

Computer and Information Services Newsletter

This newsletter is an information resource of the University of Minnesota.

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Student Access System

Giving students on-line access to their own records
Jeff von Munkwitz-Smith, Office of the Registrar



The Student Access System was developed to give students on-line access to information in their academic records. A major goal of the development was to use technology to improve the services we provide by reducing the need for students to come in person during our regular office hours to receive services. The system consists of a series of screens that retrieve information from the Student Data Base, the source of information on the academic transcript.

Student Records

The *Basic Student Record Information* screen contains student address, college, major and adviser, total credits earned, and University of Minnesota cumulative GPA. It also shows any holds on the student's record, along with the clearance addresses.

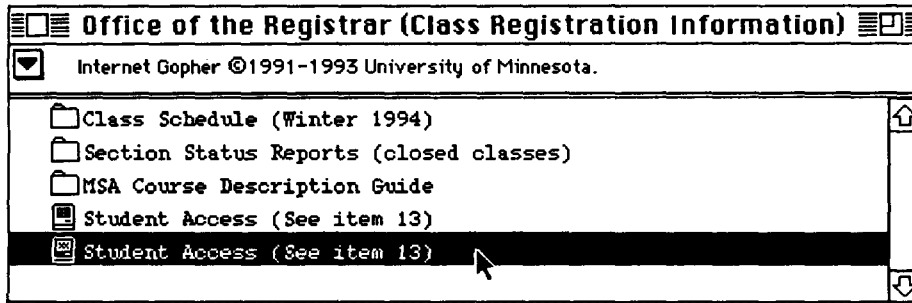
Coursework and Grades

The *University Day Coursework and Grades* screen contains information on the student's registrations on a quarter by quarter basis. Day registration information and grades are available on the system as soon as they are processed.

The *CEE and Transfer Coursework and Grades* screen contains information on the student's Continuing Education and Extension registrations and on work transferred to the University from other institutions. Extension Classes

➔ continued on next page

Gopher Figure 1
Student Access available under U of M Campus Information section



The system is available to students who have registered for day courses at the University since the mid-1970s or who have registered for Extension courses since the late 1980s.

Hours

Normally the system is available 8 AM to 8 PM, Monday through Friday, and 9 AM to 1 PM Saturday. The system may be used by up to 150 students at the same time.

registration information and grades are available on the system the day after they are processed by CEE.

Password Change

The *Password Change* screen allows students to set their own passwords for accessing the system. We *strongly* encourage students to change their passwords the first time they use the system and regularly thereafter.

Access

The system has been in use since April 1993. Through mid-January more than 11,000 students (and former students) have used it. Lately, there have been over 50,000 transactions on the system each week. A recent change eliminated the need to use function keys to move from screen to screen, making the system easier to use.

The system is menu option 13 on the AIS Public Access Menu, the same one that LUMINA is on. (The article *Accessing LUMINA from Gopher and Minuet* in the November 1993 newsletter has information on getting to the AIS Public Access Menu.) In addition, there is a link from Gopher under the Office of the Registrar item under University of Minnesota Campus Information. Two options for connecting with the Student Access System are available on that menu: via TN3270 (first selection) and via Telnet (second selection, use terminal ID 56), shown in Figure 1.

Choosing *Student Access System* calls an initial logon screen. Students key their University of Minnesota File Number or their Social Security Number and their Password. A student's initial password is his or her birthdate in the format MMDDYY. (For example, a student born on October 25, 1951 would have an initial password of 102551.)

Future Enhancements

The *Course Status Display* screen, which shows real-time information on course availability, will be added to the system in early 1994.

A project currently in progress will give students address update capability in Spring 1994. That project will also give students the ability to register themselves for day courses. We hope to test that addition to the system with a pilot group of students during the fall quarter registration period in late Spring 1994 and extend the capability to other students before Winter 1995 registration, which begins in November 1994.

We plan to add viewing of *Academic Progress Audit Reports* and other capabilities in the future. An expansion of the hours of operation for the system is also planned.

The Office of Student Financial Aid has a project in the design phase that will allow students to display information on the status of their financial aid applications and awards. The Office of Student Accounts Receivable is considering making student account information available on the system.

For More Information

For more information, feel free to contact

x-regstr@vm1.spcs.umn.edu

or Jeff von Munkwitz-Smith, Office of the Registrar, B-25 Fraser Hall, 625-1800, E-mail:

j-von@vm1.spcs.umn.edu

Some Scanning Basics

Edwin Beylerian, Biomedical Graphics



This is the first of a series of articles on various topics covering desktop publishing, computer graphics and imaging. Some of the future articles will include slide imaging, color on the desktop, illustration, page layout programs, authoring for interactive multimedia and computer animation and video. We welcome your comments and suggestions.

A Short History of Scanning

Scanning is the process by which an image is converted into pixel maps for use in documents for printing or for direct computer imaging. Some scanners are designed for transparent artwork such as slides, some for reflective artwork, such as photographs, line art or even three-dimensional objects. Some scanners combine both functions. The quality of the scan depends in good part on the precision of the scanner's optics and their alignment.

The advent of affordable desktop scanners allowed the entry of a new range of users into a domain that used to be reserved to specialized service bureaus using high-end laser drum-scanning equipment. While the current desktop technology cannot emulate the quality and high definition of drum scans, color fidelity and speed keep improving and good quality color is becoming more affordable to a wider public, whether for printing, film recording or specialized uses.

