

Computing Account and Grant Applications: With the ACSS administrative and accounting groups located at the Lauderdale facility, people seeking applications for computer accounts and research grants should now call or visit the Computing Information Center to obtain the appropriate forms.

Short Course Enrollment: The Computing Information Center is the place to register for the short courses taught by ACSS staff. Each quarter a number of informal classes for microcomputers and mainframes are offered. Call the Center for a schedule or more information on the short courses being offered during the current quarter.

Computing Newsletters: The mailing list data base for the *ACSS Newsletter* is maintained at the Computing Information Center. If you want a free subscription, call or write the Center at the number or address listed below. Subscriptions for the *ACSS Microcomputer Newsletter* are also accepted. And, if you're curious about computing activities at other academic institutions, both domestic and foreign, note the collection of newsletters from 90 other centers on file. Back issues of the *ACSS Newsletter* are kept on file as are the current issues of the *ACSS Newsletter* and the *ACSS Microcomputer Newsletter*.

The Computing Information Center is open from 8 am to 4:30 pm, Monday through Friday. The telephone number is 625-7397, and the address is

ACSS Computing Information Center
128A Lind Hall
University of Minnesota
207 Church St SE
Minneapolis, MN 55455

ACSS Brief

General Information

Academic Computing Services and Systems • University of Minnesota • Twin Cities

Computing Information Center

The ACSS Computing Information Center (CIC) provides documentation services for the hardware, software, and applications packages that are available for ACSS mainframe computer systems. In addition, the CIC provides other services for both ACSS potential and current users.

The Computing Information Center is open from 8 am to 4:30 pm, Monday through Friday. Users wanting to contact the CIC by using electronic mail on a mainframe computer system should use either of the following BITNET addresses:

On the CA system: YZE6075@UMNACCA

On the VX system: MAD@UMNACVX

The Computing Information Center's telephone number is 625-7397; the federal mailing address is

ACSS Computing Information Center
128A Lind Hall
University of Minnesota
207 Church St SE
Minneapolis, MN 55455

The campus mailing address is

ACSS Computing Information Center
128A Lind Hall

Documentation Services

The Computing Information Center supports ACSS general consulting services in 128C Lind by maintaining a complete set of documentation for the hardware, software, and applications packages that ACSS provides for its mainframe computers. The Computing Information Center also serves as a distribution point for free documentation published by ACSS and gives assistance to users who want to order personal copies of vendor-published documentation.

CIC's Documentation. Complete sets of reference manuals for the various operating systems (NOS 2 for the CYBER CA, NOS/VE for the CYBER NV, VMS for the VAX 8600, and UNIX for the ENCORE) are available. Programming language reference manuals for the various compilers (Fortran, COBOL, Ada, Pascal) also are available. The collection contains documentation for all publicly available application packages on ACSS's systems, including documentation in the following areas:

Statistics: BMDP, SAS, and SPSS

Data Bases: INGRES, SIR, and System 2000

Graphics: Precision Visuals software, DISSPLA, and TELLAGRAF

Users curious about computing activities at other academic institutions, both domestic and foreign, can find a collection of newsletters from 90 other centers on file. Back issues of the *ACSS Newsletter* are kept on file as are the current issues of the *ACSS Newsletter* and the *ACSS Microcomputer Newsletter*.

The collection is available to the University community on a *non-circulating* basis. Users can examine the collection in 128C Lind Hall.

Free Documentation. The Computing Information Center is a distribution point for free documentation (Briefs, maps, and brochures) that describes ACSS's services and systems in more detail. Some of the free documentation available at Lind Hall are

Brochure

XEDIT 3.1 Reference Summary

CA Mainframe System Briefs

CYBER/NOS Access

EXPLAIN Information

Using the CA System Full Screen Editor (FSE)

Using MAIL on the CA System

WRITEUP Information

Map

Computing Facilities Map

UX Mainframe System Briefs

ENCORE/UNIX Access

UNIX Software

Using MAIL on the UX System

VX Mainframe System Briefs

VAX/VMS Access

General Information Briefs

ACSS Central Configuration

Artificial Intelligence Services

Computing Information Center

Consulting Schedule

Documentation Directory

Getting Started at ACSS

Graphics Packages

Liberal Arts Computing

Mathematics, Engineering, and Statistics Software

Phone Numbers

Short Course Schedule

Software

Tools for Administrators

Xerox 8700 Fonts Available with Scribe

Vendor-Published Documentation. Documents and manuals printed by computer companies, such as Control Data Corporation and Digital Equipment Corporation, are sometimes not available at University bookstores and need to be ordered from the company, or vendor, that publishes the material. Staff at the Computing Information Center can provide information on how to place an order.

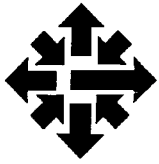
Other Services

Because the ACSS administrative and accounting groups are located off campus at the Lauderdale Computing Facility, the Computing Information Center also serves as the ACSS on-campus contact point so that users can pick up computing account and grant application forms, enroll for short courses offered by ACSS, and subscribe to newsletters published by ACSS.

Computing Account and Grant Applications. Users seeking applications for computer accounts and research grants should call or visit the Computing Information Center to obtain the appropriate forms.

Short Course Enrollment. The Computing Information Center is the place to register for the short courses taught by ACSS staff. Each quarter a number of informal classes about microcomputers and mainframe computers are offered. The CIC has a schedule and more information on the short courses being offered during the current quarter.

Computing Newsletters. The mailing list data base for the *ACSS Newsletter* is maintained at the Computing Information Center. Users wanting a free subscription should call or write the Computing Information Center at the telephone number or address listed at the beginning of this Brief. Subscriptions for the *ACSS Microcomputer Newsletter* are also accepted.



ACSS Brief

CYBER/NOS Access

Academic Computing Services and Systems (ACSS) operates two Control Data Corporation (CDC) CYBER mainframe computers. The system CA CYBER provides interactive and batch computing services for research and interactive computing services for instructional use; the system MD CYBER provides interactive computer-aided design services for instructional use.

This *Brief* presents basic information about using the CA or MD system for the first time and then discusses other sources that provide additional information about using the system.

GETTING AN ACCOUNT

To use ACSS's CA system you first need to apply for a NOS user name. To obtain an application, either call the ACSS Accounting Office (625-1511) or pick up a form at the ACSS Computing Information Center in 128A Lind Hall.

Faculty members interested in using the CYBERs for instructional computing should contact the instructional services coordinator at 626-1085 if they have questions regarding the administration of classroom accounts.

ACCESSING THE CYBER SYSTEM

You can access ACSS's CYBER systems from your home or office by *dialing up*, (using a telephone to call the computer), and using one of the following:

- a terminal and modem
- a microcomputer that has a modem and communications software
- either a terminal or a microcomputer with communications software that is attached to a University integrated telephone equipment unit (ITE) equipped with a data option board

You also can use a terminal or microcomputer in one of ACSS's public labs to access ACSS's CYBER systems. For a listing of computing facilities on the Twin Cities campus and their locations and equipment, refer to the Informations Systems map, available at the ACSS Computing Information Center, 128A Lind Hall.

Dialing up from your home or office. Turn on the terminal or microcomputer. If you are using a microcomputer, load the communications software.

Set the terminal or the microcomputer software to FULL DUPLEX (or FULL ECHOPLEX) and EVEN PARITY. The CYBER also requires 7-bit ASCII and 1-bit stop settings. (The CYBER should never be used at half duplex.) On microcomputer communications software, set "handshaking" to XON/XOFF. If you need assistance in setting up your microcomputer, call the Microcomputer HELP-Line (626-4276).

Dial 626-1620 to access the CA system or 626-1622 to access the MD system. These numbers are *autobaud*, which means that they adjust to the speed of the phone connection. The CYBER will answer with a high-pitched "eeeeeeee" sound.

- If the modem has a coupler for the telephone handset (usually 300 baud or 30 characters per second), place the handset into the modem's cups.
- If the modem is a dataset (usually 1200 baud or 120 characters per second), press the button and put the telephone handset back in its cradle.
- If the microcomputer or terminal is attached to one of the University's ITE phones (up to 9600 baud or 960 characters per second), hit the carriage return once.

When the terminal or microcomputer is connected to the CYBER, you can log on.

Using Public Labs. The terminals located in campus public labs are "hardwired" to ACSS-net, a campus network allowing selection of various mainframe computers. Instead of dialing a phone number, turn on the terminal (the switch is located on the back of the terminal in the lower left corner) and press the **RETURN** key. The network responds with

```
ACSS-net (CA,MD,VX,UX,IB,HS) ?
```

This message on the screen is the system prompt from ACSS-net. Respond by typing **CA** or **MD** and pressing the **RETURN** key. The system responds with

```
Copyright Control Data Corporation, 1985

DI System Name is 08002530015D, TDI2
Terminal Name is 710000, $CONSOLE_30015D_710000
You may enter CDCNET commands.

Connection TO_CA created.
```

You are now connected to the CYBER and can log on.

LOGGING ON

You follow roughly the same procedure when logging on the CA and MD systems. The following example assumes you are logging on the CA.

After you connect to the CA system by dialing up from your home or office or using the terminals in campus labs, the following information appears on the screen:

```
WELCOME TO THE NOS SOFTWARE SYSTEM.
COPYRIGHT CONTROL DATA 1978, 1985.

87/01/23. 07.25.07. T040303
UOFM CYBER-CA (BC). NOS 2.4.3-647/642.
FAMILY:
```

In response to the NOS prompt for **FAMILY**: press the **RETURN** key. The system then responds with

```
USER NAME:
```

Type the user name given to you by the ACSS Accounting Office and then press **RETURN**. (For security, the user name is not displayed.) NOS responds with

```
PASSWORD:
```

Type the password given to you by the Accounting Office and then press **RETURN**. (The password is not displayed.)

If all goes well, NOS responds with

```
JSN: AALB, NAMIAF
/
```

The four-letter code (**AALB**) after **JSN**: is the job sequence name, a code assigned by the operating system allowing you to recover your session if you are unintentionally logged off. The **/** is the NOS operating system prompt. The NOS operating system is now waiting for commands.

If all does not go well, NOS responds with either

```
IMPROPER LOGIN, TRY AGAIN
```

or

```
ACCOUNT CLOSED.
```

Analyze what you did wrong. Did you press the **RETURN** key after the **FAMILY :** prompt? Did you type the correct user name? The correct password? To try again, just press the **RETURN** key until NOS again prompts you for your user name. Proceed as before. The operating system gives you four attempts and then responds with

```
RETRY LIMIT
LOGIN TERMINATED
```

If you cannot log on, contact the ACSS HELP-Line (626-5592). For more information about how to log on, error messages, and recovering jobs, consult the ACSS publication *An Introduction to CYBER Computing*, available at University bookstores.

CHANGING PASSWORDS

NOS requires that passwords be from four to seven characters long. New user names have an assigned initial password that should be changed as soon as possible. To change your password type:

```
PASSWOR
```

The system responds by asking you to type the old password and then the new password. Then the system requests verification of the new password by having you type the new password a second time. If all goes well, the systems responds with

```
UPDATE COMPLETE.
```

If you forget your password or mistype it when changing it, call the HELP-Line (626-5592).

LOGGING OFF

To log off NOS, type **bye**. NOS responds with:

```
UN=YZE6082 LOG OFF 07.25.31.
JSN=AALB SRU-S= 0.174
CHARACTERS= 0.048KCHS
IAF CONNECT TIME 00.00.11.
LOGGED OUT.
```

```
You may enter CDCNET commands
ready
```

```
ACSS-net (CA,MD,VX,UX,IB,HS) ?
```

If you do not use the terminal for ten minutes, NOS ends or "times out" terminal sessions. A warning beep sounds thirty seconds before the terminal connection is broken. For information on how to recover a session that has been timed out, refer to *An Introduction to CYBER Computing*, which can be purchased at University bookstores.

SPECIAL KEYS

When you use the NOS system, certain terminal keys and key combinations signal special situations. Some of the most common are the following:

- To back up to correct a typing error, press the **BACKSPACE** key
- To make scrolling output on the screen pause and then resume scrolling, press **CTRL-S** to pause and then **CTRL-Q** to resume
- To cancel or "bail out" of any facility or terminate a program, press **CTRL-Y**

For more information about using other special keys, refer to the on-line documentation **WRITEUP,CDCNET**.

ON-LINE DOCUMENTATION

Three utilities provide information about using NOS on-line documentation.

EXPLAIN is a NOS 2 utility that provides information on how to read on-line manuals and documentation. The best way to learn about EXPLAIN is to type the command `explain` during an interactive session. The system promptly shows you an on-line document that tells you how to use the utility.

Within EXPLAIN is the on-line manual **COMMAND**, which documents all NOS 2 commands, as well as ACSS's adaptations to the NOS 2 system. **COMMAND** is the most important on-line manual available to you in the NOS 2 system. For more information on how to use the EXPLAIN utility, refer to the *ACSS Brief* titled *EXPLAIN Information*, available in the ACSS Computing Information Center, 128A Lind Hall.

HELPME provides information on building a command with many parameters. Type the command `HELPME` during an interactive session to learn how to use this utility.

HELPME first provides a description of the specified command and then prompts you for the parameters one by one. HELPME also provides an explanation for each parameter as you request it.

WRITEUP, a third utility, also provides information on NOS. In addition, other WRITEUPS are available that explain most aspects of using the CA and MD systems. To view the complete list, type `WRITEUP, INDEX`.

To learn how to use the WRITEUP utility, refer to the *ACSS Brief* titled *WRITEUP Information* or type the command `WRITEUP` while you are logged on.

WRITEUPS usually contain information on how you can obtain printed copies. Note that when you want to make a printed copy of a WRITEUP and want the copy to be in upper- and lowercase letters, you must use the `/PT=AS` parameter. Also note that you can direct the output to a local file with the `L=filename` parameter. (A long WRITEUP usually is usually not read at a terminal.) Then, `ROUTE` or `PRINT` a copy of the file to a printer or use the XEDIT editor to do key-word searches through the output file.

PRINTED DOCUMENTATION

Information on the NOS 2 operating system is principally available through the *NOS Version 2 Reference Set*, published by CDC. These manuals introduce the system and its basic concepts. You can review reference copies at the ACSS Computing Information Center, 128A Lind Hall, or you can purchase one directly from CDC. Staff in the Computing Information Center can provide you with information on how to order manuals from CDC or other vendors. You also can refer to ACSS's manual, *An Introduction to CYBER Computing*, which can be purchased at University bookstores.

CONSULTING

Consultants are available to answer questions in 128C Lind Hall. Type `WRITEUP, CONSKED` for details on this and other ACSS consulting services. The ACSS HELP-Line is open for phone questions from 8 am to 5 pm, Mondays through Fridays. Call 626-5592.

CLASSES

ACSS teaches short courses on NOS and its applications software each quarter and once during the summer. Pick up the current short course schedule at the ACSS Computing Information Center, 128A Lind Hall. For information about short courses call 625-7397.

ACSS Brief

NV Mainframe System

Academic Computing Services and Systems • University of Minnesota • Twin Cities

CYBER/VE Access

Academic Computing Services and Systems (ACSS) operates two Control Data Corporation (CDC) CYBER mainframe computers, the CA system and the NV system. The CA system, a CYBER using the NOS 2 operating system, provides interactive and batch computing services for research and interactive computing services for instructional use. The NV system, a CYBER using the NOS/VE operating system, provides interactive computer-aided design services for instructional use.

This Brief presents information about the NV system. Instructions for opening an account and using the system for the first time are given. The last section lists the resources and services that ACSS provides to give you additional information about using the NV system.

Refer to the ACSS Brief *CYBER/NOS Access* for information about the CA System.

Opening an Account

To use ACSS's NV system you first need to apply for a NOS/VE user name. To obtain an application, either call the ACSS Accounting Office (625-1511) or pick up a form at the ACSS Computing Information Center (CIC) in 128A Lind Hall.

If you are a faculty member interested in using the NV system for instructional computing, you should contact the instructional computing consultant at 626-0200.

Using the NV System

This section provides basic information about accessing the NV system, logging in to the the system, changing your password, using special keys, and logging out of the system.

Accessing the NV System. You can access the NV system from your home or office by *dialing up* (using a telephone to "call" or connect to the computer), and using one of the following:

- a terminal and modem
- a microcomputer that has a modem and communications software
- either a terminal or a microcomputer with communications software that is attached to a University integrated telephone equipment unit (ITE) equipped with a data option board

You also can use a terminal or microcomputer in one of ACSS's public labs to access the NV system. For a listing of computing facilities on the Twin Cities campus and their locations and equipment, you should refer to the *Information Systems Computing Facilities* map, available at the Computing Information Center, 128A Lind Hall.

Accessing the NV system from your home or office. Turn on the terminal or microcomputer. If you are using a microcomputer, load the communications software.

Set the terminal or the microcomputer software to FULL DUPLEX (or FULL ECHOPLEX) and EVEN PARITY. The NV also requires 7-bit ASCII and 1-bit stop settings. (The NV system should never be used at half duplex.) On microcomputer communications software, set "handshaking" to XON/XOFF. If you need assistance in setting up your microcomputer, call the Microcomputer HELP-Line (626-4276).

Dial 626-1622 to access the NV system. This number is *autobaud*, which means that it adjusts to the speed of the telephone connection. The NV system will answer with a high-pitched "eeeeeeee" sound.

- If the modem has a coupler for the telephone handset (usually 300 baud or 30 characters per second), place the handset into the modem's cups.
- If the modem is a dataset (usually 1200 baud or 120 characters per second), press the button and put the telephone handset back in its cradle.
- If the microcomputer or terminal is attached to one of the University's ITE phones (up to 9600 baud or 960 characters per second), hit the carriage return once.

When the terminal or microcomputer is connected to the NV system, you can log in.

Accessing the NV system by using a public lab The terminals located in campus public labs are "hardwired" to ACSS-net, a campus network that allows you to select and work on any of several mainframe computers. Instead of dialing a phone number, turn on the terminal (the switch is usually located on the back of the terminal in the lower left corner) and press the RETURN key. The network responds with

```
ACSS-net (CA,NV,VX,UX,IB,HS) ?
```

This message is the system prompt from ACSS-net. Respond by typing NV and pressing the RETURN key. (The nv code you type in will typically not appear on your screen.) The system responds with

```
connected
```

You are now connected to the NV system and can proceed to log in.

Logging In. The following example shows you how to log in to the NV system.

After you connect to the NV system by dialing up from your home or office or using the terminals in campus labs, the following information appears on your screen:

```
Enter validation for service access.  
User:
```

In response to the NOS/VE prompt for User: type in the user name you received from our Accounting Office and press the RETURN key. The system then responds with

```
Password:
```

Type the password given to you by the ACSS Accounting Office and then press RETURN. (For security, the password is not displayed on your terminal screen.) The NV responds with

```
Family:
```

In response to this, simply press RETURN.

If all goes well, the NV responds with its Welcome message:

```
Enter validation for service access.  
User: user name  
Password: password  
Family: <CR>
```


Welcome to the NOS/VE Software System.
Copyright Control Data 1983, 1987.
CYBER 830 Class SN244,244. NOS/VE 1.2.2 L678
Current date. Current time.

IT/ACSS NOS/VE Normal production time.

The / is the NOS/VE operating system prompt. The NOS/VE operating system is now waiting for commands.

At the User: prompt, you can, if you like, type in both your user name and password. In this case, the Family: prompt won't appear.

If all does not go well, NOS/VE responds with

```
Error: Incorrect user validation information.  
Incorrect validation entered.  
Please try again.
```

The system then prompts you for your user name again.

Analyze what you did wrong. Did you type the correct user name? The correct password? Did you press the RETURN key after the FAMILY: prompt? To try again, just press the RETURN key until the NV again prompts you for your user name. Proceed as before. The operating system gives you three attempts and then responds with

```
No more retries allowed. Connection rejected.
```

At this point, you can press RETURN again once or twice. The ACSS-net prompt will appear again. Go through the logging in process as before: Type nv, wait for the prompts, and then type in your user name and password. If, after trying repeatedly, you cannot log in, contact the ACSS HELP-Line (626-5592).

Changing the Password. NOS/VE permits passwords be from 1 to 31 characters long, but we recommend passwords of from 4 to 8 characters, any combination of letters and numbers.

New user names are assigned a beginning password that you should change as soon as possible. (Create a new password that is easy to remember, not a string a random characters. Also, don't use a password that is easy to guess, like your first or last name or your initials.) To change your password, type:

```
SET_PASSWORD
```

The system will respond by asking you to type your old password, then your new password.

You can also abbreviate the SET_PASSWORD command as SETPW. If you forget your password or mistype it when changing it, call the HELP-Line (626-5592).

Using Special Keys. When you use the NV system, certain terminal keys and key combinations perform special functions. Some of the most common are the following:

- To back up to correct a typing error, press the BACKSPACE key.
- To make scrolling output on your screen pause and then resume scrolling, press CTRL-S to pause and then CTRL-Q to resume.
- To cancel or "bail out" of any facility or terminate a program, press CTRL-Y.

A CTRL command requires that you keep the CONTROL (or CTRL) key on your terminal pressed down while typing a letter key. No hyphen is necessary.

Logging Out. Type `logout` to log out of the NV system. NV responds with:

```
Logout at: today's date      time you logged off
User = Your user name  SRUS = Number of system resource units you used
```

```
You may enter CDCNET commands
ready
```

```
ACSS-net (CA, NV, VX, UX, IB, HS) ?
```

Using ACSS Resources and Services

To help you use the NV system, ACSS provides many resources and services, such as on-line documentation, printed documentation, consulting services, and short courses.

On-Line Documentation. Three utilities provide information about using NOS/VE on-line documentation.

EXPLAIN is a NOS/VE utility that enables you to read on-line manuals and documentation. The best way to learn about **EXPLAIN** is to type the command `explain` during an interactive session. The system promptly shows you a screen that tells you how to use the utility.

Within **EXPLAIN** is the on-line manual **SCL**, which documents all NOS/VE commands. **SCL** is the most important on-line manual available to you in the NOS/VE system. For more information on how to use the **EXPLAIN** utility, refer to the *ACSS Brief NOS/VE On-line Documentation*, available in the ACSS CIC, 128A Lind Hall.

DISCI (short for `DISPLAY_COMMAND_INFORMATION`) provides brief information on command formats and parameters. Type the command `disci command` during an interactive session (replacing `command` with an actual command name). For more information on how to use the **DISCI** utility, refer to the *ACSS Brief NOS/VE On-line Documentation*.

WRITEUP, a utility added by ACSS, provides text files on ACSS software and services. To view the complete list of **WRITEUPS**, type `WRITEUP INDEX`. For more information on the **WRITEUP** utility see the *ACSS Brief NV WRITEUP Information*.

Printed Documentation. Information on the NOS/VE operating system is principally available through several CDC documents available for reference at the CIC, 128A Lind. These include the *Introduction to NOS/VE: Tutorial*, the *SCL for NOS/VE System Interface Usage* manual, and the two-volume *SCL for NOS/VE Quick Reference*. The first two are particularly helpful for beginners. Copies of these manuals are available for reference in the CIC.

You can also purchase these manuals directly from CDC. Staff in the CIC can provide you with information on how to order manuals from CDC or other vendors.

Also in the CIC are other free documents on using the CYBER NV and our other systems. See the ACSS Briefs *NOS/VE On-line Documentation*, *NV WRITEUP Information*, *Getting Output From the CYBER NV*, *Using the EDIT_FILE Editor*, *NOS/VE Command Format*, and *NOS/VE equivalents to NOS Commands*.

Consulting. Consultants are available to answer questions during posted hours in in 128C Lind Hall and 140 Blegen Hall. See our *Consulting Schedule*, available in the CIC, for details on this and other ACSS consulting services. The ACSS HELP-Line is open for phone questions from 8 am to 5 pm, Mondays through Fridays. Call 626-5592.

ACS Brief

Academic Computing Services • University of Minnesota • Twin Cities

General Information

DEC Systems Support from ACS

In past years, ACS has negotiated discount programs with Digital Equipment Corporation (DEC) on behalf of University DEC systems. The success of those programs is reflected in the growing number of VMS and Ultrix systems at the University. This ACS effort for DEC system users has expanded in several directions.

Discount programs include:

- software distribution and consulting support for the most commonly used VMS and Ultrix products in academic environments for a yearly membership fee (ESL).
- licenses at no charge for a large number of DEC products for educational VAX systems (CSLG).
- reduced costs for VMS software products that are not available through ESL (RTC).
- discounts of up to 50 percent for software licenses not available through the CSLG (Market Basket).

Discount grants are also available for hardware and documentation.

ACS provides phone consulting services for VMS and Ultrix users and technical support for VMS and Ultrix system management, coordinates DECnet networks, facilitates the coordination of DEC VMS and Ultrix managers groups and handles umbrella contracts for third-party software vendors. Discounts are currently available for hardware maintenance only under a third party master maintenance agreement through June 1990. ACS is investigating a DEC master maintenance agreement for FY91.

Short descriptions of the current DEC contracts and ACS support services for DEC systems follow.

Educational Software Library (ESL)

The Educational Software Library entitles University owners of VAX systems, ranging from workstations to central systems, to utilize a large number of VMS and Ultrix products for a yearly membership fee. This fee is less than the yearly maintenance costs of one or two software products alone. ACS handles the distribution of software to University sites that purchase an ESL contract. The products offered through ESL include VMS and Ultrix system software; DECnet and workstation windows; a large number of compilers such as Ada, Fortran, Pascal, C, Cobol, and Basic; VMS programming tools, the GKS graphics library, LISP, DATATRIEVE, etc.

ACS helps ESL members with questions related to system software installation and bug problems. Problems that can not be resolved by ACS personnel are referred to DEC.

A detailed description of the ESL program and a full list of the products that it includes can be found on the ACS ESL_Booklet publication. The ESL_Booklet is an on-line document on the ACS VX system. Individuals with accounts on that system can view or obtain a copy of the document using the ListDoc utility. Copies can also be obtained by calling User Services at 626-0200.

Campus-wide Software License Grant (CSLG)

This program grants "no charge" licenses for over 160 DEC products for educational VAX systems at the University and is the basic DEC software license mechanism. Eligibility for participation is based on the function of the system and meeting and reporting the conditions required by the contract.

It is desirable that systems using the ESL program to obtain software, also obtain a license from the CSLG plan. A full list of contract terms and the products that the CSLG plan covers is also included in the ESL_Booklet.

Right-To-Copy program (RTC)

The right-to-copy contract entitles managers of any University VMS system to obtain VMS software products at reduced costs by a shared approach across using systems.

Although the extensive ESL program covers most VAX software, there are a few products that University systems would need to "copy" from ACS. ACS acts as a coordinator for systems needing RTC arrangements for distribution. Once any University site obtains a given product not included in the ESL, other sites can benefit from shared maintenance costs. ACS can arrange the RTC contracts with DEC and handle the distribution of the media.

DEC's Educational Market Basket program

Systems that do not qualify for the ESL program or that require software not available on a Right-To-Copy basis can benefit from DEC's Educational Market Basket. This program offers software licenses for DEC systems to universities at up to 50 percent off the regular list prices.

Hardware and documentation discounts

Discount grants from DEC are available for hardware and documentation. Hardware acquisitions at discounted prices can be handled directly through the Purchasing Department of the University under special bids SP#105 for workstations and 3X00 servers and SP#106 for 6X00 servers. DEC documentation discounts are available through ACS .

ACS support

The ACS HELP-Line provides general support for VMS users. The ACS User Services offers free VMS training classes on a regular basis. ACS's VMS Group provides consulting services for new system owners to become acquainted with VMS and Ultrix management tasks. Special arrangements can be made for help with software installation and system maintenance on a regular basis. ACS handles umbrella contracts for third-party vendors of VMS products for all type of systems.

VMS and Ultrix Managers Groups

The University of Minnesota VMS Managers Group was formed several years ago and meets regularly every second Thursday of each month. It provides a forum for an exchange of technical expertise and references among the VMS user community. The group organizes seminars and invites special speakers to address VMS topics. It also entertains a VMS related on-line conference on the ACS VX system.

Currently, the group is expanding to provide a forum for Ultrix users.

Networks

Both, VMS and Ultrix systems can use DECnet and TCP/IP protocols on the University networks. Both protocols are provided by DEC for Ultrix. VMS systems include only DECnet, but versions of TCP/IP are available for VMS.

The University Telecommunications Department coordinates the TCP/IP networks. The ACS VMS Group coordinates DECnet at the University. Sites planning to run either of these protocols should contact Telecommunications and/or ACS for the assignment of address and tuning information. Not all types of network activity are recommended for the University wide network. Thus it is advisable that sites, planning to purchase computing systems to be networked, contact ACS or Telecommunications for additional information during the planning stages.

For more information

Please contact our User Services Consultant at 626-0200 for more information about these programs, or to make arrangements to help you to evaluate, purchase, or maintain your system.

are lines

ACS Brief

VX Central System

Academic Computing Services • University of Minnesota • Twin Cities

Editing Files with EDT

This is not a full description of EDT, but only a summary of some basic points. For fuller instruction on EDT, see the documentation and on-line training software described at the end of this document.

Entering EDT and Creating a File

After you have logged on to VX, you must inform the system that you are working at a VT100 terminal. You do this by typing in **SET TERMINAL /VT100** and pressing RETURN. (You *must* do this, or you will not be able to begin screen editing later.) Then you are ready to enter the EDT editor. To do this, you simply type in the word **EDIT**, followed by the name of the file you are going to edit or create. (You can also use screen editing on VT200 and VT300 terminals.)

In the example that follows, after you type in the command EDT responds with the message `Input file does not exist`—this indicates that you are creating a new file. Your screen will now look like this:

```
$ SET TERM/VT100
$ EDIT TEXT.LIS
Input file does not exist
[EOB]
*
```

Now you're in EDT line-editing mode. If you named a file you have worked on before, the first thing that appears on your screen is the first line of your file. In this case, since your file is empty, the first line of your file is `[EOB]`, which stands for End of Buffer. It indicates that your file is empty—the end of the (now empty) buffer that will contain your file is the first (and only) line in that file.

Your cursor is now located to the right of the asterisk, which is the EDT prompt for line-editing commands (like the dollar sign in the VX system outside of EDT.) Now, if you are at a VT100 terminal (or a terminal or microcomputer capable of emulating a VT100), you are ready to switch to keypad editing. (If you failed to define your terminal as a VT100, you can do it now by typing the command **SET TERM VT100**. Then press RETURN and another asterisk prompt will appear on your screen.)

To change from line-editing to keypad editing, you simply type the letter **C** (for **Change**) and press RETURN. Your screen will immediately redraw itself. The `[EOB]` will now be at the upper left of your screen. You can then start typing in your text or simply press RETURN a few times, and the `[EOB]` will move down your terminal screen, line by line, as you enter text or blank lines in your file.

Basics of Keypad Editing

In keypad editing you can always type in new text from your keyboard; you'll do all *editing* of the text with the keypad or function keys. To enter lines of text, or to insert new lines in a previously written file, you simply move the cursor to the place the new text belongs and start typing. As you type, the old text will move to the right to make room for the newly written text.

To move the cursor and to delete text, you'll use several keys that are not on the numerical keypad of the standard VT100 terminal; they are located on or near the alphabetic keyboard. (Other terminals and micros may locate these keys within or near the keypad.) These are the four "arrow" keys (with which you can move the cursor up, down, right, and left over your screen) and the **DELETE** key, which deletes characters to the left of your cursor, one at a time. (The **DELETE** key may have other labels on terminals and micros that emulate a VT100.)

Keypad Cursor Control

Two important advantages of keypad editing are rapid cursor movement and rapid deletions, which are explained in the next two sections. The keypad commands described here are some of the most commonly used commands for cursor movement in EDT. For details on these and other cursor commands, see the *EDT Reference Manual*.

All the editing actions described below refer to keys on the VT100 keypad, including the comma and minus keys. Where two keys are indicated, strike the keys consecutively.

Key 4 + Key 1

makes the cursor move **forward word by word**. You need to set the direction of the cursor movement forward, and then you can strike Key 1 as often as you want to move the cursor.

Key 5 + Key 1

makes the cursor move **backward word by word**. As with Key 4, you need only strike Key 5 once to set the direction of the cursor movement backward, and then you strike Key 1 as often as you need to.

Key 4 + Key 8

makes the cursor move **forward 16 lines** at a time

Key 5 + Key 8

makes the cursor move **backward 16 lines** at a time

Key PF1 + Key 4

makes the cursor jump to the **end of the file**.

Key PF1 + Key 5

makes the cursor jump to the **beginning of the file**.

You will notice that in these and other commands, **Key 4** sets cursor movement forward and **Key 5** sets cursor movement backward.

Keypad Deletions and Replacements

The following keypad commands are some of the most commonly used deleting functions. See the *EDT Reference Manual* for more details and information about other commands.

All the keys referred to below are on the VT100 keypad, including the comma and minus keys. Where two keys are indicated, strike the keys consecutively.

Comma key

deletes the **character** the cursor is positioned upon.

Key PF1 + Comma key

replaces the character you just deleted.

Minus key

deletes one **word** to the right of the cursor.

Key PF1 + Minus key

replaces the word you just deleted.

Key PF4

deletes part or all of a **line**, from wherever the cursor is positioned at the moment to the right-hand end of the line.

Key PF1 + Key PF

replaces the line you just deleted.

A Summary of EDT Keypad Commands

The following table summarizes EDT keypad commands. For more information about these commands, consult DEC's *EDT Reference Manual*.

One key may require special explanation: the **Gold** key. This key—which is not typically colored gold—is located in the upper left-hand corner of the standard VT100 keypad and marked **PF1**.

The **Gold** (PF1) key is used in combination with other keys. Most keys on the keypad perform two separate editing functions “upper” and a “lower” function. You select the upper function by simply pressing the key. To select the lower function, press the **Gold** key first, then the key in question. Make sure you *don't* press them at the same time!

Note that the labels used in the **Function** column in the table also appear in the keypad diagram.

An asterisk in the **Action** column indicates that the direction of cursor movement depends on whether you have last used **ADVANCE** (Key 4) or **BACKUP** (Key 5).

Finally, notice that the table is ordered from left to right and from top to bottom along the keypad.

<u>Key</u>	<u>Function</u>	<u>Action</u>
PF1	Gold	Selects lower function of key you press next
PF	HELP	Displays VT100 keypad map and on-line help.
PF3	FIND NEXT FIND	Finds next occurrence of character string. * Finds a specific character string. *
PF4	DEL LINE UND LINE	Deletes rest of current line and moves next line up. Restores (undeletes) last deleted line.
<hr/>		
7	PAGE *COMMAND	Moves cursor to top of current or next page. The next page is determined by the location of a Form Feed within the file. Type to issue a single line-mode command.
8	SECTION FILL	Displays preceding or following 16 lines. * Fills selected lines to specified width.
9	APPEND REPLACE	Moves selected lines to end of Paste Buffer. Replaces selected range with text in Paste Buffer.
-	DEL WORD UND WORD	Deletes current word. Inserts (undeletes) last deleted word at cursor.
<hr/>		
4	ADVANCE BOTTOM	Sets direction of action to “forward,” toward the bottom of the file. Displays the last part of the file and moves cursor to the end.
5	BACKUP TOP	Sets direction of action to “backward,” toward the top of the file. Displays the first part of the file and moves cursor to the beginning.
6	CUT PASTE	Moves selected lines into Paste Buffer. Inserts text from Paste Buffer at cursor.
,	DEL CHAR UND CHAR	Deletes character at cursor. Inserts (undeletes) last deleted character at cursor.
<hr/>		

1	WORD CHNG CASE	Moves cursor one word right or left. * Changes character or lines to opposite case. *
2	EOL DEL EOL	Moves cursor to end of line. * Deletes rest of current line.
3	CHAR SPECINS	Moves cursor one character to the right or left.* Inserts special character.
<hr/>		
0	LINE OPEN LINE	Moves cursor to beginning of current line or next line. * Inserts a RETURN at cursor.
.	SELECT RESET	Marks beginning of select range. Cancels select range or Gold key press.
ENTER	ENTER SUBSTITUTE	To enter search string or line-mode command. Replaces FIND lines with text in Paste Buffer.

Other Keys

The following keys, which may have different labels on different terminals or micros, can also be used to perform certain EDT functions:

F12 (or BACKSPACE or CTRL-H)	moves the cursor to the beginning of the current line.
F13 (or LINEFEED or CTRL-J)	deletes the word to the left of the cursor.
DEL or RUBOUT	deletes the character to the left of the cursor.
RETURN	ends a text line or inserts a blank line.
TAB	moves text to next tab stop.

Getting Help

For immediate help with keypad editing questions, press the PF2 key, then press the key(s) that generate the command in question. If you simply press the PF2 key by itself, EDT displays a VT100 keypad diagram showing key functions, like the one in the diagram. From there, you can press a specific keypad key to get a description of that EDT function, or you can return to screen editing.

Exiting Keypad Editing and EDT

When you are ready to finish working on your text you have to leave the EDT keypad editing first and then leave EDT.

You leave the keypad editing mode in the way we explained in a previous section, by pressing CTRL and keeping it depressed while you press the letter Z.

When the asterisk-prompt appears, type EXIT and you will leave EDT. When you type EXIT VX will save the text you have created and all the editing changes you have made, and indicate that it is saving the file by displaying the file name, file type, version number, and the length of the file in lines. Then VX displays its dollar-sign prompt again. When you type the EXIT command to leave EDT, the system automatically saves the file, as indicated by the line displaying the file name, type, version number, and length.

A New Version Each Time

When you return to your file TEXT.LIS;1 to edit it further, the system automatically creates a copy of this file when you enter EDT, and it is this copy that you will edit. When you exit from this second editing session, the system will save that copy as a second file with a higher version number (TEXT.LIS;2). Your VX directory will then contain two versions of the file, the more recent version having the higher version number.

Every time you enter EDT to edit a file, the system will create a new copy of the file from the existing copy with the higher version number. When you exit EDT, the system will store that copy as a new file with a new (higher) version number.

In general, then, when you enter EDT, you should not specify a version number in the file name. The reason: If you happen to type in a version number that is lower than your most recent version, you will edit a file that does not contain all your most recent changes.

As you use EDT more and more, you will find that a number of sequentially numbered versions of the same file will accumulate on your directory. You should remove earlier versions from your directory from time to time (using the **PURGE** command) when you are sure that you have no use for these files; keeping them around only takes up storage space unnecessarily—and adds to your VX file storage costs.

Recovering Files

If your editing session is interrupted by a system crash or other unusual occurrence, you can recover most or all of your editing changes—they'll be preserved in a file on your account named *filename*.JOU. See **HELP EDIT /RECOVER** for details.

For More Information

There is extensive documentation in the *EDT Reference Manual*. You'll also find an introductory chapter on EDT in *A Beginner's Guide to VAX/VMS Utilities & Applications* (Digital Press). DEC also publishes a *Guide to VMS Text Processing*, which includes sections on EDT, EVE, and other utilities. All these publications are available for reference in our Computing Information Center, 128A Lind.


On-line Training Software

We strongly recommend that you use the on-line training software to learn EDT. You must be working from a VT100-compatible terminal or micro to use the training package, and you must set your terminal as a VT100, as explained above. Then, at the VMS dollar prompt, type:

```
$ RUN EDT2CAI
```

The VT100 keypad:

PF1	PF2	PF3	PF4
7	8	9	—
4	5	6	,
1	2	3	Enter
0	.		



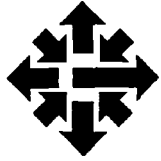
* On some keyboards, NCSA Telnet reverses the functions of these two keys.

EDT keypad functions:

PF1	PF2	PF3	PF4
GOLD	HELP	FIND NEXT FIND	DEL LINE UND LINE
7 PAGE COMMAND	8 SECTION (SCROLL) FILL (FORMAT)	9 APPEND REPLACE	— DEL WORD UND WORD
4 ADVANCE BOTTOM	5 BACKUP TOP	6 CUT PASTE	, DEL CHAR UND CHAR
1 WORD CHNG CASE	2 EOL (END OF LINE) DEL EOL	3 CHARACTER SPECINS	ENTER ENTER
0 LINE OPEN LINE	.	* SELECT RESET	SUBSTITUTE

Upper function: Press key alone.

Lower function: Press and release the GOLD key, then press the other keypad key.



ACSS Brief

ENCORE/UNIX Access

Academic Computing Services and Systems (ACSS) operates an Encore Multimax mainframe computer that runs UMAX, a Berkeley-compatible UNIX operating system. This *Brief* presents basic information about using the ENCORE/UNIX machine (UX system) for the first time and then discusses other resources that provide additional information on using it.

GETTING AN ACCOUNT

To use ACSS's UX system, you first need to apply for a UX account. To obtain an application, either call the ACSS Accounting Office (625-1511) or pick up a form at the ACSS Computing Information Center (CIC) in 128A Lind Hall.

Faculty members interested in using the UX system for instructional computing should contact the instructional services coordinator at 626-1085.

ACCESSING THE UX SYSTEM

The UX system can be accessed in several ways:

- By using a terminal and modem.
- By using a microcomputer that has a modem and communications software.
- By using either a terminal or a microcomputer with communications software that is attached to an Integrated Telephone Equipment unit (ITE) equipped with a data option board.
- By using a terminal or microcomputer in one of ACSS's public labs. (See Information Systems' map of computing facilities for locations of labs and a list of terminals.)

Dialing Up from your home or office. Turn on the terminal or microcomputer. If you are using a microcomputer, load your communications software. It is preferable to choose software that enables your micro to emulate a VT100 terminal. Call the Micro HELP-Line (626-4276) if you need assistance in setting up your micro and associated communications software.

Dial 626-1681 to access the UX system. This number is autobaud, which means that it adjusts to the speed of the phone connection. The telecommunication system's modem pool will answer with a high-pitched "eeeeeeee" sound.

- If the modem has a coupler for the phone's handset (usually 300 baud or 30 characters per second), place the handset into the modem's cups.
- If the modem is a dataset (usually 1200 baud or 120 characters per second), press the button and put the handset back in its cradle.
- If the micro or terminal is attached to one of the University's ITE phones (up to 9600 baud or 960 characters per second), hit the carriage return key once or twice.
- Data settings are: 7 data bits, even parity, 1 stop bit.

Using Public Labs. The terminals located in the campus public labs are "hardwired" to ACSSNET, a campus network that connects several computers to the terminals in public labs. Instead of dialing a phone number, turn the terminal on and press the carriage return key to get the network prompt:

```
ACSS-net (CA, MD, VX, UX, IB, HS) ?
```

Respond by typing `ux` and pressing the carriage return key.

to the system, the UX system responds and then prompts you for an account number:

```
4.2 (umn-acss-ux)
```

```
:
```

account number as given to you by the Accounting Office. It may be any combination of characters — in this example, **yours**) :

```
: yours
```

Use capital letters!

Press the carriage return key. The UX system will reply:

```
word:
```

word given to you by the Accounting Office and then press the carriage return key. (The word will be displayed as you type it.)

The UX system will reply with the date and time of your last login, and a brief message of the day.

```
login: Mon Jan 12 14:01:17 on tty35
```

```
For problems, please send mail to "consult".
```

You will be notified if you have any unread mail since your last login. The first time you login to the UX system, it will prompt you for various information such as your full name, campus phone number, home phone, and address. Answer the questions. When done, the UX system will prompt you for input:

```
ix%
```

The UX system is now waiting for commands.

Well, the UX system will reply:

```
incorrect
```

You did wrong. Did you type the correct account name (login), without any blanks in it? The system will prompt you, again without blanks or capital letters? To try again, just press the carriage return key and the system will again prompt for your login (account number). Proceed as before. If you cannot log on, call the HELP-Line (626-5592).

PASSWORDS

Each user will initially have an assigned password that you should change as soon as possible. To change your password, at the system prompt type:

```
1
```

The system will prompt for the old password and then for the new one twice. If you try to use a password less than 8 characters, the UX system will prompt you for a longer password, as shown here:

```
Enter old password for yours.
```

```
password:
```

New password:
Please use a longer password.
New password:
Retype new password:

LOGGING OFF

To log off the UX system, enter:

```
logout
```

If you do not use the terminal for twenty minutes, the UX system will end your terminal session. A warning message will be displayed at your terminal about four minutes before the terminal connection is broken.

SPECIAL KEYS

- To back up to correct a typing error use the DELETE key.
- To cancel a line: CTRL-U. (Hold down the CTRL key while pressing U.)
- To pause output, then resume: CTRL-S to pause and CTRL-Q to resume. On VT100 style terminals, press the NO SCROLL key to pause, then again to resume.
- To cancel or "bail out" of any facility or terminate a program: CTRL-Y or CTRL-C.
- To exit utilities such as MAIL: CTRL-D.
- To temporarily suspend a program: CTRL-Z.

NOTE: All these keys are user-selectable — see the command `stty`.

LEARNING UNIX

When an account is opened for you, several command files are automatically set up on your account. These files define settings that are necessary to our site. They can also be modified to make computing on the UX easier, depending upon your needs and technical expertise. You can, for example, set up "aliases" to abbreviate commands you use frequently.) The command files are:

<code>.cshrc</code>	for aliases you want to be executed for <code>csh</code> startups. (<code>csh</code> is a "shell" program that accepts terminal input and executes it as commands).
<code>.login</code>	for initial login only (terminal definition, <code>msgs</code> , etc)
<code>.logout</code>	for when you log off the system.
<code>.profile</code>	is for activation of the borne shell (<code>sh</code> instead of <code>csh</code>).
<code>.rhosts</code>	for similar hosts that you wish to use (remote communications).
<code>.msgsrc</code>	is updated by the <code>msgs</code> command (used for system messages).

One way to get a nodding familiarity with the UX system is to refer to the *Getting Started with UMAX 4.2* and *UMAX 4.2 User's Guide* published by the Encore Computer Corporation. These manuals are very similar to those for Berkeley UNIX, or System V UNIX. The staff at ACSS's Computing Information Center can provide information on how to place an order for vendor-published documentation.

Another way to start learning UNIX is to use the on-line tutorial package called LEARN. To use the on-line tutorial, it is best to work at a VT100 style terminal or a microcomputer that emulates a VT100.

TERMINAL SETTINGS

When using the UX system, you must tell it the characteristics of the terminal you are using each time you log on.

If you are using a VT100 terminal (or a VT100 emulator), set the type of terminal by inserting into the file `.login` this line:

```
setenv TERM vt100
```

(If you are using another type of terminal, enter the appropriate code: `z19`, `h19`, `z29`, `viking`, `ergo301`, `tty43`, `dw2`, `dw3`, etc.)

If your tabs are not being processed correctly, enter the line `stty -tabs` in your `.login` file.

Before using the `vi` editor to edit the `.login` file the first time, define your terminal with the `setenv TERM` command described above.

ON-LINE DOCUMENTATION

UNIX has an interactive `help` facility that gives information on system use. Once logged in, type `help` to see the list of topics and follow instructions.

There are also many on-line manual pages available through the command `man`.

<code>man help</code>	How to use the help program.
<code>man man</code>	Information from the programmer's manual on how to use <code>man</code> .
<code>man csh</code>	Information on the C shell command interpreter.
<code>man vi</code>	The Visual screen-oriented editor.
<code>man ex</code>	The EX text editor.
<code>man more</code>	Information on how to examine a text file a screen at a time.
<code>man termcap</code>	How to define functions and capabilities of a terminal.
<code>man stty</code>	More options of terminal functions.
<code>man labs</code>	General information about campus lab facilities.
<code>man packages</code>	General information about local packages.
<code>man lpr</code>	How to get printed output.

PRINTED DOCUMENTATION

Along with the *Getting Started with UMAX 4.2* and *UMAX 4.2 User's Guide* manuals published by the Encore Computer Corporation, as mentioned above, there are five manuals (excerpts from the Berkeley UNIX reference set) that have been published by ACSS. If you don't know which manual to buy or read, visit the Computing Information Center in 128A Lind Hall, ask for help, and examine the collection of manuals. A good place to start is the *UNIX Beginner's Guide*, a reasonably priced overview of UNIX basics.

CONSULTING

Consultants are available to answer questions in 128C Lind Hall daily. The ACSS HELP-Line is open for phone questions from 8 am to 5 pm, Mondays through Fridays. Call 626-5592.

CLASSES

ACSS teaches short courses on UNIX and 'C' language most academic quarters. Pick up the current short course schedule at the Computing Information Center (128A Lind Hall). For information about short courses, call 625-7397.

ENCORE/UNIX Access

Academic Computing Services and Systems (ACSS) operates an Encore Computer Company Multimax mainframe computer that runs UMAX, a Berkeley-compatible UNIX operating system. The ENCORE/UNIX mainframe computer, the UX system, provides interactive computing services for research and instructional use.

This Brief presents information about opening an account on the UX system and using it for the first time. The last section lists the resources and services that ACSS provides that can give you additional information about using the UX system.

Opening an Account

To use ACSS's UX system, you first need to apply for a UX account. To obtain an application, either call the ACSS Accounting Office (625-1511) or pick up a form at ACSS's Computing Information Center in 128A Lind Hall.

Faculty members interested in using the UX system for instructional computing should contact the instructional computing consultant at 626-0200.

Using the UX System

This section provides basic information about accessing the UX system, logging in to the system, defining your terminal, using command files, changing your password, using special keys, and logging out of the system.

Accessing the UX System. The UX system can be accessed in several ways:

- By using a terminal and modem.
- By using a microcomputer that has a modem and communications software.
- By using either a terminal or a microcomputer with communications software that is attached to an Integrated Telephone Equipment unit (ITE) equipped with a data option board.
- By using a terminal or microcomputer in one of ACSS's public labs. (For a listing of computing facilities on the Twin Cities campus and their locations and equipment, refer to the *Informations Systems Computing Facilities* map, available at the Computing Information Center, 128A Lind Hall.)

Accessing the UX system from your home or office. Turn on the terminal or microcomputer. If you are using a microcomputer, load your communications software. (Software that enables your microcomputer to emulate a VT 100 terminal is preferable.) Data settings are 7 data bits, 1 stop bit, even parity. Call the Microcomputer HELP-Line (626-4276) if you need assistance in setting up your microcomputer and associated communications software.

Dial 626-1681 to access the UX system. This number is autobaud, which means that it adjusts to the speed of the phone connection. The UX system will answer with a high-pitched "eeeeeeeee" sound.

- If the modem has a coupler for the phone's handset (usually 300 baud or 30 characters per second), place the handset into the modem's cups.
- If the modem is a dataset (usually 1200 baud or 120 characters per second), press the button and put the handset back in its cradle.

- If the microcomputer or terminal is attached to one of the University's ITE phones (up to 9600 baud or 960 characters per second), hit the RETURN key once or twice.

Accessing the UX system by using a public lab. The terminals located in the campus public labs are "hardwired" to ACSS-net, a campus network that connects several computers to the terminals in public labs. Instead of dialing a phone number, turn the terminal on and press the RETURN key to get the network prompt

```
ACSS-net (CA, NV, VX, UX, IB, HS) ?
```

Respond by typing **UX** and pressing the RETURN key.

Logging In. After connecting to the UX system by dialing up or using a public lab, the system responds and then prompts you for an account number

```
UMAX 4.2 (ux.acss.umn.edu)
```

```
login:
```

Type your UX account number as given to you by the Accounting Office. It may be any combination of alphanumeric characters. NOTE: Do not use uppercase (capital) characters! (UNIX distinguishes between uppercase and lowercase letters.) Then press the RETURN key. The UX system responds with

```
Password:
```

Type in the password given to you by the Accounting Office and then press the RETURN key. (For security reasons, the password is not displayed as you type it.)

If all goes well, the UX system responds with the date and time of your last interactive session, a welcome banner, and a brief message of the day, such as

```
Last login: Mon Nov 16 08:53:12 on tty47
```

```
UMAX 4.2 UNIX. This is the Encore Multimax system!
```

```
Any problems, please send mail to "consult".
```

You will also be notified if you have any "unread" mail since your last interactive session. The first time you log in to the UX system, you will be prompted for information such as your full name, campus phone number, home phone, and the type of terminal you are using. Please answer the questions. When you are done, the UX system displays a system prompt similar to

```
ux.acss.edu%
```

The UX system is now waiting for commands.

If all does not go well, the UX system will reply

```
Login incorrect
```

Analyze what you did wrong. Did you type the correct account name (login), without any uppercase letters or blanks in it? The correct password, again without any uppercase letters or blanks? To try again, just press the RETURN key and the UX system will prompt you for your account name. Proceed as before. If you cannot log in, contact the ACSS HELP-Line (626-5592).

Defining Your Terminal. After logging in, the first thing you need to do is inform the UX system of the characteristics of the terminal you are using.

If you are using a VT100 terminal (or a VT100 emulator), define the type of terminal by typing

```
setenv TERM vt100
```

(If you are using another type of terminal, enter the appropriate code: z19, h19, z29, viking, ergo301, tty43, dw2, dw3, etc.)

Using Command Files. When an account is opened for you, several command files are automatically set up on your account. These files define settings that are used by ACSS but can be modified to make computing on the UX easier, depending upon your needs and technical expertise. (You can, for example, set up “aliases” to abbreviate commands that are used frequently.) The command files are

.cshrc	for aliases you want to be executed for csh startups. (csh is a “shell” program that accepts terminal input and executes it as commands).
.login	for initial log in only (terminal definition, msgs , etc)
.logout	for when you log out of the system.
.profile	is for activation of the borne shell (sh instead of csh).
.rhosts	for similar hosts that you wish to use (remote communications).
.msgsrc	is updated by the msgs command (used for system messages).

For example, if you always use a VT100 terminal, you can insert **setenv TERM vt100** into the **.login** command file so that you do not need to define the terminal every time you log in. Type the command **more .login** (note the period before *login*) to see what commands are included in your **.login** file. Use the vi editor to modify the command file. Type **man vi** to get instructions on how to use the editor.

If your tabs are not being processed correctly, enter the line **stty -tabs** in your **.login** file.

Changing the Password. Your new UX account has an initial password assigned by ACSS Accounting. You should change that password as soon as possible. (Classroom users usually cannot change their password.) To change your password type:

```
passwd
```

The system will prompt for the old password and then for the new one twice. If you try to use a password of less than six characters, the UX system will prompt you for a longer password.

Using Special Keys. When you use the UX system, certain terminal keys and key combinations perform special functions. Some of the most common are the following:

- To back up to correct a typing error use the DELETE key.
- To cancel a line: CTRL-U. (Hold down the CTRL key while pressing U.)
- To pause output, then resume: CTRL-S to pause and CTRL-Q to resume. On VT100-style terminals, press the NO SCROLL key to pause, then again to resume.
- To cancel or “bail out” of any facility or terminate a program: CTRL-Y or CTRL-C.
- To exit utilities such as MAIL: CTRL-D.
- To temporarily suspend a program: CTRL-Z.

NOTE: You are able to define what happens when you press a certain key. For more information, refer to on-line documentation in **man stty**.

Logging Out. To log out of the UX system, enter

`logout`

If you do not use the terminal for twenty minutes, the UX system will end your terminal session. A warning message will be displayed at your terminal about four minutes before the terminal connection is broken.

Using ACSS Resources

To help you use the UX system, ACSS provides many resources and services such as on-line documentation, printed documentation, consulting services, and short courses.

On-line Documentation. UNIX has an interactive help facility that gives information on system use. Once you are logged in, type `help` to see the list of topics and then follow the instructions.

There are also many on-line manuals available through the command `man`.

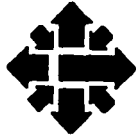
<code>man help</code>	How to use the help program
<code>man man</code>	Information about how to use <code>man</code> to read on-line documentation
<code>man csh</code>	Information on the C shell command interpreter
<code>man vi</code>	The VISual screen-oriented editor
<code>man ex</code>	The EX text editor
<code>man more</code>	Information about how to examine a text file a screen at a time
<code>man termcap</code>	How to define functions and capabilities of a terminal
<code>man stty</code>	More options of terminal functions
<code>man labs</code>	General information about campus lab facilities
<code>man packages</code>	General information about local packages
<code>man lpr</code>	How to get printed output

Printed Documentation. Information on the UMAX operating system is principally available through *Getting Started with UMAX 4.2* and *UMAX 4.2 User's Guide*, published by the Encore Computer Corporation. These manuals are very similar to those for Berkeley UNIX, or System V UNIX. You can review reference copies at the Computing Information Center, 128A Lind Hall, or you can purchase them directly from the Encore Computer Corporation. The staff at the Computing Information Center can provide information on how to place an order for vendor-published documentation.

ACSS publishes a general information manual, *An Introduction to UNIX Computing*, which can be purchased at the University bookstores. In addition, ACSS also has reprinted five manuals (excerpts from the Berkeley UNIX reference set), which can be purchased at University bookstores as well. If you don't know which manual to buy or read, visit the Computing Information Center in 128A Lind Hall, ask for help, and examine the collection of manuals. Free documentation also is available in 128A Lind Hall.

Consulting Services. Consultants are available to answer questions during posted hours in 128C Lind Hall and 140 Blegen Hall. The ACSS HELP-Line is open for phone questions from 8 am to 5 pm, Mondays through Fridays. Call 626-5592.

Short Courses. ACSS teaches short courses about UNIX and 'C' language each quarters. Pick up the current short course schedule at the Computing Information Center, 128A Lind Hall. For information about short courses, call 625-7397.



ACSS BRIEF

EXPLAIN Information

EXPLAIN is a new on-line documentation utility on our NOS 2 systems that all users should know how to use. The best way to begin learning about EXPLAIN is to type the command

```
explain
```

during an interactive session. You will immediately see an on-line document that tells you how to use the EXPLAIN utility.

The most important EXPLAIN manual is COMMAND, which documents all NOS 2 commands, including ACSS's additions to the NOS 2 system. To read COMMAND, type

```
explain,m=command
```

and your terminal will display the first screen of the COMMAND manual, with instructions on how to read further. After you have entered the COMMAND manual, you can read it section by section, page by page, by selecting menu items as they are presented on your terminal screen, or by pressing RETURN, which always takes you to the next screen.

When you want to back up in an EXPLAIN manual to re-read one or more previous screens, type the minus (-) character. This returns you to the last screen displayed at your terminal. As you continue to type the - character, EXPLAIN displays the other screens you have read in reverse order. Typing the plus (+) is equivalent to typing RETURN; it causes EXPLAIN to go to the next screen.

Quick Look-Up. You can quickly look up a reference on a specific command by typing the command name, followed by a question mark—for example:

```
access?
```

This will cause EXPLAIN to display the reference on the NOS 2 command ACCESS immediately.

Or, if you are working in a NOS 2 session and want a command description more quickly, you can get it. Suppose, for example, you want help on the NOS 2 command COPY. Just type

```
explain,m=command.copy
```

You will immediately enter the COMMAND manual at the first of a series of screens explaining the purpose, format, and parameters of the COPY command, with instructions on how to read further. You can then continue to read anywhere in the COMMAND manual, or leave the manual by typing QUIT.

DISI: DISplay Index. Most EXPLAIN manuals are well indexed. To refer to the index of a manual while you are reading it, type in the command

```
disi
```

EXPLAIN then displays the first page of the manual index. DISI also permits you to locate a particular index item quickly. For example, if you are reading the COMMAND manual and want to look up the topic "permanent file" in the index, type

```
disi permanent file
```

and EXPLAIN will turn to the index page listing that item.

EXPLAIN lists index items in menu form: You type in the letter of the index item you want to read. In COMMAND, for example, many commands are indexed to the topic "permanent file." When you select "permanent file" from the index, EXPLAIN displays the first item indexed to "permanent file." If you want to continue reading about "permanent file" references, you do not have to return to the index. You merely type a question mark, and EXPLAIN will display the second "permanent file" reference in the manual, and so on, until you've seen all portions of the manual indexed to the "permanent file" topic.

"Fuzzy Matching." While reading an EXPLAIN manual, you may request information on an item not listed in the manual's index. EXPLAIN will refer to the index, find the index item that most closely matches the item you requested (a so-called "fuzzy match"), and turn to that page in the on-line manual. If EXPLAIN finds more than one item similar to (but not exactly like) the item you requested, EXPLAIN displays a list of these "fuzzy matches" and lets you select one of them.

Making Copies: REVIEW. If you want to copy certain portions of an on-line manual for reference later, you can do it with the NOS 2 utility REVIEW. For example, if you want to copy some screens from the COMMAND manual into a file called OUTFILE, access the COMMAND manual with this command:

```
review,m=command,l=outfile
```

After REVIEW displays a screen you want to copy, type in the command PRINT, and REVIEW will copy that screen from the COMMAND manual into the file OUTFILE. You can continue moving through the manual and PRINTING as many screens into OUTFILE as you need.

EXPLAIN HELP. If, when reading COMMAND or any other on-line document with EXPLAIN or REVIEW, you need help with commands, just type HELP. EXPLAIN and REVIEW will immediately display the first of a series of screens that summarize the commands.

A SUMMARY OF EXPLAIN COMMANDS

RETURN or +	Goes to the next screen.
-	Goes to the previous screen.
<	Takes you back to the screen you were on when you requested an indexed topic or selected an item from a menu.
UP	Goes to the previous or current menu.
xx?	Goes to the first indexed screen for the topic xx.
?	Goes to another indexed screen for the topic you previously entered.
TOP	Takes you to the first screen in the manual.
HELP	Takes you to the HELP menu.
DISI	Displays a manual's index.
QUIT	Exits an online manual.

ACSS Brief

CA Mainframe System

Academic Computing Services and Systems • University of Minnesota • Twin Cities

EXPLAIN Information

On the CYBER/NOS mainframe computer (the CA system), EXPLAIN is an on-line documentation utility, which can be used to read several on-line manuals that you should find helpful when learning how to use the NOS 2 operating system. To begin learning how to use EXPLAIN, type the command

```
explain
```

when you are logged in to the CA system. You will see a screen that tells you how to use the EXPLAIN utility.

COMMAND Manual. The most important EXPLAIN manual is COMMAND, which gives information about all NOS 2 commands, including ACSS's additions to the NOS 2 system. To read COMMAND, type

```
explain,m=command
```

and your terminal will display the first screen of the COMMAND manual, with instructions on how to read further. After you have entered the COMMAND manual, you can read it section by section, page by page, by selecting menu items as they are presented on your terminal screen, or by pressing RETURN, which always takes you to the next screen.

When you want to back up in a manual to re-read one or more previous screens, type the minus (-) character. This returns you to the last screen displayed at your terminal. As you continue to type the minus character, EXPLAIN displays the other screens you have read in reverse order. Typing the plus (+) character is equivalent to typing RETURN; it causes EXPLAIN to go to the next screen.

Quick Look-Up. You can quickly look up a description of a specific command by typing the command name, followed by a question mark—for example

```
access?
```

will cause EXPLAIN to display the description of the NOS 2 command ACCESS immediately.

Or, if you are working on the CA system and need to have a command description quickly, you can get it. Suppose, for example, you want help on the NOS 2 command COPY. Just type

```
explain,m=command.copy
```

You will immediately enter the COMMAND manual at the first of a series of screens explaining the purpose, format, and parameters of the COPY command, with instructions on how to read further. You can then continue to read anywhere in the COMMAND manual, or leave the manual by typing QUIT.

DISI: DISPlay Index. Most EXPLAIN manuals are well indexed. To refer to the index of a manual while you are reading it, type in the command

```
disi
```

EXPLAIN then displays the first page of the manual index. DISI also permits you to locate a particular index item quickly. For example, if you are reading the COMMAND manual and want to look up the topic "permanent file" in the index, type

disi permanent file

and EXPLAIN will turn to the index page listing that item.

EXPLAIN lists index items in menu form: You type in the letter of the index item you want to read. In COMMAND, for example, many commands are indexed to the topic "permanent file." When you select "permanent file" from the index, EXPLAIN displays the first item indexed to "permanent file." If you want to continue reading about "permanent file" references, you do not have to return to the index. You merely type a question mark, and EXPLAIN will display the second "permanent file" reference in the manual, and so on, until you've seen all portions of the manual indexed to the "permanent file" topic.

"Fuzzy Matching." While reading an EXPLAIN manual, you may request information on an item not listed in the manual's index. EXPLAIN will refer to the index, find the index item that most closely matches the item you requested (a so-called "fuzzy match"), and turn to that page in the on-line manual. If EXPLAIN finds more than one item similar to (but not exactly like) the item you requested, EXPLAIN displays a list of these "fuzzy matches" and lets you select one of them.

Making Copies: REVIEW. If you want to copy certain portions of an on-line manual for reference later, you can do it with the NOS 2 REVIEW utility. For example, if you want to copy some screens from the COMMAND manual into a file called OUTFILE, access the COMMAND manual with this command

```
review,m=command,l=outfile
```

After REVIEW displays a screen you want to copy, type in the command PRINT, and REVIEW will copy that screen from the COMMAND manual into the file OUTFILE. You can continue moving through the manual and transferring as many screens into OUTFILE as you need with the PRINT command.

EXPLAIN HELP. When looking at COMMAND or any other on-line manual with EXPLAIN or REVIEW, if you forget the commands used to "page" through the manual, just type HELP. EXPLAIN and REVIEW will immediately display the first of a series of screens that summarize the commands.

A SUMMARY OF EXPLAIN COMMANDS

RETURN or +	Goes to the next screen.
-	Goes to the previous screen.
<	Takes you back to the screen you were on when you requested an indexed topic or selected an item from a menu.
UP	Goes to the previous or current menu.
xx?	Goes to the first indexed screen for the topic xx.
?	Goes to another indexed screen for the topic you previously entered.
TOP	Takes you to the first screen in the manual.
HELP	Takes you to the HELP menu.
DISI	Displays a manual's index.
QUIT	Exits an on-line manual.



ACSS Brief

Full Screen Editor (FSE)

Introduction

The purpose of this Brief is to introduce ACSS's users to Control Data Corporation's (CDC) Full Screen Editor (FSE) on the CYBERs, explain the process of starting an editing session, summarize the editing and programmable function keys, and describe the use of FSE's help functions.

To use CDC's FSE in its full screen mode, you must have a terminal with a numeric keypad as well as a keyboard. The terminals that CDC has defined for FSE are listed in the GETTING STARTED section of this writeup.

If you do not find your terminal listed, or your site has not yet defined your terminal for FSE, you may be able to define it yourself. See the *NOS Screen Formatting Reference Manual* for further information. Both this and the *NOS Full Screen Editor User's Guide* are available in the ACSS Reference Room, 128A Lind Hall.

This document describes how to use FSE on the VT100, Z19 and Z29 terminals. Equivalenters for other terminals can be found in Appendix D, "Terminal Support," of the *NOS Full Screen Editor User's Guide*. For those interested in line editing, see Chapter 4 of the *NOS Full Screen Editor User's Guide*.

Getting Started

FSE is only available through CDC's CDCNET, which is currently on the ME and MD CYBER mainframes. To log on to ME or MD through CDCNET, you simply respond with the machine code for the CYBER you want to log on to in response to the ACSS Network prompt.

Below is a sample log-on session.

```
ACSS-net (NOS,ME,MD,VX) ?           {Respond ME or MD}
connected

Copyright Control Data Corporation, 1985

DI System Name is 080025300162, TDI1
Terminal Name is 100000, $CONSOLE_300162_100000
You may enter CDCNET commands.

Connection TO_MD created.
Procedure SETUPMD completed.

WELCOME TO THE NOS SOFTWARE SYSTEM.
COPYRIGHT CONTROL DATA 1978, 1985.

86/03/17. 11.43.39. T070602
MERITSS/MD (03/12-AP).                NOS 2.4.3-647/642.
FAMILY:
USER NAME:                             {Enter your user name}
PASSWORD:                               {Enter your user password}

JSN: AADN, NAMIAF
```

Establish the screen mode appropriate for your terminal using the NOS SCREEN command:

```
/screen, VT100  
or  
/screen, z19
```

Without this command, FSE will be in line- mode editing by default. NOS will verify (as shown below) that the screen mode is now set for a DEC VT100. To specify type-ahead, enter the model name followed by a T. Type-ahead allows you to press a function key two or more times in succession, but the multiple commands will not be executed until the RETURN key is hit.

```
SCREEN, VT100.  
or  
SCREEN, Z19.
```

The following table gives the predefined screen mode codes for FSE:

Terminal	Model	Model with Type-Ahead
CDC Viking 721	721	721T
CDC Viking 721 Version 3	721V3	721V3T
CDC 722	722	722T
CDC 722-30	72230	72230T
DEC VT100	VT100	VT100T
Zenith Z19/Z29 and Heathkit H19	Z19	Z19T
IBM 3270	3270	3270T
Lear Siegler ADM3A	ADM3A	ADM3AT
Lear Siegler ADM5	ADM5	ADM5T
Tektronix 4115	T4115	T4115T

To run FSE, enter:

```
/fse, myfile
```

If **myfile** is not local to your session, FSE will create it. If **myfile** is a permanent file but not local, you must tell FSE to get the file as follows:

```
/fse, myfile, g
```

If you do not specify a file name, FSE will prompt you for a file name and create the file.

When FSE opens the file, it will redraw your screen so that it resembles Figure 1 and 2 (on the last page of this document). In reading the following sections, you may sometimes need to refer to these figures; note particularly the Directive Line.

Editing Keys

The directions that follow are for the VT100 and Z19/29 terminals and those terminals and micros that emulate VT100s. Remember, these keys will vary depending upon the terminal you are using. See Appendix D in the *NOS Full Screen Editor User's Guide* for the equivalent keys for your terminal.

Every text editor has its own logic and requires some practice before you can use it efficiently. Be forewarned that, when you strike some editing keys in FSE, it causes characters to appear on your screen where your cursor was. These characters are not written to your file and disappear when you complete the command sequence by pressing RETURN.

VT100

Positioning the cursor - Use the arrow keys located above the main keyboard to move your cursor around the screen. The arrow keys automatically repeat when held down on the VT100.

Correcting text - Most minor text corrections can be made by positioning the cursor at the start of the text to be corrected and typing over the existing text.

Inserting characters - Position the cursor at the point where you wish to insert text, press the number 3 key of the keypad as many times as needed and then RETURN, and add the text.

Inserting lines - Position the cursor anywhere in the line before which you want to insert the line and press the number 4 key of the keypad and then RETURN.

Deleting characters - Position the cursor on the character you wish to delete and press the PF3 key and then RETURN.

Deleting lines - Position the cursor anywhere on the line you wish to delete and press the PF4 key and then RETURN.

Paging forward - Press the number 1 key of the keypad and then RETURN.

Paging backward - Press the PF1 key plus RETURN.

Positioning the cursor - Use the arrow keys located above the main keyboard to move your cursor around the screen. The arrow keys automatically repeat when held down on the VT100.

Z19/29

Positioning the cursor - Use the arrow keys located to the left of the main keyboard to move your cursor around the screen. The arrow keys will repeat when the REPEAT key is held down.

Correcting text - Most minor text corrections can be made by positioning the cursor at the start of the text to be corrected and typing over the existing text.

Inserting characters - Position the cursor at the point where you wish to insert text, press the "IC" key of the keypad only once and add the text.

Inserting lines - Position the cursor anywhere in the line before which you want to insert the line and press "IL" key of the keypad.

Deleting characters - Position the cursor on the character you wish to delete and press the "DC" key.

Deleting lines - Position the cursor anywhere on the line you wish to delete and press the "DL" key.

Paging forward - Press the "f1" key above the keyboard and then RETURN.

Paging backward - Press the "f2" key plus RETURN.

Clearing the screen - Hold down the SHIFT key while pressing the ERASE key and then RETURN to rewrite the entire screen.

Home - The HOME key on the keypad will position the cursor at the FSE directive line, allowing you to enter FSE directives.

Programmable Function Keys

FSE requires you to use "programmable function keys." The VT100 has no such keys, but provides keypad keys instead. The list below gives the keypad equivalents of function keys. Keys F9 through F16 are not generally available on any of the other predefined terminals. If you have a CDC Viking 721, see the Screen Editing chapter of the NOS *Full Screen Editor User's Guide* .

VT100

In the following summary, unshifted function keys are the numeric keypad keys 1-9. The shifted function keys are the following keypad keys:

Function Key	Keypad Key
Shifted F1	PF1
Shifted F2	PF2
Shifted F3	PF3
Shifted F4	PF4
Shifted F5	-
Shifted F6	,
Shifted F7	ENTER
Shifted F8	.
Shifted F9	0

Key	Description
PF1	BKW FWD Lowercase (FWD) plus RETURN moves your cursor forward one page in the file. The PF1 key (BKW) plus RETURN moves back one page in the file.
F2	LINEDN LINEUP Lowercase (LINEUP) plus RETURN moves the current line to the top of the screen. The PF2 key (LINEDN) plus RETURN positions the current line to the bottom of the screen.
F3	DELC INSC Lowercase (INSC) plus RETURN inserts a character at the position marked by the cursor. The PF3 key (DELC) plus RETURN deletes the current character marked by the cursor. When the type-ahead function is active as described earlier in this document, the PF3 key can be pressed several times before the RETURN key to perform the delete or insert more than once, but you will not see the results until you press the RETURN key.
F4	DELL INSL Lowercase (INSL) plus RETURN inserts a blank line over which new text can be typed. The PF4 key (DELL) plus RETURN deletes the current line. When the type-ahead function is active, press the PF4 key several times for more than one insert or delete, but you will not see the results until you press the RETURN key.
F5	UNDO MARK Lowercase (MARK) plus RETURN the first time marks a line or the beginning of a range of lines you wish to select. Use the cursor to locate the end of a range of lines you wish to select and press the MARK key plus RETURN to close the range of lines selected. The "-" key (UNDO) plus RETURN undoes the most recent change. When the type-ahead function is active, you can press UNDO repeatedly until all changes made during the current editing session are canceled.
F6	COPY MOVE Lowercase (MOVE) plus RETURN moves any previously marked text to before the current line or character. The "," key (COPY) plus RETURN copies any marked text to before the current line or character.
F7	HOME HELP Lowercase (HELP) plus RETURN displays the FSE help file. The ENTER key (HOME) plus RETURN positions the cursor on the directive line.
F8	CLEAR QUIT Lowercase (QUIT) plus RETURN stops the current editing session. If your file is an indirect access file, the changes you've made will not become permanent when you end the terminal session. If your file is direct access, the changes will become permanent. The "." key (CLEAR) plus RETURN clears your screen.
F9	UNMARK ENDLIN Lowercase (ENDLIN) plus RETURN moves the cursor to the current line. The "0" key (UNMARK) plus RETURN cancels marks that you have previously set on text.

The following summary is for the Z19/Z29 function keys.

Function Key	Keypad Key
Shifted F1	Shifted Keypad #1
Shifted F2	Shifted Keypad #2
Shifted F3	Shifted Keypad #3
Shifted F4	Shifted Keypad #4
Shifted F5	Shifted Keypad #5
Shifted F6	Shifted Keypad #6
Shifted F7	Shifted Keypad #7
Shifted F8	Shifted Keypad #8

Key	Description
f1	<p>MARK FWD</p> <p>Lowercase f1 (FWD) plus RETURN moves your cursor forward one page in the file. Shifted Keypad #1 key (MARK) plus RETURN the first time marks a line or the beginning of a range of lines for later use with another directive. Use the cursor to locate the end of a range of lines you wish to select and press the shifted Keypad #1 key plus RETURN to close the range of lines selected.</p>
f2	<p>MRKCHR BKW</p> <p>Lowercase f2 (BKW) plus RETURN move back one page in the file. Shifted Keypad #2 key (MRKCHR) plus RETURN the first time marks a character or the beginning of a range of characters for later use with another directive. Use the cursor to locate the end of a range of characters you wish to select and press the shifted Keypad #1 key plus RETURN to close the range of characters selected.</p>
f3	<p>LINEUP</p> <p>The f3 key (LINEUP) plus RETURN moves the current line to the top of the screen.</p>
f4	<p>COPY LINEDN</p> <p>Lowercase f4 (LINEDN) plus RETURN positions the current line to the bottom of the screen. Shifted Keypad #4 key (COPY) plus RETURN copies any marked text to before the current line or character.</p>
f5	<p>MOVE ENDLIN</p> <p>Lowercase f5 (ENDLIN) plus RETURN moves the cursor to the current line. The Keypad #5 key (MOVE) plus RETURN moves any previously marked text to before the current line or character.</p>
f6	<p>UNDO</p> <p>Lowercase f6 (UNDO) undoes the most recent change. When the type-ahead function is active, you can press UNDO repeatedly until all changes made during the current editing session are canceled.</p>
f7	<p>LEFT QUIT</p> <p>Lowercase f7 (QUIT) plus RETURN stops the current editing session. If your file is an indirect access file, the changes you've made will not become permanent when you end the terminal session. If your file is direct access, the changes will become permanent. Shifted Keypad #7 key (LEFT) plus RETURN moves the cursor to the left of the current line.</p>
f8	<p>RIGHT HELP</p> <p>Lowercase (HELP) plus RETURN displays the FSE help file. Shifted Keypad #8 key (RIGHT) plus RETURN positions the cursor to the right of the current line.</p>

FSE Directives

The following is a list of the directives to be used with FSE. For directive syntax, common parameters, specific parameters for each directive, and advanced FSE functions (specifying micros, redefining Programmable Function Keys, and changing screen format), see the directive chapter in the *NOS Full Screen Editor User's Guide*, or use the FSE HELP function.

ALTER	DELETE	HELP	PRINT	TEACH	. "DOT"
BACK	EDIT	INSERT	QUIT	UNDO	- "DASH"
COPY	FSE	LOCATE	REPLACE	UNMARK	- "COMMENT"
DATA	GET	MOVE	SET	VIEW	/ "SLASH"

To access the help file, press ENTER and then RETURN to move the cursor to the directive line and then type in the directive HELP and press RETURN. This makes FSE display the first window of the help file. The F7 key, plus RETURN, will also display the first window of the help file. To page through the file, press the number 1 on the keypad and press RETURN. The help file can be searched for a directive by keying in HELP followed by a space and the directive name on the directive line. To leave HELP, move the cursor to the directive line, type EDIT, and press RETURN. The help screen will disappear and the cursor will return to the edit screen.

To leave FSE, move the cursor to the Directive Line and type QUIT.

Remember, if you are editing a local file, you must RETAIN your file after leaving FSE, or key in QUIT REPLACE (QR) on the Directive Line when exiting FSE.