An AGFA at Biomedical Graphics

Biomedical Graphics recently acquired an AGFA Horizon scanner, situated at the cutting edge of the desktop scanning technology. It is a high-speed transparency and flat art scanner equipped with superior optics and a sophisticated interface that allows precise adjustment of the tonal ranges of an image before scanning. This insures an optimum image quality before scanning – a highly desirable feature, since image correction after the fact often results in the loss of data. Its compatibility with the Macintosh and PC environment, combined with its input quality, further bridges the gap between desktop and laser scanning.

Target Your Output Medium

Whether you are scanning an image for printing, for incorporating into a computer-imaged slide or for use on the computer in a database or in a multimedia presentation, our goal in scanning is to produce an image on the monitor that is as close as possible to the desired outcome. Scans should be made in the resolution which would result in the best image definition for the targeted output medium. It is not desirable to scan at a higher definition than necessary to insure good image quality: this results in larger files and longer processing time.

In press work, the scan resolution in pixels per inch needs only to be twice the screen density of the printed piece (a black and white half-tone printed at 150 line-screen needs a scan at 300 p.p.i.). If the image is to be enlarged, we will scan at a proportionally higher definition. Although it is possible to enlarge images on the computer in a page layout or an image-processing program such as Adobe PhotoShop®, image quality quickly deteriorates after a 150% enlargement. In conclusion, it is better to plan the final size of your image and scan accordingly at the start.

Multiple File Formats and Media

If you are ordering a scan from us, we need to know the final size of the image, its target resolution and the medium in which the output will be made, whether it is for film recording, press printing, color laser output or other special uses. This will insure that we provide you with the best scan possible.

Let us know what file format to save it in and how you want us to save it for you, whether on a diskette, a removable SyQuest® cartridge, or whether you would like us to send it over the network.

We also provide color correction, sharpening and file compression at an hourly charge. If you have any questions regarding scanning that are beyond the scope of this column, feel free to call Edwin at Biomedical Graphics at 626-4984.



StuffIt: a Macintosh Utility

Introduction



StuffIt, known for its file compression and archival abilities, has proven useful in storing single files or groups of files on a disk. It is also good for moving a single file or related collection of files between computers connected by a modem or network. This latter capability can save time and, in cases where you're charged for downloading information, money.

StuffIt Lite 3.0.1 is available from the Macintosh Information Server. To find it follow this path

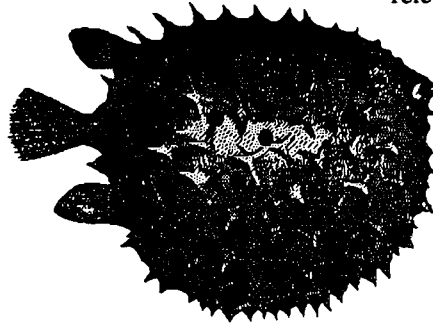
```
information
  Utilities
    StuffIt
```

It's Improved Shareware

StuffIt Lite is shareware. The fee is \$25. (Licensing details are contained on a form that can be printed from within the application.)

Self Extracting Archive

StuffIt Lite has an option lacking in earlier shareware releases of StuffIt: the ability to create a Self Extracting Archive, also known as a SEA. The SEA capability is useful because whoever wishes to access the contents of the stuffed file just has to double-click on it. They do not need a copy of StuffIt to begin extracting the file's contents.



A Simple Example of Compression

In compressing a file, using software such as StuffIt and PKZIP, the amount of compression depends upon its content. Let's look at how content and compression are related.

Repeating Patterns

The amount of compression depends upon the number of repeating patterns within a file.

In our example, the simplified text in Figure 1 is our pattern. To compress this file, we need two items: a dictionary and a method of storing the order of words in a file. To preserve the word order, we'll use a pipe and a

bunch of tennis balls. We're lucky. We have a pipe wide enough to hold one tennis ball at a time and long enough to hold as many as we want to put into it. Once we've closed off one end of the pipe, our model is finished. Our dictionary is also simple: a file of index cards. We use a marker to write on the cards, and to write numbers on the balls.

Let's compress the file. Looking at Figure 1 (a very simple text file), we note several words and the <END> symbol. <END> simply tells us that there is nothing left in the file. Also notice that words are separated by spaces. These spaces will be important in reconstructing the file.

Let's take the first word from the file in Figure 1; it's the preposition

a

We must number every item in our dictionary. On an index card numbered 1, write a. Next, write the number 1 on a tennis ball and place it in the pipe. We automatically number each card whenever we write a new word on it. Our next word is

rose

and it's new to the dictionary. Now we need to do everything we did for the first word, except this card is number 2. Since the next word

is

Figure 1: Text File to be Compressed

```
a rose is a rose is a rose<END>
```

Figure 2: Dictionary for the all the Words

```
a rose is<END>
```

Figure 3: The Pipe

```
12312313<END>
```

Figure 4: Compressed File

```
a rose is<P> 12312313<END>
```

Compression

A problem encountered by many computer users is a full hard disk, even though many files on an individual's hard disk are rarely used and simply occupy space. One way to free a percentage of this space is to compress unused files. This is one of the reasons to use StuffIt.

If you want to see how compression works read the section called *A Simple Example of Compression*. That section also contains examples of how much space you can save.

Archive: Bundling Files

StuffIt's ability to bundle files together is also useful. Say you're working on a book with an overseas colleague who also uses a Mac. You've agreed to write the odd-numbered chapters. Once written, you send these chapters to another colleague who serves as editor. You could send each chapter individually via E-mail, but this means mailing multiple files. A better choice is to use StuffIt's archive option.

An archive is a group of loosely related files bundled as one. As with physical packages, bundling computer files greatly simplifies handling and transfer (especially during FTP activities).

Archived files are more versatile than many people realize. It is commonly believed that once files are archived, all must be unstuffed or extracted to get the one of interest. StuffIt lets you remove a single file or a single folder and its contents.

If you use StuffIt frequently or for an important task, you may want to learn to do some fancier packaging, such as archiving files hierarchically or segmenting large archives for mailing. (Most E-mail or E-mail sites impose an absolute or polite size limit on files.) Although the steps you need to do this are not covered in the StuffIt documentation, it is not hard to work through. Remember that the archive is being broken into sections, transferred via floppy disk or E-mail, and then rejoined. Once joined, it

is not in the dictionary, we create card number 3 and write the number 3 on a tennis ball. Then we put the ball into the pipe. Since the rest of the words in Figure 1 are already in the dictionary, we write the appropriate numbers on tennis balls and drop them into the pipe, that is,

another ball numbered 1 for *a*
 another ball numbered 2 for *rose*
 another ball numbered 3 for *is*

You can see how this process works. Figure 2 shows a complete dictionary, and the pipe contents are in Figure 3. The compressed file is displayed in Figure 4, where the <P> shows when the dictionary ends and the pipe begins. A complete, compressed file holds both dictionary and pipe. Figure 1, our example text file, has 27 characters. The dictionary and pipe hold 19 characters.

To restore the text file we separate dictionary and pipe. We take tennis balls from the open end of the pipe, match the tennis ball number with the

dictionary card, and place that word in the reconstructed text file. Once all tennis balls are used, the reconstructed file should be an exact duplicate of Figure 1. As we are dealing with whole words, automatically place a <space> in the reconstructed file whenever a new tennis ball is taken from the pipe.

Text, Applications, and Pictures

Since every language repeats words, some compression can be obtained. This highly simplified example was for a text file. Application and picture files compress differently. And by

using additional techniques, StuffIt will do a better job of compressing.

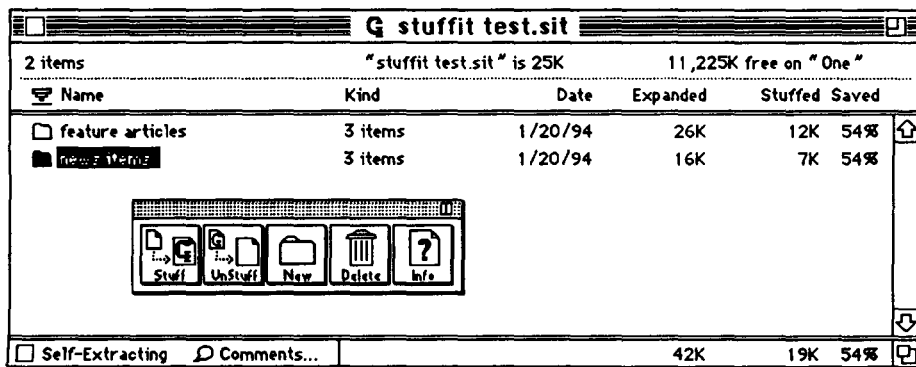
We used Stuffit to test compression. Our results are shown in Table 1.

The weather GIF (from the University of Illinois Weather Machine) is a picture file that already comes stored in a compressed format — thus its size is not meaningfully reduced. In fact, pre-compressed files may actually grow if you attempt to compress them.

Table 1: Stuffit Examples

Item	Expanded Size (k)	Stuffed Size (k)	Saved %
• Our Dec 13, 93 price list for Mac Computers	124	26	79
• Map Control Panel	29	17	43
• TeachText v7.0 (application)	36	25	31
• MacWrite II Stationary Templates folder	21	9	57
• a weather GIF	111	109	2

Figure A: Stuffit Window and Floating Control Panel



To create an SEA, check the box labeled *Self-Extracting*, shown in the lower left-hand corner of Figure A.

The Info Button

The Info button displays information about the stuffed item, including the normal (expanded) size, the stuffed size, and the amount of disk space saved. The *Edit* menu's *Preferences* option also lets you choose to have that information displayed when you work with StuffIt's files, as shown in Figure A.

works as a normal archive. If your files and folders are organized in an arrangement which you'd like to keep, StuffIt can do this too. Archive the outermost folder, and the inside organization will be maintained.

How to Stuff

Here is what you would do to "stuff" some files. Start up StuffIt and select *New* from the *File* menu. Give your new archive an appropriate name and decide where on your disk you want to put it. We suggest you follow the convention of ending the file name with

.sit

— unless you create a self extracting archive, in which case follow the convention of ending the file name with

.sea

Floating Control Panel

You can generally make your next selections from StuffIt's floating control panel, shown in Figure A. (These options are also available in StuffIt's *Archive* menu.)