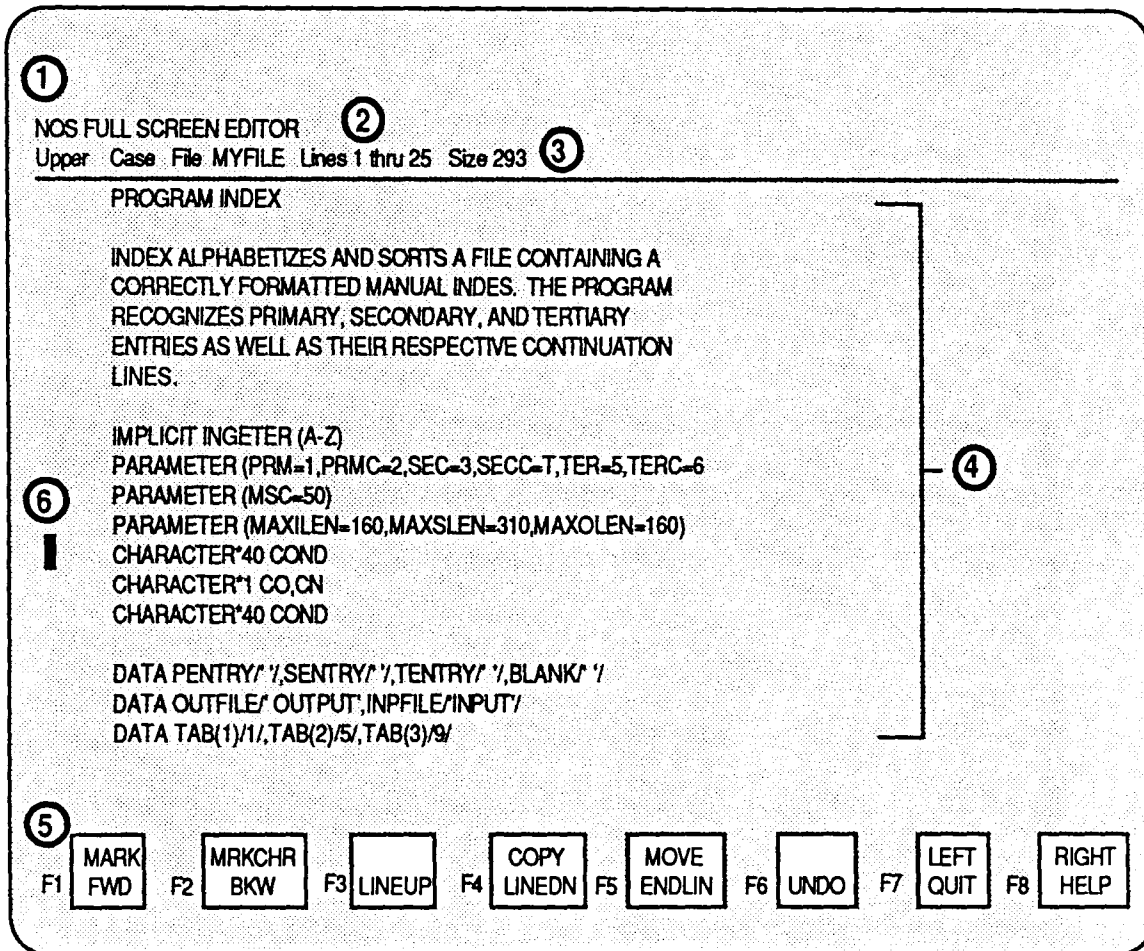


Figure 1: The FSE Screen - Z19/29

1. This is the Directive Line, on which FSE directives are to be entered. To position the cursor at this line, press the ENTER key, then RETURN.
2. This is the Message Line for FSE messages and prompts.
3. This is the File Header, which gives the current file information. If the file is upper- and lowercase, no prefix to the file name appears.
4. The contents of the file.
5. These represent the Programmable Function Key prompts. More is said about these elsewhere in this document.
6. This is the cursor, showing your current position in the file.

The above screen is adapted from CDC's *NOS Full Screen Editor User's Guide*.

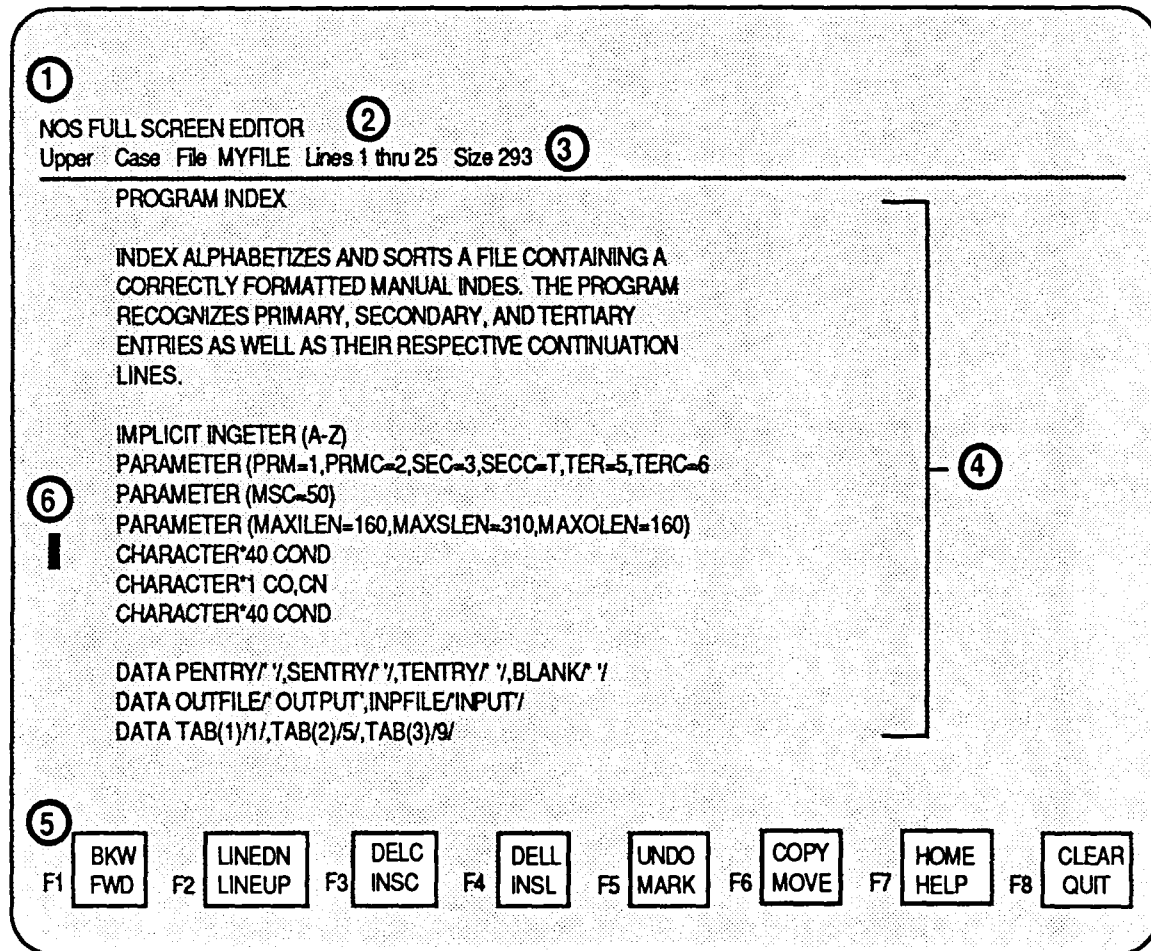


Figure 2: The FSE Screen - VT100

1. This is the Directive Line, on which FSE directives are to be entered. To position the cursor at this line, press the ENTER key, then RETURN.
2. This is the Message Line for FSE messages and prompts.
3. This is the File Header, which gives the current file information. If the file is upper- and lowercase, no prefix to the file name appears.
4. The contents of the file.
5. These represent the Programmable Function Key prompts. More is said about these elsewhere in this document.
6. This is the cursor, showing your current position in the file.

The above screen is adapted from CDC's *NOS Full Screen Editor User's Guide*.

Getting Output from the CYBER CA

Academic Computing Services (ACS) operates two Control Data Corporation (CDC) CYBER central system computers, the CYBER CA and the CYBER NV. The CYBER CA, running the NOS 2 operating system, provides interactive and batch computing services for research and interactive computing services for instructional use. This Brief provides basic information on printing files from the CA system.

ACS also operates the CYBER NV, running the NOS/VE operating system. This Brief does not contain information on printing files from the NV computer. The ACS Brief *Getting Output from the CYBER NV* has information on printing files from the NV.

Getting Printed Copies of Output

You can print files on the CA using one of two commands, **ROUTE** or **PRINT**. Both commands send a file to a printer, and both have comparable formats. But there are significant differences between the two commands.

PRINT also allows you to print files on the laser printers in default format and enables you to take advantage of the special printing capabilities of the printers. With **PRINT** you can

- print in "portrait" or "landscape" mode. ("Portrait" mode places the text on a vertical page, as this manual is printed. "Landscape" rotates the text 90 degrees, placing text on a horizontal page.)
- print 66 or 88 lines per page.
- print on one or both sides of a page (simplex or duplex).
- print on three-hole punch paper, with printing shifted one-quarter inch to allow for the punches.
- print the output reduced about 50 percent.
- print in different fonts and manipulate the format of your file.

Both commands allow you to specify the output site and bin to which your output is to be delivered.

ROUTE allows you to send a file to a laser printer for printing in the **default format only**: on 8 1/2 by 11-inch plain paper, one side per page, in *landscape* mode (i.e., horizontally across the page), with 66 lines per page. **ROUTE** also allows you to:

- designate a new site for printed output. Output goes to either a numbered bin or to specially labeled shelves. You can send terminal output to the laser printers or, in some cases, change the default printer site for a batch job.
- specify upper- and lowercase characters on your printed output when output text is in upper- and lowercase.
- request that special forms (labels, multipart paper, etc.), processed only at Lauderdale, be delivered to 128 Lind Hall, 170 Anderson Hall, or 125 E Classroom Office Building, St. Paul.

Note: Not all classroom accounts are validated to use the **ROUTE** command.

The ROUTE Command

The basic ROUTE command has the following form:

ROUTE, *filename*, *options*

where *filename* is the name of the local file you want to ROUTE and the *options* are:

- FC=xx** specifies that the file be printed on special forms. FC=LP specifies a line printer instead of a laser printer. See below for other codes.
- EC=cc** specifies external characteristics of the file, indicated by a two- or three-character code. A6 is the NORMAL 63-character set, uppercase printer output (and the default); A9 is upper- and lowercase ASCII output.
- UN=ss** specifies the site where output is to be produced. EA is 128B Lind Hall, EB is 170 Anderson Hall, BC is Lauderdale. Plots and special forms output are only produced at Lauderdale (site BC).
- UJN=ujn** specifies the site and bin number to which output should be delivered. It can, for example, be used to designate a Lind Hall delivery site for output produced at Lauderdale (site BC). Replace *ujn* with the site code and bin number, separated by an asterisk. (Example: BC*100).
- DEF** defers routing of the file OUTPUT until the job is finished. You may place the ROUTE command early in the job stream, but postpone the file's release until the job terminates. This option does not work with the EC=A9 parameter.
- ... other optional output parameters; see the on-line manual WRITEUP,COMMAND.

Special Forms

We provide a number of special forms for output, including mailing labels. Service for user-provided forms is also available. You request special services with the forms code parameter (FC=) on the ROUTE command. You should read WRITEUP,SERVICE=FORMS to get details on costs and supplies. Special forms are printed only at Lauderdale (UN=BC).

The form codes for routing to the impact printer are:

AA	Back (unlined side) of 14 7/8 x 11 inch paper
AD	Two-part, carbonless 14 7/8 x 11 inch paper
AJ	Mailing labels 15/16 x 3 1/2, 1 up
AK	Mailing labels 7/16 x 4 inch, 1 up
AL	Mailing labels 1 7/16 x 4 inch, 3 up
AM	Mailing labels 15/16 x 3 1/2 inch, 3 up
AN	Mailing labels 15/16 x 3 1/2 inch, 4 up
AR	New ribbon with stock forms
LP	Printing on a line printer, on 11 by 14-inch computer paper
ZZ	Any user-supplied form

Codes for colored paper (all 8 1/2 by 11) for routing to the Lauderdale laser printer (the Xerox 8700) are:

XB	Blue paper
XG	Green paper
XH	Goldenrod paper
XP	Pink paper
XY	Canary yellow paper

XC	100% cotton bond thesis paper
XX	User-supplied paper

If you need multiform paper, colored paper, or special forms for your printing, contact the ACS Services Supervisor (626-1661) to set up the forms code; you will use that forms code with the **ROUTE** command with that forms code to get your file printed.

The PRINT Command

The **PRINT** command has most of the parameters of the **ROUTE** command, excluding **DC** and **FC**, plus the options for special printing on the laser printers. The format of the **PRINT** command is

PRINT, filename, options

where *filename* is the name of the local file you want to print. (This is required.) The *options* are listed below. Where two options are given, the second is the default value. You can explicitly select these defaults by including them in your **PRINT** commands, or implicitly select them by omitting the option from your **PRINT** command.

The **PRINT** command has most of the parameters of the **ROUTE** command, excluding **DC** and **FC**, plus the options for special printing on the laser printers.

Parameters

EC=xx specifies the "external characteristics" of the file. The two possibilities are A6 (uppercase only) and A9 (upper and lowercase). The default is A6.

REP=n specifies the number of repeated copies printed; the default is 0 (i.e., one copy only).

PR=printer specifies any of several ACS printers on which your file will be printed. Unless otherwise specified, these printers are Apple LaserWriters. Some of the codes are:

ANDHI70	Anderson 170 (also code EB)
BLGH140A	Blegen 140
COB125A	Classroom Office Building 125
DHLH207A	Diehl 207 (was LRC)
ELTH121A	Elliott 121
FOLH14A	Folwell 14
LAUDLP	Lauderdale line printer
LIND128A	Lind 128B Printronix laser printer
LIND128B	Lind 128B
MCNH69A	McNeal 69
PHYS130A	Physics 130
WALIB9A	Walter 9
XEROX	Lauderdale Xerox 8700 laser printer

You cannot use the **PR=** and **UN=** parameters in the same **PRINT** command.

Use the **LISTPR** command to display a list of all available printers and their codes and locations.

UN=xx specifies, with a 2-character site code, the site at which your file will be printed. The default is Lauderdale (code **BC**). Only the codes **BC** (Lauderdale), **EA** (Lind), and **EB** (Anderson) are valid.

You cannot use the **PR=** and **UN=** parameters in the same **PRINT** command.

UJN=xx*xxx specifies, with a site code and bin number, the site and bin to which your output is delivered. The site codes and bin numbers of each site are listed below.

- 88,66** specifies 88 or 66 lines per page; the default is 66 lines per page.
- P, L** specifies "portrait" or "landscape" output; the default is "landscape."
- D,S** specifies duplex output (printed on both sides of a page) or simplex (printed on one side); the default is duplex on the Lauderdale Xerox 8700, simplex on all other printers.
- B,NB** bars across page; the default is NB, no bars.
- 3P,NP** specifies three-hole punched or plain paper; the default is punched (3P) on the Lauderdale Xerox 8700, plain paper (NP=No Punch) on all other printers.
- SH,NS** specifies output that is shifted for three-hole paper or not shifted; the default is shifted on the Lauderdale Xerox, not shifted on all other printers.
- R,N** specifies reduced or normal output; the default is normal.

You still use the UJN parameter to have output delivered to a specific bin at either site.

Open bins at Lauderdale (site code BC) are numbered 97 to 144; open bins at Lind Hall (site EA) are 425 to 448. Anderson Hall 170 (site EB) has public bins 501 to 550. To send output to Classroom Office Building 125E, on the St. Paul campus, use UJN=270. Here no UN parameter is necessary; the file is printed on the Lauderdale Xerox and delivered to 125E Classroom Office Building.

Certain combinations of output parameters are not valid on the PRINT command. For example, the printer can only reduce the output for landscape pages. If you select incompatible parameters, you receive an error message. The invalid parameter combinations are listed below:

<u>Invalid combinations</u>	<u>Explanations</u>
R, P	Reduction only works for landscape.
R, 88	Reduction only works for 66 lines per page.
B, P	Lines can only be drawn in landscape mode.

Examples

In the past, when you used a ROUTE command to get your CA text file called MYFILE printed in upper/lower case on a conventional line printer at the Lind Hall site, the command looked something like this:

```
ROUTE, MYFILE, DC=LP, EC=A9, UN=EA, UJN=EA*436
```

This command will now produce output on 8 1/2 by 11-inch plain paper, one-sided, in landscape mode. Your output will be printed at Lind on a laser printer and delivered to bin 436 in our Lind I/O station.

If you wanted to print the same file in portrait mode, on three-hole punched paper, shifted to the right, and double-sided, you would use the following PRINT command:

```
PRINT, MYFILE, EC=A9, UJN=EA*436, P
```

This file will be printed at Lauderdale (by default, because you have specified no printer) and delivered to Lind (as you specified with the UJN parameter).

If MYFILE is a long output listing, you might want to reduce the image, and print it duplexed on three-hole punched paper, both to reduce the bulk of the listing and to place it in a three-ring binder. The **PRINT** command would look like this:

```
PRINT, MYFILE, UJN=EA*436, R
```

This file would also be printed on the Lauderdale Xerox by default, in that printer's default format (duplex, shifted, on punched paper) and also reduced (as specified by the **R** parameter) and delivered to Lind.

Site Codes and Bin Numbers

The number on the **UJN** parameters identifies the bin where your output will be placed. Open bins at Lauderdale (site code BC) are numbered 97 to 144; open bins at Lind Hall (site EA) are 425 to 448. Anderson Hall 170 (site EB) has public bins 501 to 550. To send output to Classroom Office Building 125E, on the St. Paul campus, use **UJN=270**. Here no **UN** parameter is necessary; the file is printed on the Lauderdale xerox and delivered to 125E Classroom Office Building.

Printing Time

At printing sites (Lauderdale, Lind, and Anderson), allow at least one hour for your output to appear under normal conditions, longer if the CA is busy. (Busy times are, for example, during midquarters, at the end of a quarter, and during finals week.) Very long files, or those that require the special printing features of the Lauderdale laser printer, will take longer to arrive in campus bins. Long files are often postponed until overnight when there is less demand for the printers.

No printed file should take longer than 24 hours to arrive in your bin. If a file doesn't arrive, you should, of course, call the HELP-Line.

Finding Your Output

When you go to the site and bin to pick up your output, you may find that other users have sent their output to the same bin. Which is yours?

You can identify your output easily. The first page of each printed file displays information about the print job, including the date and time it was printed, the user name that printed the file, etc. There will also be eight large letters on this page. The first four letters are the "hash" assigned to your account. (To learn what your hash is, simply type **hash** while on the CA. The resulting display will include your user number and four-letter hash code.) Any output with your user name and hash code on it must be yours.

The second four letters in the eight-letter code are the job sequence name (JSN) of the print job. This JSN changes with each job you send to the printer, and is displayed at your terminal when you route the file, in a message like this: **ROUTE COMPLETE. JSN IS ABML.**

Printer "Carriage Control": The First Column of Output

Whenever your job produces output for a line printer, the printer sees any character in column 1 of a print line as a "carriage control" character. The character is not printed; rather it controls the behavior of the printer. For example, on a line printer you can use most or all of the following:

<u>character</u>	<u>action</u>
space	single space
1	eject page before print
0	skip 1 line before print (double space)
-	skip two lines before print (triple space)
+	suppress space before print (over-print)
/	suppress space after print (over-print)

If you don't want the first column of your output to be interpreted as carriage control—for example, if you are losing the first column of a text file or skipping pages unnecessarily—you can shift the entire file one column over with the **COPYSBF** command.

Not all possible controls are available at all sites. All these controls work when you print a file at Lauderdale (site BC).

On a laser printer, the following control characters work:

<u>character</u>	<u>action</u>
1	eject page before print
0	skip 1 line before print (double space)
-	skip two lines before print (triple space)
+	suppress space before print (over-print)

For More Information

Information about the **PRINT** command is available on-line as **WRITEUP,PRINT** on the CA. On **ROUTE** and **PRINT**, you can also refer to **WRITEUP,COMMAND**. For more information about getting output from the CYBER CA see *An Introduction to CYBER NOS Computing*.

ACSS Brief

NV Mainframe System

Academic Computing Services and Systems • University of Minnesota • Twin Cities

Getting Output from the CYBER NV

Academic Computing Services and Systems (ACSS) operates two Control Data Corporation (CDC) CYBER mainframe computers, the CYBER NV and the CYBER CA. The CYBER NV, running the NOS/VE operating system, provides interactive computer-aided design services for instructional use. This Brief provides basic information on printing files from the NV system.

ACSS also operates the CYBER CA, running the NOS 2 operating system. This Brief contains no information on printing files from the CA computer. The ACSS manual *Introduction to CYBER NOS Computing* has information on printing files from the CA.

Printer Defaults and Capabilities

You can send an NV file to a laser printer in Lind Hall 128B or Anderson 170, or to a laser printer, a Xerox 8700, at the Lauderdale Computer Facility.

If you specify no special print options (with the **PRINT_FILE** command, described below), your file is printed in the *default* format of the printer you use. Each printer has its own defaults:

By default, the Lauderdale printer prints on both sides of a sheet of paper ("duplex" mode) on three-hole punched paper (to store in a three-ring binder). The printing is also shifted a quarter-inch on the page to allow for the three punched holes.

By default, the Lind Hall printer prints on one side of a page only ("simplex" mode) on unpunched paper, with no shifting.

The Lind printer *is not capable* of duplex printing, shifting, or handling punched paper, nor can it duplicate many other options available on the Lauderdale printer. If you want any of these options, you must use the Lauderdale printer, which is the default printer. These options are explained more fully in the description of the **PRINT** command.

PRINT_FILE Command

ACSS has made significant changes to the **PRINT** command. The **PRINT** command can be used in the forms **PRINT_FILE**, **PRINT_FILES**, **PRINT**, or **PRIF**.

With **PRINT_FILE** you can easily send an NV file to an laser printer, get the file delivered to a specific site and bin, print several copies of your file, and use the printing options of the Xerox 8700 laser printer.

Users of the CYBER CA will find that the **PRINT_FILE** command is roughly similar in its options to the NOS 2 **PRINT** command. The format of the **PRINT_FILE** command is

PRINT_FILE *filename(s) option(s)*

Replace *filename(s)* with the name of the file or files you want to print. Replace *option(s)* with those printing options you want to use. (See the list of options below.)

When you print more than one file with a single command, separate file names with a space and enclose them within a single set of parentheses:

PRINT (FILE1 FILE2 FILE3) options

The options and their abbreviations (or "aliases") are listed below. **Please note** that you can use some of these options only when you print the file on the Lauderdale Xerox 8700 laser printer. (See the **PRINTER_SITE=** option, described below.)

OUTPUT_SITE= (alias **SITE** or **OS=**) specifies the site to which file will be delivered. The current options are **EA** (Lind Hall 128B), **EB** (Anderson Hall 170), and **BC** (the Lauderdale computing facility). The default is **BC**.

OUTPUT_BIN= (alias **BIN** or **OB=**) specifies the number of the bin to which your printed file will be delivered. Bins at Lind Hall are numbered 401 through 448. Open bins at Lauderdale are numbered 97 through 144. Bins at Anderson Hall are labeled 155-271. If you do not specify a bin number, your output is placed in a general bin at the site you specified.

COPIES= (alias **C=**) specifies the number of copies to print. The default, of course, is 1.

PRINT_DENSITY= (alias **PD=**) specifies the number of printed lines per page. The default is 66; the only option is 88.

PRINT_OPTIONS= (alias **PO=**) specifies the printer options you can use on a laser printer. The options are

LANDSCAPE or L	Selects wide page orientation, with text printed on a horizontal page. This is the default on all printers.
PORTRAIT or P	Selects tall page orientation, with text printed on a vertical page, like this Brief.
SIMPLEX or S	Prints on one side of a page. The default on all laser printers, except at Lauderdale.
DUPLEX or D	Prints on two sides of a page. The default on the Lauderdale laser printer.
REDUCE or R	Selects reduced printing (two pages fit on a single printed page).
NORMAL or N	Selects normal-sized printing. The default on all printers.
BARS or B	Prints bars on the page.
NO_BARS or NB	Prints no bars. The default on all printers.
SHIFT or SH	Shifts text to allow for punching. The default on the Lauderdale laser printer.
NO_SHIFT or NS	Selects no shifting. The default on all laser printers, except at Lauderdale.
THREE_HOLE_PUNCH or THP	Prints on punched paper. The default on the Lauderdale printer.
NO_THREE_HOLE_PUNCH or NTHP or NO_PUNCH or NP	Prints on unpunched paper. The default on all laser printers, except at Lauderdale.

Only the Lauderdale laser printer (the Xerox 8700) can print some options mentioned here—duplex, shifted, three-hole-punched paper, reduced printing, and bars. See the following option.

When specifying more than one option, separate them with a space or comma, and enclose them with a single set of parentheses: **PO=(L, S)**.

PRINTER_SITE= (alias **PS=**) specifies the printer on which the file is printed. Your choices are one of two laser printers: Lind Hall printer **EA**, Lauderdale printer **BC**, and Anderson Hall printer **EB**. *Only the Lauderdale laser printer (the Xerox 8700) can print some options mentioned here—duplex, shifted, three-hole-punched paper, reduced printing, and bars. The Lauderdale printer is the default printer.*

PRINTER_TYPE= (alias **PT=**) specifies the type of printer on which the file is printed. Your choices are **XEROX**, a laser printer at the specified printer site (Lind Hall, Lauderdale, or Anderson Hall), or **LP**, the line printer at Lauderdale.

Invalid Combinations

Certain combinations of these options don't work together. For example, the printer reduces output only when the file is printed in landscape mode. These are the invalid combinations:

Invalid combinations

Explanations

REDUCE and **PORTRAIT**

Reduction works only for landscape mode.

REDUCE and **PRINT_DENSITY=88**

Reduction works only when print density is 66.

BARS and **PORTRAIT**

Bars can only be drawn in landscape mode.

Setting a Banner

If you're going to print a number of jobs during a single terminal session, you can avoid retyping the **OUTPUT_SITE** and **OUTPUT_BIN** parameters by using the **CHANGE_JOB_ATTRIBUTE** command. (This command can also be placed in your login **PROLOG** file.) For example, if you want to send all your files to Lind Hall bin 436, use this command:

```
CHANGE_JOB_ATTRIBUTE ROUTING_BANNER='EA*436'
```

Thereafter, any job you send to a printer during the terminal session will get a "routing banner" that directs ACSS operators to forward the output to Lind bin 436. (A routing banner is large print on the first page of output, conventionally used at ACSS to direct files to the correct bin.) The routing banner string must have the same format as **NOS UJN=parameter**.

Examples

```
PRINT MYFILE BIN=100
```

The command above takes advantage of most of the default values of the **PRINT** command. The file **MYFILE** is printed on the Lauderdale printer and delivered to Lauderdale bin 100. It is shifted and printed on punched 8 1/2 by 11-inch paper in landscape mode on both sides of the page, with no bars, reduction, or other options.

```
PRINT MYFILE SITE=EA BIN=436 PS=EA
```

The command above sends the file **MYFILE** to the Lind Hall laser printer (**PRINTER_SITE=EA** or **PS=EA**), where it is printed in the default mode of that printer: It is in landscape mode and simplex on unpunched paper, with no other options.

```
PRINT MYFILE SITE=EA BIN=436 PO=PORTRAIT
```

The command above prints MYFILE at Lauderdale (by default) to take advantage of that printer's capabilities, and has the file delivered to Lind Hall bin 436. The file is in portrait mode (P), shifted, and printed in duplex on punched paper.

```
PRINT MYFILE SITE=EA BIN=436 PS=EA C=5
```

The command above prints five copies of MYFILE on the Lind Hall printer, and gets these copies delivered to Lind bin 436. The format of the printed file is simplex, unshifted, in landscape mode on unpunched paper.

```
PRINT MYFILE BIN=100 PO=(S,P,NS,NP)
```

The command above prints MYFILE on the Lauderdale printer and gets it delivered it to Lauderdale bin 100. However, this command prints the file in simplex and portrait mode, with no shifting and on unpunched paper.

For More Information

Type

```
DISPLAY_COMMAND_INFORMATION PRINT
```

for a brief reminder of the parameters and options of the PRINT command. Also see the on-line manual EXPLAIN M=SCL for information on the commands discussed here, CHANGE_JOB_ATTRIBUTE. For a more complete description of PRINT, type

```
WRITEUP PRINT_FILE
```




UCC BRIEF

GETTING STARTED

The University Computer Center (UCC) operates a CDC CYBER 730 for interactive computing, a CDC CYBER 74 for batch computing, and a CDC CYBER 172 (MERITSS) for instructional use. We also have a DEC VAX-11/780 (VMS) for interactive computing, and a CRAY-1A for batch.

ACCOUNTS/COSTS

To use the computer systems, you need a *user number*. This user number, along with a secure *password*, is your authorization to use the computer systems. To get a user number, you must fill out an application form. Application forms and rate sheets are available from the Account Clerk in 235c Experimental Engineering.

Guard your user number carefully since you will be responsible for all charges accrued to that number. All users should change their passwords frequently as a security measure. Instructional users cannot change their passwords. To change your password use (1) the `PASSWOR` command for your CYBER password, (2) the `SET PASSWORD` command for your VAX password, and (3) the `CRAYPW` command for your CRAY password.

University faculty, staff, and graduate students using the computer system for research projects are expected to look for external support from research grants to pay for all computing costs. The Computer Center, however, does make grants available when necessary. If you are unable to get funds elsewhere, you may apply for a grant when you open a user account.

For classroom users all *processing* charges are paid for by the University Computer Center. Departments are expected to pay for all *computing-related* costs incurred by their students.

ACCESS TO THE COMPUTER

There are currently 20 locations on the Twin Cities campus where INTERACTIVE terminals are available for instructional use. The locations are listed in the monthly UCC Newsletter. They are also available in the *Guide to CYBER Interactive Computing* along with instructions on how to operate the terminals and how to use the interactive system. The terminals at the instructional labs are intended for classroom project use on MERITSS. Research users must give priority to student users.

There are currently 11 BATCH remote job entry sites on campus where punched card jobs can be run. The locations are listed in the monthly UCC Newsletter. They are also listed in the *Guide to CYBER Batch Computing*. The guide also shows you how to prepare and submit a batch job, tells you the locations of keypunches, and explains how to get punched cards.

At the present time UCC has two public terminal clusters. Everyone with a VAX, CYBER, or CRAY account can use these terminals. There is a \$1.55 per hour surcharge added to your connect-time charges to recover the cost of providing this service. These public research clusters are located in 14 Folwell Hall, and 167B Social Sciences. Additional research clusters are planned for 130 Experimental Engineering and 69 Physics.

DOCUMENTATION

UCC produces and sells documentation ranging from introductory guides to involved writeups describing subroutines and packages. You should investigate these documents before attempting any computing at UCC.

Printed Documents

Many of these documents are available at no direct cost to you. Some of these free documents are the *Documentation Directory* which lists all major UCC documents, and *UCC Briefs* which are introductory sheets describing special areas of interest, including access to the VAX and CRAY. They are available in 140 Experimental Engineering. UCC also publishes a monthly newsletter for its users. For a subscription, call 376-4912.

Other documents are available at a nominal cost from UCC's Computer Store, 211 Experimental Engineering (373-4877). Some documents you may want to purchase are: the *Guide to CYBER Interactive Computing*, the *Guide to CYBER Batch Computing, Facilities and Services*, the *VAX/VMS Primer*, and the *CRAY Operating System Reference Manual*.

Writeups from the Computer

The WRITEUP control statement on the CYBERs and the HELP and MOREHELP commands on the VAX/VMS system can give you many documents directly from the computer itself. On the VAX, simply type HELP. For the CYBERs type WRITEUP to find out how to use the WRITEUP facility, and WRITEUP(INDEX) for a list of all documents available.

RELATED SERVICES

Short Courses

A schedule of the UCC short courses being taught each school quarter is available in 140 Experimental Engineering or WRITEUP(CLASSES=CURRENT). These low cost classes are open to any new or experienced UCC computer user, and cover many topics. Use the command WRITEUP(CLASSES) to get a short detailed description of each class. For more information contact Jerry Stearns, 376-8806.

Learning from Video Tapes

UCC has several instructional video tapes you may find useful, including: "Interactive Processing: Parts 1 and 2," and "The How-tos of Key punching." These and others are available in the learning resource centers at: 204 Walter Library (East Bank); Engineering Library, Lind Hall (East Bank); and Temporary South of Coffey (St. Paul).

Consulting

UCC provides consultants to help with problems and questions about the computer systems and software. See WRITEUP(CONSULT) for hours.

140 Experimental Engineering	9 AM - 5 PM	M-F,	7 PM - 9 PM	M-Th	
HELP-line	9 AM - 5 PM		M-F		(612)376-5592
Statistics Packages	1 PM - 2 PM		M-F		376-5062
Business Data Products	1 PM - 3 PM		M-F		376-1761
Microcomputers	10 AM - 12 N & 2-4 PM		M-F		376-4276
Non-Traditional	10:30-11:30 AM		M W F		373-5780
Text Processing	9 AM - 12 N		T W TH		376-2943

You should not ask the UCC consultants to write your programs or correct them for you. If you have any other problems or questions you may call User Services at 373-3963.



UCC BRIEF

GETTING STARTED AT UCC

The University of Minnesota Computer Center (UCC) operates a CDC CYBER for interactive and batch research computing (system CA), two CDC CYBERs for interactive instructional use (MERITSS systems ME and MD), a DEC VAX-11/780 for interactive computing (system VA), and a CRAY-1 for large-scale batch computing (system CR).

ACCOUNTS/COSTS

To use our computer systems, you need a *user number* (with a secret password). To get a user number, you must fill out an application form available from the Accounting Office in 235c Exp Eng (373-4548). The office also has computer rate sheets. MERITSS users must contact the MERITSS group in 210 Exp Eng (373-7745).

Guard your user number and password carefully since you will be responsible for all charges accrued to that number. You should change your password frequently as a security measure. Classroom users cannot change their passwords. To change your password use (1) the `PASSWOR` command for your CYBER password, (2) the `SET PASSWORD` command for your VAX password, and (3) the `CRAYPW` command for your CRAY password.

University faculty, staff, and graduate students using the computer system for research projects are expected to look for external support from research grants to pay for all computing costs. The Computer Center, however, does make grants available when necessary. If you are unable to get funds elsewhere, you may apply for a grant when you open a user account.

For classroom users all *processing* charges are paid by the University Computer Center. Departments are billed for all *computing-related* costs incurred by their students.

ACCESS TO THE COMPUTER

There are currently 18 locations on the Twin Cities campus where INTERACTIVE terminals are available for classroom project use. The locations are listed in the monthly UCC Newsletter, online in `WRITEUP(LABS)`, and in the *Guide to CYBER Computing* along with instructions on how to operate the terminals and how to use the interactive system. The terminals at the instructional labs are intended only for classroom project use on MERITSS.

There are currently 8 BATCH remote job entry sites on campus where punched card jobs can be run. The locations are listed in the monthly UCC Newsletter in `WRITEUP(LABS)`, and in the *Guide to CYBER Computing*. The Guide shows you how to prepare and submit a batch job, tells you the locations of keypunches, and explains how to get punched cards.

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Business Data Products	1 PM - 3 PM M-F	376-1761
Microcomputers	10 AM - 12 N & 2-4 PM M-F	376-4276
Non-Traditional and Text/Word Processing (124 Shepherd Labs)	1 PM - 3 PM M-F	376-2944
Graphics	9 AM - 5 PM M-F	376-5592

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Guard your user number and password carefully since you will be responsible for all charges accrued to that number. You should change your password frequently as a security measure. Classroom users cannot change their passwords. To change your password use (1) the `PASSWOR` command for your CYBER password, (2) the `SET PASSWORD` command for your VAX password, and (3) the `CRAYPW` command for your CRAY password (until April 1, when you should use the `ACCOUNT` command for this purpose).

University faculty, staff, and graduate students using the computer system for research projects are expected to look for external support from research grants to pay for all computing costs. The Computer Center, however, does make grants available when necessary. If you are unable to get funds elsewhere, you may apply for a grant when you open a user account.

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There are currently 20 locations on the Twin Cities campus where INTERACTIVE terminals are available for classroom project use. The locations are listed in the monthly UCC Newsletter, on-line in `WRITEUP(LABS)`, and in the *Guide to CYBER Computing* along with instructions on how to operate the terminals and how to use the interactive system. The terminals at the instructional labs are intended only for classroom project use on MERITSS.

There are currently 5 BATCH remote job entry sites on campus where punched card jobs can be run. The locations are listed in the monthly UCC Newsletter, on-line in `WRITEUP(LABS)`, and in the *Guide to CYBER Computing*. The Guide shows you how to prepare and submit a batch job, tells you the locations of keypunches, and explains how to get punched cards.

At the present time UCC has four public terminal clusters. Anyone with a VAX, CYBER, or CRAY account can use these terminals. There is a \$1.55 per hour surcharge added to your connect-time charges to recover the cost of providing this service. These public research clusters are located in 14 Folwell Hall, 25 Blegen, 69 Physics, and 130 Experimental Engineering.

SERVICES

UCC produces and sells documentation ranging from introductory guides to writeups describing subroutines and packages. You should investigate these documents before attempting any computing at UCC.

Printed Documents

Several of UCC's documents are available at no direct cost to you. These free documents are the *UCC Briefs* which are introductory sheets describing special areas of interest, including access to the VAX. They are available in 130 and 140 Experimental Engineering. UCC also publishes a free monthly newsletter for its users. For a subscription, call 376-4912.

Other documents are available at a nominal cost from UCC's Computer Store, 20 Exp. Eng. (basement) (373-4877). Some documents you may want to purchase are: the *Guide to CYBER Computing, Introduction to Computing, Facilities and Services*, the *VAX/VMS Primer*, *VAX/VMS Command Language User's Guide*, and the *CRAY Operating System Reference Manual*.

Writeups from the Computer

The WRITEUP control statement on the CYBERs and the HELP and MOREHELP commands on the VAX/VMS system can give you many documents directly from the computer itself. On the VAX, simply type HELP for VMS system information and MOREHELP for service information. For the CYBERs type WRITEUP to find out how to use the WRITEUP facility, and WRITEUP(INDEX) for a list of all documents available.

Short Courses

A schedule of the UCC short courses being taught each school quarter is available in 130 Experimental Engineering or on WRITEUP(CLASSES=CURRENT). These low cost classes are open to any new or experienced UCC computer user, and cover many topics. Use the command WRITEUP(CLASSES) to get a short detailed description of each class. For more information call 376-8806.

Video Tapes

UCC has several instructional video tapes you may find useful, including: "Interactive Processing: Parts 1 and 2," and "The How-tos of Key punching." These and others are available in the learning resource centers at: 204 Walter Library (East Bank); Lind Hall Engineering Library; Diehl Hall Biomedical Library; and St. Paul Central Library.

Consulting

UCC provides consultants to help with problems and questions about the computer systems and software. See WRITEUP(CONSULT) for hours.

130 Experimental Engineering	10 AM - 4 PM	M-F,	7 PM - 9 PM	M-TH	
HELP-line	9 AM - 5 PM		M-F		(612)376-5592
Statistics Packages	1 PM - 2 PM		M-F		376-5062
Business Data Products	1 PM - 3 PM		M-F		376-1761
Microcomputers	10 AM - 12 N & 2-4 PM		M-F		376-4276
Non-Numeric	1 PM - 3 PM		M-F		376-2944

You should not ask the UCC consultants to write your programs or correct them for you.

If you have any other problems or questions you may call the HELP-line at 376-5592.



UCC BRIEF

GETTING STARTED AT UCC

The University of Minnesota Computer Center (UCC) operates a CDC CYBER for interactive and batch research computing (system CA), two CDC CYBERs for interactive instructional use (MERITSS systems ME and MD), a DEC VAX-11/780 for interactive computing (system VA), and a CRAY-1 for large-scale batch computing (system CR).

ACCOUNTS/COSTS

To use our computer systems, you need a *user number* (with a secret password). To get a user number, you must fill out an application form available from the Accounting Office in 235d Exp Eng (373-4548). The office also has computer rate sheets. MERITSS users must contact the MERITSS group in 214 Exp Eng (373-7753).

Guard your user number and password carefully since you will be responsible for all charges accrued to that number. You should change your password frequently as a security measure. Classroom users cannot change their passwords. To change your password use (1) the `PASSWOR` command for your CYBER password, (2) the `SET PASSWORD` command for your VAX password, and (3) the `ACCOUNT` command for your CRAY password.

University faculty, staff, and graduate students using the computer system for research projects are expected to look for external support from research grants to pay for all computing costs. The Computer Center, however, does make grants available when necessary. If you are unable to get funds elsewhere, you may apply for a grant when you open a user account.

For classroom users all *processing* charges are paid by the University Computer Center. Departments are billed for all *computing-related* costs incurred by their students.

ACCESS TO THE COMPUTER

There are currently 20 locations on the Twin Cities campus where INTERACTIVE terminals are available for classroom project use. The locations are listed in the monthly UCC Newsletter, on-line in `WRITEUP(LABS)`, and in the *Guide to CYBER Computing* along with instructions on how to operate the terminals and how to use the interactive system. The terminals at the instructional labs are intended only for classroom project use on MERITSS.

There are currently 5 BATCH remote job entry sites on campus where punched card jobs can be run. The locations are listed in the monthly UCC Newsletter, on-line in `WRITEUP(LABS)`, and in the *Guide to CYBER Computing*. The Guide shows you how to prepare and submit a batch job, tells you the locations of keypunches, and explains how to get punched cards.

At the present time UCC has three public terminal clusters. Anyone with a VAX, CYBER, or CRAY account can use these terminals. There is a \$1.55 per hour surcharge added to your connect-time charges to recover the cost of providing this service. These public research clusters are located in 14 Folwell Hall, 69 Physics, and 130 Experimental Engineering.

SERVICES

UCC produces documentation ranging from introductory guides to writeups describing subroutines and packages. You should investigate these documents before attempting any computing at UCC.

Printed Documents

Several of UCC's documents are available at no direct cost to you. These free documents are the *UCC Briefs* which are introductory sheets describing special areas of interest, including access to the VAX. They are available in 140 Experimental Engineering. UCC also publishes a free monthly newsletter for its users. For a subscription, call 376-1491.

Other documents are available at a nominal cost from the U of M Computer Stores in the Williamson Hall bookstore (East Bank) and the H.D. Smith bookstore (West Bank). Some documents you may want to purchase are: the *Guide to CYBER Computing*, the *CYBER Supplement*, *Introduction to Computing*, the *Guide to CRAY Computing, Facilities and Services*, the *VAX/VMS Primer*, and the *VAX/VMS Command Language User's Guide*.

Writeups from the Computer

The WRITEUP control statement on the CYBERs and the HELP and MOREHELP commands on the VAX/VMS system can give you many documents directly from the computer itself. On the VAX, simply type HELP for VMS system information and MOREHELP for service information. For the CYBERs type WRITEUP to find out how to use the WRITEUP facility, and WRITEUP(INDEX) for a list of all documents available.

Short Courses

A schedule of the UCC short courses being taught each school quarter is available in 130 Experimental Engineering or on WRITEUP(CLASSES=CURRENT). These low cost classes are open to any new or experienced UCC computer user, and cover many topics. Use the command WRITEUP(CLASSES) to get a short detailed description of each class. Fees and registration are handled through the Reference Room, 140 Experimental Engineering. For more information call 376-8806.

Video Tapes

UCC has several instructional video tapes you may find useful, including: "Interactive Processing: Parts 1 and 2," "Introduction to CRAY Access," and "The How-tos of Key punching." These and others are available in the learning resource centers at: 204a Walter Library (East Bank); 128 Lind Hall, Engineering Library; 270 Diehl Hall, Biomedical Library; and the St. Paul Campus Library Listening and Viewing Area.

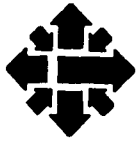
Consulting

UCC provides consultants to help with problems and questions about the computer systems and software. See WRITEUP(CONSULT) for hours.

130 Experimental Engineering	10 AM - 4 PM	M-F, 7 PM - 9 PM	T	
HELP-line	7 AM - 7 PM		M-F	(612)376-5592
Statistics Packages	1 PM - 2 PM		M-F	376-1761
Data Bases	10 AM - 11 PM		M-F	376-1761
Microcomputers	9:30 AM - 12 N & 1:30-4 PM		M-F	376-4276
Text/Word Processing	1 PM - 4 PM		M-F	376-2943

You should not ask the UCC consultants to write your programs or correct them for you.

If you have any other problems or questions you may call the HELP-line at 376-5592.



ACSS BRIEF

GETTING STARTED AT ACSS

The University of Minnesota Academic Computing Services and Systems (ACSS) operates a CDC CYBER for interactive and batch research computing (system CA), two CDC CYBERs for interactive instructional use (MERITSS systems ME and MD), and a DEC VAX-11/780 (system VA) and VAX 8600 (system VX) for interactive computing. As this *Brief* goes to press, details on the new 8600 are not yet available.

ACCOUNTS/COSTS

To use ACSS's computer systems, you need a user name (with a secret password). To get a user name, you must fill out an application form available from the Accounting Office in 7A Wulling Hall (373-4548). The office also has computer rate sheets. MERITSS users must contact MERITSS Accounting in 7A Wulling Hall (373-7745).

Guard your user name and password carefully since you will be responsible for all charges accrued to that account. You should change your password frequently as a security measure. Classroom users cannot change their passwords. To change your password use (1) the `PASSWOR` command for your CYBER password or (2) the `SET PASSWORD` command for your VAX password.

University faculty, staff, and graduate students who use the computer systems for research projects are expected to look for external support from research grants to pay for all computing costs. However, ACSS does make grants available when necessary. If you are unable to get funds elsewhere, you may apply for a grant when you open a user account.

ACSS pays for all processing charges incurred by classroom users. Departments are billed for all computing-related costs incurred by their students.

COMPUTER ACCESS

Twenty-two locations with INTERACTIVE terminals and seven BATCH printer sites (five with card readers), where punched card jobs can be run, are currently available on the Twin Cities campus. The locations are listed in the monthly *ACSS Newsletter*, on line in `WRITEUP(LABS)`, and in manuals published by ACSS — *An Introduction to CYBER Computing* and *An Introduction to MERITSS Computing*. At present, the terminals in the instructional labs are intended only for classroom project use on MERITSS. This will change during 1986, as explained below.

At the present time ACSS has four public terminal clusters. Anyone with a VAX or CYBER account can use these terminals. There is a \$1.55 per hour surcharge added to your connect-time charges to recover the cost of providing this service. These public research clusters are located in 25 Blegen Hall, 14 Folwell Hall, 128B Lind Hall, and 69 Physics. During winter quarter 1986, ACSS will combine clusters and instructional labs into "public labs," from which any user can access any mainframe. Watch the *ACSS Newsletter* for details.

If you have a terminal or a microcomputer with communications software and a modem, you may access the computer via telephone lines. The dial-up numbers are listed below.

CYBER CA	110 & 300 baud	376-5730
CYBER CA	1200 baud	376-5706
MERITSS ME/MD	300 baud (only)	376-7730
VAX/VMS VA	300 & 1200 baud	376-8070

An Introduction to CYBER Computing has instructions on how to use the interactive system and how to prepare and submit a batch job.

DOCUMENTATION

ACSS produces documentation ranging from printed guides to on-line information.

Several of ACSS's documents are available at no direct cost to you. These free documents are the *ACSS Briefs*, which are introductory sheets describing special areas of interest. *Briefs* are available in 128A Lind Hall. ACSS also publishes a free monthly newsletter for its users. To request a subscription, call 376-1491.

Other documents are available at a nominal cost at the Electronics Desk in the Minnesota Book Center (Williamson Hall) and the H. D. Smith Bookstore. You may want to purchase some of the following documents: *An Introduction to CYBER Computing*, *CYBER Supplement*, *An Introduction to MERITSS Computing*, *Introduction to Computing, Facilities and Services*, *VAX/VMS Primer*, and *VAX/VMS Command Language User's Guide*.

On-line documentation is available on all the ACSS computer systems. On the CYBER CA, MD, and ME machines the on-line documents are available via the WRITEUP and EXPLAIN commands. To get instructions for the WRITEUP utility, read the one-page *Brief* titled *WRITEUP Information* (available in 128A Lind Hall) or just type WRITEUP while you are logged in to the machine. The command EXPLAIN is described in the *Brief* titled *EXPLAIN Information* available in 128A Lind Hall. You can also type EXPLAIN while you are logged in to the machine and obtain help interactively on how to use the utility. To obtain on-line documentation on the VAX/VMS system, simply type HELP for VMS system information and MOREHELP for service information.

SHORT COURSES

Throughout the year ACSS offers many non-credit short courses and seminars to help you use the computer systems. Course topics include: introductions to computers, to interactive computing, and to ACSS; CYBER, VAX, and microcomputer operating systems; programming languages; statistical and data base programs; text processing and analysis; and graphics. A current schedule is listed in the *ACSS Newsletter*. To get additional information about ACSS Short Courses, use the command WRITEUP(CLASSES). A fee is charged for enrollment. Register in person at the Reference Room, 128A Lind Hall. Mail registrations can be sent to Short Course Registration, Academic Computing Services and Systems, 128A Lind Hall. Contact Jerry Stearns for more information at 376-8806.

CONSULTING

ACSS provides consultants to help with problems and questions about the computer systems and software. You should not ask the ACSS consultants to write your programs or correct them for you. See WRITEUP(CONSULT) for hours.

If you have any other problems or questions you may call the HELP-Line at 376-5592.

WALK-IN Consulting	10 am – 4 pm 10 am – Noon & 2 pm – 4 pm 7 pm – 9 pm	M – W & F Th T & Th	128 Lind Hall
HELP-Line	8 am – 5 pm	M – F	376-5592
Artificial Intelligence	3 pm – 4 pm	M – F	376-2944
Data Bases	10 am – 11 am	M – F	376-1761
Graphics	8 am – 5 pm	M – F	376-5592
Microcomputers	9:30 am – Noon & 1:30-4 pm	M – F	376-4276
Statistics Packages	1 pm – 2 pm	M – F	376-1761
Text Processing & Analysis	3 pm – 4 pm	M – F	376-2944

ACSS Brief

General Information

Academic Computing Services and Systems • University of Minnesota • Twin Cities

Getting Started at ACSS

The University of Minnesota Academic Computing Services and Systems (ACSS) provides computing services for research and instructional use. This Brief gives information about ACSS's mainframe computer systems, computer accounts and costs, computer access, documentation, short courses, and consulting services.

Mainframe Computer Systems

The mainframe computers that ACSS operates include

<u>manufacturer</u>	<u>computer</u>	<u>operating system</u>	<u>mnemonic</u>
Control Data Corporation (CDC)	CYBER 170-855 CYBER 180-830	NOS 2.5 NOS/VE 1.2	CA system NV system
Encore Computer Corporation (ECC) Digital Equipment Corporation (DEC)	ENCORE Multimax VAX 8600	UMAX 4.2 VMS 4.5	UX system VX system

Accounts/Costs

To use any of ACSS's mainframe computers, you need a user name with a secret password. To obtain an application for a user name, either call the ACSS Accounting Office (625-1511) or pick one up at the ACSS Computing Information Center (CIC) in 128A Lind Hall. Both offices also distribute computer rate sheets. If you are a faculty member who would like to use a mainframe computer for instruction, you should contact the ACSS instructional computing consultant (626-0200).

Guard your user name and password carefully since you will be responsible for all charges accrued to your user name. You should change your password frequently as a security measure. For instructions on how to change your password, refer to the appropriate ACSS Access Brief written for the system that you are using: *CYBER/NOS Access*, *CYBER/VE Access*, *ENCORE/UNIX Access*, or *VAX/VMS Access*. (Classroom users usually cannot change their passwords.)

University faculty, staff, and graduate students who use a mainframe computer system for research projects are expected to look for external support from research grants to pay for all computing costs. However, ACSS does provide \$1000 grants when necessary. If you are unable to get funds elsewhere, you may apply for a grant when you submit your application for a user name; there is a \$50 nonrefundable annual grant fee.

ACSS pays for all processing charges incurred by classroom users. Departments are billed for all computing-related costs incurred by their students.

Computer Access

ACSS maintains many public labs on campus; anyone with an CA, NV, UX, or VX user name can use the terminals in these labs. The locations of campus computing labs are listed on line in WRITEUP,LABS on the CA System; in the monthly *ACSS Newsletter*; in the free map *Information Systems Computing Facilities*; and in the ACSS manuals *An Introduction to CYBER NOS Computing* and *An Introduction to UNIX Computing*.

The ACSS Access Briefs mentioned above in the Accounts/Costs section and the ACSS manuals *An Introduction to CYBER NOS Computing* and *An Introduction to UNIX Computing* give instructions on how to access the computer system by using a public lab or by dialing up from your home or office and how to log in and log out.

Documentation

ACSS publishes free documentation that can help you use its mainframe computer systems. On-line documentation gives you help when you are logged in to the system. Manuals and guides published by ACSS as well as by vendors (computer manufacturers and software developers) give information about using the mainframe computer systems. If you just need to look at a manual for reference, the Computing Information Center in 128A Lind Hall maintains a complete set of documentation for hardware, software, and applications packages.

Free documentation. Briefs, brochures, and maps are available in 128A Lind Hall at no direct cost to you. ACSS also publishes two free monthly newsletters for its users. To request a subscription, call 625-7397.

On-line documentation. On the CA system, on-line documents are available via the WRITEUP and EXPLAIN utilities. To get instructions for these utilities, refer to the ACSS Briefs *WRITEUP Information* or *EXPLAIN Information*, available in 128A Lind Hall. You also can type WRITEUP or EXPLAIN while you are logged in to the CA system. On the NV system type WRITUEP to obtain on-line documentation. To obtain on-line documentation on the VX system, type HELP for system information and MOREHELP for service information. To obtain on-line documentation on the UX system, type man man.

Manuals and guides. ACSS publishes several manuals and guides, which you can purchase at University bookstores. Manuals published by vendors such as Digital Equipment Corporation's (DEC) *Introduction to VAX/VMS* and Control Data Corporation's (CDC) *Full Screen Editor User's Guide*, must be ordered directly from the vendor. Staff at the Computing Information Center, 128A Lind Hall, can provide information on how to place an order.

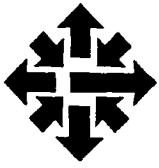
Short Courses

Throughout the year ACSS offers many noncredit short courses and seminars to help you use the computer systems. Course topics include: introductions to computers, to interactive computing, and to ACSS; CYBER, VAX, UNIX, and microcomputer operating systems; programming languages; statistical and data base programs; text processing and analysis; and graphics. A current schedule is listed in the *ACSS Newsletter*. On the CA system, use the command WRITEUP,CLASSES to get additional information about the courses ACSS offers. Introductory courses are free. A fee is charged for advanced courses. Register in person at the Computing Information Center, 128A Lind Hall. Registrations also can be sent either by campus mail to Short Course Registration, Academic Computing Services and Systems, 128A Lind Hall, or by federal mail to ACSS Short Course Registration, 128A Lind Hall, University of Minnesota, 207 Church Street SE, Minneapolis, MN 55455. For more information, contact the Computing Information Center at 625-7397.

Consulting Services

ACSS provides consultants to help with problems and questions about computer systems and software. You should not ask the ACSS consultants to write your programs or correct them for you. For information about their hours and specializations, see WRITEUP,CONSKED on the CA system or MOREHELP CONSULTING on the VX system. If you have any other problems or questions, you should call the HELP-Line at 626-5592.

WALK-IN Consulting	10 am - 4 pm	W, Th, F	128C Lind Hall
	10 am - 2 pm	M	
	10 am -12 noon, 2 pm - 4 pm	Tu	
	11:30 am -1:30 pm	Tu	140 Blegen Hall
	10 am - 12 noon	W	
	12:30 pm - 2:30 pm	Th	
HELP-Line	8 am - 5 pm	M - F	626-5592
Artificial Intelligence	3 pm - 4 pm	M - F	625-8332
Data Bases	10 am - 11 am	M - F	626-1887
Graphics	8 am - 5 pm	M - F	626-5592
Microcomputers	9 am - 4 pm	M - F	626-4276
	(Closed from 12:00 to 1:30 pm-M, Tu, F)		
Statistics Packages	1 pm - 3 pm	M - F	626-1887
Text Analysis/Humanities	3 pm - 4 pm	M - F	625-8332
Text Processing	10 am - Noon	Tu, W, & Th	625-1391



ACSS Brief

Getting Started

The University of Minnesota Academic Computing Services and Systems (ACSS) operates a CDC CYBER for interactive and batch research computing (system CA), two CDC CYBERs for interactive instructional use (MERITSS systems ME and MD), and a DEC VAX 8600 (system VX) for interactive computing.

ACCOUNTS/COSTS

To use ACSS's computer systems, you need a user name (with a secret password). To get a user name, you must fill out an application form available from the Accounting Office in 7A Wulling Hall (625-1511). The office also has computer rate sheets. MERITSS users should contact MERITSS Accounting also in 7A Wulling Hall (625-1511).

Guard your user name and password carefully since you will be responsible for all charges accrued to that account. You should change your password frequently as a security measure. Classroom users cannot change their passwords. To change your password use (1) the `PASSWOR` command for your CYBER password or (2) the `SET PASSWORD` command for your VAX password.

University faculty, staff, and graduate students who use the computer systems for research projects are expected to look for external support from research grants to pay for all computing costs. However, ACSS does make grants available when necessary. If you are unable to get funds elsewhere, you may apply for a grant when you open a user account.

ACSS pays for all processing charges incurred by classroom users. Departments are billed for all computing-related costs incurred by their students.

COMPUTER ACCESS

The locations of campus computing labs are listed on line in `WRITEUP(LABS)`, in the monthly *ACSS Newsletter*, and in manuals published by ACSS — *An Introduction to CYBER Computing* and *An Introduction to MERITSS Computing*.

ACSS maintains many public labs on campus; anyone with a VAX or CYBER account can use the terminals in these labs. These public labs are located in 25 Blegen Hall, 14 Folwell Hall, 128B Lind Hall, 69 Physics, and elsewhere. (See the *Information Services Computing Facilities Map* for locations of labs and a list of terminals.)

If you have a terminal or a microcomputer with communications software and a modem, you may access the computer via telephone lines. The dial-up numbers are listed below.

CYBER CA	110 & 300 baud	376-5730
CYBER CA	1200 baud	376-5706
MERITSS ME/MD	300 baud (only)	376-7730
VAX/VMS VX	300 & 1200 baud	376-9070

An Introduction to CYBER Computing has instructions on how to use the interactive system and how to prepare and submit a batch job.

DOCUMENTATION

ACSS produces documentation ranging from printed guides to on-line information.

Several of ACSS's documents are available at no direct cost to you. These free documents are the *ACSS Briefs*, which are introductory sheets describing special areas of interest. *Briefs* are available in 128A Lind Hall. ACSS also publishes a free monthly newsletter for its users. To request a subscription, call 376-1491.

Other documents are available at a nominal cost at the Electronics Desk in the Minnesota Book Center (Williamson Hall) and the H. D. Smith Bookstore. You may want to purchase some of the following documents: *An Introduction to CYBER Computing*, *CYBER Supplement*, *An Introduction to MERITSS Computing*, *Introduction to Computing, Facilities and Services*, *VAX/VMS Primer*, and *VAX/VMS Command Language User's Guide*.

On-line documentation is available on all the ACSS computer systems. On the CYBER CA, MD, and ME machines the on-line documents are available via the WRITEUP and EXPLAIN commands. To get instructions for the WRITEUP utility, read the one-page *Brief* titled *WRITEUP Information* (available in 128A Lind Hall) or just type WRITEUP while you are logged in to the machine. The command EXPLAIN is described in the *Brief* titled *EXPLAIN Information* available in 128A Lind Hall. You can also type EXPLAIN while you are logged in to the machine and obtain help interactively on how to use the utility. To obtain on-line documentation on the VAX/VMS system, simply type HELP for VMS system information and MOREHELP for service information.

SHORT COURSES

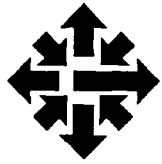
Throughout the year ACSS offers many non-credit short courses and seminars to help you use the computer systems. Course topics include: introductions to computers, to interactive computing, and to ACSS; CYBER, VAX, and microcomputer operating systems; programming languages; statistical and data base programs; text processing and analysis; and graphics. A current schedule is listed in the *ACSS Newsletter*. To get additional information about ACSS Short Courses, use the command WRITEUP(CLASSES). A fee is charged for enrollment. Register in person at the Reference Room, 128A Lind Hall. Mail registrations can be sent to Short Course Registration, Academic Computing Services and Systems, 128A Lind Hall. Contact Jerry Stearns for more information at 625-1543.

CONSULTING

ACSS provides consultants to help with problems and questions about the computer systems and software. You should not ask the ACSS consultants to write your programs or correct them for you. See WRITEUP(CONSULT) for hours.

If you have any other problems or questions you may call the HELP-Line at 376-5592.

WALK-IN Consulting	10 am – 4 pm 7 pm – 9 pm	M – F M & W	128 Lind Hall
HELP-Line	8 am – 5 pm	M – F	376-5592
Artificial Intelligence	3 pm – 4 pm	M – F	625-8332
Data Bases	10 am – 11 am	M – F	376-1761
Graphics	8 am – 5 pm	M – F	376-5592
Microcomputers	9 am – Noon & 1:30 – 4 pm	M, T, & F	626-4276
	9 am – 4 pm	W & Th	626-4276
Statistics Packages	1 pm – 2 pm	M – F	376-1761
Text Analysis	3 pm – 4 pm	M – F	625-8332
Text Processing	9 am – 11 am	M & T	625-1391
	1 pm – 3 pm	W & F	625-1391



ACSS Brief

Getting Started

The University of Minnesota Academic Computing Services and Systems (ACSS) operates a CDC CYBER for interactive and batch research computing and MERITSS interactive instructional computing (system CA), a CDC CYBER for interactive computer-aided design instructional use (MERITSS system MD), and a DEC VAX 8600 (system VX) for interactive computing in research and instruction.

ACCOUNTS/COSTS

To use ACSS's computer systems, you need a user name (with a secret password). To get a user name, you must fill out an application form available from the Accounting Office in 7A Wulling Hall (625-1511). The office also has computer rate sheets. MERITSS users should contact MERITSS Accounting also in 7A Wulling Hall (625-1511).

Guard your user name and password carefully since you will be responsible for all charges accrued to that account. You should change your password frequently as a security measure. Classroom users cannot change their passwords. To change your password use (1) the `PASSWOR` command for your CYBER password or (2) the `SET PASSWORD` command for your VAX password.

University faculty, staff, and graduate students who use the computer systems for research projects are expected to look for external support from research grants to pay for all computing costs. However, ACSS does make grants available when necessary. If you are unable to get funds elsewhere, you may apply for a grant when you open a user account.

ACSS pays for all processing charges incurred by classroom users. Departments are billed for all computing-related costs incurred by their students.

COMPUTER ACCESS

The locations of campus computing labs are listed on line in `WRITEUP(LABS)`, in the monthly *ACSS Newsletter*, and in the manual *An Introduction to CYBER Computing* published by ACSS.

ACSS maintains many public labs on campus; anyone with a VAX or CYBER account can use the terminals in these labs. Public labs are located in 140 Blegen Hall, 14 Folwell Hall, 128B Lind Hall, 130 Physics, and elsewhere. (See the *Information Services Computing Facilities Map* for locations of labs and a list of terminals.)

If you have a terminal or a microcomputer with communications software and a modem, you may access the computer via telephone lines. The dial-up numbers are listed below.

CYBER CA	626-1620
CYBER MD	626-1622
VAX VX	626-1641

An Introduction to CYBER Computing has instructions on how to use the interactive system and how to prepare and submit a batch job.

DOCUMENTATION

ACSS produces documentation ranging from printed guides to on-line information.

Several of ACSS's documents are available at no direct cost to you. These free documents are the *ACSS Briefs*, which are introductory sheets describing special areas of interest. *Briefs* are available in 128A Lind Hall. ACSS also publishes a free monthly newsletter for its users. To request a subscription, call 625-7397.

Other documents are available at a nominal cost at the Electronics Desk in the Minnesota Book Center (Williamson Hall) and the H. D. Smith Bookstore. You may want to purchase some of the following documents: *An Introduction to CYBER Computing*, *CYBER Supplement*, *Introduction to Computing, Facilities and Services*. Vendor-published manuals, such as *Introduction to VAX/VMS* and the *VAX/VMS DCL Dictionary*, may be ordered at the Information Desk in the Minnesota Book Center.

On-line documentation is available on all the ACSS computer systems. On the CYBER CA and MD machines, the on-line documents are available via the WRITEUP and EXPLAIN commands. To get instructions for the WRITEUP utility, read the *Brief* titled *WRITEUP Information* (available in 128A Lind Hall) or just type WRITEUP while you are logged in to the machine. The command EXPLAIN is described in the *Brief* titled *EXPLAIN Information* available in 128A Lind Hall. You can also type EXPLAIN while you are logged in to the machine and obtain help interactively on how to use the utility. To obtain on-line documentation on the VX system, simply type HELP for VMS system information and MOREHELP for service information.

SHORT COURSES

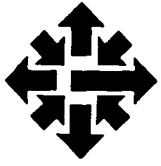
Throughout the year ACSS offers many non-credit short courses and seminars to help you use the computer systems. Course topics include: introductions to computers, to interactive computing, and to ACSS; CYBER, VAX, and microcomputer operating systems; programming languages; statistical and data base programs; text processing and analysis; and graphics. A current schedule is listed in the *ACSS Newsletter*. Use the command WRITEUP(CLASSES) to get additional information about ACSS Short Courses. A fee is charged for enrollment. Register in person at the Reference Room, 128A Lind Hall. Registrations also can be sent either by campus mail to Short Course Registration, Academic Computing Services and Systems, 128A Lind Hall or by federal mail to ACSS Short Course Registration, University of Minnesota, 207 Church Street, SE, Minneapolis, MN 55455. For more information, contact Jerry Stearns at 625-1543.

CONSULTING

ACSS provides consultants to help with problems and questions about the computer systems and software. You should not ask the ACSS consultants to write your programs or correct them for you. See WRITEUP(CONSULT) for hours.

If you have any other problems or questions you may call the HELP-Line at 626-5592.

WALK-IN Consulting	10 am – 4 pm 7 pm – 9 pm	M – F Tu & Th	128 Lind Hall
HELP-Line	8 am – 5 pm	M – F	626-5592
Artificial Intelligence	3 pm – 4 pm	M – F	625-8332
Data Bases	10 am – 11 am	M – F	626-1887
Graphics	8 am – 5 pm	M – F	626-5592
Microcomputers	9 am – Noon & 1:30 – 4 pm 9 am – 4 pm	M, Tu, & F W & Th	626-4276
Statistics Packages	11 am – 2 pm	M – F	626-1893
Text Analysis	3 pm – 4 pm	M – F	625-8332
Text Processing	9 am – Noon 1 pm – 2 pm	M, W, & F M, Tu, Th, & F	625-1391



ACSS Brief

Graphics Packages

Academic Computing Services and Systems (ACSS) offers its users a broad spectrum of graphics application software packages for which it provides varying levels of support. The packages mentioned below are separated into groups that reflect that level. Each package's description is followed by the mnemonic that represents the ACSS system on which the package is available: CA for the CYBER research and instructional system, MD for the CYBER instructional system, and VX for the VAX/VMS research and instructional system.

Strong Support

ACSS highly recommends the software packages published by Precision Visuals, Inc. (PVI). The standard metafile that may be generated from these packages can be viewed from both CA and VX machines and processed by many ACSS graphics devices. For general-purpose applications, ACSS recommends DI-3000, GRAFMAKER, and PICSURE. These three packages have been designed to be used by users of different programming abilities and requirements. WRITEUP,DI3000 and WRITEUP,PVI on the CA and MOREHELP WRITEUPS GRAPHICS on the VX provide additional information on these packages.

CONTOUR SYSTEM: a library of FORTRAN subroutines that allow the user to generate two- and three-dimensional contour maps and mesh pictures from either gridded or randomly located data. Three-dimensional 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 graphics are supported in both batch and interactive environments. DI-3000 is device-independent and has many features including full three-dimensional 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 three-dimensional modeling interface. (CA, MD, 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. Ten different typefaces are available, and the characters may be drawn as outlines or solid characters. (VX)

GRAFMAKER: a set of FORTRAN subroutines for generating line graphs, bar graphs, needle graphs, and pie charts. Features include options for 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

Products in this section, which were developed by Integrated Software Systems Corporation (ISSCO), receive intermediate support from ACSS. The packages are maintained and updated; however, *ACSS recommends that new users consider the PVI packages described above for their graphics applications.* Refer to WRITEUP,GRAFGEN and MOREHELP WRITEUPS GRAPHICS for additional information on the ISSCO packages.

DISSPLA: an industry-standard library of over 400 FORTRAN subroutines capable of two- and three-dimensional linear plots, pie and bar charts, three-dimensional 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)

TELL-A-GRAF: a sophisticated, widely used interactive graphics program for producing publication-quality, two-dimensional linear plots, bar and pie charts, and signs. (VX)

Minimal Support

The following programs have minimal ACSS support and are not recommended to 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,MD)

CNTOUR: a FORTRAN subroutine that references PLOTPAC and MNCORE to produce contour plots with simple annotation. (CA,MD)

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

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

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,MD)

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

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

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

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

SCLPLT: an easy FORTRAN subroutine for generating scaled two-dimensional linear plots for a printer. (CA,MD)

SIGN: a program for plotting text and creating signs. (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 and consists of the Terminal Control System (TCS), Advanced Graphing II (AG2), and the Character Generating System (CGS). (CA,MD)

If you wish more information about the software listed in this *Brief*, you can refer to the documentation that is referenced 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 provide assistance with vendor orders and has copies of all documentation available for review.

ACSS Brief

General Information

Academic Computing Services and Systems • University of Minnesota • Twin Cities

Graphics Packages

Academic Computing Services and Systems (ACSS) offers its users a broad spectrum of graphics application software packages for which it provides varying levels of support. The packages mentioned below are separated into groups that reflect that level. Each package's description is followed by the mnemonic that represents 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.

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Intermediate Support

Products in this section, which were developed by Computer Associates (CA), receive intermediate support from ACSS. The packages are maintained and updated; however, *ACSS recommends that new users consider the PVI packages described above for their graphics applications.* Refer to WRITEUP,GRAFGEN and MOREHELP WRITEUPS GRAPHICS for additional information on the CA packages.

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CNTOUR: a FORTRAN subroutine that references PLOTPAC and MNCORE to produce contour plots with simple annotation. (CA)

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 **UCC BRIEF****LIBERAL ARTS COMPUTING**

Many of the application programs available on the University Computer Center's mainframe computers can be used for non-traditional research. You should select the particular application for your project after conferring with a UCC consultant. This brief summarizes the more widely used applications and the mainframe programs that perform them.

Many text and data entry chores as well as some processing and analysis can also be done on microcomputers. UCC has also established microcomputer labs and program consulting -- call the micro HELP-line at 376-4276.

TEXT PROCESSING

These programs help you enter your text into a computer, and edit, format, and print the text.

EDT (VAX/VMS)

Documentation: *EDT Editor Manual* (University Bookstores)

Function: general purpose text editing program

XEDIT (CYBER)

Documentation: *XEDIT User's Guide* (University Bookstores);
also machine-retrievable writeup

Function: general purpose text editing program

SCRIBE (VAX/VMS)

Documentation: *Scribe User Manual, Scribe Pocket Reference* (University Bookstores)

Function: text formatting program

PROSE (CYBER, VAX/VMS)

Documentation: *Prose Instruction Manual* (University Bookstores);
also machine-retrievable writeup

Function: text formatting program

TEXT ANALYSIS

Once your text is in the computer, you can subject it to a variety of analytical procedures. The most common of these is concordance building. For other special-purpose programs, see the consultants.

GENCORD (CYBER, CRAY)

Documentation: *WRITEUP(GENCORD)*; machine-retrievable writeup

Function: selective concordance generating program

LTTRCNT (CYBER)

Documentation: *WRITEUP(LTTRCNT)*

Function: provides statistics on letter frequency

MLSORT (CYBER)

Documentation: WRITEUP(TEXAIDS=MLSORT)

Function: multi-line sorting program

STATISTICAL ANALYSIS

Another commonly used technique is statistical analysis. Many procedures are available, and you should consult a statistical consultant on the correct procedure for the data and problem involved in the research. SPSS, BMDP, and CLUSTER are the most useful packages. For more information on mathematics and statistical routines see *UCC Brief: Mathematical and Statistical Routines* (140 Experimental Engineering).

DATA BASES

Another aid for non-traditional research is the storage, retrieval, and processing of data using a data base management system (DBMS).

BIBDB (CYBER)

Documentation: WRITEUP(TEXAIDS=BIBDB)

Function: bibliographic or mailing list database management system

S2000: System 2000 Data Base Management System (CYBER)

Documentation: *S2000 User Aids, S2000 Reference Manual*
(University Bookstores)

Function: programs to facilitate the organization and retrieval of data in a data base

SIR: Scientific Information Retrieval (CYBER)

Documentation: *SIR User's Manual* (University Bookstores)

Function: data base management system with built-in statistical procedures

DOCUMENTATION

UCC provides documentation on many aspects of non-traditional computing for new and experienced users. *UCC Brief: Reference Room and Documentation Services*, found in 140 Experimental Engineering, provides information on where to acquire or refer to the documents needed.

Of special interest is our *Guide to Text Processing and Liberal Arts Computing*, available in University Bookstores (H.D. Smith and Minnesota Book Center). Users should also take note of the *UCC Newsletter*, which contains news of current interest to all users, and articles of special interest to non-traditional users. Call 376-1491 for a free subscription.

Organizations and publications directed specifically to humanities users include:

- | | |
|--|--|
| * ACH (Association for Computers and the Humanities) | * ALLC (Association for Literary and Linguistic Computing) |
| * ACH Newsletter | * ALLC Bulletin |
| * Computers and the Humanities (Journal)
Cambridge University
Cambridge, England | * ALLC Journal |

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ACSS BRIEF

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XEDIT (CYBER)

Documentation: *XEDIT User's Guide* (University bookstores); also machine-retrievable writeup

Function: general-purpose text editing program

SCRIBE (VAX/VMS)

Documentation: *Scribe User Manual, Scribe Pocket Reference* (University bookstores)

Function: text formatting program

PROSE (CYBER, VAX/VMS)

Documentation: *Prose Instruction Manual* (University bookstores); also machine-retrievable writeup

Function: text formatting program

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Another commonly used technique is statistical analysis. Many procedures are available, and you should consult a statistical consultant on the correct procedure for the data and problem involved in the research. SPSS, BMDP, and CLUSTER are the most useful packages. For more information on mathematics and statistical routines see *ACSS Brief: Mathematical and Statistical Routines*.

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BIBDB (CYBER)

Documentation: *WRITEUP(TEXAIDS=BIBDB)*

Function: bibliographic or mailing list data base management system

S2000: System 2000 Data Base Management System (CYBER)

Documentation: *S2000 User Aids, S2000 Reference Manual* (University bookstores)

Function: programs to facilitate the organization and retrieval of data in a data base

SIR: Scientific Information Retrieval (CYBER)

Documentation: *SIR User's Manual* (University Bookstores)

Function: data base management system with built-in statistical procedures

DOCUMENTATION

ACSS provides documentation on many aspects of non-traditional computing for new and experienced users. *ACSS Brief: Reference Room and Documentation Services*, found in the ACSS Reference Room, 128A Lind Hall, provides information on where to acquire or review the needed documents.

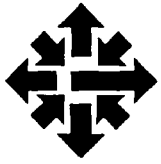
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Organizations and publications directed specifically to humanities users include:

The Association for Computers and the Humanities (ACH): *ACH Newsletter*

Computers and the Humanities (Journal), Cambridge University, Cambridge, England

The Association for Literary and Linguistic Computing (ALLC): *ALLC Journal*
ALLC Bulletin



ACSS Brief

Liberal Arts Computing

Many of the application programs available on the Academic Computing Services and Systems (ACSS) mainframe computers can be used for "non-traditional" research. This *Brief* summarizes the more widely used applications, the mainframe programs that perform them, and their documentation and its location on campus. If you would like more help in choosing an application for your project, call the ACSS Special Projects Group at 625-8332.

Many text and data entry chores as well as some text processing and analysis also can be done on microcomputers. ACSS has established microcomputer labs and program consulting—call the Micro HelpLine at 626-4276 for information.

TEXT PROCESSING

The following programs are designed to help you enter your text into a computer and edit, format, and print the text.

EDT (VAX)

Function: general-purpose text-editing program

Documentation: *EDT Editor Manual* (ACSS Computing Information Center); EDT2CAL (on-line training package)

FSE: Full Screen Editor (CYBER)

Function: general-purpose text-editing program

Documentation: *NOS Full Screen Editor's Guide, Brief: Using the Full Screen Editor* (ACSS Computing Information Center); WRITEUP,FSE

PROSE (CYBER, VAX)

Function: text-formatting program

Documentation: *Prose Instruction Manual* (University Bookstores); WRITEUP,PROSE

SCRIBE (VAX)

Function: text-formatting program

Documentation: *Scribe at ACSS* (University Bookstores); *Scribe Document Production System User Manual, Scribe User Manual Supplement for Version 5, Scribe Document Production System Data Base Administrator's Guide for Supplement Version 5* (ACSS Computing Information Center)

XEDIT (CYBER)

Function: general-purpose text-editing program

Documentation: *XEDIT User's Guide* (University Bookstores); WRITEUP,XEDIT

You also can enter text into a computer with ACSS's Kurzweil optical scanner. For more information, refer to the September 1986 issue of the *ACSS Newsletter* or call Carol Winther at 625-9525 between 10:00 am and 12:00 noon, Monday through Friday.

TEXT ANALYSIS

Once your text is in the computer, you can subject it to a variety of analytical procedures. The most common of these is concordance building. For information about other special-purpose programs, see the consultants.

FNOTE (CYBER)

Function: extracts footnotes from a text

Documentation: WRITEUP,TEXHELP=FNOTE

GENCORD (CYBER)

Function: selective concordance-generating program

Documentation: WRITEUP,GENCORD

LTTRCNT (CYBER)

Function: provides statistics on letter frequency

Documentation: WRITEUP,TEXHELP=LTTRCNT

MLSORT (CYBER)

Function: multi-line sorting program
Documentation: WRITEUP,TEXHELP=MLSORT

TEXTAL (CYBER)

Function: pattern-matching text-analysis program
Documentation: WRITEUP,TEXTAL

WRDSTAT (CYBER)

Function: provides statistics on word distribution patterns occurring in a text
Documentation: WRITEUP,TEXHELP=WRDSTAT

STATISTICAL ANALYSIS

Many procedures also are available for statistical analysis, and you should consult a statistical consultant about the appropriate procedure to use for the data and problem involved in your research. SPSS, BMDP, and CLUSTER are the most useful packages. For more information on mathematics and statistical routines, read *ACSS Brief: Mathematics and Statistics Routines*. Also, consult the *ACSS Newsletter* for the phone number and hours of the statistics HELP-Line.

DATA BASES

Another aid for non-traditional research is the storage, retrieval, and processing of data using a data base management system. The *ACSS Newsletter* contains the phone number and hours of the data base HELP-Line.

BIBMAIL (CYBER)

Function: bibliographic or mailing list data base management system
Documentation: WRITEUP,BIBMAIL

INGRES (VAX/VMS)

Function: relational data base management system
Documentation: *ACSS Newsletter* (September 1986) or data base HELP-Line

S2000: System 2000 Data Base Management System (CYBER)

Function: programs to facilitate the organization and retrieval of data in a data base
Documentation: *System 2000: DEFINE, CREATE, QUEST*, plus supplementary manuals (ACSS Computing Information Center)

DOCUMENTATION

ACSS provides documentation on many aspects of non-traditional computing for new and experienced users. ACSS's *Brief: Computing Information Center and Documentation Services*, which can be found in the ACSS Computing Information Center, 128A Lind Hall, provides information on where to acquire or review the needed documents.

ACSS's Guide to Text Processing and Liberal Arts Computing, available in University Bookstores (H.D. Smith and Minnesota Book Center), should be of special interest to all users. Also worth noting is the *ACSS Newsletter*, which contains articles of current interest about computing and articles of special interest to users doing non-traditional research. Call 625-7397 for a free subscription.

ADDITIONAL INFORMATION

Several organizations and publications are directed specifically to users who work with humanities projects. The publications that follow should be available in the University libraries.

- *ACH Newsletter*, The Association for Computers and the Humanities (ACH)
- *ALLC Journal*, *ALLC Bulletin*, The Association for Literary and Linguistic Computing (ALLC)
- *Computers and the Humanities* (Journal), Box 1057, Osprey, FL 33559

Documentation for math-stat routines comes in several forms. Each Minnesota Subprogram Library writeup is shelved in 140 ExpEng. Manuals for programs such as SPSS may be purchased from the Computer Store, 211 ExpEng, or the University bookstores. Machine-retrievable documentation for many routines is available through the WRITEUP utility. All these UCC math-stat packages are cataloged in either Guide to User Libraries or Guide to Applications Packages (2 vols.) available at the Computer Store. Finally, reserve copies of all UCC-related documentation are kept in UCC's Reference Room, 235a ExpEng.