Initially, the only active buttons will be the *Stuff* and *New* buttons. All the buttons are active in Figure 1 because we've selected an item, a folder. Generally people find that the buttons' simple functions are self-explanatory, except for the Info button. See *The Info Button* section below for more information.

If you want to subdivide your documents into folders, you can use the "New Folder" button to create folders, as we've done in Figure A. You can also simply use the *Stuff* button to select items to be archived, including folders and their contents. You'll find that unstuffing will faithfully reproduce the contents.

The Info button also lets you make changes to the item. You can lock the document to prevent changes to it, and System 7 users can turn the document into stationery (described in your Mac manual.) If the item is a document, you may also change the document type and creator. Caution: changing the type or creator could render the document useless! We've covered this topic briefly in previous articles concerning the transfer of documents between computers.

Unstuffing

It's easy to extract items from an archive. Open the archive in the usual Macintosh way, that is by double clicking on it or using *Open* in StuffIt's *File* menu. At the bottom of the window, you'll see totals for the archive, just as you see them in Figure A.

Next, highlight the desired item, or items, and click on the *Unstuff* button. StuffIt presents a dialog box to select a location for these items. A SEA will also expand its contents wherever desired. (SEAs are reusable. They can expand their contents time and time again.)

Conclusion

StuffIt is a useful tool for all Mac users. It's a spacesaver and a timesaver. With it you can store files in less space and group related files into archives for storage or to be E-mailed. In addition, StuffIt Lite lets you create Self-Extracting-Archives, called SEAs, that automatically decompress when Mac users double-click on the archive.

Internet Update

*Committee on Institutional Cooperation Network (CICNet)
and Minnesota IntereXchange Network (MIXNet)*



There have been two noteworthy Internet connection changes to sites outside the University of Minnesota. The first concerns restructuring CICNet connectivity. The second is an upgrade from Ethernet to FDDI speeds for MIXNet.

When a connection to Iowa or Wisconsin failed, we would send a full T1 amount of data to the remaining site. That site, of course, had its own traffic to add or receive from the next site, resulting in congestion.

CICNet

In 1986 the Big Ten (plus Chicago, minus Purdue) started an organization called CICNet to interconnect their schools in a robust and reliable way with T1 (1.544 Mbps) lines. (CICNet is partly funded by the National Science Foundation.)

Eastern and Western Rings

The design had T1 lines running from each university to two other CICNet Universities using Eastern and Western rings. Iowa and Wisconsin were Minnesota's two neighbors in the Western ring.

If the T1 line to one university should fail, the other connection would carry the load.

From each university, there was to be no more than two hops (through routers) to reach an NSFNet hub site. (NSFNet, the National Science Foundation Network, is one of the networks that make up the Internet.) In addition, for reliability, the T1 lines were to be physically separate (not combined on the same fiber/copper nor equipment, nor in the same conduit, nor taking the same right-of-way). The diagram in Figure 1 shows the original Western ring.

Congestion

Well, the passage of time brought two notable changes:

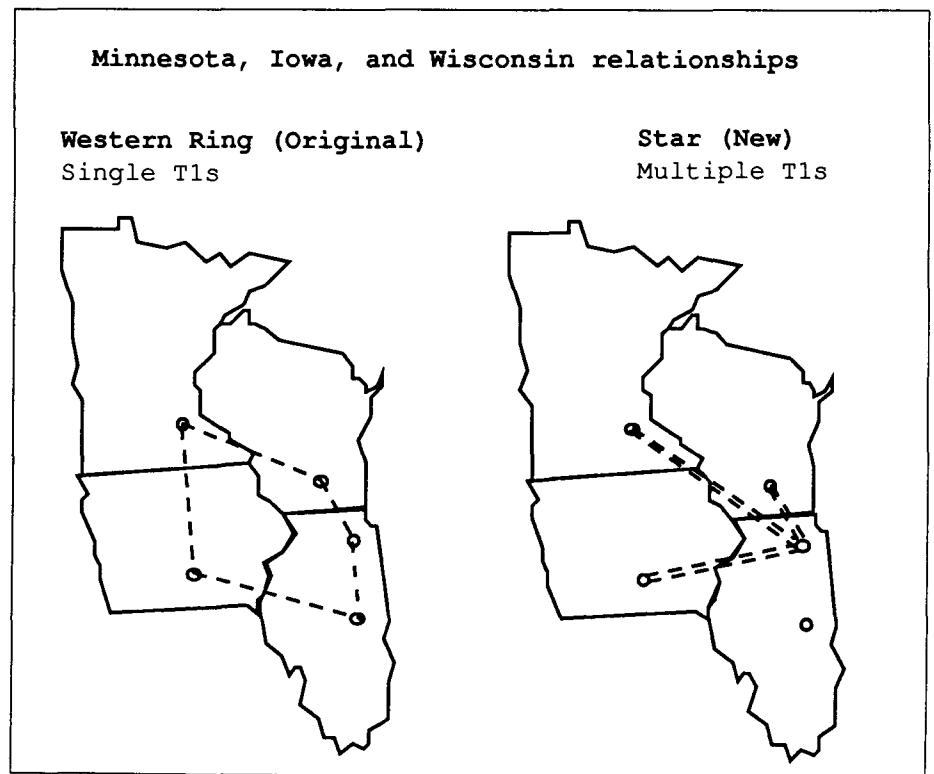
- automatic computer programs reduced the number of T1 and T3 lines used by long distance carriers
- Minnesota's total T1 traffic increased to more than a single T1 could carry.