MATHEMATICS AND STATISTICS LIBRARIES

IMSL: International Mathematics and Statistics Library

See: IMSL catalog on reserve in 235a ExpEng; WRITEUP(IMSL); Computer Store

MINNLIB: Minnesota Subprogram Library

See: writeups in 140 ExpEng; WRITEUP(FORSUBS)

MATHEMATICS LIBRARIES

BESPACK: Bessel and Airy functions library

See: User Libraries Manager in 235d ExpEng

BSPLINE: approximation problems library

See: A Practical Guide to Splines in 235a ExpEng

EISPACK: eigenvalue-eigenvector analysis library

See: WRITEUP(EISPACK)

EPISODE: ordinary differential equations library

See: User Libraries Manager in 235d ExpEng

FUNPACK: exponential, elliptic, and Dawson's integrals library

See: WRITEUP(FUNPACK)

LINPACK: simultaneous linear equations library

See: LINPACK User's Guide in 235a ExpEng

YSMPLIB: solutions to sparse systems of equations library

See: User Libraries Manager in 235d ExpEng

STATISTICS PROGRAMS

BMD,BMDP: mathematics and statistics programs

See: reference manuals on reserve in 235a ExpEng; Computer Store

CLUSTER: cluster analysis program

See: writeup in 140 ExpEng; WRITEUP(CLUSTER)

COFAMM: confirmatory factor analysis program

See: COFAMM User's Guide in 235a ExpEng

HICLUS: hierarchical cluster analysis program

See: How To Use HICLUS in 235a ExpEng



UCC BRIEF

Mathematics and Statistics Routines

IVAN: program for interactive analysis of factorial designs
See: Applied Statistics Department

KYST-2: multidimensional scaling and unfolding program
See: How To Use KYST-2 in 235a ExpEng

LISREL: program to fit and test models for linear structural relationships
See: LISREL User's Guide in 235a ExpEng

MATTER: interactive matrix manipulation program
See: Applied Statistics Department

MINITAB: interactive statistical programs for small and medium data sets
See: MINITAB Reference Manual in Computer Store

MULTREG: interactive multiple regression program
See: MULTREG Reference Manual in Computer Store

OMNITAB: general purpose program for numerical and statistical data analysis
See: OMNITAB Reference Manual in Computer Store

SINDSCAL: program for individual differences in multidimensional scaling
See: How to Use SINDSCAL in 235a ExpEng

SIR: data retrieval system with statistical analysis
See: SIR Reference Manual in Computer Store

SPSS: statistical programming system for the social sciences
See: SPSS Reference Manual in Computer Store

SPSSONL: interactive version of SPSS 8.0
See: SPSS ONLINE in Computer Store

TSP: program for statistical analysis of time series by least squares
See: Time Series Processor Version 2.7 User's Manual in 235a ExpEng

LINEAR/NONLINEAR PROGRAMMING

APEX: program for general purpose, large-scale linear programming
See: APEX-1 Reference Manual in 235a ExpEng

GPM: nonlinear programming (nonlinear optimization) library
See: Extended GPM Nonlinear Programming Subroutines in the Engineering Library in Lind Hall

GRG2: nonlinear programming (nonlinear optimization) library
See: User Libraries Manager in 235d ExpEng

LPKODE: program for general purpose linear programming
See: WRITEUP(LPKODE)

MPOS: multi-purpose optimization program
See: Multi-Purpose Optimization System User's Guide in 235a ExpEng

NOTE

Several computer languages have their own libraries of math-stat routines:
PASCLIB(Pascal), ALMAP(FORTRAN preprocessor, FORPREP), SIMULIB
(SIMULA), SIMLIB(SIMSCRIPT), PL1LIB(PL/1).
For more information, please consult the appropriate documentation.

Liberal Arts Computing Services

Academic Computing Services and Systems (ACSS) offers its users a broad spectrum of application software for liberal arts and humanities research. This Brief lists application programs in text processing, text analysis, statistical analysis, and data base management that are available on two of ACSS's mainframe computer systems—the VAX/VMS computer system and the CYBER/NOS 2 computer system. The symbols CA and VX following each package refer to CA-CYBER/NOS 2; VX-VAX/VMS. Each application software listing includes a summary of the application package's function and available documentation. Sources of documentation for the software or application package are indicated by the documentation reference. The symbol CIC refers to ACSS's Computing Information Center in 128A Lind Hall. For more information about the CIC, refer to the ACSS Brief *Computing Information Center*, available in 128A Lind Hall.

Guide to Text Processing and Liberal Arts Computing, an ACSS publication, is available at University bookstores. ACSS also publishes a free monthly newsletter. You can subscribe to it by calling 625-7397 or by writing to ACSS Newsletter, Computing Information Center, 128A Lind Hall, University of Minnesota, 207 Church Street SE, Minneapolis, MN 55455.

Several organizations and publications are directed specifically to users who work with liberal arts and humanities projects. The publications that follow should be available in University libraries.

- *ACH Newsletter, The Association for Computers and the Humanities (ACH)*
- *ALLC Journal, ALLC Bulletin, The Association for Literary and Linguistic Computing (ALLC)*
- *Computers and the Humanities (Journal), Box 1057, Osprey, FL 33559*

If you have questions about using software or application packages, consulting services are available at posted hours in 128C Lind Hall and 140 Blegen Hall. Telephone consulting is available from 8 am to 5 pm, Monday through Friday; call 626-5592.

You can also call the consultants in ACSS's Special Projects group. They are particularly interested in research projects in the liberal arts. Call 625-8332.

TEXT PROCESSING

The following programs are designed to help you enter text into a computer and edit, format, and print the text.

EDT (VX)

Function: general-purpose text-editing program

Documentation: *EDT Editor Manual* (CIC); EDT2CAI (on-line training package)

FSE: Full-Screen Editor (CA)

Function: general-purpose text-editing program

Documentation: *NOS Full Screen Editor's Guide*, *ACSS Brief Using the Full-Screen Editor* (CIC); WRITEUP,FSE (on line)

PROSE (CA, VX)

Function: text-formatting program

Documentation: *Prose Instruction Manual* (University bookstores); WRITEUP,PROSE (on line)

SCRIBE (VX)

Function: text-formatting program

Documentation: *Scribe at ACSS* (University bookstores); *Scribe Document Production System User Manual*, *Scribe User Manual Supplement for Version 5*, *Scribe Document Production System Data Base Administrator's Guide for Supplement Version 5* (CIC)

XEDIT (CA)

Function: general-purpose text-editing program

Documentation: XEDIT User's Guide (University bookstores); WRITEUP,XEDIT (on line)

You also can enter text into a computer with ACSS's Kurzweil optical scanner. For more information, call Carol Winther at 625-9525 between 10 am and 12 noon, Monday through Friday.

TEXT ANALYSIS

Once your text is in the computer, you can subject it to a variety of analytical procedures. The most common of these is concordance building. For information about other special-purpose programs, see the consultants.

GENCORD (CA,VX)

Function: selective concordance-generating program

Documentation: WRITEUP,GENCORD (on line, CA)

LTTRCNT (CA,VX)

Function: provides statistics on letter frequency

Documentation: WRITEUP,TEXHELP=LTTRCNT (on line, CA), ACSS\$WRITEUP:LTTRCNT (on line, VX)

MLSORT (CA)

Function: multi-line sorting program

Documentation: WRITEUP,TEXHELP=MLSORT (on line, CA)

TEXTAL (CA,VX)

Function: pattern-matching text-analysis program

Documentation: WRITEUP,TEXTAL (on line, CA), ACSS\$WRITEUP:TEXTAL (on line, VX)

WRDSTAT (CA,VX)

Function: provides statistics on word distribution patterns occurring in a text

Documentation: WRITEUP,TEXHELP=WRDSTAT (on line, CA), ACSS\$WRITEUP:WRDSTAT (on line, VX)

STATISTICAL ANALYSIS

Many procedures also are available for statistical analysis, and you should consult a statistical consultant about the appropriate procedure to use for the data and problem involved in your research. SPSS, BMDP, and CLUSTER are the most useful packages. For more information on mathematics and statistical software, read the ACSS Brief *Mathematics, Engineering, and Statistics Software*. Also, consult the *ACSS Newsletter* for the phone number and hours of the statistics HELP-Line.

DATA BASE MANAGEMENT

Another aid for liberal arts and humanities research is the storage, retrieval, and processing of data using a data base management system. The *ACSS Newsletter* contains the phone number and hours of the data base HELP-Line.

BIBMAIL (CA)

Function: bibliographic or mailing list data base management system

Documentation: WRITEUP,BIBMAIL (on line)

INGRES (VX)

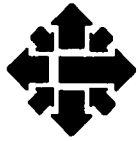
Function: relational data base management system

Documentation: ACSS Newsletter (September 1986) or data base HELP-Line

S2000: System 2000 Data Base Management System (CA)

Function: programs to facilitate the organization and retrieval of data in a data base

Documentation: System 2000: DEFINE, CREATE, QUEST, plus supplementary manuals (CIC)



ACSS BRIEF

MATHEMATICS AND STATISTICS ROUTINES

Documentation for math and statistics routines comes in several forms. Each Minnesota Subprogram Library writeup is documented on the CYBERs in WRITEUP(MINNLIB). Manuals for programs such as SPSS may be purchased from the University bookstores. Machine-retrievable documents for many routines are available through the CYBER WRITEUP utility. All the ACSS math and statistics packages are cataloged in the *Guide to Subprogram Libraries* or the *Guide to Math and Engineering Packages*, available at the Minnesota Book Center and the H.D. Smith Bookstore. Finally, reserve copies of all ACSS-related documents are kept in the ACSS Reference Room, 128A Lind Hall.

Mathematics and Statistics Libraries

IMSL: International Mathematics and Statistics Library. See: IMSL manuals in the Reference Room, WRITEUP(IMSL).
MINNLIB: Minnesota Subprogram Library. See: WRITEUP(MINNLIB), WRITEUP(FORSUBS).
HARWELL: Harwell Subroutine Library. See: Harwell manual in the Reference Room.
M01LIB-M08LIB: Cray Applications Libraries. See: writeups available in the Reference Room.
CALGOPL: ACM Collected Algorithms file. See: writeups available in the Reference Room.

Mathematics Libraries and Programs

BESPACK: Bessel and Airy functions library. See: writeup available in the Reference Room.
BSPLINE: approximation problems library. See: *A Practical Guide to Splines* in the Reference Room.
EISPACK: eigenvalue-eigenvector analysis library. See: WRITEUP(EISPACK).
EPISODE: ordinary differential equations library. See: writeup available in the Reference Room.
FUNPACK: exponential, elliptic, and Dawson's integrals library. See: WRITEUP(FUNPACK).
INTLIB: M77 interval arithmetic library. See: WRITEUP(INTLIB).
LINPACK: simultaneous linear equations library. See: *LINPACK User's Guide* in the Reference Room.
LSODE: ordinary differential equations library. See: WRITEUP(LSODE).
LSODI: ordinary differential equations (implicit) library. See: WRITEUP(LSODI).
MATLAB: interactive matrix computation. See: WRITEUP(MATLAB).
MINPACK: nonlinear equations and nonlinear least squares. See: WRITEUP(MINPACK).
PCGPAK: Large sparse nonsymmetric linear equations. See: WRITEUP(PCGPAK), *PCGPAK User's Guide* in the Reference Room.
SCILIB: Cray Scientific Applications library. See: *Cray Library Reference Manual* in the Reference Room.
SPARSPK: Sparse linear equations. See: WRITEUP(SPARSPK), *SPARSPK User's Guide* in the Reference Room.
YSMPLIB: solutions to sparse systems of equations library. See: writeup available in the Reference Room.

Linear/Nonlinear Programming

APEX: program for general purpose, large-scale linear programming. See: *APEX-1 Reference Manual* in the Reference Room.
GPM: nonlinear programming (nonlinear optimization) library. See: writeup available in the Reference Room.
GRG2: nonlinear programming (nonlinear optimization) library. See: writeup available in the Reference Room.
LINDO: interactive linear, quadratic, and integer programming system. See: *LINDO User's Manual* in the Reference Room.
LPKODE: program for general purpose linear programming. See: WRITEUP(LPKODE).
MIN5LIB: linear and nonlinear programming package. See: WRITEUP(MIN5LIB), *MINOS User's Guide* in the Reference Room.
MPOS: multi-purpose optimization program. See *Multi-Purpose Optimization System User's Guide* in the Reference Room.

Statistics Programs

BMDP: mathematics and statistics programs. See: reference manuals in the Reference Room and Minnesota Book Center

CLUSTER: hierarchical cluster analysis. See: WRITEUP(CLUSTER).

COFAMM: confirmatory factor analysis program. See: *COFAMM User's Guide* in the Reference Room.

CTAB: multidimensional contingency tables. See: *CTAB User's Guide* in the Reference Room.

GLIM: interactive generalized linear modeling package. See: *GLIM Manual* in the Reference Room.

HICLUS: hierarchical cluster analysis program. See: *How To Use HICLUS* in the Reference Room.

IVAN: program for interactive analysis of factorial designs. See: *IVAN User's Manual* in the Reference Room.

KYST-2: multidimensional scaling and unfolding program. See: *How To Use KYST-2* in the Reference Room.

LISREL: linear structural relationships/confirmatory factor analysis. See: *LISREL User's Guide* in the Reference Room.

LOGIT: logistic regression program. See: reference manual in the Reference Room.

MATTER: interactive matrix manipulation program. See: *MATTER User's Manual* in the Reference Room.

MINITAB: interactive statistical programs for small data sets. See: *MINITAB Reference Manual* in the Reference Room.

MULTREG: interactive multiple regression program. See: *MULTREG Reference Manual* in the Reference Room.

OMNITAB: general purpose program for numerical and statistical data analysis. See: *OMNITAB Reference Manual* in the Reference Room.

SCSS: interactive conversational statistical system, compatible with SPSS. See: *User's Guide to SCSS Conversational System* in University bookstores.

SHAZAM: econometric analysis of time series. See: WRITEUP(SHAZAM).

SINDSCAL: program for individual differences in multidimensional scaling. See: *How to Use SINDSCAL* in the Reference Room.

SPSS: statistical programming system for the social sciences. See: *SPSS Reference Manual* in University bookstores. WRITEUP(SPSS).

SPSS-X: Current upgrade of SPSS, a complete rewriting. See *SPSS-X Users' Guide* in the University bookstores. WRITEUP(SPSSX).

SPSSONL: interactive version of SPSS. See: *SPSS/ONLINE* in University bookstores.

TSP: program for statistical analysis of time series by least squares. See: *Time Series Processor User's Manual* in the Reference Room.

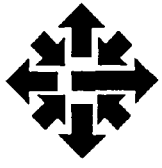
NOTE

Several computer languages have their own libraries of math-statistics routines:

PASCLIB(Pascal), SIMULIB(SIMULA), SIMLIB(SIMSCRIPT)

For more information, please consult the relevant computer language document.

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ACSS Brief

MATHEMATICS AND STATISTICS ROUTINES

Documentation for math and statistics routines comes in several forms. Each Minnesota Subprogram Library writeup is documented on the CYBER CA in WRITEUP,MINNLIB. Manuals for programs such as SPSS may be purchased from the University Bookstores. Machine-retrievable documents for many routines are available through the CYBER WRITEUP utility. All the ACSS math-statistics packages are cataloged in the *Guide to Subprogram Libraries* or the *Guide to Math and Engineering Packages* available at the Minnesota Book Center and the H.D. Smith Bookstore. Finally, reserve copies of all ACSS-related documents are kept in the ACSS Reference Room, 128A Lind Hall.

Mathematics and Statistics Libraries

IMSL: International Mathematics and Statistics Library. See: IMSL manuals in the Reference Room; WRITEUP,IMSL.
MINNLIB: Minnesota Subprogram Library. See: WRITEUP,MINNLIB; WRITEUP,FORSUBS.
CALGOPL: ACM Collected Algorithms file. See: writeups available in the Reference Room; WRITEUP,CALGOPL.

Mathematics Libraries and Programs

BESPACK: Bessel and Airy functions library. See: writeup available in the Reference Room.
BSPLINE: approximation problems library. See: *A Practical Guide to Splines* in the Reference Room.
EISPACK: eigenvalue-eigenvector analysis library. See: WRITEUP,EISPACK.
EPISODE: ordinary differential equations library. See: writeup available in the Reference Room.
FUNPACK: exponential, elliptic, and Dawson's integrals library. See: WRITEUP,FUNPACK.
INTLIB: M77 interval arithmetic library. See: WRITEUP,INTLIB.
LINPACK: simultaneous linear equations library. See: user's guide in the Reference Room.
MATLAB: interactive matrix computation. See: WRITEUP,MATLAB.
MINPACK: nonlinear equations and nonlinear least squares. See: WRITEUP,MINPACK.
YSMPLIB: solutions to sparse systems of equations library. See: writeup available in the Reference Room.

Linear/Nonlinear Programming

APEX: program for general purpose, large-scale linear programming. See: *APEX-1 Reference Manual* in the Reference Room.
GPM: nonlinear programming (nonlinear optimization) library. See: writeup available in the Reference Room.
GRG2: nonlinear programming (nonlinear optimization) library. See: writeup available in the Reference Room.
LINDO: interactive linear, quadratic and integer programming system. See: LINDO manual in the Reference Room.
LPKODE: program for general purpose linear programming. See: WRITEUP,LPKODE.
MIN5LIB: linear and nonlinear programming package. See WRITEUP,MIN5LIB and user's guide in the Reference Room.
MPOS: multi-purpose optimization program. See user's guide in the Reference Room.

Statistics Programs

BMDP: mathematics and statistics programs. See: reference manuals in the Reference Room; Minnesota Book Center.
CLUSTER: hierarchical cluster analysis. See: WRITEUP,CLUSTER.
CTAB: multidimensional contingency tables. See: user's guide in the Reference Room.
GLIM: interactive generalized linear modeling package. See: manual in the Reference Room.
IVAN: program for interactive analysis of factorial designs. See: manual in the Reference Room.
KYST-2A: multidimensional scaling and unfolding program. See: *How To Use KYST-2* in the Reference Room.
LISREL: linear structural relationships/confirmatory factor analysis. See: user's guide in the Reference Room.
LOGIT: logistic regression program. See: reference manual in the Reference Room.
MATTER: interactive matrix manipulation program. See: manual in the Reference Room.
MINITAB: interactive statistical programs for small data sets. See: *MINITAB Reference Manual* in the Reference Room.
MULTREG: interactive multiple regression program. See: *MULTREG Reference Manual* in the Reference Room.

RATS: Regression and Time Series Analysis. See RATS User's Manual in the Reference Room.
SCSS: interactive conversational statistical system, compatible with SPSS. See: *User's Guide to SCSS Conversational System* in University Bookstores.
SHAZAM: econometric analysis of time series. See: WRITEUP, SHAZAM.
SPSS: statistical programming system for the social sciences. See: *SPSS Reference Manual* in University Book Stores; WRITEUP, SPSS.
SPSSX: Current upgrade of SPSS, a complete rewriting. See SPSSX Users' Guide in the University Bookstores; WRITEUP, SPSSX.
SPSSONL: interactive editor for SPSS . See: *SPSS/ONLINE* in University Book Stores.
TSP: program for statistical analysis of time series by least squares. See: *Time Series Processor User's Manual* in 128A Lind Hall.

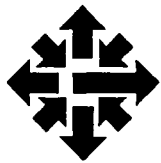
NOTE

Several computer languages have their own libraries of math and statistics routines:

PASCLIB(Pascal), SIMULIB(SIMULA), SIMLIB(SIMSCRIPT)

For more information, please consult the relevant computer language document.

AUG86:MJF



ACSS Brief

MATHEMATICS, ENGINEERING, AND STATISTICS SOFTWARE

Documentation for math, engineering and statistics software at Academic Computing Services and Systems (ACSS) comes in several forms. For example, each Minnesota Subprogram Library writeup is documented on the CYBER CA in WRITEUP,MINNLIB. Manuals for programs such as SPSS may be purchased from the University bookstores. Machine-retrievable documents for many routines are available through the CYBER utility WRITEUP. All the ACSS math-statistics packages are cataloged in the *Guide to Subprogram Libraries* or the *Guide to Math and Engineering Packages* available at the Minnesota Book Center and the H.D. Smith Bookstore. Finally, reserve copies of all ACSS-related documents are kept in the ACSS Computing Information Center (CIC), 128A Lind Hall. The symbols CA, MD, UX, and VX following each package refer to machine: CA—CYBER, MD—CYBER, UX—ENCORE, VX—VAX.

Mathematics and Statistics Libraries

- CMLIB: A collection of non-proprietary, easily transportable Fortran subprogram packages for math and statistics. To get more information type **help** and select topic **libraries**. (UX)
- CALGOPL: ACM Collected Algorithms file. See WRITEUP,CALGOPL and other writeups available in the ACSS Computing Information Center. (CA)
- IMSL: International Mathematics and Statistics Library. See WRITEUP,IMSL and IMSL manuals in the ACSS Computing Information Center. (CA,MD,VX)
- MINNLIB: Minnesota Subprogram Library. See WRITEUP,MINNLIB; WRITEUP,FORSUBS. (CA,MD)

Mathematics Libraries and Programs

- BESPACK: Bessel and Airy functions library. See writeup available in the ACSS Computing Information Center. (CA,MD,VX)
- BSPLINE: B-spline approximation problems library. See *A Practical Guide to Splines* in the ACSS Computing Information Center. (CA,MD,VX)
- EISPACK: Eigenvalue-eigenvector analysis library. See WRITEUP,EISPACK on the CA and MD, and on the UX type **help** and select topic **libraries**. (CA,MD,UX,VX)
- EPISODE: Ordinary differential equations library. See writeup available in the ACSS Computing Information Center. (CA,MD,VX)
- FORSIM: Program for ordinary and partial differential equations. See user's guide in the ACSS Computing Information Center. (CA)
- FUNPACK: Exponential, elliptic, and Dawson's integrals library. See WRITEUP,FUNPACK. (CA,MD,VX)
- INTLIB: M77 interval arithmetic library. See WRITEUP,INTLIB. (CA,MD)
- LINPACK: Linear equations library. See WRITEUP,LINPACK and user's guide in the ACSS Computing Information Center. (CA,MD,VX)

- LSODE: Ordinary differential equations library. See WRITEUP,LSODE. (CA,MD,VX)
- LSODI: Implicit ordinary differential equations library. See WRITEUP,LSODI. (CA,MD,VX)
- MACSYMA: Program for symbolic and algebraic manipulation. See user's guide in the ACSS Computing Information Center. (VX)
- MATLAB: Program for interactive matrix computation. See WRITEUP,MATLAB. (CA)
- MINPACK: Nonlinear equations and nonlinear least squares library. See WRITEUP,MINPACK. (CA,MD,VX)
- REDUCE2: Program for symbolic and algebraic manipulation. See the user's guide in the ACSS Computing Information Center. (CA,VX)
- YSMPLIB: Yale sparse linear equations library. See writeup available in the ACSS Computing Information Center. (CA,MD,VX)

Linear/Nonlinear Programming Libraries and Programs

- APEX: Program for general purpose, large-scale linear programming. See *APEX-1 Reference Manual* in the ACSS Computing Information Center. (CA,MD)
- GPM: Nonlinear programming (nonlinear optimization) library. See writeup available in the ACSS Computing Information Center. (CA,MD)
- GRG2: Nonlinear programming (nonlinear optimization) library. See writeup available in the ACSS Computing Information Center. (CA,MD,VX)
- LINDO: Program for interactive linear, quadratic and integer programming. See LINDO manual in the ACSS Computing Information Center. (CA,MD,VX)
- LPKODE: Program for general purpose linear programming. See WRITEUP,LPKODE. (CA,MD)
- MIN5LIB: MINOS 5 linear and nonlinear programming library. See WRITEUP,MIN5LIB and user's guide in the ACSS Computing Information Center. (CA,MD,VX)
- MPOS: Program for multi-purpose optimization. See user's guide in the ACSS Computing Information Center. (CA,MD)

Engineering Programs

- NONSAP: Program for nonlinear structural analysis. See the user's guide in the ACSS Computing Information Center. (CA)
- SAP4: Program for linear structural analysis. See the user's guide in the ACSS Computing Information Center. (CA,MD)
- SPICE2: Program for electronic integrated circuit simulation. See WRITEUP,SPICE2, and the user's guide in the ACSS Computing Information Center. (CA,MD,VX)

Simulation Languages and Programs

- DYNAMO: Program for continuous systems. See the user's guide in the ACSS Computing Information Center. (CA,MD)

- GPSS: Program for discrete event simulation. See the user's guide in the ACSS Computing Information Center. (CA)
- MIMIC: Program for continuous systems and analog computer simulation. See the user's guide in the ACSS Computing Information Center. (CA)
- SIMSCRIPT: Language for discrete event simulation. See the user's guide in the ACSS Computing Information Center. (CA)

Statistics Programs

General-purpose Packages

- BMDP: Mathematics and statistics programs. See reference manuals in the ACSS Computing Information Center; University bookstores. (CA)
- MINITAB: Interactive statistical programs for small data sets. See *MINITAB Reference Manual* in the ACSS Computing Information Center. (CA,VX)
- OMNITAB: Older package used for statistical and numerical analysis. See reference manual in ACSS Computing information Center. (CA)
- SAS: Batch-oriented statistical analysis package, which is the mainstay of IBM statistical users. See the SAS manuals in the University bookstores. (VX)
- SPSS: Statistical programming system for the social sciences. See *WRITEUP,SPSS; SPSS Reference Manual, SPSS 9.0 Support Packet (ACSS), and SPSS 9.0 Update (ACSS)* in University bookstores. (CA)
- SPSSONL: Interactive editor for SPSS. See *SPSS/ONLINE* in University bookstores. (CA)
- SPSSX: Current upgrade of SPSS, a complete rewriting. See *SPSSX Users' Guide* in the University bookstores; *WRITEUP,SPSSX*. (CA,VX)
- SPSSX Tables: Package that produces camera-ready tables using SPSSX. See *SPSSX Tables manual* in the University bookstores. (VX)

Anova and Regression

- GLIM: Generalized linear interactive modeling package. See manual in the ACSS Computing Information Center. On the UX type **man glim**. (CA,UX)
- IVAN: Program for interactive analysis of factorial designs. See manual in the ACSS Computing Information Center. (CA)
- LOGIT: Logistic regression program. See manual in the ACSS Computing Information Center. (CA)
- MULTREG: Interactive multiple regression program. See *MULTREG Reference Manual* in the ACSS Computing Information Center. On the UX type **help** and select topic **statpaks**. (CA,UX)

Factor and Cluster Analysis

- CLUSTER: Hierarchical cluster analysis. See *WRITEUP,CLUSTER*. (CA)
- EQS: Linear structural equations/confirmation factor analysis. *EQS User's Guide* in the ACSS Computing Information Center. (VX)
- LISREL: Linear structural relationships/confirmatory factor analysis. See user's guide in the ACSS Computing Information Center. (CA,VX)

TRYSYS1: Tryon hierarchical cluster analysis. WRITEUP,TRYSIS1. (CA)

Matrix Analysis

CTAB: Multidimensional contingency tables. See user's guide in the ACSS Computing Information Center. (CA)

MATTER: Interactive matrix manipulation program. See manual in the ACSS Computing Information Center. (CA)

Multidimensional Scaling

KYST-2A: Multidimensional scaling and unfolding program. See *How To Use KYST-2* in the ACSS Computing Information Center. (CA)

Time Series

RATS: Regression and Time Series Analysis. See RATS User's Manual in the ACSS Computing Information Center. (CA)

SHAZAM: Econometric analysis of time series. See WRITEUP,SHAZAM. (CA)

TSP: Program for statistical analysis of time series by least squares. See *Time Series Processor User's Manual* in 128A Lind Hall. (CA)

NOTE

Some computer languages have their own libraries of math and statistics routines:

PASCLIB(Pascal), SIMLIB(SIMSCRIPT)

For more information, please consult the relevant computer language document.

Mathematics, Engineering, and Statistics Software

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Mathematics and Statistics Libraries

- CALGOPL: ACM Collected Algorithms file. See WRITEUP,CALGOPL and the *Collected Algorithms* publication available in the ACSS Computing Information Center. (CA)
- CMLIB: Collection of public domain libraries for math and statistics. On the UX type help and select the topic libraries. (UX)
- IMSL: International Mathematics and Statistics Library. See WRITEUP,IMSL and IMSL manuals in the ACSS Computing Information Center. (CA,VX)
- MINNLIB: Minnesota subprogram library. See WRITEUP,MINNLIB. (CA)

Mathematics Libraries and Programs

- BESPACK: Bessel and Airy functions library. See BESPACK documentation available in the ACSS Computing Information Center. (CA,VX)
- BSPLINE: B-spline interpolation and approximation library. See *A Practical Guide to Splines* in the ACSS Computing Information Center. (CA,VX)
- EISPACK: Eigenvalue-eigenvector analysis library. See WRITEUP,EISPACK on the CA, and on the UX type help and select the topic libraries. See also *Matrix Eigensystem Routines: EISPACK Guide* in the ACSS Computing Information Center. (CA,UX,VX)
- EPISODE: Ordinary differential equations library. See the *Episode User's Manual* available in the ACSS Computing Information Center. (CA,VX)
- FORSIM: Program for ordinary and partial differential equations. See the *FORSIM VI Simulation Package* in the ACSS Computing Information Center. (CA)
- FUNPACK: Exponential, elliptic, and Dawson's integrals library. See WRITEUP,FUNPACK. (CA,VX)
- INTLIB: M77 interval arithmetic library. See WRITEUP,INTLIB. (CA)
- LINPACK: Linear equations library. See WRITEUP,LINPACK and the *LINPACK User's Guide* in the ACSS Computing Information Center. (CA,VX)

- LSODE:** Ordinary differential equations library. See **WRITEUP,LSODE** on the CA. (CA,VX)
- LSODI:** Implicit ordinary differential equations library. See **WRITEUP,LSODI** on the CA. (CA,VX)
- OPT** Optimization Library. On the UX type help and select the topic libraries. (UX)
- MACSYMA:** Program for symbolic and algebraic manipulation. See user's guide in the ACSS Computing Information Center. (VX)
- MATLAB:** Instructional matrix program. See **WRITEUP,MATLAB**. (CA)
- MINPACK:** Nonlinear equations and nonlinear least squares library. See **WRITEUP,MINPACK** and the *MINPACK User's Guide* in the ACSS Computing Information Center. (CA,VX)
- PCGPAK** Sparse linear equations (iterative methods) library. See the *PCGPAK User's Guide* in the ACSS Computing Information Center, and use the command **type ACSS\$WRITEUP:PCGPAK** on the VX. (VX)
- QUADPAK** Numerical integration (quadrature) library. See *QUADPAK: A Subroutine Package for Automatic Integration* in the ACSS Computing Information Center, **WRITEUP,QUADPAK** on the CA, or use the command **type ACSS\$WRITEUP_[QUADPAK]INDEX** on the VX. (CA,VX)
- REDUCE2:** Program for symbolic and algebraic manipulations. See **WRITEUP,REDUCE2** on the CA. On the VX, the program is called REDUCE. (CA,VX)
- SPARSPK** Waterloo sparse linear equations and least squares (direct methods) library. See *SPARSPAK: Waterloo Sparse Matrix Package User's Guide for SPARSPAK-A and SPARSPAK-B* in the ACSS Computing Information Center and use the command **type ACSS\$WRITEUP:SPARSPK** on the VX. (VX)
- YSMPLIB:** Yale sparse linear equations (direct methods) library. See the YSMPLIB manuals available in the ACSS Computing Information Center. (CA,VX)

Linear/Nonlinear Programming Libraries and Programs

- GRG2:** Nonlinear programming (nonlinear optimization) library. See the *GRG2 User's Guide* in the ACSS Computing Information Center. (CA,VX)
- LINDO:** Program for solving linear, quadratic, and integer programming problems. See the *LINDO User's Manual* in the ACSS Computing Information Center. (CA,VX)
- LPKODE:** Instructional program for linear, integer, and mixed integer programming and the transportation problem. See **WRITEUP,LPKODE**. (CA)
- MIN5LIB:** MINOS 5 linear and nonlinear programming library. See **WRITEUP,MIN5LIB** on the CA, and the *MINOS 5.0 User's Guide* in the ACSS Computing Information Center. (CA,VX)
- MPOS:** Multi-purpose optimization program for solving linear, quadratic, integer, and mixed integer programming problems. See **WRITEUP,MPOS** (160 pages) and the *Multi-Purpose Optimization User's Guide* available in the ACSS Computing Information Center. (CA)

Engineering Programs

- NONSAP:** Program for nonlinear structural analysis. See the *NONSAP Manual* in the ACSS Computing Information Center. (CA)
- SAP4:** Program for linear structural analysis. See the manual *SAP IV, A Structural Analysis Program* in the ACSS Computing Information Center. (CA)

SPICE2: Program for electronic integrated circuit simulation. See **WRITEUP,SPICE2** (75 pages), and the *SPICE Manual* in the ACSS Computing Information Center. On the VX the package is called SPICE. (CA,VX)

Simulation Languages and Programs

DYNAMO: Program for continuous systems simulation. See the *Dynamo User's Manual* in the ACSS Computing Information Center. (CA)

GPSS: Program for discrete event simulation. See the *GPSS User's Manual* in the ACSS Computing Information Center. (CA)

MIMIC: Program for continuous systems and analog computer simulation. See the user's guide in the ACSS Computing Information Center. (CA)

SIMSCRIPT: Language for discrete event simulation. See the user's guide in the ACSS Computing Information Center. (CA)

Statistics Programs

General-purpose Packages

BMDP: Mathematics and statistics programs. See **WRITEUP,BMDP** and the *BMDP85 Statistical Software Manual* in the ACSS Computing Information Center; Health Sciences Bookstores. (CA)

MINITAB: Interactive statistical programs for small data sets. See *MINITAB 82 Reference Manual* (CA), *MINITAB 5.1 Reference Manual* (VX), and the *MINITAB Handbook* in the ACSS Computing Information Center. (CA,VX)

S Interactive statistical language for data analysis. See *S: An Interactive Environment for Data Analysis* in the ACSS Computing Information Center. (UX)

SAS: Batch-oriented statistical analysis package, which is the mainstay of IBM statistical users. See the *SAS User's Guide: Basics* and *SAS User's Guide: Statistics*, and *SAS Companion for the VMS Operating System* in the University bookstores, and use the command **type ACSS\$WRITEUP:SAS** on the VX. (VX)

SPSS: Statistical package for the social sciences. See **WRITEUP,SPSS**; *SPSS User's Manual Version 6*, *SPSS Version 7-9 Update*, *SPSS 9.0 Support Packet* (ACSS), and *SPSS 9.0 Update* (ACSS) in University bookstores. (CA)

SPSSONL: Interactive editor for SPSS. See *SPSS/ONLINE Manual* in the University bookstores, and **WRITEUP,SPSS**. (CA)

SPSSX: Current upgrade of SPSS, a complete rewriting. See *SPSSX Users' Guide*, *SPSSX Basics Primer* in the University bookstores and **WRITEUP,SPSSX**. (CA,VX)

SPSSX Tables: Package that produces camera-ready tables using SPSSX. See *SPSSX Tables Manual* and *SPSSX User's Guide* in the University bookstores. (VX)

Anova and Regression

GLIM: Generalized linear interactive modeling package. See *The GLIM System, Release 3* in the ACSS Computing Information Center. On the UX type **man glim**. (CA,UX)

IVAN: Program for interactive analysis of factorial designs. See *Ivan User's Manual* in the ACSS Computing Information Center. (CA)

MULTREG: Interactive multiple regression program. See *MULTREG User's Manual* in the ACSS Computing Information Center. On the UX type help and select the topic statpaks. (CA,UX)

Factor and Cluster Analysis

CLUSTER: Hierarchical cluster analysis package. See **WRITEUP,CLUSTER**. (CA)

EQS: Linear structural equations/confirmation factor analysis. *Theory and Implementation of EQS , a Structural Equation Program* in the ACSS Computing Information Center. (VX)

LISREL: Linear structural relationships/confirmatory factor analysis. See *LISREL VI Guide* in the ACSS Computing Information Center. (CA)

TRYSYS1: Tryon hierarchical cluster analysis. See **WRITEUP,TRYSIS1**; *TRYSYS Refence Manual* in the ACSS Computing Information Center. (CA)

Matrix Analysis

CTAB: Multidimensional contingency tables. See user's guide in the ACSS Computing Information Center. (CA)

MATTER: Interactive matrix manipulation program. See *Matter User's Manual* in the ACSS Computing Information Center. (CA,VX)

Multidimensional Scaling

KYST-2A: Multidimensional scaling and unfolding program. See *How To Use KYST-2* in the ACSS Computing Information Center. (CA)

SINDSCL Performs individual differences multidimensional scaling. See *How to Use SINDSCL* in the ACSS Computing Information Center. (CA)

Time Series

RATS: Regression and Time Series Analysis. See *RATS User's Manual* in the ACSS Computing Information Center. (CA)

SHAZAM: Econometric analysis of time series. See **WRITEUP,SHAZAM**. (CA)

TSP: Program for statistical analysis of time series by least squares. See *Time Series Processor User's Guide* and *TSP Refence Manual* in the ACSS Computing Information Center. (CA)

NOTE

Some computer languages have their own libraries of math and statistics routines:

PASCLIB(Pascal), SIMLIB(SIMSCRIPT)

For more information, please consult the relevant computer language document.

ACSS Brief

General Information

Academic Computing Services and Systems • University of Minnesota • Twin Cities

Mathematics, Engineering, and Statistics Software

Documentation for mathematics, engineering and statistics software at Academic Computing Services and Systems (ACSS) comes in several forms. Machine-retrievable documents for many routines are available through the CYBER utility WRITEUP. For example, each Minnesota Subprogram Library is documented on the CYBER CA in WRITEUP,MINNLIB. Manuals for programs such as SPSS may be purchased from the University bookstores. All the ACSS math-statistics packages are cataloged in the *Guide to Subprogram Libraries* or the *Guide to Application Packages: Math and Engineering* available at the Minnesota Book Center. Finally, reserve copies of all ACSS-related documents are kept in the ACSS Computing Information Center (CIC), 128A Lind Hall. The symbols CA, UX, and VX following each package refer to machine: CA-CYBER/NOS, UX-ENCORE/UNIX, VX-VAX/VMS.

Mathematics and Statistics Libraries

- CALGOPL: ACM Collected Algorithms file. See WRITEUP,CALGOPL and the *Collected Algorithms* publication available in the ACSS Computing Information Center. (CA)
- CMLIB: Collection of public domain libraries for math and statistics. On the UX type help and select the topic libraries. (UX)
- IMSL: International Mathematics and Statistics Library. See WRITEUP,IMSL and IMSL manuals in the ACSS Computing Information Center. (CA,VX)
- MINNLIB: Minnesota subprogram library. See WRITEUP,MINNLIB. (CA)

Mathematics Libraries and Programs

- BESPACK: Bessel and Airy functions library. See BESPACK documentation available in the ACSS Computing Information Center. (CA,VX)
- BSPLINE: B-spline interpolation and approximation library. See *A Practical Guide to Splines* in the ACSS Computing Information Center. (CA,VX)
- EISPACK: Eigenvalue-eigenvector analysis library. See WRITEUP,EISPACK on the CA, and on the UX type help and select the topic libraries. See also *Matrix Eigensystem Routines: EISPACK Guide* in the ACSS Computing Information Center. (CA,UX,VX)
- EPISODE: Ordinary differential equations library. See the *Episode User's Manual* available in the ACSS Computing Information Center. (CA,VX)
- FORSIM: Program for ordinary and partial differential equations. See the *FORSIM VI Simulation Package* in the ACSS Computing Information Center. (CA)
- FUNPACK: Exponential, elliptic, and Dawson's integrals library. See WRITEUP,FUNPACK. (CA,VX)
- INTLIB: M77 interval arithmetic library. See WRITEUP,INTLIB. (CA)
- LINPACK: Linear equations library. See WRITEUP,LINPACK and the *LINPACK User's Guide* in the ACSS Computing Information Center. (CA,VX)

- LSODE: Ordinary differential equations library. See **WRITEUP,LSODE** on the CA. (CA,VX)
- LSODI: Implicit ordinary differential equations library. See **WRITEUP,LSODI** on the CA. (CA,VX)
- OPT Optimization Library. On the UX type help and select the topic **libraries**. (UX)
- MACSYMA: Program for symbolic and algebraic manipulation. See user's guide in the ACSS Computing Information Center. (VX)
- MATLAB: Instructional matrix program. See **WRITEUP,MATLAB**. (CA)
- MINPACK: Nonlinear equations and nonlinear least squares library. See **WRITEUP,MINPACK** and the *MINPACK User's Guide* in the ACSS Computing Information Center. (CA,VX)
- PCGPAK Sparse linear equations (iterative methods) library. See the *PCGPAK User's Guide* in the ACSS Computing Information Center, and use the command type **ACSS\$WRITEUP:PCGPAK** on the VX. (VX)
- QUADPAK Numerical integration (quadrature) library. See *QUADPAK: A Subroutine Package for Automatic Integration* in the ACSS Computing Information Center, **WRITEUP,QUADPAK** on the CA, or use the command type **ACSS\$WRITEUP_[QUADPAK]INDEX** on the VX. (CA,VX)
- REDUCE: Program for symbolic and algebraic manipulations. See **WRITEUP,REDUCE2** on the CA. On the VX, the program is called REDUCE. (CA-REDUCE2,VX-REDUCE)
- SPARSPK Waterloo sparse linear equations and least squares (direct methods) library. See *SPARSPAK: Waterloo Sparse Matrix Package User's Guide for SPARSPAK-A and SPARSPAK-B* in the ACSS Computing Information Center and use the command type **ACSS\$WRITEUP:SPARSPK** on the VX. (VX)
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SPSSONL: Interactive editor for SPSS. See *SPSS/ONLINE Manual* in the University bookstores, and **WRITEUP,SPSS**. (CA)

SPSSX: Current upgrade of SPSS, a complete rewriting. See *SPSSX Users' Guide*, *SPSSX Basics Primer* in the University bookstores and **WRITEUP,SPSSX**. (CA,VX)

SPSSX Tables: Package that produces camera-ready tables using SPSSX. See *SPSSX Tables Manual* and *SPSSX User's Guide* in the University bookstores. (VX)

Anova and Regression

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IVAN: Program for interactive analysis of factorial designs. See *Ivan User's Manual* in the ACSS Computing Information Center. (CA)

- LOGIT: Logistic regression program. See manual in the ACSS Computing Information Center. (CA)
- MULTREG: Interactive multiple regression program. See *MULTREG User's Manual* in the ACSS Computing Information Center. On the UX type help and select the topic **statpaks**. (CA,UX)

Factor and Cluster Analysis

- CLUSTER: Hierarchical cluster analysis package. See **WRITEUP,CLUSTER**. (CA)
- EQS: Linear structural equations/confirmation factor analysis. *Theory and Implementation of EQS , a Structural Equation Program* in the ACSS Computing Information Center. (VX)
- LISREL: Linear structural relationships/confirmatory factor analysis. See *LISREL VI Guide* in the ACSS Computing Information Center. (CA)
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Matrix Analysis

- CTAB: Multidimensional contingency tables. See user's guide in the ACSS Computing Information Center. (CA)
- MATTER: Interactive matrix manipulation program. See *Matter User's Manual* in the ACSS Computing Information Center. (CA,VX)

Multidimensional Scaling

- KYST-2A: Multidimensional scaling and unfolding program. See *How To Use KYST-2* in the ACSS Computing Information Center. (CA)
- SINDSCL Performs individual differences multidimensional scaling. See *How to Use SINDSCL* in the ACSS Computing Information Center. (CA)

Time Series

- RATS: Regression and Time Series Analysis. See *RATS User's Manual* in the ACSS Computing Information Center. (CA)
- SHAZAM: Econometric analysis of time series. See **WRITEUP,SHAZAM**. (CA)
- TSP: Program for statistical analysis of time series by least squares. See *Time Series Processor User's Guide* and *TSP Refence Manual* in the ACSS Computing Information Center. (CA)

NOTE

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PASCLIB(Pascal), SIMLIB(SIMSCRIPT)

For more information, please consult the relevant computer language document.



UCC BRIEF

NEC Spinwriter Typewheels

The NEC Spinwriter is a Diablo-type letter quality printer attached to the University Computer Center's VAX/VMS system. The Spinwriter supports a variety of typewheels:

- "Emperor P.S."--Full ASCII character set,
proportional-width characters.
- "Bold P.S."--Full ASCII character set,
proportional-width characters.
- "Italic P.S."--Full ASCII character set,
proportional-width italicized characters.
- "Courier 72"--Full ASCII character set,
fixed-width characters.
- "APL 10/Light Italic"--Almost full ASCII character set,
APL graphics,
fixed-width italicized characters.
- "Technical Math/Times Roman"--Almost full ASCII character
some Greek letters and math symbols,
fixed-width characters.
- "Multilingual A"--Full ASCII character set,
European language characters and accent mark
fixed-width characters.

You can create the file on the VAX with the VAX editor, or you can create it on another system, such as a microcomputer or the CYBERS and then send it to the VAX for printing on the Spinwriter. In either case, you must have a VAX/VMS account to use the Spinwriter.

You print files on the Spinwriter with the VAX's ENQUEUE SPINWRITER command. Tell the Spinwriter which wheel to use with the ENQUEUE qualifier /TYPEWHEEL=wheelname. For example, to print two copies of myfile.pod with the Bold P.S. typewheel and send them to the West Bank output site you would type:

```
enqueue spinwriter myfile.pod /typewheel=boldps /copies=2
```

This Brief shows you each typewheel that is available for the Spinwriter, a short piece of text printed with the wheel, and a

list of all the characters on the wheel. Use the Brief to select the wheel you want to use. You can print a file with only one typewheel at a time.

Refer to the VAX on-line documentation for further information on using the Spinwriter. MOREHELP SPINWRITER provides information on preparing files to be sent to the Spinwriter, including how to obtain special printing effects such as bolding and super and subscripting. HELP ENQUEUE SPINWRITER provides information on sending files to the Spinwriter, including an explanation of all ENQUEUE qualifiers.

Call the UCC main HELP-Line (376-5592) if you have questions about using the Spinwriter that aren't answered in this Brief or the VAX HELPS. If you need a character set that isn't available now, bring it to our attention. We may order additional typewheels if there is a user demand for them.

THE TYPEWHEEL CHARTS

Each chart shows the proper name of the typewheel and in parentheses the name to be used in the ENQUEUE qualifier /TYPEWHEEL=wheelname.

A short quotation shows what text printed by the typewheel looks like.

The columns present the following information:

ASCII Codes This column lists the decimal and character codes
dec char for the standard ASCII character set. SP means
 space (the blank character).

Shift-in These are the characters the Spinwriter will
characters print for the corresponding ASCII codes in normal
 "as you see it" operating mode, called "shift-in"
 mode. No special commands are needed in either
 regular text or Scribe files. Most wheels
 reproduce the full ASCII character set, except
 where blanks occur in the column.

Shift-out These are the characters the Spinwriter will
characters print for the corresponding ASCII codes in the
 "shift-out" mode of operation. To indicate a
 shift-out character in a regular text file,
 enclose the ASCII character or characters in ^N
 (for shift-out, SO) and ^O (for shift-in, SI).
 (^N means type the up-arrow character followed by
 the letter N.) Then, when you ENQUEUE the file
 for printing, use the ENQUEUE qualifier /UPARROW.
 (To print the character ^ in a file when /UPARROW
 is used, type ^^.) Thus to print the not sign
 (\) with the Emperor P.S. wheel you would type
 ^N-^O in your text file.

Scribe
facecode

Scribe uses its facecode commands to perform the SO-SI function. To insert a special character or characters in a file that is going to be formatted with Scribe for the Spinwriter, you would enclose the ASCII character or characters within delimiters after the facecode command. This column shows the appropriate facecode to use for each special character. Thus to print the not sign (\) in a .POD file, you would type @y(-) in your input file for Scribe.

Scribe
commandstring

Some Scribe facecode command-ASCII character combinations have been defined as commandstrings in Scribe's database. These commandstrings can be used instead of facecode commands to produce the same characters. Thus @y(-) and @not both produce \. You must end a Scribe commandstring with a space or another Scribe commandstring. (Use @;, the Scribe null command, to end a commandstring in a string of characters.)

EMPEROR P.S. (/TYPEWHEEL=EMPERORPS)

"The effects of the craving for protection reach neither far nor deep, when the essence of it is only isolation; but when it tends to pack men together it gives rise to developments which have a wide and mighty bearing."

Friedrich Ratzel
The History of Mankind

ASCII dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring
32	SP	SP	SP	@y	
33	!	!			
34	"	"			
35	#	#			
36	\$	\$			
37	%	%	¢	@y	@cent
38	&	&			
39	'	'			
40	((
41))			
42	*	*			
43	+	+			
44	,	,			
45	-	-	¬	@y	@not
46	.	.			
47	/	/			
48	0	0			
49	1	1			
50	2	2	½	@y	@half
51	3	3			
52	4	4	¼	@y	@4th
53	5	5			
54	6	6			
55	7	7			
56	8	8			
57	9	9			
58	:	:			
59	;	;			
60	<	<	←	@y	@lar
61	=	=			
62	>	>			
63	?	?			
64	@	@			
65	A	A			
66	B	B			
67	C	C			
68	D	D			
69	E	E			
70	F	F			
71	G	G			
72	H	H			
73	I	I			
74	J	J			
75	K	K			

ASCII dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring
76	L	L			
77	M	M			
78	N	N			
79	O	O			
80	P	P			
81	Q	Q			
82	R	R			
83	S	S			
84	T	T			
85	U	U			
86	V	V			
87	W	W			
88	X	X			
89	Y	Y			
90	Z	Z			
91	[[
92	\	\			
93]]			
94	^	^			
95	~	~			
96	~	~			
97	a	a			
98	b	b			
99	c	c			
100	d	d			
101	e	e			
102	f	f			
103	g	g			
104	h	h			
105	i	i			
106	j	j			
107	k	k			
108	l	l			
109	m	m			
110	n	n			
111	o	o			
112	p	p			
113	q	q			
114	r	r			
115	s	s			
116	t	t			
117	u	u			
118	v	v			
119	w	w			
120	x	x			
121	y	y			
122	z	z			
123	{	{			
124	|	|			
125	}	}			
126	~	~			

BOLD P.S. (BOLDPS)

"Considerable quantities of black lead are taken occasionally for use from Winterham in the county of Amelia. I am not able, however, to give a particular state of the mine. There is no work established at it; those who want, going and procuring it for themselves."

Thomas Jefferson
Notes on the State of Virginia

ASCII dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring
32	SP	SP	SP	@y	
33	!	!			
34	"	"			
35	#	#			
36	\$	\$			
37	%	%	e	@y	@cent
38	&	&			
39	'	'			
40	((
41))			
42	*	*			
43	+	+			
44	,	,			
45	-	-	¬	@y	@not
46	.	.			
47	/	/			
48	0	0			
49	1	1			
50	2	2	½	@y	@half
51	3	3			
52	4	4	¼	@y	@4th
53	5	5			
54	6	6			
55	7	7			
56	8	8			
57	9	9			
58	:	:			
59	;	;			
60	<	<	←	@y	@lar
61	=	=			
62	>	>			
63	?	?			
64	@	@			
65	A	A			
66	B	B			
67	C	C			
68	D	D			
69	E	E			
70	F	F			
71	G	G			
72	H	H			
73	I	I			
74	J	J			
75	K	K			

ASCII dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring
76	L	L	L		
77	M	M	M		
78	N	N	N		
79	O	O	O		
80	P	P	P		
81	Q	Q	Q		
82	R	R	R		
83	S	S	S		
84	T	T	T		
85	U	U	U		
86	V	V	V		
87	W	W	W		
88	X	X	X		
89	Y	Y	Y		
90	Z	Z	Z		
91	[[[
92	\	\	\		
93]]]		
94	^	^	^		
95	`	`	`		
96					
97	a	a	a		
98	b	b	b		
99	c	c	c		
100	d	d	d		
101	e	e	e		
102	f	f	f		
103	g	g	g		
104	h	h	h		
105	i	i	i		
106	j	j	j		
107	k	k	k		
108	l	l	l		
109	m	m	m		
110	n	n	n		
111	o	o	o		
112	p	p	p		
113	q	q	q		
114	r	r	r		
115	s	s	s		
116	t	t	t		
117	u	u	u		
118	v	v	v		
119	w	w	w		
120	x	x	x		
121	y	y	y		
122	z	z	z		
123	{	{	{		
124	|	|	|		
125	}	}	}		
126	~	~	~		

ITALIC P.S. (ITALICPS)

"13. A glad heart lights up the face, but by mental anguish the spirit is broken.

"14. The mind of the intelligent man seeks knowledge, but the mouth of fools feeds on folly.

"15. Every day is miserable for the depressed, but a lighthearted man has a continual feast."

Proverbs, Chapter 15

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32	SP	SP	SP	@y	
33	!	!			
34	"	"			
35	#	#			
36	\$	\$			
37	%	%	¢	@y	@cent
38	&	&			
39	'	'			
40	((
41))			
42	*	*			
43	+	+			
44	,	,			
45	-	-	¬	@y	@not
46	.	.			
47	/	/			
48	0	0			
49	1	1			
50	2	2	½	@y	@half
51	3	3			
52	4	4	¼	@y	@4th
53	5	5			
54	6	6			
55	7	7			
56	8	8			
57	9	9			
58	:	:			
59	;	;			
60	<	<	←	@y	@lar
61	=	=			
62	>	>			
63	?	?			
64	@	@			
65	A	A			
66	B	B			
67	C	C			
68	D	D			
69	E	E			
70	F	F			
71	G	G			
72	H	H			
73	I	I			
74	J	J			
75	K	K			

ASCII dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring
76	L	L			
77	M	M			
78	N	N			
79	O	O			
80	P	P			
81	Q	Q			
82	R	R			
83	S	S			
84	T	T			
85	U	U			
86	V	V			
87	W	W			
88	X	X			
89	Y	Y			
90	Z	Z			
91	[[
92	\	\			
93]]			
94	^	^			
95	~	~			
96					
97	a	a			
98	b	b			
99	c	c			
100	d	d			
101	e	e			
102	f	f			
103	g	g			
104	h	h			
105	i	i			
106	j	j			
107	k	k			
108	l	l			
109	m	m			
110	n	n			
111	o	o			
112	p	p			
113	q	q			
114	r	r			
115	s	s			
116	t	t			
117	u	u			
118	v	v			
119	w	w			
120	x	x			
121	y	y			
122	z	z			
123	{	{			
124	|	|			
125	}	}			
126	~	~			

"The effects of the craving for protection reach neither far nor deep, when the essence of it is only isolation; but when it tends to pack men together it gives rise to developments which have a wide and mighty bearing."

Friedrich Ratzel
The History of Mankind

ASCII dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring
32	SP	SP	SP	@y	
33	!	!			
34	"	"			
35	#	#			
36	\$	\$			
37	%	%	¢	@y	@cent
38	&	&			
39	'	'			
40	((
41))			
42	*	*			
43	+	+			
44	,	,			
45	-	-	-	@y	@not
46	.	.			
47	/	/			
48	0	0			
49	1	1			
50	2	2			
51	3	3			
52	4	4			
53	5	5			
54	6	6			
55	7	7			
56	8	8			
57	9	9			
58	:	:			
59	;	;			
60	<	<			
61	=	=			
62	>	>			
63	?	?			
64	@	@			
65	A	A			
66	B	B			
67	C	C			
68	D	D			
69	E	E			
70	F	F			
71	G	G			
72	H	H			
73	I	I			
74	J	J			
75	K	K			

ASCII dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring
76	L	L			
77	M	M			
78	N	N			
79	O	O			
80	P	P			
81	Q	Q			
82	R	R			
83	S	S			
84	T	T			
85	U	U			
86	V	V			
87	W	W			
88	X	X			
89	Y	Y			
90	Z	Z			
91	[[
92	\	\			
93]]			
94	^	^			
95	~	~			
96					
97	a	a			
98	b	b			
99	c	c			
100	d	d			
101	e	e			
102	f	f			
103	g	g			
104	h	h			
105	i	i			
106	j	j			
107	k	k			
108	l	l			
109	m	m			
110	n	n			
111	o	o			
112	p	p			
113	q	q			
114	r	r			
115	s	s			
116	t	t			
117	u	u			
118	v	v			
119	w	w			
120	x	x			
121	y	y			
122	z	z			
123	{	{			
124	|	|			
125	}	}			
126	~	~			

"To this list we must add the two equivalences that are needed on those occasions when the signs ∇ and \equiv are introduced into proofs. They are

- (vii) $(P \nabla Q) \equiv [(P \vee Q) \cdot \sim (P \cdot Q)]$
- (viii) $(P \equiv Q) \equiv [(P \supset Q) \cdot (Q \supset P)]."$

Robert Neidorf
Deductive Forms

ASCII Codes dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring
32	SP	SP	SP	@e	
33	!	!	"	@e	
34	"	"	)	@e	
35	#	#	<	@e	
36	\$	\$	≤	@e	
37	%	%	=	@e	
38	&	&	>	@e	
39	'	'	]	@e	
40	(	(	v	@e	
41	)	)	^	@e	
42	*	*	≠	@e	
43	+	+	‡	@e	
44	,	,	,	@e	
45	-	-	+	@e	
46	.	.	.	@e	
47	/	/	/	@e	
48	0	0	0	@e	
49	1	1	1	@e	
50	2	2	2	@e	
51	3	3	3	@e	
52	4	4	4	@e	
53	5	5	5	@e	
54	6	6	6	@e	
55	7	7	7	@e	
56	8	8	8	@e	
57	9	9	9	@e	
58	:	:	(	@e	
59	;	;	[	@e	
60	<	<	;	@e	
61	=	=	x	@e	
62	>	>	:	@e	
63	?	?	\	@e	
64	@	@	-	@e	
65	A	A	A	@e	
66	B	B	⊥	@e	
67	C	C	∩	@e	
68	D	D	∪	@e	
69	E	E	ε	@e	
70	F	F	-	@e	
71	G	G	∇	@e	
72	H	H	Δ	@e	
73	I	I	ι	@e	
74	J	J	ο	@e	
75	K	K	'	@e	

<i>ASCII dec</i>	<i>Codes char</i>	<i>Shift-In character</i>	<i>Shift-Out character</i>	<i>Scribe facecode</i>	<i>Scribe commandstring</i>
76	L	L	□	@e	
77	M	M	|	@e	
78	N	N	T	@e	
79	O	O	O	@e	
80	P	P	*	@e	
81	Q	Q	?	@e	
82	R	R	p	@e	
83	S	S	┌	@e	
84	T	T	~	@e	
85	U	U	+	@e	
86	V	V	u	@e	
87	W	W	w	@e	
88	X	X	∩	@e	
89	Y	Y	†	@e	
90	Z	Z	c	@e	
91	[	[	+	@e	
92	\	\	└	@e	
93	]	]	→	@e	
94	^	^	≥	@e	
95	-	-	-	@e	
96	`	`	◇	@e	
97	a	a	A	@e	
98	b	b	B	@e	
99	c	c	C	@e	
100	d	d	D	@e	
101	e	e	E	@e	
102	f	f	F	@e	
103	g	g	G	@e	
104	h	h	H	@e	
105	i	i	I	@e	
106	j	j	J	@e	
107	k	k	K	@e	
108	l	l	L	@e	
109	m	m	M	@e	
110	n	n	N	@e	
111	o	o	O	@e	
112	p	p	P	@e	
113	q	q	Q	@e	
114	r	r	R	@e	
115	s	s	S	@e	
116	t	t	T	@e	
117	u	u	U	@e	
118	v	v	V	@e	
119	w	w	W	@e	
120	x	x	X	@e	
121	y	y	Y	@e	
122	z	z	Z	@e	
123	{	{	{	@e	
124	|	|	└	@e	
125	}	}	}	@e	
126	~	~	\$	@e	

TECHNICAL MATH/TIMES ROMAN (TECHMATH)

"An azimuthal projection is obtained if $\theta = n\lambda$. Taking $\partial r/\partial \lambda = 0$, and with $r = f(\rho)$ selected arbitrarily, yields

$$2.4 \theta = R^2 \int \frac{\pm D(\rho, \lambda) \sin \rho d\lambda}{r(\partial r/\partial \rho)} + g(\rho)."$$

Waldo R. Tobler
Geographic Area and Map Projections

ASCII dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring
32	SP	SP	SP	@z,@g	
33	!	!			
34	"	"			
35	#	#			
36	\$	\$	/	@z	@int
37	%	%	0	@z	@par
38	&	&			
39	'	'			
40	(	(	∫	@z	@uhi
41	)	)	∫	@z	@lhi
42	*	*	∞	@z	@inf
43	+	+			
44	,	,			
45	-	-			
46	.	.			
47	/	/	∠	@z	@lhs
48	0	0	0	@z	@sup0
49	1	1	1	@z	@sup1
50	2	2	2	@z	@sup2
51	3	3	3	@z	@sup3
52	4	4	4	@z	@sup4
53	5	5	5	@z	@sup5
54	6	6	6	@z	@sup6
55	7	7	7	@z	@sup7
56	8	8	8	@z	@sup8
57	9	9	9	@z	@sup9
58	:	:			
59	;	;			
60	<	<	↓	@z	@dar
61	=	=			
62	>	>	↑	@z	@uar
63	?	?			
64	@	@			
65	A	A			
66	B	B			
67	C	C			
68	D	D	Δ	@g	
69	E	E			
70	F	F			
71	G	G			
72	H	H			
73	I	I			
74	J	J			
75	K	K			

ASCII dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring
76	L	L			
77	M	M			
78	N	N			
79	O	O			
80	P	P			
81	Q	Q			
82	R	R			
83	S	S			
84	T	T			
85	U	U			
86	V	V			
87	W	W	Ω	@g	
88	X	X			
89	Y	Y			
90	Z	Z			
91	[	[	L	@z	@llb
92	\	\	\]	@z	@uhs
93	]	]	]	@z	@lrb
94	^	^			
95	-	-			
96	~	~			
97	a	a	α	@g	@alpha
98	b	b	β	@g	@beta
99	c	c			
100	d	d	δ	@g	@delta
101	e	e	ε	@g	@epsilon
102	f	f			
103	g	g	γ	@g	@gamma
104	h	h	η	@g	@eta
105	i	i			
106	j	j			
107	k	k			
108	l	l	λ	@g	@lambda
109	m	m	μ	@g	@mu
110	n	n			
111	o	o			
112	p	p	π	@g	@pi
113	q	q			
114	r	r	ρ	@g	@rho
115	s	s	σ	@g	@sigma
116	t	t	τ	@g	@tau
117	u	u			
118	v	v			
119	w	w	ω	@g	@omega
120	x	x	ξ	@g	@xi
121	y	y			
122	z	z			
123	{	{	Γ	@z	@ulb
124	|	|			
125	}	}	Γ	@z	@urb
126	~	~	α	@z	@pro

To build a large integral, large sigma, large brace, or large brackets, vertically align the appropriate character representations in two lines of single-spaced text.

MULTILINGUAL A (MULTILINGUAL)

«Du lieu où nous étions placés, nous aurions pu voir, dans les beaux jours d'Athènes, les flottes sortir du Pirée pour combattre l'ennemi ou pour se rendre aux fêtes de Délos; nous aurions pu entendre éclater au théâtre de Bacchus les douleurs d'Edipe, de Philoctète et d'Hécube; nous aurions pu ouïr les applaudissements des citoyens aux discours de Démosthène.»

Chauteaubriand
L'Itinéraire de Paris à Jérusalem

ASCII dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring, accent form
32	SP	SP	SP	@n,@y	
33	!	!	i	@n	
34	"	"			
35	#	#			
36	\$	\$	£	@n	@pound
37	%	%	¢	@y	@cent
38	&	&	§	@y	@sect
39	'	'			
40	((
41))			
42	*	*	¤	@n	@ecopyr
43	+	+	†	@y	@dagger
44	,	,			
45	-	-	¬	@y	@not
46	.	.			
47	/	/			
48	0	0	°	@y	@deg
49	1	1	1	@y	
50	2	2			
51	3	3			
52	4	4			
53	5	5			
54	6	6			
55	7	7			
56	8	8			
57	9	9			
58	:	:			
59	;	;			
60	<	<			
61	=	=			
62	>	>			
63	?	?	¿	@n	
64	@	@			
65	A	A	Æ	@n	
66	B	B	•	@y	@copyr
67	C	C			
68	D	D			
69	E	E	€	@n	
70	F	F			
71	G	G			
72	H	H	A	@n	
73	I	I			
74	J	J			
75	K	K			

ASCII dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring, accent form
76	L	L			
77	M	M			
78	N	N			
79	O	O	Ø	@n	
80	P	P	Ɔ	@y	@parag
81	Q	Q			
82	R	R	•	@y	@registered
83	S	S			
84	T	T	™	@y	@trademark
85	U	U	∴		@uu(X)
86	V	V			
87	W	W	∴		@ua(X)
88	X	X	∴		@uc(X)
89	Y	Y	∴		@ug(X)
90	Z	Z	∴		@ut(X)
91	[[
92	\	\			
93]]			
94	^	^			
95	~	~			
96					
97	a	a	æ	@n	
98	b	b			
99	c	c	•		@ce(c)
100	d	d			
101	e	e	œ	@n	
102	f	f			
103	g	g			
104	h	h	à	@n	
105	i	i			
106	j	j	ij	@n	
107	k	k			
108	l	l			
109	m	m			
110	n	n			
111	o	o	ø	@n	
112	p	p			
113	q	q			
114	r	r			
115	s	s	ß	@n	
116	t	t			
117	u	u	∴		@lc(x)
118	v	v	∴		@ha(x)
119	w	w	∴		@la(x)
120	x	x	∴		@lc(x)
121	y	y	∴		@lg(x)
122	z	z	∴		@lt(x)
123	{	{			
124	|	|			
125	}	}			
126	~	~			

In text files enter an accent with a backspace (type ^H) over the character (e.g., epe^H^Nw^Oe).

For Scribe files use a Scribe form to enter the accented character (e.g., ep@la[ele]). X under "Scribe accent form" above stands for an upper case accented character; x stands for a lower case accented character. (Put the Scribe tab @\ before an accent form at the beginning of an itemize or enumerate paragraph.)





UCC BRIEF

NEC Spinwriter Typewheels

The NEC Spinwriter is a Diablo-type letter quality printer attached to the University Computer Center's VAX/VMS system. The Spinwriter supports a variety of typewheels:

"Emperor P.S."--Full ASCII character set,
proportional-width characters.

"Bold P.S."--Full ASCII character set,
proportional-width characters.

"Italic P.S."--Full ASCII character set,
proportional-width italicized characters.

"Courier 72"--Full ASCII character set,
fixed-width characters.

"APL 10/Light Italic"--Almost full ASCII character set,
APL graphics,
fixed-width italicized characters.

"Technical Math/Times Roman"--Almost full ASCII character set,
some Greek letters and math symbols,
fixed-width characters.

"Multilingual A"--Full ASCII character set,
European language characters and accent marks,
fixed-width characters.

You can create the file on the VAX with the VAX editor, or you can create it on another system, such as a microcomputer, or the CYBERs and then send it to the VAX for printing on the Spinwriter. In either case, you must have a VAX/VMS account to use the Spinwriter.

You print files on the Spinwriter with the VAX's ENQUEUE SPINWRITER command. Tell the Spinwriter which wheel to use with the ENQUEUE qualifier /TYPEWHEEL=wheelname. For example, to print two copies of myfile.pod with the Bold P.S. typewheel and send them to the West Bank output site you would type:

```
enqueue spinwriter myfile.pod /typewheel=boldps /copies=2 /site=wb
```

This Brief shows you each typewheel that is available for the Spinwriter, a short piece of text printed with the wheel, and a list of all the characters on the wheel. Use the Brief to select the wheel you want to use. You can print a file with only one typewheel at a time.

Refer to the VAX on-line documentation for further information on using the Spinwriter. MOREHELP SPINWRITER provides information on preparing files to be sent to the Spinwriter, including how to obtain special printing effects such as bolding and super and subscripting. HELP ENQUEUE SPINWRITER provides information on sending files to the Spinwriter, including an explanation of all ENQUEUE qualifiers.

Call the UCC main HELP-Line (376-5592) if you have questions about using the Spinwriter that aren't answered in this Brief or the VAX HELPs. If you need a character set that isn't available now, bring it to our attention. We may order additional typewheels if there is a user demand for them.

THE TYPEWHEEL CHARTS

Each chart shows the proper name of the typewheel and in parentheses the name to be used in the ENQUEUE qualifier /TYPEWHEEL=wheelname.

A short quotation shows what text printed by the typewheel looks like.

The columns present the following information:

ASCII Codes dec| char	This column lists the decimal and character codes for the standard ASCII character set. SP means space (the blank character).
Shift-in characters	These are the characters the Spinwriter will print for the corresponding ASCII codes in normal "as you see it" operating mode, called "shift-in" mode. No special commands are needed in either regular text or Scribe files. Most wheels reproduce the full ASCII character set, except where blanks occur in the column.
Shift-out characters	These are the characters the Spinwriter will print for the corresponding ASCII codes in the "shift-out" mode of operation. To indicate a shift-out character in a regular text file, enclose the ASCII character or characters in ^N (for shift-out, SO) and ^O (for shift-in, SI). (^N means type the up-arrow character followed by the letter N.) Then, when you ENQUEUE the file for printing, use the ENQUEUE qualifier /UPARROW. (To print the character ^ in a file when /UPARROW is used, type ~.) Thus to print the not sign (-) with the Emperor P.S. wheel you would type ^N-^O in your text file.
Scribe facecode	Scribe uses its facecode commands to perform the SO-SI function. To insert a special character or characters in a file that is going to be formatted with Scribe for the Spinwriter, you would enclose the ASCII character or characters within delimiters after the facecode command. This column shows the appropriate facecode to use for each special character. Thus to print the not sign (-) in a .POD file, you would type @y(-) in your input file for Scribe.
Scribe commandstring	Some Scribe facecode command-ASCII character combinations have been defined as commandstrings in Scribe's database. These commandstrings can be used instead of facecode commands to produce the same characters. Thus @y(-) and @not both produce -. You must end a Scribe commandstring with a space or another Scribe commandstring. (Use @, the Scribe null command, to end a commandstring in a string of characters.)

EMPEROR P.S. (/TYPEWHEEL=EMPERORPS)

"The effects of the craving for protection reach neither far nor deep, when the essence of it is only isolation; but when it tends to pack men together it gives rise to developments which have a wide and mighty bearing."

Friedrich Ratzel
The History of Mankind

ASCII dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring
32	SP	SP	SP	@y	
33	!	!			
34	"	"			
35	#	#			
36	\$	\$			
37	%	%	¢	@y	@cent
38	&	&			
39	'	'			
40	((
41))			
42	*	*			
43	+	+			
44	,	,			
45	-	-	¬	@y	@not
46	.	.			
47	/	/			
48	0	0			
49	1	1			
50	2	2	½	@y	@half
51	3	3			
52	4	4	¼	@y	@4th
53	5	5			
54	6	6			
55	7	7			
56	8	8			
57	9	9			
58	:	:			
59	;	;			
60	<	<	←	@y	@lar
61	=	=			
62	>	>			
63	?	?			
64	@	@			
65	A	A			
66	B	B			
67	C	C			
68	D	D			
69	E	E			
70	F	F			
71	G	G			
72	H	H			
73	I	I			
74	J	J			
75	K	K			

ASCII dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring
76	L	L			
77	M	M			
78	N	N			
79	O	O			
80	P	P			
81	Q	Q			
82	R	R			
83	S	S			
84	T	T			
85	U	U			
86	V	V			
87	W	W			
88	X	X			
89	Y	Y			
90	Z	Z			
91	[[
92	\	\			
93]]			
94	^	^			
95	~	~			
96					
97	a	a			
98	b	b			
99	c	c			
100	d	d			
101	e	e			
102	f	f			
103	g	g			
104	h	h			
105	i	i			
106	j	j			
107	k	k			
108	l	l			
109	m	m			
110	n	n			
111	o	o			
112	p	p			
113	q	q			
114	r	r			
115	s	s			
116	t	t			
117	u	u			
118	v	v			
119	w	w			
120	x	x			
121	y	y			
122	z	z			
123	{	{			
124	|	|			
125	}	}			
126	~	~			

BGLD P.S. (BOLDPS)

"Considerable quantities of black lead are taken occasionally for use from Winterham in the county of Amelia. I am not able, however, to give a particular state of the mine. There is no work established at it; those who want, going and procuring it for themselves."

Thomas Jefferson
Notes on the State of Virginia

ASCII dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring
32	SP	SP	SP	@y	
33	!	!			
34	"	"			
35	#	#			
36	\$	\$			
37	%	%	¢	@y	@cent
38	&	&			
39	'	'			
40	((
41))			
42	*	*			
43	+	+			
44	,	,			
45	-	-	¬	@y	@not
46	.	.			
47	/	/			
48	0	0			
49	1	1			
50	2	2	½	@y	@half
51	3	3			
52	4	4	¼	@y	@4th
53	5	5			
54	6	6			
55	7	7			
56	8	8			
57	9	9			
58	:	:			
59	;	;			
60	<	<	←	@y	@lar
61	=	=			
62	>	>			
63	?	?			
64	@	@			
65	A	A			
66	B	B			
67	C	C			
68	D	D			
69	E	E			
70	F	F			
71	G	G			
72	H	H			
73	I	I			
74	J	J			
75	K	K			

ASCII dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring
76	L	L			
77	M	M			
78	N	N			
79	O	O			
80	P	P			
81	Q	Q			
82	R	R			
83	S	S			
84	T	T			
85	U	U			
86	V	V			
87	W	W			
88	X	X			
89	Y	Y			
90	Z	Z			
91	[[
92	\	\			
93]]			
94	^	^			
95	~	~			
96					
97	a	a			
98	b	b			
99	c	c			
100	d	d			
101	e	e			
102	f	f			
103	g	g			
104	h	h			
105	i	i			
106	j	j			
107	k	k			
108	l	l			
109	m	m			
110	n	n			
111	o	o			
112	p	p			
113	q	q			
114	r	r			
115	s	s			
116	t	t			
117	u	u			
118	v	v			
119	w	w			
120	x	x			
121	y	y			
122	z	z			
123	{	{			
124	|	|			
125	}	}			
126	~	~			

"13. A glad heart lights up the face, but by mental anguish the spirit is broken.

"14. The mind of the intelligent man seeks knowledge, but the mouth of fools feeds on folly.

"15. Every day is miserable for the depressed, but a lighthearted man has a continual feast."

Proverbs, Chapter 15

ASCII dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring
32	SP	SP	SP	@y	
33	!	!			
34	"	"			
35	#	#			
36	\$	\$			
37	%	%	¢	@y	@cent
38	&	&			
39	'	'			
40	((
41))			
42	*	*			
43	+	+			
44	,	,			
45	-	-	¬	@y	@not
46	.	.			
47	/	/			
48	0	0			
49	1	1			
50	2	2	½	@y	@half
51	3	3			
52	4	4	¼	@y	@4th
53	5	5			
54	6	6			
55	7	7			
56	8	8			
57	9	9			
58	:	:			
59	;	;			
60	<	<	←	@y	@lar
61	=	=			
62	>	>			
63	?	?			
64	@	@			
65	A	A			
66	B	B			
67	C	C			
68	D	D			
69	E	E			
70	F	F			
71	G	G			
72	H	H			
73	I	I			
74	J	J			
75	K	K			

ASCII dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring
76	L	L			
77	M	M			
78	N	N			
79	O	O			
80	P	P			
81	Q	Q			
82	R	R			
83	S	S			
84	T	T			
85	U	U			
86	V	V			
87	W	W			
88	X	X			
89	Y	Y			
90	Z	Z			
91	[[
92	\	\			
93]]			
94	^	^			
95	~	~			
96					
97	a	a			
98	b	b			
99	c	c			
100	d	d			
101	e	e			
102	f	f			
103	g	g			
104	h	h			
105	i	i			
106	j	j			
107	k	k			
108	l	l			
109	m	m			
110	n	n			
111	o	o			
112	p	p			
113	q	q			
114	r	r			
115	s	s			
116	t	t			
117	u	u			
118	v	v			
119	w	w			
120	x	x			
121	y	y			
122	z	z			
123	{	{			
124	|	|			
125	}	}			
126	~	~			

"The effects of the craving for protection reach neither far nor deep, when the essence of it is only isolation; but when it tends to pack men together it gives rise to developments which have a wide and mighty bearing."