A New Design

In the new star design, Iowa, Wisconsin, and Minnesota each have two T1 lines directly to Chicago to a site called Downers Grove (specifically to the Downers Grove Illinois MCI POP – Point Of Presence). The diagram in Figure 1 also shows the new star connection design. While route diversity is still not present, in reality it was not before. From Minnesota's perspective, the elimination of overhead lines running 40 miles into Madison, Wisconsin removed a failure point in the original design.

Each T1 line goes to a different Cisco router in Downers Grove. These have duplicate power supplies, hot-swappable boards, etc. The chance of both routers going

Figure 1: Network Diagrams of CICNet Connections



down is extremely slim. (MCI provides uninterruptible and conditioned power.)

Minnesota's Traffic Has Increased

The good news is Minnesota's traffic is no longer added into Madison's and Iowa's traffic. The bad news is Minnesota's traffic increased, and we need to have more than two T1 lines to Downers Grove. In December, a traffic routing defect at Downers Grove was found and corrected. Several more T1 lines to Argonne National Labs will be added to enable full Downers Grove traffic movement to NSFNet.

Future CICNet Changes

A future change may see CICNet's NSFNet connection moving from Argonne National Labs to the ANSnet equipment co-located in Downers Grove.

Argonne gets its NSFNet connection from ANS in Downers Grove. (Advanced Networks and Services, ANS, is the group that runs the NSFNet backbone.) CICNet intends to get its connection in the same manner, specifically off the equipment feeding Argonne National Labs, just a few feet away from CICNet's equipment in the Downers Grove MCI POP.

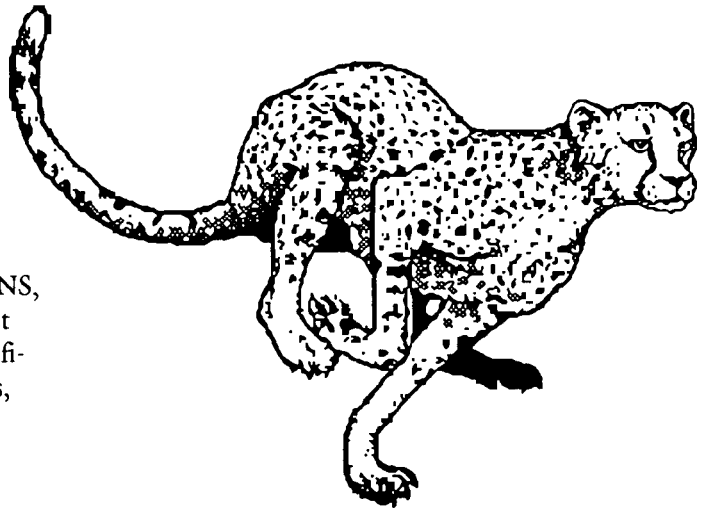
The University and MIXNet

MIXNet is the Minnesota IntereXchange Network. The routers on this network unite the University of Minnesota (UMN), CICNet, the Minnesota Regional Network (MRNet), and the Minnesota Supercomputer Center (MSC) networks.

Recently the MIXNet physical connections were changed to an FDDI ring (100,000,000 bits per second).

From 10 million to 100 million BPS

Both MRNet and the University (UMN) get their NSFNet connectivity through CICNet. MSC gets its connectivity through another T1 line going to the University of Illinois at Urbana Champaign. Recently the MIXNet physical connections were changed to an FDDI ring (100,000,000 bits per second). Before this, the network was Ethernet (10,000,000 bits per second) with two bridges. The bridges allowed the long transmission distance (from Telecommunications on the East Bank to MSC on the West Bank) to be accommodated, but the Ethernet network tended to break several times per year.



The University of Minnesota and the Minnesota Supercomputer Center have other connections, and traffic between them does not (and should not) use the MIXNet. MRNet and MSC do exchange traffic over the MIXNet, as does the University and MRNet.

Minnesota and MRNet

Most Internet connections in the State of Minnesota go through MRNet. This provides cost savings and regional integration for other educational and commercial institutions in the state. Their CICNet connectivity fee is spread among a large membership. (MRNet, phone 612/342-2570, can provide Internet connections for groups and individuals.)

The University of Minnesota continues its charter membership in CICNet, and thus retains connectivity directly with CICNet.

Statistics Software

Transporting Data Between SAS and SPSS



Occasionally you may need to transfer data between statistics packages in order to use different analysis options. However, the data you've used with the first package may be in a machine-dependent and package-dependent binary format which cannot be used with the second package. It is fairly easy to transfer data from SPSS to SAS, but transferring a SAS data file to SPSS is more complicated.

Using SPSS Data Files in SAS

SAS contains a data translation engine that handles SPSS portable files under these operating systems: VMS, EPX, CMS, Windows, and OS/2. SPSS portable files are created by using the EXPORT command. (For more detail see *Moving SPSS System Files Between Hosts* in our December 1993 newsletter.)

To translate the SPSS data to SAS you use

```
PROC CONVERT
```

in conjunction with a FILENAME statement. In our example, we'll assume you have already created an SPSS portable file that we'll call TEST.EXP. You create a command file with the following command block as the first portion of the file. The name XXX is used here to make a logical name for the file TEST.EXP within the command file.

```
filename xxx 'test.exp';
proc convert spss=xxx out=temp;
run;
```

Using SAS Data Files in SPSS

It's more difficult to move data from SAS to SPSS since SPSS doesn't have a translator. You need to have two files for SPSS:

- a raw data file
- an SPSS command file containing a list of variable names for the raw data.

Both files must be ASCII character format rather than binary format. If your data is only in a binary format SAS data library, you'll have to use SAS commands to help create these two character files.

To make a complete example, we'll start by generating a SAS data library called MJF and a data set called MJF.AAA having 16 variables, ALPH1 to ALPH16. Figure 1 shows file TEST1.SAS which we can run using the command

```
SAS TEST1.SAS
```

In a typical SPSS job, you would have done this kind of step previously and you'd probably have more variables and observations.

Figure 1: Generate a SAS Data Library (MJF) and a Data Set (MJF.AAA).

```
libname mjf ' ';
*comment: use '.' on Unix instead of ' ';
data mjf.aaa;
  input alpha1-alpha16;
cards;
01 02 03 02 03 04 05 04 06 07 06 08 09 10 10 10
09 11 11 13 17 13 14 15 15 16 18 19 20 21 23 24
;
run;
```

Figure 2: Have SAS Write a List of Variable Names.

```
options ls=80;
libname mjf ' ';
*comment: use '.' on Unix instead of ' ';
proc contents data=mjf.aaa short;
run;
```

Step 1: Create a List of Variable Names

As the first step, we need a list of variable names for the data. This will be used later in the SAS job that writes out the raw data and in the SPSS job to read in the data. Figure 2 shows file TEST2.SAS which uses the PROC CONTENTS command to write the list of variable names. The



```
OPTIONS LS=80
```

command sets the output line size to 80 columns. We can run this file by using the command

```
SAS TEST2.SAS
```

This puts out the variable name list on file TEST2.LIS with some other extraneous text. We then have to use a text editor on TEST2.LIS to remove everything except the lines containing the list of names.

Step 2: Use SAS to Create a Raw Data File

Next, we put together the list of variable names from the edited file (TEST2.LIS) into a SAS command file (TEST3.SAS) to create a raw data file called MYDATA.DAT. See Figure 3. The name XXX is used here to make a logical name for MYDATA.DAT. We use the data library MJF and the data set MJF.AAA. The DATA command writes to an empty file _NULL_ because our real goal is to create MYDATA.DAT. The PUT statement defines the variable names to write out. We run the file with the command

```
SAS TEST3.SAS
```

Step 3: Read the Raw Data File Into SPSS

The last step is to put the list of variable names from TEST2.LIS into an SPSS command file (TEST4.SPS). This reads the raw data file from MYDATA.DAT and creates an SPSS system file (MYDATA.SPS). See Figure 4. We run the file with the command

```
SPSS TEST4.SPS
```

or on UNIX,

```
spss -m TEST4.SPS
```

For More Information

If you have questions about statistical packages, call the Central Systems Help Line at 626-5592 or send E-mail to consult@vx.cis.umn.edu.

Figure 3: Have SAS Write a Raw Data File.

```
options ls=80;
filename xxx 'mydata.dat';
libname mjf ' ';
*comment: use '.' on Unix instead of ' ';
data _null_;
set mjf.aaa;
file xxx;
*comment: the two lines of variable names came from file TEST2.LIS;
put
ALPHA1   ALPHA2   ALPHA3   ALPHA4   ALPHA5   ALPHA6   ALPHA7   ALPHA8
ALPHA9   ALPHA10  ALPHA11  ALPHA12  ALPHA13  ALPHA14  ALPHA15  ALPHA16
;
run;
```

Figure 4: Have SPSS Read the Raw Data File. Create an SPSS System File.

```
data list free file='mydata.dat'/
ALPHA1   ALPHA2   ALPHA3   ALPHA4   ALPHA5   ALPHA6   ALPHA7   ALPHA8
ALPHA9   ALPHA10  ALPHA11  ALPHA12  ALPHA13  ALPHA14  ALPHA15  ALPHA16.
save outfile='mydata.sys'.
finish.
```

IBM/CMS Central System News

Local Printing and File Transfer Update
 TPRINT version 2.01 and PCTTRANS version 1.3 Installed

TPRINT and Microcomputers



TPRINT is the command that allows you to print files from the mainframe to a locally attached printer from your microcomputer. TPRINT enhancements include those listed below.

- The new version of TPRINT allows you to print a file while editing it or to print the current mail file from the MAIL or MAILBOOK utilities. Simply enter the TPRINT command on the command line of XEDIT, MAIL, or while reading a note from within MAILBOOK, as shown below:

```
=====> tprint (ibmpc
```

- YTERM users can now interrupt printing with TPRINT by holding down the ALT key and pressing the BREAK key.

```
[ALT] [BREAK]
```

- If you are not using YTERM or TinCan Macintosh software to connect to the IBM mainframe, you may still be able to use the TPRINT command for local printing. ProComm (IBM/MS-DOS software) users must use the terminal type of VT100 for the command to work properly, for example:

```
tprint sales data a (vt100
```

If you dial-in with ProComm and use PROJECT-GROUP (PROFS) to send or read your mail, there is a new Printer selection at the end of the printer list that you must use for local printing.