Friedrich Ratzel
The History of Mankind

ASCII dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring
32	SP	SP	SP	@y	
33	!	!			
34	"	"			
35	#	#			
36	\$	\$			
37	%	%	¢	@y	@cent
38	&	&			
39	'	'			
40	((
41))			
42	*	*			
43	+	+			
44	,	,			
45	-	-	-	@y	@not
46	.	.			
47	/	/			
48	0	0			
49	1	1			
50	2	2			
51	3	3			
52	4	4			
53	5	5			
54	6	6			
55	7	7			
56	8	8			
57	9	9			
58	:	:			
59	;	;			
60	<	<			
61	=	=			
62	>	>			
63	?	?			
64	@	@			
65	A	A			
66	B	B			
67	C	C			
68	D	D			
69	E	E			
70	F	F			
71	G	G			
72	H	H			
73	I	I			
74	J	J			
75	K	K			

ASCII dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring
76	L	L			
77	M	M			
78	N	N			
79	O	O			
80	P	P			
81	Q	Q			
82	R	R			
83	S	S			
84	T	T			
85	U	U			
86	V	V			
87	W	W			
88	X	X			
89	Y	Y			
90	Z	Z			
91	[[
92	\	\			
93]]			
94	^	^			
95	~	~			
96	·	·			
97	a	a			
98	b	b			
99	c	c			
100	d	d			
101	e	e			
102	f	f			
103	g	g			
104	h	h			
105	i	i			
106	j	j			
107	k	k			
108	l	l			
109	m	m			
110	n	n			
111	o	o			
112	p	p			
113	q	q			
114	r	r			
115	s	s			
116	t	t			
117	u	u			
118	v	v			
119	w	w			
120	x	x			
121	Y	Y			
122	Z	Z			
123	{	{			
124	|	|			
125	}	}			
126	~	~			

"To this list we must add the two equivalences that are needed on those occasions when the signs ∇ and \equiv are introduced into proofs. They are

- (vii) $(P \nabla Q) \equiv [(P \vee Q) \cdot \sim(P \cdot Q)]$
- (viii) $(P \equiv Q) \equiv [(P \supset Q) \cdot (Q \supset P)]."$

Robert Neidorf
Deductive Forms

ASCII Codes dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring
32	SP	SP	SP	@e	
33	!	!	..	@e	
34	"		)	@e	
35	#		<	@e	
36	\$	\$	≤	@e	
37	%	%	=	@e	
38	&	&	>	@e	
39	'	'	]	@e	
40	(	(	∇	@e	
41	)	)	∧	@e	
42	*	*	≠	@e	
43	+	+	÷	@e	
44	,	,	,	@e	
45	-	-	+	@e	
46	.	.	.	@e	
47	/	/	/	@e	
48	0	0	0	@e	
49	1	1	1	@e	
50	2	2	2	@e	
51	3	3	3	@e	
52	4	4	4	@e	
53	5	5	5	@e	
54	6	6	6	@e	
55	7	7	7	@e	
56	8	8	8	@e	
57	9	9	9	@e	
58	:	:	(	@e	
59	;	;	[	@e	
60	<	<	;	@e	
61	=	=	x	@e	
62	>	>	:	@e	
63	?	?	\	@e	
64	@		-	@e	
65	A	A	A	@e	
66	B	B	⊥	@e	
67	C	C	∩	@e	
68	D	D	⊆	@e	
69	E	E	ε	@e	
70	F	F	-	@e	
71	G	G	∇	@e	
72	H	H	Δ	@e	
73	I	I	ι	@e	
74	J	J	ο	@e	
75	K	K	'	@e	

<i>ASCII Codes dec</i>	<i>Codes char</i>	<i>Shift-In character</i>	<i>Shift-Out character</i>	<i>Scribe facecode</i>	<i>Scribe commandstring</i>
76	L	L	□	@e	
77	M	M	|	@e	
78	N	N	T	@e	
79	O	O	O	@e	
80	P	P	*	@e	
81	Q	Q	?	@e	
82	R	R	p	@e	
83	S	S	┌	@e	
84	T	T	~	@e	
85	U	U	+	@e	
86	V	V	u	@e	
87	W	W	w	@e	
88	X	X	∩	@e	
89	Y	Y	†	@e	
90	Z	Z	∩	@e	
91	[	[	+	@e	
92	\	\	┌	@e	
93	]	]	+	@e	
94	^		≥	@e	
95	-	-	-	@e	
96	`		◇	@e	
97	a	a	A	@e	
98	b	b	B	@e	
99	c	c	C	@e	
100	d	d	D	@e	
101	e	e	E	@e	
102	f	f	F	@e	
103	g	g	G	@e	
104	h	h	H	@e	
105	i	i	I	@e	
106	j	j	J	@e	
107	k	k	K	@e	
108	l	l	L	@e	
109	m	m	M	@e	
110	n	n	N	@e	
111	o	o	O	@e	
112	p	p	P	@e	
113	q	q	Q	@e	
114	r	r	R	@e	
115	s	s	S	@e	
116	t	t	T	@e	
117	u	u	U	@e	
118	v	v	V	@e	
119	w	w	W	@e	
120	x	x	X	@e	
121	y	y	Y	@e	
122	z	z	Z	@e	
123	{	{	{	@e	
124	|	|	┌	@e	
125	}	}	}	@e	
126	~	~	\$	@e	

"An azimuthal projection is obtained if $\theta = n\lambda$. Taking $\partial r/\partial \lambda = 0$, and with $r = f(\rho)$ selected arbitrarily, yields

$$2.4 \theta = R^2 \int \frac{\pm D(\rho, \lambda) \sin \rho d\lambda}{r(\partial r/\partial \rho)} + g(\rho)."$$

Waldo R. Tobler
Geographic Area and Map Projections

ASCII dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring
32	SP	SP	SP	@z,@g	
33	!	!			
34	"	"			
35	#	#			
36	\$		/	@z	@int
37	%	%	0	@z	@par
38	&				
39	,	,			
40	(	(		@z	@uhi
41	)	)	∫	@z	@lhi
42	*	*	∞	@z	@inf
43	+	+			
44	,	,			
45	-	-			
46	.	.			
47	/	/	∠	@z	@lhs
48	0	0	0	@z	@sup0
49	1	1	1	@z	@sup1
50	2	2	2	@z	@sup2
51	3	3	3	@z	@sup3
52	4	4	4	@z	@sup4
53	5	5	5	@z	@sup5
54	6	6	6	@z	@sup6
55	7	7	7	@z	@sup7
56	8	8	8	@z	@sup8
57	9	9	9	@z	@sup9
58	:	:			
59	;				
60	<	<	↓	@z	@dar
61	=	=			
62	>	>	↑	@z	@uar
63	?	?			
64	@				
65	A	A			
66	B	B			
67	C	C			
68	D	D	Δ	@g	
69	E	E			
70	F	F			
71	G	G			
72	H	H			
73	I	I			
74	J	J			
75	K	K			

ASCII dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring
76	L	L			
77	M	M			
78	N	N			
79	O	O			
80	P	P			
81	Q	Q			
82	R	R			
83	S	S			
84	T	T			
85	U	U			
86	V	V			
87	W	W	Ω	@g	
88	X	X			
89	Y	Y			
90	Z	Z			
91	[	[	[	@z	@llb
92	\	\	\	@z	@uhs
93	]	]	]	@z	@lrb
94	^				
95	~				
96	`	-			
97	a	a	α	@g	@alpha
98	b	b	β	@g	@beta
99	c	c			
100	d	d	δ	@g	@delta
101	e	e	ε	@g	@epsilon
102	f	f			
103	g	g	γ	@g	@gamma
104	h	h	η	@g	@eta
105	i	i			
106	j	j			
107	k	k			
108	l	l	λ	@g	@lambda
109	m	m	μ	@g	@mu
110	n	n			
111	o	o			
112	p	p	π	@g	@pi
113	q	q			
114	r	r	ρ	@g	@rho
115	s	s	σ	@g	@sigma
116	t	t	τ	@g	@tau
117	u	u			
118	v	v			
119	w	w	ω	@g	@omega
120	x	x	ξ	@g	@xi
121	y	y			
122	z	z			
123	{	{	[	@z	@ulb
124	|	|			
125	}	}	]	@z	@urb
126	~	~	α	@z	@pro

To build a large integral, large sigma, large brace, or large brackets, vertically align the appropriate character representations in two lines of single-spaced text.

«Du lieu où nous étions placés, nous aurions pu voir, dans les beaux jours d'Athènes, les flottes sortir du Pirée pour combattre l'ennemi ou pour se rendre aux fêtes de Délos; nous aurions pu entendre éclater au théâtre de Bacchus les douleurs d'Edipe, de Philoctète et d'Hécube; nous aurions pu ouïr les applaudissements des citoyens aux discours de Démosthène.»

Chateaubriand
L'Itinéraire de Paris à Jérusalem

ASCII dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring, accent form
32	SP	SP	SP	@n,@y	
33	!	!	i	@n	
34	"	"			
35	#	#			
36	\$	\$	£	@n	@pound
37	%	%	¢	@y	@cent
38	&	&	§	@y	@sect
39	'	'			
40	((
41))			
42	*	*	¤	@n	@ecopyr
43	+	+	†	@y	@dagger
44	,	,			
45	-	-	¬	@y	@not
46	.	.			
47	/	/			
48	0	0	°	@y	@deg
49	1	1	1	@y	
50	2	2			
51	3	3			
52	4	4			
53	5	5			
54	6	6			
55	7	7			
56	8	8			
57	9	9			
58	:	:			
59	;	;			
60	<	<			
61	=	=			
62	>	>			
63	?	?	¿	@n	
64	@	@			
65	A	A	Æ	@n	
66	B	B			
67	C	C	•	@y	@copyr
68	D	D			
69	E	E	ƒ	@n	
70	F	F			
71	G	G			
72	H	H	A	@n	
73	I	I			
74	J	J			
75	K	K			

ASCII dec	Codes char	Shift-In character	Shift-Out character	Scribe facecode	Scribe commandstring, accent form
76	L	L			
77	M	M			
78	N	N			
79	O	O	Ø	@n	
80	P	P	¶	@y	@parag
81	Q	Q			
82	R	R	•	@y	@registered
83	S	S			
84	T	T	™	@y	@trademark
85	U	U	∴		@uu(X)
86	V	V	∵		
87	W	W	∶		@ua(X)
88	X	X	∷		@uc(X)
89	Y	Y	∸		@ug(X)
90	Z	Z	∹		@ut(X)
91	[[
92	\	\			
93]]			
94	^	^			
95	~	~			
96	·	·			
97	a	a	æ	@n	
98	b	b			
99	c	c	•		@ce(c)
100	d	d			
101	e	e	œ	@n	
102	f	f			
103	g	g			
104	h	h	â	@n	
105	i	i			
106	j	j	ij	@n	
107	k	k			
108	l	l			
109	m	m			
110	n	n			
111	o	o	ø	@n	
112	p	p			
113	q	q			
114	r	r			
115	s	s	ß	@n	
116	t	t			
117	u	u	∴		@lu(x)
118	v	v	∵		@ha(x)
119	w	w	∶		@la(x)
120	x	x	∷		@lc(x)
121	y	y	∸		@lg(x)
122	z	z	∹		@lt(x)
123	{	{			
124	|	|			
125	}	}			
126	~	~			

In text files enter an accent with a backspace (type ^H) over the character (e.g., epe^H^Nw^Oe).

For Scribe files use a Scribe form to enter the accented character (e.g., ep@la[e]e). X under "Scribe accent form" above stands for an upper case accented character; x stands for a lower case accented character. (Put the Scribe tab @\ before an accent form



UCC BRIEF

NON-TRADITIONAL COMPUTING SERVICES

As a service to non-traditional users, UCC provides special consulting for research projects involving the use of a computer. All faculty, graduate students, and undergraduates are eligible for this service.

The consultants help users apply for UCC user numbers and grants, and provide assistance in preparing proposals for University or external granting agencies. They also consult with users regarding the computer aspects of their research design, aid in selecting and implementing the proper computer application(s), and assist with problems that may arise due to the special nature of humanities and similar projects. The consulting service deals with the use of microcomputers as well as large computers, and the pros and cons of each are assessed for the individual project.

Each project is eligible for a limited amount of special consulting time. It is expected that most users will gain enough expertise in using the computer to continue the project using the regular UCC consulting channels. Users requiring additional help or special software should contact the UCC Professional Services Division (376-1764).

The consulting phone number is 373-5780 and is regularly staffed MWF, 10:30-11:30. At any other time, please call for an appointment.

UCC provides documentation on many aspects of computing for new and experienced users. *UCC Brief: Reference Room and Documentation Services*, found in 140 Experimental Engineering, gives information on where to acquire or reference the documents needed.

Of special interest is a *Guide to Computing in the Humanities*. This is available in the Computer Store, 211 Experimental Engineering. Users should also take note of the *UCC Newsletter* which contains news of current interest to all users, and articles of special interest to non-traditional users. Call 373-4912 for a free subscription.

The University of Minnesota Humanities Users Group (HUG) has been organized to provide a means of communication and to be a united voice for the interests and needs of computer users specifically interested in humanities. Users are urged to join and be actively involved in this group.

Other organizations and publications directed specifically at humanities users include:

- | | |
|--|--|
| * ACH (Association for Computers and the Humanities) | * ALLC (Association for Literary and Linguistic Computing) |
| * ACH Newsletter | * ALLC Bulletin |
| * Computers and the Humanities (Journal)
216 Lind Hall/U of MN
Minneapolis, MN 55455 | * ALLC Journal
Cambridge University
Cambridge, England |

Many of the application programs available at UCC can be used profitably for non-traditional research. The particular application suitable for the individual project should be selected after conferring with a UCC consultant. The following is a brief summary of the more widely used applications and the computer programs that perform them.

TEXT PROCESSING

Many humanities projects involve the study and manipulation of written documents. The body of text can be typed, edited, and formatted on the computer with a significant saving in time and energy.

XEDIT (CYBER)

Documentation: *XEDIT User's Guide* (Computer Store); also machine-retrievable writeup

Function: general purpose text editing program

PROSE (TERAK, CYBER)

Documentation: *Prose Instruction Manual* (Computer Store); also machine-retrievable writeup

Function: text formatting program

EDT (VAX/VMS)

Documentation: *EDT Editor Manual* (Computer Store)

Function: general purpose text editing program

SCRIBE (VAX/VMS)

Documentation: *Scribe User Manual, Scribe Pocket Reference* (Computer Store)

Function: text formatting program

TEXT ANALYSIS

Once a text is entered, it may be subjected to a variety of analytical procedures. The most common of these is concordance building. For other special-purpose programs, see the consultants.

GENCORD (CYBER)

Documentation: *GENCORD: A Concordance Program*; machine-retrievable writeup

Function: selective concordance generating program

TAGEDIT (VAX/VMS)

Documentation: *TAGEDIT Reference Manual* (Computer Store)

Function: special-purpose concordance generating program

STATISTICAL ANALYSIS

Another commonly used technique is statistical analysis. Many procedures are available and a statistical consultant should be consulted for the correct procedure for the data and problem involved in the research. SPSS, BMDP, and CLUSTER are the most useful packages. For more information on mathematics and statistical routines see *UCC Brief: Math-Stat Software* (140 Exp.Eng.).

DATA BASES

Another aid for non-traditional research is the storage and retrieval of data using a data base management system (DBMS).

S2000: System 2000 Data Base Management System (CYBER)

Documentation: *S2000 User Aids, S2000 Reference Manual* (Computer Store)

Function: programs to facilitate the organization and retrieval of data in a data base

SIR: Scientific Information Retrieval (CYBER)

Documentation: *SIR User's Manual* (Computer Store or Williamson Hall)

Function: data base management system with built-in statistical procedures

RIM (VAX/VMS)

Documentation: *RIM User's Manual*, (see Data Base consultant)

Function: relational data base management system

ACSS Brief

NV Mainframe System

Academic Computing Services and Systems • University of Minnesota • Twin Cities

NOS/VE Command Format

Academic Computing Services and Systems (ACSS) operates two Control Data Corporation (CDC) CYBER mainframe computers, the CA system and the NV system. The NV system, a CYBER using the NOS/VE operating system, provides interactive computer-aided design services for instructional use. This Brief presents information about using commands on the NV system.

Refer to the ACSS Brief *CYBER/VE Access* for information about accessing the NV System.

NOS/VE Command Format

The basic format of NOS/VE commands is:

VERB_OBJECT PARAMETER=VALUE

The VERB is a single word. The OBJECT may be one or more words. The verb and all the words in the object are joined by underscores. These are common verbs: CREATE, DELETE, DISPLAY, SET. The following are a few NOS/VE commands (verbs plus objects, with no parameters shown):

**CREATE_FILE
DELETE_VARIABLE
DISPLAY_PROGRAM_ATTRIBUTES
SET_WORKING_CATALOG**

You can abbreviate commands by using the first three letters of the verb and the first letter of each word of the object, with no underscores. The four commands shown above are abbreviated like this:

**CREF
DELV
DISPA
SETWC**

Commands typically have parameters that enable you to select various options. Parameters are separated from the command by a space or comma. Parameters are often (but not always) *equivalenced*. That is, the parameter is followed by an equals sign and a particular value: **PARAMETER=VALUE**. The parameter may consist of one or more words joined by underscores. An example:

SET_TERMINAL_ATTRIBUTES TERMINAL_MODEL=VT100

The command is **SET_TERMINAL_ATTRIBUTES**. The parameter to this command is **TERMINAL_MODEL=VT100**.

You can also abbreviate parameters, using the first letter of each word in the parameter. The entire command above can be abbreviated like this:

SETTA TM=VT100

Even in an abbreviated command, you must retain the space between the command and the parameter.

What Do I Do After I Log on?

After you've logged in to the NV, you can begin work. If you're logging in for the first time, there are a number of things you can try that will help you learn the system and its command formats. They are listed below roughly in order of increasing difficulty.

Type `DISPLAY_VALUE $DATE`. The NV will display today's date. Repeat the command, but this time abbreviate it, using the rules for aliases explained earlier.

Type `DISPLAY_VALUE $TIME`. The NV will display the current time. Abbreviate the command.

Type `SET_PASSWORD` to change your password. The system will respond by asking you to type your old password, then your new password. You can also abbreviate the `SET_PASSWORD` command as `SETPW`. If you forget your password or mistype it when changing it, call the HELP-Line (626-5592).

Practice using the on-line documentation systems. First, try the `DISPLAY_COMMAND_INFORMATION` utility (abbreviated `DISCI`). Then try typing `EXPLAIN`, `HELP`, and `WRITEUP`. `DISCI`, `EXPLAIN`, and `WRITEUP` are discussed in more detail in the ACSS Briefs *NOS/VE On-line Documentation* and *NV WRITEUP Information*.

Practice using `EDIT_FILE`, the NOS/VE file editor. See the ACSS Brief *Using the EDIT_FILE Editor*. Create a short file, leave the editor, and save the file. Then reenter the file and edit it.

Try printing your file. See the ACSS Brief *Getting Output From the CYBER NV*.

Consulting

Consultants are available to answer questions during posted hours in 128C Lind Hall and 140 Blegen Hall. See our Consulting Schedule, available in the CIC, for details on this and other ACSS consulting services. The ACSS HELP-Line is open for phone questions from 8 am to 5 pm, Mondays through Fridays. Call 626-5592.

ACSS Brief

NV Mainframe System

Academic Computing Services and Systems • University of Minnesota • Twin Cities

NOS/VE On-line Documentation

EXPLAIN is Control Data Corporation's on-line documentation utility, available on Academic Computing Services and System's (ACSS) NOS/VE system, the NV. All EXPLAIN manuals provide menus to help you move through the manual easily; they also permit you to search through the manual for a specific topic, and contain on-line HELP facilities.

This document tells you how to use EXPLAIN when your terminal is in "line mode," when it brings each new screen of information onto your terminal screen a line at a time. It also describes two other on-line documentation utilities: DISCI and HELP.

EXPLAIN works somewhat differently when your terminal is in "screen mode," when new information appears a full screen at a time. Using EXPLAIN in screen mode is discussed in Section 3 of this document, which assumes that you're familiar with Sections 1 and 2. If you need more fundamental information about the NV, see the ACSS Briefs *CYBER/VE Access and NOS/VE Command Format*.

The last two pages of this document contain summaries of EXPLAIN commands for both line and screen mode.

Using EXPLAIN in Line Mode

Starting EXPLAIN. The best way to begin learning about EXPLAIN is to type the command

```
explain
```

during an interactive session. (You can abbreviate it **exp**.) You will immediately see an on-line document that tells you how to use the EXPLAIN utility. Use the menus and the instructions on your screen to go to different parts of this introductory manual. This manual also contains a list of all the other available EXPLAIN manuals, with descriptions. When you want to leave the manual, type **QUIT**.

Perhaps the most important EXPLAIN manual is **SCL**, which documents all NOS/VE commands. (SCL stands for System Command Language.) To read SCL, type

```
explain m=scl
```

and your terminal will display the first screen of the SCL manual, with instructions on how to read further. After you have entered the SCL manual, you can read it section by section, page by page, by selecting menu items as they are presented on your terminal screen, or by pressing RETURN, which typically takes you to the next screen.

When you want to back up in an EXPLAIN manual to re-read one or more previous screens, type the minus (-) character. This returns you to the last screen displayed at your terminal. As you continue to type the - character, EXPLAIN displays the other screens you have read in reverse order. Typing the plus (+) is equivalent to typing RETURN; it causes EXPLAIN to go to the next screen.

Quick look-up: While you are in an EXPLAIN manual, you can quickly look up a reference on a specific command by typing the command name, followed by a question mark—for example:

```
attach_file?
```

This will cause EXPLAIN to display the reference on the NOS/VE command **ATTACH_FILE** immediately.

Or, if you are working in a NOS/VE session and want a command description more quickly, you can get it. Suppose, for example, you want to enter the SCL manual and read the entry on the NOS/VE command **COPY_FILE**. Just type

```
explain m=scl s='copy_file'
```

(Notice the apostrophes enclosing **copy_file**.) You will immediately enter the SCL manual at the first of a series of screens explaining the purpose, format, and parameters of the **COPY_FILE** command, with instructions on how to read further. You can then continue to read anywhere in the SCL manual, or leave the manual by typing **QUIT**.

When searching for a command in an EXPLAIN manual, you can use the command's abbreviation (or "alias").

DISI: DISplay Index. Most EXPLAIN manuals are well indexed. To refer to the index of a manual while you are reading it, type in the command

```
disi
```

EXPLAIN then displays the first page of the manual index. DISI also permits you to locate a particular index item quickly. For example, if you are reading the SCL manual and want to look up the topic "permanent file" in the index, type

```
disi permanent file
```

and EXPLAIN will turn to the index page listing that item.

EXPLAIN lists index items in menu form: You type in the letter of the index item you want to read. In SCL, for example, many commands are indexed to the topic "permanent file." When you select "permanent file" from the index, EXPLAIN displays the first item indexed to "permanent file." If you want to continue reading about "permanent file" references, you do not have to return to the index. Type a question mark, and EXPLAIN will display the second "permanent file" reference in the manual. You can continue typing question marks until you've seen all portions of the manual indexed to the "permanent file" topic.

"Fuzzy matching.": While reading an EXPLAIN manual, you may request information on an item not listed in the manual's index. EXPLAIN will refer to the index, find the index item that most closely matches the item you requested (a so-called "fuzzy match"), and turn to that page in the on-line manual. If EXPLAIN finds more than one item similar to (but not exactly like) the item you requested, EXPLAIN displays a list of these "fuzzy matches" and lets you select one of them.

Making copies: If you want to copy certain portions of an on-line manual for reference later, you can do it with the EXPLAIN command **EXCERPT**. For example, if you want to copy some screens from the SCL manual into a file called **OUTFILE**, access the SCL manual with this form of the **EXPLAIN** command:

```
explain m=scl l=outfile
```

The **L=** parameter specifies the name of the file you will copy the screens to; in this example, the output file is named **OUTFILE**. After EXPLAIN displays a screen you want to copy, type in the command **EXCERPT**, and EXPLAIN will copy that screen, and all immediately following screens on the same topic, from the SCL manual into the file **OUTFILE**. You can continue moving through the manual and **EXCERPT**ing screens into **OUTFILE** as you need them.

If you do not use the **L=** parameter to the **EXPLAIN** command, the excerpted screens are copied into a file with the default name **MANUAL_PAGES**.

After you leave the manual (with the **QUIT** command) you can print the file with the **PRINT_FILE** command.

EXPLAIN HELP. If, when reading SCL or any other on-line document with EXPLAIN, you need help with commands, just type **HELP**. **EXPLAIN** will immediately display the first of a series of screens that summarize the commands.

The system command **HELP** is roughly equivalent to the **EXPLAIN** command. It immediately opens the SCL on-line manual.

Other EXPLAIN Manuals

Many EXPLAIN manuals are available on the NOS/VE system, including on-line documents on several programming languages (including Fortran and Pascal) and on "migrating" to NOS/VE from a NOS, VMS, or other operating systems.

To see a complete list of on-line manuals, type EXPLAIN. Then, from the first menu screen, select option a, "Linking to Other Online Manuals." EXPLAIN will then display a list of manuals in menu form—by selecting an item, you can go directly to that manual. If you then want to return to the first manual, type REVERT.

ACSS has not purchased and installed all of Control Data's on-line manuals. For a current list of installed manuals, type

```
DISPLAY_CATALOG $SYSTEM.MANUALS
```

Since you can use any NOS/VE command from within an EXPLAIN manual, you can use this command inside or outside of EXPLAIN.

Using NOS/VE commands within EXPLAIN help you move from one manual to the next. From anywhere within an EXPLAIN manual, you can type the appropriate form of the EXPLAIN command to call up another manual.

More On-Line Documentation

A Short Cut: DISPLAY_COMMAND_INFORMATION (DISCI). You can get brief information on a NOS/VE command quickly with the DISPLAY_COMMAND_INFORMATION command, abbreviated DISCI. The DISCI command displays a reminder of the parameters of a command, the abbreviations of the parameters, and the default value of each parameter. If, for example, you need a brief reminder of the parameters of the CREATE_FILE command, type:

```
disci create_file
```

In response, the system will respond:

```
file, f          : file = $required
local_file_name, lfn : name = $optional
password, pw     : name = none
retention, r    : integer 1..999 = 999
log, l          : boolean = false
status         : var of status = $optional
```

The left column lists the parameters of the command (along their abbreviations) in order.

The right column tells you if the parameter is required or options, the specific type of each parameter (For example, a real number or integer, a boolean value, etc.), and, finally, after the equals sign, the parameter default, if any.

Thus the disci display shown above tells you that the file parameter is first, the local_file_name is second, etc. The display gives you the abbreviation for each parameter except status, which has no abbreviation.

The value for the file parameter must be a filename; this parameter is required. The local_file_name and password parameters must be names. The local_file_name and the status parameter are optional. The defaults for the password, retention, and log parameters are, in order, none, 999, and false.

You can also use the accepted alias for any command; for example, typing

```
disci c=cref
```

will produce the same create_file information shown above.

Using **HELP**. The system command **HELP** normally puts you immediately in the SCL on-line manual.

When you type **HELP** after NOS/VE displays an error message. The system will display a more complete explanation of your error, with a suggestion on how to correct your error or where to look for the correct information. This information is part of a manual of explanations for error messages — you have to type **QUIT** to leave the manual and return to the system.

EXPLAIN in VT100 Screen Mode

You can use **EXPLAIN** in screen mode from several kinds of terminals. In screen mode, **EXPLAIN** displays, at the bottom of the screen, a row of “prompts,” reminders of the **EXPLAIN** functions you can use and the function keys you type to use the functions. In this section, we’ll describe basic functions on the popular VT100 terminal. (Many terminals and microcomputers now emulate the VT100.)

If you have set your terminal in VT100 screen mode before you typed **EXPLAIN**, it will remain in screen mode when you enter an on-line manual. To start up screen mode outside of **EXPLAIN**, type these NOS/VE commands:

```
set_terminal_attributes terminal_model=vt100      {alias setta tm=vt100}
change_interaction_style style=screen           {alias chais s=screen}
```

These commands may already be in your login file; in that case they are automatically executed when you log on to the NV.

If you want to go back to line mode, you can type **DEACTIVATE_SCREEN** within **EXPLAIN**.

What Works and What Doesn't. When you're in screen mode, most of the line mode commands still work. Two don't: **DISI** (display index) and **EXCERPT**. If you type in these commands while you're in screen mode, **EXPLAIN** displays a somewhat misleading message saying that **DISI** (or **EXCERPT**) is not a command. Use the appropriate key commands, as explained below.

Starting EXPLAIN in Screen Mode. Begin as you do in line mode, by typing the command

```
explain
```

When you enter an **EXPLAIN** manual, you will see a screen roughly like shown on the back page of this Brief. (This example shows the first screen of the SCL on-line manual, with function key prompts at the bottom of the screen.) As in line mode, you can use the **m=** parameter to select a particular manual. When you want to leave the manual, type **QUIT**, or the 6 key on the VT100 keypad.

Use the keypad on your VT100 terminal instead of typing in commands. The key command reminders on your screen briefly explain each keypad command. The p1, p2, p3, and p4 commands refer to the top row of keys on your VT100 keypad. The remainder of the commands (k-, k., etc.) refer to the other key pad keys. (ke is the Enter key.)

Every time you use a keypad command, you must press the required key, then **RETURN**.

VT100 Commands.

Going to the next screen: Press **RETURN** or the 2 key on the keypad (k2 on the screen prompts).

Going to previous screens: Press the 1 key on the keypad (k1) to see screens you have seen before, in reverse order. Press 3 (k3) to move backwards through the manual, screen by screen.

Quick look-up: Type the minus key (-) key on the keypad. A message on the screen will ask you to type in the term you want to search for. Type the term, then press **RETURN**. As in line mode, you can use the command's abbreviation (or “alias”). Type a question mark, and **EXPLAIN** will display the second reference in the manual. You can continue typing question marks until you've seen all portions of the manual indexed to the “permanent file” topic.

Fuzzy matching works in screen mode, as in line mode.

Display the index: Type the comma key and a message will appear on your screen, asking to type in the term you want to look up in the index. Type in the term, then press RETURN.

If you simply want to see the first page of the index, press RETURN in response to the message. EXPLAIN then displays the first page of the manual index.

Making copies: To copy a single screen—the “current” screen, the one displayed on your terminal—to a local file, type the Enter key. As in line mode, the screen is copied to a file that has the default name MANUAL_PAGES.

With EXPLAIN’s “logging” facility, all the screens you display on your terminal are copied to the local file. To turn logging on, press the period key on your keypad (k.). After you’ve pressed this key, each screen you display is copied to the local file. Turn logging off by pressing the period key again.

EXPLAIN HELP: If you need help with EXPLAIN commands, type the 4 key on the keypad.

Format of the EXPLAIN Command:

EXPLAIN M=*manual name* S=*command name* L=*output file name*

All parameters are optional.

Some Useful EXPLAIN Commands (Line Mode)

<u>Type:</u>	<u>and the NY does this:</u>
a carriage return or +	Goes to the next screen.
.	Goes to the previous screen.
>	Takes you back to the screen you were on when you requested an indexed topic or selected an item from a menu.
UP	Goes to the previous or current menu.
topic?	(Replace <i>topic</i> with the topic you’re interested in.) Goes to the first screen indexed for the topic.
?	Goes to another indexed screen for the topic you previously entered.
TOP	Takes you to the first screen in the manual.
HELP	Takes you to the HELP menu.
DISI	Displays a manual’s index.
DISI topic	Displays the index page on the specified topic.
EXCERPT	Copies the current screen and all immediately following screens on the same subject to a file that is named, by default, MANUAL_PAGES.
EXPLAIN	(Used within EXPLAIN, with the M= parameter.) Takes you from the current manual to the manual specified by the M= parameter.
REVERT	(When you have moved from one on-line manual to another.) Takes you from one on-line manual to the previous manual.
QUIT	Exits the online manual system.

If You Get Lost . . .

Some of Control Data’s on-line manuals have complex organizations. In these manuals, it’s easy to lose track of where you are. The commands UP, TOP, and > (described above) can help you get your bearings.

This manual provides quick reference material for NOS/VE commands, control statements, functions, and utilities.

The following topics are described in this manual:

- | | |
|---------------------------|-----------------------------------|
| a. How To Use This Manual | f. Getting Started in NOS/VE |
| b. Commands | g. Accessing Other Online Manuals |
| c. Control Statements | h. Entries Listed Alphabetically |
| d. Functions | i. Glossary |
| e. Utilities | j. About This Manual |

To return to this main menu, type TOP.

To obtain help on any screen, press HELP.

To exit this online manual, type QUIT.

To immediately display a command description, type that command followed by a question mark. (For example, ACCEPT_LINE?)

Choose a topic or press RETURN to select item a.

```
p1 First p2 Revert p3 KeyOn p4 KeyOff k- Find k, Index ke Copy k. SetLog
k1 Bkw k2 Fwd k3 Back k4 Help k5 Home k6 Quit k7 Refrsh k8 Up
```

VT100 Keypad Commands for EXPLAIN On-line Manuals

- | | | |
|-----------|-----------------|---|
| p1 | (First) | Takes you to the first screen of the manual, with the main menu. |
| p2 | (Revert) | Takes you to the previous EXPLAIN manual. |
| p3 | (KeyOn) | Displays key prompts at the bottom of your screen. |
| p4 | (KeyOff) | Removes the display of key prompts. |
| k- | (Find) | Begins a search through the on-line manual for a specific term. |
| k, | (Index) | Displays the first page of the manual index (press RETURN) or the index page for a specific term (type the term). |
| ke | (Copy) | Copies the current screen to a local file. |
| k. | (SetLog) | Copies all succeeding displayed screens to a local file. Turn copying off by pressing the key again. |
| k1 | (Bkw) | Goes backwards through the manual, page by page. |
| k2 | (Fwd) | Goes to the next screen. |
| k3 | (Back) | Displays in reverse order the screens you have previously displayed. |
| k4 | (Help) | Opens EXPLAIN's HELP file, for information on EXPLAIN commands. |
| k5 | (Home) | Returns the cursor to the "command line," at the top of the screen. |
| k6 | (Quit) | Closes EXPLAIN, returning you to the operating system. |
| k7 | (Refrsh) | Redisplays the current screen, removing error messages or system messages. |
| k8 | (Up) | Returns to the previously used menu. |

ACSS Brief

NV Mainframe System

Academic Computing Services and Systems • University of Minnesota • Twin Cities

NV WRITEUP INFORMATION

WRITEUP is an ACSS utility available on the CYBER NV and which is designed to provide quick and easy access to machine-retrievable documentation on every aspect of ACSS systems.

Using WRITEUPS

The command

```
WRITEUP
```

tells you how to use the WRITEUP facility.

To obtain a list of all WRITEUP documents available on the system, type the command:

```
WRITEUP INDEX
```

To view a document from WRITEUP INDEX type the command:

```
WRITEUP writeup_name
```

where *writeup_name* is the name of the WRITEUP. To list more than one writeup, use the following command format:

```
WRITEUP (name1 name2 ... namen)
```

To make a copy of a WRITEUP to send to a printer or to search with the editor, type the command:

```
WRITEUP writeup_name output_file
```

where *output_file* is any name you want. This command will then put a copy of *writeup_name* in your output file.

To send the your output file to a printer, type the following command:

```
PRINT_FILE output_file OUTPUT_SITE=EA OUTPUT_BIN=436
```

This command will produce output on 8-1/2- by 11-inch paper, one sided, in landscape mode. The output in this example will be printed at the I/O station in 128B Lind Hall and placed in open bin 436. For other printing options, see WRITEUP PRINT_FILE or the ACSS Brief *Getting Output From the CYBER NV*.

Names of Some Current WRITEUPS

WRITEUP CONSULT

Details consulting services and hours.

WRITEUP HOURS

Shows current operating hours.

WRITEUP ICEM

Preliminary information on ICEM applications.

WRITEUP PRINT_FILE

Shows how to send file(s) to NOS printers.

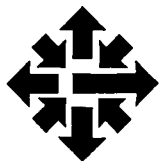
WRITEUP SAMPLE_PROLOG

Sample prolog file.

WRITEUP WRITEUP

Explains how to use the Writeup utility.





ACSS Brief

Phone Numbers

Access:		
CYBER (CA) (autobaud)		626-1620
CYBER (MD) (autobaud)		626-1622
UNIX (UX) (autobaud)		626-1681
VAX (VX) (autobaud)		626-1641
RBF 2400 baud (HASP/UT200)		626-1656
RBF 4800 baud (HASP/UT200)		626-1663
Accounts		625-1511
Computer Hours (recorded message)		626-1819
Consulting:		
HELP-Line		626-5592
8 a.m.–5 p.m., Monday-Friday		
Artificial Intelligence		625-8332
3-4 p.m., Monday, Thursday, Friday		
Data Bases		626-1887
10–11 a.m., Monday-Friday		
Microcomputer & Workstation		626-4276
9:00 a.m.–noon and 1:30–4 p.m., Monday, Tuesday, Friday		
9:00 a.m.–4 p.m., Wednesday, Thursday		
Statistics Packages		626-1887
1–2 p.m., Monday-Friday		
Text Analysis/Humanities		625-8332
3-4 p.m., Monday, Thursday, Friday		
Text Processing		625-1391
9:30 a.m.–12:30 p.m., Monday-Friday		
Contract Services		625-2303
Data Base Mgmt; Graphics; Microcomputer Software; Professional Services; Statistics		
East Bank I/O, 128B Lind Hall		625-5082
Engineering Services	627-4357, 627-4180	
Equipment Maintenance Information	627-4357, 627-4180	
Graphics Software		626-5592
HELP-Line		626-5592
8 a.m.–5 p.m., Monday-Friday		
HOURS-line (recorded message)		626-1819
Information, Wulling Hall		625-6665
Information, Lauderdale		626-1600
Instructional Labs		625-7850
Lauderdale Computer Room		626-0550
Lauderdale Services		626-1838
Magnetic Tape Librarian		626-1838
Math and Statistics Packages		625-5830
Newsletter Subscription		625-7397
Permanent File Restoration		626-0595
Professional Services Division		625-2303
Project Assistance		625-2303
Public Labs		625-7850
14 Folwell Hall		625-4896
306B Lind Hall		625-9032
9 Walter Library		626-1899
Reference Room/Information Center		625-7397
Remote Batch (RJE) Services		625-7850
Short Courses		625-1543
Shuttle Bus Service		625-9525
System Status (recorded message)		626-1819



ACSS Brief

General Information

Academic Computing Services and Systems • University of Minnesota • Twin Cities

Phone Numbers

Access:

CYBER (CA) (autobaud)	626-1620
CYBER (NV) (autobaud)	626-1622
ENCORE (UX) (autobaud)	626-1681
VAX (VX) (autobaud)	626-1641
RBF 2400 baud (HASP/UT200)	626-1656
RBF 4800 baud (HASP/UT200).....	626-1663
Accounts (CYBER, ENCORE, VAX)	625-1511
Administrative Offices, Lauderdale	626-1600
Computer Hours (recorded message).....	626-1819
Computing Information Center	625-7397
Consulting:	
HELP-Line	626-5592
8 am-5 pm, Monday-Friday	
Artificial Intelligence	625-8332
3-4 pm, Monday- Friday	
Data Bases	626-1887
10-11 am, Monday-Friday	
Microcomputer & Workstation	626-4276
9 am-4 pm, Monday-Friday	
(Closed from 12:00-1:30-M, Tu, F)	
Statistics Packages	626-1887
1 pm -3 pm, Monday-Friday	
Text Analysis/Humanities	625-8332
3-4 pm, Monday-Friday	
Text Processing.....	625-1391
10:00 am - noon, Tuesday, Wednesday, Thursday	
Contract Services	625-2303
Data Base Mgmt; Graphics; Microcomputer Software; Professional Services; Statistics	
East Bank I/O, 128B Lind Hall.....	625-5082
Engineering Services	627-4357
Equipment Maintenance/Repair.....	627-4357
Graphics Software	626-5592
HELP-Line	626-5592
HOURS-line (recorded message)	626-1819
Lauderdale Computer Room	626-0550
Lauderdale Services	626-1838
Magnetic Tape Librarian.....	626-1838
Lauderdale User's Room	626-0386
Math and Statistics Packages	625-5830
Newsletter Subscription	625-7397
Permanent File Restoration	626-0595
Project Assist	626-1090
Project MinneMac	625-9348
Project Woksape	625-1809
Public Labs (Managed by ACSS)	625-7850
170 Anderson Hall	624-6526
90 Blegen	624-1387
14 Folwell Hall	625-4896
306B Lind Hall	625-9032
130 Physics	625-6820
9 Walter Library	626-1899
Lab Manager (14 Folwell Hall)	625-7850
Publications Information	626-1093
Remote Batch (RJE) Services	625-7850
Short Course Registration	625-7397
Shuttle Bus Service	625-9525
System Status (recorded message)	626-1819



UCC BRIEF

REFERENCE ROOM AND DOCUMENTATION SERVICES

REFERENCE ROOM

We maintain a small resource library for reference use only in 140 Experimental Engineering, for use by our staff members and clients. The hours are from 8:00 a.m. to 4:30 p.m., Monday through Friday. The Reference Room provides:

- UCC-related manuals and documents covering the following topics:

CDC CYBER NOS operating system	DEC VAX 11/780 hardware
CYBER 74, 172, and 730 hardware	VAX/VMS operating system
CRAY-1 hardware	CRAY COS operating system
Assemblers and compilers	Statistical packages
Data base management systems	Computer system utilities
Text editors and processors	Special processors
Microcomputer systems and software	Graphics software

Current manuals are marked and shelved separately.

- Journals, miscellaneous reports, newsletters, and archive copies of all UCC publications. Some items available for reference use include:
 - ACM Transactions, Journal, and Communications
 - ACM SIG publications
 - DATAMATION
 - IBM Journals
 - Microcomputing journals

- Various computer-related text books. These are available for reference use only in the resource library.

- A data base catalog of Reference Room holdings. This data base is maintained by the reference librarian, who has written a brochure that describes the use of the library data base. See the librarian for a copy of the data base brochure and for help with other reference searches.

For assistance in using any of the Reference Room materials, call 373-7744 or go to 140 Experimental Engineering.

DOCUMENTATION

We produce documentation in printed and machine-retrievable form, and it can be acquired through several different channels:

- Some introductory, printed documents are available without charge in 140 Experimental Engineering. You should investigate these documents, especially the *Documentation Directory*, before attempting any computing at UCC.

Documents of general interest are:

UCC Brief: WRITEUP Information	UCC Brief: VAX/VMS Access
UCC Brief: Getting Started at UCC	UCC Brief: CRAY Access
UCC Newsletter	

2. UCC and vendor printed documents are sold through our Computer Store, 211 Experimental Engineering. Purchases can be made with a University departmental journal voucher, by charging the cost to a non-instructional user number, or by paying cash. Store hours are 9:00 a.m. - 3:00 p.m., Monday - Friday; 5:00 p.m. - 7:00 p.m., Monday - Thursday. (612/373-4877)

Documents of general interest are:

Guide to Cyber Batch Computing	Facilities and Services
Guide to Cyber Interactive Computing	VAX/VMS Primer
CRAY Operating System Ver. 1 Reference Manual	

3. Machine-retrievable documents are available for the VAX 11/780 and the three CYBER machines (includes information about the CRAY and the VAX as well). The Computer Store will print and ship on-line documents to those of you who cannot obtain your own copies. Call or write for more information.

- a. WRITEUP -- Documents on the CYBERs are available via a special control statement, WRITEUP. To get instructions on using the WRITEUP utility, read the one-page description of WRITEUP (140 Experimental Engineering) or use the control statement WRITEUP.

To obtain a list of on-line writeup documents, use the control statement WRITEUP(INDEX).

Some writeups of general interest are:

WRITEUP(CLASSES)	-- a list of non-credit classes offered by UCC.
WRITEUP(CONTROL)	-- descriptions of all the NOS control statements.
WRITEUP(CRAY)	-- descriptions of all the COS control statements.
WRITEUP(DOCLIST)	-- a list of available documents.
WRITEUP(NLETTER)	-- a copy of our most recent monthly newsletter.
WRITEUP(STORE=PRICE)	-- a copy of the Computer Store's catalog and price list.
WRITEUP(VAXVMS)	-- introductory information on using our VAX 11/780.
WRITEUP(CRAYUSE)	-- introductory information on using our CRAY-1.

- b. HELP -- On-line information on the VAX 11/780 is available via the HELP and commands. MOREHELP leads you to information on our VAX/VMS services such as on-line writeups, consulting hours, special output devices, and additional software. To discover what main topics are covered by MOREHELP, use the command:

MOREHELP

Topics of general interest are:

MOREHELP WRITEUPS -- how to retrieve on-line writeups
MOREHELP CONSULTING -- locations and times consulting is available



REFERENCE ROOM AND DOCUMENTATION SERVICES

Reference Room

We maintain a small resource library for reference use only in 140 Experimental Engineering, for use by our staff members and clients. The hours are from 8:00 a.m. to 4:30 p.m., Monday through Friday. The Reference Room provides:

1. UCC-related manuals and documents covering the following topics:

CYBER hardware	CDC NOS operating system
DEC VAX-11/780 hardware	VAX/VMS operating system
CRAY-1 hardware	CRAY COS operating system
Assemblers and compilers	Statistical packages
Data base management systems	Computer system utilities
Text editors and processors	Special processors
Microcomputer systems and software	Graphics software

Current manuals are marked and shelved separately.

2. Journals, miscellaneous reports, newsletters, and archive copies of all UCC publications. Some items available for reference use include:
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 - ACM SIG publications
 - DATAMATION
 - IBM Journals
 - Microcomputing journals
3. Various computer-related text books. These are available for reference use only in the resource library.
4. A data base catalog of Reference Room holdings. This data base contains entries for all of the Reference Room's holdings and is maintained by the reference librarian. Printed catalogs are produced regularly, and custom searches of the data base can also be performed. See the librarian for help with the data base and other reference searches.

For assistance using any of the Reference Room materials, call 373-7744 or go to 140 Experimental Engineering.

Documentation

We produce documentation in printed and machine-retrievable form, and it can be acquired through several different channels:

1. Some introductory, printed documents are available without charge in 140 Experimental Engineering. You should investigate these documents before attempting any computing at UCC.

Documents of general interest are:

UCC Brief: WRITEUP Information	UCC Newsletter
UCC Brief: Getting Started at UCC	UCC Sites Map
UCC Brief: VAX/VMS Access	

2. UCC and vendor printed documents are sold through the University bookstores at Williamson Hall and the West Bank.

Documents of general interest are:

Guide to CYBER Computing	Facilities and Services
Introduction to Computing	VAX/VMS Primer
CRAY Operating System Ver. 1 Reference Manual	VAX Command Language User's Guide
Guide to CRAY Computing	

3. Machine-retrievable documents are available on the VAX-11/780 and the CYBERs (includes information about the CRAY and the VAX as well).

WRITEUP -- Documents on the CYBERs are available via the WRITEUP control statement. To get instructions on using the WRITEUP utility, read *UCC Brief: WRITEUP* (140 Experimental Engineering) or use the control statement WRITEUP.

To get a list of all CYBER writeups, use the control statement WRITEUP(INDEX).

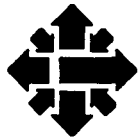
Some writeups of general interest are:

WRITEUP(CLASSES)	-- a list of non-credit classes offered by UCC.
WRITEUP(CONTROL)	-- descriptions of all the NOS control statements.
WRITEUP(CRAY)	-- descriptions of all the COS control statements.
WRITEUP(DOCLIST)	-- a catalog of UCC documents.
WRITEUP(NLETTER)	-- a copy of our most recent monthly newsletter.
WRITEUP(VAXVMS)	-- introductory information for our VAX-11/780.
WRITEUP(CRAYUSE)	-- introductory information for our CRAY-1.

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UCC Sites Map
XEDIT 3.1 Reference Summary
Welcome

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Documents of general interest are:

Introduction to Computing
Introduction to MERITSS Computing
Guide to CYBER Computing and its Supplement
CRAY Operating System Version 1
Reference Manual
Guide to CRAY Computing

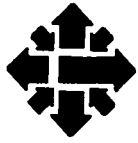
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VAX/VMS Primer
VAX Command Language
User's Guide

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EXPLAIN - On-line documentation utility on machines running NOS 2 (ME and MD). For instructions on using the EXPLAIN utility, read *UCC Brief: EXPLAIN Information*, available in 128A Lind Hall, or use the commands **EXPLAIN** and **EXPLAIN,m=command**.

HELP - On-line information on the VAX-11/780 is available via the HELP and MOREHELP commands. Type **HELP** for VMS system information. MOREHELP leads you to information on our VAX/VMS services such as on-line writeups, consulting hours, special output devices, and additional software. To discover what main topics are covered by MOREHELP, type the command **MOREHELP**.



ACSS BRIEF

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<i>ACSS Brief:</i> VAX/VMS Access	<i>XEDIT 3.1 Reference Summary</i>
<i>ACSS Brief:</i> WRITEUP Information	<i>Welcome</i>

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<i>Introduction to CYBER Computing</i>	<i>VAX/VMS Primer</i>
<i>Introduction to MERITSS Computing</i>	<i>VAX Command Language</i>
	<i>User's Guide</i>

3. Machine-retrievable documents are available on the VAX-11/780 and the CYBERs.

EXPLAIN - On-line documentation utility on machines running NOS 2 (CA, ME, MD). For instructions on using the EXPLAIN utility, read *ACSS Brief: EXPLAIN Information*, available in 128A Lind Hall, or use the commands **EXPLAIN** and **EXPLAIN, m=command**.

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S2K - PROCESS SYSTEM 2000 CONTROL STATEMENT

January 1980

S2K control statement provides an alternate way to call S2000 with four additional parameters: IA, CT, PG, UN. Cracks control statement parameters and then executes the System 2000 binary file with the properly transformed parameter list. The S2KIA entry point is called when the IA parameter is specified on the control statement.

The program cracks the control statement parameters and then constructs a procedure file containing the necessary control statements to perform the operations selected by the IA, CT, PG, and UN parameters. The procedure file is written onto a scratch file and the system CALL program is overlayed to execute the file.

S2K(p1,p2,...,pn)

where parameters can be substituted from the following list:

<u>PARAMETER</u>	<u>DESCRIPTION</u>
TA	Corresponding System 2000 file is local.
TB	Corresponding System 2000 file is local.
TC	Corresponding System 2000 file is local.
TD	Corresponding System 2000 file is local.
TE	Corresponding System 2000 file is local.
TF	Corresponding System 2000 file is local.
TU	Corresponding System 2000 file is local.
DB	All System 2000 files are local.
TP	Allow System 2000 save/load operations using local file TAPE999.
PG	Causes all the data base files to be purged. If this parameter is used, a data base name must be specified.
CR=nn	Where nn is a two-digit octal number that is the display code value of the System 2000 system terminator.



UCC Brief

IA or IA=dbn Specifies that the permanent files to be used by System 2000 are indirect. A data base name must be specified if an IA parameter is used. The data base name can appear in two ways:

- (1) If the data base name is seven or fewer characters, it may be equivalenced to an IA parameter if one appears on the control card.
- (2) If a data base name is expected and is not found as described above, then it is assumed that the characters remaining after the control card terminator (up to a maximum of twenty characters) will be the data base name.

CT= Change the category type of the permanent files for the data base name specified (see IA description). Allowable category types are:

P	Private
PR	Private
S	Semi-private
SP	Semi-private
L	Public
PU	Public

UN= Is equivalenced to an alternate user number containing the indirect access permanent files to be used.

C= Is equivalenced to the name of a file to be used as the default System 2000 command file.

D= Is equivalenced to the name of a file to be used as the default System 2000 data file.

M= Is equivalenced to the name of a file to be used as the default System 2000 message file.

R= Is equivalenced to the name of a file to be used as the default System 2000 report file.

UCC BRIEF

A SHORT GUIDE TO LISP FACILITIES AT THE UNIVERSITY OF MINNESOTA

The intended audience of this guide is students wishing to use LISP 1.5 on the UCC CYBER CA and CB systems, and the ME (MERITSS) system. This guide briefly describes how to get started on-line with LISP 1.5 on both the interactive and batch facilities. This documentation may prove helpful also to those users already familiar with LISP 1.5 (or another LISP) on another system who want to learn the University of Minnesota implementation. A list of annotated references for further instruction is included at the end of this guide.

Available System

The LISP 1.5 interpreter is the University of Texas (U.T.) LISP version 4.1. The language is available on three computers: the CA, CB, and the ME (MERITSS) systems. LISP can be run from both the batch and interactive environments, although, by its virtue of being an interpreted (and not compiled) language, it is best used interactively.

Using LISP interactively

To use LISP interactively you must:

1. Log-in.
2. Enter the batch subsystem: BATCH, 55000. (A field length of 55000 is recommended for normal LISP runs.)
3. Enter the LISP system: LISP,C,Z. (The C means conversational mode; the Z is for simulated interrupts.)
4. Enter LISP functions, symbolic expressions, etc. (Ready for Read-Eval-Print loop.)
5. Exit LISP by typing a carriage return, FIN, or (DIE).

Using LISP through Batch

A typical batch job might look like.

```
Jobname.  
USER(username,password,family)  
CHARGE(chargeno,projectno) <----May be required.  
RFL(55000)  
LISP. -or- LISP(Parameters)  
7-8-9 card. (end of record)  
LISP program  
FIN  
6-7-8-9 card. (end-of-file)
```

Character set

LISP uses the CDC 63-character ASCII set. Some special characters to note are:

<u>Character</u>	<u>Meaning</u>
! (exclamation point)	Comment delimiter
" (quote)	Literal follows
# (number sign)	Special atom follows
] (close bracket)	Acts as super). Closes all (up to nearest [, or beginning of S expression
[(open bracket)	acts as a (, but closes a].

LISP Control Statement Parameters

There are many control statement parameters (see WRITEUP(LISP=USAGE) for more information), but some important parameters to remember are:

<u>Parameter</u>	<u>Meaning</u>
C	Conversational or Interactive mode
I=1fn	Specifies SYSIN file (default = INPUT)
L	Lists input on SYSOUT
N	Lists only user-generated output on SYSOUT
O=1fn	Specifies SYSOUT file (default = OUTPUT)
P	List input on SYSOUT with parenthesis count

Z	Simulate an interrupt on recoverable errors in interactive mode
Ifn	Specifies a file with a subsystem

Important Notes and Comments

When using LISP remember these points:

1. Only the first 80 (eighty) columns of a line are processed. Symbolic expressions cannot continue onto the next line.
2. LISP subsystems can be read in automatically by placing the file name of the subsystem on the control statement parameter: LISP, Ifn1, ... , Ifn10. Up to 10 (ten) subsystems may be specified. (See WRITEUP(LISP=SUBSYS) for more information.)
3. External files with symbolic expressions (programs and/or data) may be read in by using the I/O functions. (See WRITEUP(LISP=INOUT) for more information.)
4. Comments are delimited by an ! and may be inserted in the program anywhere a blank is permitted. For example:

(A !THIS IS A COMMENT! B) is the same as (A B).
5. Each top-level expression must start on a new line.
6. Data to be read in for a particular expression must immediately follow that expression.

Debugging Aid

The function TRACE allows monitoring of the LISP system during execution. To turn on the trace use:

```
(TRACE (QUOTE (list of functions to trace))).
```

To turn off the trace use:

```
(UNTRACE (QUOTE (list of function to disable trace for))).
```

A warning about trace: it causes a lot of output.

Further References

The indexed writeup, WRITEUP(LISP), is the general reference guide for LISP at the University Computer Center. For an explanation of how to use the writeup utility, enter WRITEUP. For a list of subjects covered in the LISP writeup, enter WRITEUP(LISP).

The list on the following page contains some references for further exploration of LISP.

MAR83:AEP

REFERENCES

- Allen, J. *Anatomy of LISP*. McGraw-Hill Book Company 1978. Crisp and clear. The best overall LISP book around.
- Charniak, E., Riesbeck, C., and McDermott, D. *Artificial Intelligence Programming*. Hillsdale, New Jersey: Lawrence Erlbaum 1979. A book on AI and LISP programming style. The authors expound on their philosophy of LISP and personal experiences and pitfalls. Required reading for the serious student of AI.
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- Winston, P. and Horn, K.P. *LISP*. Massachusetts: Addison-Wesley 1981. Softbound oil-color cover. Using the MACLISP dialect, Winston and Horn provide an excellent introduction to LISP with gradually more and more advanced examples. Exercises and answers included. Available infrequently at U of M bookstores.



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LISP Systems Available

Two LISP interpreters are available:

1. University of Texas LISP Version 4.1 (UTLISP)
2. University of Massachusetts at Amherst LISP Version 3.2 (ALISP)

Since ALISP is much more interactive than UTLISP and has many more programming tools embedded in it, you will probably find it more useful than UTLISP. Writeups are available for both: type WRITEUP(ALISP) for ALISP, and WRITEUP(LISP) for UTLISP.

For simple interactive use of either interpreter, you must be aware of at least the following differences:

	ALISP	UTLISP
QUOTE character	'	"
Super-bracket	none]
LISP editor	yes	no
LISP filer	yes	no
Prettyprinter	yes	no

Example terminal session for ALISP:

Terminal dialogue	Comments
RECOVER /SYSTEM: BATCH	Enter batch subsystem
\$RFL,0	
/FETCH,ALISP	
/ALISP	Run the ALISP system
5/15/84 12.49.54 ALISP VERSION 3.2 OF OCT. 20, 1978	Off we go...
?(CAR '(HEAD MID TAIL))	Value of the CAR
HEAD	
?(CDR '(HEAD MID TAIL))	
(MID TAIL)	
?	Etc.
?(EXIT)	Exit from ALISP
END ALISP RUN	Termination message
CP: 196 FL: 23042 GC: 0	Run statistics
/	Back in batch mode

ALISP may give file errors if you are not on the default disk pack (PACKNAM=0). The control statement option ALISP,NEWS. will print the current news on ALISP before running the ALISP system.

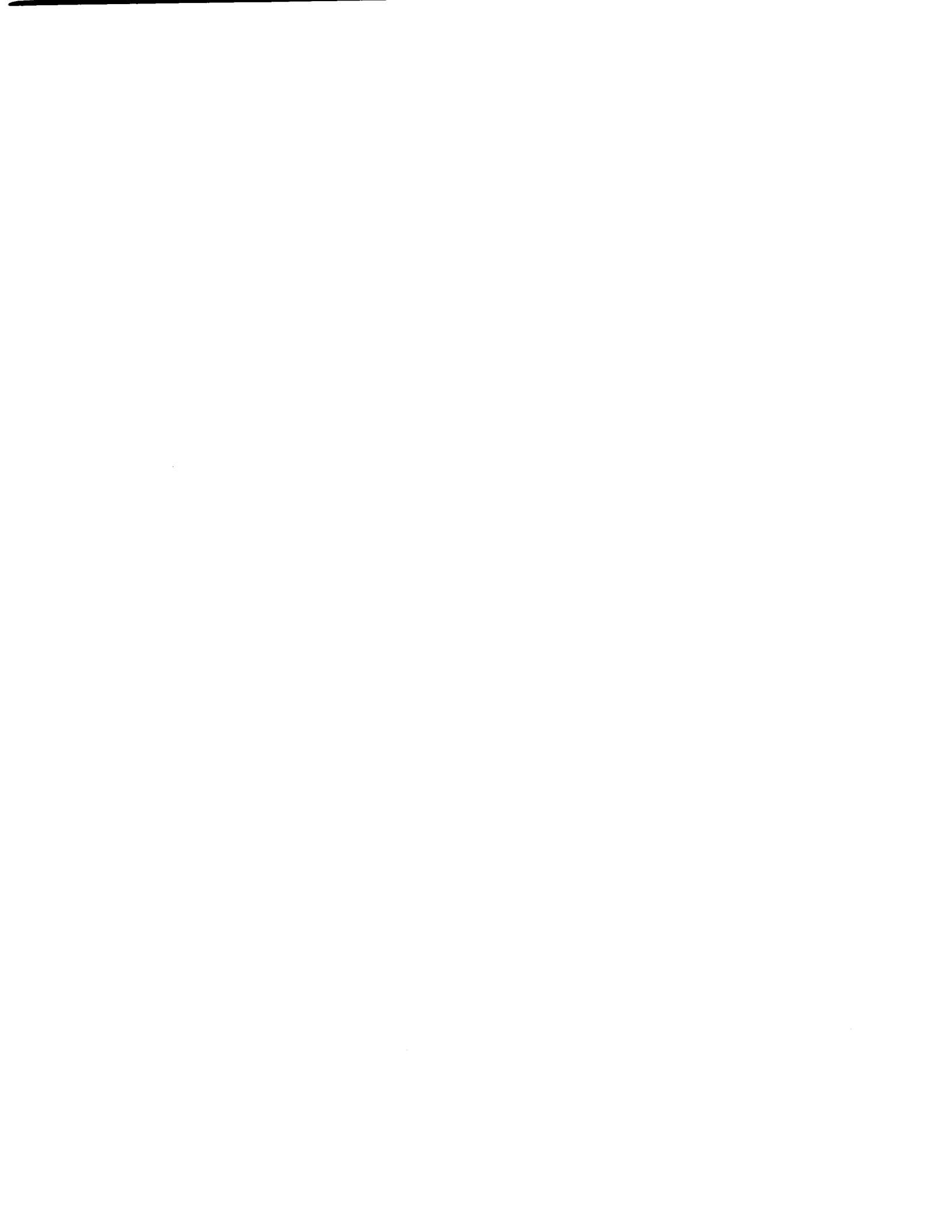
Example terminal session for UTLISP:

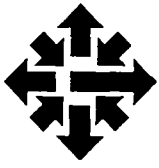
Terminal dialogue	Comments
RECOVER /SYSTEM: BATCH,55000	Enter batch subsystem
\$RFL,55000	
/LISP,C,Z	Run the UTLISP system
***** LISP 4.1	
*EVAL:	
?(CAR "(HEAD MID TAIL))	Off we go...
*VALUE:	
HEAD	Value of the CAR
*EVAL:	
?(CDR "(HEAD MID TAIL))	
*VALUE:	
(MID TAIL)	
*EVAL:	
?	Etc.
?FIN	Finish UTLISP run
GARBAGE COLLECTIONS: 0 0	Termination message
UT LISP 4.1 (80/03/13)	Run statistics
/	Back in batch mode.

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References

- Allen, J. *Anatomy of LISP*. McGraw-Hill Book Company, 1978. Crisp and clear. The best overall LISP book around.
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For simple interactive use of either interpreter, you must be aware of at least the following differences:

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QUOTE character	'	"
Length of S-expressions	(no limit)	one line
Super-bracket	none]
LISP editor	yes	no
LISP filer	yes	no
Prettyprinter	yes	no

Example terminal session for ALISP:

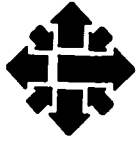
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/ALISP	Run the ALISP system
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(MID TAIL)	
?	Etc.
?(EXIT)	Exit from ALISP
END ALISP RUN	Termination message
CP: 196 FL: 23042 GC: 0	Run statistics
/	Back in batch mode

Example terminal session for UTLISP:

Terminal dialogue	Comments
RECOVER /SYSTEM: BATCH,55000	Enter batch subsystem
\$RFL,55000	
/LISP,C,Z	Run the UTLISP system
***** LISP 4.1	
*EVAL:	
?(CAR '(HEAD MID TAIL))	Off we go...
*VALUE:	
HEAD	Value of the CAR
*EVAL:	
?(CDR '(HEAD MID TAIL))	
*VALUE:	
(MID TAIL)	
*EVAL:	
?	Etc.
?FIN	Finish UTLISP run
GARBAGE COLLECTIONS: 0 0	Termination message
UT LISP 4.1 (80/03/13)	Run statistics
/	Back in batch mode.

REFERENCES

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- Greenberg. *Notes on the Programming Language LISP*. Cambridge, Massachusetts: Student Information Processing Board, M.I.T. 1976. Revised 1978. A hard-to-get publication, well worth the time and effort spent to get it. The most lucid introduction to LISP around these parts of the world. Excellently written in an informal style.
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- Winston, P. and Horn, K.P. *LISP*. Massachusetts: Addison-Wesley 1981. Softbound oil-color cover. Using the MACLISP dialect, Winston and Horn provide an excellent introduction to LISP with radually more and more advanced examples. Exercises and answers included. Available infrequently at U of M bookstores.



ACSS BRIEF

A SHORT GUIDE TO LISP FACILITIES AT THE UNIVERSITY OF MINNESOTA

The intended audience of this guide is students wishing to use LISP 1.5 on the ACSS CYBER CA and ME (MERITSS) systems. This guide briefly describes how to get started on-line with LISP 1.5. This documentation may also prove helpful to those users already familiar with LISP 1.5 (or another LISP) on another system who want to learn the University of Minnesota implementation. A list of annotated references for further instruction is included at the end of this guide.

LISP Systems Available

Two LISP interpreters are available:

1. University of Texas LISP Version 4.1 (UTLISP)
2. University of Massachusetts at Amherst LISP Version 3.2 (ALISP)

Since ALISP is much more interactive than UTLISP and has many more programming tools embedded in it, you will probably find it more useful than UTLISP. Writeups are available for both: type WRITEUP(ALISP) for ALISP, and WRITEUP(LISP) for UTLISP.

For simple interactive use of either interpreter, you must be aware of at least the following differences:

	ALISP	UTLISP
QUOTE character	'	"
Length of S-expressions	(no limit)	one line
Super-bracket	none]
LISP editor	yes	no
LISP filer	yes	no
Prettyprinter	yes	no

Example terminal session for ALISP:

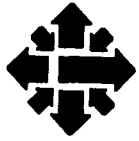
Terminal dialogue	Comments
RECOVER /SYSTEM: BATCH	Enter batch subsystem
\$RFL,0	
/FETCH,ALISP	
/ALISP	Run the ALISP system
5/15/84 12.49.54 ALISP VERSION 3.2 OF OCT. 20, 1978	
?(CAR '(HEAD MID TAIL))	Off we go...
HEAD	Value of the CAR
?(CDR '(HEAD MID TAIL))	
(MID TAIL)	
?	Etc.
?(EXIT)	Exit from ALISP
END ALISP RUN	Termination message
CP: 196 FL: 23042 GC: 0	Run statistics
/	Back in batch mode

Example terminal session for UTLISP:

Terminal dialogue	Comments
RECOVER /SYSTEM: BATCH,55000	Enter batch subsystem
\$RFL,55000	
/LISP,C,Z	Run the UTLISP system
***** LISP 4.1	
*EVAL:	
? (CAR ' (HEAD MID TAIL))	Off we go...
*VALUE:	
HEAD	Value of the CAR
*EVAL:	
? (CDR ' (HEAD MID TAIL))	
*VALUE:	
(MID TAIL)	
*EVAL:	
?	Etc.
?FIN	Finish UTLISP run
GARBAGE COLLECTIONS: 0 0	Termination message
UT LISP 4.1 (80/03/13)	Run statistics
/	Back in batch mode.

REFERENCES

- Allen, J. *Anatomy of LISP*. McGraw-Hill Book Company 1978. Crisp and clear. The best overall LISP book around.
- Charniak, E., Riesbeck, C., and McDermott, D. *Artificial Intelligence Programming*. Hillsdale, New Jersey: Lawrence Erlbaum 1979. A book on AI and LISP programming style. The authors expound on their philosophy of LISP and personal experiences and pitfalls. Required reading for the serious student of AI.
- Friedman, Daniel P. *The Little LISPer*. Science Research Associates 1974. Introductory level text to teach LISP 1.5 concepts-- particularly how to think recursively. Good for the absolute beginner. Available from U of M bookstores.
- Greenawalt, E. M. *U.T. LISP Reference Manual*. University of Texas at Austin 1975. This manual contains the version of LISP currently implemented at the University of Minnesota. It is a good reference--but not one to learn from. At 175 pages it is not a pocket reference. Available as WRITEUP(LISP=*)
- Greenberg. *Notes on the Programming Language LISP*. Cambridge, Massachusetts: Student Information Processing Board, M.I.T. 1976. Revised 1978. A hard-to-get publication, well worth the time and effort spent to get it. The most lucid introduction to LISP around these parts of the world. Excellently written in an informal style.
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Software

ACSS offers its users a broad spectrum of software. Graphics packages, language processor packages, mathematics and engineering libraries and packages, software-writing tools, and statistics packages are among the types of software available. If you wish more information about the software listed in this Brief, you can call the HELP-Line at 376-5592. Also, check another source, the ACSS software data base, which is available through the ACSS Reference Room in 128A Lind Hall. Contact ACSS librarian Michael Dunham at 373-7744 if you have questions. The symbols CA, ME, and VX following each package refer to machines: CA - CYBER, ME - MERITSS, VX - VAX.

Data Base Management Systems and Tools

PERT/COST	An evaluation and review technique for project costs. (CA)
PERT/TIME	An evaluation and review technique for project schedules. (CA)
SIR	A scientific hierarchical/network DBMS, often useful in research applications, that features an SPSS-like query language, a report writer, and an easy interface to statistics packages. (CA, VX)
System 2000	A generalized hierarchical DBMS, often useful in business applications, that features powerful interactive query facilities, a report writer, and FORTRAN/COBOL procedural language interfaces. (CA, ME)

Graphics Packages and Libraries

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, ME)
CNTOUR	A FORTRAN subroutine referencing PLOTPAC and MNCORE to produce contour plots with simple annotation. (CA, ME)
CONTOUR	A collection of FORTRAN subroutines that provide grid generation and contouring capabilities. A rich set of options allows extensive control of map characteristics. (VX)
DISSPLA	An industry standard library of over 400 FORTRAN subroutines capable of two- and three-dimensional linear plots, pie and bar charts, three-dimensional 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 (e.g., eight languages and fifteen fonts), and more. (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)
GRAFMAKER	A set of FORTRAN subroutines designed for use in application programs to easily create charts—pie charts, line graphs, bar graphs, and needle graphs. In addition, GRAFMAKER includes GRAFEASY, a set of subroutine calls that simplify GRAFMAKER even further for quick and easy graphic presentation of data. (VX)

MNCORE	ACSS's implementation of the ACM 1979 CORE standard for vector graphics. 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, ME)
PASPLOT	A library of Pascal subroutines for two-dimensional linear plots, with lines, special symbols, scaling, and windowing. (CA, ME)
PICSURE	An interactive computer graphics software system for generating charts and graphs with a simple sequence of English-like commands. No knowledge of computer languages is required to use PICSURE. The basic types are line graphs, bar charts, pie charts, and text charts. (VX)
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, ME)
PLOT3D	A FORTRAN subroutine that creates perspective plots of three-dimensional surfaces with hidden lines removed. (CA, ME)
PLTSCL	An easy-to-use FORTRAN subroutine used with PLOTPAC to generate scaled, two-dimensional linear plots. PLTSCL, SCLPLT (which produces output for a printer), and PRNTPLT (Pascal) provide the simplest way to produce a linear plot. (CA, ME)
PRNPLO	A FORTRAN subroutine, more sophisticated than SCLPLT, that is used for plotting grids, axes, titles, and lines on standard printers. (CA, ME)
PRNTPLT	An easy Pascal subroutine that uses PASPLOT to plot simple two-dimensional linear plots for a printer. PRNTPLT, SCLPLT (which produces output for a printer), and PLTSCL provide the simplest way to produce a linear plot. (CA, ME)
SCLPLT	An easy FORTRAN subroutine for generating scaled two-dimensional linear plots for a printer. SCLPLT, PLTSCL (which produces output for a plotter), and PRNTPLT (Pascal) provide the simplest way to produce a linear plot. (CA, ME)
SIGN	A program for plotting text and creating signs. (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, ME)
TELL-A-GRAF	A sophisticated, widely used, interactive graphics program for producing publication-quality, two-dimensional linear plots, bar and pie charts, and signs. (VX)

Humanities and Text-Analysis Packages

COLUMN	A program that formats text one word per line for use with TEXAN. (CA, ME)
GENCORD	A concordance-generating program. See WRITEUP(GENCORD).(CA)
LTTRCNT	A program that generates statistics on letter frequencies and position. See WRITEUP(TEXAIDS). (CA)
PWT	A program that formats tagged text with tags beneath the word. See WRITEUP(TEXAIDS). (CA)
TEXAN	A program for retrieving patterns from tagged text. (CA)

Language Processors

Language Machine/ system	Description of the language Description of the processor available Name	Version	Description (source)
ADA			General purpose structured language.
VX	ADA		ANSI 1983 standard full Ada compiler (educational use only)
APL			A Programming Language. Numerical + operator oriented language.
CA,ME	APL	2.1	APL interpreter (CDC + U of Massachusetts)
BASIC			Beginners All purpose Symbolic Instruction Code.
CA,MD,ME	BASIC	3.5	BASIC compiler (CDC)
COBOL-74			ANSI 1974 standard COmmon Business-Oriented Language.
CA,MD,ME	COBOL5	5.3	COBOL-74 compiler (CDC)
VA	COBOL11	3.0	COBOL-74 compiler (DEC)
CA,MD,ME	COBOL	4.7	
VX	COBOL		COBOL-74 compiler (DEC)
EMULATOR			Assembly Language and Simulator for another computer.
CA,MD,ME	EMULATE	1.0	CDC 3200 computer (U of Minnesota)
CA	MIXBYTE	1.0	MIX decimal machine language simulator
CA,MD,ME	MACRO11	2.0	DEC PDP-11 emulator (U of Minnesota)
CA	MIXAL	2.0	Knuth MIX computer (U of Minnesota)
FORTRAN IV			ANSI 1966 FORmula TRANslation language - numerical language.
CA,MD,ME	MNF	5.4	Minnesota Fortran compiler (U of Minnesota)
CA,MD,ME	FTN	4.8	ForTraN compiler (CDC)
FORTRAN-77			ANSI 1977 FORmula TRANslation language - extended numerical.
CA,MD,ME	M77	2.7	Minnesota Fortran-77 (U of Minnesota)
CA,MD,ME	FTN5	5.1	Fortran-77 compiler (CDC)
VA	FORTRAN	3.5	Fortran-77 compiler (DEC)
VX	FORTRAN		Fortran-77 compiler (DEC)
GPSS			General Purpose Simulation System. Discrete event simulation.
CA	GPSS	2.0	GPSS compiler (Northwestern U)
LISP 1.5			LISt Processing language - non-numerical, symbolic-expression.
CA,MD,ME	LISP	4.1	LISP interpreter (U of Texas)
CA,MD,ME	ALISP	3.2	LISP interpreter (U of Mass. at Amherst)
VX	LISP		VAX LISP (DEC)
MIMIC			MIMIC an analog computer - continuous-system simulation.
CA	MIMIC	1.3	Interpreter (CDC)
OPS5			Artificial Intelligence package.
VX	OPS5		General purpose expert systems language
Pascal			ISO 7185 Standard Pascal. General-purpose, structured language.
CA,MD,ME	PASCAL	4.1	Pascal compiler (ETH Zurich + U of Minn)
CA,MD,ME	APASCAL	4.1	Full ASCII Pascal compiler (U of Minn)
VA	PASCAL	2.5	Pascal compiler (U of Washington + DEC)
VX	PASCAL		Pascal compiler (DEC)
PL/1			Programming Language 1 - all-purpose language.
CA	PL1	Feb77	PL/1 compiler (New York U)
RPG-II			Report Program Generator II- business-oriented language.
CA,MD,ME	RPGII	1.0	RPG-II translator (U of Minnesota + CDC)
SIL			System-Implementation Language. Machine-dependent, medium level.
CA,MD,ME	SYMPL	1.4	SYsteMs Programming Language compiler (CDC)
SIMSCRIPT			SIMulation tranSCRIPT language - discrete event simulation.
CA,MD,ME	SIMIIS	3.2	SIMSCRIPT II.5 compiler (CACI)
SNOBOL4			StriNg Oriented and symBOLic LAnguage - non-numeric language.
CA,MD,ME	SNOBOLC	3.3	SNOBOL4 interpreter (UC Berkeley + Minn.)
CA	SNOBOL	3.10	SNOBOL4 interpreter (U of Colorado)

Mathematics and Engineering Packages and Libraries

Languages and Packages

MPOS	A multipurpose optimization program. (CA, ME)
NONSAP	A package for nonlinear structural analysis. (CA)
REDUCE2	A program for symbolic and algebraic manipulation. (CA)
SAP4	A program for linear structural analysis. (CA)
SPICE2	An electronic circuit simulator. (CA, ME)

Simulation Languages and Packages

DYNAMO	A continuous systems simulator. (CA, ME)
FORSIM	An ordinary and partial differential equations package. (CA)
GPSS	A discrete event simulator. (CA)
MIMIC	A continuous system and analog computer simulator. (CA)
SIMSCRIPT	An event-based simulator. (CA, ME)
SIMULA	A process-oriented simulator. (CA, ME)

Libraries

BESPACK	Bessel and Airy functions library. (CA, ME)
BSPLINE	B-spline library. (CA, ME)
EISPACK	Eigenvalue-eigenvector library. (CA, ME)
EPISODE	Ordinary differential equations package. (CA, ME)
FUNPACK	Special functions library. (CA, ME)
GPM	Nonlinear programming library. (CA, ME)
GRG2	Nonlinear programming library; more comprehensive than GPM. (CA, ME)
IMSL	Mathematical and statistical library. (CA, ME)
INTLIB	M77 interval arithmetic library. (CA, ME)
LINPACK	Linear algebra library. (CA, ME)
MINNLIB	Minnesota subprogram library. (CA, ME)
MINPACK	Unconstrained minimization and nonlinear least squares library. (CA, ME)
YSMPLIB	Yale sparse matrix library, direct methods. (CA, ME)

Software-Writing Tools

Debugging

CPDEBUG	A program debugger. (CA, MD, ME)
DEBUG	(CID: CYBER Interactive Debug) A program debugger. (CA, MD, ME)
/DEBUG	An interactive symbolic debug option for languages. (VX)
PASCODE	A Pascal binary decompiler. (CA, MD, ME)

Performance Measurement

ANALYZE	A Pascal performance measurement program used in conjunction with AUGMENT. (CA, MD, ME)
AUGMENT	A Pascal performance measurement program used in conjunction with ANALYZE. (CA, MD, ME)

Source Program Extraction Tools

/CROSS	A cross-reference option for languages. (VX)
DOCUMENT	A documentation extraction program for assembler. (CA, ME)
PASCREF	A Pascal cross-reference program. (CA, ME)
SNOREF	A SNOBOL cross-reference program. (CA, ME)

Source Program Preparation

COPYCL	A program that creates a COBOL source library. (CA, ME)
DRESS	A program that prepares a program source for MODIFY. (CA, ME)
ID2ID	A program that substitutes identifiers in a Pascal program. (CA, ME)

POLISH	A FORTRAN program reformatter. (CA, ME)
PREPARE	A program that adds checkpoints to program binary for CPDEBUG. (CA, ME)
PRETTY	A Pascal pretty printer. (CA, ME)
REFORM	A reformatter that adds or deletes sequence numbers. (CA, ME)
SNOTIDY	A SNOBOL pretty printer. (CA, ME)
SPRUCE	A Pascal program formatter. (CA, ME)
STRATEN	A reformatter of assembly language programs. (CA, ME)
TIDY	A reformatter of FORTRAN programs. (CA, ME)

Text File Maintenance

COMPARE	A program that compares two text files and reports their differences. (CA, ME)
MODIFY	A maintenance package for program source libraries. (CA, ME)
SLP	A maintenance package for program source libraries. (VX)
SORTOPL	A program that sorts MODIFY decks. (CA, ME)
TOOLAID	Packages with a variety of text manipulation tools. (CA, ME)
UPDATE	A maintenance package for program source libraries. (CA, ME)

Others

CATALOG	A program that lists information about records assigned to a job. (CA, ME)
ESTMATE	An estimator of indexed-sequential file size. (CA, ME)
LIBEDIT	A general-purpose utility that manipulates records and maintains files. (CA, ME)
SORT	A generalized, external sort and merge program. (CA, ME)
SORT/MERGE	A system utility which can sort records of information according to key fields and merge files with similar records into one sorted file. (CA, ME)

Statistics

General-purpose Packages

BMDP	A batch-oriented, comprehensive statistical package having fair data management capabilities. (CA, ME)
MINITAB	A general-purpose, interactive instructional statistical package to use with small to moderate data sets, which is designed for users with no previous computing experience. (CA, ME, VX)
OMNITAB	An older, general-purpose package used for statistical and numerical analysis. (CA, ME)
SAS	A batch-oriented statistical analysis package, which is the mainstay of IBM statistical users. (VX)
SCSS	A conversational, statistical package based on SPSS. (CA)
SPSS	A batch-oriented, comprehensive statistical package having extensive file-handling abilities. (CA, ME)
SPSSONL	An interactive editor used for accessing SPSS interactively. (CA, ME)
SPSS-X	A new, upgraded version of SPSS. (CA, ME, VX)
SPSS-X Tables	A package that produces camera-ready tables using SPSS-X. (VX)

Anova and Regression

GLIM	Interactive, generalized linear models including regression, ANOVA, ANCOVA, contingency table and profit analysis: for the statistically knowledgeable user. (CA, ME)
IVAN	An instructional, interactive package used for analysis of factorial designs. (CA, ME)
MULTREG	An interactive package used for multiple regression analysis. (CA, ME)

Cluster Analysis

CLUSTER	A program used to perform hierarchical cluster analysis. (CA)
HICLUS	A package using similarity measures to construct individual and group hierarchical clusters. (CA)

Factor Analysis

COFAMM	A confirmatory factor analysis package with model modification. (CA)
LISREL	A package for analysis of linear structural relationships by the method of maximum likelihood; confirmatory factor analysis. (CA, ME, VX)

Matrix Analysis

CTAB Log linear contingency table analysis. (CA, ME)
MATTER An extensive, easy-to-use, interactive matrix manipulation program including eigenvalues, Fourier transforms, ARIMA modeling, and forecasting for the statistically knowledgeable user. (CA, ME)

Multidimensional Scaling

KYST-2A A program for multidimensional scaling. (CA)
SINDSCAL A program for the analysis of individual differences in multidimensional scaling. (CA)