- You may now send special commands to your locally attached printer to initialize a special mode, such as landscape or compressed printing. You must include these initialization strings in a TPRINT "profile," which is just a CMS file on disk that has a filetype of TPRINT. These two sample profiles are supplied on the system

```
YTERMNLQ
YTERMCMP
```

- The option

```
PAGEHEAD n
```

may be used to print files and to include your userid, fileid, time, and page number on each page. "N" represents the number of lines to print on each page; it must be specified, there is no default value.

- The option

```
SPEED n
```

may be used to specify the effective baud rate (n) of the printer. You would use this if you suspect that your printer is being overrun with data.

PCTTRANS and Microcomputers



The PCTTRANS command can be used to transfer files between the IBM mainframe and your microcomputer if you are dialled-in with YTERM or TinCan.

PCTTRANS Change

The maximum record length of a file that can be transferred has been increased from 512 characters to 1024 characters. The record length describes the files width.

On-Line Help Available

For more information on TPRINT, enter

```
HELP TPRINT
```

for further information on PCTTRANS, enter

```
HELP PCTTRANS
```

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request@boombox.micro.umn.edu

For more complete descriptions of the products available through the discount program, consult our paper handouts, which are available at all Microcomputer HelpLines, or our electronic versions, which are available on Gopher.

Use Gopher for 24-hour Service

Use Gopher to search the Computer Department's database to find out part numbers, prices, and product availability. "Electronic Ordering" options are available at these two Gopher locations:



Computer Information

Microcomputer Prices

Minnesota BookCenter... Electronic Ordering

University of Minnesota Campus Information

Department and College Information

Minnesota BookCenter Electronic Desk

▼ CDs for Microcomputers

We carry a wide range of CD-ROM discs for microcomputers.

CD-ROM Titles	University Price
---------------	------------------

For IBM/MS-DOS

American Heritage Illustrated Encyclopedia	\$56
Electric Cook Book	49
Information USA	49
Mega Movie Guide	35
Oxford Reference Library	35
Software Jukebox: Arcade	35
Software Jukebox: Sports game	35
Time Table of Arts & Entertainment	49
Time Table of Business/Politics/Media	49
Time Table of Science & Innovation	49
Where in the World is Carmen Diego?	64

For Windows

Art Gallery	\$30
Bookshelf	72
CIA World Tour (Multimedia*)	20
Cinematica	30
Dinosaurs	30
Golf	39
Interactive Encyclopedia (without "print")	273
Interactive Encyclopedia with Print	273
Jazz: A Multimedia History (Multimedia*)	49
Lyric Language French (Multimedia*)	42
Lyric Language Spanish (Multimedia*)	42
Madness of Roland (Multimedia*)	42
Mega Movie Guide	42
Merriam-Webster Online Dictionary/Thesaurus	25
Microsoft C/C++ Windows Software Dev. Kit	210
Multimedia Beethoven: The 9th Symphony	30
Multimedia Mozart	30
Multimedia Stravinski	30
Musical Instruments	30
Nautilus Subscription Kit	21
Office — includes Word, Excel, Powerpoint & Mail	450
Publisher	65
USA Today	49
Word with Bookshelf	119
Works (Multimedia*)	59

For OS/2

OS/2 v2.1 (operating system software)	\$125
---	-------

▼ Apple "Holiday" Bundle now available *through March 14*

Apple Model • Purchase Number	CPU	RAM MB	Hard Disk MB	Keyboard	Color ^ Display	Special Price	Bundle's Savings
Macintosh LC 475 • B1775LL/A • B1776LL/A	680LC40	4 8	80 160	extended extended	Color Plus Color Plus	\$1,175 1,410	\$152 177
Macintosh Quadra 800 • B1777LL/A	68040	8	230	extended	16" Color	\$2,790	\$558
PowerBook Duo 230 • B1781LL/A — includes Duo Dock (M1928LL/A) with bay for optional hard drive • B1782LL/A — includes Duo Dock (M2631LL/A) with 230MB hard disk	68030	4 4	120 120	adjustable adjustable	Color Plus Color Plus	\$2,000 \$2,360	\$729 \$724

^ (1) Color Plus is Apple's M2346LL/A, a 14-inch display and (2) 16-inch Color is Apple's M1044Z/A

For DOS and Windows

Barron's Book of Notes	\$35
Dictionary of the Living World (Windows Multimedia*)	104
Electronic Home Library	56
Electronic Library Arts	
Western Art (Windows Multimedia*)	56
Greatest Books Collection	35
Library of the Future, 1st Edition	104
Library of the Future, 2nd Edition	207
Library of the Future, 3rd Edition	207
Microsoft's Encarta (encyclopedia) 1992 edition	149
Stories of Murder, Mystery	35
USA Wars: Desert Storm	35
USA Wars: Civil War	28
<i>Compatible with most drives but most compatible with Sony drives.</i>	
Doctor's Book of Home Remedies	\$28
Executive Factomatic	35
KGB/CIA World Factbook	28
King James Bible	18
Public Relations Handbook	35
Sales Managers Factomatic	35
Secrets of Exec Success	28
U.S. Presidents	28
Vocabulearn CE French	42
Vocabulearn CE Spanish	42
Wizard single	14