Statistical Graphics

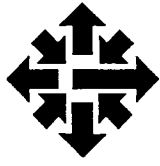
SAS/GRAPH A stand-alone, easy-to-use interactive graphical system designed for use with SAS. Produces high-quality plots on a large number of plotters. (VX)
SPSS-X A stand-alone, easy-to-use interactive graphical system designed GRAPHICS for use with SPSS-X. Produces high-quality plots on a large number of plotters. (VX)

Time Series

RATS Regression and time series: analysis and forecast of time series. (CA)
SHAZAM Econometric and time series analysis including 2 and 3SLS, non-linear and ridge regression, maximum likelihood estimates, dynamic models, ARIMA models, and forecasting. (CA)
TSP The classic time series analysis package. (CA)

Text-Processing Packages

EDT The primary editor on the VX: a screen-oriented interactive text editor when used with a DEC VT100 or VT52-type terminal; a line editor when used with other terminals. (VX)
FNOTE A footnote handling program. (CA, ME)
MLSORT A multiline sorting program, especially suited for bibliographies. (CA, ME)
PROSE A portable text formatter useful for producing simply formatted documents. (CA, MD, ME)
SCRIBE A general-purpose text formatter that can take advantage of the special features of a variety of printers in producing simple as well as complex documents. (VX)
SOS An interactive line-oriented text editor. (VX)
XEDIT An interactive line- and context-oriented text editor. (CA, ME)



ACSS Brief

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PICSURE	An interactive computer graphics software system for generating charts and graphs with a simple sequence of English-like commands. No knowledge of computer languages is required to use PICSURE. The basic types are line graphs, bar charts, pie charts, and text charts. (VX)
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PLTSCL	An easy-to-use FORTRAN subroutine used with PLOTPAC to generate scaled, two-dimensional linear plots. PLTSCL, SCLPLT (which produces output for a printer), and PRNTPLT (Pascal) provide the simplest way to produce a linear plot. (CA, MD)
PRNPLO	A FORTRAN subroutine, more sophisticated than SCLPLT, that is used for plotting grids, axes, titles, and lines on standard printers. (CA, MD)
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BASIC		Beginners All purpose Symbolic Instruction Code.
CA,MD	BASIC	3.5 BASIC compiler (CDC)
C		C Programming Language
UX	cc	C programming language (Encore)
COBOL		COmmon Business-Oriented Language.
CA,MD	COBOL5	5.3 COBOL-74 compiler (CDC)
VX	COBOL11	3.0 COBOL-74 compiler (DEC)
CA,MD	COBOL	4.7 (New program use not recommended)
Emulators		Assembly Language Simulators for another computer.
CA,MD	EMULATE	1.0 CDC 3200 computer (U of Minnesota)
VX	ISPS	Instruction Set Processor Simulator
CA	MIXBYTE	1.0 MIX decimal machine language simulator
CA,MD	MACRO11	2.0 DEC PDP-11 emulator (U of Minnesota)
CA	MIXAL	2.0 Knuth MIX computer (U of Minnesota)
FORTRAN IV		ANSI 1966 FORmula TRANslation language - numerical language.
CA,MD	MNF	5.4 MiNnesota Fortran compiler (Use not recommended).
CA,MD	FTN	4.8 ForTraN compiler (CDC) (Use not recommended).
FORTRAN-77		ANSI 1977 FORmula TRANslation language - extended numerical.
CA,MD	M77	2.7 Minnesota Fortran-77 (U of Minnesota)
CA,MD	FTN5	5.1 ForTraN compiler (CDC)
VX	FORTRAN	3.5 FORTRAN compiler (DEC)
UX	f77	Fortran-77 compiler (Encore)
GPSS		General Purpose Simulation System. Discrete event simulation.
CA	GPSS	2.0 GPSS compiler (Northwestern U)
LISP		LISt Processing language - non-numerical, symbolic-expression.
CA,MD	LISP	4.1 LISP interpreter (U of Texas)
CA,MD	ALISP	3.2 LISP interpreter (U of Mass. at Amherst)
VX	LISP	VAX Common Lisp (DEC)
MIMIC		MIMIC an analog computer - continuous-system simulation.
CA	MIMIC	1.3 interpreter (CDC)
OPS5		General Purpose Expert System Language.
VX	OPS5	
Pascal		ISO 7185 Standard Pascal. General-purpose, structured language.
CA,MD	PASCAL	4.1 Pascal compiler (ETH Zuerich + U of Minn)
CA,MD	APASCAL	4.1 Full ASCII Pascal compiler (U of Minn)
VX	PASCAL	2.5 Pascal compiler (U of Washington + DEC)
UX	pc	Pascal compiler (Encore)
PL/1		Programming Language 1 - all-purpose language.
CA	PL1	eb77 PL/1 compiler (New York U)
PROLOG		Logic programming language.
VX	Prolog	1.5 Prolog compiler. (Quintus)
RPG-II		Report Program Generator II- business-oriented language.
CA,MD	RPGII	1.0 RPG-II translator (U of Minnesota + CDC)
SIL		System-Implementation Language. Machine-dependent, medium level.
CA,MD	SYMPL	1.4 SYsteMs programming Language compiler (CDC)
SIMSCRIPT		SIMulation tranSCRIPT language - discrete event simulation.
CA	SIMIIS	3.2 SIMSCRIPT II.5 compiler (CACI)
SNOBOL4		StriNg Oriented and symBOLic LAnguage - non-numeric language.
CA	SNOBOLC	3.3 SNOBOL4 interpreter (UC Berkeley + Minn.)
CA,MD	SNOBOL	3.10 SNOBOL4 interpreter (U of Colorado)

Mathematics and Engineering Packages and Libraries

Languages and Packages

APEX	A large-scale linear programming package. (CA)
CALGOPL	The ACM Collected Algorithms file. (CA)
LINDO	An interactive linear, quadratic and integer programming package. (CA)
LPKODE	A program for general purpose linear programming. (CA)
MATLAB	An interactive program for matrix computation. (CA)
MPOS	A multipurpose optimization program. (CA, MD)
NONSAP	A package for nonlinear structural analysis. (CA)
REDUCE2	A program for symbolic and algebraic manipulation. (CA)
SAP4	A program for linear structural analysis. (CA)
SPICE2	An electronic circuit simulator. (CA, MD)

Simulation Languages and Packages

DYNAMO	A continuous systems simulator. (CA, MD)
FORSIM	An ordinary and partial differential equations package. (CA)
GPSS	A discrete event simulator. (CA)
MIMIC	A continuous system and analog computer simulator. (CA)
SIMSCRIPT	An event-based simulator. (CA)

Libraries

BESPACK	Bessel and Airy functions library. (CA)
BSPLINE	B-spline library. (CA)
EISPACK	Eigenvalue-eigenvector library. (CA)
EPISODE	Ordinary differential equations package. (CA)
FUNPACK	Special functions library. (CA)
GPM	Nonlinear programming library. (CA)
GRG2	Nonlinear programming library; more comprehensive than GPM. (CA)
IMSL	Mathematical and statistical library. (CA, MD)
INTLIB	M77 interval arithmetic library. (CA)
LINPACK	Linear algebra library. (CA)
MINNLIB	Minnesota subprogram library. (CA, MD)
MINPACK	Unconstrained minimization and nonlinear least squares library. (CA)
MIN5LIB	MINOS 5 linear and nonlinear programming library. (CA, MD)
YSMPLIB	Yale sparse matrix library, direct methods. (CA)

Software-Writing Tools

Debugging

CPDEBUG	A program debugger. (CA, MD)
DEBUG	(CID: CYBER Interactive Debug) A program debugger. (CA, MD)
/DEBUG	An interactive symbolic debug option for languages. (VX)
PASCODE	A Pascal binary decompiler. (CA, MD)

Performance Measurement

ANALYZE	A Pascal performance measurement program used in conjunction with AUGMENT. (CA, MD)
AUGMENT	A Pascal performance measurement program used in conjunction with ANALYZE. (CA, MD)

Source Program Extraction Tools

/CROSS	A cross-reference option for languages. (VX)
DOCUMENT	A documentation extraction program for assembler. (CA)
PASCREF	A Pascal cross-reference program. (CA)
SNOREF	A SNOBOL cross-reference program. (CA)

Source Program Preparation

CLEAN77	A FORTRAN program reformattor. (CA, MD)
COPYCL	A program that creates a COBOL source library. (CA)
DRESS	A program that prepares a program source for MODIFY. (CA)
ID2ID	A program that substitutes identifiers in a Pascal program. (CA)
PREPARE	A program that adds checkpoints to program binary for CPDEBUG. (CA)
PRETTY	A Pascal pretty printer. (CA)
REFORM	A reformatter that adds or deletes sequence numbers. (CA)
SNOTIDY	A SNOBOL pretty printer. (CA)
SPRUCE	A Pascal program formatter. (CA)
STRATEN	A reformatter of assembly language programs. (CA)
TIDY	A reformatter of FORTRAN programs. (CA)

Text File Maintenance

COMPARE	A program that compares two text files and reports their differences. (CA)
MODIFY	A maintenance package for program source libraries. (CA, MD)
SLP	A maintenance package for program source libraries. (VX)
SORTOPL	A program that sorts MODIFY decks. (CA)
TOOLAID	Packages with a variety of text manipulation tools. (CA)
UPDATE	A maintenance package for program source libraries. (CA, MD)

Others

CATALOG	A program that lists information about records assigned to a job. (CA, MD)
ESTMATE	An estimator of indexed-sequential file size. (CA)
LIBEDIT	A general-purpose utility that manipulates records and maintains files. (CA, MD)
SORT	A generalized, external sort and merge program. (CA, MD)
SORT/MERGE	A system utility which can sort records of information according to key fields and merge files with similar records into one sorted file. (CA, MD)

Statistics

General-purpose Packages

BMDP	A batch-oriented, comprehensive statistical package having fair data management capabilities. (CA)
MINITAB	A general-purpose, interactive instructional statistical package to use with small to moderate data sets, which is designed for users with no previous computing experience. (CA, VX)
SAS	A batch-oriented statistical analysis package, which is the mainstay of IBM statistical users. (VX)
SCSS	A conversational, statistical package based on SPSS. (CA)
SPSS	A batch-oriented, comprehensive statistical package having extensive file-handling abilities. (CA)
SPSSONL	An interactive editor used for accessing SPSS interactively. (CA)
SPSSX	A new, upgraded version of SPSS. (CA, VX)
SPSSX Tables	A package that produces camera-ready tables using SPSS-X. (VX)

Anova and Regression

GLIM	Interactive, generalized linear models including regression, ANOVA, ANCOVA, contingency table and profit analysis: for the statistically knowledgeable user. (CA)
IVAN	An instructional, interactive package used for analysis of factorial designs. (CA)
LOGIT	A logistic regression program. (CA)
MULTREG	An interactive package used for multiple regression analysis. (CA)

Factor and Cluster Analysis

CLUSTER	A program used to perform hierarchical cluster analysis. (CA)
LISREL	A package for analysis of linear structural relationships by the method of maximum likelihood; confirmatory factor analysis. (CA, VX)

Matrix Analysis

CTAB Log linear contingency table analysis. (CA)
MATTER An extensive, easy-to-use, interactive matrix manipulation program including eigenvalues, Fourier transforms, ARIMA modeling, and forecasting for the statistically knowledgeable user. (CA)

Multidimensional Scaling

KYST-2A A program for multidimensional scaling. (CA)

Statistical Graphics

SAS/GRAPH A stand-alone, easy-to-use interactive graphical system designed for use with SAS. Produces high-quality plots on a large number of plotters. (VX)
SPSSX/Graphics A stand-alone, easy-to-use interactive graphical system designed for use with SPSS-X. Produces high-quality plots on a large number of plotters. (VX)

Time Series

RATS Regression and time series: analysis and forecast of time series. (CA)
SHAZAM Econometric and time series analysis including 2 and 3SLS, non-linear and ridge regression, maximum likelihood estimates, dynamic models, ARIMA models, and forecasting. (CA)
TSP The classic time series analysis package. (CA)

Humanities and Text-Analysis Packages

COLUMN A program that formats text one word per line for use with TEXAN. (CA)
GENCORD A concordance-generating program. See WRITEUP,GENCORD.(CA)
LTTTCNT A program that generates statistics on letter frequencies and position.
 See WRITEUP,TEXAIDS. (CA)
PWT A program that formats tagged text with tags beneath the word. See WRITEUP,TEXAIDS. (CA)
TEXAN A program for retrieving patterns from tagged text. (CA)

Text-Processing Packages

EDT The primary editor on the VX: a screen-oriented interactive text editor when used with a DEC VT100 or VT52-type terminal; a line editor when used with other terminals. (VX)
FNOTE A footnote handling program. (CA)
FSE A full screen editor on the CYBER machines: useable with DEC VT100, Zenith Z19 and Z29, and possibly some other terminals. (CA, MD)
MLSORT A multiline sorting program, especially suited for bibliographies. (CA)
PROSE A portable text formatter useful for producing simply formatted documents. (CA, MD)
SCRIBE A general-purpose text formatter that can take advantage of the special features of a variety of printers in producing simple as well as complex documents. (VX)
SOS An interactive line-oriented text editor. (VX)
XEDIT An interactive line- and context-oriented text editor. (CA, MD)

ACSS Brief

General Information

Academic Computing Services and Systems • University of Minnesota • Twin Cities

Software

Academic Computing Services and Systems (ACSS) offers its users a broad spectrum of software. Graphics packages, language processor packages, mathematics and engineering libraries and packages, software-writing tools, and statistics packages are among the types of software available. If you wish more information about the software listed in this Brief, you can call the HELP-Line at 626-5592. Also, check another source, the ACSS software data base, which is available through the ACSS Computing Information Center in 128A Lind Hall. Contact ACSS librarian Michael Dunham at 625-7397 if you have questions. The symbols CA, NV, VX, and UX following each package refer to machines: CA-CYBER/NOS; NV-CYBER/VE; UX-ENCORE/UNIX; and VX-VAX/VMS.

Data Base Management Systems and Tools

INGRES	A relational, forms-oriented DBMS for organizing, accessing, and analyzing data. (VX)
PERT/COST	An evaluation and review technique for project costs. (CA)
PERT/TIME	An evaluation and review technique for project schedules. (CA)
SIR	A scientific hierarchical/network DBMS, often useful in research applications, that features an SPSS-like query language, a report writer, and an easy interface to statistics packages. (CA, VX)
SYSTEM 2000	A generalized hierarchical DBMS, often useful in business applications, that features powerful interactive query facilities, a report writer, and FORTRAN/COBOL procedural language interfaces. (CA)

File Transfer Programs

KERMIT	File transfer protocol. KERMIT provides reliable file transfer and primitive virtual terminal communication between machines. (CA,VX,UX)
MACGET	Sends file to a Macintosh running MacTerminal. (UX)
MACPUT	Receives file from a Macintosh running MacTerminal. (UX)
UMODEM	File transfer protocol. UMODEM uses the Christensen protocol to transfer files to and from CP/M systems. (UX)

Graphics Packages and Libraries

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)
CONTOUR	A collection of FORTRAN subroutines that provide grid generation and contouring capabilities. A rich set of options allows extensive control of map characteristics. (VX)
DISSPLA	An industry standard library of over 400 FORTRAN subroutines capable of two- and three-dimensional linear plots, pie and bar charts, three-dimensional 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 (e.g., eight languages and fifteen fonts), and more. (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. Ten different typefaces are available, and the characters may be drawn as outline or solid characters. (VX)

GRAFMAKER	A set of FORTRAN subroutines designed for use in application programs to easily create charts—pie charts, line graphs, bar graphs, and needle graphs. In addition, GRAFMAKER includes GRAFEASY, a set of subroutine calls that simplify GRAFMAKER even further for quick and easy graphic presentation of data. (VX)
MNCORE	ACSS's implementation of the ACM 1979 CORE standard for vector graphics. 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)
PICSURE	An interactive computer graphics software system for generating charts and graphs with a simple sequence of English-like commands. No knowledge of computer languages is required to use PICSURE. The basic types are line graphs, bar charts, pie charts, and text charts. (VX)
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. PLTSCL, SCLPLT (which produces output for a printer), and PRNTPLT (Pascal) provide the simplest way to produce a linear plot. (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. PRNTPLT, SCLPLT (which produces output for a printer), and PLTSCL provide the simplest way to produce a linear plot. (CA)
SCLPLT	An easy FORTRAN subroutine for generating scaled two-dimensional linear plots for a printer. SCLPLT, PLTSCL (which produces output for a plotter), and PRNTPLT (Pascal) provide the simplest way to produce a linear plot. (CA)
SIGN	A program for plotting text and creating signs. (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)
TELL-A-GRAF	A sophisticated, widely used, interactive graphics program for producing publication-quality, two-dimensional linear plots, bar and pie charts, and signs. (VX)

Language Processors

ADA	General purpose, structured language. (VX - Ada; UX - adaed)
APL	A Programming Language. Numerical and operator oriented language. (CA)
BASIC	Beginners All purpose Symbolic Instruction Code. (CA,NV)
C	C Programming Language. (UX - cc,VX -cc)
C++	Extended C Programming Language (UX - CC))
COBOL	COmmon Business-Oriented Language. (CA-COBOL5,VX - COBOL)
EMULATE	CDC 3200 computer simulator. (CA)
FORTRAN IV	Fortran IV use is not recommended. (CA-MNF,FTN)
FORTRAN 77	ANSI 1977 Fortran. (CA-M77,FTN5; UX-f77;VX-Fortran;NV-Fortran)
GPSS	General Purpose Simulation System. Discrete event simulation. (CA)
HYPERCUBE	Intel simulator. (UX-ipSC)
ISPS	Instruction Set Processor Simulator. (VX)
LISP	LISt Processing language - non-numerical, symbolic-expression. (CA-ALISP,LISP; VX; UX)
MACRO11	DEC PDP-11 emulator. (CA)
MIMIC	MIMIC an analog computer - continuous-system simulation. (CA)
MIXAL	Knuth MIX computer. (CA)
MIXBYTE	MIX decimal machine language simulator. (CA)
MODULA-2	Modula-2 programming language. (UX-mc)
OPSS	General-purpose expert system language. (VX)
PASCAL	ISO/ANSI/IEEE 1982 standard Pascal. (CA-Pascal, APascal; VX; UX-pc)
PROLOG	Logic programming language. (UX-wup,VX-Prolog)
RPG-II	Report Program Generator II- business-oriented language. (CA)
SIL	System-Implementation Languages. (CA-SYML,NV-CYBIL)
SIMSCRIPT	SIMulation tranSCRIPT language - discrete event simulation. (CA-SIMIIS)
SMALLTALK	Object-oriented lanaguage. (UX-st)
SNOBOL4	StriNg Oriented and symBOLic Language - non-numeric language. (CA-SNOBOLC, SNOBOL)

Mathematics and Engineering Packages and Libraries

Mathematics and Statistics Libraries

CALGOPL	ACM Collected Algorithms file. (CA)
CMLIB	Collection of libraries for math and statistics. (UX)
IMSL	International Mathematics and Statistics Library. (CA,VX)
MINNLIB	Minnesota subprogram library. (CA)

Mathematics Libraries and Programs

BESPACK	Bessel and Airy functions library. (CA,VX)
BSPLINE	B-spline interpolation and approximation library. (CA,VX)
EISPACK	Eigenvalue-eigenvector analysis library. (CA,UX,VX)
EPISODE	Ordinary differential equations library. (CA,VX)
FORSIM	Program for ordinary and partial differential equations. (CA)
FUNPACK	Exponential, elliptic, and Dawson's integrals library. (CA,VX)
INTLIB	M77 interval arithmetic library. (CA)
LINPACK	Linear equations library. (CA,VX)
LSODE	Ordinary differential equations library. (CA,VX)
LSODI	Implicit ordinary differential equations library. (CA,VX)
OPT	Optimization library. (UX)
MACSYMA	Program for symbolic and algebraic manipulation. (VX)
MATLAB	Instructional matrix program. (CA)
MINPACK	Nonlinear equations and nonlinear least squares library. (CA,VX)
PCGPAK	Sparse linear equations (iterative methods) library. (VX)
QUADPAK	Numerical integration (quadrature) library. (VX)
REDUCE2	Program for symbolic and algebraic manipulation. (CA,VX)
SPARSPK	Waterloo sparse linear equations and least squares (direct methods) library. (VX)
YSMPLIB	Yale sparse linear equations (direct methods) library. (CA,VX)

Linear/Nonlinear Programming Libraries and Programs

GRG2	Nonlinear programming (nonlinear optimization) library. (CA,VX)
LINDO	Program for solving linear, quadratic, and integer programming problems. (CA,VX)
LPKODE	Instructional program for linear, integer, and mixed integer programming. (CA)
MINSLIB	MINOS 5 linear and nonlinear programming library. (CA,VX)
MPOS	Multi-purpose optimization program for solving linear, quadratic, integer, and mixed integer programming problems. (CA)

Engineering Programs

NONSAP	Program for nonlinear structural analysis. (CA)
SAP4	Program for linear structural analysis. (CA)
SPICE2	Program for electronic integrated circuit simulation. On the VX the package is called SPICE.. (CA,VX)

Simulation Languages and Programs

DYNAMO	Program for continuous systems simulation. (CA)
GPSS	Program for discrete event simulation. (CA)
MIMIC	Program for continuous systems and analog computer simulation. (CA)
SIMSCRIPT	Language for discrete event simulation.(CA)

Software-Writing Tools

Debugging

CPDEBUG A program debugger. (CA)
DEBUG (CID: CYBER Interactive Debug) A program debugger. (CA)
/DEBUG An interactive symbolic debug option for languages. (VX)
PASCODE A Pascal binary decompiler. (CA)

Performance Measurement

ANALYZE A Pascal performance measurement program used in conjunction with AUGMENT. (CA)
AUGMENT A Pascal performance measurement program used in conjunction with ANALYZE. (CA)

Source Program Extraction Tools

/CROSS A cross-reference option for languages. (VX)
DOCUMENT A documentation extraction program for assembler. (CA)
PASCREF A Pascal cross-reference program. (CA)
SNOREF A SNOBOL cross-reference program. (CA)

Source Program Preparation

CLEAN77 A FORTRAN program reformattor. (CA,VX)
COPYCL A program that creates a COBOL source library. (CA)
DRESS A program that prepares a program source for MODIFY. (CA)
ID2ID A program that substitutes identifiers in a Pascal program. (CA)
PREPARE A program that adds checkpoints to program binary for CPDEBUG. (CA)
PRETTY A Pascal pretty printer. (CA)
REFORM A reformatter that adds or deletes sequence numbers. (CA)
SNOTIDY A SNOBOL pretty printer. (CA)
SPRUCE A Pascal program formatter. (CA)
STRATEN A reformatter of assembly language programs. (CA)
TIDY A reformatter of FORTRAN programs. (CA)

Text File Maintenance

COMPARE A program that compares two text files and reports their differences. (CA)
DIFFERENCES A program that compares two text files and reports their differences. (VX)
MODIFY A maintenance package for program source libraries. (CA)
SLP A maintenance package for program source libraries. (VX)
SORTOPL A program that sorts MODIFY decks. (CA)
TOOLAID Packages with a variety of text manipulation tools. (CA)
UPDATE A maintenance package for program source libraries. (CA)

Others

CATALOG A program that lists information about records assigned to a job. (CA)
ESTMATE An estimator of indexed-sequential file size. (CA)
LIBEDIT A general-purpose utility that manipulates records and maintains files. (CA)
LIBRARY A utility that manipulates and maintains libraries. (VX)
SORT A generalized, external sort and merge program. (CA)
SORT/MERGE A system utility which can sort records of information according to key fields and merge files with similar records into one sorted file. (CA,VX)

Statistics

General-purpose Packages

BMDP	Batch oriented set of statistics programs with common interface. (CA)
MINITAB	Interactive statistical package for small data sets. (CA,VX)
SAS	Batch-oriented statistical analysis package, which is the mainstay of IBM statistical users. (VX)
S	Interactive statistical language for data analysis. (UX)
SPSS	Statistical programming system for the social sciences. (CA)
SPSSONL	Interactive editor for SPSS. (CA)
SPSSX	Current upgrade of SPSS, a complete rewriting. (CA,VX)
SPSSX Tables	Package that produces camera-ready tables using SPSSX. (VX)

Anova and Regression

GLIM	Interactive generalized linear modeling package. (CA,UX)
IVAN	Interactive program for analysis of factorial designs and analyses of space. (CA)
LOGIT	Logistic regression program. (CA)
MULTREG	Interactive multiple regression program. (CA,UX)

Factor and Cluster Analysis

CLUSTER	Hierarchical cluster analysis. (CA)
EQS	Linear structural equations/confirmatory factor analysis. (VX)
LISREL	Linear structural relationships/confirmatory factor analysis. (CA)
TRYSYS1	Tryon hierarchical cluster analysis. (CA)

Matrix Analysis

CTAB	Multidimensional contingency tables. (CA)
MATTER	Interactive matrix manipulation program. (CA,VX)

Multidimensional Scaling

KYST-2A	Multidimensional scaling and unfolding program. (CA)
SINDSCL	Performs individual differences multidimensional scaling. (CA)

Time Series

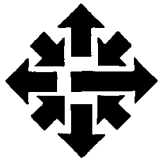
RATS	Regression and Time Series Analysis. (CA)
SHAZAM	Econometric analysis of time series. (CA)
TSP	Program for statistical analysis of time series by least squares. (CA)

Humanities and Text-Analysis Packages

COLUMN	A program that formats text one word per line for use with TEXAL. (CA)
GENCORD	A concordance-generating program. See WRITEUP,GENCORD. (CA)
LTTRCNT	A program that generates statistics on letter frequencies and position. (CA)
PWT	A program that formats tagged text with tags beneath the word. (CA)
TEXTAL	A program for retrieving patterns from tagged text. (CA)
WRDSTAT	A program that counts words in a text. (CA)

Text-Processing Packages

ED	The primary editor on the VX: a screen-oriented interactive text editor when used with a DEC VT100 or VT52-type terminal; a line editor when used with other terminals. (VX)
BIB	Bibliographic formatter. BIB is a preprocessor for NROFF or TROFF that formats citation and bibliographies. (UX)
DICTION	Looks for frequently misused phrases. (UX)
EXPLAIN	A thesaurus that suggests alternate phrases. (UX)
FNOTE	A footnote handling program. (CA)
FSE	A full screen editor on the CYBER machines: useable with a DEC VT100, Zenith Z19 and Z29, and possibly some other terminals. (CA,NV)
ISPELL	Corrects spelling for a file. (UX)
MLSORT	A multiline sorting program, especially suited for bibliographies. (CA)
PROSE	A portable text formatter useful for producing simply formatted documents. (CA)
RVI	Remote screen editor based on VI. (UX)
SCRIBE	A general-purpose text formatter that can take advantage of the special features of a variety of printers in producing simple as well as complex documents. (VX)
SOS	An interactive line-oriented text editor. (VX)
STYLE	A program that returns statistics on sentence length and type, word usage, and sentence openers for document and gives readability grades on four separate scales. (UX)
TEX	A powerful formatting program emphasizing typographical control and mathematical formatting. (VX)
XEDIT	An interactive line- and context-oriented text editor. (CA)



ACSS Brief

Software

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Data Base Management Systems and Tools

INGRES	A relational, forms-oriented DBMS for organizing, accessing, and analyzing data. (VX)
PERT/COST	An evaluation and review technique for project costs. (CA)
PERT/TIME	An evaluation and review technique for project schedules. (CA)
SIR	A scientific hierarchical/network DBMS, often useful in research applications, that features an SPSS-like query language, a report writer, and an easy interface to statistics packages. (CA, VX)
SYSTEM 2000	A generalized hierarchical DBMS, often useful in business applications, that features powerful interactive query facilities, a report writer, and FORTRAN/COBOL procedural language interfaces. (CA)

File Transfer Programs

KERMIT	File transfer protocol. KERMIT provides reliable file transfer and primitive virtual terminal communication between machines. (CA,MD,VX,UX)
MACGET	Send file to to a Macintosh running MacTerminal. (UX)
MACPUT	Receives file from a Macintosh running MacTerminal. (UX)
UMODEM	File transfer protocol. UMODEM uses the Christensen protocol to transfer files to and from CP/M systems. (UX)

Graphics Packages and Libraries

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, MD)
CNTOUR	A FORTRAN subroutine referencing PLOTPAC and MNCORE to produce contour plots with simple annotation. (CA, MD)
CONTOUR	A collection of FORTRAN subroutines that provide grid generation and contouring capabilities. A rich set of options allows extensive control of map characteristics. (VX)
DISSPLA	An industry standard library of over 400 FORTRAN subroutines capable of two- and three-dimensional linear plots, pie and bar charts, three-dimensional 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 (e.g., eight languages and fifteen fonts), and more. (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, MD, VX)
GRAFMAKER	A set of FORTRAN subroutines designed for use in application programs to easily create charts—pie charts, line graphs, bar graphs, and needle graphs. In addition, GRAFMAKER includes GRAFEASY, a set of subroutine calls that simplify GRAFMAKER even further for quick and easy graphic presentation of data. (VX)

MNCORE	ACSS's implementation of the ACM 1979 CORE standard for vector graphics. 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, MD)
PASPLOT	A library of Pascal subroutines for two-dimensional linear plots, with lines, special symbols, scaling, and windowing. (CA, MD)
PICSURE	An interactive computer graphics software system for generating charts and graphs with a simple sequence of English-like commands. No knowledge of computer languages is required to use PICSURE. The basic types are line graphs, bar charts, pie charts, and text charts. (VX)
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, MD)
PLOT3D	A FORTRAN subroutine that creates perspective plots of three-dimensional surfaces with hidden lines removed. (CA, MD)
PLTSCL	An easy-to-use FORTRAN subroutine used with PLOTPAC to generate scaled, two-dimensional linear plots. PLTSCL, SCLPLT (which produces output for a printer), and PRNTPLT (Pascal) provide the simplest way to produce a linear plot. (CA, MD)
PRNPLO	A FORTRAN subroutine, more sophisticated than SCLPLT, that is used for plotting grids, axes, titles, and lines on standard printers. (CA, MD)
PRNTPLT	An easy Pascal subroutine that uses PASPLOT to plot simple two-dimensional linear plots for a printer. PRNTPLT, SCLPLT (which produces output for a printer), and PLTSCL provide the simplest way to produce a linear plot. (CA, MD)
SCLPLT	An easy FORTRAN subroutine for generating scaled two-dimensional linear plots for a printer. SCLPLT, PLTSCL (which produces output for a plotter), and PRNTPLT (Pascal) provide the simplest way to produce a linear plot. (CA, MD)
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, MD)
TELL-A-GRAF	A sophisticated, widely used, interactive graphics program for producing publication-quality, two-dimensional linear plots, bar and pie charts, and signs. (VX)

Language Processors

ADA	General purpose, structured language. (VX, UX)
ALISP	LISt Processing language - non-numerical, symbolic-expression. (CA,MD)
APASCAL	General-purpose, structured language. Full ASCII Pascal compiler. (CA,MD)
APL	A Programming Language. Numerical and operator oriented language. (CA)
BASIC	Beginners All purpose Symbolic Instruction Code. (CA,MD)
CC	C Programming Language. (UX - cc)
COBOL	COmmon Business-Oriented Language. (CA,MD,VX)
EMULATE	CDC 3200 computer simulator. (CA,MD)
FORTRAN	FORTRAN compiler (DEC). (VX)
FRANZ LISP	LISt Processing language - non-numerical, symbolic-expression. (UX)
FTN	ForTraN compiler (CDC) (Use not recommended). (CA,MD)
FTN5	ForTraN compiler (CDC). (CA,MD)
f77	Fortran-77 compiler (ENCORE). (UX)
GPSS	General-purpose simulation system. Discrete event simulation. (CA)
ISPS	Instruction Set Processor Simulator. (VX)
LISP	LISt Processing language - non-numerical, symbolic-expression. (CA,MD,VX)
MACRO11	DEC PDP-11 emulator. (CA,MD)
MIMIC	MIMIC an analog computer - continuous-system simulation. (CA)
MIXAL	Knuth MIX computer. (CA)
MIXBYTE	MIX decimal machine language simulator. (CA)
MNF	MiNnesota Fortran compiler (Use not recommended). (CA,MD)
M77	Minnesota Fortran-77. (CA,MD)
OPSS	General Purpose Expert System Language. (VX)
PASCAL	General-purpose, structured language. (CA,MD,VX, UX)
PL1	Programming Language 1 - all-purpose language. (CA,UX)
PROLOG	Logic programming language. (VX)
RPG-II	Report Program Generator II- business-oriented language. (CA,MD)

Scheme	MIT Scheme LISP dialect. (UX)
SIMSCRIPT	SIMulation tranSCRIPT language - discrete event simulation. (CA)
SMALLTALK	Object-oriented program language. (UX)
SNOBOL4	StriNg Oriented and symBOLic Language - non-numeric language. (CA,MD)
SYMPL	SYsteMs Programming Language. (CA, MD)

Mathematics and Engineering Packages and Libraries

Mathematics and Statistics Libraries

CALGOPL	ACM Collected Algorithms file. (CA)
CMLIB	A collection of non-proprietary, easily transportable Fortran subprogram packages for math and statistics. (UX)
IMSL	International Mathematics and Statistics Library. (CA,MD,VX)
MINNLIB	Minnesota subprogram library. (CA,MD)

Mathematics Libraries and Programs

BESPACK	Bessel and Airy functions library. (CA,MD,VX)
BSPLINE	B-spline approximation problems library. (CA,MD,VX)
EISPACK	Eigenvalue-eigenvector analysis library. (CA,MD,VX,UX)
EPISODE	Ordinary differential equations library. (CA,MD,VX)
FORSIM	Program for ordinary and partial differential equations. (CA)
FUNPACK	Exponential, elliptic, and Dawson's integrals library. (CA,MD,VX)
INTLIB	M77 interval arithmetic library. (CA,MD)
LINPACK	Linear equations library. (CA,MD,VX)
LSODE	Ordinary differential equations library. (CA,MD,VX)
LSODI	Implicit ordinary differential equations library. (CA,MD,VX)
OPT	Fortran-callable library of optimization subroutines. (UX)
MACSYMA	Program for symbolic and algebraic manipulation. (VX)
MATLAB	Program for interactive matrix computation. (CA)
MINPACK	Nonlinear equations and nonlinear least squares library. (CA,MD,VX)
REDUCE2	Program for symbolic and algebraic manipulation. (CA,VX)
YSMPLIB	Yale sparse linear equations library. (CA,MD,VX)

Linear/Nonlinear Programming Libraries and Programs

APEX	Program for general purpose, large-scale linear programming. (CA,MD)
GPM	Nonlinear programming (nonlinear optimization) library. (CA,MD)
GRG2	Nonlinear programming (nonlinear optimization) library. (CA,MD,VX)
LINDO	Program for interactive linear, quadratic and integer programming. (CA,MD,VX)
LPKODE	Program for general purpose linear programming. (CA,MD)
MIN5LIB	MINOS 5 linear and nonlinear programming library. (CA,MD,VX)
MPOS	Program for multi-purpose optimization. (CA,MD)

Engineering Programs

NONSAP	Program for nonlinear structural analysis. (CA)
SAP4	Program for linear structural analysis. (CA,MD)
SPICE2	Program for electronic integrated circuit simulation. (CA,MD,VX)

Simulation Languages and Programs

DYNAMO	Program for continuous systems. (CA,MD)
GPSS	Program for discrete event simulation. (CA)
MIMIC	Program for continuous systems and analog computer simulation. (CA)
SIMSCRIPT	Language for discrete event simulation. (CA)

Software-Writing Tools

Debugging

CPDEBUG A program debugger. (CA, MD)
DEBUG (CID: CYBER Interactive Debug) A program debugger. (CA, MD)
/DEBUG An interactive symbolic debug option for languages. (VX)
PASCODE A Pascal binary decompiler. (CA, MD)

Performance Measurement

ANALYZE A Pascal performance measurement program used in conjunction with AUGMENT. (CA, MD)
AUGMENT A Pascal performance measurement program used in conjunction with ANALYZE. (CA, MD)

Source Program Extraction Tools

/CROSS A cross-reference option for languages. (VX)
DOCUMENT A documentation extraction program for assembler. (CA)
PASCREF A Pascal cross-reference program. (CA)
SNOREF A SNOBOL cross-reference program. (CA)

Source Program Preparation

CLEAN77 A FORTRAN program reformatting. (CA, MD, VX)
COPYCL A program that creates a COBOL source library. (CA)
DRESS A program that prepares a program source for MODIFY. (CA)
ID2ID A program that substitutes identifiers in a Pascal program. (CA)
PREPARE A program that adds checkpoints to program binary for CPDEBUG. (CA)
PRETTY A Pascal pretty printer. (CA, MD)
REFORM A reformatting that adds or deletes sequence numbers. (CA, MD)
SNOTIDY A SNOBOL pretty printer. (CA)
SPRUCE A Pascal program formatter. (CA, MD)
STRATEN A reformatting of assembly language programs. (CA, MD)
TIDY A reformatting of FORTRAN programs. (CA, MD)

Text File Maintenance

COMPARE A program that compares two text files and reports their differences. (CA)
DIFFERENCES A program that compares two text files and reports their differences. (VX)
MODIFY A maintenance package for program source libraries. (CA, MD)
SLP A maintenance package for program source libraries. (VX)
SORTOPL A program that sorts MODIFY decks. (CA)
TOOLAID Packages with a variety of text manipulation tools. (CA)
UPDATE A maintenance package for program source libraries. (CA, MD)

Others

CATALOG A program that lists information about records assigned to a job. (CA, MD)
ESTMATE An estimator of indexed-sequential file size. (CA)
LIBEDIT A general-purpose utility that manipulates records and maintains files. (CA, MD)
LIBRARY A utility that manipulates and maintains libraries. (VX)
SORT A generalized, external sort and merge program. (CA, MD)
SORT/MERGE A system utility which can sort records of information according to key fields and merge files with similar records into one sorted file. (CA, MD, VX)

Statistics

General-purpose Packages

BMDP Mathematics and statistics programs. (CA)
MINITAB Interactive statistical programs for small data sets. (CA, VX)
OMNITAB Older package used for statistical and numerical analysis. (CA)

SAS Batch-oriented statistical analysis package, which is the mainstay of IBM statistical users. (VX)
 SPSS Statistical programming system for the social sciences. (CA)
 SPSSONL Interactive editor for SPSS. (CA)
 SPSSX Current upgrade of SPSS, a complete rewriting. (CA,VX)
 SPSSX Tables Package that produces camera-ready tables using SPSSX. (VX)

Anova and Regression

GLIM Interactive generalized linear modeling package. (CA,UX)
 IVAN Program for interactive analysis of factorial designs. (CA)
 LOGIT Logistic regression program. (CA)
 MULTREG Interactive multiple regression program. (CA,UX)

Factor and Cluster Analysis

CLUSTER Hierarchical cluster analysis. (CA)
 EQS Linear structural equations/confirmation factor analysis. (VX)
 LISREL Linear structural relationships/confirmatory factor analysis. (CA,VX)
 TRYSYS1 Tryon hierarchical cluster analysis. (CA)

Matrix Analysis

CTAB Multidimensional contingency tables. (CA)
 MATTER Interactive matrix manipulation program. (CA)

Multidimensional Scaling

KYST-2A Multidimensional scaling and unfolding program. (CA)

Time Series

RATS Regression and Time Series Analysis. (CA)
 SHAZAM Econometric analysis of time series. (CA)
 TSP Program for statistical analysis of time series by least squares. (CA)

Humanities and Text-Analysis Packages

COLUMN A program that formats text one word per line for use with TEXAN. (CA)
 GENCORD A concordance-generating program. See WRITEUP,GENCORD. (CA)
 LTRCNT A program that generates statistics on letter frequencies and position. (CA)
 PWT A program that formats tagged text with tags beneath the word. (CA)
 TEXAN A program for retrieving patterns from tagged text. (CA)

Text-Processing Packages

EDT The primary editor on the VX: a screen-oriented interactive text editor when used with a DEC VT100 or VT52-type terminal; a line editor when used with other terminals. (VX)
 BIB Bibliographic formatter. BIB is a preprocessor for NROFF or TROFF that formats citation and bibliographies. (UX)
 FNOTE A footnote handling program. (CA)
 FSE A full screen editor on the CYBER machines: useable with a DEC VT100, Zenith Z19 and Z29, and possibly some other terminals. (CA, MD)
 ISPELL Corrects spelling for a file. (UX)
 MLSORT A multiline sorting program, especially suited for bibliographies. (CA)
 PROSE A portable text formatter useful for producing simply formatted documents. (CA, MD)
 RVI Remote screen editor based on VI. (UX)
 SCRIBE A general-purpose text formatter that can take advantage of the special features of a variety of printers in producing simple as well as complex documents. (VX)
 SOS An interactive line-oriented text editor. (VX)
 XEDIT An interactive line- and context-oriented text editor. (CA, MD)



ACSS Brief

General Information

Academic Computing Services and Systems • University of Minnesota • Twin Cities

Software on the CA, NV, UX, and VX

Academic Computing Services and Systems (ACSS) offers its users a broad spectrum of software. Graphics packages, language processor packages, mathematics and engineering libraries and packages, software-writing tools, and statistics packages are among the types of software available. If you wish more information about the software listed in this Brief, you can call the HELP-Line at 626-5592. Also, check another source, the ACSS software data base, which is available through the ACSS Computing Information Center in 128A Lind Hall. Contact ACSS librarian Michael Dunham at 625-7397 if you have questions. The symbols CA, NV, VX, and UX following each package refer to machines: CA-CYBER/NOS; NV-CYBER/VE; UX-ENCORE/UNIX; and VX-VAX/VMS.

Data Base Management Systems and Tools

INGRES	A relational, forms-oriented DBMS for organizing, accessing, and analyzing data. (VX)
PERT/COST	An evaluation and review technique for project costs. (CA)
PERT/TIME	An evaluation and review technique for project schedules. (CA)
SIR	A scientific hierarchical/network DBMS, often useful in research applications, that features an SPSS-like query language, a report writer, and an easy interface to statistics packages. (CA, VX)
SYSTEM 2000	A generalized hierarchical DBMS, often useful in business applications, that features powerful interactive query facilities, a report writer, and FORTRAN/COBOL procedural language interfaces. (CA)

File Transfer Programs

KERMIT	File transfer protocol. KERMIT provides reliable file transfer and primitive virtual terminal communication between machines. (CA,VX,UX)
MACGET	Sends file to a Macintosh running MacTerminal. (UX)
MACPUT	Receives file from a Macintosh running MacTerminal. (UX)
UMODEM	File transfer protocol. UMODEM uses the Christensen protocol to transfer files to and from CP/M systems. (UX)

Graphics Packages and Libraries

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)
CONTOUR	A collection of FORTRAN subroutines that provide grid generation and contouring capabilities. A rich set of options allows extensive control of map characteristics. (VX)
DISSPLA	An industry standard library of over 400 FORTRAN subroutines capable of two- and three-dimensional linear plots, pie and bar charts, three-dimensional 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 (e.g., eight languages and fifteen fonts), and more. (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 othe PVI packages. Ten different typefaces are available, and the characters may be drawn as outline or solid characters. (VX)

GRAFMAKER	A set of FORTRAN subroutines designed for use in application programs to easily create charts—pie charts, line graphs, bar graphs, and needle graphs. In addition, GRAFMAKER includes GRAFEASY, a set of subroutine calls that simplify GRAFMAKER even further for quick and easy graphic presentation of data. (VX)
MNCORE	ACSS's implementation of the ACM 1979 CORE standard for vector graphics. 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)
PICSURE	An interactive computer graphics software system for generating charts and graphs with a simple sequence of English-like commands. No knowledge of computer languages is required to use PICSURE. The basic types are line graphs, bar charts, pie charts, and text charts. (VX)
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. PLTSCL, SCLPLT (which produces output for a printer), and PRNTPLT (Pascal) provide the simplest way to produce a linear plot. (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. PRNTPLT, SCLPLT (which produces output for a printer), and PLTSCL provide the simplest way to produce a linear plot. (CA)
SCLPLT	An easy FORTRAN subroutine for generating scaled two-dimensional linear plots for a printer. SCLPLT, PLTSCL (which produces output for a plotter), and PRNTPLT (Pascal) provide the simplest way to produce a linear plot. (CA)
SIGN	A program for plotting text and creating signs. (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)
TELL-A-GRAF	A sophisticated, widely used, interactive graphics program for producing publication-quality, two-dimensional linear plots, bar and pie charts, and signs. (VX)

Language Processors

ADA	General purpose, structured language. (VX - Ada; UX - adaed)
APL	A Programming Language. Numerical and operator oriented language. (CA,NV)
BASIC	Beginners All purpose Symbolic Instruction Code. (CA,NV,UX)
C	C Programming Language. (UX - cc,NV,VX -cc)
C++	Extended C Programming Language (UX - CC)
COBOL	COmmon Business-Oriented Language. (CA-COBOL5,NV-COBOL,VX-COBOL)
EMULATE	CDC 3200 computer simulator. (CA)
FORTRAN IV	Fortran IV use is not recommended. (CA-MNF,FTN)
FORTRAN 77	ANSI 1977 Fortran. (CA-M77,FTN5; UX-f77;VX-Fortran;NV-Fortran)
GPSS	General Purpose Simulation System. Discrete event simulation. (CA)
HYPERCUBE	Intel simulator. (UX-iPSC)
ISPS	Instruction Set Processor Simulator. (VX)
LISP	LISt Processing language - non-numerical, symbolic-expression. (CA-ALISP,LISP; VX; UX)
MACRO11	DEC PDP-11 emulator. (CA)
MIMIC	MIMIC an analog computer - continuous-system simulation. (CA)
MIXAL	Knuth MIX computer. (CA)
MIXBYTE	MIX decimal machine language simulator. (CA)
MODULA-2	Modula-2 programming language. (UX-mc)
OPSS	General-purpose expert system language. (VX)
PASCAL	ISO/ANSI/IEEE 1982 standard Pascal. (CA-Pascal, APascal;NV; VX; UX-pc)
PROLOG	Logic programming language. (UX-wup,VX-Prolog)
RPG-II	Report Program Generator II- business-oriented language. (CA)
SIL	System-Implementation Languages. (CA-SYMP,L,NV-CYBIL)
SIMSCRIPT	SIMulation tranSCRIPT language - discrete event simulation. (CA-SIMI5)
SMALLTALK	Object-oriented lanaguage. (UX-st)
SNOBOL4	StriNg Oriented and symBOLic Language - non-numeric language. (CA-SNOBOLC, SNOBOL)

Mathematics and Engineering Packages and Libraries

Mathematics and Statistics Libraries

CALGOPL ACM Collected Algorithms file. (CA)
CMLIB Collection of libraries for math and statistics. (UX)
IMSL International Mathematics and Statistics Library. (CA,VX)
MINNLB Minnesota subprogram library. (CA)

Mathematics Libraries and Programs

BESPACK Bessel and Airy functions library. (CA,VX)
BSPLINE B-spline interpolation and approximation library. (CA,VX)
EISPACK Eigenvalue-eigenvector analysis library. (CA,UX,VX)
EPISODE Ordinary differential equations library. (CA,VX)
FORSIM Program for ordinary and partial differential equations. (CA)
FUNPACK Exponential, elliptic, and Dawson's integrals library. (CA,VX)
INTLIB M77 interval arithmetic library. (CA)
LINPACK Linear equations library. (CA,VX)
LSODE Ordinary differential equations library. (CA,VX)
LSODI Implicit ordinary differential equations library. (CA,VX)
OPT Optimization library. (UX)
MACSYMA Program for symbolic and algebraic manipulation. (VX)
MATLAB Instructional matrix program. (CA)
MINPACK Nonlinear equations and nonlinear least squares library. (CA,VX)
PCGPAK Sparse linear equations (iterative methods) library. (VX)
QUADPAK Numerical integration (quadrature) library. (VX)
REDUCE Program for symbolic and algebraic manipulation. (CA-REDUCE2,VX-REDUCE)
SPARSPK Waterloo sparse linear equations and least squares (direct methods) library. (VX)
YSMPLB Yale sparse linear equations (direct methods) library. (CA,VX)

Linear/Nonlinear Programming Libraries and Programs

GRG2 Nonlinear programming (nonlinear optimization) library. (CA,VX)
LINDO Program for solving linear, quadratic, and integer programming problems. (CA,NV,VX,UX)
LPKODE Instructional program for linear, integer, and mixed integer programming. (CA)
MINSLB MINOS 5 linear and nonlinear programming library. (CA,VX)
MPOS Multi-purpose optimization program for solving linear, quadratic, integer, and mixed integer programming problems. (CA)

Engineering Programs

NONSAP Program for nonlinear structural analysis. (CA)
SAP4 Program for linear structural analysis. (CA)
SPICE2 Program for electronic integrated circuit simulation. On the VX the package is called SPICE.. (CA,VX)

Simulation Languages and Programs

DYNAMO Program for continuous systems simulation. (CA)
GPSS Program for discrete event simulation. (CA)
MIMIC Program for continuous systems and analog computer simulation. (CA)
SIMSCRIPT Language for discrete event simulation.(CA)

Software-Writing Tools

Debugging

CPDEBUG A program debugger. (CA)
DEBUG (CID: CYBER Interactive Debug) A program debugger. (CA)
/DEBUG An interactive symbolic debug option for languages. (VX)
PASCODE A Pascal binary decompiler. (CA)

Performance Measurement

ANALYZE A Pascal performance measurement program used in conjunction with AUGMENT. (CA)
AUGMENT A Pascal performance measurement program used in conjunction with ANALYZE. (CA)

Source Program Extraction Tools

/CROSS A cross-reference option for languages. (VX)
DOCUMENT A documentation extraction program for assembler. (CA)
PASCREF A Pascal cross-reference program. (CA)
SNOREF A SNOBOL cross-reference program. (CA)

Source Program Preparation

CLEAN77 A FORTRAN program reformatter. (CA,VX)
COPYCL A program that creates a COBOL source library. (CA)
DRESS A program that prepares a program source for MODIFY. (CA)
ID2ID A program that substitutes identifiers in a Pascal program. (CA)
PREPARE A program that adds checkpoints to program binary for CPDEBUG. (CA)
PRETTY A Pascal pretty printer. (CA)
REFORM A reformatter that adds or deletes sequence numbers. (CA)
SNOTIDY A SNOBOL pretty printer. (CA)
SPRUCE A Pascal program formatter. (CA)
STRATEN A reformatter of assembly language programs. (CA)
TIDY A reformatter of FORTRAN programs. (CA)

Text File Maintenance

COMPARE A program that compares two text files and reports their differences. (CA)
DIFFERENCES A program that compares two text files and reports their differences. (VX)
MODIFY A maintenance package for program source libraries. (CA)
SLP A maintenance package for program source libraries. (VX)
SORTOPL A program that sorts MODIFY decks. (CA)
TOOLAID Packages with a variety of text manipulation tools. (CA)
UPDATE A maintenance package for program source libraries. (CA)

Others

CATALOG A program that lists information about records assigned to a job. (CA)
ESTMATE An estimator of indexed-sequential file size. (CA)
LIBEDIT A general-purpose utility that manipulates records and maintains files. (CA)
LIBRARY A utility that manipulates and maintains libraries. (VX)
SORT A generalized, external sort and merge program. (CA)
SORT/MERGE A system utility which can sort records of information according to key fields and merge files with similar records into one sorted file. (CA,VX)

Statistics

General-purpose Packages

BMDP	Batch oriented set of statistics programs with common interface. (CA)
MINITAB	Interactive statistical package for small data sets. (CA,VX)
SAS	Batch-oriented statistical analysis package, which is the mainstay of IBM statistical users. (VX)
S	Interactive statistical language for data analysis. (UX)
SPSS	Statistical programming system for the social sciences. (CA)
SPSSONL	Interactive editor for SPSS. (CA)
SPSSX	Current upgrade of SPSS, a complete rewriting. (CA,VX)
SPSSX Tables	Package that produces camera-ready tables using SPSSX. (VX)

Anova and Regression

GLIM	Interactive generalized linear modeling package. (CA,UX)
IVAN	Interactive program for analysis of factorial designs and analyses of space. (CA)
LOGIT	Logistic regression program. (CA)
MULTREG	Interactive multiple regression program. (CA,UX)

Factor and Cluster Analysis

CLUSTER	Hierarchical cluster analysis. (CA)
EQS	Linear structural equations/confirmatory factor analysis. (VX)
LISREL	Linear structural relationships/confirmatory factor analysis. (CA)
TRYSYS1	Tryon hierarchical cluster analysis. (CA)

Matrix Analysis

CTAB	Multidimensional contingency tables. (CA)
MATTER	Interactive matrix manipulation program. (CA,VX)

Multidimensional Scaling

KYST-2A	Multidimensional scaling and unfolding program. (CA)
SINDSCL	Performs individual differences multidimensional scaling. (CA)

Time Series

RATS	Regression and Time Series Analysis. (CA)
SHAZAM	Econometric analysis of time series. (CA)
TSP	Program for statistical analysis of time series by least squares. (CA)

Humanities and Text-Analysis Packages

COLUMN	A program that formats text one word per line for use with TEXAL. (CA)
GENCORD	A concordance-generating program. See WRITEUP,GENCORD. (CA,VX)
LTTRCNT	A program that generates statistics on letter frequencies and position. (CA)
PWT	A program that formats tagged text with tags beneath the word. (CA)
TEXTAL	A program for retrieving patterns from tagged text. (CA,VX)
WRDSTAT	A program that counts words in a text. (CA)

Text-Processing Packages

ED	The primary editor on the VX: a screen-oriented interactive text editor when used with a DEC VT100 or VT52-type terminal; a line editor when used with other terminals. (VX)
BIB	Bibliographic formatter. BIB is a preprocessor for NROFF or TROFF that formats citation and bibliographies. (UX)
DICTION	Looks for frequently misused phrases. (UX)
EXPLAIN	A thesaurus that suggests alternate phrases. (UX)
FNOTE	A footnote handling program. (CA)
FSE	A full screen editor on the CYBER machines: useable with a DEC VT100, Zenith Z19 and Z29, and possibly some other terminals. (CA,NV)
ISPELL	Corrects spelling for a file. (UX)
MLSORT	A multiline sorting program, especially suited for bibliographies. (CA)
PROSE	A portable text formatter useful for producing simply formatted documents. (CA)
RVI	Remote screen editor based on VI. (UX)
SCRIBE	A general-purpose text formatter that can take advantage of the special features of a variety of printers in producing simple as well as complex documents. (VX)
SOS	An interactive line-oriented text editor. (VX)
STYLE	A program that returns statistics on sentence length and type, word usage, and sentence openers for document and gives readability grades on four separate scales. (UX)
TEX	A powerful formatting program emphasizing typographical control and mathematical formatting. (UX,VX)
XEDIT	An interactive line- and context-oriented text editor. (CA)



UCC BRIEF

1982 Summer Short Courses

-
- ^Introduction to Computers.....; June 15-17 (TWTh), 3:15-5pm, MechE 221
 - ^Introduction to UCC.....; June 24 (Th), 3:15-5pm, MechE 221
 - ^NOS (system configuration)....; June 28 (M), 2:15-4pm, Arch 45
 - NOS (files/jobs).....; June 29-30 (TW), 2:15-4pm, Arch 45
 - NOS (permanent files).....; July 1 (Th), 2:15-4pm, Arch 45
 - NOS (program execution).....; July 2 (F), 2:15-4pm, Arch 45
 - ^Interactive System Commands...; July 6-8 (TWTh), 3:15-5pm, Arch 60
 - SPSS..(basics).....; July 6 (T), 2:15-3:30pm, Arch 45
 - SPSS..(data manipulation).....; July 7 (W), 2:15-3:30pm, Arch 45
 - SPSS..(SPSS files).....; July 8 (Th), 2:15-3:30pm, Arch 45
 - SPSS..(On-Line).....; July 9 (F), 2:15-3:30pm, Arch 45
 - CP/M Software & UCC Systems...; July 20-22 (TWTh), 10:15am-Noon, MechE 221
 - Beginning FORTRAN.....; July 20-29 (TWTh), 3:15-5pm, MechE 221
 - Introduction to VAX/VMS.....; July 12-16 (MTWThF), 2:15-4pm, AkerH 21
 - Graphics.....; July 19-28 (MW), 2:15-4pm, MechE 102
 - ^XEDIT.....; July 26-28 (MW), 10:15am-Noon, MechE 102
 - Text Editing on VAX/VMS.(EDT)..; July 20-29 (TTh), 1:15-3:00pm, MechE 102
 - Intro to System 2000..(DBMS)..; July 13-29 (TTh), 3:15-5pm, Arch 30
 - Pascal for Programmers.....; June 28-July 9 (MWF), 3:15-5pm, MechE 221
 - Intermediate FORTRAN.....; Aug 3-12 (TWTh), 3:15-5pm, AkerH 21
 - ^Introduction to the CRAY 1-A..; Aug 5 (Th) 3:15-5pm, AkerH 211
 - ^COS (Cray Operating System)...; Aug 9-13 (MWF), 3:15-5pm, AkerH 211
-

NOTE: Up-arrow (^) indicates this course is a prerequisite introductory course for other, unmarked courses.
 (*) indicates change or new course since first publication.
 Courses with the same name (e.g., NOS, SPSS) are designed as a sequence.

HOLIDAY: July 5 is a University holiday. No classes will be held.

1981-82 UCC Extension Classes Summer 1982

These classes are offered through University of Minnesota Continuing Education and Extension (CEE). They are listed under Professional Improvement Courses. You may obtain more information and registration materials by calling (612) 373-3195 or by going to 101 Westbrook Hall, U of M Minneapolis campus.

Computing: What Is It?	\$24	6:15-8:00 PM
PIC 0913		June 14-16, 21-23 (MTW)
		Physics 131

NEW COURSE

CP/M Software & UCC Systems.

This course is designed to provide the user of a CP/M based microcomputer (such as the Xerox 820) with information about fully utilizing the micro in co-operation with the University's large computers. It will cover, in detail, use of the following software: WordStar, MailMerge, DataStar, Access-80, & UCC's COM program.

SHORT COURSE FEES BEGIN FALL '82

UCC will begin charging for its Short Courses next fall quarter, 1982. The decision to charge for courses was made as a result of the state and University fiscal crises. The charge to class registrants is still much less than that charged for similar courses offered elsewhere.

Short Courses are divided into two categories: "Introductory Courses" (Column A), and "Electives" (Column B). Courses in each category include those listed below.

Column A (Introductory Courses)	Column B (Electives)
Computing: What Is It?	FORTTRAN
Introduction to Computers	Pascal
Introduction to UCC	SNOBOL
NOS (Network Operating System)	COBOL
Interactive System Commands	COS (CRAY Operating System)
Text Processing: An Overview	CRAY FORTRAN Features (CFT)
Introduction to VAX/VMS	CRAY Assembly Language (CAL)
EDT (VAX/VMS Editor)	SPSS
XEDIT	SCSS
Introduction to the CRAY 1-A	Introduction to System 2000
Introduction to DBMS	SIR
Introduction to Programming	RIM
Graphics I: An Overview	PROSE
Introduction to Batch Computing	Scribe
	Text Processing on Micros
	Graphics II, III

Course registrants are divided into three categories: University students, University faculty/staff, and non-University users. Introductory courses have a fixed fee for each registrant category. Elective classes have a range of fees for each registration category, depending on the length of the course and the amount of resources used. Fee ranges for these categories are as follows:

	Column A	Column B
Student	\$10	\$20-30
Faculty/Staff	\$20	\$30-50
Non-Univ. User	\$30	\$50-100

Registration will be done at the UCC Computer Store in Exp. Eng., beginning in September, 1982. For questions on UCC Short Courses, call Jerry Stearns, at 373-4360.



UCC BRIEF

SYSTEMS RATE SHEET

A. SYSTEM USAGE

Cybers:	
Normal ¹	\$.17/SRU ⁴
Low, PO ²	\$.12/SRU
No Frills, P1 ³	\$.06/SRU + 100 SRUs/job
Cray	\$.55/SBU
VAX	\$2.00/CPM + \$.40/kilo-unit I/O

B. COMPUTER RELATED COSTS

B.1 Public Terminal Access.....\$1.55/hour

B.2 Interactive Connect Time

Cyber <= 300 baud	\$1.45/hour
Cyber 1200 baud	\$2.50/hour
Cyber 9600 baud	\$5.00/hour
Cyber Telenet	\$11.90/hour
VAX	\$2.50/hour

B.3 Mass Storage Usage: Permanent Files⁵

Cybers (545 hours) ⁶	\$.02/KSH or \$17.03/month ⁷
Cray (300 hours) ⁶	\$.42/KBH or \$24.61/month ⁸
VAX (27 days) ⁶	\$.64/KBD or \$16.87/month ⁸

B.4 Output

Paper Output	\$.033/page
Card Output	\$.011/card
Xerox 9700:	
Paper	\$.03/image
Setups (queue)	\$1.00/setup
Setups (special tape)	\$3.00/setup
Varian Plotter:	
Paper	\$.25/foot
Setups	\$.55/setup

B.5 Tape & Disk Pack Mounts

Tape Mounts:	
Labeled Resident Tape	\$.44/mount
Unlabeled Resident Tape	\$.66/mount
Transient Tape	\$1.10/mount
844 Disk Pack Mounts	\$2.20/mount

-
- 1 8AM-8PM Monday-Friday
 - 2 8PM-4AM Monday-Friday; 4AM-5:15PM Saturday; 4PM Sunday-1AM Monday
 - 3 12PM-4AM Monday-Friday; 4AM-8AM Saturday
 - 4 SRU=System Resource Unit; SBU=System Billing Unit; CPM=Central Processor Minute.
System units include central processor seconds, memory used, disk/tape transfers.
 - 5 All files backed-up on tape at least once each day.
 - 6 Approximate time files available each month.
 - 7 KBH=kilo-block-hour; KBD=kilo-block-day.
Approximate cost of storing 1 million 6-bit characters each month;
 - 8 KSH=kilo-sector-hour.
Approximate cost of storing 1 million 8-bit bytes each month;
KBH=kilo-block-hour; KBD=kilo-block-day.

Also see:
Services Rate Sheet
MERITSS Rate Sheet
PSD Rate Sheet
Computer Store Price List
Engineering Services Policies Booklet

September, 1982

4/23/00
Internal



UCC BRIEF

SERVICES RATE SHEET

1. SPECIAL OUTPUT SERVICES

Microfiche:	Setups.....	\$ 3.00/setup
	Originals.....	\$ 1.50/fiche
	Duplicates.....	\$.20/fiche
Xerox 9700:	Setups (queue).....	\$ 1.00/setup
	Setups (special tape).....	\$ 3.00/setup
	Paper.....	\$ 0.03/image
Special Forms:	Setups.....	\$ 3.00-\$6.00/setup ¹
	Forms.....	\$ 0.001-\$0.08/form ²

2. MAGNETIC TAPE SERVICES

Storage.....	\$ 0.75/tape/month
Cleaning/Storage Setups.....	\$ 2.00
Cleaning.....	\$ 2.00/tape
Evaluation Setups.....	\$.50

3. DISK PACK SERVICE

844 Disk Pack Storage.....	\$ 5.00/quarter
844 Disk Pack Lease (no charge after 24 months)	
844-21 (single density).....	\$25.00/month
844-41 (double density).....	\$30.00/month
Disk Unit Rental with pack and weekly back-up dump:	
(single density).....	\$1080/month
(double density).....	\$1440/month

4. PERMANENT FILE SERVICES

Permanent files restored from monthly archive ³	\$ 5.00/file
Permanent files loaded from incremental dumps ⁴	\$10.00/file

5. SHELF STORAGE & SECURE OUTPUT SERVICES

Rented Shelves (available at Lauderdale only).....	\$ 6.00/quarter
Secured Bin Rental:	
Setups.....	\$10.00/setup
Small Bin.....	\$ 3.00/month
Medium Bin.....	\$ 6.00/month
Large Bin.....	\$ 9.00/month

6. SPECIAL GRAPHICS SERVICES

4-Pen Plotter:	Setups.....	\$.25/setup
	Hours.....	\$30.00/hour
Flatbed Digitizer.....		\$25.00/hour
Photo Digitizer:	Setups.....	\$ 5.00/setup
	Hours.....	\$60.00/hour
High resolution microforms:	Setups.....	\$ 3.00/setup
	Hours.....	\$72.00/hour
Dicomed 47 special rate Slides.....		\$ 5.00/slide
Special services.....		rate arranged

- 1 Depends on form requested.
2 Depends on form requested.
3 Maximum charge per request: \$20.00. Use ARCLIST, RELOAD.
4 Maximum charge per request: \$30.00. Call 376-5605 for file restoration.
5 235 million character capacity.
6 117 million character capacity.

Also see:
Systems Rate Sheet
MERITSS Rate Sheet
PSD Rate Sheet
Computer Store Price List
Engineering Services Policies Booklet

September, 1982



ACSS Brief

Tools for Administrators of VX Instructional Users

The allocation of classroom user names is based on the structure of VMS which divides users into unique groups. These groups allow selected users to be entitled to group control privileges and, in the ACSS hierarchy, assignment of user and group names for each department. Thus, each student user name can easily be assigned within a class group and a department, and each group or department administrator can be easily identified. The existing VMS feature of group privilege validation and other system designed mechanisms in conjunction with some locally developed ACSS utilities are available to provide department and group master users with administrative tools.

All classroom user names for a department are managed on VX by a contact person designated by the department. Departments are given one or more master department user names. Access to those user names allows control over passwords and login environment for all the department's classroom users. Within each department, student user names can be divided into individual groups, or one group for each class, if desired. In addition to the departmental administrator user, each class or group is given one or more master group user names, which allows control over passwords, files and login environment for the individual users in the particular group.

Department master users are identified by being in the 00 group of the department. Within other groups, group or class master users are identified by being a member of each group whose user name ends below 20 octal in the group.

For example:

- 1) Department master users of the department identified as DP are in group DP00. Members of that group have names of the form DP00nn, where DP is a unique identification code used for each department. Thus, [DP00,DP00nn], is the full VMS name of a department administrator.
- 2) Student users of the department identified as DP have names of the form DPXXnnn, within group names of the form DPXX. Thus, [DPXX,DPXXnnn] is the full VMS name for a student user, where XX is any alphabetic combination with exclusion of 00 and nnn any number greater than 20 octal.
- 3) [DPXX,DPXX001] is a group master administrator of the group or class XX of the DP department.

Please note that most users do not need to be concerned with their full name, group and user name, but only with the user name itself, such as DPXXnnn. We described the full names here to clarify the user name hierarchy designed for administrative purposes.

Department administrators are able to control passwords and login environment for all users in the department. In addition, group administrators can control file utilization for their groups. Both types of administrators have group control privileges entitled on their user names.

To control system access:

```
$ Set Password Username Newpassword
```

changes the password of a specified username.

```
$ Set Password Username Newpassword dd-mmm-yyyy
```

changes the password of a specified user name and sets an expiration time to a specified date.

To control login environment:

All user names within each department execute the departments' DPLogin.com file at login time. Each department can use this file to control system access and to create login environments for all the department users. The DPLogin.com file is owned by the [DP00,DP00000] user. For example, [MT00,MT00000]MTLogin.com file is executed at login time for every user name within the Math Department. Examples of a department DPLogin.com file are given in the EXAMPLES section.

To obtain information on users' files:

```
$ Directory [UserName...]*.*;*
```

Lists the permanent file directory information of the user name, including all sub-directories. Examples of the `Directory` command are given in the EXAMPLES section.

```
$ Set Protection=(S:xxx,O:xxx,G:xxx,W:xxx) [UserName]Filename
```

Sets the UIC-based file protection of *Usernames*' file to enable the master group or class administrator permission to the object. Examples of the `Set Protection` command are given in the EXAMPLES section. This instruction can be executed only by master group administrators, since it implies control within the VMS group. A user with group privileges as the class or group administrator has, within the group, the same type of control on files that is granted to the system.

To clean up permanent file space:

```
$ Delete [Directory]filename.Type;Number
```

Deletes the file *filename* on the specified directory. This instruction is restricted to master group administrators. Examples of the `Delete` command are given in the EXAMPLES section. (Note: master users will need to use the `Set Protection` command before deleting user name files.)

To monitor system usage:

```
$ Show Users
```

Shows the User name, Process name, Process Identification (PID), and terminal (TID) of all users on the system.

```
$ Stop/Identification=PID
```

Logs off the User name with the selected PID.

```
$ Show Process/Identification=PID
```

Shows the current process of the specified PID.

```
$ Show Process/Identification=PID/continuous
```

Shows a continuous display of the process.

The last three instructions can be executed only by the master group administrator.

To communicate with other users:

```
$ Reply/Terminal=TID Message text
```

Sends a message to a user currently in the system on terminal TID.

```
$ Mail
```

Sends interactive mail to a user or users.

```
$ Mail text.lis list.dat
```

Mails file text.lis to all users in file list.dat.

To control resources:

Utilities to control resources such as cumulative CPU time, connect time and administration of permanent file space can be made available for the winter quarter if there is enough interest among administrators for their availability.

Examples

Example of department administrator DpLogin.Com file:

```
$! This file "traps" the user for an interactive SPSS session
$! if the user is in the DP1A group.  If the user is in the
$! DP1B group, the procedure displays a message informing
$! that class about a lecture cancellation.  Each "non-trapped"
$! user would then execute a procedure selected by the
$! instructor if available.  The trap and the message could also be
$! done in each group administrator's DpXXlog.com file.
$!
$ On Control_Y Then Goto Logout
$ IF F$MODE().EQS."BATCH" Then Exit
$ SET TERM /VT100/INSERT/LINE      ! Set terminal type to VT100
$ uic = F$User()
$ group = F$Extract(1,4,uic)
$ log_file = group + "LOG.COM"
$ If group .EQS. "DP1A" then goto SPSS
$ If group .EQS. "DP1B" then goto MESSAGE
$ CLASS:
$ if (F$search("['group']"log_file")) .NES. "" then@['group']log_file'
$ Exit
$ SPSS:
$ Deassign sys$input
$ SPSS ! EXECUTE STATISTICS PACKAGE
$ goto LOGOUT
$ Message:
$ Type Sys$input
  Class for Dp1B 9:00am. 25-Sep-1985 has been canceled
  for today.  Further notices will be available.
$ goto CLASS
$ LOGOUT:
$ set nocontrol=y
$ Logout
```

Example of group administrator DpXXlog.com file:

```
$! Allow students to access current homework assignment by
$! typing Type homework.
$!
$ Define Homework [dpla]homework1.lis
```

Examples of the **Directory** command:

```
$ Directory
```

The **Directory** command lists all versions of all files in the current disk and directory in the brief format. The heading identifies the disk and directory, and the trailing gives the total number of files.

```
$ Directory/Full [Std23.Pascal]HMWK3.Pas
```

The **Directory/Full** command gives full information on a particular file. If the information is not available to the administrator, the system responds with: (-RMS-E-PRIV, insufficient privilege or file protection violation). In order to obtain the information, the protection of the file has to be altered using the **Set Protection** command.

```
$ Directory/Total/Size=All [STD123...]
```

The **Directory** command outputs only the header and a trailing line that identifies the total number of files and the blocks used and allocated for all versions of all files for student STD123.

```
$ Set Protection=(s:rwed,o:rwed,g:re,w:re) Readme.txt
```

The **Set Protection** command gives the System and the Owner of the file read, write, execute, and delete permission, while giving the Group and World read and execute permission only.

```
$ Set Protection=(s:re,o:re,g,w) mystuff.dir
```

The **Set Protection** command gives permission to read and execute only to the System and Owner of the directory. Note: The file protection will have to be changed before it can be deleted.

Examples of the **Delete** and **Purge** commands:

```
$ Delete Hmwk3.Pas
```

The **Delete** command deletes the file Hmwk3.Pas from the current default disk and directory.

```
$ Delete/confirm/since=today [Std23.Pascal]*.obj
USERF:[STD23.PASCAL]TEST.OBJ;1, delete? [N]: Y
USERF:[STD23.PASCAL]HMWK3.OBJ;3, delete? [N]: N
USERF:[STD23.PASCAL]HMWK3.OBJ;2, delete? [N]: N
USERF:[STD23.PASCAL]HMWK3.OBJ;1, delete? [N]: Y
```

The **Delete** command examines all versions of files with file type **obj** in the subdirectory [Std23.Pascal], and locates those that were created or modified today. Before deleting each file, it requests confirmation that the file should be deleted. The default response -N- is given in square brackets.

```
$ Purge/keep=2 [STD12]*.obj
```

The **Purge** command deletes all but the last two versions of files with file type **obj** from the directory of student user STD12.

One convenient and cost-effective way to produce high quality copy for a dissertation or article is to prepare and edit the text using a Terak microcomputer, transfer the data to the Cyber computer, format the text using PROSE, and, finally, have the text printed on a quality printer such as the Anderson-Jacobson terminal (AJ) at UCC.

The following example illustrates the costs involved in such an operation; it also gives sample listings of the unformatted text containing PROSE directives (FILE 1) and the final output from the AJ (FILE 2). Entries marked with an asterisk (*) are those costs that are covered by UCC grants. Other costs will be borne by the user. Costs denoted by double asterisks (**) are non-recurring costs that will not increase as the size of the text file increases.

Estimated costs for producing final copy of text starting with Terak input and editing, and finishing with AJ output:

Terak costs:

\$36.00 System disk **
 (2.50 additional disks...each)

Sample Cyber costs:

file size: 150 PROSEd double spaced lines (3+ pages)
 9600 characters on Cyber
 5142 characters on Terak file - 28% full
 14 blocks on Terak disk

file costs: * \$0.90 PROSE execution (3 iterations)
 * 0.15 transfer from Terak to Cyber, and print files
 via ROUTE control statement
 * 0.40 connect time for PROSE, transfer and ROUTE
 * .55 paper for line printer

A * \$2.00 sub-total for copies of 3 preliminary versions

B \$1.00 set up time on AJ **

C * 0.50 set up connect time **

D * 0.30 PROSE execution cost (final copy)

E 0.50 AJ costs (\$3.00/hour)

F * 0.25 connect time (\$1.45/hour)

G 0.25 paper for AJ (.05/page)

H 3.30 AJ ribbon (200 pages/ribbon) **

 \$6.10 sub-total for one AJ copy 3 pages long

 \$44.10 Total (includes system disk)

To estimate the Cyber costs for a larger file, simply multiply each recurring cost by the number of pages divided by 3 and add that amount to the sum of all non-recurring costs.

For example: \$2.00 * 200 pages/3 (A)
 1.30 * 200 pages/3 (D+E+F+G)
 + 4.80 (B+C+H)

 \$224.80 total estimated cost (not including disks)



```
.margin(116 r90)
.form([ /6 154 #51 '- ' pn:1 ' -' /6])
.output(asc)
.input(u@ b# h\ )
.page
.option(l- r- e- k1 f-)
Chapter 1
Introduction
.option(l+ r+ f+ e- s2 k2)
```

File 1

Houses are not just stone and mud walls. They were the homes of generations of living families and as such must reflect some of the personal as well as social and economic factors that shaped them (Rapaport 1969).

Not only house plan but details of construction are related to and influenced by these factors, and a detailed examination of all aspects of house construction should lead to a better understanding of the interaction of the people, their environment, and house building technology (see Rapaport 1976).

Despite a century of research on Mycenaean architecture, an adequate analysis of the construction practices of the Mycenaean populace has not yet been published. Attention has focused almost exclusively on the palaces and citadels; yet, even from this restricted viewpoint, only recently has there been a comprehensive examination of the techniques of palace construction (Wright 1978). The few attempts at a meaningful discussion of domestic architecture have relied heavily on comparisons with palatial or upper class structures as did Shear (1969) in her analysis of the houses at Mycenae. They have also tended to generalize over too large a geographical area such as Greece or the Aegean (Drerup 1969; Sinos 1971). The remains of well excavated residential houses as, for example, at Korakou (Blegen 1921) Zygouries (Blegen 1928), Eutresis (Goldman 1931), and Malthi (Valmin 1938) have been published with admirable detail, but unfortunately they are no longer available for primary study by today's students of domestic architecture. Each scholar with a new approach or problem must take a fresh look at the evidence and this cannot often be satisfactorily accomplished solely by using publications or even notebooks. Even on-site inspection can be useless if the site has become overgrown, eroded, or the trenches backfilled. Of the 25 sites visited by McDonald and Aschenbrenner in 1973, only 7 were judged to have good preservation and even this number has probably decreased since then. The house remains at Nichoria, which were the original basis for this thesis, have been covered since the study seasons concluded.

As is well known, construction materials and other natural resources vary from site to site and region to region throughout Greece. Recent studies by McDonald and Aschenbrenner (in press) make it clear that micro-regional investigation must be the first sphere of research and must constitute the basis for the analysis and comparison of individual site features. In addition, generalizations based on specific sites, especially palaces, do not always hold true when sites of a different type or size are considered (McDonald and Aschenbrenner in press). In fact, no detailed study of house construction techniques carried out while excavations were in progress has yet been published. Therefore, thorough investigations of individual sites at the village level are necessary before any pronouncements about 'Mycenaean domestic construction practices' can be made.

Chapter 1
Introduction

Houses are not just stone and mud walls. They were the homes of generations of living families and as such must reflect some of the personal as well as social and economic factors that shaped them (Rapaport 1969). Not only house plan but details of construction are related to and influenced by these factors, and a detailed examination of all aspects of house construction should lead to a better understanding of the interaction of the people, their environment, and house building technology (see Rapaport 1976).

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Terak Basics for Text Processing

This document summarizes the commands necessary for basic text entering and editing on the Terak. It assumes that you have had some instruction or experience with the Terak. It is not a complete reference for using the Terak, nor does it contain material which explains how and why these commands work as they do. For a more complete discussion of these matters, refer to the MMOS Reference Manual, available at the UCC Computer Store, 211 Experimental Engineering. Please direct comments on Terak Basics to Vicky Walsh, 373-5780.

Remember:

- The line at the top of the screen displays the choices you have at that point, you need enter only the first character for commands.

- If you change your mind about adding, deleting, or changing the text while in the editor, press ESC instead of ETX and the editor will ignore the last command.

- To be editable, files must be smaller than 40 blocks (about 20000 characters). The editor will let you know that you are approaching the limit when you attempt to insert too much text. This limit is a good reason for entering the text in small chunks. You can request information about a file's size by pressing the S-key then the E-key (for Set Environment). The bottom line of the display indicates the number of characters now in the file and the percentage of the file used. Try to keep your file to 75% or less. Press the Q-key to return to the editor.

- To ensure that you have enough room on your disk for the file you wish to create, check the remaining space:

Press the F-key (for File)

Press the F-key for list of files on the disk

The bottom line of the display indicates the number of unused blocks and the largest space available for a file. If the number of unused blocks is small (less than 40), use a new disk. If the number of unused blocks is large enough but the largest space available is not, press the K-key (for Krunch), type volume name followed by a colon (e.g., SEAN:), and press RETURN. The system will pack the files to free a larger continuous block for data.

- If something happens that you do not understand, it may be a system problem. Call the MICRO HELP-line for assistance (dial MICRO). Don't turn off the machine until you have tried to get help; it may be possible to salvage your work.



UCC BRIEF

Terak Basics for Text Processing

To Begin

Press the D-key for Date and set current date.

To Create a New File

Press the W-key (for Workfile) and enter name of new file, press RETURN.

Press the E-key (for Editor).

Press RETURN for workfile already specified.

If you are entering indented paragraphs, you will want to turn off Auto Indent.

Press the S-key for Set

Press the E-key for Environment

Press the A-key for Auto indent

Press the F-key for False to turn off auto indent

Press the Q-key to Quit

Quit returns you to the editor and allows you to format your paragraphs yourself. This has to be done only once for each file.

To enter text:

Press the I-key to Insert new text

Type in text as you would on any keyboard; press RETURN at the end of each line.

Press ETX to have text written on the workfile. It is best to enter the text in small sections to avoid losing anything. Note that editing can also be done within the entering process.

Press the Q-key to Quit the editor.

Press the U-key to Upside the file (this will save the workfile on your disk).

Return to editor. Repeat this procedure until you have entered all the text, tired of typing, or run out of room on the file.

To Edit an Existing File or List Text on the Screen

If the file is to be PROSEd, it doesn't matter how neat the text file looks; PROSE will format it correctly, so don't waste time editing the text's appearance.

Press the E-key for Editor, type name of file, press RETURN.

Using the up, down, right, and left arrows at the right of the keyboard, position the cursor at the place in the text where you wish to make the correction. You may also press the P-key to go to the next Page or screen of text.

To insert text:

Press the I-key for Insert

Type the text to be added

(including RETURNS if more than one line)

Press ETX to have the text added to the workfile

To split a line that is too long (ends in !):

Position cursor at beginning of word toward end of line

Press the I-key for Insert

Press RETURN

Press ETX to finish

To delete text:

Press the D-key for Delete

Space over the characters or words you wish deleted;

press RETURN to delete whole lines

Press ETX to have the text deleted from the workfile

To change text (to correct misspellings, change wording, etc.):

Press the X-key for eXchange

Type the new text over the existing part to be corrected

Press ETX to have the changes written on the workfile

(will only do one line at a time)

To move text:

Press the D-key for Ddelete

Space over the characters or words you wish deleted;

press RETURN to delete whole lines

Press ESC when all is deleted

(the text is not permanently deleted; you are protected against unexpected happenings)

Position cursor to place in text where text is to be moved

Press the C-key to Copy the text just deleted into the workfile at that position

Position cursor to original data

Press the D-key for Ddelete

Delete the text which was moved (as above)

Press ETX to have this text deleted from the workfile

N.B. Text deleted or inserted is saved in a word buffer, and can be accessed by the copy command. The amount of text that can be saved at one time is limited, so it is best to move it in small chunks (a paragraph or less).

When finished editing:

Press the Q-key to Quit

Press the U-key to Update (will save what you've done on your disk under the same filename)

or

Press the W-key to Write the text on a different file (to keep two versions)

Type name of new file, press RETURN

Press the E-key or the R-key to Exit or Return to the editor

If a large amount of text is to be entered or edited at one time, it is advisable to Quit the editor, and Update or Write the file to disk at regular intervals to avoid losing any work.

To create a new system disk (on a double disk system only):

Press the F-key for Filer.

Press the T-key to Transfer.

Type 4,5 (to copy all the files on the lower disk to the upper disk).

Press the C-key to Change the name of the new disk, type 5, then press RETURN, and type the new disk name followed by a colon (e.g. BILL:); press RETURN.

If there are files on the original disk which you do not want kept on the new disk:

Press the R-key for Remove

Type 5:filename.TEXT

(for each file to be removed)

See the Terak writeup if you need to create a new system disk using a single disk system.

To make a copy of a file on a second disk

As a security measure, it is often wise to keep a copy of your file on another disk in case of an accident to the first.

Press the F-key for the Filer.

Press the T-key to Transfer.

Type the entire name of the file to be copied (e.g. CHAP1.TEXT); press RETURN.

Type the name of the volume to receive the copy (e.g. VICKY:); press RETURN.

(In this case, the file name will be the same on the new disk.)

To move a file to or from the CYBER

Press the X-key for eXecute.

Type COM (for the communication program).

(Half Duplex should be OFF.)

Make sure the modem is turned ON, set to ACST, and FULL duplex. Dial the CYBER (you have a phone number with your user number information); put handset in modem. Press RETURN several times until the system requests your user number. Log-on as usual.

If multiple letters appear when you are typing, type FULL after log-on to set FULL duplex.

Type ASCII (if not already set), press RETURN.

Type \S (to Send a file from the Terak to the Cyber)

or \G (to Get a file on your disk from the Cyber).

Type the file name, press RETURN.

If sending a file, type SAVE or REPLACE in response to 'FINAL NOS STATEMENT:' to have the file saved after transmission; press RETURN.

The COM program will transmit your file to or from the Cyber.

(Repeat this for as many files as you wish.)

Log-off as usual.

Type \Q (to Quit the communication program).

To PROSE a file on a TERAk with attached printer

Make sure printer and modem are turned on and set to half duplex. The printer should be set to 300 BAUD. Position paper to top of page.

Press the X-key for eXecute.

Type PROSE,filename,PRINTER:

Press RETURN.

To list a file on a printer attached to a TERAk

Make sure printer and modem are turned on and set to half duplex. The printer should also be set to 300 BAUD. Position paper to top of page.

Press the X-key for eXecute.

Type DECLIST, press RETURN.

Type file name, press RETURN.

To COMPARE two text files

Press the X-key to eXecute.

Type COMPARE,file1,file2,file3

Press RETURN.

Use the Editor to read file3 for the differences; file3 can be PRINTER: for a hard copy.

ACSS Brief

VX Mainframe System

Academic Computing Services and Systems • University of Minnesota • Twin Cities

Tools for Administrators of VX Instructional Users

The allocation of classroom user names is based on the structure of VMS which divides users into unique groups. These groups allow selected users to be entitled to group control privileges and, in the ACSS hierarchy, assignment of user and group names for each department. Thus, each student user name can easily be assigned within a class group and a department, and each group or department administrator can be easily identified. The existing VMS feature of group privilege validation and other system designed mechanisms in conjunction with some locally developed ACSS utilities are available to provide department and group master users with administrative tools.

All classroom user names for a department are managed on VX by a contact person designated by the department. Departments are given one or more master department user names. Access to those user names allows control over passwords and login environment for all the department's classroom users. Within each department, student user names can be divided into individual groups, or one group for each class, if desired. In addition to the departmental administrator user, each class or group is given one or more master group user names, which allows control over passwords, files and login environment for the individual users in the particular group.

Department master users are identified by being in the 00 group of the department. Within other groups, group or class master users are identified by being a member of each group whose user name ends below 20 octal in the group.

For example:

- 1) Department master users of the department identified as DP are in group DP00. Members of that group have names of the form DP00nn, where DP is a unique identification code used for each department. Thus, [DP00,DP00nn], is the full VMS name of a department administrator.
- 2) Student users of the department identified as DP have names of the form DPXXnnn, within group names of the form DPXX. Thus, [DPXX,DPXXnnn] is the full VMS name for a student user, where XX is any alphabetic combination with exclusion of 00 and nnn any number greater than 20 octal.
- 3) [DPXX,DPXX001] is a group master administrator of the group or class XX of the DP department.

Please note that most users do not need to be concerned with their full name, group and user name, but only with the user name itself, such as DPXXnnn. We described the full names here to clarify the user name hierarchy designed for administrative purposes.

Department administrators are able to control passwords and login environment for all users in the department. In addition, group administrators can control file utilization for their groups. Both types of administrators have group control privileges entitled on their user names.

To control system access:

```
$ Set Password Username Newpassword
```

changes the password of a specified username.

```
$ Set Password Username Newpassword dd-mmm-yyyy
```

changes the password of a specified user name and sets an expiration time to a specified date.

To control login environment:

All user names within each department execute the departments' DPLLogin.com file at login time. Each department can use this file to control system access and to create login environments for all the department users. The DPLLogin.com file is owned by the [DP00,DP00000] user. For example, [MT00,MT00000]MTLogin.com file is executed at login time for every user name within the Math Department. Examples of a department DPLLogin.com file are given in the EXAMPLES section.

To obtain information on users' files:

```
$ Directory [UserName...]*.*;*
```

Lists the permanent file directory information of the user name, including all sub-directories. Examples of the Directory command are given in the EXAMPLES section.

```
$ Set Protection=(S:xxx,O:xxx,G:xxx,W:xxx) [UserName]Filename
```

Sets the UIC-based file protection of *Usernames'* file to enable the master group or class administrator permission to the object. Examples of the Set Protection command are given in the EXAMPLES section. This instruction can be executed only by master group administrators, since it implies control within the VMS group. A user with group privileges as the class or group administrator has, within the group, the same type of control on files that is granted to the system.

To clean up permanent file space:

```
$ Delete [Directory]filename.Type;Number
```

Deletes the file *filename* on the specified directory. This instruction is restricted to master group administrators. Examples of the Delete command are given in the EXAMPLES section. (Note: master users will need to use the Set Protection command before deleting user name files.)

To monitor system usage:

```
$ Show Users
```

Shows the User name, Process name, Process Identification (PID), and terminal (TID) of all users on the system.

```
$ Stop/Identification=PID
```

Logs off the User name with the selected PID.

```
$ Show Process/Identification=PID
```

Shows the current process of the specified PID.

```
$ Show Process/Identification=PID/continuous
```

Shows a continuous display of the process.

The last three instructions can be executed only by the master group administrator.

To communicate with other users:

```
$ Reply/Terminal=TID Message text
```

Sends a message to a user currently in the system on terminal TID.

\$ Mail

Sends interactive mail to a user or users.

\$ Mail *text.lis list.dat*

Mails file *text.lis* to all users in file *list.dat*.

To control resources:

Utilities to control resources such as cumulative CPU time, connect time and administration of permanent file space can be made available for the winter quarter if there is enough interest among administrators for their availability.

Examples

Example of department administrator DpLogin.Com file:

```
#! This file "traps" the user for an interactive SPSS session
#! if the user is in the DP1A group.  If the user is in the
#! DP1B group, the procedure displays a message informing
#! that class about a lecture cancellation.  Each "non-trapped"
#! user would then execute a procedure selected by the
#! instructor if available.  The trap and the message could also be
#! done in each group administrator's DpXXlog.com file.
#!
$ On Control_Y Then Goto Logout
$ IF F$MODE().EQS."BATCH" Then Exit
$ SET TERM /VT100/INSERT/LINE      ! Set terminal type to VT100
$ uic = F$User()
$ group = F$Extract(1,4,uic)
$ log_file = group + "LOG.COM"
$ If group .EQS. "DP1A" then goto SPSS
$ If group .EQS. "DP1B" then goto MESSAGE
$ CLASS:
$ if (F$search("[ 'group' ]'log_file'") .NES. "") then @[ 'group' ]'log_file'
$ Exit
$ SPSS:
$ Deassign sys$input
$ SPSS      ! EXECUTE STATISTICS PACKAGE
$ goto LOGOUT
$ Message:
$ Type Sys$input
      Class for Dp1B 9:00am. 25-Sep-1985 has been canceled
      for today.  Further notices will be available.
$ goto CLASS
$ LOGOUT:
$ set nocontrol=y
$ Logout
```

Example of group administrator DpXXlog.com file:

```
#! Allow students to access current homework assignment by
#! typing Type homework.
#!
$ Define Homework [dpla]homework1.lis
```

Examples of the **Directory** command:

```
$ Directory
```

The **Directory** command lists all versions of all files in the current disk and directory in the brief format. The heading identifies the disk and directory, and the trailing gives the total number of files.

```
$ Directory/Full [Std23.Pascal]HMWK3.Pas
```

The **Directory/Full** command gives full information on a particular file. If the information is not available to the administrator, the system responds with: (-RMS-E-PRIV, insufficient privilege or file protection violation). In order to obtain the information, the protection of the file has to be altered using the **Set Protection** command.

```
$ Directory/Total/Size=All [STD123...]
```

The **Directory** command outputs only the header and a trailing line that identifies the total number of files and the blocks used and allocated for all versions of all files for student STD123.

```
$ Set Protection=(s:rwed,o:rwed,g:re,w:re) Readme.txt
```

The **Set Protection** command gives the System and the Owner of the file read, write, execute, and delete permission, while giving the Group and World read and execute permission only.

```
$ Set Protection=(s:re,o:re,g,w) mystuff.dir
```

The **Set Protection** command gives permission to read and execute only to the System and Owner of the directory. Note: The file protection will have to be changed before it can be deleted.

Examples of the **Delete** and **Purge** commands:

```
$ Delete Hmwk3.Pas
```

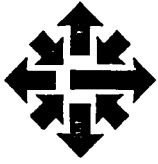
The **Delete** command deletes the file Hmwk3.Pas from the current default disk and directory.

```
$ Delete/confirm/since=today [Std23.Pascal]*.obj
USERF:[STD23.PASCAL]TEST.OBJ;1, delete? [N]: Y
USERF:[STD23.PASCAL]HMWK3.OBJ;3, delete? [N]: N
USERF:[STD23.PASCAL]HMWK3.OBJ;2, delete? [N]: N
USERF:[STD23.PASCAL]HMWK3.OBJ;1, delete? [N]: Y
```

The **Delete** command examines all versions of files with file type **obj** in the subdirectory [Std23.Pascal], and locates those that were created or modified today. Before deleting each file, it requests confirmation that the file should be deleted. The default response -N- is given in square brackets.

```
$ Purge/keep=2 [STD12]*.obj
```

The **Purge** command deletes all but the last two versions of files with file type **obj** from the directory of student user STD12.



ACSS Brief

UNIX Software

Academic Computing Services and Systems (ACSS) operates an .ENCORE Multimax computer running the UMAX 4.2 operating system. A wide variety of software is available on this machine. For more information about the software listed in this *Brief*, you can call the HELP-Line at 626-5592. The ACSS Computing Information Center (CIC), 128A Lind Hall, 625-7397, has UNIX manuals available for reference. Please note that, in UNIX, most commands, including package names, must be typed in **lowercase**.

- accstat** Accounting statistics report generator. ACCSTAT supplies a user with information about machine usage and accounting charges to their ENCORE account. To get more information from the on-line UNIX manual, type **man accstat**.
- adaed** Translator/interpreter for the ADA programming language that is intended primarily for educational use. See the directory `/usr1/lang/adatests` for examples. Note that certain variables must be set in your environment. Type **source /usr1/lang/ada/setup**. To get more information from the on-line UNIX manual, type **man adaed**.
- ansitape** ANSI-standard tape handler. ANSITAPE will read or write ANSI standard format tapes. (Note: User tapes are not currently supported.) To get more information from the on-line UNIX manual, type **man ansitape**.
- bib** Bibliographic formatter. BIB is a preprocessor for NROFF or TROFF that formats citation and bibliographies. To get more information from the on-line UNIX manual, type **man bib invert**.
- CC** C++ translator. AT&T C++ Translator translates C++ source code to C source code. It supports the C++ programming language as described in Bjarne Stroustrup's *The C++ Programming Language*. To get more information from the on-line UNIX manual, type **man CC**.
- cpio** BRL version of the System V utility that is a possible means of transferring files between System V systems and Berkeley UNIX systems on tape. (Note: User tapes are not currently supported.) To get more information from the on-line UNIX manual type **man cpio**.
- finger** Program for allowing a finger command to be executed at a remote system. To get more information from the on-line UNIX manual, type **finger finger** or **man fingd**.
- glim** Generalized linear interactive modeling fitting. A wide class of statistical models known as glms (generalized linear models) may be fitted with GLIM's facilities. This class of models includes (but is not restricted to) regression, fixed effects analysis of variance and con-variance, variance component estimation, probit analysis, logistic regression, and log-linear models for contingency tables. To get more information from the on-line UNIX manual type **man glim**.
- help** An easy way to find and use information. The purpose of help is to provide easy access to on-line documentation. To get more information from the on-line UNIX manual, type **man help**.
- ispell** Correct spelling for a file. ISPELL is fashioned after the spell program ITS. To get more information from the on-line UNIX manual, type **man ispell**.
- kermit** File transfer protocol. KERMIT provides reliable file transfer and primitive virtual terminal communication between computers. To get more information from the on-line UNIX manual, type **man kermit**.
- learn** Computer-aided instruction courses and practice in the use of UNIX, the C shell, and the Berkeley text editors. To get more information from the on-line UNIX manual, type **man learn**.
- lpr** Two laserwriters and one printronix are now available using the LPR command. They are referred to as lrc, lind128b, and lind128a. The first is located in the Diehl Hall Learning Resources Center and the other two are in Lind Hall. To get more information from the on-line UNIX manual, type **man lpr enscript transcript ps4014 ps630 pscat psdit psprev psroff pproff**.
- macget** Send a file to a Macintosh via modem7/macterminal protocol. MACPUT sends a file to a Macintosh running MacTerminal. (Note: requires 8 data bits, no parity and complete data transparency, which is only available by using Telnet to access this machine, and the other machine allows you to connect in this manner.) To get more information from the on-line UNIX manual, type **man macget**.

macprint Print a Macintosh Postscript file on a laserwriter attached to the UX. The MACP RINTcommand prepends a file of postscript definitions to the files to be printed. To get more information from the on-line UNIX manual, type **man macprint**.

macput Receive a file from a Macintosh via modem7/macterminal. MACGET receives a file from a Macintosh running MacTerminal. (Note: requires 8 data bits, no parity and complete data transparency, which is only available by using telnet to access this machine, and the other machine allows you to connect in this manner.) To get more information from the on-line UNIX manual, type **man macput**.

mkmf Makefile generator. MKMF creates a file Makefile that tells the make command how to construct and maintain programs and libraries. To get more information from the on-line UNIX manual, type **man mkmf**.

multreg An interactive package used for regression analysis. In addition to computing estimates, standard errors, and tests, this package can be used for a wide variety of statistical calculations such as predictions, residual analysis, plotting, transformations, variable selection, weighted least squares, and cross validation. To get more information type **help** and select topic **statpaks**.

packages Used to obtain information about locally-applied packages. Each package available is listed along with a brief description and a reference to more extensive documentation. To get more information from the on-line UNIX manual, type **man packages**.

patch A program for applying a diff file to an original. PATCH will take a patch file containing any of the the three forms of difference listing produced by the diff program and apply those differences to an original file, producing a patched version. To get more information from the on-line UNIX manual, type **man patch**.

qterm Query terminal. QTERM is used to query a terminal to determine its name. To get more information from the on-line UNIX manual, type **man qterm**.

rsc Revision control system (RCS). RCE creates new RCS files or changes attributes of existing ones. To get more information from the on-line UNIX manual, type **man ci co ident merge rcs rcsdiff rcsfile rcsintro rcsmerge rlog sccstorcs**.

rvi Remote screen editor based on VI. To get more information from the on-line UNIX manual type **man rvi**.

S Interactive environment for data analysis and graphics. (Always capital S.) Users type expressions to S; S evaluates the expressions. Results may be assigned to a permanent data base or, if not, will be printed on the terminal. All expressions operate on self-describing structures. To get more information from the on-line UNIX manual type **man S cvwrite pf rdpen**.

shar Create file storage archive for extraction by **/bin/sh**. SHAR prints its input files with special command lines around them to be used by the shell, **/bin/sh**, to extract them later. To get more information from the on-line UNIX manual, type **shar**.

scheme MIT Scheme LISP dialect. The manual for scheme is the *Revised Revised Revised Report on Scheme or An Uncommon LISP* from the MIT Artificial Intelligence Laboratory. To get more information from the on-line UNIX manual, type **man scheme**.

st Little Smalltalk system from the University of Arizona. An interactive interpreter for a SMALLTALK-like language designed for small systems having only conventional terminals. To get more information from the on-line UNIX manual, type **man st**.

tac Concatenate and print files in reverse. TAC reads each file in sequence and writes it on the standard output, reversed by the file segments delimited by string. To get more information from the on-line UNIX manual, type **man tac tmail**.

tools Miscellaneous tools. To get more information from the on-line UNIX manual, type **man jot lam rs**.

umodem File transfer protcol. UMODEM uses the Christensen protocol to transfer files to and from CP/M systems. To get more information from the on-line UNIX manual, type **man umodem**.

vmsprep VMS tape preparation aid. VMSPREP traverses hierarchies of files and prepares them for transportation to VMS. (Note: User tapes are not currently supported.) To get more information from the on-line UNIX manual, type **man vmsprep**.

wup Waterloo UNIX Prolog. PROLOG programming environment from the University of Waterloo. To get more information from the on-line UNIX manual, type **man wup**.

ACSS Brief

CA Mainframe System

Academic Computing Services and Systems • University of Minnesota • Twin Cities

Using MAIL on the CYBER CA

Every user of the ACSS CYBER/NOS mainframe computer (CA system) can use MAIL, a utility used to send messages to and to receive messages from other users on the CA system.

To use MAIL, you have to enter the MAIL utility and join MAIL. First you type the MAIL command:

```
/mail
MAIL Version 2.1      Mon Feb 24, 1986  9:39 a.m.
Command? join
Enter the codename you wish to use (up to 10 characters)
? codename
Enter the password for your codename (up to 10 characters, C/R if none)
XXXXXXXXXX
Enter your real name (up to 24 characters)
? your name
Welcome new user!  Please remember your password.
```

After you type `mail`, the system displays the MAIL header, which gives the version of MAIL currently running on the system and the date and time. Then MAIL's `Command?` prompt appears. You respond with the `join` command, and MAIL asks you to enter a codename and password of your own invention, and then your name. (You need not type in your real name.) As always, MAIL keeps your password secure with the X string shown above.

You have joined MAIL. Hereafter, whenever you enter MAIL, the utility will prompt you for your MAIL password and tell you how many MAIL messages you have received.

Having joined, you can make more information about yourself available to other users by typing in the `setinfo` command. In response to the numbered prompts, you can type in as much—or as little—information about yourself as you wish to make public. It is *unwise* to enter too much personal information (your home address and phone number, etc.) here; this information will be available to every other MAIL user.

Sending and Receiving Mail

To send a message to another MAIL user, use the `send` command. MAIL will prompt you for the codename of the person you are writing to and the subject of the message. Numbered prompts will permit you to enter each line of the message. End each line with a carriage return, and type only a carriage return when the message is finished:

```
Command? send
Send to? jjp
Last accessed: Mon Feb 24, 1985  3:38 p.m.
Subject? CSci assignment
Enter your message.  Hit C/R when done.
  1? Did you get the assignment today?  If <CR>
  2? so, please tell me what it is because I <CR>
  3? missed class. <CR>
```

```
4? Thanks, ABB <CR>
5? <CR>
Sent to: JJP
```

To read messages sent to you, use the `read` command followed by your codename, as shown here:

```
Command? read, abb
Enter your password
XXXXXXXXXX
Last accessed: Mon Feb 24, 1986 3:30 p.m.
2 Message(s), 2 new.
U 1 JJP      86/2/28 16:11 "Assignment"
U 2 SOH      86/2/28 16:21 "Whiteout"
Command? <CR>
```

MAIL will prompt you for your password and tell you how many messages you have received. It displays the messages in the order received, numbered consecutively (as shown in the second column above), the sender of the message (senders' codenames are in the third column above), the date and time of sending (fourth and fifth columns), and the subject of the message (sixth column).

To begin reading messages, press RETURN. With each <CR>, MAIL will display each new message or response received until it has displayed all of them. If you have no mail, MAIL will tell you so by saying no messages.

On-Line HELP

To use the on-line HELP facility within MAIL, you can simply type `help`. MAIL HELP will display more information about the HELP facility. To get information about a particular command, type `help, a comma, and the command`. MAIL HELP responds with a brief entry on the command, including the command's abbreviated form, purpose, and format. For a complete list of MAIL commands, type `help, dir`.

Other Useful Commands

We cannot describe all of the commands here, but here are a few other MAIL commands and their functions:

Type `users` to see a complete list of MAIL users, in alphabetical order by codename. To begin the list at a particular place—say, at the letter L—type `users, l`.

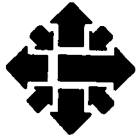
To interrupt a display, type `s`.

If you decide you no longer want to belong to MAIL, type `unjoin`.

Type `quit` to leave MAIL. To leave MAIL and log out of the system with a single command, type `bye`.

For More Information

There is now an indexed WRITEUP on the CA system that includes the introductory information provided here and a list and descriptions of all MAIL commands. Type `writeup, mail`. There are also chapters on MAIL in the ACSS manual *Introduction to CYBER NOS Computing*.



ACSS BRIEF

Using MAIL on the CYBERs

Every user of the CYBERs can use MAIL, with which you can send messages to and receive messages from other users on your system.

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```
/mail
MAIL Version 2.1      Mon Feb 24, 1986  9:39 a.m.
Command? join
Enter the codename you wish to use (up to 10 characters)
? codename
Enter the password for your codename (up to 10 characters, C/R if none)
XXXXXXXXXX
Enter your real name (up to 24 characters)
? your name
Welcome new user!  Please remember your password.
```

After you type **mail**, the system displays the MAIL header, which gives the version of MAIL currently running on the system and the date and time. Then MAIL's **Command?** prompt appears. You respond with the **join** command, and MAIL asks you to enter a codename and password of your own invention, and then your name. (You need not type in your real name.) As always, MAIL keeps your password secure with the X string shown above.

You have joined MAIL. Hereafter, whenever you enter MAIL, the utility will prompt you for your MAIL password and tell you how many MAIL messages you have received.

Having joined, you can make more information about yourself available to other users by typing in the **setinfo** command. In response to the numbered prompts, you can type in as much—or as little—information about yourself as you wish to make public. It is *unwise* to enter too much personal information (your home address and phone number, etc.) here; this information will be available to every other MAIL user.

Sending and Receiving Mail

To send a message to another MAIL user, use the **send** command. MAIL will prompt you for the codename of the person you are writing to and the subject of the message. Numbered prompts will permit you to enter each line of the message. End each line with a carriage return, and type only a carriage return when the message is finished:

```
Command? send
Send to? jjp
Last accessed: Mon Feb 24, 1985  3:38 p.m.
Subject? CSci assignment
Enter your message.  Hit C/R when done.
  1? Did you get the assignment today?  If <CR>
  2? so, please tell me what it is because I <CR>
  3? missed class. <CR>
  4? Thanks, ABB <CR>
  5? <CR>
Sent to: JJP
```

To read messages sent to you, use the `read` command followed by your codename, as shown here:

```
Command? read, abb
Enter your password
XXXXXXXXXX
Last accessed: Mon Feb 24, 1986 3:30 p.m.
2 Message(s), 2 new.
U 1 JJP      86/2/28 16:11 "Assignment"
U 2 SOH      86/2/28 16:21 "Whiteout"
Command? <CR>
```

MAIL will prompt you for your password and tell you how many messages you have received. It displays the messages in the order received, numbered consecutively (as shown in the second column above), the sender of the message (senders' codenames are in the third column above), the date and time of sending (fourth and fifth columns), and the subject of the message (sixth column).

To begin reading messages, press `RETURN`. With each `<CR>`, MAIL will display each new message or response received until it has displayed all of them. If you have no mail, MAIL will tell you so by saying `No messages`.

On-Line HELP

To use the on-line HELP facility within MAIL, you can simply type `help`. MAIL HELP will display more information about the HELP facility. To get information about a particular command, type `help, a comma, and the command`. MAIL HELP responds with a brief entry on the command, including the command's abbreviated form, purpose, and format. For a complete list of MAIL commands, type `help, dir`.

Other Useful Commands

We cannot describe all of the commands in this article, but here are a few other MAIL commands and their functions:

Type `users` to see a complete list of MAIL users, in alphabetical order by codename. To begin the list at a particular place—say, at the letter L—type `users, l`.

To interrupt a display, type `s`.

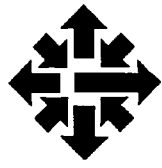
If you decide you no longer want to belong to MAIL, type `unjoin`.

Type `quit` to leave MAIL. To leave MAIL and log off from the system with a single command, type `bye`.

For More Information

There is now an indexed WRITEUP on all CYBERs that includes the introductory information provided here and a list and descriptions of all MAIL commands. Type `writeup, mail`. There are also chapters on MAIL in the *Introduction to MERITSS Computing* and *Introduction to CYBER Computing*.

FEB86: SKB



ACSS Brief

Using MAIL on the CYBERs

Every user of the CYBERs can use MAIL, with which you can send messages to and receive messages from other users on your system.

To use MAIL, you have to enter the MAIL utility and join MAIL. First you type the MAIL command:

```
/mail
MAIL Version 2.1      Mon Feb 24, 1986  9:39 a.m.
Command? join
Enter the codename you wish to use (up to 10 characters)
? codename
Enter the password for your codename (up to 10 characters, C/R if none)
XXXXXXXXXXXX
Enter your real name (up to 24 characters)
? your name
Welcome new user! Please remember your password.
```

After you type `mail`, the system displays the MAIL header, which gives the version of MAIL currently running on the system and the date and time. Then MAIL's `Command?` prompt appears. You respond with the `join` command, and MAIL asks you to enter a codename and password of your own invention, and then your name. (You need not type in your real name.) As always, MAIL keeps your password secure with the X string shown above.

You have joined MAIL. Hereafter, whenever you enter MAIL, the utility will prompt you for your MAIL password and tell you how many MAIL messages you have received.

Having joined, you can make more information about yourself available to other users by typing in the `setinfo` command. In response to the numbered prompts, you can type in as much—or as little—information about yourself as you wish to make public. It is *unwise* to enter too much personal information (your home address and phone number, etc.) here; this information will be available to every other MAIL user.

Sending and Receiving Mail

To send a message to another MAIL user, use the `send` command. MAIL will prompt you for the codename of the person you are writing to and the subject of the message. Numbered prompts will permit you to enter each line of the message. End each line with a carriage return, and type only a carriage return when the message is finished:

```
Command? send
Send to? jjp
Last accessed: Mon Feb 24, 1985  3:38 p.m.
Subject? CSci assignment
Enter your message. Hit C/R when done.
  1? Did you get the assignment today? If <CR>
  2? so, please tell me what it is because I <CR>
  3? missed class. <CR>
  4? Thanks, ABB <CR>
  5? <CR>
Sent to: JJP
```

To read messages sent to you, use the **read** command followed by your codename, as shown here:

```
Command? read, abb
Enter your password
XXXXXXXXXX
Last accessed: Mon Feb 24, 1986 3:30 p.m.
2 Message(s), 2 new.
U  1 JJP          86/2/28  16:11 "Assignment"
U  2 SOH          86/2/28  16:21 "Whiteout"
Command? <CR>
```

MAIL will prompt you for your password and tell you how many messages you have received. It displays the messages in the order received, numbered consecutively (as shown in the second column above), the sender of the message (senders' codenames are in the third column above), the date and time of sending (fourth and fifth columns), and the subject of the message (sixth column).

To begin reading messages, press **RETURN**. With each **<CR>**, MAIL will display each new message or response received until it has displayed all of them. If you have no mail, MAIL will tell you so by saying **No messages**.

On-Line HELP

To use the on-line HELP facility within MAIL, you can simply type **help**. MAIL HELP will display more information about the HELP facility. To get information about a particular command, type **help, a comma, and the command**. MAIL HELP responds with a brief entry on the command, including the command's abbreviated form, purpose, and format. For a complete list of MAIL commands, type **help, dir**.

Other Useful Commands

We cannot describe all of the commands here, but here are a few other MAIL commands and their functions:

Type **users** to see a complete list of MAIL users, in alphabetical order by codename. To begin the list at a particular place—say, at the letter L—type **users, l**.

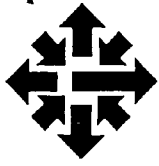
To interrupt a display, type **s**.

If you decide you no longer want to belong to MAIL, type **unjoin**.

Type **quit** to leave MAIL. To leave MAIL and log off from the system with a single command, type **bye**.

For More Information

There is now an indexed WRITEUP on all CYBERs that includes the introductory information provided here and a list and descriptions of all MAIL commands. Type **writeup, mail**. There are also chapters on MAIL in the *Introduction to MERITSS Computing*.



ACSS Brief

Using MAIL on the ENCORE

Electronic mail has become one of the most important and widely used applications of mainframe computers. With UNIX MAIL, you can send messages to colleagues who have an account on ACSS's ENCORE/UNIX mainframe computer (UX system). Your correspondents do not have to be on the UX system at the time you send your message; when they log in to the UX, the system will inform them that MAIL messages are waiting.

Opening an Account

To use UNIX MAIL you need to have an account on the UX system. To open an account, either pick up an application form at the ACSS Computing Information Center located in 128A Lind Hall or call the ACSS Accounting Office (625-1151). To learn how to log in and start using the UX system, see our *ENCORE/UNIX Access Brief*, available free from the Computing Information Center.

Beginning MAIL

To read your MAIL, simply type the command `mail` and press RETURN (indicated as `<CR>`). The UX system will respond with two possible messages. If you have no new MAIL, you will see:

```
Mail version 2.18 5/19/83.  Type ? for help.
"/usr/spool/mail/pug":  0 messages
No Mail
```

If you have MAIL, you will be informed about the message:

```
Mail version 2.18 5/19/83.  Type ? for help.
"/usr/spool/mail/pug":  1 message 1 new
>N  1:pug                Tue Mar 24 12:30  10/241 "Re: meeting"  -
&
```

The `&` sign is the prompt for MAIL commands.

Sending and MAIL

To send MAIL to another UX user, you must know your correspondent's UX log-in name.

In response to the system or MAIL prompt, type the command `mail` followed by your correspondent's login name. MAIL will prompt you for the subject of your message, as in the following example:

```
&mail pug<CR>
Subject: Next Meeting<CR>
I missed the last committee meeting.<CR>
When do we meet next? <CR>
.<CR>
EOT
```

To find out what editing options are available to you, while sending a MAIL message, key in `~?`. To send

your message and not leave MAIL, type a single period on a line, followed with a carriage return. To leave MAIL without sending your message, use `CTRL/C`. (That is, press the `C` key while holding down the `CONTROL` key.)

When you type the period MAIL says `EOT` (End Of Transmission) to let you know the message is completed and sent. Your correspondent will receive it almost instantly.

If you end the message by typing `CTRL/C`, MAIL responds with (Interrupt - one more to kill letter). Type in `CTRL/C` one more time and you will be back to the system prompt.

If you make a mistake and want to correct it, the simplest way is to use the `DELETE` key on your terminal (or the `BACKSPACE` key, depending on your terminal definition) to backspace over the error. You can correct an error on a line after you press `RETURN` by using the `~v` command to enter the `vi` editor. (The command `~e` accesses the `ex` editor.) Your message is written to a temporary file, which you can edit. Exiting the editor will rewrite your MAIL message and return you to the next new line in your MAIL message. (Use `~p` to view the message as it will appear to the recipient.)

Reading Your Mail

To read your MAIL message, type `mail` at the UNIX prompt `>`. Again, the system will tell you that you have MAIL waiting for you before you see the MAIL prompt. To read the waiting message, type `<CR>`:

```
Mail version 2.18 5/19/83.  Type ? for help.
"/usr/spool/mail/pug":  1 message 1 new
>N  1 phj                Thu Mar 19 13:20  13/360 "Re:  Next Meeting
&<CR>
Message 1:
From phj Tue Mar 24 13:01:09 1987
Date: Tue, 24 Mar 87 13:01:06 cst
From:  phj (Peter H. Johnson)
To:    pug
Subject: Meeting
Status: RO
```

```
I missed the last committee meeting.
When do we meet next?
```

Notice the format of the message you've received. MAIL numbers each unread message you have received consecutively, records the date and time it was sent, and provides the login name of the person who sent the message. After MAIL displays the message, it displays the `&` prompt, so you can enter more commands.

To exit MAIL, use the `quit` command (abbreviated `q`). MAIL will write any messages flagged as read to your file called `mbox`. These messages can be reread by using the `mail -f` command. If you do not want to have a MAIL message written to `mbox`, use the `delete` (abbreviated `d`) command or the `delete print` (abbreviated `dp`) command after reading the message. You can undelete a message with the `undelete` (abbreviated `u`) command.

Using HELP

After you've begun the MAIL utility, you can use its built-in HELP function. Simply type the word `help` in response to the `&` prompt for a list of all the MAIL commands. If you want to learn about a particular command, type

```
&help command
```

Replace `command` with the name of the command you're interested in. For example, typing

`&help directory`

produces information about the `directory` command in MAIL.

Helpful MAIL Commands

The following are a few helpful commands. For information on all MAIL commands, type `?` while reading messages or `~?` when sending a message.

To send a reply to a UX user whose message you've just read, use the `reply` (abbreviated `r`) command. This saves you the trouble of typing in the user name and subject; the UX will send your message to the sender of the last message you've read.

To re-read the last message you read, type a `p`. To go back one message, type a hyphen.

To end your UX MAIL session, type a `q`. If you wish to terminate the mail session without modifying your mailbox, type an `x`.

Helpful Editing Commands

Typing `~~` will allow you to use the tilda as a text character in the first character position of a line.

To use a file as a message, you can read the file into MAIL with `~r file`. (Replace `file` with the name of the file.) You can also write your message to a file with the `~w file` command.

To forward one of your messages to another party, use the `~f` command.

For More Information

UX's own HELP file also has information on the MAIL utility. Log on to UX and type `help mail`. More information is available through the UX's online manual. Type `man mail`. Within MAIL there also is a help file. Type `help` for a reference summary of MAIL commands.

One printed reference on UNIX MAIL is the section in the *UNIX Beginner's Guide*, which consists of selections from the Berkeley UNIX Reference Set, reprinted by ACSS with permission of the University of California, Berkeley. A reference copy of this manual (and a complete Reference Set) is available in the ACSS Computing Information Center, 128A Lind Hall, or you can purchase a copy from the Minnesota Book Center, Williamson Hall.



ACSS Brief

VX Central System

Academic Computing Services and Systems • University of Minnesota • Twin Cities

Using MAIL on the VAX

With VMS MAIL, you can send messages or files to any other VX user. Your correspondents do not have to be on the VX system at the time you send your message; when they log on to the VX, the system will inform them that MAIL messages are waiting for them. This Brief tells you how to send mail to other VX users and read mail they send you.

Beginning MAIL

Having logged on to the VX, simply type the command **mail** and press RETURN (indicated as <CR>). The VX will respond with the MAIL> prompt, which signals you to start using MAIL commands:

```
$ mail <CR>
MAIL>
```

Sending Mail

To send mail to another VX user, you must have previously learned your correspondent's VX user name.

In response to the MAIL> prompt, type the command **send**. MAIL will then prompt you for your correspondent's user name and the subject of your message. MAIL will respond with Enter your message, as shown below.

```
MAIL> SEND
To: PUG
Subj: VAX MAIL
Enter your message below. Press CTRL/Z when complete, or CTRL/C to quit:
```

Notice the instructions about ending your MAIL message. The commands CTRL/Z and CTRL/C require you to keep the CONTROL key of your keyboard depressed while pressing either the Z key or the C key. CTRL/Z ends your message and sends it to your correspondent (i.e., the person whose user name you typed in). CTRL/C ends the message but does *not* send it. Use CTRL/C if you decide not to send your message.

As the example below shows, you end each line of your message by pressing RETURN:

```
Enter your message below. Press CTRL/Z when complete, or CTRL/C to quit:
I missed the last committee meeting.<CR>
When do we meet next? <CR>
CTRL/Z
Exit
MAIL>
```

When you type CTRL/Z MAIL responds with Exit to let you know the message is completed and sent. Your correspondent will receive it almost instantly. The MAIL> prompt tells you that you can continue typing in MAIL commands.

If you end the message by typing in CTRL/C, MAIL responds with Cancel. Your message will not be sent.

If you make a mistake and want to correct it, the simplest way is to use the DELETE key on your terminal (not the BACKSPACE key) to backspace over the error. You cannot correct an error on a line after you press RETURN. For long messages, you may want to use the **send/filename** command or the **send/edt** command (both described later).

Reading Your Mail

If you have mail waiting for you, the VX system tells you when you log on, and again after you begin the MAIL utility:

```
User name: your user name <CR>
Password: your password <CR>
```

```
You have 1 new Mail message.
```

```
$ mail
```

```
You have 1 new message.
```

```
MAIL>
```

To read the waiting message, type in the command `read` or type `<CR>`:

```
MAIL> read <CR>
#1          19-SEP-1988 15:05:05
From:      KEM
To:        PUG
Subj:      Committee meeting
```

```
The next meeting of the committee is Oct. 10, at 4 pm.
```

```
MAIL>
```

Notice the format of the message you've received. MAIL numbers each message you receive consecutively and records the date and time it was sent, also providing the user name of the person who sent the message. After MAIL displays the message, it displays its MAIL> prompt, so you can enter more commands. If you don't want to save a permanent copy of this message on your account, type `delete` to erase the message from your MAIL file.

Using HELP

After you've started the MAIL utility, you can use its built-in HELP function. Simply type the word `help` in response to the MAIL> prompt for a list of all the MAIL commands. If you want to learn about a particular command, type

```
MAIL> help command
```

Replace *command* with the name of the command you're interested in. For example, typing

```
MAIL> help directory
```

produces information about the `directory` command in MAIL.

Exiting MAIL

When you want to stop using MAIL, simply type `exit`. The VMS operating system will file your new mail as "old" (already read) mail on your account and then display its prompt, the dollar sign:

```
MAIL> exit
$
```

To end your VX session, type `logoff`.

Other Commands

The following are a few helpful commands. For information on all MAIL commands, use MAIL's HELP utility, as described above.

If you want to send the same message to more than one correspondent, type in all the relevant user names in response to the `To:` prompt, separating them with commas:

```
MAIL> SEND
To:    PUG, SKB
```

To send a reply to a VX user whose message you've just read, use the `reply` command. This saves you the trouble of typing in the user name and subject; the VX will send your message to the sender of the last message you've read.

If you want to use the VX's text editor, EDT, to prepare a file to send, simply type `edit filename`. You'll go directly into the editor. When you finish the message and exit EDT, you can begin MAIL, and enter the command `send filename`. As before, MAIL will first prompt you for a correspondent's name with `To:.` Mail will then put you into the EDT editor. (You can use EDT from any terminal; to use the full-screen mode, you need a VT-100-compatible terminal or micro.)

To re-read the last message you read, type `last`.

All the mail messages you receive are stored as files (called your "mail box") on your VX directory. After you have read your new mail, you can see a list of old messages by typing `directory`. This displays a list of your old mail, numbered and dated consecutively. To read an old message, type its number. To delete an old message from your mail box, type `delete`, followed by the number of your message.

More VMS MAIL Commands

As you use VMS MAIL, you'll probably find more and more uses for electronic mail. This section calls your attention to a few commands that help you make better use of the MAIL utility. We recommend that all users of MAIL eventually acquaint themselves with the commands described here.

Using EDT within VMS MAIL

You can use EDT, the VMS text editor, to write your MAIL messages. First start the MAIL utility, as described earlier, and then, in response to the MAIL> prompt, type the command `send/edit`, like so:

```
$ mail
MAIL> send/edit
To:    lvms
Subj:  committee meeting
[EOB]
*
```

MAIL prompts you for a recipient's name and a subject, as shown here, and then you go immediately into line-editing mode in the EDT text editor. You can now use EDT line editing or screen editing to prepare your message, just as if you were preparing a text file.

When you exit from EDT (with the `exit` command), you'll go right back into MAIL and your message will be sent. If you decide you do not want to send the message, exit EDT with the `quit` command.

Sending Messages

Using mailing lists: You may often find yourself sending the same message to a number of people—say, fellow committee members or department members. Use EDT to create a text file containing the usernames of these people, recording their user names one to a line, and give the file the file type `.dis` (for distribution list).

For this example, assume the file you have created is called `members.dis`. When MAIL prompts you for a user name (with `To :`), type the `@` sign followed by the file name:

```
To: @members
```

You can include the file type `.dis`, but it's not necessary.

Then proceed with the rest of your message as usual. MAIL will distribute your message to all users whose names are in the file `members.dis`.

You cannot use more than one distribution list at a time, but you can add individuals to a distribution by including their names in your response to the `To :` prompt:

```
To: phj, pmg, @members
```

Users `phj` and `pmg` will also receive your message. The distribution list must *always* be last.

Making a Message Current

Some of the commands in this section work only on the “current” message. A message that you have just displayed on your terminal is current. To make an old message current, type the command `read` followed by the number the MAIL utility has assigned to the message, like this:

```
MAIL> read 124
```

This command makes your MAIL message 124 the current message, and MAIL will display the message at your terminal. You can find an old MAIL message, along with the number MAIL assigned to it, with the `directory` command, as explained earlier.

Forwarding Messages

Sometime you want to forward an electronic mail message, sending it on to another MAIL user. To do this, you will, of course, need to know the user name of the person you will forward to.

Forwarding a single message: When a message is current (as explained above), simply use the `forward` command. For example, to forward a current message to `kfm`, type

```
MAIL> forward
To: kfm
Subj: Committee meeting
```

After you provide a subject, user `kfm` will receive a copy of the message on her account, along with information that you forwarded the message. The original message remains stored on your account unless you delete it (as explained earlier.)

Printing a Message

There is a `print` command within VMS MAIL that prints the current message, but we do not recommend that you use it, because it does not permit you to specify a site and bin for your printed output. As a result, your printed message will arrive

in a general bin at our 128B Lind Hall station, where most VX output (except laser printer output) is delivered if it has no site or bin specified. For many users, this is not convenient.

Instead, you can "extract" the message from your mail file, turning it into a separate text file, and then print the text file with the VMS operating system's own **print** command, which, unlike MAIL's **print** command, permits a specified site and bin number.

In the example below, you use MAIL's **extract** command to copy the *current* message into a newly created text file called **mail.txt**.

```
MAIL> extract mail.txt
%MAIL-I-CREATED, USERB:[SKB]MAIL.TXT;1 created
```

MAIL then creates the file **mail.txt** and copies the message into it. You may then exit MAIL whenever you're ready and use the VMS **print** command, which has this format:

```
$ print/name=site.bin filename
```

Coming Improvements

We're working to make ACSS electronic mail services better. As we accomplish this, we'll inform you in the *ACSS Newsletter*. (If you don't have a subscription, you can get one by contacting the ACSS Computing Information Center, 128A Lind Hall, 625-7397. Subscriptions are free.)

Network Mail

With VMS MAIL you can send messages and files to users of other Minnesota computers and to users of university computers around the world. To learn more about network mail, type **morehelp networks**.

For More Information

The VX's own HELP file also has information on the MAIL utility. Log on to the VX and type **help mail**.

Among the longer on-line documents called Writeups, there is a document called **ACSS\$Writeup:Mail** that contains all the information in this Brief and more. For more information on using VX Writeups, type **morehelp writeups**.

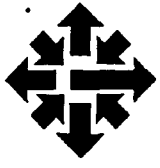
The ACSS quarterly short course schedule usually includes free courses on electronic mail and the VAX/VMS system. Consult the ACSS Computing Information Center, 128A Lind Hall (625-7397), for information about the current schedule.

The complete printed reference on VMS MAIL is the *VAX/VMS Mail Utility Reference Manual*, part of the *VAX/VMS Reference Set* (a publication of the Digital Equipment Corporation, manufacturer of the VAX). The manual is reasonably brief (about 80 pages) and provides a complete description of all MAIL commands and their uses. You can find a reference copy of this manual (and a complete *Reference Set*) in the ACSS Computing Information Center, 128A Lind Hall.

The VX has excellent on-line training software, including a module on using MAIL. Log on to the VX and type **run vms2cai** to begin the training session. From there, follow the instructions that appear on your screen. (Note that you can use this training software only if you are working at a VT-100 terminal, or a terminal or microcomputer that "emulates" a VT-100. A computing lab consultant can tell you if a lab terminal or micro emulates a VT-100. For your own micro, consult the documentation for your micro and comr.unications software.)

For more information about VX training software, including training for using the EDT editor, type **morehelp training**.





ACSS Brief

Using the CYBER Full Screen Editor (FSE)

This *Brief* introduces ACSS's users to Control Data Corporation's (CDC) Full Screen Editor (FSE) on the CYBERs, explains the process of starting an editing session, summarizes the editing and programmable function keys, and describes the use of FSE's help functions.

To use CDC's FSE in its full screen mode, you must have a terminal with a numeric keypad as well as a keyboard. The terminals that CDC has defined for FSE are listed in the GETTING STARTED section of this *Brief*.

If you do not find your terminal listed, or your site has not yet defined your terminal for FSE, you may be able to define it yourself. See the *NOS Screen Formatting Reference Manual* for further information. Both this and the *NOS Full Screen Editor User's Guide* are available in the ACSS Computing Information Center, 128A Lind Hall.

This *Brief* describes how to use FSE on the VT100, Z19, and Z29 terminals. Equivalents for other terminals can be found in Appendix D, "Terminal Support," of the *NOS Full Screen Editor User's Guide*. Those interested in line editing should see Chapter 4 of the *NOS Full Screen Editor User's Guide*.

Getting Started

FSE is only available through CDC's CDCNET, which is currently on the MD and CA CYBER mainframes. To log on to MD or CA through CDCNET, you simply respond with the machine code for the CYBER you want to log on to in response to the ACSS Network prompt.

Below is a sample log-on session.

```
ACSS-net (CA,MD,VX,UX,IB) ? {Respond MD or CA. In this example we'll assume you respond
                             with MD.}
```

```
WELCOME TO THE NOS SOFTWARE SYSTEM.
COPYRIGHT CONTROL DATA 1978, 1985.
```

```
86/05/17. 11.43.39. T070602
MERITSS/MD (05/14-AR).          NOS 2.4.3-647/642.
FAMILY:
USER NAME: {Enter your user name}
PASSWORD:  {Enter your user password}
```

```
JSN: AADN, NAMIAF
```

Establish the screen mode appropriate for your terminal using the NOS SCREEN command:

```
/screen, VT100          or          /screen, Z19
```

Without this command, FSE will be in line-mode editing by default. NOS will verify (as shown below) that the screen mode is now set for a DEC VT100 or Zenith terminal.

```
SCREEN, VT100.          or          SCREEN, Z19.
```

To specify type-ahead mode, enter the model name followed by a T. Type-ahead allows you to enter consecutive

inputs (i.e., *command* <CR> *command* <CR>) without waiting for a response from the system. Even without type-ahead, however, you can enter multiple commands before the return is entered (i.e., *command command* <CR>.)

The following table gives the predefined screen mode codes for FSE:

Terminal	Model	Model with Type-Ahead
CDC Viking 721	721	721T
CDC Viking 721 Version 3	721V3	721V3T
CDC 722	722	722T
CDC 722-30	72230	72230T
DEC VT100	VT100	VT100T
Zenith Z19/Z29 and Heathkit H19	Z19	Z19T
IBM 3270	3270	3270T
Lear Siegler ADM3A	ADM3A	ADM3AT
Lear Siegler ADM5	ADM5	ADM5T
Tektronix 4115	T4115	T4115T

To run FSE, enter:

```
/fse,myfile
```

If **myfile** is not local to your session, FSE will create it. If **myfile** is a permanent file but not local, you must tell FSE to get the file as follows:

```
/fse,myfile,g
```

If you do not specify a file name, FSE will prompt you for a file name and create the file. You can also use the **a** parameter to the FSE command to enter full ASCII mode (for upper- and lower case characters), like this:

```
fse,myfile,a
```

or

```
fse,myfile,ga
```

Note that in the second example, the two parameters **g** and **a** are not separated by commas.

When FSE opens the file, it will redraw your screen so that it resembles Figures 1 and 2. In reading the following sections, you may sometimes need to refer to these figures; note particularly the Directive Line.

Editing Keys

The directions that follow are for the VT100 and Z19/29 terminals and those terminals and micros that emulate VT100s. Remember, these keys will vary depending upon the terminal you are using. See Appendix D in the *NOS Full Screen Editor User's Guide* for the equivalent keys for your terminal.

Every text editor has its own logic and requires some practice before you can use it efficiently. Be forewarned that, when you strike some editing keys in FSE, it causes characters to appear on your screen where your cursor was. These characters are not written to your file and disappear when you complete the command sequence by pressing RETURN.

VT100

Positioning the cursor - Use the arrow keys located above the main keyboard to move your cursor around the screen. The arrow keys automatically repeat when held down on the VT100.

Correcting text - Most minor text corrections can be made by positioning the cursor at the start of the text to be corrected and typing over the existing text.

Inserting characters - Position the cursor at the point where you wish to insert text, press the number 3 key once for every character to be inserted, then RETURN, and add the text.

Inserting lines - Position the cursor anywhere in the line before which you want to insert the line(s) and press the number 4 key of the keypad as many times as needed and then RETURN.

Deleting characters - Position the cursor on the first character you wish to delete and press the PF3 key once for every character to be deleted and then RETURN.

Deleting lines - Position the cursor anywhere on the first line you wish to delete and press the PF4 key as many times as needed and then RETURN.

Paging forward - Press the number 1 key of the keypad as many times as needed and then RETURN.

Paging backward - Press the PF1 key as many times as needed plus RETURN.

Z19/29

Positioning the cursor - Use the arrow keys located to the right of the main keyboard to move your cursor around the screen. The arrow keys will repeat when the REPEAT key is held down.

Correcting text - Most minor text corrections can be made by positioning the cursor at the start of the text to be corrected and typing over the existing text.

Inserting characters - Position the cursor at the point where you wish to insert text, press the "IC" key of the keypad *only once*, and add the text. You can then move around the screen using the arrow keys and insert characters wherever you like. To exit insert mode, press "IC" again or RETURN.

Inserting lines - Position the cursor anywhere in the line before which you want to insert the line and press the "IL" key of the keypad.

Deleting characters - Position the cursor on the character you wish to delete and press the "DC" key.

Deleting lines - Position the cursor anywhere on the line you wish to delete and press the "DL" key.

Paging forward - Press the "f1" key above the keyboard and then RETURN. For multiple paging, press "f1" as many times as necessary, then RETURN.

Paging backward - Press the "f2" key plus RETURN. For multiple paging, press "f2" as many times as desired, then RETURN.

Clearing the screen - Hold down the SHIFT key while pressing the ERASE key and then RETURN to rewrite the entire screen.

Home - The HOME key on the keypad will position the cursor at the FSE Directive Line, allowing you to enter FSE directives.

Programmable Function Keys

FSE requires you to use "programmable function keys." The VT100 has no such keys, but provides keypad keys instead. The list below gives the keypad equivalents of function keys. Keys F9 through F16 are not generally available on any of the other predefined terminals. If you have a CDC Viking 721, see the Screen Editing chapter of the *NOS Full Screen Editor User's Guide*.

VT100

In the following summary, the commands are organized according to the command squares that appear along the bottom of the FSE screen.

Function	Description
FWD	Keypad key 1 plus RETURN moves your cursor forward one page in the file. Press key 1 as often as needed, then press RETURN, to page forward by two or more pages.
BKW	Keypad key PF1 plus RETURN moves back one page in the file. Press key PF1 as often as needed, then press RETURN, to page backward by two or more pages.
LINEUP	Keypad key 2 plus RETURN moves the current line to the top of the screen.
LINEDN	Keypad key PF2 plus RETURN positions the current line to the bottom of the screen.
INSC	Keypad key 3, pressed as often as needed, plus RETURN inserts the desired number of characters at the position marked by the cursor.
DELC	Keypad key PF3 plus RETURN deletes the current character marked by the cursor. The PF3 key can be pressed several times before the RETURN key to delete more than one line, but you will not see the results until you press the RETURN key.
INSL	Keypad key 4, pressed as often as needed, plus RETURN, inserts the desired number of blank lines over which new text can be typed.
DELL	Keypad key PF4 plus RETURN deletes the current line. Press the PF4 key several times for more than one delete; you will not see the results until you press the RETURN key.
MARK	Keypad key 5 plus RETURN the first time marks a line or beginning of a range of lines you wish to select for later use with another directive. Use the cursor to locate the end of a range of lines you wish to select and press the MARK key plus RETURN to close the range of lines selected.
UNDO	Keypad key "-" plus RETURN undoes the most recent change. You can press UNDO repeatedly until all changes made during the current editing session are canceled.
MOVE	Keypad key 6 plus RETURN moves any previously marked text to before the current line or character.
COPY	Keypad key "," plus RETURN copies any marked text to before the current line or character. If there is no marked text, the current line is copied. Press more than once to create multiple copies.
HELP	Keypad key 7 plus RETURN displays the FSE help file.
HOME	Keypad key ENTER plus RETURN positions the cursor on the directive line.
QUIT	Keypad key 8 plus RETURN stops the current editing session. If your file is an indirect access file, the changes you've made will not become permanent when you end the terminal session. If your file is direct access, the changes will become permanent.

- CLEAR** Keypad key "." plus RETURN clears your screen.
- ENDLIN** Keypad key 9 plus RETURN moves the cursor to the end of the current line.
- UNMARK** Not implemented on a VT100. See the SET KEY directive in the *NOS Full Screen Editor User's Guide*.

Z19/Z29

The following summary is for the Z19/Z29 function keys and keypad keys. The commands are organized according to the command squares that appear along the bottom of the FSE screen. (Note that, on the Z19 and Z29 terminals, shifted keypad commands require you to hold down the SHIFT key while you press the indicated keypad key.)

Function	Description
FWD	Lowercase f1 plus RETURN moves your cursor forward one page in the file.
MARK	Shifted keypad 1 key plus RETURN the first time marks a line or the beginning of a range of lines for later use with another directive. Use the cursor to locate the end of a range of lines you wish to select and press the shifted keypad 1 key plus RETURN to close the range of lines selected.
BKW	Lowercase f2 plus RETURN moves back one page in the file.
MRKCHR	Shifted keypad 2 key plus RETURN the first time marks a character or the beginning of a range of characters for later use with another directive. Use the cursor to locate the end of a range of characters you wish to select and press the shifted Keypad 2 key plus RETURN to close the range of characters selected.
LINEUP	Lowercase f3 plus RETURN moves the text beginning with the current line to the top of the screen.
LINEDN	Lowercase f4 plus RETURN positions the text previous to the current line to the bottom of the screen.
COPY	Shifted keypad 4 key plus RETURN copies any marked text to before the current line or character. If there is no marked text, the current line is copied. Press more than once to create multiple copies.
ENDLIN	Lowercase f5 plus RETURN moves the cursor to the end of the current line.
MOVE	Shifted keypad 5 key plus RETURN moves any marked text to before the current line or character.
UNDO	Lowercase f6, the blue square key, undoes the most recent change. You can press UNDO repeatedly until all changes made during the current editing session are cancelled.
QUIT	Lowercase f7, the red square key, plus RETURN stops the current editing session. If your file is an indirect access file, the changes you've made will not become permanent when you end the terminal session. If your file is direct access, the changes will become permanent.
LEFT	Shifted keypad 7 key plus RETURN shifts your view of the file to the left.
HELP	Lowercase f8, the white square key, plus RETURN displays the FSE help file.
RIGHT	Shifted keypad 8 key plus RETURN shifts your view of your file to the right.

FSE Directives

The following is a list of the directives to be used with FSE. For directive syntax, common parameters, specific parameters for each directive, and advanced FSE functions (specifying micros, redefining Programmable Function Keys, and changing screen format), see the Directive chapter in the *NOS Full Screen Editor User's Guide*, or use the FSE HELP function.

ALTER	DELETE	HELP	PRINT	TEACH	. "DOT"
BACK	EDIT	INSERT	QUIT	UNDO	- "DASH"
COPY	FSE	LOCATE	REPLACE	UNMARK	-- "COMMENT"
DATA	GET	MOVE	SET	VIEW	/ "SLASH"

To access the help file on a VT100, press ENTER, then RETURN, to move the cursor to the directive line, then type in the directive HELP and press RETURN. The number 7 keypad key plus RETURN will also access the help file on a VT100. On the Zenith terminals, press the f8 key plus RETURN.

FSE will display the first window of the help file. To page through the file, press the number 1 on the keypad for a VT100, or the f1 key on a Zenith terminal, and press RETURN. The help file can be searched for a directive by keying in HELP followed by a space and the directive name on the directive line. To leave HELP, move the cursor to the directive line as described above, type EDIT, and press RETURN. The help screen will disappear and the cursor will return to the edit screen.

To leave FSE, move the cursor to the directive line as described above and type QUIT.

Remember, if you are editing an indirect access file, you must RETAIN your file after leaving FSE, or key in QUIT REPLACE (QR) on the directive line to exit FSE and write your changes to your permanent file.

Documentation

See the *Full Screen Editor User's Guide* (a CDC publication), which you need to order directly from the Control Data Corporation. Staff at the ACSS Computing Information Center (128A Lind Hall) can provide information on ordering vendor-published documentation. Reference copies of the *User's Guide* and this *Brief* are also available in the ACSS Computing Information Center. For multiple copies of this (or any other) *Brief*, call Paula Goblrirsch at 626-1093. Most of this *Brief* is also available on line as WRITEUP,FSE.

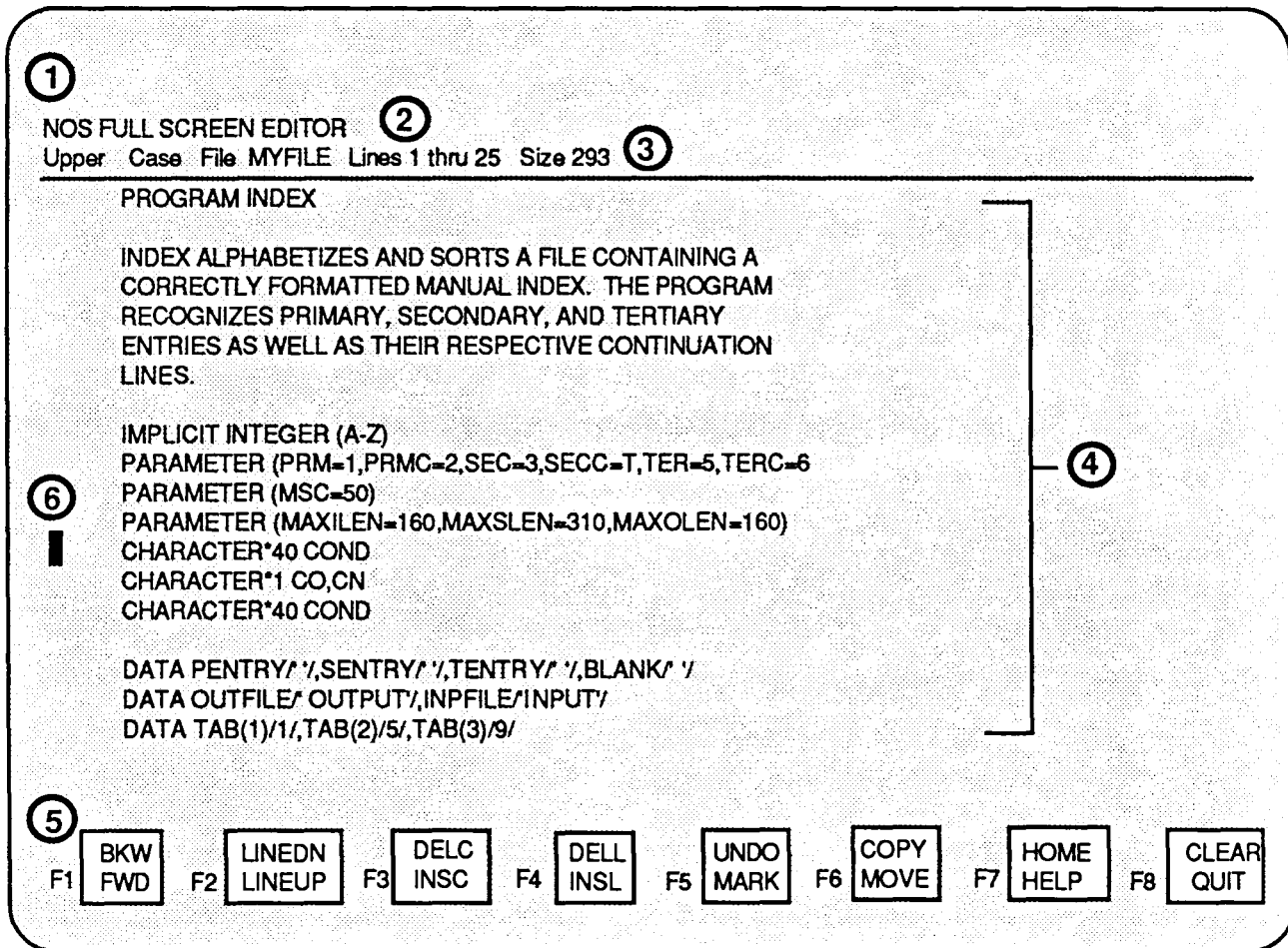


Figure 1: The FSE Screen - VT100

1. This is the **Directive Line**, on which FSE directives are to be entered. To position the cursor at this line, press the ENTER key, then RETURN.
2. This is the **Message Line** for FSE messages and prompts.
3. This is the **File Header**, which gives the current file information. If the file is upper- and lowercase, no prefix to the file name appears.
4. The contents of the file.
5. These represent the **Programmable Function Key** prompts. More is said about these elsewhere in this *Brief*.
6. This is the **cursor**, showing your current position in the file.

The above screen is adapted from CDC's *NOS Full Screen Editor User's Guide*.

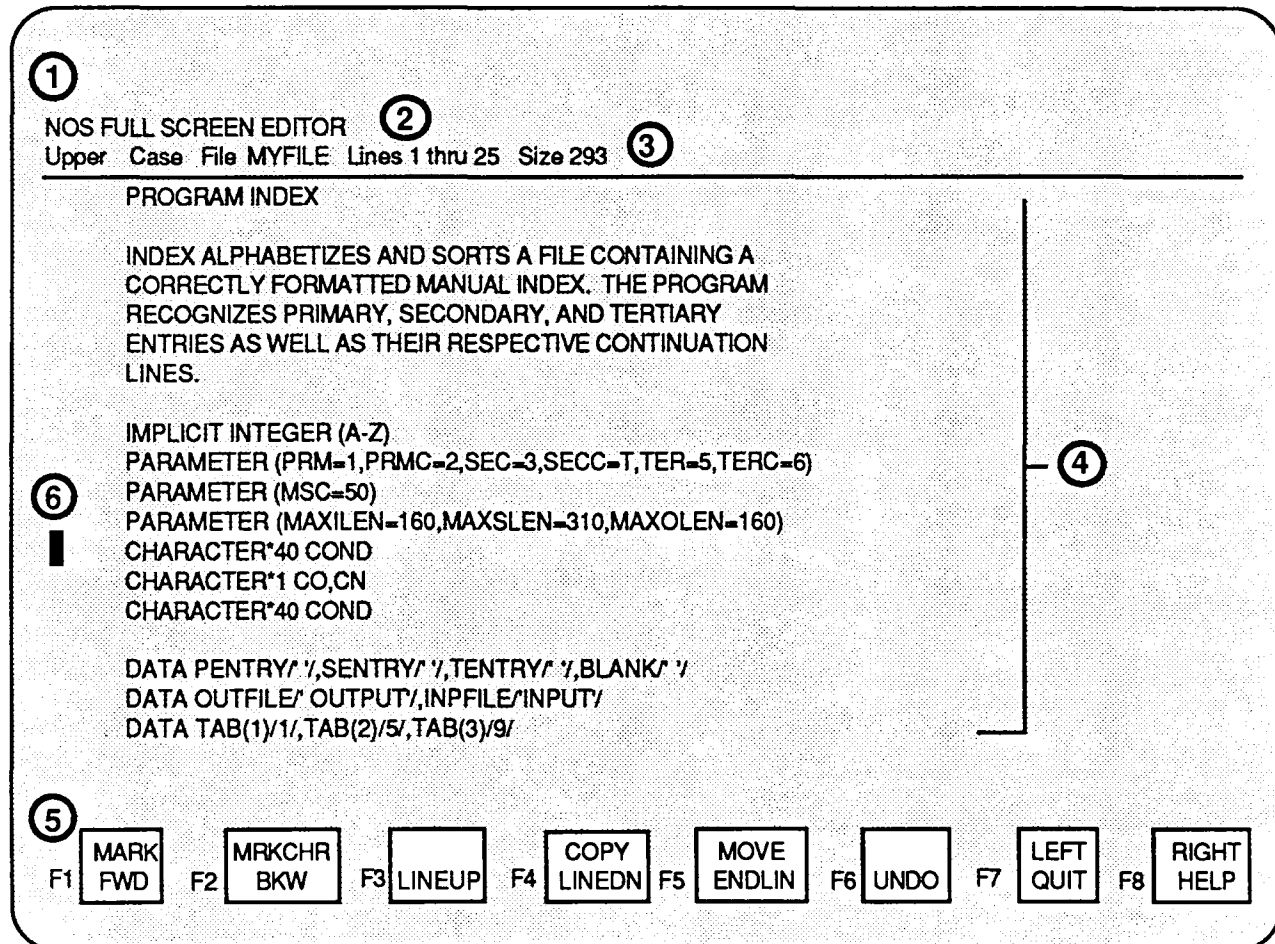


Figure 2: The FSE Screen - Z19/29

1. This is the **Directive Line**, on which FSE directives are to be entered. To position the cursor at this line, press the ENTER key, then RETURN.
2. This is the **Message Line** for FSE messages and prompts.
3. This is the **File Header**, which gives the current file information. If the file is upper- and lowercase, no prefix to the file name appears.
4. The contents of the file.
5. These represent the **Programmable Function Key** prompts. More is said about these elsewhere in this *Brief*.
6. This is the **cursor**, showing your current position in the file.

The above screen is adapted from CDC's *NOS Full Screen Editor User's Guide*.

ACSS Brief

NV Mainframe System

Academic Computing Services and Systems • University of Minnesota • Twin Cities

Using the EDIT_FILE Editor

This ACSS Brief introduces users of ACSS's CYBER NOS/VE mainframe computer (the NV system) to Control Data Corporation's (CDC) EDIT_FILE editor (EDIF) by explaining how to start an editing session, and summarizing the editing and programmable function keys on a VT100 terminal.

To use CDC's EDIF in its full-screen mode, you must have a terminal with a numeric keypad as well as a keyboard. The terminals that CDC has defined for EDIF are listed in the "Getting Started" section of this Brief.

If you do not find your terminal listed, or your site has not yet defined your terminal for EDIF, you may be able to define it yourself. Refer to the CDC manual *Terminal Definition for NOS/VE Usage*. It is available in the ACSS Computing Information Center, 128A Lind Hall.

This Brief describes how to use EDIF on a VT100 terminal. Equivalent instructions for other terminals can be found in Chapter 11, "Using Other Terminals in Screen Mode" of the *Full-Screen NOS/VE File Editor Tutorial/Usage* manual. Those interested in line editing should see Chapter 5 of the manual.

Getting Started

To log in to the NV system, you simply respond with the system code (NV) in response to the ACSS Network prompt. More information on logging in can be found in the ACSS Brief *CYBER/VE Access*.

Below is a sample log-in session.

```
ACSS-net (CA,NV,VX,UX,IB,HS) ?      {Type nv.}
connected
```

```
Enter validation for service access.
```

```
User: username <CR>
```

```
Password: password <CR>
```

```
Family: <CR>
```

```
Welcome to the NOS/VE Software System
```

```
Copyright Control Data 1983, 1987.
```

```
CYBER 830 Class SN244,244. NOS/VE 1.2.2 L678
```

```
September 30, 1987. 12:36 PM.
```

```
IT/ACSS NOS/VE Normal production time.
```

```
/
```

Once you have logged in to NV, your default catalog will be \$LOCAL. However, your text files will not be saved on \$LOCAL when you log out. You must set your catalog to catalog \$user. To do this, use the SET_WORKING_CATALOG command (SETWC):

```
/setwc $user
```

Establish the screen mode appropriate for your terminal with the command `CHANGE_TERMINAL_ATTRIBUTE` (CHATA) with the `TERMINAL_ATTRIBUTE` (TM) parameter:

```
/chata tm=dec_vt100
```

The following table gives the predefined screen mode codes for EDIF:

<u>Terminal</u>	<u>Code</u>
CDC Viking 721	CDC_721
CDC 722	CDC_722
CDC 722-30	CDC_722_30
DEC VT100	DEC_VT100
Zenith Z19/Z29 and Heathkit H19	ZEN_19 or ZEN_29
IBM PC	PC_CONNECT_10, PC_CONNECT_11 or PC_CONNECT_12
with CDC CONNECT for IBM PC V1.0, CDC CONNECT V1.1 or CDC CONNECT V1.2	
Macintosh	MAC_CONNECT_10 or MAC_CONNECT_11
with CDC CONNECT for Macintosh V1.0 or Macintosh V1.1	

Finally, set your terminal for screen mode with the command `CHANGE_INTERACTION_STYLE` (CHAI):

```
/chais s=screen
```

To run EDIF, enter:

```
/edif myfile
```

If `myfile` does not exist, EDIF will create it. If `myfile` is an existing file, the first page of data or text in the file will appear in the EDIF screen.

When EDIF opens the file, it will redraw your screen (reproduced in a figure at the end of this Brief). In reading the following sections, you may sometimes need to refer to this figure; note particularly the Directive Line.

Editing Keys

The directions that follow are for the VT100 and those terminals and microcomputers that emulate VT100s. Remember, these keys will vary if you are using other kinds of terminals. See Chapter 11, "Using Other Terminals in Screen Mode" of the manual *Full-Screen Editor for NOS/VE Tutorial/Usage* for the equivalent keys for your terminal.

Every text editor has its own logic and requires some practice before you can use it efficiently. Be forewarned that, when you strike some editing keys in EDIF, it causes characters to appear on your screen where your cursor was. These characters are not written to your file and disappear when you complete the command sequence by pressing RETURN.

Positioning the cursor: Use the arrow keys located above the main keyboard to move your cursor around the screen. The arrow keys automatically repeat when held down on the VT100.

Correcting text: Most minor text corrections can be made by positioning the cursor at the start of the text to be corrected and typing over the existing text.

Inserting characters: Position the cursor at the point where you wish to insert text, press the number 7 keypad key once for every character to be inserted, then RETURN, and add the text.

Inserting lines: Position the cursor anywhere in the line before which you want to insert the line(s) and press the number 8 keypad key as many times as needed and then press RETURN.

Deleting characters: Position the cursor on the first character you wish to delete and press the ENTER keyboard key once for every character to be deleted and then press RETURN.

Deleting lines: Position the cursor anywhere on the first line you wish to delete and press the PERIOD keypad key as many times as needed and then RETURN.

Paging forward: Press the number 2 key of the keypad as many times as needed and then RETURN.

Paging backward: Press the 1 keypad key as many times as needed and then press RETURN.

Programmable Function Keys

EDIF requires you to use "programmable function keys." When you use EDIF with the VT100 you use the VT100's keypad keys instead. The list below gives the keypad equivalents of function keys. (Keys F9 through F16 are not generally available on any of the other predefined terminals.) If you have a CDC Viking 721, see the the "Basics" chapter of the manual *NOS/VE File Editor Tutorial/Usage*.

In the following summary, the commands are organized according to the command squares that appear along the bottom of the EDIF screen.

Function Description

FIRST	Keypad key PF1 plus RETURN returns the cursor to the first character of the first line of the file.
BKW	Keypad key 1 plus RETURN moves back one page in the file. Press key 1 as often as needed, then press RETURN, to page backward by two or more pages.
LAST	Keypad key PF2 plus RETURN moves the cursor to the end of file.
FWD	Keypad key 2 plus RETURN moves your cursor forward one page in the file. Press key 2 as often as needed, then press RETURN, to page forward by two or more pages.
HOME	Keypad key PF3 plus RETURN positions the cursor on the directive line.
BACK	Keypad key 3 plus RETURN returns you to a previous editing session in suspension. To start a second editing session, use the command EDIF filename .
COPY	Keypad key PF4 plus RETURN copies any marked text to before the current line or character. If there is no marked text, the current line is copied. Press more than once to create multiple copies.
HELP	Keypad key 4 plus RETURN displays the EDIF help file.
UNDO	Keypad key 5 plus RETURN undoes the most recent change. You can press the UNDO key repeatedly until all changes made during the current editing session are canceled. UNDO will also unmark MARKed text.
EXIT	The comma key on the keypad plus RETURN will exit your editing session without making any changes to your file. You will be prompted to verify your decision to abandon the session:

Reply Y to abandon edit session, or N to resume session

- QUIT Keypad key 6 plus RETURN stops the current editing session and the changes you've made will become permanent.
- DELCH Keypad key ENTER plus RETURN deletes the current character marked by the cursor. The ENTER key can be pressed several times before the RETURN key to delete more than one character, but you will not see the results until you press the RETURN key.
- INSCH Keypad key 7 pressed as often as needed, plus RETURN inserts the desired number of characters at the position marked by the cursor.
- DELLN The period (or decimal) key on the keypad, followed by RETURN, deletes the current line. Press the key several times for more than one delete; you will not see the results until you press the RETURN key.
- INSLN Keypad key 8 pressed as often as needed, plus RETURN, inserts the desired number of blank lines over which new text can be typed.

The following keys are not normally displayed on the EDIF screen. They are

- MARK Keypad key 0 plus RETURN the first time marks a line or beginning of a range of lines you wish to select for later use with another directive. Use the cursor to locate the end of a range of lines you wish to select and press the MARK key plus RETURN to close the range of lines selected. To unmark MARKed text, use the UNDO key plus RETURN.
- MOVE Keypad key 9 plus RETURN moves any previously marked text to before the current line or character.

Documentation

See the manual *NOS/VE File Editor Tutorial/Usage*, which you can order directly from the Control Data

①

Reply Y to abandon edit session, or N to resume session ②

File: MYFILE Lines 1 Thru 25 Size 293 ③

PROGRAM INDEX

INDEX ALPHABETIZES AND SORTS A FILE CONTAINING A CORRECTLY FORMATTED MANUAL INDEX. THE PROGRAM RECOGNIZES PRIMARY, SECONDARY, AND TERTIARY ENTRIES AS WELL AS THEIR RESPECTIVE CONTINUATION LINES.

IMPLICIT INTEGER (A-Z) ④
PARAMETER (PRM=1,PRMC=2,SEC=3,SECC=4,TER=5,TERC=6)
PARAMETER (MSC=50)
PARAMETER (MAXILEN=160,MAXSLEN=310,MAXOLEN=160)
CHARACTER*40 COND
CHARACTER*1 COND
CHARACTER*40 COND

DATA PENTRY'/,SENTRY'/,TENTRY'/,BLANK' '
DATA OUTFILE'/OUTPUT',INPFILE'/INPUT'
DATA TAB(1)/1/,TAB(2)/5/,TAB(3)/9/

⑥

⑤ p1 First p2 Last p3 Home p4 Copy k- k, Exit ke DelCh k. DelLn
k1 Bkw k2 Fwd k3 Back k4 Help k5 Undo k6 Quit k7 InsCh k8 InsLn

Corporation. Staff at the ACSS Computing Information Center (128A Lind Hall) can help you order this manual and other vendor-published documentation. Reference copies of the *Tutorial* and free copies of this Brief are also available in the Computing Information Center, 128 A Lind Hall.

The EDIT_FILE Screen - VT100

1. This is the **Directive Line**, on which EDIF directives are to be entered. To position the cursor at this line, press the ENTER key, then RETURN.
2. This is the **Message Line** for EDIF messages and prompts.
3. This is the **File Header**, which gives the current file information. If the file is upper- and lowercase, no prefix to the file name appears
4. The contents of the file.



 **UCC BRIEF****VAX/VMS ACCESS**

UCC's VAX/VMS system provides general interactive computing with an emphasis on text processing and graphics services. Languages available are: FORTRAN, COBOL, and Pascal. Packages available include: TELL-A-GRAF, DISSPLA, and MNCORE (graphics); Scribe (text formatter); EDT (screen editor); SIR (database); and SPSS (statistics).

This *UCC Brief: VAX/VMS Access* tells you the bare minimum you need to know to get logged-on to the VAX for the first time, then points you to other documents that will take you further.

USERNAME

To use UCC's VAX/VMS system you need a VMS username, available from the UCC Accounts Manager (373-4548).

You have your choice of usernames. It can be a CYBER account number, or something more intuitive like your initials or last name. Short is better than long. Tell the Accounts Manager what you want your username to be.

TERMINALS

Terminals are the only way to access the VAX/VMS system; it has no card reader. You can use your own terminal and modem, your department's (if it supplies such equipment), or UCC's public research cluster terminals: high-speed VT100 terminals with graphics capability found in 14 Folwell Hall and 167B Social Sciences.

Reserve Folwell Hall terminals at 376-2741. You do not have to reserve 167B Social Sciences terminals, but the room is kept locked. Check out the key in 90 Blegen Hall. (Knock on the door in 90 Blegen if the operator isn't visible.)

CONNECTION**Dial-Up¹**

The 300 baud number is 376-9770. The 1200 baud number is 376-8070.

1. Turn on the terminal. Make sure it is set to FULL DUPLEX and NO PARITY.

¹Novices may become confused at this point. (What is a "Baud," anyway?) Ask someone in your office situation who knows about such things to help you. The UCC publication *Introduction to Computing*, available from the Computer Store, can also help you.

2. Dial the appropriate number for your modem's speed.
3. The VAX will answer with a high-pitched "eeeeeeeeee" sound.
 - a. If your modem has a coupler for the phone's handset (usually 300 baud), place the handset into the modem's cups.
 - b. If your modem is a dataset (usually 1200 baud), then press the button and put the handset back in its cradle.

Research Clusters

The research cluster terminals are "hardwired" to the VAX. You do not dial-up. Instead:

1. Turn the terminal on (switch on back, lower left corner). If the terminal was already on, press the SET-UP key at the upper left of the keyboard, then the "0" (zero) key. This resets all terminal settings to the default.
2. Find the T-bar box next to the terminal. Flip the switch to "VAX/VMS".

LOG-ON

Press the RETURN key several times until VMS says:

Username:

Type your VMS username, as given to you by the Accounts Manager. Then press RETURN. VMS replies:

Username: YOURS
Password:

Type the password given to you by the Accounts Manager, then press RETURN. (The password will not be displayed.)

If all goes well, VMS replies:

```
Welcome to VAX/VMS Version V2.5
University of Minnesota, Shepherd Labs VAX.  30 September 82, 11:42 P.M.
$
```

The \$ is the VMS system prompt. VMS is now waiting for your commands.

If all does not go well, VMS replies:

LOGIN - user validation error

You must analyze what you did wrong. Did you type the correct username, without any blanks in it? The correct password, again without blanks? To try again, just press carriage RETURN. VMS again prompts for your username. Proceed as before. If you cannot get logged on, call the UCC HELP-line at 376-5592.

LOG-OFF

To log-off VMS, enter:

```
$ logoff
```

VMS replies:

```
USERNAME    logged out at 1 OCT 82 00:15:30.02
```

IT IS IMPERATIVE THAT YOU EXPLICITLY LOG-OFF THE RESEARCH CLUSTER TERMINALS! IF YOU JUST TURN OFF THE TERMINAL AND WALK AWAY, YOU ARE STILL LOGGED ON!

For dial-up terminals, turn your terminal OFF after you have logged out, and HANG UP the phone, or VMS will not drop the phone connection and you will be wasting a port.

SPECIAL KEYS

To backup to correct a typing error: the DELETE key.
Do NOT use the BACKSPACE key!

To cancel a line: CTRL-U
(Hold down the CTRL (control) key while pressing U.)

To make a listing pause, then resume: CTRL-O or NO SCROLL, CTRL-O

To cancel print-out in progress at a terminal: CTRL-C

To "bail-out" of any facility, terminate a program: CTRL-Y

WHAT DO YOU DO ONCE YOU'VE LOGGED IN?

The best way to get a nodding familiarity with VMS is to work your way through Chapters 1, 2, & 4 of the *VMS Primer*. This is an excellent tutorial introduction to the system and its basic concepts.

You can buy a *VMS Primer* from the UCC Computer Store, or you can save some money and just check out a copy for a few days from the UCC Reference Room. The Computer Store is in 211 Experimental Engineering and the Reference Room is in 140 Experimental Engineering.

DOCUMENTATION

On-line

VMS has an excellent interactive HELP facility that lets you get information on how to use the system from the system itself. Once logged in, type HELP to see the list of topics and follow instructions. Additional information is available with the MOREHELP command. Type MOREHELP to see the list of topics. Here are some things to explore:

```
HELP SET PASSWORD
MOREHELP HOURS
MOREHELP CONSULTING
```

```
MOREHELP OUTPUT
MOREHELP WRITEUPS
```

Printed

The basic reference manual for VMS is the *VAX/VMS Command Language User's Guide*. Beyond that there are some 30 additional manuals published by DEC and other vendors describing VMS and packages such as TELL-A-GRAF, Scribe, and SIR.

If you are at a loss for what to buy, visit the Reference Room in 140 Experimental Engineering, ask for help, and peruse the collection of manuals.

Microfiche and printed copies of some VMS manuals are available for on-site reference use in 14 Folwell Hall, 90 Blegen Hall, and 130 Experimental Engineering.

CONSULTING

Consultants are available to answer your questions in 140 Experimental Engineering. Type MOREHELP CONSULTING for details. The UCC HELP-line is open to answer phone questions 9 a.m. to 5 p.m., Mondays through Fridays. Call 376-5592.

CLASSES

UCC teaches short courses on VMS and its applications software each quarter and once during the summer. Call 376-8806 for the current short course schedule. There are nominal fees for these courses.


 **UCC BRIEF**

VAX/VMS ACCESS

UCC's VAX/VMS system provides general interactive computing with an emphasis on text processing and graphics services. Languages available are: FORTRAN, COBOL, and Pascal. Packages available include: TELL-A-GRAF (interactive graphics), DISSPLA, and MNCORE (graphics); Scribe (text formatter); EDT (screen editor); SIR (database); and SPSS (statistics).

Graphics output devices connected to the VAX are: Printronix low-resolution dot-matrix plotter, CalComp 4-color pen plotter, and Dicomed D47 and D48 film recorders that produce high-resolution color images on 4x5 Polaroid film, 4x5 sheet film, and 35 mm film (slides and movies). Text processing output devices connected to the VAX are: Printronix dot-matrix printer, NEC Spinwriter Diablo-type letter quality printer, and Xerox 9700 laser printer.

Lastly, the VAX is a front-end to the CRAY-1. Thus, you can easily submit jobs to the CRAY-1 from the VAX, combining the advantages of the VAX's friendly environment for job preparation and the CRAY's processing power.

This *UCC Brief: VAX/VMS Access* tells you the bare minimum you need to know to get logged-on to the VAX for the first time, then points you to other documents that will take you further.

USERNAME

To use UCC's VAX/VMS system you need a VMS username, available from the UCC Accounting Office (373-4548).

You have the right to choose any username you want. It can be something intuitive like your initials or last name, or it can be a CYBER account number. Short is better than long. Tell the Accounting Office what you want your username to be.

TERMINALS

Terminals are the only way to access the VAX/VMS system; it has no card reader. You can use your own terminal and modem, your department's (if it supplies such equipment), or UCC's public research cluster terminals: high-speed VT100 terminals with graphics capability found in 14 Folwell Hall and 25 Blegen Hall.

Reserve Folwell Hall terminals by calling 376-2741. You do not have to reserve 25 Blegen Hall terminals, but you should call that facility first (373-5599) to find out their conventions for using the terminals. Public research terminal clusters are planned for 69 Physics and 130 Experimental Engineering by January, 1984.

CONNECTION

Dial-Up¹

You access the VAX by dialing either 376-9770 or 376-8070. Both numbers are *autobaud*. This means that both work at either 300 or 1200 baud.

1. Turn on the terminal. Make sure it is set to FULL DUPLEX and NO PARITY. The VAX also requires 8-bit ASCII and 1 stop bit, if your terminal has these settings. The VAX should never be used at half duplex.
2. Dial either phone number. If one is busy, try the other.
3. The VAX will answer with a high-pitched "eeeeeeeeee" sound.
 - a. If your modem has a coupler for the phone's handset (usually 300 baud), place the handset into the modem's cups.
 - b. If your modem is a dataset (usually 1200 baud), then press the button and put the handset back in its cradle.

Research Clusters

The research cluster terminals are "hardwired" to the VAX. You do not dial-up. Instead:

1. Turn the terminal on (switch on back, lower left corner). If the terminal was already on, press the SET-UP key at the upper left of the keyboard, then the "0" (zero) key. This resets all terminal settings to the default.
2. Find the T-bar box next to the terminal. Flip the switch to "VAX/VMS".

LOG-ON

Press the RETURN key several times until VMS says:

Username:

Type your VMS username, as given to you by the UCC Accounting Office. Then press RETURN. VMS replies:

Username: YOURS

Password:

Type the password given to you by the Accounting Office, then press RETURN. (The password will not be displayed.)

If all goes well, VMS replies:

Welcome to VAX/VMS Version V3.3

University of Minnesota -- 30 September 83, 11:42 P.M.

\$

¹Novices may become confused at this point. (What is a "Baud," anyway?) Ask someone in your office situation who knows about such things to help you. The UCC publication **Introduction to Computing**, available from the Computer Store, can also help you.

The \$ is the VMS system prompt. VMS is now waiting for your commands.

If all does not go well, VMS replies:

```
User authorization failure
```

You must analyze what you did wrong. Did you type the correct username, without any blanks in it? The correct password, again without blanks? To try again, just press carriage RETURN slowly and repeatedly until VMS again prompts for your username. Proceed as before. If you cannot get logged on, call the UCC HELP-line at 376-5592.

LOG-OFF

To log-off VMS, enter:

```
$ logoff
```

VMS replies:

```
USERNAME    logged out at 1 OCT 82 00:15:30.02
```

VMS does not time-out terminal sessions.

IT IS IMPERATIVE THAT YOU EXPLICITLY LOG-OFF THE RESEARCH CLUSTER TERMINALS! IF YOU JUST TURN OFF THE TERMINAL AND WALK AWAY, YOU ARE STILL LOGGED ON!

For dial-up terminals, turn your terminal OFF after you have logged out, and HANG UP the phone, or VMS will not drop the phone connection and you will be wasting a port.

SPECIAL KEYS

When you use the VMS system, you type certain terminal keys and key combinations to signal special situations. These are listed below. The most confusion is caused by the DELETE and BACKSPACE keys. **On VMS, you use the DELETE key to back up to correct a typing mistake. DO NOT use the BACKSPACE key!** The DELETE key is sometimes labeled RUBOUT. This is different from the way that the UCC Cyber and many other computers work. If you use BACKSPACE (control-H) instead of DELETE, it will appear to be working correctly, but VMS will reject your commands with an "unrecognized command" error message.

To backup to correct a typing error: the DELETE key.

Do NOT use the BACKSPACE key!

To cancel a line: CTRL-U

(Hold down the CTRL (control) key while pressing U.)

To make a listing pause, then resume: CTRL-S to pause, then CTRL-Q to resume. On VT100-type terminals, use the NO SCROLL key: once to pause and again to resume listing.

To cancel print-out in progress at a terminal: CTRL-C

To "bail-out" of any facility, terminate a program: CTRL-Y

WHAT DO YOU DO ONCE YOU'VE LOGGED IN?

The best way to get a nodding familiarity with VMS is to work your way through Chapters 1, 2, 3, & 6 of the *VMS Primer*. This is an excellent tutorial introduction to the system and its basic concepts.

You can buy a *VMS Primer* from the UCC Computer Store, or you can save some money and just check out a copy for a few days from the UCC Reference Room or use the shelf copies in 14 Folwell and 25 Blegen. The Computer Store is in 20 Experimental Engineering and the Reference Room is in 140 Experimental Engineering.

DOCUMENTATION

On-line

VMS has an excellent interactive HELP facility that lets you get information on how to use the system from the system itself. Once logged in, type HELP to see the list of topics and follow instructions. Additional information is available with the MOREHELP command. Type MOREHELP to see the list of topics. Here are some things you should explore:

HELP SET PASSWORD
MOREHELP HOURS
MOREHELP CONSULTING

MOREHELP OUTPUT
MOREHELP WRITEUPS
MOREHELP TAPES

Printed

The basic reference manual for VMS is the *VAX/VMS Command Language User's Guide*. Beyond that there are some 30 additional manuals published by DEC and other vendors describing VMS and packages such as TELL-A-GRAF, Scribe, and SIR.

If you are at a loss for what to buy, visit the Reference Room in 140 Experimental Engineering, ask for help, and peruse the collection of manuals.

Microfiche and printed copies of some VMS manuals are available for on-site reference use in 14 Folwell Hall, 25 Blegen Hall, 90 Blegen Hall, and 130 Experimental Engineering.

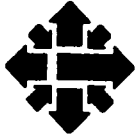
CONSULTING

Consultants are available to answer your questions in 140 Experimental Engineering. Type MOREHELP CONSULTING for details. The UCC HELP-line is open to answer phone questions 9 a.m. to 5 p.m., Mondays through Fridays. Call 376-5592.

CLASSES

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SEP83:LBM



ACSS BRIEF

VAX/VMS ACCESS

ACSS's VAX/VMS system provides users general interactive computing, with an emphasis on text processing and graphics services. A Printronix dot-matrix printer and a Xerox 9700 laser printer are available for text processing output; graphics output devices consist of a Printronix low-resolution dot-matrix plotter and a CalComp 4-color pen plotter. FORTRAN and Pascal languages are available on the VAX, and system packages include EDT (a screen editor), DISSPLA and TELL-A-GRAF (graphics), and SIR (a data base system).

This *Brief* presents the minimum information you need to know to log on to the VAX for the first time and then discusses other sources that will provide you with additional information on the system.

USERNAME

To use ACSS's VAX/VMS system you need a VMS username, available from the ACSS Accounting Office, 7 Wulling Hall (373-4548). You may choose any username you want. It can be something intuitive like your initials or last name, or it can be a CYBER account number. Short is better than long. Tell the Accounting Office what you want your username to be.

TERMINALS

Terminals are the only way to access the VAX/VMS system; it has no card reader. You can use your own terminal and modem, your department's (if it supplies such equipment), or ACSS's public research cluster terminals. High-speed VT100 terminals, some with graphics capability, are found in 14 Folwell Hall, 128B Lind Hall, 25 Blegen Hall, and 69 Physics. You may reserve Folwell Hall terminals by calling 376-2741. You cannot reserve terminals at the other sites.

CONNECTION

Dial Up¹

Dial 376-8070 to access the VAX. This number is *autobaud*, which means that it works at either 300 or 1200 baud.

1. Turn on the terminal. Make sure it is set to FULL DUPLEX and NO PARITY. The VAX also requires 8-bit ASCII and 1 stop bit if your terminal has these settings. The VAX should never be used at half duplex.
2. Dial the phone number. The VAX will answer with a high-pitched "eeeeeeeeee" sound.
 - a. If your modem has a coupler for the phone's handset (usually 300 baud), place the handset into the modem's cups.
 - b. If your modem is a dataset (usually 1200 baud), press the button and put the handset back in its cradle.

¹Novices may become confused at this point. (What is a "baud," anyway?) Ask someone in your office situation who knows about such things to help you. The UCC publication *Introduction to Computing*, available at the Electronics Desk in the Minnesota Book Center (Williamson Hall) or H. D. Smith Bookstore, can also help you.

Research Cluster

The research cluster terminals are "hardwired" to the VAX. You do not dial a phone number. Instead, turn the terminal on (the switch is on the back of the terminal in the lower left corner). If the terminal is already on, press the SET-UP key at the upper left of the keyboard and then the "0" (zero) key. This resets all terminal settings to the default.

LOG ON

Press the RETURN key several times until VMS says:

Username:

Type your VMS username, as given to you by the Accounting Office, and then press RETURN. VMS will reply:

Username: **YOURS**

Password:

Type the password given to you by the Accounting Office and then press RETURN. (The password will not be displayed.)

If all goes well, VMS will reply:

```
Welcome to VAX/VMS Version V3.6
University of Minnesota -- 30 September 85, 11:00 P.M.
$
```

The \$ is the VMS system prompt. VMS is now waiting for your commands. If all does not go well, VMS will reply:

```
User authorization failure
```

You must analyze what you did wrong. Did you type the correct username, without any blanks in it? The correct password, again without blanks? To try again, just press the carriage RETURN slowly and repeatedly until VMS again prompts for your username. Proceed as before. If you cannot get logged on, contact the ACSS HELP-line at 376-5592.

LOG OFF

To log off VMS, enter:

```
$ logoff
```

VMS will reply:

```
USERNAME      logged out at 30-SEP-1985 11:28:56.00
```

VMS does not time-out terminal sessions.

It is **imperative** that you explicitly log off the research cluster terminals! If you simply turn off the terminal and walk away, you are **still logged on!**

For dial-up terminals, turn your terminal OFF after you have logged out and HANG UP the phone, or VMS will not drop the phone connection and you will be wasting a port.

SPECIAL KEYS

When you use the VMS system, you type certain terminal keys and key combinations to signal special situations. These are listed below. The most confusion is caused by the DELETE and BACKSPACE keys. On VMS, you use the DELETE key to back up to correct a typing mistake. **DO NOT** use the BACKSPACE key! The DELETE

key is sometimes labeled RUBOUT. This is different from the way that the ACSS CYBER and many other computers work. If you use BACKSPACE (control [CTRL]-H) instead of DELETE, it will appear to be working correctly, but VMS will reject your commands with a "unrecognized command" error message.

- To back up to correct a typing error: the DELETE key. Do NOT use the BACKSPACE key!
- To cancel a line: CTRL-U (Hold down the CTRL key while pressing U.)
- To make a scrolling pause and then resume: CTRL-S to pause and then CTRL-Q to resume. On VT100 type terminals, use the NO SCROLL key, once to pause and again to resume listing.
- To cancel a printout in progress at a terminal: CTRL-C
- To "bail out" of any facility or terminate a program: CTRL-Y

WHAT DO YOU DO ONCE YOU'VE LOGGED IN?

The best way to get a nodding familiarity with VMS is to work your way through Chapters 1, 2, 3, and 6 of the *VMS Primer*. This is an excellent tutorial introduction to the system and its basic concepts. You can buy a *VMS Primer* from the University Bookstores, or you can save some money and just check out a copy for a few days from the ACSS Reference Room or use the shelf copies in 14 Folwell Hall. Go to the Electronics Desk in the Minnesota Book Center (Williamson Hall) or the H. D. Smith Bookstore (West Bank); the Reference Room is located in 128A Lind Hall.

DOCUMENTATION

On line

VMS has an excellent interactive HELP facility that lets you get information on system use from the system itself. Once logged in, type HELP to see the list of topics and then follow the instructions. Additional information is available with the MOREHELP command. Type MOREHELP to see the list of topics. Here are some things you can explore:

HELP SET PASSWORD	MOREHELP OUTPUT
MOREHELP HOURS	MOREHELP WRITEUPS
MOREHELP CONSULTING	MOREHELP TAPES

Printed

The basic reference manual for VMS is the *VAX/VMS Command Language User's Guide*. Beyond that, there are some 30 additional manuals published by DEC and other vendors describing VMS and applications packages such as SIR. If you are at a loss for what to buy, visit the Reference Room in 128A Lind Hall, ask for help, and examine the collection of manuals. Microfiche and printed copies of some VMS manuals are also available for on-site reference use in 14 Folwell Hall.

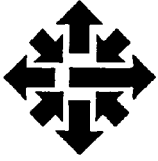
CONSULTING

Consultants are available to answer your questions in 128 Lind Hall. Type MOREHELP CONSULTING for details. The ACSS HELP-line is open for phone questions from 7 am to 7 pm, Mondays through Fridays. Call 376-5592.

CLASSES

ACSS teaches short courses on VMS and its applications software each quarter and once during the summer. Call 376-8806 for the current short course schedule.





ACSS Brief

VAX/VMS Access

ACSS's VAX/VMS system provides users general interactive computing, with an emphasis on text processing and graphics services. A Printronix dot-matrix printer and a laser printer are available for text processing output; graphics output devices are also available. FORTRAN, Pascal, COBOL, and other languages are available on the VAX, and system packages include EDT (a screen editor), DI-3000 (graphics), and SIR (a data base system).

This *Brief* presents basic information that you need to know to log on to the VAX for the first time and then discusses other sources that will provide you with additional information on the system.

USER NAME

To use ACSS's VAX/VMS system you need a VMS user name, available from the ACSS Accounting Office, 7 Wulling Hall (625-1511). To facilitate accounting, you will be assigned a VAX user name that is identical to your CYBER user name.

TERMINALS

Terminals are the only way to access the VAX/VMS system; it has no card reader. You can use your own terminal and modem, your department's (if it supplies such equipment), or ACSS's public labs. VT100 terminals, some with graphics capability, are found in 14 Folwell Hall, 128B Lind Hall, 25 Blegen Hall, 69 Physics and elsewhere. (See ACSS map of computing facilities for locations of labs and a list of terminals.) You may reserve Folwell Hall terminals by calling 376-2741 (after 5/24/86, 625-7850). You cannot reserve terminals at the other sites.

CONNECTION

Dial Up*

Dial 376-9070 to access the VAX. This number is *autobaud*, which means that it works at either 300 or 1200 baud.

1. Turn on the terminal. Make sure it is set to FULL DUPLEX and NO PARITY. The VAX also requires 8 bit ASCII and 1 stop bit if your terminal has these settings. The VAX should never be used at half duplex.
2. Dial the phone number. The VAX will answer with a high-pitched "eeeeeeeeee" sound.
 - a. If your modem has a coupler for the phone's handset (usually 300 baud), place the handset into the modem's cups.
 - b. If your modem is a dataset (usually 1200 baud), press the button and put the handset back in its cradle.

*Novices may become confused at this point. (What is a "baud," anyway?) Ask someone in your office situation who knows about such things to help you. The ACSS publication *Introduction to Computing*, available at the Electronics Desk in the Minnesota Book Center (Williamson Hall) or H. D. Smith Bookstore, can also help you.

Public Labs on Campus

The terminals located in campus Public Labs are "hardwired" to the VAX. You do not dial a phone number. Instead, turn the terminal on (the switch is on the back of the terminal in the lower left corner). If the terminal is already on, press the SET-UP key at the upper left of the keyboard and then the "0" (zero) key. This resets all terminal settings to the default.

LOG ON

Press the RETURN key several times until VMS says:

Username:

Type your VMS user name, as given to you by the Accounting Office, and then press RETURN. VMS will reply:

Username: **YOURS**
Password:

Type the password given to you by the Accounting Office and then press RETURN. (The password will not be displayed.)

If all goes well, VMS will reply:

```
Welcome to VAX/VMS version V4.2--22 April 86, 11:00 A.M.  
Academic Computing Services and Systems--University of Minnesota  
$
```

The \$ is the VMS system prompt. VMS is now waiting for your commands. If all does not go well, VMS will reply:

```
User authorization failure
```

You must analyze what you did wrong. Did you type the correct user name, without any blanks in it? The correct password, again without blanks? To try again, just press the carriage RETURN slowly and repeatedly until VMS again prompts for your user name. Proceed as before. If you cannot get logged on, contact the ACSS HELP-Line at 376-5592.

PASSWORDS

VMS 4.2 requires that your password be at least eight characters long. The system also requires you to change your password at least once every 30 days. If you do not change your password, it will expire.

When your password expires, the system will permit you to log on one more time, providing you with a system message that reminds you to change your password. If you do not change your password during this session, your password will no longer work. Don't let this happen to you; if, by some unavoidable circumstance, your password expires, call the HELP-Line (376-5592).

LOG OFF

To log off VMS, enter:

```
$ logoff
```

VMS will reply:

```
USERNAME logged out at 22-APR-1986 11:28:56.00
```

VMS does not time out terminal sessions.

It is **imperative** that you explicitly log off the research cluster terminals! If you simply turn off the terminal and walk away, you are **still logged on!**

For dial-up terminals, turn your terminal OFF after you have logged out and HANG UP the phone, or VMS will not drop the phone connection and you will be wasting a port.

SPECIAL KEYS

When you use the VMS system, you type certain terminal keys and key combinations to signal special situations. These are listed below. The most confusion is caused by the DELETE and BACKSPACE keys. On VMS, you use the DELETE key to back up to correct a typing mistake. DO NOT use the BACKSPACE key! The DELETE key is sometimes labeled RUBOUT. This is different from the way that the ACSS CYBER and many other computers work. If you use BACKSPACE (control [CTRL]-H) instead of DELETE, it will appear to be working correctly, but VMS will reject your commands with an "unrecognized command" error message.

--To back up to correct a typing error: the DELETE key. Do NOT use the BACKSPACE key!

--To cancel a line: CTRL-U (Hold down the CTRL key while pressing U.)

--To make a scrolling pause and then resume: CTRL-S to pause and then CTRL-Q to resume. On VT100-type terminals, use the NO SCROLL key, once to pause and again to resume listing.

--To cancel a printout in progress at a terminal: CTRL-C

--To "bail out" of any facility or terminate a program: CTRL-Y

WHAT DO YOU DO ONCE YOU'VE LOGGED IN?

One way to get a nodding familiarity with VMS is to work your way through Chapters 1, 2, 3, and 6 of the *VMS Primer*. This is an excellent tutorial introduction to the system and its basic concepts. You can buy a *VMS Primer* from the University Bookstores, or you can save some money and just check out a copy for a few days from the ACSS Reference Room or use the shelf copies in 14 Folwell Hall. Go to the Electronics Desk in the Minnesota Book Center (Williamson Hall) or the H. D. Smith Bookstore (West Bank); the Reference Room is located in 128A Lind Hall.

Another way to start learning VMS is to use the on-line tutorial package called *An Introduction to VMS*. (To use the *Introduction*, you must work at a VT100 terminal or a terminal or micro that emulates a VT100.) See the on-line document MOREHELP TRAINING for more information about the *Introduction* and other tutorials.

DOCUMENTATION

On line

VMS has an excellent interactive HELP facility that lets you get information on system use from the system itself. Once logged in, type HELP to see the list of topics and then follow the instructions. Additional information is available with the MOREHELP command. Type MOREHELP to see the list of topics. Here are some things you can explore:

HELP SET PASSWORD
MOREHELP HOURS
MOREHELP CONSULTING

MOREHELP PRINTED_OUTPUT
MOREHELP WRITEUPS
MOREHELP TRAINING

Users of our previous VMS machine, the VAX 11/780 (known as the VA) may also want to read the on-line document accessed with the command \$TYPE SYS\$WRITEUP:VMS42

Printed

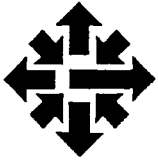
The basic reference manual for VMS is the *VAX/VMS Command Language User's Guide*. Beyond that, there are some 30 additional manuals published by the Digital Equipment Corporation (DEC) and other vendors which describe VMS and applications packages such as SIR. If you don't know which manual to buy or read, visit the Reference Room in 128A Lind Hall, ask for help, and examine the collection of manuals. Microfiche and printed copies of some VMS manuals are also available for on-site reference use in 14 Folwell Hall.

CONSULTING

Consultants are available to answer your questions in 128 Lind Hall. Type MOREHELP CONSULTING for details on this and other ACSS consulting services. The ACSS HELP-Line is open for phone questions from 8 am to 5 pm, Mondays through Fridays. Call 376-5592.

CLASSES

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ACSS Brief

VAX/VMS Access

ACSS's VAX/VMS system provides users general interactive computing, with an emphasis on text processing and graphics services. A Printronix dot-matrix printer and a laser printer are available for text processing output; graphics output devices are also available. FORTRAN, Pascal, COBOL, MACRO, and other languages are available on the VAX, and system packages include EDT (a screen editor), DI-3000 (graphics), and SIR (a data base system).

This *Brief* presents basic information that you need to know to log on to the VAX for the first time and then discusses other sources that will provide you with additional information on the system.

USER NAME

To use ACSS's VAX/VMS system you need a VMS user name, available from the ACSS Accounting Office, 7 Wulling Hall (625-1511).

TERMINALS

Terminals are the only way to access the VAX/VMS system; it has no card reader. You can use your own terminal and modem, your department's (if it supplies such equipment), or ACSS's public labs. VT100 terminals, some with graphics capability, are found in 14 Folwell Hall, 128B Lind Hall, 25 Blegen Hall, 69 Physics and elsewhere. (See Information Systems's map of computing facilities for locations of labs and a list of terminals.) You may reserve Folwell Hall terminals by calling 625-7850. You cannot reserve terminals at the other sites.

CONNECTION

Dial Up*

Dial 626-1641 to access the VAX. This number is *autobaud*, which means that it works at either 300 or 1200 baud.

1. Turn on the terminal. Make sure it is set to FULL DUPLEX and NO PARITY. The VAX also requires 8-bit ASCII and 1 stop bit if your terminal has these settings. The VAX should never be used at half duplex.
2. Dial the phone number. The VAX will answer with a high-pitched "eeeeeeeeee" sound.
 - a. If your modem has a coupler for the phone's handset (usually 300 baud), place the handset into the modem's cups.
 - b. If your modem is a dataset (usually 1200 baud), press the button and put the handset back in its cradle.

*Novices may become confused at this point. (What is a "baud," anyway?) Ask someone in your office situation who knows about such things to help you. The ACSS publication *Introduction to Computing*, available at the Electronics Desk in the Minnesota Book Center (Williamson Hall) or H. D. Smith Bookstore, can also help you.

Public Labs on Campus

The terminals located in campus Public Labs are "hardwired" to the VAX. Instead of dialing a phone number, turn the terminal on (the switch is on the back of the terminal in the lower left corner). The system will prompt you with

```
ACSS-net (CA,ME,MD,VX,UX,IB) ?
```

Respond by typing `VX` and pressing the RETURN key.

If the terminal is already on, press the SET-UP key at the upper left of the keyboard and then the "0" (zero) key to reset all terminal settings to the default before responding to the system prompt.

LOG ON

Press the RETURN key several times until VMS says:

```
Username :
```

Type your VMS user name, as given to you by the Accounting Office, and then press RETURN. VMS will reply:

```
Username: YOURS  
Password:
```

Type the password given to you by the Accounting Office and then press RETURN. (The password will not be displayed.)

If all goes well, VMS will reply:

```
Welcome to VAX/VMS version V4.2--22 April 86, 11:00 A.M.  
Academic Computing Services and Systems--University of Minnesota  
$
```

The \$ is the VMS system prompt. VMS is now waiting for your commands. If all does not go well, VMS will reply:

```
User authorization failure
```

Analyze what you did wrong. Did you type the correct user name, without any blanks in it? The correct password, again without blanks? To try again, just press the carriage RETURN slowly and repeatedly until VMS again prompts for your user name. Proceed as before. If you cannot get logged on, contact the ACSS HELP-Line (626-5592).

PASSWORDS

VMS 4.2 requires that your password be at least eight characters long. Your user name will have an assigned initial password that you should change as soon as you can. To change your password type:

```
set password
```

The system will prompt for the old password and then for the new one two times. If you have forgotten or mistyped your password, call the HELP-Line (626-5592).

LOG OFF

To log off VMS, enter:

```
$ logoff
```

VMS will reply:

```
USERNAME    logged out at 22-APR-1986 11:28:56.00
```

VMS does not time out terminal sessions.

It is **imperative** that you explicitly log off the research cluster terminals! If you simply turn off the terminal and walk away, you are **still logged on!**

For dial-up terminals, turn your terminal OFF after you have logged out and HANG UP the phone, or VMS will not drop the phone connection and you will be wasting a port.

SPECIAL KEYS

When you use the VMS system, you type certain terminal keys and key combinations to signal special situations. These are listed below. The most confusion is caused by the DELETE and BACKSPACE keys. On VMS, you use the DELETE key to back up to correct a typing mistake. DO NOT use the BACKSPACE key! The DELETE key is sometimes labeled RUBOUT. This is different from the way that the ACSS CYBER and many other computers work. If you use BACKSPACE (control [CTRL]-H) instead of DELETE, it will appear to be working correctly, but VMS will reject your commands with an "unrecognized command" error message.

--To back up to correct a typing error: the DELETE key. Do NOT use the BACKSPACE key!

--To cancel a line: CTRL-U (Hold down the CTRL key while pressing U.)

--To make a scrolling pause and then resume: CTRL-S to pause and then CTRL-Q to resume. On VT100-type terminals, use the NO SCROLL key, once to pause and again to resume listing.

--To cancel a printout in progress at a terminal: CTRL-C

--To "bail out" of any facility or terminate a program: CTRL-Y

WHAT DO YOU DO ONCE YOU'VE LOGGED IN?

One way to get a nodding familiarity with VMS is to work your way through the *VAX/VMS User's Introduction* (DEC publication number AA-Y500A-TE). This is an excellent tutorial introduction to the system and its basic concepts. You can order a the *Introduction* from the Information Desk in the Minnesota Book Center (Williamson Hall), or you can save some money and look at a copy from the ACSS Reference Room (128A Lind Hall) or use the shelf copies in 14 Folwell Hall.

Another way to start learning VMS is to use the on-line tutorial package called *An Introduction to VMS*. (To use the *Introduction*, you must work at a VT100 terminal or a terminal or micro that emulates a VT100.) See the on-line document MOREHELP TRAINING for more information about the *Introduction* and other tutorials.

DOCUMENTATION

On line

VMS has an excellent interactive HELP facility that lets you get information on system use from the system itself. Once logged in, type HELP to see the list of topics and then follow the instructions. Additional information is available with the MOREHELP command. Type MOREHELP to see the list of topics. Here are some things you can explore:

HELP SET PASSWORD
MOREHELP HOURS
MOREHELP CONSULTING

MOREHELP PRINTED_OUTPUT
MOREHELP WRITEUPS
MOREHELP TRAINING

Users of our previous VMS machine, the VAX 11/780 (known as the VA) may also want to read the on-line document accessed with the command \$TYPE SYS\$WRITEUP:VMS42

Printed

The basic reference manual for VMS is the *VAX/VMS DCL Dictionary* (DEC publication number AA-Z200-TE). Beyond that, there are some 30 additional manuals published by the Digital Equipment Corporation (DEC) and other vendors which describe VMS and applications packages. If you don't know which manual to buy or read, visit the Reference Room in 128A Lind Hall, ask for help, and examine the collection of manuals. Microfiche and printed copies of some VMS manuals are also available for on-site reference use in 14 Folwell Hall.

CONSULTING

Consultants are available to answer your questions in 128 Lind Hall. Type MOREHELP CONSULTING for details on this and other ACSS consulting services. The ACSS HELP-Line is open for phone questions from 8 am to 5 pm, Mondays through Fridays. Call 626-5592.

CLASSES

ACSS teaches short courses on VMS and its applications software each quarter and once during the summer. Call 625-1543 for the current short course schedule.

ACS Brief

VX Central System

Academic Computing Services • University of Minnesota • Twin Cities

VMS Equivalents to NOS Commands

Academic Computing Services (ACS) operates a VAX VMS system, which is called VX. Many VMS operating system commands are different from NOS 2 commands. This Brief lists many of the most commonly used NOS 2 commands alphabetically, including some ACS additions. Accompanying each command is the equivalent VMS command, if one exists, and any necessary comments on the VMS command. VMS commands are always in **boldface** type.

For more information on these VMS commands, including formats and all available options, see the on-line HELP utility on VX. You can display or print on-line documents using the LISTDOC utility. You can also consult printed manuals about VMS commands at our Computing Information Center, 128A Lind (625-7397). To ask questions about VMS commands, call our HELP-Line at 626-5592.

This list is also available as an on-line VX document through the LISTDOC utility. Some specific on-line documents of interest are listed at the end of this Brief.

<u>NOS</u>	<u>VMS</u>	<u>Comments</u>
A	No equivalent.	It is not necessary to make files local in VMS.
ACCOUNT	No equivalent.	
ACCSTAT	ACCSTAT	An ACS addition to VMS.
ACQUIRE	No equivalent.	It is not necessary to make files local in VMS.
APASCAL	PASCAL	
ARCHIVE	BACKUP	The BACKUP utility prompts you for file names and other information. You can also use the ACS procedure package TAPE_PROCEDURES to prepare backup jobs on tapes.
ASCII	No equivalent.	VMS typically uses the full ASCII character set.
ASSIGN	DEFINE	Also see the /USER qualifier for both commands.
ATTACH	No equivalent.	It is not necessary to make files local in VMS.
BASIC	No equivalent.	BASIC may be available in the future.
BATCH	No equivalent.	There are no subsystems in VMS.
BEGIN	@	
BITSEND	SEND/FILE	
BRIEF	No equivalent.	
BLANK	INITIALIZE	INITIALIZE writes a specific label to a tape.
BYE	LOGOUT	

<u>NOS</u>	<u>VMS</u>	<u>Comments</u>
CALL	@	
CATALOG	DIRECTORY /FULL ANALYZE /RMS_FILE LIBRARIAN /LIST	Gives complete information about files on your directory. Analyzes internal structure of an RMS file. Gives information about contents of a specified library.
CATLIST	DIRECTORY ARCLIST	Displays a list of permanent files. Displays a list of archived files. See also the on-line document WELCOME.
CATLIST,FN=	DIRECTORY /FULL <i>filename</i>	Lists only files with the specified filename.
CBF	No equivalent.	See the entry for the NOS command COPY.
CBR	No equivalent.	
CCF	No equivalent.	See the entry for the NOS command COPY.
CCR	No equivalent.	
CHANGE	SET FILE /PROTECTION	See also SET FILE /ACL, SET PROTECTION, and RENAME.
CLEAR	No equivalent.	The concept of local files does not exist in VMS, so it is not necessary for the user to clear them.
COBOL5	COBOL	
COMMENT	#!	Comments in a batch job or procedure file should be prefixed by the characters #!
COMPARE	DIFFERENCES	
COMPASS	No equivalent.	The assembler in VMS is MACRO.
COPY or COPYEI	COPY TYPE	COPY <i>inputfile outputfile</i> copies one file to another. TYPE <i>filename</i> displays the file on your terminal screen. Also see BACKUP for copying directory structures.
COPYBF	No equivalent.	See the entry for the NOS command COPY.
COPYBR	No equivalent.	
COPYCF	No equivalent.	See the entry for the NOS command COPY.
COPYCH	No equivalent.	
COPYCR	No equivalent.	
COPYL	LIBRARIAN /REPLACE	
COPYMF	COPY	Use VMS wildcards in the COPY command.
COPYU	No equivalent.	
COUNTU	SEARCH/STATISTICS/NOOUTPUT	
COPYX	LIBRARIAN /REPLACE	
COPYSBF	No equivalent.	In VMS it is not generally necessary to shift characters out of the first column before printing the file.

<u>NOS</u>	<u>VMS</u>	<u>Comments</u>
COST	COST	An ACS addition to VMS.
CSET	No equivalent.	VMS typically uses the full ASCII character set.
CTIME	SHOW PROCESS /ALL, SHOW PROCESS /ACCOUNTING, or CONTROL-T. (See also the SET CONTROL command.)	
DAYFILE	No exact equivalent.	Use the /LOG qualifier on the VMS SUBMIT command, the SET HOST /LOG command, and ACSSUTIL:DATFILE.COM.
DEFINE	CREATE	Creates a file with the specified name.
DISPLAY	SHOW SYMBOL, SHOW LOGICAL, or WRITE SYS\$OUTPUT	
DOCUMENT	No equivalent.	
DROP	DELETE /ENTRY= <i>job-entry-number</i> drops a specified batch or print job. To learn the job entry number, use SHOW QUEUE SYS\$BATCH or SHOW QUEUE /ALL <i>printname</i> .	
DUMPPF	BACKUP	
E		See the NOS command ENQUIRE.
ENQUIRE	SHOW /FULL	The SHOW command, with various parameters, will accomplish most of the functions of ENQUIRE. Notice especially the parameters QUEUE, PROCESS, ACCOUNTING, CPU, DEVICES, STATUS, and SYSTEM.
EVICT	No equivalent.	
EXAMINE	INSPECT	Analyzes tapes.
EXECUTE	No equivalent.	There are no subsystems or primary files in VMS.
FCOPY	No equivalent.	
FETCH	No equivalent.	For libraries, use the VMS LIBS command.
FILE	CREATE /FDL	
FORM	CONVERT	See also the FDL editor and ACSSUTIL:FILESET
FTN5	FORTRAN	Some conversion will be necessary.
FSE	EDIT	EDIT <i>filename</i> begins the EDT editor, which provides both line and screen editing. Other screen editors, including EVE, are available.
FTP	FTP	See the on-line WRITEUP FTP.
FUTURE	No exact equivalent.	"Future" versions of software are made accessible to users in other ways, as announced.
GET	No equivalent.	It is not necessary to make files local in VMS.
GTR	No exact equivalent.	See the VMS command LIBRARIAN /EXTRACT.
HELLO	No exact equivalent.	The VMS command SET HOST 0 will not log off your current session, but will begin login on a second concurrent VX session. You can also use TELNET to connect to other University computers from VX, including the CYBER CA.

<u>NOS</u>	<u>VMS</u>	<u>Comments</u>
HELP	HELP	To get information about a particular command or topic, type HELP <i>command</i> . Also try MOREHELP .
HELPME	No equivalent.	
HOLD	REQUEST /REPLY	
HTIME	No equivalent.	
ITEMIZE	DIRECTORY /FULL ANALYZE /RMS_FILE LIBRARIAN /LIST	Gives complete information about files on your directory. Analyzes internal structure of an RMS file. Gives information about contents of a specified library.
LABEL	TAPES GET and MOUNT	
LENGTH	DIRECTORY /SIZE <i>filename</i>	
LGO	RUN <i>filename</i>	
LIB	No equivalent.	
LIBEDIT	LIBRARY	
LIBRARY	LIBS	
LIMITS	SHOW PROCESS /PRIVILEGES /QUOTAS	See the on-line document WELCOME for SHOW QUOTA information on privileges and quotas.
LINE	SET TERMINAL	
LIST	TYPE <i>filename</i>	Displays the file on your terminal screen. Do TYPE/PAGE <i>filename</i> to display the file a screenful at a time.
LISTLB	INSPECT	
LOAD	No equivalent.	See the VMS LINK command.
LOADPF	BACKUP	
LOCATE	SEARCH	
LOCK	SET FILE /PROTECTION	
LOGIN	See HELLO.	
LOGOUT	LOGOUT	
LO72	No equivalent.	
MACHINE	No equivalent.	
MAIL	MAIL	Begins the VAX MAIL utility. See also VAX NOTES.
MERGE	MERGE	
MFL	SET WORKING_SET	
MNF	FORTRAN	Some conversion will be necessary.
MODE	No equivalent.	

<u>NOS</u>	<u>VMS</u>	<u>Comments</u>
MODIFY	CMS and REVISE	
M77	FORTTRAN	Some conversion will be necessary.
NEW	No equivalent.	
NEWS	NEWS	Displays brief messages concerning system updates, announcements, etc.
NOEXIT	SET NOON	
NOGO	No equivalent necessary.	NOGO is default in VMS.
NORERUN	No equivalent.	SUBMIT /NORERUN is the default on VMS. Also see SET RESTART_VALUE.
NORMAL	No equivalent.	VMS typically uses the full ASCII character set.
NOSORT	No equivalent.	
NOTE	WRITE SYSS\$OUTPUT	
NOTE, <i>filename</i>	WRITE	Use OPEN before WRITE.
NULL	No equivalent.	There are no subsystems within VMS.
NUSERS	SHOW USERS	Displays total number of users and lists each user name currently in use. Also try FINGER.
OFFSW	No equivalent.	
OLD	No equivalent.	
ONSW	No equivalent.	
OPLEDIT	No equivalent.	
PACK	No equivalent.	
PACKNAM	SET DEFAULT <i>device</i> or DISKS GET	Sets a new device name for the current session. Mounts a disk to which you have permission.
PASCAL	PASCAL	
PASSWOR	SET PASSWORD	VX will prompt you for your old and new passwords.
PAST announced.	No exact equivalent.	Past versions of software are made accessible in various ways, as
PERMIT	SET FILE /ACL or SET PROTECTION	See the on-line document PROTECTION.
PFCOST	No equivalent.	
PLOT	PRINT /QUEUE=VERSATEC or PRINT /QUEUE=XEROX /CHAR=IMAGE	
PRIMARY	No equivalent.	There are no primary files within VMS.
PROSE	PROSE	Other text formatters on VX are RUNOFF, TeX, and LaTeX.

<u>NOS</u>	<u>VMS</u>	<u>Comments</u>
PRINT	PRINT	Sends the specified file to a printer. There are many options available in printers, paper, etc. See MOREHELP PRINTED_OUTPUT.
PURGALL	DELETE *.*;*	This form of DELETE erases all your files! Use with care!
PURGE	DELETE	DELETE <i>filename.type;version</i> erases specified version(s) or of the file.
	PURGE	PURGE <i>filename.type</i> erases all versions of a file with the specified filename, except the most recent version.
QGET	No equivalent.	
R	SET MAGTAPE /REWIND	VMS files (other than magnetic tape files) are automatically positioned at the beginning.
REBLOCK	No exact equivalent.	
RBR	No equivalent.	
RECEIVE	RECEIVE	
RECOVER	No equivalent.	
REDO	RECALL	To repeat commands, use the up-arrow or CONTROL-B (keep the CONTROL key pressed down while pressing the B key).
RENAME	RENAME	
REPLACE	No equivalent.	By default files are permanent on VMS.
REQUEST	TAPES GET	
RERUN	SUBMIT /RESTART	See also SET RESTART_VALUE.
RESEQ	No equivalent.	
RESOURC	RESERVE	
RETAIN	No equivalent.	By default files are permanent in VMS.
RETURN	No equivalent.	See CLOSE, SET MAGTAPE /UNLOAD, and TAPES RETURN.
REWIND	SET MAGTAPES /REWIND	VMS files (other than magnetic tape files) are automatically positioned at the beginning.
RFL	SET WORKING_SET	
ROLLOUT	WAIT	
ROUTE	PRINT	
RUN	RUN <i>filename</i>	There are no subsystems or primary files in VMS.
SAVE	No equivalent.	Files are permanent by default in VMS.
SCOPY	No equivalent.	
SCREEN	SET TERMINAL	
SEND	SEND or FTP	See the FTP document classified under Networking in ListDoc.

<u>NOS</u>	<u>VMS</u>	<u>Comments</u>
SET	No exact equivalent.	DCL provides expression evaluation and assignment of variables. See HELP = and HELP := .
SETASL	No equivalent.	
SETCORE	No equivalent.	
SETFS	No equivalent.	
SETJOB	SET PROCESS /NAME="name"	
SETJSL	No equivalent.	
SETPR	No equivalent.	
SETTL	SUBMIT /CPUTIME=	
SKIPEI	SET MAGTAPE /SKIP	
SKIPF	SET MAGTAPE /SKIP	
SKIPFB	SET MAGTAPE /SKIP	
SKIPR	No equivalent.	
SORT5	SORT	
STIME	No equivalent.	
SUBMIT	SUBMIT	
SWITCH	No equivalent.	
TAPES	TAPES	See also TAPEPROCEDURES.
TBLOCK	@ACSS\$UTIL:BLOCK	This utility will prompt you for the tape ID and VSN and other necessary information.
TCOPY	No equivalent.	
TDUMP	DUMP	
TEXT	CREATE <i>filename</i>	
TIMEOUT	No equivalent.	
TRMDEF	SET TERMINAL	
U	SET MAGTAPE /DISMOUNT CLOSE <i>filename</i>	
UNBLOCK	@ACSS\$UTIL:UNBLOCK	This utility will prompt you for the tape ID and VSN and other necessary information.
UNLOAD	SET MAGTAPE /DISMOUNT CLOSE <i>filename</i>	
UNLOCK	SET FILE /PROTECTION	
UNPAGE	No equivalent.	

<u>NOS</u>	<u>VMS</u>	<u>Comments</u>
UPDATE	CMS and REVISE	
UPROC	No exact equivalent.	Create a file called LOGIN.COM on your main directory.
USECPU	No equivalent.	
USER	No equivalent.	
VERIFY	DIFFERENCES	DIFFERENCES is for text files only.
VFYLIB	LIBRARIAN, MMS, or CMS	
VSN	No equivalent.	See the VMS TAPES command.
WAIT	WAIT	
WRITEF	No equivalent.	
WRITER	No equivalent.	VMS files do not have a logical record structures.
WRITEUP	LISTDOC	See also the VMS HELP command.
X	No equivalent	There is no batch subsystem in VMS.
XEDIT	EDIT	EDIT <i>filename</i> begins the EDT editor, providing line and screen editing. The EVE editor is also available.
*	\$!	

References

Many on-line documents are available within the ListDoc documentation utility. Type **HELP LISTDOC** for more information on this utility.

Within ListDoc, in the **VMS_System** category, you will find these relevant on-line documents:

WELCOME describes VMS file structure.

TAPES_MANAGEMENT describes using VMS tapes. (See also the printed manual *A Guide to Using VAX VMS Magnetic Tapes.*)

PROTECTION explains VMS file protection and permission.

Under the Networking category, the document **FTP** tells how to use FTP to move files from one system to another.

ACSS Brief

VX Mainframe System

Academic Computing Services and Systems • University of Minnesota • Twin Cities

VX WRITEUP INFORMATION

Academic Computing Services and Systems (ACSS) maintains a collection of on-line documents called **Writeups** on the VAX/VMS system (VX). **Writeups** describe in detail how to use various system software and services. Writeups are accessed with regular file commands.

Using Writeups

To display a list of all the available writeups on your terminal, type

```
$ dir acss$writeup
```

To see any of these on-line documents, type:

```
$ type acss$writeup:writeupname
```

(Replace **writeupname** with the actual name of the Writeup.) Or you can use the text editor:

```
$ edt/read acss$writeup:writeupname
```

To obtain a printed copy use the **print** command, type:

```
$ print acss$writeup:writeupname
```

We recommend adding the **/characteristics=portrait** qualifier for printing:

```
$ print acss$writeup:writeupname /char=portrait
```

Names of Current Writeups

Protection Covers file protection based on VMS groups and ACLs: how to change and check the protections of your root directory or all the files created during a session; how to permit access to a file (and the file's "path") to a particular user or a group of users.

VMSTapes Presents answers to most of the problems that frequently arise when using tapes, from the handling of internal (VMS-standard) tapes to using tapes created on other systems or to be used on other systems. Includes advice on how to write programs to "crack" non-standard tape formats.

Inspect Describes the use of the **Inspect** utility to analyze tape structures and obtain general information about a tape's structure and contents to assist you in selecting the correct VMS utility for reading the tape.

VAXnotes Explains how to join in existing public electronic conferences, how to set up and moderate conferences open to all users or to predefined users groups, and how to utilize the package as a bulletin board.

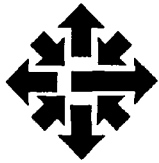
Batch Explains how to submit batch jobs and how to maintain control of jobs after submission to "see" your job, watch its progress, stop it, keep logs, select when to run them, and how to breakpoint them. It also describes the different batch queues and gives suggestions on which queue to use for different type of jobs.

Symbols Shows how to create DCL symbols and how to manipulate them on procedure calls and and DCL operations.

Mail_Problems Covers the use of the VMS Mail utility, including hints on how to change your forwarding address, how to use mailing lists, and how to organize and maintain your mailbox.

Other On-Line Information

Morehelp This is not a writeup but a VMS help library created and maintained at ACSS. The Morehelp library covers a variety of topics on local additions and changes to the system as well as additional information on general facilities and miscellaneous items. To read entries in Morehelp just type the **Morehelp** command or **@Morehelp** from within the VMS HELP utility.



ACSS Brief

Welcome

Welcome to the MERITSS interactive instructional system. This short document tells you how to access MERITSS and where to get additional information and assistance. For thorough instructions on using MERITSS, see *An Introduction to MERITSS Computing*, available at the Electronics Desk in the Minnesota Book Center (Williamson Hall) and the H. D. Smith Bookstore (West Bank).

If you have a USER NAME, a PASSWORD, a CHARGE and PROJECT number, and the location of a lab from your course instructor, you are ready for the information in this document. Once you are in the lab, sit down at an available terminal, turn it on, and press the RETURN key.

You will get a response, similar to the one below, that displays the network message, date, time, and system name and which requests your user name. If you need assistance, ask for help in the lab, look for posted instructions, check the log-in example in *An Introduction to MERITSS Computing*, or call the ACSS HELP-Line at 376-5592 (8 am to 5 pm, Monday through Friday).

In the following example what you type appears in boldface letters. Terminate each line by typing the RETURN key. Comments about the session are entered at the far right of the sample session.

```
ACSS Network V0.1 Port 2H00
To connect to machine xx type c xx
Where xx is ME or MD.
* c me
```

Turn on the terminal and press the RETURN key. Select the ME computer for MERITSS unless you have been specifically told by your instructor to choose the MD computer.

```
WELCOME TO THE NOS SOFTWARE SYSTEM
COPYRIGHT CONTROL DATA 1978, 1983
85/07/25. 14.24.16. MERITSS/ME (07/15-AI).
NOS 2.4-617/617.
```

Note: <cr> refers to typing the RETURN key.

```
FAMILY:<cr>
USER NAME: 1234567
PASSWORD
XXXXXXXXXX
TERMINAL: 304, PORT 2H0
USERS, TYPE WRITEUP(NOTE) 85/08/20.
RECOVER/ CHARGE: charge
CHARGE NUMBER:
XXXXXXXXXXXX
PROJECT NUMBER:
XXXXXXXXXXXXXXXXXXXXXXXXXXXX
JSN: ACDG,TTY
READY
```

Protect your password! Make sure it is blocked out by the XXXs or does not appear on your screen if you are at a video terminal.

If your classroom account does not require a charge number, at this point you can enter commands to the system.

When you see the word READY displayed at your terminal, you have successfully logged in to the MERITSS system and are ready to do any number of computational activities. You may create, save, and edit program and data files (XEDIT); you may select a language processor subsystem (M77TS, PASCAL, MNFTS) to associate with your program files and execute your programs; you may use an applications package to perform some desired calculations (SPSS, SORTMRG, BMDP); or you may inspect the set of on-line documents (WRITEUP). An *on-line* document is stored in the computer's memory and you can make the computer print it out for you.

Each of these activities is documented in on-line or printed materials distributed by ACSS. After you've read the pertinent document you are ready to compute on MERITSS.

```
READY.
bye
UN=1234567      LOG OFF      14.24.16.
JSN=ACDG        SRU-S=       0.202.
CHARACTERS=    0.749 KCHS
```

The final step in our example shows how to log off. To log off: type in the word *bye*.

You're all done. (Turn the terminal off.)
Do not fail to log off!

CONSULTING

ACSS provides consultants to help with problems and questions about the computer systems and software.

If you are having trouble with a classroom assignment, first see your instructor or T.A. for assistance. You should not ask the ACSS consultants to write your programs or correct them for you.

If you need help using the MERITSS instructional system, and you cannot be helped by the lab consultant, you may use our walk-in consulting service in 128 Lind Hall. The general consultants can deal with most of the problems you encounter. If your problem is fairly complex, check the expertise code under each consultant's name — listed in WRITEUP(CONSKED) — for specialized service. Please take your program listing, output, and computer job dayfile when you seek help.

If you cannot get to 128 Lind Hall, you may call the main HELP-Line (376-5592), staffed from 8 am to 5 pm, weekdays. Consultants are available to answer phone questions on computing at ACSS.

WALK-IN Consulting	10 am – 4 pm 7 pm – 9 pm	M – F M & W	128 Lind Hall
HELP-Line	8 am – 5 pm	M – F	376-5592
Artificial Intelligence	3 pm – 4 pm	M – F	625-8332
Data Bases	10 am – 11 am	M – F	376-1761
Graphics	8 am – 5 pm	M – F	376-5592
Microcomputers	9 am – Noon & 1:30 – 4 pm 9 am – 4 pm	M, T, & F W & Th	626-4276 626-4276
Statistics Packages	1 pm – 2 pm	M – F	376-1761
Text Analysis	3 pm – 4 pm	M – F	625-8332
Text Processing	9 am – 11 am 1 pm – 3 pm	M & T W & F	625-1391 625-1391

DOCUMENTATION

Some introductory, printed documents are available without charge in 128A Lind Hall. See the *Briefs*, especially *WRITEUP Information* and *EXPLAIN Information*, and see the *ACSS Newsletter*.

ACSS and vendor-printed documents are sold through the U of M bookstores. Purchases can be made by check or cash. You can purchase *An Introduction to MERITSS Computing* at the University of Minnesota bookstores.

On-line documents are available on the MERITSS system via the WRITEUP and EXPLAIN commands. To get instructions for the WRITEUP utility, read the one-page *Brief* titled *WRITEUP Information* (available in 128A Lind Hall) or just type WRITEUP while you are logged in to the machine. The command EXPLAIN is described in the *Brief* titled *EXPLAIN Information* available in 128A Lind Hall. You can also type EXPLAIN while you are logged in to the machine and obtain help interactively on how to use the utility.

SHORT COURSES

Throughout the year ACSS offers many non-credit short courses and seminars to help you use the computer systems. Course topics include: introductions to computers, to interactive computing, and to ACSS; CYBER, VAX, and microcomputer operating systems; programming languages; statistical and data base programs; text processing and analysis; and graphics. A current schedule is listed in our *Newsletter*. To get additional information about ACSS Short Courses, use the command WRITEUP(CLASSES). A fee is charged for enrollment. Register in person at the Reference Room, 128A Lind Hall. Mail registrations can be sent by campus mail to Short Course Registration, Academic Computing Services and Systems, 128A Lind Hall. Contact Jerry Stearns for more information at 625-1543.

WELCOME

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85/07/25. 14.24.16. MERITSS/ME (07/15-AI).
NOS 2.4-617/617.
```

Note: <cr> refers to typing the RETURN key.

```
FAMILY: <cr>
USER NAME: 1234567
PASSWORD
XXXXXXXXXX
TERMINAL: 304, PORT 2H0
USERS, TYPE WRITEUP(NOTE) 85/08/20.
RECOVER/ CHARGE: charge
CHARGE NUMBER:
XXXXXXXXXXXX
PROJECT NUMBER:
XXXXXXXXXXXXXXXXXXXXXXXXXX
JSN: ACDG, TTY
READY
.
.
.
```

Protect your password! Make sure it is blocked out by the XXXs or does not appear on your screen if you are at a video terminal.

If your classroom account does not require a charge number, at this point you can enter commands to the system.

When you see the word READY displayed at your terminal, you have successfully logged in to the MERITSS system and are ready to do any number of computational activities. You may create, save, and edit program and data files (XEDIT); you may select a language processor subsystem (M77TS, PASCAL, MNFTS) to associate with your program files and execute your programs; you may use an applications package to perform some desired calculations (SPSS, SORTMRG, BMDP); or you may inspect the set of on-line documents (WRITEUP). An *on-line* document is stored in the computer's memory and you can make the computer print it out for you.

Each of these activities is documented in on-line or printed materials distributed by ACSS. After you've read the pertinent document you are ready to compute on MERITSS.

```
.
.
.
READY.
bye
UN=1234567 LOG OFF 14.24.16.
JSN=ACDG SRU-S= 0.202.
CHARACTERS= 0.749 KCHS
```

The final step in our example shows how to log off. Do not fail to log off!

To log off: type in the word *bye*.

You're all done.

(Turn the terminal off.)

CONSULTING

ACSS provides consultants to help with problems and questions about the computer systems and software.

If you are having trouble with a classroom assignment, first see your instructor or T.A. for assistance. You should not ask the ACSS consultants to write your programs or correct them for you.

If you need help using the MERITSS instructional system, and you cannot be helped by the lab consultant, you may use our walk-in consulting service in 128 Lind Hall. The general consultants can deal with most of the problems you encounter. If your problem is fairly complex, check the expertise code under each consultant's name — listed in WRITEUP(CONSKED) — for specialized service. Please take your program listing, output, and computer job dayfile when you seek help.

If you cannot get to 128 Lind Hall, you may call the main HELP-Line (376-5592), staffed from 8 am to 5 pm, weekdays. Consultants are available to answer phone questions on computing at ACSS.

WALK-IN Consulting	10 am – 4 pm 10 am – Noon & 2 pm – 4 pm 7 pm – 9 pm	M – W & F Th T & Th	128 Lind Hall
HELP-Line	8 am – 5 pm	M – F	376-5592
Artificial Intelligence	3 pm – 4 pm	M – F	376-2944
Data Bases	10 am – 11 am	M – F	376-1761
Graphics	8 am – 5 pm	M – F	376-5592
Microcomputers	9:30 am – Noon & 1:30-4 pm	M – F	376-4276
Statistics Packages	1 pm – 2 pm	M – F	376-1761
Text Processing & Analysis	3 pm – 4 pm	M – F	376-2944

DOCUMENTATION

Some introductory, printed documents are available without charge in 128A Lind Hall. See the *Briefs*, especially *WRITEUP Information* and *EXPLAIN Information*, and see the *ACSS Newsletter*.

ACSS and vendor-printed documents are sold through the U of M bookstores. Purchases can be made by check or cash. You can purchase *An Introduction to MERITSS Computing* at the University of Minnesota bookstores.

On-line documents are available on the MERITSS system via the WRITEUP and EXPLAIN commands. To get instructions for the WRITEUP utility, read the one-page *Brief* titled *WRITEUP Information* (available in 128A Lind Hall) or just type WRITEUP while you are logged in to the machine. The command EXPLAIN is described in the *Brief* titled *EXPLAIN Information* available in 128A Lind Hall. You can also type EXPLAIN while you are logged in to the machine and obtain help interactively on how to use the utility.

SHORT COURSES

Throughout the year ACSS offers many non-credit short courses and seminars to help you use the computer systems. Course topics include: introductions to computers, to interactive computing, and to ACSS; CYBER, VAX, and microcomputer operating systems; programming languages; statistical and data base programs; text processing and analysis; and graphics. A current schedule is listed in our *Newsletter*. To get additional information about ACSS Short Courses, use the command WRITEUP(CLASSES). A fee is charged for enrollment. Register in person at the Reference Room, 128A Lind Hall. Mail registrations can be sent to Short Course Registration, Academic Computing Services and Systems, 128A Lind Hall. Contact Jerry Stearns for more information at 376-8806.



ACSS Brief

Winter Quarter Short Courses 1986

INTRODUCTORY COURSES

Introduction to Computers	McAllister	Jan 13-24	(MWF)	2:15-4 pm	\$15,\$25,\$35
Beginning NOS 2 (CYBER OS)	Krmpotich	Jan 27-Feb 7	(MWF)	2:15-4 pm	\$15,\$25,\$35
Introduction to VAX/VMS	Stearns	Jan 28-Feb 13	(TTh)	2:15-4 pm	\$15,\$25,\$35
XEDIT (CYBER Text Editor)	Brodie	Feb 4-13	(TTh)	2:15-4 pm	\$15,\$25,\$35

ELECTIVE COURSES

DI-3000 Graphics Routines	McAllister	Feb 17-28	(MWF)	2:15-4 pm	\$35,\$45,\$80
SPSS (Statistics Package)	Alberg	Feb 17-21	(MWThF)	2:15-4 pm	\$25,\$35,\$60
Magnetic Tapes in NOS 2	Oberg	Feb 25-Mar 6	(TTh)	2:15-4 pm	\$25,\$35,\$60
SIR DBMS Seminar	Oberg	Mar 24-26	(MTW)	9 am-4 pm	\$100,\$100,\$150

MICROCOMPUTER APPLICATIONS COURSES (Absolutely limited to 10 per class)

Introduction to Micros: MS-DOS, Section 1		Jan 14-16	(TTh)	1:30-4 pm	\$25,\$35,\$60
Introduction to Micros: MS-DOS, Section 2		Jan 21-23	(TTh)	1:30-4 pm	\$25,\$35,\$60
Introduction to Micros: MS-DOS, Section 3		Jan 27-29	(MW)	1:30-4 pm	\$25,\$35,\$60

(Introduction to Micros or equivalent knowledge is required for the courses listed below.)

Introduction to Word Perfect, Section 1		Jan 14	(Tu)	9:30 am-Noon	\$25,\$35,\$60
Introduction to Word Perfect, Section 2		Feb 5	(W)	1:30-4 pm	\$25,\$35,\$60
Intern. Word Perfect for Office Applications		Feb 13	(Th)	1:30-4 pm	\$25,\$35,\$60
Intern. Word Perfect for Authors		Mar 7	(F)	9:30 am-Noon	\$25,\$35,\$60
Introduction to dBase II & III, Section 1		Jan 28-30	(TTh)	1:30-4 pm	\$40,\$50,\$80
Introduction to dBase II & III, Section 2		Mar 4-6	(TTh)	9:30 am-Noon	\$40,\$50,\$80
Beginning Lotus 1-2-3, Section 1		Feb 4	(Tu)	1:30-4 pm	\$25,\$35,\$60
Beginning Lotus 1-2-3, Section 2		Feb 12	(W)	9:30 am-Noon	\$25,\$35,\$60
Advanced Lotus 1-2-3		Feb 18	(Tu)	9:30 am-Noon	\$25,\$35,\$60

(The courses listed below are overviews only for the Apple Macintosh. Limited to 20.)

Microsoft Word for the Macintosh		Jan 22	(W)	2:15-4 pm	\$15,\$25,\$40
Beginning MacDraw and MacDraft		Feb 14	(F)	10 am-Noon	\$15,\$25,\$40
Microsoft Excel (Spreadsheet)		Feb 17	(M)	9:15-11am	\$15,\$25,\$40
Statistical Programs for the Macintosh		Feb 25	(Tu)	2:15-4 pm	\$15,\$25,\$40
Preparing Newsletters & Brochures		Mar 5	(W)	2:00-4 pm	\$15,\$25,\$40

(includes overviews of PageMaker, ReadySetGo, & MacPublisher programs)

REGISTRATION: Registration is located at the ACSS Reference Room, 128A Lind Hall. (Hours: 8:00 am to 4:30 pm, Monday through Friday). Mail registrations will be accepted. Deadline for registering is 4:15 pm on the last working day BEFORE the class begins. If you need more information on short courses, call Jerry Stearns at 376-8806.

FEES: Fees are printed in order for the following groups: 1) University students, 2) faculty and staff, and 3) non-University persons. Course fees may be paid by cash or check or with a signed University journal voucher. We can no longer charge short courses to user accounts. NO refunds will be made after the class has begun.

Note: Monday, January 20, is a University holiday. No classes will be held.





ACSS BRIEF

WRITEUP INFORMATION

WRITEUP is a utility designed to provide quick and easy access to machine-retrievable documentation. There are many forms of the WRITEUP command:

WRITEUP(w1,w2,...,wn/options)	General form, where w1, etc. are any of the following specifiers (in parentheses below).
WRITEUP.	Produces a copy of this description.
WRITEUP(INDEX)	Produces an index of all WRITEUPs.
WRITEUP(INDEX=name1+name2+...namen)	Produces an index of those WRITEUPs named.
WRITEUP(name)	Produces the WRITEUP "name", or the first subwriteup of an indexed WRITEUP "name".
WRITEUP(name=subname1+subname2+...subnamen)	Produces the subwriteups "subname1", etc. of the indexed WRITEUP "name".
WRITEUP(name=*)	Produces all subwriteups of the indexed WRITEUP "name".

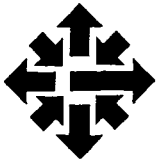
Any of the following "options" can be included after a slash (/) and separated by commas. (The default values are in angle brackets.)

OPTION DESCRIPTION

L=ofn <OUTPUT>	Used to specify an alternate output file.
PT=TT (or) PT=LP (or) PT=AS	Used to change the default printer type. If the output file is your interactive terminal, then the default printer type is TT. Otherwise, the default is LP (line printer). WRITEUP determines how it should convert the WRITEUP files for output based on the printer type and the type of the particular file in question. The types of the WRITEUP files are indicated in the WRITEUP INDEX.) PT=AS produces printer-formatted upper and lower case WRITEUPs in the file selected by the L option. Note that this option (AS) is not automatically implemented for the default value of the L option. The list files produced by the AS option should be routed to the upper and lower case line printer. Therefore, the ROUTE statement must include the parameters DC=LP and EC=A9 to correctly route the list file.
D=yyymmdd <000000>	Used to specify that only WRITEUPs, subwriteups, or WRITEUP INDEX entries modified on or after the specified date will be output. For example: WRITEUP(CONTROL=*/D=800122) will produce only those subwriteups of CONTROL which were modified on or after 22 Jan 80.
LO=S <Not Specified>	Controls the format of the WRITEUP INDEX. Specifying LO=S causes WRITEUP produce a short list of the INDEX which includes only the names of the WRITEUPs.
SR (or) SR=n <Not Specified>	Activates the scroll mode for a WRITEUP output at an interactive terminal. When in the scroll mode, WRITEUP stops the output once n lines are printed. Printing resumes after the carriage return key is pressed. The default value for the number of lines (n) is 23.

The full WRITEUP INDEX identifies several properties of each WRITEUP: name, width, length, last mod. date, format, whether or not it is indexed, and a one line description of the WRITEUP.





ACSS Brief

WRITEUP INFORMATION

WRITEUP is a utility that is available on the CYBER CA and which is designed to provide quick and easy access to machine-retrievable documentation on every aspect of ACSS systems. The command

WRITEUP

tells you how to use the WRITEUP facility.

To obtain a list of all WRITEUP documents available on the system, type the command:

WRITEUP, INDEX

The **WRITEUP, INDEX** command identifies several properties of each WRITEUP: name, width, length, last modification date, format, whether or not it is indexed, and a one-line description of its contents. To produce a short list of the index, which includes only the names of the WRITEUPS, type:

WRITEUP, INDEX/LO=S

To view a document from **WRITEUP, INDEX** type the command:

WRITEUP, name

where *name* is the name of the WRITEUP.

Some very long or multitopic WRITEUPS are indexed: they are divided into sections, or subwriteups. If a WRITEUP is indexed, the **WRITEUP, name** command will produce only the first subwriteup. To produce more than one subwriteup, type the command:

WRITEUP, name=subwriteup1+subwriteup2+...subwriteupn

To produce all of the subwriteups of an indexed WRITEUP type:

WRITEUP, name=*

The **WRITEUP, INDEX** list shows the printed page length for each document so that if the document is long you can choose to make a printed copy of it instead of reading it on line. To make a copy of a long WRITEUP to send to a line printer or to search with the XEDIT editor, type the command:

WRITEUP, name/PT=AS, L=LIST

The parameter **PT=AS** produces printer-formatted, upper- and lower-case WRITEUPS. The **L=LIST** parameter puts the copy of **WRITEUP, name** in an alternate output file called **LIST**.

To send the file **LIST** to the line printer, type the following command:

PRINT, LIST, EC=A9, UN=EA, UJN=EA*436

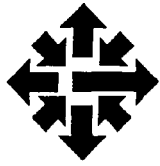
This command will produce output on 8-1/2- by 11-inch paper, one sided, in landscape mode. The output will be printed at the I/O station in 128B Lind Hall and placed in bin 436. For other printing options, see **WRITEUP, PRINT**.

WRITEUPs of general interest include:

WRITEUP, ACCRATE
WRITEUP, ACCSTAT
WRITEUP, CLASSES
WRITEUP, CONSKED
WRITEUP, CONSULT
WRITEUP, DOCLIST
WRITEUP, HOURS
WRITEUP, LABS

Provides information on billing charge rates
Explains how to obtain billing statistics
Lists available non-credit ACSS classes
Provides the quarterly consulting schedule
Details consulting services and hours
Lists available ACSS documents
Shows current operating hours
Lists all open shop RJE and terminal cluster sites

DEC86:PMG



ACSS Brief

Xerox 8700 Fonts Available with Scribe

The Xerox 8700 laser printer is a high-speed, high-quality, low-cost printer for computerized text files. Files can be sent to the Xerox 8700 from Academic Computing Services and System's (ACSS) CYBER (CA) system or VAX/VMS (VX) system. The 8700 can print any text file that you could send to a line printer or view on a screen on either of these systems. However, to take advantage of the "typesetting" versatility of this laser printer, you must format your text with Scribe, a program that runs on the VX system. Files can be written and edited on any system with communications to the VAX. For information on how to use Scribe, refer to *Scribe at ACSS*, which can be purchased at the University bookstores, or *Scribe Document Production System User Manual*, which can be purchased from UniLogic, Limited (staff at the ACSS Computing Information Center, 128A Lind Hall, can provide information on how to order this manual from the vendor). Both manuals also are available as reference copies in the ACSS Computing Information Center.

Two Xerox 8700 font families with a range of type sizes and typefaces are available through Scribe. This *Brief* lists all the Scribe printing characters for the Xerox 8700 fonts, shows you how these characters are obtainable with Scribe commands, and gives examples of their appearance in running text. The information is presented first for the Helvetica 10 Font Family (a sans serif type style) and then for the Times Meta 10 Font Family (a serif type style). Helvetica 10 is the default font family for most Scribe document types. Either family can be selected for a particular document with the appropriate beginning Scribe command:

**@Style(FontFamily Helvetica10) or
@Style(FontFamily TimesMeta10)**

Printing characters on the 8700 are assembled into fonts, collections of characters of one style, face, and size of type, that Scribe terms *rawfonts*. Scribe also may sort characters from different rawfonts into *typecases*. Scribe organizes rawfonts and typecases of similar size into its own font groups and assigns a *facecode* to each rawfont and typecase in the group. Scribe specifies which font group is to be used by each of its formatting environments, such as *BodyFont* for its default text environment. Then all facecodes associated with *BodyFont* are available for changing typeface within the text environment, such as @B(text) for **bolding**, @I(text) for *italics*, or @G(text) for Γρεεκ.

The first chart for each font family in this *Brief*:

**@Marker(FontFamily,Helvetica10,X9700,X8700) and
@Marker(FontFamily,TimesMeta10,X9700,X8700)**

is taken from the Scribe data base. The chart shows the names of all font groups in the font family, the facecodes that are available within those fonts, and the rawfonts and typecases associated with those facecodes. Scribe uses *BodyFont* in most of its formatting environments, *SmallBodyFont* in footnotes, and the various *TitleFonts* in different types of headings. You can refer to the .MAK and .DEV files in the Scribe data base for precise information on Scribe font use. (See Chapter 11, "Using the Scribe Data Base," in *Scribe at ACSS*.)

ACSS has added a number of Scribe font groups to the data base, such as SmallBodyFont6, BodyFont9, 14points, 18points, and 24points. These font groups are not associated with any predefined Scribe environments, but they can be used as the other groups are used to create new environments or modify existing ones. For example, you could modify the quotation environment to produce a small italic typeface with the following command:

@Modify(Quotation,Font SmallBodyFont,Use I)

or define a new environment to use 9-point bold italic type in the Times Meta 10 family:

@Define(BI9Text=Text,Font BodyFont9,Facecode P)

(Use *X* and *Facecode X* are near-synonymous terms for facecode designations.)

The facecode names are usually descriptive of the typefaces they produce: "R" for regular or Roman, "I" for italic, "B" for bold, "P" for bold italic, "F" for fixed-width, "C" for small capitals, "G" for Greek, "A" for math, "Y" for publication symbols, and "T" for typewriter. Facecodes for "F," "G," and "T" are associated with fixed-width characters, whose printing space is all the same, as with a typewriter. The other facecodes are associated with proportionately-spaced characters, whose printing space is based on the design of the characters, as in typesetting.

The second chart for each font family:

**HELVETICA 10 FONTFAMILY, CHARACTER SETS and
TIMES META 10 FONT FAMILY, CHARACTER SETS**

lists by Scribe rawfont or typecase name all the characters in that rawfont or typecase. Most contain the full ASCII standard character set. The larger ones contain only uppercase letters, digits, and some punctuation marks. The Greek typecases show which characters map onto the ASCII characters by their corresponding positions in the columns. Thus to print Greek characters, enclose the appropriate ASCII characters in delimiters after the Greek facecode command, for example @G(abcd) to print αβχδ.

The third chart for each font family:

**HELVETICA 10 FONT FAMILY, SPECIAL SYMBOLS and
TIMES META 10 FONT FAMILY, ACCENT FORMS AND TEXTFORMS**

lists the special symbols and accent characters available for each family. Some characters shown for one family are also available in the other family, as indicated in the short discussion preceding each chart. Math characters are listed in Chapter 7, "Math Support for the Xerox 8700," in *Scribe at ACSS*.

The fourth chart for each font family:

**HELVETICA 10 FONT FAMILY, TEXT SAMPLES and
TIMES META 10 FONT FAMILY, TEXT SAMPLES**

gives printing samples of all the ASCII character sets by font and facecode. The same printing characters may be associated with more than one font group or facecode within a group. Refer to the first chart to determine the rawfont or typecase being used.

NOTE: The Xerox 8700 has a memory limitation on the number of machine fonts (Scribe rawfonts) it can print from on one page, and it also must have a stored list of possible machine font combinations for every page that it prints. Scribe contains a list of likely combinations (available for inspection in its data base file X8700.PDE). However, if you run into an error message that states:

**Error found while processing:
These fonts should be in one font set:**

you have asked for a machine font combination that Scribe and the 8700 do not know about, and the particular page will not print. You can either change the fonts or ask to have a new font combination set up. Call Text Processing at 625-1391 for assistance.

You may also run into a printer memory problem, with no error message from Scribe, if you are having a file printed in duplex (using both sides of the paper). If Scribe specifies a font combination change between the first and second sides of one piece of paper, your printed output will end on the preceding page, and the machine operators will return a "font memory exceeded, job aborted" error message with the output. There are numerous ways to work around the problem; call Text Processing for assistance.

NOTE: The Xerox 8700 laser printer is a slower model of the Xerox 9700 laser printer. Scribe uses the **9700** designation for its device commands and output file names. At ACSS, such files are queued to an 8700 printer.

@Marker(FontFamily,Helvetica10,X9700,X8700)

```
@DefineFont (BodyFont,  
  R=<TypeCase "UN110E">,  
  I=<TypeCase "UN510E">,  
  B=<TypeCase "UN210E">,  
  P=<TypeCase "UN510E">,  
  F=<TypeCase "P06B0B">,  
  C=<TypeCase "UN108E">,  
  A=<TypeCase "Math10">,  
  G=<TypeCase "GK110P">,  
  Y=<TypeCase "HESymbols">,  
  T=<TypeCase "P07TDC">)
```

```
@DefineFont (SmallBodyFont,  
  R=<TypeCase "UN108E">,  
  I=<TypeCase "UN508P">,  
  B=<TypeCase "UN208E">,  
  P=<TypeCase "UN508P">,  
  F=<TypeCase "P06B0B">,  
  C=<TypeCase "UN108E">,  
  A=<TypeCase "Math8">,  
  G=<TypeCase "GK108P">,  
  Y=<TypeCase "HESymbols">,  
  T=<TypeCase "UD108P">)
```

```
@DefineFont (SmallBodyFont6,  
  R=<TypeCase "UN106E">,  
  I=<TypeCase "UN508P">,  
  B=<TypeCase "UN208E">,  
  P=<TypeCase "UN508P">,  
  F=<TypeCase "P06B0B">,  
  C=<TypeCase "UN106E">,  
  A=<TypeCase "Math8">,  
  G=<TypeCase "GK108P">,  
  Y=<TypeCase "HESymbols">,  
  T=<TypeCase "UD108P">)
```

```
@DefineFont (TitleFont1,  
  R=<TypeCase "UN210E">,  
  B=<TypeCase "UN210E">,  
  I=<TypeCase "UN210E">,  
  C=<TypeCase "UN208E">)
```

```
@DefineFont (TitleFont2,  
  R=<TypeCase "UN211E">,  
  B=<TypeCase "UN211E">,  
  I=<TypeCase "UN211E">,  
  C=<TypeCase "UN208E">)
```

```
@DefineFont (TitleFont3,  
  R=<TypeCase "UN214E">,  
  B=<TypeCase "UN214E">,  
  I=<TypeCase "UN214E">,  
  C=<TypeCase "UN211E">)
```

```
@DefineFont (TitleFont4,  
  R=<TypeCase "UN214E">,  
  B=<TypeCase "UN214E">,  
  I=<TypeCase "UN214E">,  
  C=<TypeCase "UN211E">)
```

```
@DefineFont (TitleFont5,  
  R=<TypeCase "UN214B">,  
  B=<TypeCase "UN214B">,  
  I=<TypeCase "UN214B">,  
  C=<TypeCase "UN211E">)
```

```
@DefineFont (14points,  
  R=<TypeCase "UN114B">,  
  B=<TypeCase "UN214E">)
```

```
@DefineFont (18points,  
  R=<TypeCase "UN118B">,  
  B=<TypeCase "UN218B">)
```

```
@DefineFont (24points,  
  R=<TypeCase "UN124B">,  
  B=<TypeCase "UN224B">)
```


HELVETICA 10 FONT FAMILY, CHARACTER SETS

UN106E	UN108E	UN208E	UN508P	UD108P	GK108P	UN110E	UN210E	UN510E	P07TDC
P	P	P	<i>P</i>	P	Π	P	P	<i>P</i>	P
Q	Q	Q	<i>Q</i>	Q	Θ	Q	Q	<i>Q</i>	Q
R	R	R	<i>R</i>	R	Ρ	R	R	<i>R</i>	R
S	S	S	<i>S</i>	S	Σ	S	S	<i>S</i>	S
T	T	T	<i>T</i>	T	Τ	T	T	<i>T</i>	T
U	U	U	<i>U</i>	U	Τ	U	U	<i>U</i>	U
V	V	V	<i>V</i>	V		V	V	<i>V</i>	V
W	W	W	<i>W</i>	W	Ω	W	W	<i>W</i>	W
X	X	X	<i>X</i>	X	Ξ	X	X	<i>X</i>	X
Y	Y	Y	<i>Y</i>	Y	Ψ	Y	Y	<i>Y</i>	Y
Z	Z	Z	<i>Z</i>	Z	Ζ	Z	Z	<i>Z</i>	Z
[[[<i>[</i>	[[[<i>[</i>	[
\	\	\	<i>\</i>	\		\	\	<i>\</i>	\
]]]	<i>]</i>]]]	<i>]</i>]
↑	↑	↑	<i>↑</i>	↑		↑	↑	<i>↑</i>	↑
-	-	-	<i>-</i>	-		-	-	<i>-</i>	-
,	,	,	<i>,</i>	,		,	,	<i>,</i>	,
a	a	a	<i>a</i>	a	α	a	a	<i>a</i>	a
b	b	b	<i>b</i>	b	β	b	b	<i>b</i>	b
c	c	c	<i>c</i>	c	χ	c	c	<i>c</i>	c
d	d	d	<i>d</i>	d	δ	d	d	<i>d</i>	d
e	e	e	<i>e</i>	e	ε	e	e	<i>e</i>	e
f	f	f	<i>f</i>	f	φ	f	f	<i>f</i>	f
g	g	g	<i>g</i>	g	γ	g	g	<i>g</i>	g
h	h	h	<i>h</i>	h	η	h	h	<i>h</i>	h
i	i	i	<i>i</i>	i	ι	i	i	<i>i</i>	i
j	j	j	<i>j</i>	j		j	j	<i>j</i>	j
k	k	k	<i>k</i>	k	κ	k	k	<i>k</i>	k
l	l	l	<i>l</i>	l	λ	l	l	<i>l</i>	l
m	m	m	<i>m</i>	m	μ	m	m	<i>m</i>	m
n	n	n	<i>n</i>	n	ν	n	n	<i>n</i>	n
o	o	o	<i>o</i>	o	ο	o	o	<i>o</i>	o
p	p	p	<i>p</i>	p	π	p	p	<i>p</i>	p
q	q	q	<i>q</i>	q	θ	q	q	<i>q</i>	q
r	r	r	<i>r</i>	r	ρ	r	r	<i>r</i>	r
s	s	s	<i>s</i>	s	σ	s	s	<i>s</i>	s
t	t	t	<i>t</i>	t	τ	t	t	<i>t</i>	t
u	u	u	<i>u</i>	u	υ	u	u	<i>u</i>	u
v	v	v	<i>v</i>	v	ς	v	v	<i>v</i>	v
w	w	w	<i>w</i>	w	ω	w	w	<i>w</i>	w
x	x	x	<i>x</i>	x	ξ	x	x	<i>x</i>	x
y	y	y	<i>y</i>	y	ψ	y	y	<i>y</i>	y
z	z	z	<i>z</i>	z	ζ	z	z	<i>z</i>	z
{	{	{	<i>{</i>	{		{	{	<i>{</i>	{
			<i> </i>					<i> </i>	
}	}	}	<i>}</i>	}		}	}	<i>}</i>	}
~	~	~	<i>~</i>	~		~	~	<i>~</i>	~

HELVETICA 10 FONT FAMILY, CHARACTER SETS

GK110P	P06BOB	UN211E	UN214E	UN114B	UN214B	UN118B	UN218B	UN124B	UN224B
!	!	!	!	'	'	'	'	'	'
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%	%	%	%	0	0	0	0	0	0
&	&	&	&	1	1	1	1	1	1
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))))	4	4	4	4	4	4
*	*	*	*	5	5	5	5	5	5
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0	0	0	0	B	B	B	B	B	B
1	1	1	1	C	C	C	C	C	C
2	2	2	2	D	D	D	D	D	D
3	3	3	3	E	E	E	E	E	E
4	4	4	4	F	F	F	F	F	F
5	5	5	5	G	G	G	G	G	G
6	6	6	6	H	H	H	H	H	H
7	7	7	7	I	I	I	I	I	I
8	8	8	8	J	J	J	J	J	J
9	9	9	9	K	K	K	K	K	K
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Δ	C	C	C						
E	D	D	D						
Φ	E	E	E						
Γ	F	F	F						
H	G	G	G						
I	H	H	H						
K	I	I	I						
Λ	J	J	J						
M	K	K	K						
N	L	L	L						
O	M	M	M						
	N	N	N						
	O	O	O						

HELVETICA 10 FONT FAMILY, SPECIAL SYMBOLS

All symbols below are available in both the Helvetica 10 and the Times Meta 10 font families. However in the Times Meta 10 family left and right single quotes will automatically be printed for the grave accent and apostrophe keyboard characters, and there are forms listed in the Times Meta 10 accent chart that print left and right double quotes.

Each of the following symbols can be obtained by enclosing the corresponding ASCII character in delimiters after the @Y facecode command or by using the Scribe commandstring. Thus @Y(R) and @Registered both produce ®.

Referring back to the previous chart, each lowercase Greek character can also be produced by a Scribe commandstring, so that @alpha@beta@gamma@delta would produce $\alpha\beta\gamma\delta$.

All Scribe commandstrings must be followed by another Scribe command, a blank space, or a pair of empty delimiters. You can use@;, the Scribe null command, to end a commandstring in the middle of a list of characters: @pi@;r@+(2) produces πr^2 .

ASCII Char	Facecode Y Symbol	Commandstring
------------	-------------------	---------------

#	■	@square
%	¢	@cent
&	§	@sect
'	'	@prime
+	±	@pom
-	¬	@not
0	°	@deg
2	$\frac{1}{2}$	@half
4	$\frac{1}{4}$	@4th
<	≤	@ltoe
=	≠	@nteq
>	≥	@gtoe
B	•	@bullet
C	©	@copyr
D	†	@dagger
G	‡	@2dagger
M	—	@mdash
N	-	@ndash
P	¶	@parag
R	®	@registered
T	™	@trademark
[	'	@lsq
]	'	@rsq
—	—	@sumins
x	×	@times
{	“	@ldq
}	”	@rdq

HELVETICA 10 FONT FAMILY, TEXT SAMPLES

FONT BODYFONT

- R "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values .
- I, P *"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values*
- B **"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values**
- F **"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values**
- C **"ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES**
- T **"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values**

FONT SMALLBODYFONT

- R "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- I, P *"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values*
- B **"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values**
- F **"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values**
- C **"ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES**
- T **"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values**

HELVETICA 10 FONT FAMILY, TEXT SAMPLES

FONT SMALLBODYFONT6

- R "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- I, P *"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values*
- B "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- F "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- C "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES
- T "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

FONT TITLEFONT1

R, B, I

"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

- C "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

FONT TITLEFONT2

R, B, I

"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

- C "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

FONT TITLEFONT3, FONT TITLEFONT4

R, B, I

"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

- C "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

FONT TITLEFONT5

R, B, I

"ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

C

"ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

FONT 14POINTS

R

"ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

B

"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

FONT 18POINTS

R

"ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

B

"ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

FONT 24POINTS

R "ALL CITIES WHICH HAVE
ATTAINED ANY CONSIDERABLE
SIZE INCLUDE IN VARYING
PROPORTIONS ALL THE ABOVE
FACTORS OF COMMERCE,
MANUFACTURES, POLITICAL AND
SOCIAL FORCES." RICHARD HURD,
PRINCIPLES OF CITY LAND VALUES

B "ALL CITIES WHICH HAVE
ATTAINED ANY
CONSIDERABLE SIZE INCLUDE
IN VARYING PROPORTIONS
ALL THE ABOVE FACTORS OF
COMMERCE, MANUFACTURES,
POLITICAL AND SOCIAL
FORCES." RICHARD HURD,
PRINCIPLES OF CITY LAND
VALUES

@Marker(FontFamily,TimesMeta10,X9700)

```
@DefineFont (BodyFont,  
  R=<RawFont  "TM110P">,  
  I=<RawFont  "TM310P">,  
  B=<RawFont  "TM210P">,  
  P=<RawFont  "TM410P">,  
  F=<TypeCase "P06BOB">,  
  C=<TypeCase "TM108C">,  
  G=<TypeCase "GK110M">,  
  A=<TypeCase "TMMA10">,  
  Y=<TypeCase "TMSymbols">,  
  N=<TypeCase "FLSymbols">,  
  T=<TypeCase "P07TCC">)
```

```
@DefineFont (SmallBodyFont,  
  R=<RawFont  "TM108P">,  
  I=<RawFont  "TM308P">,  
  B=<RawFont  "TM208P">,  
  P=<RawFont  "TM408P">,  
  F=<TypeCase "P06BOB">,  
  C=<TypeCase "TM108C">,  
  G=<TypeCase "GK108M">,  
  A=<TypeCase "TMMA8">,  
  Y=<TypeCase "TMSymbols">,  
  N=<TypeCase "FLSymbols">,  
  T=<TypeCase "P07TCC">)
```

```
@DefineFont (BodyFont9,  
  R=<RawFont  "TM109P">,  
  I=<RawFont  "TM309P">,  
  B=<RawFont  "TM209P">,  
  P=<RawFont  "TM409P">,  
  F=<TypeCase "P06BOB">,  
  C=<TypeCase "TM108C">,  
  G=<TypeCase "GK110M">,  
  A=<TypeCase "TMMA10">,  
  Y=<TypeCase "TMSymbols">,  
  N=<TypeCase "FLSymbols">,  
  T=<TypeCase "P07TCC">)
```

```
@DefineFont (TitleFont1,  
  R=<RawFont  "TM112P">,  
  I=<RawFont  "TM312P">,  
  B=<RawFont  "TM212P">,  
  P=<RawFont  "TM412P">,  
  C=<TypeCase "TM210C">)
```

```
@DefineFont (TitleFont2,  
  R=<RawFont  "TM112P">,  
  I=<RawFont  "TM312P">,  
  B=<RawFont  "TM212P">,  
  P=<RawFont  "TM412P">,  
  C=<TypeCase "TM210C">)
```

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@DefineFont (TitleFont3,  
  R=<RawFont  "TM112P">,  
  I=<RawFont  "TM312P">,  
  B=<RawFont  "TM212P">,  
  P=<RawFont  "TM412P">,  
  C=<TypeCase "TM210C">)
```

```
@DefineFont (TitleFont4,  
  R=<RawFont  "TM114P">,  
  I=<RawFont  "TM314P">,  
  B=<RawFont  "TM214P">,  
  P=<RawFont  "TM414P">,  
  C=<TypeCase "TM212C">)
```

```
@DefineFont (TitleFont5,  
  R=<RawFont  "TM114P">,  
  I=<RawFont  "TM314P">,  
  B=<RawFont  "TM214P">,  
  P=<RawFont  "TM414P">,  
  C=<TypeCase "TM212C">)
```

```
@DefineFont (18points,  
  R=<RawFont  "TM118P">,  
  I=<RawFont  "TM318P">,  
  B=<RawFont  "TM218P">,  
  P=<RawFont  "TM418P">)
```

```
@DefineFont (24points,  
  R=<TypeCase "TM124P">,  
  I=<TypeCase "TM324P">,  
  B=<TypeCase "TM224P">,  
  P=<TypeCase "TM424P">)
```


TIMES META 10 FONT FAMILY, CHARACTER SETS

TM108P	TM208P	TM308P	TM408P	GK108R	TM109P	TM209P	TM309P	TM409P	TM110P
P	P	P	P	Π	P	P	P	P	P
Q	Q	Q	Q	Θ	Q	Q	Q	Q	Q
R	R	R	R	Ρ	R	R	R	R	R
S	S	S	S	Σ	S	S	S	S	S
T	T	T	T	Τ	T	T	T	T	T
U	U	U	U	Τ	U	U	U	U	U
V	V	V	V	Ω	V	V	V	V	V
W	W	W	W	Ξ	W	W	W	W	W
X	X	X	X	Ψ	X	X	X	X	X
Y	Y	Y	Y	Z	Y	Y	Y	Y	Y
Z	Z	Z	Z		Z	Z	Z	Z	Z
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a	a	a	a	β	a	a	a	a	a
b	b	b	b	χ	b	b	b	b	b
c	c	c	c	δ	c	c	c	c	c
d	d	d	d	ε	d	d	d	d	d
e	e	e	e	φ	e	e	e	e	e
f	f	f	f	γ	f	f	f	f	f
g	g	g	g	η	g	g	g	g	g
h	h	h	h	ι	h	h	h	h	h
i	i	i	i	κ	i	i	i	i	i
j	j	j	j	λ	j	j	j	j	j
k	k	k	k	μ	k	k	k	k	k
l	l	l	l	ν	l	l	l	l	l
m	m	m	m	ο	m	m	m	m	m
n	n	n	n	π	n	n	n	n	n
o	o	o	o	θ	o	o	o	o	o
p	p	p	p	ρ	p	p	p	p	p
q	q	q	q	σ	q	q	q	q	q
r	r	r	r	τ	r	r	r	r	r
s	s	s	s	υ	s	s	s	s	s
t	t	t	t	ς	t	t	t	t	t
u	u	u	u	ω	u	u	u	u	u
v	v	v	v	ξ	v	v	v	v	v
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TIMES META 10 FONT FAMILY, CHARACTER SETS

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}

TIMES META 10 FONT FAMILY, CHARACTER SETS

TM124P	TM224P	TM324P	TM424P	TM124P	TM224P	TM324P	TM424P
!	!	!	!	E	E	<i>E</i>	E
,	,	,	,	F	F	<i>F</i>	F
,	,	,	,	G	G	<i>G</i>	G
-	-	-	-	H	H	<i>H</i>	H
.	.	.	.	I	I	<i>I</i>	I
/	/	/	/	J	J	<i>J</i>	J
0	0	0	0	K	K	<i>K</i>	K
1	1	1	1	L	L	<i>L</i>	L
2	2	2	2	M	M	<i>M</i>	M
3	3	3	3	N	N	<i>N</i>	N
4	4	4	4	O	O	<i>O</i>	O
5	5	5	5	P	P	<i>P</i>	P
6	6	6	6	Q	Q	<i>Q</i>	Q
7	7	7	7	R	R	<i>R</i>	R
8	8	8	8	S	S	<i>S</i>	S
9	9	9	9	T	T	<i>T</i>	T
:	:			U	U	<i>U</i>	U
;	;			V	V	<i>V</i>	V
?	?	?		W	W	<i>W</i>	W
A	A	A	A	X	X	<i>X</i>	X
B	B	B	B	Y	Y	<i>Y</i>	Y
C	C	C	C	Z	Z	<i>Z</i>	Z
D	D	D	D				

TIMES META 10 FONT FAMILY, ACCENT FORMS AND TEXTFORMS

Accented and special characters are available in 10-point roman and italic fonts for the Times Meta 10 font family. Separate accents can also be placed above or beneath characters from other fonts in any of Scribe's font families. Include the beginning Scribe command **@Libraryfile(Accents)** to use any of the characters below. Include the beginning Scribe command **@Style(FontFamily=TimesMeta10)** to print a whole document with this font family.

All accent forms and textforms below will print the character shown in the @R column for any font and facecode combination, except that characters in the @I column will print in an italic environment. A few characters have different names for their regular and italic forms; the Scribe name will always print the particular character shown where there is only one column of characters: `biblioth@egr que` produces *bibliothèque*, `@i(biblioth@egr que)` produces *bibliothèque*, `g@aum rl@ipa nd` produces *gärland*, `@i(g@aum rl@iipa nd)` produces *gärland*.

The Scribe forms in the list below (@uac to @tic) must be followed by @; (the Scribe null command), another Scribe command, or a pair of empty delimiters: `@agr@; Tours` or `@agr()` *Tours* produces à *Tours*; within a word they may also be followed by a space, as shown in the above examples. The whole form could also be enclosed within delimiters after another Scribe command, as shown in the example in the following paragraph. The Scribe textforms [`@uaca(X)` to `@tia(x)`] are complete commands which can be used to accent characters from other fonts (represented by X and x): `@b{@gra(a) Tours}` produces à **Tours**; `@s{biblioth@gra(e)que}` produces *bibliothèque*.

The textforms will not always place the accents correctly over characters from other fonts, as evident from the last example. The forms that produce accents alone (@uacc to @tic) can be used with other Scribe commands to achieve a better placement: `@define(dn,script -2pt) @s(biblioth@!e@/dn<@grc>@hsp(1pt)que)` produces *bibliothèque*.

Any font error messages that occur when using these forms and textforms should be referred to Text Processing Services, 625-1391. There are many possible combinations of fonts, and the Scribe and 8700 font files must be updated when new combinations are requested.

Informal Name	Scribe Name	Example @R @I	Informal Name	Scribe Name	Example @R @I
A acute	@uac	Á Á	a umlaut	@aum	ä ä
a acute	@aac	á á	C cedilla	@ucce	Ç Ç
A angstrom	@uaan	Å Å	c cedilla	@cce	ç ç
a angstrom	@aan	å å	E acute	@ueac	É É
A circumflex	@uaci	Â Â	e acute	@eac	é é
a circumflex	@aci	â â	E circumflex	@ueci	Ê Ê
AE	@ae	Æ Æ	e circumflex	@eci	ê ê
ae	@ae	æ æ	E grave	@uegr	È È
A grave	@uagr	À À	e grave	@egr	è è
a grave	@agr	à à	E macron	@uema	Ê Ê
A macron	@uama	Ā Ā	e macron	@ema	ē ē
a macron	@ama	ā ā	E tail	@ueta	Ẹ Ẹ
A tail	@uata	Ạ Ạ	e tail	@eta	ẹ ẹ
a tail	@ata	ạ ạ	E umlaut	@ueum	Ë Ë
A tilde	@uati	Ã Ã	e umlaut	@eum	ë ë
a tilde	@ati	ã ã	I acute	@uiac	Í Í
A umlaut	@uaum	Ä Ä	i acute	@iac	í í

Informal Name	Scribe Name	Example @R @I	Informal Name	Scribe Name	Example @R @I
I circumflex	@uici	Î Î	double quote	@eldq	“ ”
i circumflex	@ici	î î	English right		” ”
I grave	@uigr	Ì Ì	double quote	@erdq	“ ”
i grave	@igr	ì ì	Spanish exclamation		
IJ	@uij	Ĳ Ĳ	point	@sexp	ı ı
ij	@ij	ÿ ŷ	Spanish question		
I macron	@uima	Ī Ī	mark	@squm	ı ı
i macron	@ima	ī ī	French left		
I tail	@uita	Ĭ Ĭ	double quote	@fldq	« »
i tail	@ita	ĭ ĭ	French right		
I umlaut	@uium	Ï Ï	double quote	@frdq	» »
i umlaut	@ium	ï ï	D bar	@udba	Đ Đ
N tilde	@unti	Ñ Ñ	d bar	@dba	đ đ
n tilde	@nti	ñ ñ	round d	@rd	ð ð
O acute	@uoac	Ó Ó	round d bar	@rdba	ð ð
o acute	@oac	ó ó	variant E 1	@vae1	Ɛ Ɛ
O apostrophe	@uoap	Ɔ Ɔ	variant E 2	@vae2	Ɛ Ɛ
o apostrophe	@oap	ɔ ɔ	L slash	@ulsl	Ł Ł
O circumflex	@uoci	Ô Ô	l slash	@lsl	ł ł
o circumflex	@oci	ô ô	round r	@rr	ŕ ŕ
OE	@ueo	Ɔ Ɔ	tall s	@ts	ſ ſ
oe	@oe	œ œ	es-zet	@ss	ß ß
O grave	@uogr	Ò Ò	Thorn	@uth	þ þ
o grave	@ogr	ò ò	thorn	@thorn	þ þ
O macron	@uoma	Ō Ō	old Thorn	@uoth	Ʈ Ʈ
o macron	@oma	ō ō	old thorn	@oth	Ʈ Ʈ
O slash	@uosl	Ø Ø	reverse Y	@urey	Ƴ Ƴ
o slash	@osl	ø ø	reverse y	@rey	Ƴ Ƴ
O tail	@uota	Ɔ Ɔ	IPA a	@ipa	ə ə
o tail	@ota	ɔ ɔ	IPA au	@ipau	ɔ ɔ
O tilde	@uoti	Õ Õ	IPA ng	@ipng	ŋ ŋ
o tilde	@oti	õ õ	IPA sh	@ipsh	ʃ ʃ
O umlaut	@uoum	Ö Ö	IPA th	@ipth	θ θ
o umlaut	@oum	ö ö	IPA u	@ipu	ʌ ʌ
U acute	@uuac	Ú Ú	IPA zh	@ipzh	ʒ ʒ
u acute	@uac	ú ú	italic D bar	@iudba	Đ Đ
U angstrom	@uuan	Û Û	italic d bar	@idba	đ đ
u angstrom	@uan	û û	italic round d	@ird	ð ð
U apostrophe	@uuap	Ɔ Ɔ	italic round d bar	@irdba	ð ð
u apostrophe	@uap	ɔ ɔ	italic variant E 1	@ivae1	Ɛ Ɛ
U circumflex	@uuci	Û Û	italic variant E 2	@ivae2	Ɛ Ɛ
u circumflex	@uci	û û	italic L slash	@iulsl	Ł Ł
U grave	@uugr	Û Û	italic l slash	@ilsl	ł ł
u grave	@ugr	ù ù	italic round r	@irr	ŕ ŕ
U macron	@uuma	Ū Ū	italic tall s	@its	ſ ſ
u macron	@uma	ū ū	italic es-zet	@iss	ß ß
U tail	@uuta	Ɔ Ɔ	italic Thorn	@iuth	þ þ
u tail	@uta	ɔ ɔ	italic thorn	@ithorn	þ þ
U umlaut	@uuum	Û Û	italic old Thorn	@iuoth	Ʈ Ʈ
u umlaut	@uum	ü ü	italic old thorn	@ioth	Ʈ Ʈ
Y macron	@uyma	Ȳ Ȳ	italic reverse Y	@iurey	Ƴ Ƴ
y macron	@yma	ȳ ȳ	italic reverse y	@irey	Ƴ Ƴ
English left			italic IPA a	@iipa	ə ə

Informal Name	Scribe Name	Example @R @I	Informal Name	Scribe Name	Example @R @I
italic IPA au	@iipau	ɔ	beneath		
italic IPA ng	@iipng	ŋ	tail character		
italic IPA sh	@iipsh	ʃ	beneath	@tacb	˘
italic IPA th	@iipth	θ	concave tie		˘
italic IPA u	@iipu	ʌ	character	@cctiec	˘
italic IPA zh	@iipzh	ʒ	convex tie		˘
uppercase acute		˙	character	@cvtiec	˘
character	@uacc	˙	straight tie		˘
acute character	@acc	˙	character	@sttiec	˘
uppercase double		¨	uppercase tilde		˘
acute character	@udacc	¨	character	@utic	˘
double acute		¨	tilde character	@tic	˘
character	@dacc	¨	uppercase acute		˘
uppercase angstrom		˚	accent	@uaca(X)	˘
character	@uanc	˚	acute accent	@aca(x)	˘
angstrom character	@anc	˚	uppercase double		˘
angstrom character		˚	acute accent	@udaca(X)	˘
beneath	@ancb	˚	double acute accent	@daca(x)	˘
uppercase breve		˘	uppercase angstrom		˘
character	@ubrc	˘	accent	@uana(X)	˘
breve character	@brc	˘	angstrom accent	@ana(x)	˘
cedilla character		¸	angstrom beneath	@anb(x)	˘
beneath	@cecb	¸	uppercase breve		˘
uppercase circumflex		ˆ	accent	@ubra(X)	˘
character	@ucic	ˆ	breve accent	@bra(x)	˘
circumflex		ˆ	cedilla beneath	@ceb(x)	˘
character	@cic	ˆ	uppercase circumflex		˘
comma character		,	accent	@ucia(X)	˘
beneath	@cocb	,	circumflex accent	@cia(x)	˘
uppercase dieresis		¨	comma beneath	@cob(x)	˘
character	@udic	¨	uppercase dot		˘
dieresis		¨	accent	@udoa(X)	˘
character	@dic	¨	dot accent	@doa(x)	˘
uppercase dot		˙	dot beneath	@dob(x)	˘
character	@udoc	˙	uppercase grave		˘
dot character	@doc	˙	accent	@ugra(X)	˘
uppercase grave		˘	grave accent	@gra(x)	˘
character	@ugrc	˘	uppercase double		˘
grave character	@grc	˘	grave accent	@udgra(X)	˘
uppercase double		¨	double grave accent	@dgra(x)	˘
grave character	@udgrc	¨	uppercase hacek		˘
double grave		¨	accent	@uhaa(X)	˘
character	@dgrc	¨	hacek accent	@uha(x)	˘
uppercase hacek		ˇ	uppercase hook		˘
character	@uhac	ˇ	accent	@uhoa(X)	˘
hacek character	@hac	ˇ	hook accent	@hoa(x)	˘
uppercase hook		ˆ	uppercase macron		˘
character	@uhoc	ˆ	accent	@umaa(X)	˘
hook character	@hoc	ˆ	macron accent	@maa(x)	˘
uppercase macron		˘	macron beneath	@mab(x)	˘
character	@umac	˘	tail beneath	@tab(x)	˘
macron character	@mac	˘	concave tie	@cctie(xx)	˘˘
macron character	@macb	˘	convex tie	@cvtie(xx)	˘˘

Informal Name	Scribe Name	Example @R @I	Informal Name	Scribe Name	Example @R @I
straight tie	@sttie(xx)	$\bar{x}\bar{x}$			
uppercase tilde accent	@utia(X)	\tilde{X}			
tilde accent	@tia(x)	\tilde{x}			

TIMES META 10 FONT FAMILY, TEXT SAMPLES

FONT BODYFONT

- R "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- I *"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values*
- B "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- P ***"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values***
- F "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- C "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES
- T "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

FONT SMALLBODYFONT

- R "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- I *"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values*
- B "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- P ***"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values***
- F "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- C "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES
- T "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

TIMES META 10 FONT FAMILY, TEXT SAMPLES

FONT BODYFONT9

- R "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- I *"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values*
- B **"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values**
- P ***"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values***
- F **"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values**
- C **"ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES**
- T **"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values**

FONT TITLEFONT1, FONT TITLEFONT2, FONT TITLEFONT3

- R "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- I *"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values*
- B **"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values**
- P ***"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values***
- C **"ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES**

TIMES META 10 FONT FAMILY, TEXT SAMPLES

FONT TITLEFONT4, FONT TITLEFONT5

R "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

I *"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values*

B **"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values**

P *"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values*

C **"ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES**

FONT 18POINTS

- R "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- I *"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values*
- B **"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values**
- P *"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values*

FONT 24POINTS

R ALL CITIES WHICH HAVE
ATTAINED ANY CONSIDERABLE
SIZE INCLUDE IN VARYING
PROPORTIONS ALL THE ABOVE
FACTORS OF COMMERCE,
MANUFACTURES, POLITICAL
AND SOCIAL FORCES.
RICHARD HURD, PRINCIPLES
OF CITY LAND VALUES

I *ALL CITIES WHICH HAVE
ATTAINED ANY
CONSIDERABLE SIZE INCLUDE
IN VARYING PROPORTIONS
ALL THE ABOVE FACTORS OF
COMMERCE, MANUFACTURES,
POLITICAL AND SOCIAL
FORCES. RICHARD HURD,
PRINCIPLES OF CITY LAND
VALUES*

FONT 24POINTS

**B ALL CITIES WHICH HAVE
ATTAINED ANY CONSIDERABLE
SIZE INCLUDE IN VARYING
PROPORTIONS ALL THE ABOVE
FACTORS OF COMMERCE,
MANUFACTURES, POLITICAL
AND SOCIAL FORCES.
RICHARD HURD, PRINCIPLES
OF CITY LAND VALUES**

**P *ALL CITIES WHICH HAVE
ATTAINED ANY
CONSIDERABLE SIZE
INCLUDE IN VARYING
PROPORTIONS ALL THE
ABOVE FACTORS OF
COMMERCE,
MANUFACTURES, POLITICAL
AND SOCIAL FORCES.
RICHARD HURD, PRINCIPLES
OF CITY LAND VALUES***



UCC BRIEF

Xerox 9700 Fonts Available with Scribe

The Xerox 9700 laser printer is a high-speed, high-quality, low-cost printer for computerized text files. Files can be sent to the Xerox 9700 from the University Computer Center's Cyber system or VAX/VMS. The 9700 can print any text file that you could send to a line printer or view on a screen on either of these systems. However, to take advantage of the "typesetting" versatility of this laser printer, you must format your text with Scribe, a program which runs on UCC's VAX/VMS. Files can be written and edited on any system with communications to the VAX. Refer to the *Scribe Document Production System User Manual* and *Scribe at UCC*, available in the University of Minnesota Bookstores, for specific information on using Scribe. (Reference copies are located in the UCC Reference Room, 140 Experimental Engineering.)

Two Xerox 9700 font families with a range of type sizes and type faces are available through Scribe. This brief lists all the Scribe printing characters for the Xerox 9700 fonts, shows how these characters are obtainable with Scribe commands, and gives examples of their appearance in running text. The information is presented first for the Helvetica 10 Font Family, a sans serif type style, and then for the Times Roman 10 Font Family, a serif type style. Helvetica 10 is the default font family for most Scribe document types. Either family can be selected for a particular document with the appropriate beginning Scribe command:

`@Style(FontFamily Helvetica10)` or
`@Style(FontFamily TimesRoman10)`.

Printing characters on the 9700 are grouped into fonts, or collections of characters of one style, face, and size of type. Scribe takes these "machine fonts" and regroups the characters into "typecases", composed primarily of characters from one machine font, but also including other characters to make up a "standard" character set. Scribe organizes typecases with similar size type into "Scribe fonts", and assigns a "facecode" to each typecase in a Scribe font. Scribe's text and environment formatting definitions then specify a particular Scribe font and facecode within that font for all text in a document. Scribe's "facecode commands", such as `@B(text)` for bolding, are further available to readily change typeface within any formatting environment.

The first chart for each font family in this brief,

`@Marker(FontFamily,Helvetica10,X9700)` and
`@Marker(FontFamily,TimesRoman10,X9700)`,

is taken from the Scribe database. The chart shows the names of all the Scribe fonts in the font family, the facecodes that are available within those fonts, and the typecases associated with the facecodes. Scribe uses "BodyFont" in most of its formatting environments, "Smallbodyfont" in footnotes, and the various "TitleFonts" in different types of headings. You can refer to the .MAK and .DEV files in the Scribe database for precise information on Scribe font use. (See Ch. 9, "Using the Scribe Database", in *Scribe at UCC*.)

UCC has added a number of Scribe fonts to the database, i.e. "BodyFont10", "SmallBodyFont9", "SmallBodyFont8", "11points", "14points", "18points", and "24points". These fonts are not associated with any predefined Scribe environments, but they can be used to create new environments or modify existing ones. For example, you could modify

the quotation environment to produce a small italic typeface with the following command:

@Modify(Quotation, Font Smallbodyfont, Use I),

or define a new environment to use the 9 point type size in the Times Roman 10 family:

@Define(Text9=Text,Font Smallbodyfont9,Facecode R).

("Use X" and "Facecode X" are synonymous terms for facecode designations.)

The facecode names are usually descriptive of the typefaces they produce: "R" for regular or roman, "I" for italic, "B" for bold, "P" for bold italic, "F" for fixed-width, "C" for small capitals, "G" for Greek, "Y" for publication symbols, and "T" for typewriter. Scribe uses "R" when no other facecode is specified. Typecases for "R", "I", "B", "P", "C", and "Y" contain proportionally spaced characters, where the printing space is based on the design of the character, as in hand-lettering. Typecases for "F", "G", and "T" contain fixed-width characters, where the printing space for all characters is the same, as with a typewriter.

The second chart for each font family,

**HELVETICA 10 FONT FAMILY, CHARACTER SETS and
TIMES ROMAN 10 FONT FAMILY, CHARACTER SETS,**

lists by Scribe typecase name all the characters in each typecase. In most instances the typecases contain the full ASCII standard character set. The larger typecases contain only uppercase letters, digits, and four punctuation marks: . - . / . The Greek typecases show which characters "map" onto the standard ASCII characters by their corresponding positions in the columns. Thus to print Greek characters, you would enclose the appropriate ASCII characters in delimiters after the Greek facecode command, for example **@G(abcd)** to print as $\alpha\beta\chi\delta$.

The third chart for each font family,

**HELVETICA 10 FONT FAMILY, SPECIAL SYMBOLS and
TIMES ROMAN 10 FONT FAMILY, SPECIAL SYMBOLS,**

lists the special symbols available by facecode and Scribe commandstring. Each symbol can be obtained by enclosing the corresponding ASCII character in delimiters after the proper facecode command, or by using a Scribe commandstring if one is noted. Thus **@Y(R)** and **@Registered** both produce ®. Each lowercase Greek character can be produced by a Scribe commandstring too, so that **@alpha@beta@gamma@delta** would also print as $\alpha\beta\chi\delta$. All Scribe commandstrings must be followed by another Scribe command or a blank space; you can use @; the Scribe null command, to end a commandstring in the middle of a list of characters, as in **@pi@;r@+(2)** to print πr^2 .

The fourth chart for each font family,

**HELVETICA 10 FONT FAMILY, TEXT SAMPLES and
TIMES ROMAN 10 FONT FAMILY, TEXT SAMPLES,**

gives printing samples of all the ASCII character sets by Scribe font and facecode. Different Scribe font names or facecodes within a font may produce the same printing characters. Refer back to the first chart to determine the typecase being used.

NOTE: The Xerox 9700 has a memory limitation on the number of machine fonts it can print from on one page, and it also must have a stored list of possible machine font combinations for every page that it prints. Scribe contains a list of likely combinations (available for inspection in its database file **X9700.PDE**). However if you run into an error message that states:

Error found while processing:

These fonts should be in one font set;

you have asked for a machine font combination that Scribe and the 9700 do not know about, and the particular page will not print. You can either change the fonts used or ask to have a new font combination set up. Call Text Processing Services at 376-2943 for assistance.

@Marker(FontFamily,Helvetica10,X9700)

```
@DefineFont (BodyFont,  
  R=<TypeCase "UN110E">,  
  I=<TypeCase "UN510E">,  
  B=<TypeCase "UN210E">,  
  P=<TypeCase "UN510E">,  
  F=<TypeCase "P06B0B">,  
  C=<TypeCase "UN108E">,  
  G=<TypeCase "GK110P">,  
  Y=<TypeCase "HESymbols">,  
  T=<TypeCase "P07TDC">)
```

```
@DefineFont (SmallBodyFont,  
  R=<TypeCase "UN108E">,  
  I=<TypeCase "UN508P">,  
  B=<TypeCase "UN208E">,  
  P=<TypeCase "UN508P">,  
  F=<TypeCase "P06B0B">,  
  C=<TypeCase "UN108E">,  
  G=<TypeCase "GK108P">,  
  Y=<TypeCase "HESymbols">,  
  T=<TypeCase "UD108P">)
```

```
@DefineFont (TitleFont1,  
  R=<TypeCase "UN210E">,  
  B=<TypeCase "UN210E">,  
  I=<TypeCase "UN210E">,  
  C=<TypeCase "UN208E">)
```

```
@DefineFont (TitleFont2,  
  R=<TypeCase "UN211E">,  
  B=<TypeCase "UN211E">,  
  I=<TypeCase "UN211E">,  
  C=<TypeCase "UN208E">)
```

```
@DefineFont (TitleFont3,  
  R=<TypeCase "UN214E">,  
  B=<TypeCase "UN214E">,  
  I=<TypeCase "UN214E">,  
  C=<TypeCase "UN211E">)
```

```
@DefineFont (TitleFont4,  
  R=<TypeCase "UN214E">,  
  B=<TypeCase "UN214E">,  
  I=<TypeCase "UN214E">,  
  C=<TypeCase "UN211E">)
```

```
@DefineFont (TitleFont5,  
  R=<TypeCase "UN214B">,  
  B=<TypeCase "UN214B">,  
  I=<TypeCase "UN214B">,  
  C=<TypeCase "UN211E">)
```

```
@DefineFont (14points,  
  R=<TypeCase "UN114B">,  
  B=<TypeCase "UN214E">)
```

```
@DefineFont (18points,  
  R=<TypeCase "UN118B">,  
  B=<TypeCase "UN218B">)
```

```
@DefineFont (24points,  
  R=<TypeCase "UN124B">,  
  B=<TypeCase "UN224B">)
```


HELVETICA 10 FONT FAMILY, CHARACTER SETS

JN108E	UN208E	UN508P	UD108P	GK108P	UN110E	UN210E	UN510E	P07TDC	GK110P
P	P	P	P	Π	P	P	P	P	Π
Q	Q	Q	Q	Θ	Q	Q	Q	Q	Θ
R	R	R	R	Ρ	R	R	R	R	Ρ
S	S	S	S	Σ	S	S	S	S	Σ
T	T	T	T	Τ	T	T	T	T	Τ
U	U	U	U		U	U	U	U	
V	V	V	V		V	V	V	V	
W	W	W	W	Ω	W	W	W	W	Ω
X	X	X	X	Ξ	X	X	X	X	Ξ
Y	Y	Y	Y	Ψ	Y	Y	Y	Y	Ψ
Z	Z	Z	Z	Ζ	Z	Z	Z	Z	Ζ
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a	a	a	a	β	a	a	a	a	β
b	b	b	b	χ	b	b	b	b	χ
c	c	c	c	δ	c	c	c	c	δ
d	d	d	d	ε	d	d	d	d	ε
e	e	e	e	φ	e	e	e	e	φ
f	f	f	f	γ	f	f	f	f	γ
g	g	g	g	η	g	g	g	g	η
h	h	h	h	ι	h	h	h	h	ι
i	i	i	i		i	i	i	i	
j	j	j	j		j	j	j	j	
k	k	k	k	κ	k	k	k	k	κ
l	l	l	l	λ	l	l	l	l	λ
m	m	m	m	μ	m	m	m	m	μ
n	n	n	n	ν	n	n	n	n	ν
o	o	o	o	ο	o	o	o	o	ο
p	p	p	p	π	p	p	p	p	π
q	q	q	q	θ	q	q	q	q	θ
r	r	r	r	ρ	r	r	r	r	ρ
s	s	s	s	σ	s	s	s	s	σ
t	t	t	t	τ	t	t	t	t	τ
u	u	u	u	υ	u	u	u	u	υ
v	v	v	v	ς	v	v	v	v	ς
w	w	w	w	ω	w	w	w	w	ω
x	x	x	x	ξ	x	x	x	x	ξ
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z	z	z	z	ζ	z	z	z	z	ζ
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HELVETICA 10 FONT FAMILY, CHARACTER SETS

P06BOB	UN211E	UN214E	UN114B	UN214B	UN118B	UN218B	UN124B	UN224B
!	!	!"	'	'	'	'	'	'
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#	#	#
\$	\$	#\$%	/	/	/	/	/	/
%	%	&	0	0	0	0	0	0
&	&	'	1	1	1	1	1	1
'	'	(2	2	2	2	2	2
(()	3	3	3	3	3	3
))	*	4	4	4	4	4	4
*	*	+	5	5	5	5	5	5
+	+	.	6	6	6	6	6	6
.	.	/'	7	7	7	7	7	7
/'	/'	/'	8	8	8	8	8	8
0	0	/'	9	9	9	9	9	9
1	1	/'	A	A	A	A	A	A
2	2	/'	B	B	B	B	B	B
3	3	/'	C	C	C	C	C	C
4	4	/'	D	D	D	D	D	D
5	5	/'	E	E	E	E	E	E
6	6	/'	F	F	F	F	F	F
7	7	/'	G	G	G	G	G	G
8	8	/'	H	H	H	H	H	H
9	9	/'	I	I	I	I	I	I
:	:	/'	J	J	J	J	J	J
;	;	/'	K	K	K	K	K	K
<	<	/'	L	L	L	L	L	L
=	=	/'	M	M	M	M	M	M
>	>	/'	N	N	N	N	N	N
?	?	/'	O	O	O	O	O	O
@	@	/'						
A	A	/'						
B	B	/'						
C	C	/'						
D	D	/'						
E	E	/'						
F	F	/'						
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H	H	/'						
I	I	/'						
J	J	/'						
K	K	/'						
L	L	/'						
M	M	/'						
N	N	/'						
O	O	/'						

HELVETICA 10 FONT FAMILY, CHARACTER SETS



06BOB

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UN211E

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UN214E

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UN114B

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UN214B

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UN118B

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UN218B

**P
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UN124B

**P
Q
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Y
Z**

UN224B

**P
Q
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X
Y
Z**

HELVETICA 10 FONT FAMILY, SPECIAL SYMBOLS

ASCII Char	Facecode Y Symbol, Commandstring	ASCII Char	Facecode Y Symbol, Commandstring
!		P	¶ @parag
"		Q	
#	■ @square	R	® @registered
\$		S	
%	¢ @cent	T	™ @trademark
&	§ @sect	U	
'	' @prime	V	
(		W	
)		X	
*		Y	
+	± @pom	Z	
,		[	' @lsq
-	- @not	\	
.		]	' @rsq
/		↑	
0	° @deg	—	- @sminus
1		'	
2	½ @half	a	
3		b	
4	¼ @4th	c	
5		d	
6		e	
7		f	
8		g	
9		h	
:		i	
;		j	
<	≤ @ltoe	k	
=	≠ @nteq	l	
>	≥ @gtoe	m	
?		n	
@		o	
A		p	
B	• @bullet	q	
C	© @copyr	r	
D	† @dagger	s	
E		t	
F		u	
G	‡ @2dagger	v	
H		w	
I		x	× @times
J		y	
K		z	
L		{	" @ldq
M	— @mdash	|	
N	- @ndash	}	" @rdq
O		~	

HELVETICA 10 FONT FAMILY, TEXT SAMPLES

FONT BODYFONT

- R "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- I, P *"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values*
- B **"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values**
- F "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- C "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES
- T "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

FONT SMALLBODYFONT

- R "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- I, P *"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values*
- B "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- F "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- C "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES
- T "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

HELVETICA 10 FONT FAMILY, TEXT SAMPLES

FONT TITLEFONT1

R, B, I

"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

C **"ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES**

FONT TITLEFONT2

R, B, I

"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

C **"ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES**

FONT TITLEFONT3, FONT TITLEFONT4

R, B, I

"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

C **"ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES**

FONT TITLEFONT5

R, B, I

"ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

C **"ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES**

HELVETICA 10 FONT FAMILY, TEXT SAMPLES

FONT 14POINTS

- R "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES
- B "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

FONT 18POINTS

- R "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES
- B "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

FONT 24POINTS

R "ALL CITIES WHICH HAVE
ATTAINED ANY CONSIDERABLE
SIZE INCLUDE IN VARYING
PROPORTIONS ALL THE ABOVE
FACTORS OF COMMERCE,
MANUFACTURES, POLITICAL AND
SOCIAL FORCES." RICHARD HURD,
PRINCIPLES OF CITY LAND VALUES

B "ALL CITIES WHICH HAVE
ATTAINED ANY
CONSIDERABLE SIZE INCLUDE
IN VARYING PROPORTIONS
ALL THE ABOVE FACTORS OF
COMMERCE, MANUFACTURES,
POLITICAL AND SOCIAL
FORCES." RICHARD HURD,
PRINCIPLES OF CITY LAND
VALUES

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  I=<TypeCase "GR31OP">,  
  B=<TypeCase "PR211E">,  
  P=<TypeCase "UN511E">,  
  F=<TypeCase "PO6BOB">,  
  C=<TypeCase "PR107E">,  
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  F=<TypeCase "PO6BOB">,  
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  G=<TypeCase "GK11OR">,  
  Y=<TypeCase "TRSymbols">,  
  N=<TypeCase "FLSymbols">,  
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  G=<TypeCase "GK108R">,  
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  N=<TypeCase "FLSymbols">,  
  T=<TypeCase "PO7TCC">)
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  F=<TypeCase "PO6BOB">,  
  C=<TypeCase "PR107E">,  
  G=<TypeCase "GK108R">,  
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  N=<TypeCase "FLSymbols">,  
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  B=<TypeCase "PR108P">,  
  P=<TypeCase "GR308P">,  
  F=<TypeCase "PO6BOB">,  
  C=<TypeCase "PR108P">,  
  G=<TypeCase "GK108R">,  
  Y=<TypeCase "TRSymbols">,  
  N=<TypeCase "FLSymbols">,  
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  I=<TypeCase "PR214B">,  
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TIMES ROMAN 10 FONT FAMILY, CHARACTER SETS

Q107E	PR108P	GR308P	GK108R	PR109E	PR110E	GR310P	P07TCC	P06BOB	GK110R
P	P	P	Π	P	P	P	P	P	Π
Q	Q	Q	Θ	Q	Q	Q	Q	Q	Θ
R	R	R	Ρ	R	R	R	R	R	Ρ
S	S	S	Σ	S	S	S	S	S	Σ
T	T	T	Τ	T	T	T	T	T	Τ
U	U	U	Υ	U	U	U	U	U	Υ
V	V	V	Ω	V	V	V	V	V	Ω
W	W	W	Ξ	W	W	W	W	W	Ξ
X	X	X	Ψ	X	X	X	X	X	Ψ
Y	Y	Y	Z	Y	Y	Y	Y	Y	Z
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b	b	b	χ	b	b	b	b	b	χ
c	c	c	δ	c	c	c	c	c	δ
d	d	d	ε	d	d	d	d	d	ε
e	e	e	φ	e	e	e	e	e	φ
f	f	f	γ	f	f	f	f	f	γ
g	g	g	η	g	g	g	g	g	η
h	h	h	ι	h	h	h	h	h	ι
i	i	i		i	i	i	i	i	
j	j	j	κ	j	j	j	j	j	κ
k	k	k	λ	k	k	k	k	k	λ
l	l	l	μ	l	l	l	l	l	μ
m	m	m	ν	m	m	m	m	m	ν
n	n	n	ο	n	n	n	n	n	ο
o	o	o	π	o	o	o	o	o	π
p	p	p	θ	p	p	p	p	p	θ
q	q	q	ρ	q	q	q	q	q	ρ
r	r	r	σ	r	r	r	r	r	σ
s	s	s	τ	s	s	s	s	s	τ
t	t	t	υ	t	t	t	t	t	υ
u	u	u	ς	u	u	u	u	u	ς
v	v	v	ω	v	v	v	v	v	ω
w	w	w	ξ	w	w	w	w	w	ξ
x	x	x	ψ	x	x	x	x	x	ψ
y	y	y	ζ	y	y	y	y	y	ζ
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TIMES ROMAN 10 FONT FAMILY, CHARACTER SETS

PR111E	PR211E	UN511E	PR114B	PR214B	PR118B	PR218B	PR124B	PR224B
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"	"	"	-	-	-	-	-	-
#	#	#
\$	\$	\$	/	/	/	/	/	/
%	%	%	0	0	0	0	0	0
&	&	&	1	1	1	1	1	1
'	'	'	2	2	2	2	2	2
(((3	3	3	3	3	3
)))	4	4	4	4	4	4
*	*	*	5	5	5	5	5	5
+	+	+	6	6	6	6	6	6
,	,	,	7	7	7	7	7	7
-	-	-	8	8	8	8	8	8
.	.	.	9	9	9	9	9	9
/	/	/	A	A	A	A	A	A
0	0	0	B	B	B	B	B	B
1	1	1	C	C	C	C	C	C
2	2	2	D	D	D	D	D	D
3	3	3	E	E	E	E	E	E
4	4	4	F	F	F	F	F	F
5	5	5	G	G	G	G	G	G
6	6	6	H	H	H	H	H	H
7	7	7	I	I	I	I	I	I
8	8	8	J	J	J	J	J	J
9	9	9	K	K	K	K	K	K
:	:	:	L	L	L	L	L	L
;	;	;	M	M	M	M	M	M
<	<	<	N	N	N	N	N	N
=	=	=	O	O	O	O	O	O
>	>	>						
?	?	?						
@	@	@						
A	A	A						
B	B	B						
C	C	C						
D	D	D						
E	E	E						
F	F	F						
G	G	G						
H	H	H						
I	I	I						
J	J	J						
K	K	K						
L	L	L						
M	M	M						
N	N	N						
O	O	O						

TIMES ROMAN 10 FONT FAMILY, CHARACTER SETS

PR111E	PR211E	UN511E	PR114B	PR214B	PR118B	PR218B	PR124B	PR224B
P	P	<i>P</i>	P	P	P	P	P	P
Q	Q	<i>Q</i>	Q	Q	Q	Q	Q	Q
R	R	<i>R</i>	R	R	R	R	R	R
S	S	<i>S</i>	S	S	S	S	S	S
T	T	<i>T</i>	T	T	T	T	T	T
U	U	<i>U</i>	U	U	U	U	U	U
V	V	<i>V</i>	V	V	V	V	V	V
W	W	<i>W</i>	W	W	W	W	W	W
X	X	<i>X</i>	X	X	X	X	X	X
Y	Y	<i>Y</i>	Y	Y	Y	Y	Y	Y
Z	Z	<i>Z</i>	Z	Z	Z	Z	Z	Z
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]]	<i>]</i>						
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a	a	<i>a</i>						
b	b	<i>b</i>						
c	c	<i>c</i>						
d	d	<i>d</i>						
e	e	<i>e</i>						
f	f	<i>f</i>						
g	g	<i>g</i>						
h	h	<i>h</i>						
i	i	<i>i</i>						
j	j	<i>j</i>						
k	k	<i>k</i>						
l	l	<i>l</i>						
m	m	<i>m</i>						
n	n	<i>n</i>						
o	o	<i>o</i>						
p	p	<i>p</i>						
q	q	<i>q</i>						
r	r	<i>r</i>						
s	s	<i>s</i>						
t	t	<i>t</i>						
u	u	<i>u</i>						
v	v	<i>v</i>						
w	w	<i>w</i>						
x	x	<i>x</i>						
y	y	<i>y</i>						
z	z	<i>z</i>						
{	{	<i>{</i>						
		<i> </i>						
}	}	<i>}</i>						

TIMES ROMAN 10 FONT FAMILY, SPECIAL SYMBOLS

ASCII Char	Facecode Y Symbol, Commandstring	Facecode N Symbol, Commandstring	ASCII Char	Facecode Y Symbol, Commandstring	Facecode N Symbol, Commandstring
!		i	P	¶ @parag	Þ
"			Q		Ø
#	■ @square		R	® @registered	
\$		£ @pound	S		
%	¢ @cent	‰ @epercent	T	™ @trademark	
&	§ @sect		U		Ů
'	' @prime		V		
(W		
)			X		
*	★ @star	¤ @ecopyr	Y		
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,			[' @lsq	
-	¬ @not		\		
.]	' @rsq	
/	÷ @divide		↑	→ @rar	
0	° @deg		—	- @sminus	
1	⅓ @38th	f	,		
2	½ @half	3	a		á
3	⅓ @3rd	3	b		â
4	¼ @4th	η	c		
5	⅝ @58th	^	d		ä
6	⅔ @23rd	ð	e		é
7	⅞ @78th	θ	f		è
8	⅛ @8th		g		æ
9	¾ @34th		h		œ
:			i		
;			j		
<	≤ @ltoe	“	k		ı
=	≠ @nteq		l		
>	≥ @gtoe	”	m		
?		ı	n		
@			o		ó
A		Á	p		ö
B	• @bullet	À	q		ø
C	© @copyr		r		
D	† @dagger	Ð	s		ß
E		É	t		
F		È	u		ü
G	‡ @2dagger	Æ	v		
H		Œ	w		
I			x	× @times	
J			y		
K			z		
L		Ł	{	“ @ldq	
M	— @mdash		|		
N	- @ndash		}	” @rdq	
O		Œ	~		

TIMES ROMAN 10 FONT FAMILY, TEXT SAMPLES

FONT BODYFONT

- R "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- I *"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values*
- B "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- P *"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values*
- F "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- C "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES
- T "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

FONT BODYFONT10

- R "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- I *"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values*
- B "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- F "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- C "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES
- T "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

TIMES ROMAN 10 FONT FAMILY, TEXT SAMPLES

FONT SMALLBODYFONT

R, B, P

"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

I *"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values*

F **"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values**

C "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

T "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

FONT SMALLBODYFONT9

R, B, P

"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

I *"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values*

F **"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values**

C "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

T "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

FONT SMALLBODYFONT8

R, B, P

"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

I *"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values*

F **"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values**

C "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

T "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

TIMES ROMAN 10 FONT FAMILY, TEXT SAMPLES

FONT TITLEFONT1

R, I "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces."
Richard Hurd, Principles of City Land Values

C "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE. MANUFACTURES. POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

FONT TITLEFONT2, FONT TITLEFONT3

R, I "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES."
RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

C "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

FONT TITLEFONT4, FONT TITLEFONT5

R "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

C "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

TIMES ROMAN 10 FONT FAMILY, TEXT SAMPLES

FONT 11POINTS

- R "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- B "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

FONT 14POINTS

- R "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES
- B "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

FONT 18POINTS

- R "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES
- B "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

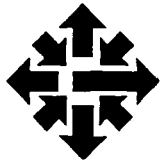
FONT 24POINTS

R "ALL CITIES WHICH HAVE
ATTAINED ANY CONSIDERABLE
SIZE INCLUDE IN VARYING
PROPORTIONS ALL THE ABOVE
FACTORS OF COMMERCE,
MANUFACTURES, POLITICAL
AND SOCIAL FORCES." RICHARD
HURD, PRINCIPLES OF CITY
LAND VALUES

B "ALL CITIES WHICH HAVE
ATTAINED ANY CONSIDERABLE
SIZE INCLUDE IN VARYING
PROPORTIONS ALL THE ABOVE
FACTORS OF COMMERCE,
MANUFACTURES, POLITICAL AND
SOCIAL FORCES." RICHARD HURD,
PRINCIPLES OF CITY LAND
VALUES

2

2



ACSS Brief

Xerox 9700 Fonts Available with Scribe

The Xerox 9700 laser printer is a high-speed, high-quality, low-cost printer for computerized text files. Files can be sent to the Xerox 9700 from Academic Computing Services and System's (ACSS) CYBER system or VAX/VMS. The 9700 can print any text file that you could send to a line printer or view on a screen on either of these systems. However, to take advantage of the "typesetting" versatility of this laser printer, you must format your text with Scribe, a program which runs on ACSS's VAX/VMS. Files can be written and edited on any system with communications to the VAX. Refer to the *Scribe Document Production System User Manual* and *Scribe at UCC*, available in the University of Minnesota bookstores, for specific information on using Scribe. (Reference copies are located in the ACSS Reference Room, 128A Lind Hall.)

Two Xerox 9700 font families with a range of type sizes and type faces are available through Scribe. This *Brief* lists all the Scribe printing characters for the Xerox 9700 fonts, shows you how these characters are obtainable with Scribe commands, and gives examples of their appearance in running text. The information is presented first for the Helvetica 10 Font Family, a sans serif type style, and then for the Times Roman 10 Font Family, a serif type style. Helvetica 10 is the default font family for most Scribe document types. Either family can be selected for a particular document with the appropriate beginning Scribe command:

**@Style(FontFamily Helvetica10) or
@Style(FontFamily TimesRoman10)**

Printing characters on the 9700 are grouped into fonts, or collections of characters of one style, face, and size of type. Scribe takes these "machine fonts" and regroups the characters into "typescases," composed primarily of characters from one machine font but also including other characters to make up a "standard" character set. Scribe organizes typescases with similar size type into "Scribe fonts," and assigns a "facecode" to each typescase in a Scribe font and facecode within that font for all text in a document. Scribe's "facecode commands," such as **@B(text)** for bolding, are further available to readily change typeface within any formatting environment.

The first chart for each font family in this *Brief*:

**@Marker(FontFamily,Helvetica10,X9700) and
@Marker(FontFamily,TimesRoman10,X9700)**

is taken from the Scribe data base. The chart shows the names of all Scribe fonts in the font family, the facecodes that are available within those fonts, and the typescases associated with those facecodes. Scribe uses "BodyFont" in most of its formatting environments, "SmallBodyFont" in footnotes, and the various "TitleFonts" in different types of headings. You can refer to the .MAK and .DEV files in the Scribe data base for precise information on Scribe font use. (See Chapter 9, "Using the Scribe Data Base," in *Scribe at UCC*.)

ACSS has added a number of Scribe fonts to the data base, i.e., "BodyFont10," "SmallBodyFont9," "SmallBodyFont8," "11points," "14points," "18points," and "24points." These fonts are not associated with any predefined Scribe environments, but they can be used to create new environments or modify existing ones. For example, you could modify the quotation environment to produce a small italic typeface with the following command:

@Modify(Quotation,Font SmallBodyFont, Use I)

or define a new environment to use 9-point type size in Times Roman 10 family:

@Define(Text9=Text,Font Small BodyFont9,Facecode R)

("Use X" and "Facecode X" are synonymous terms for facecode designations.)

The facecode names are usually descriptive of the typefaces they produce: "R" for regular or Roman, "I" for italic, "B" for bold, "P" for bold italic, "F" for fixed-width, "C" for small capitals, "G" for Greek, "Y" for publication symbols, and "T" for typewriter. Scribe uses "R" when no other facecode is specified. Typecases for "R," "I," "B," "P," "C," and "Y" contain proportionally spaced characters, where the printing space is based on the design of the character, as in hand lettering. Typecases for "F," "G," and "T" contain fixed-width characters, where the printing space for all characters is the same, as with a typewriter.

The second chart for each font family:

**HELVETICA 10 FONTFAMILY, CHARACTER SETS and
TIMES ROMAN 10 FONT FAMILY, CHARACTER SETS**

lists by Scribe typecase name all the characters in each typecase. In most instances the typecases contain the full ASCII standard character set. The larger typecases contain only uppercase letters, digits, and four punctuation marks: , - ./. The Greek typecases show which characters "map" onto the standard ASCII characters by their corresponding positions in the columns. Thus to print Greek characters, you would enclose the appropriate ASCII characters in delimiters after the Greek facecode command, for example @G(abcd) to print as $\alpha \beta \chi \delta$.

The third chart for each font family:

**HELVETICA 10 FONT FAMILY, CHARACTER SETS and
TIMES ROMAN 10 FONT FAMILY, CHARACTER SETS**

lists the special symbols available by facecode and Scribe command string. Each symbol can be obtained by enclosing the corresponding ASCII character in delimiters after the proper facecode command or by using a Scribe command string if one is noted. Thus @Y(R) and @Registered both produce ®. Each lowercase Greek character can be produced by a Scribe command string too, so that @alpha@beta@gamma@delta would also print as $\alpha \beta \chi \delta$. All Scribe command strings must be followed by another Scribe command or a blank space; you can use @;, the Scribe null command, to end a command string in the middle of a list of characters, as in @pi@;r@+(2) to print πr^2 .

The fourth chart for each font family:

**HELVETICA 10 FONT FAMILY, TEXT SAMPLES and
TIMES ROMAN 10 FONT FAMILY, TEXT SAMPLES**

gives printing samples of all the ASCII character sets by Scribe font and facecode. Different Scribe font names or facecodes within a font may produce the same printing characters. Refer back to the first chart to determine the typecase being used.

NOTE: The Xerox 9700 has a memory limitation on the number of machine fonts it can print from on one page, and it also must have a stored list of possible machine font combinations for every page that it prints. Scribe contains a list of likely combinations (available for inspection in its data base file X9700.PDE). However if you run into an error message that states:

**Error found while processing:
These fonts should be in one font set:**

you have asked for a machine font combination that Scribe and the 9700 do not know about, and the particular page will not print. You can either change the fonts used or ask to have a new font combination set up. Call Text Processing at 625-1391 for assistance.

@Marker(FontFamily,Helvetica10,X9700)

```
@DefineFont (BodyFont,  
  R=<TypeCase "UN110E">,  
  I=<TypeCase "UN510E">,  
  B=<TypeCase "UN210E">,  
  P=<TypeCase "UN510E">,  
  F=<TypeCase "P06B0B">,  
  C=<TypeCase "UN108E">,  
  G=<TypeCase "GK110P">,  
  Y=<TypeCase "HESymbols">,  
  T=<TypeCase "P07TDC">)
```

```
@DefineFont (SmallBodyFont,  
  R=<TypeCase "UN108E">,  
  I=<TypeCase "UN508P">,  
  B=<TypeCase "UN208E">,  
  P=<TypeCase "UN508P">,  
  F=<TypeCase "P06B0B">,  
  C=<TypeCase "UN108E">,  
  G=<TypeCase "GK108P">,  
  Y=<TypeCase "HESymbols">,  
  T=<TypeCase "UD108P">)
```

```
@DefineFont (TitleFont1,  
  R=<TypeCase "UN210E">,  
  B=<TypeCase "UN210E">,  
  I=<TypeCase "UN210E">,  
  C=<TypeCase "UN208E">)
```

```
@DefineFont (TitleFont2,  
  R=<TypeCase "UN211E">,  
  B=<TypeCase "UN211E">,  
  I=<TypeCase "UN211E">,  
  C=<TypeCase "UN208E">)
```

```
@DefineFont (TitleFont3,  
  R=<TypeCase "UN214E">,  
  B=<TypeCase "UN214E">,  
  I=<TypeCase "UN214E">,  
  C=<TypeCase "UN211E">)
```

```
@DefineFont (TitleFont4,  
  R=<TypeCase "UN214E">,  
  B=<TypeCase "UN214E">,  
  I=<TypeCase "UN214E">,  
  C=<TypeCase "UN211E">)
```

```
@DefineFont (TitleFont5,  
  R=<TypeCase "UN214B">,  
  B=<TypeCase "UN214B">,  
  I=<TypeCase "UN214B">,  
  C=<TypeCase "UN211E">)
```

```
@DefineFont (14points,  
  R=<TypeCase "UN114B">,  
  B=<TypeCase "UN214E">)
```

```
@DefineFont (18points,  
  R=<TypeCase "UN118B">,  
  B=<TypeCase "UN218B">)
```

```
@DefineFont (24points,  
  R=<TypeCase "UN124B">,  
  B=<TypeCase "UN224B">)
```


HELVETICA 10 FONT FAMILY, CHARACTER SETS

UN108E	UN208E	UN508P	UD108P	GK108P	UN110E	UN210E	UN510E	P07TDC	GK110P
P	P	P	P	Π	P	P	P	P	Π
Q	Q	Q	Q	Θ	Q	Q	Q	Q	Θ
R	R	R	R	Ρ	R	R	R	R	Ρ
S	S	S	S	Σ	S	S	S	S	Σ
T	T	T	T	Τ	T	T	T	T	Τ
U	U	U	U	Τ	U	U	U	U	Τ
V	V	V	V		V	V	V	V	
W	W	W	W	Ω	W	W	W	W	Ω
X	X	X	X	Ξ	X	X	X	X	Ξ
Y	Y	Y	Y	Ψ	Y	Y	Y	Y	Ψ
Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
[[[[[[[[
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]]]]]]]]	
↑	↑	↑	↑		↑	↑	↑	↑	
—	—	—	—		—	—	—	—	
,	,	,	,	,	,	,	,	,	,
a	a	a	a	α	a	a	a	a	α
b	b	b	b	β	b	b	b	b	β
c	c	c	c	χ	c	c	c	c	χ
d	d	d	d	δ	d	d	d	d	δ
e	e	e	e	ε	e	e	e	e	ε
f	f	f	f	φ	f	f	f	f	φ
g	g	g	g	γ	g	g	g	g	γ
h	h	h	h	η	h	h	h	h	η
i	i	i	i	ι	i	i	i	i	ι
j	j	j	j		j	j	j	j	
k	k	k	k	κ	k	k	k	k	κ
l	l	l	l	λ	l	l	l	l	λ
m	m	m	m	μ	m	m	m	m	μ
n	n	n	n	ν	n	n	n	n	ν
o	o	o	o	ο	o	o	o	o	ο
p	p	p	p	π	p	p	p	p	π
q	q	q	q	θ	q	q	q	q	θ
r	r	r	r	ρ	r	r	r	r	ρ
s	s	s	s	σ	s	s	s	s	σ
t	t	t	t	τ	t	t	t	t	τ
u	u	u	u	υ	u	u	u	u	υ
v	v	v	v	ς	v	v	v	v	ς
w	w	w	w	ω	w	w	w	w	ω
x	x	x	x	ξ	x	x	x	x	ξ
y	y	y	y	ψ	y	y	y	y	ψ
z	z	z	z	ζ	z	z	z	z	ζ
{	{	{	{		{	{	{	{	
}	}	}	}		}	}	}	}	
~	~	~	~		~	~	~	~	

HELVETICA 10 FONT FAMILY, CHARACTER SETS

P06BOB	UN211E	UN214E	UN114B	UN214B	UN118B	UN218B	UN124B	UN224B
!	!	!	'	'	'	'	'	'
"	"	"	-	-	-	-	-	-
#	#	#
\$	\$	\$	/	/	/	/	/	/
%	%	%	0	0	0	0	0	0
&	&	&	1	1	1	1	1	1
'	'	'	2	2	2	2	2	2
(	(	(	3	3	3	3	3	3
)	)	)	4	4	4	4	4	4
*	*	*	5	5	5	5	5	5
+	+	+	6	6	6	6	6	6
,	,	,	7	7	7	7	7	7
-	-	-	8	8	8	8	8	8
.	.	.	9	9	9	9	9	9
/	/	/	A	A	A	A	A	A
0	0	0	B	B	B	B	B	B
1	1	1	C	C	C	C	C	C
2	2	2	D	D	D	D	D	D
3	3	3	E	E	E	E	E	E
4	4	4	F	F	F	F	F	F
5	5	5	G	G	G	G	G	G
6	6	6	H	H	H	H	H	H
7	7	7	I	I	I	I	I	I
8	8	8	J	J	J	J	J	J
9	9	9	K	K	K	K	K	K
:	:	:	L	L	L	L	L	L
;	;	;	M	M	M	M	M	M
<	<	<	N	N	N	N	N	N
=	=	=	O	O	O	O	O	O
>	>	>						
?	?	?						
@	@	@						
A	A	A						
B	B	B						
C	C	C						
D	D	D						
E	E	E						
F	F	F						
G	G	G						
H	H	H						
I	I	I						
J	J	J						
K	K	K						
L	L	L						
M	M	M						
N	N	N						
O	O	O						

HELVETICA 10 FONT FAMILY, CHARACTER SETS

P06BOB	UN211E	UN214E	UN114B	UN214B	UN118B	UN218B	UN124B	UN224B
P	P	P	P	P	P	P	P	P
Q	Q	Q	Q	Q	Q	Q	Q	Q
R	R	R	R	R	R	R	R	R
S	S	S	S	S	S	S	S	S
T	T	T	T	T	T	T	T	T
U	U	U	U	U	U	U	U	U
V	V	V	V	V	V	V	V	V
W	W	W	W	W	W	W	W	W
X	X	X	X	X	X	X	X	X
Y	Y	Y	Y	Y	Y	Y	Y	Y
Z	Z	Z	Z	Z	Z	Z	Z	Z
[[[
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'	'	'						
a	a	a						
b	b	b						
c	c	c						
d	d	d						
e	e	e						
f	f	f						
g	g	g						
h	h	h						
i	i	i						
j	j	j						
k	k	k						
l	l	l						
m	m	m						
n	n	n						
o	o	o						
p	p	p						
q	q	q						
r	r	r						
s	s	s						
t	t	t						
u	u	u						
v	v	v						
w	w	w						
x	x	x						
y	y	y						
z	z	z						
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}	}	}						
~	~	~						

HELVETICA 10 FONT FAMILY, SPECIAL SYMBOLS

ASCII Char	Facecode Y Symbol, Commandstring	ASCII Char	Facecode Y Symbol, Commandstring
!		P	¶ @parag
"		Q	
#	■ @square	R	® @registered
\$		S	
%	¢ @cent	T	™ @trademark
&	§ @sect	U	
'	' @prime	V	
(		W	
)		X	
*		Y	
+	± @pom	Z	
,		[	' @lsq
-	- @not	\	
.		]	' @rsq
/		↑	
0	° @deg	—	- @sminus
1		,	
2	½ @half	a	
3		b	
4	¼ @4th	c	
5		d	
6		e	
7		f	
8		g	
9		h	
:		i	
;		j	
<	≤ @ltoe	k	
=	≠ @nteq	l	
>	≥ @gtoe	m	
?		n	
@		o	
A		p	
B	• @bullet	q	
C	© @copyr	r	
D	† @dagger	s	
E		t	
F		u	
G	‡ @2dagger	v	
H		w	
I		x	× @times
J		y	
K		z	
L		{	" @ldq
M	— @mdash	|	
N	- @ndash	}	" @rdq
O		~	

HELVETICA 10 FONT FAMILY, TEXT SAMPLES

FONT BODYFONT

- R "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values .
- I, P *"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values*
- B **"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values**
- F "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- C "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES
- T "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

FONT SMALLBODYFONT

- R "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- I, P *"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values*
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- T "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

HELVETICA 10 FONT FAMILY, TEXT SAMPLES

FONT TITLEFONT1

R, B, I

"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

C "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

FONT TITLEFONT2

R, B, I

"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

C "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

FONT TITLEFONT3, FONT TITLEFONT4

R, B, I

"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

C "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

FONT TITLEFONT5

R, B, I

"ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

C "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

FONT 14POINTS

- R "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES
- B **"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces."** Richard Hurd, Principles of City Land Values

FONT 18POINTS

- R "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES
- B **"ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES."** RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

FONT 24POINTS

R "ALL CITIES WHICH HAVE
ATTAINED ANY CONSIDERABLE
SIZE INCLUDE IN VARYING
PROPORTIONS ALL THE ABOVE
FACTORS OF COMMERCE,
MANUFACTURES, POLITICAL AND
SOCIAL FORCES." RICHARD HURD,
PRINCIPLES OF CITY LAND VALUES

B "ALL CITIES WHICH HAVE
ATTAINED ANY
CONSIDERABLE SIZE INCLUDE
IN VARYING PROPORTIONS
ALL THE ABOVE FACTORS OF
COMMERCE, MANUFACTURES,
POLITICAL AND SOCIAL
FORCES." RICHARD HURD,
PRINCIPLES OF CITY LAND
VALUES

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TIMES ROMAN 10 FONT FAMILY, CHARACTER SETS

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Q	Q	Q	Θ	Q	Q	Q	Q	Q	Θ
R	R	R	Ρ	R	R	R	R	R	Ρ
S	S	S	Σ	S	S	S	S	S	Σ
T	T	T	Τ	T	T	T	T	T	Τ
U	U	U	Τ	U	U	U	U	U	Τ
V	V	V		V	V	V	V	V	
W	W	W	Ω	W	W	W	W	W	Ω
X	X	X	Ξ	X	X	X	X	X	Ξ
Y	Y	Y	Ψ	Y	Y	Y	Y	Y	Ψ
Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
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a	a	a	α	a	a	a	a	a	α
b	b	b	β	b	b	b	b	b	β
c	c	c	χ	c	c	c	c	c	χ
d	d	d	δ	d	d	d	d	d	δ
e	e	e	ε	e	e	e	e	e	ε
f	f	f	φ	f	f	f	f	f	φ
g	g	g	γ	g	g	g	g	g	γ
h	h	h	η	h	h	h	h	h	η
i	i	i	ι	i	i	i	i	i	ι
j	j	j		j	j	j	j	j	
k	k	k	κ	k	k	k	k	k	κ
l	l	l	λ	l	l	l	l	l	λ
m	m	m	μ	m	m	m	m	m	μ
n	n	n	ν	n	n	n	n	n	ν
o	o	o	ο	o	o	o	o	o	ο
p	p	p	π	p	p	p	p	p	π
q	q	q	θ	q	q	q	q	q	θ
r	r	r	ρ	r	r	r	r	r	ρ
s	s	s	σ	s	s	s	s	s	σ
t	t	t	τ	t	t	t	t	t	τ
u	u	u	υ	u	u	u	u	u	υ
v	v	v	ς	v	v	v	v	v	ς
w	w	w	ω	w	w	w	w	w	ω
x	x	x	ξ	x	x	x	x	x	ξ
y	y	y	ψ	y	y	y	y	y	ψ
z	z	z	ς	z	z	z	z	z	ς
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}	}	}		}	}	}	}	}	
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TIMES ROMAN 10 FONT FAMILY, CHARACTER SETS

PR111E	PR211E	UN511E	PR114B	PR214B	PR118B	PR218B	PR124B	PR224B
!	!	!	'	'	'	'	'	'
"	"	"	-	-	-	-	-	-
#	#	#
\$	\$	\$	/	/	/	/	/	/
%	%	%	0	0	0	0	0	0
&	&	&	1	1	1	1	1	1
'	'	'	2	2	2	2	2	2
(	(	(	3	3	3	3	3	3
)	)	)	4	4	4	4	4	4
*	*	*	5	5	5	5	5	5
+	+	+	6	6	6	6	6	6
,	,	,	7	7	7	7	7	7
-	-	-	8	8	8	8	8	8
.	.	.	9	9	9	9	9	9
/	/	/	A	A	A	A	A	A
0	0	0	B	B	B	B	B	B
1	1	1	C	C	C	C	C	C
2	2	2	D	D	D	D	D	D
3	3	3	E	E	E	E	E	E
4	4	4	F	F	F	F	F	F
5	5	5	G	G	G	G	G	G
6	6	6	H	H	H	H	H	H
7	7	7	I	I	I	I	I	I
8	8	8	J	J	J	J	J	J
9	9	9	K	K	K	K	K	K
:	:	:	L	L	L	L	L	L
;	;	;	M	M	M	M	M	M
<	<	<	N	N	N	N	N	N
=	=	=	O	O	O	O	O	O
>	>	>						
?	?	?						
@	@	@						
A	A	A						
B	B	B						
C	C	C						
D	D	D						
E	E	E						
F	F	F						
G	G	G						
H	H	H						
I	I	I						
J	J	J						
K	K	K						
L	L	L						
M	M	M						
N	N	N						
O	O	O						

TIMES ROMAN 10 FONT FAMILY, CHARACTER SETS

PR111E	PR211E	UN511E	PR114B	PR214B	PR118B	PR218B	PR124B	PR224B
P	P	<i>P</i>	P	P	P	P	P	P
Q	Q	<i>Q</i>	Q	Q	Q	Q	Q	Q
R	R	<i>R</i>	R	R	R	R	R	R
S	S	<i>S</i>	S	S	S	S	S	S
T	T	<i>T</i>	T	T	T	T	T	T
U	U	<i>U</i>	U	U	U	U	U	U
V	V	<i>V</i>	V	V	V	V	V	V
W	W	<i>W</i>	W	W	W	W	W	W
X	X	<i>X</i>	X	X	X	X	X	X
Y	Y	<i>Y</i>	Y	Y	Y	Y	Y	Y
Z	Z	<i>Z</i>	Z	Z	Z	Z	Z	Z
[[<i>[</i>						
\	\	<i>\</i>						
]]	<i>]</i>						
↑	↑	<i>↑</i>						
˘	˘	<i>˘</i>						
a	a	<i>a</i>						
b	b	<i>b</i>						
c	c	<i>c</i>						
d	d	<i>d</i>						
e	e	<i>e</i>						
f	f	<i>f</i>						
g	g	<i>g</i>						
h	h	<i>h</i>						
i	i	<i>i</i>						
j	j	<i>j</i>						
k	k	<i>k</i>						
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o	o	<i>o</i>						
p	p	<i>p</i>						
q	q	<i>q</i>						
r	r	<i>r</i>						
s	s	<i>s</i>						
t	t	<i>t</i>						
u	u	<i>u</i>						
v	v	<i>v</i>						
w	w	<i>w</i>						
x	x	<i>x</i>						
y	y	<i>y</i>						
z	z	<i>z</i>						
{	{	<i>{</i>						
		<i> </i>						
}	}	<i>}</i>						
~	~	<i>~</i>						

TIMES ROMAN 10 FONT FAMILY, SPECIAL SYMBOLS

ASCII Char	Facecode Y Symbol, Commandstring	Facecode N Symbol, Commandstring	ASCII Char	Facecode Y Symbol, Commandstring	Facecode N Symbol, Commandstring
!		i	P	¶ @parag	Þ
"			Q		Ø
#	■ @square		R	® @registered	
\$		£ @pound	S		
%	¢ @cent	‰ @epercent	T	™ @trademark	
&	§ @sect		U		Ů
'	' @prime		V		
(			W		
)			X		
*	★ @star	¤ @ecopyr	Y		
+	± @pom		Z		
,			[	' @lsq	
-	¬ @not		\		
.			]	' @rsq	
/	÷ @divide		↑	→ @rar	
0	° @deg		—	- @sminus	
1	⅓ @38th	ƒ	,		
2	½ @half	3	a		á
3	⅓ @3rd	3	b		â
4	¼ @4th	η	c		
5	⅝ @58th	Λ	d		ä
6	⅔ @23rd	ð	e		ë
7	⅞ @78th	θ	f		è
8	⅛ @8th		g		æ
9	¾ @34th		h		œ
:			i		
;			j		
<	≤ @ltoe	«	k		κ
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A		Á	p		þ
B	• @bullet	À	q		ø
C	© @copyr		r		
D	† @dagger	Ð	s		ß
E		É	t		
F		È	u		ü
G	‡ @2dagger	Æ	v		
H		Œ	w		
I			x	× @times	
J			y		
K			z		
L		Ł	{	" @ldq	
M	— @mdash				
N	- @ndash		}	" @rdq	
O					

TIMES ROMAN 10 FONT FAMILY, TEXT SAMPLES

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- R "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
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- T "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

FONT BODYFONT10

- R "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- I *"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values*
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TIMES ROMAN 10 FONT FAMILY, TEXT SAMPLES

FONT SMALLBODYFONT

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FONT SMALLBODYFONT9

R, B, P

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R, B, P

"All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

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TIMES ROMAN 10 FONT FAMILY, TEXT SAMPLES

FONT TITLEFONT1

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R, I "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES."
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FONT TITLEFONT4, FONT TITLEFONT5

R "ALL CITIES WHICH HAVE ATTAINED ANY CONSIDERABLE SIZE INCLUDE IN VARYING PROPORTIONS ALL THE ABOVE FACTORS OF COMMERCE, MANUFACTURES, POLITICAL AND SOCIAL FORCES." RICHARD HURD, PRINCIPLES OF CITY LAND VALUES

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TIMES ROMAN 10 FONT FAMILY, TEXT SAMPLES

FONT 11POINTS

- R "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values
- B "All cities which have attained any considerable size include in varying proportions all the above factors of commerce, manufactures, political and social forces." Richard Hurd, Principles of City Land Values

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