For Macintosh

Art Gallery	\$30
Barron's Book of Notes	35
Dictionary of the Living World	104
Dinosaurs	30
Electronic Library Arts Western Art	56
Greatest Books Collection	35
Interactive Encyclopedia with Print	273
Jazz: A Multimedia History	49
Library of the Future, 1st Edition	207
Library of the Future, 2nd Edition	207
Library of the Future, 3rd Edition	207

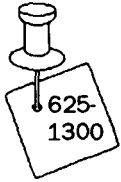
Lyric Language French	42
Lyric Language Spanish	42
Madness of Roland	42
Musical Instruments	30
Nautilus Subscription Kit	21
Office — includes Word, Excel, Powerpoint, and Mail	450
Scenic & Architecture	49
Scenic & Nature III	35
Time Table of Science and Innovation	49
Ultimate Robot	30
Vocabulearn CE French	42
Vocabulearn CE Spanish	42

For Macintosh and/or DOS, Windows

Book of Lists #3 — Mac or Windows	\$28
Business Backgrounds —	
Mac, DOS, and Windows Multimedia*	28
Countries of the World Encyclopedia — Mac or DOS	250
Deep Voyage — Mac, DOS, and Windows Multimedia*	28
Full Bloom — Mac, DOS, and Windows Multimedia*	28
Great Literature Deluxe — Mac or DOS	42
Great Literature Top 10 Best Sellers — Mac or DOS	35
History of the World — MAC or DOS	51
Island Designs — Mac, DOS, and Windows Multimedia*	28
Jets & Props — Mac, DOS, and Windows Multimedia*	42
Majestic Places —	
Mac, DOS, and Windows Multimedia*	28
Tropical Rain Forest —	
Mac, DOS, and Windows Multimedia*	28
<i>Compatible with most drives but most compatible with Sony drives.</i>	
Wild Places — Mac, DOS, or Windows	28
World View — Mac, DOS, or Windows	28

* Windows Multimedia requires Windows 3.1 and usually a sound card.

Training Resources



We own training packages for many popular software products. These training packages are available to University of Minnesota departments and current employees and students.

▼ No Fee

There is no fee for using these packages, and you may check them out for 48 hours. However, before you can check them out, you must sign a *Usage Agreement* and leave your University of Minnesota ID with us. We will return your ID when you return the training materials.

Generally the IBM/MS-DOS disks are available on 5.25-inch 360K and 3.5-inch 720K disks; the Macintosh disks are 800K.

▼ Reservations Required

To reserve or check out these materials, phone 625-1300 or stop in the Distributed Computing Services office in 190 Shepherd Labs (formerly room 132), Monday through Friday, 8 am to 4 pm.

Unless you use our Self-Paced Training Centers, you must supply your own software and equipment, such as computer and cassette player, to use these training materials.

Training Center Hours

Location	Monday-Friday
1 Nicholson Hall	8 am to 7 pm
99 Coffey Hall	9 am to 4 pm

▼ Network Training

We have three video training packages from TCT Technical Training, Inc. in Sunnyvale, California. Each package includes several video cassettes, a course notes book, and a module test. It's highly recommended that you begin with module 1 and work through the modules in numerical order.

Introduction to Data

Communications Networks

This course has no prerequisites. Its integrated series of modules are designed to teach the terms and concepts of data communications. Modules 1-4 require approximately 45-60 minutes to complete, and modules 5-6 require 75-90 minutes.

Module 1: Basic Elements in Data Communications. In module 1 you will • learn about the 3 basic elements in a data communications network: the DTE, DCE, and transmission medium • study these terms: downline loading, resource sharing, and remote job entry • see the difference between a computing terminal (such as a PC) and a dumb terminal (sometimes called a simple terminal) • build a basic data communications system.

Module 2: Hardware and Software in Data Communications. In module 2 you will • learn about computers and their differences and evaluate hardware and software components • be shown how the components work together • learn how a computer can be modified to become a DTE in a data communications network.

Module 3: Binary Numbering System and Interchange Codes. In module 3 you will • learn about the binary numbering system • learn how to convert a number from decimal to binary and back again • become familiar with the terms bit, byte, and word • learn about the hexadecimal format • get hands on experience using ASCII, EBCDIC, and Baudot charts • learn how ASCII and EBCDIC are used today.

Module 4: Data Transmission Concepts and Telephone Lines. In module 4 you will • investigate switched and dedicated telephone lines • cover point-to-point and multi-point and the idea of conditioning to improve transmission • investigate 2- and 4-wire lines • learn about simplex, half-duplex, and full duplex transmission modes, including their physical requirements, the advantages and disadvantages of each mode, and how the elimination of turnaround increases transmission rate • explore some of the limitations of the telephone line, including bandwidth, attenuation, noise (ambient/white and impulse) and signal delay.

Module 5: DTE-DCE Interface and the RS-232-C. In module 5 you will • acquire an understanding of the term interface • become familiarized with the signals used between DTE and DCE • acquire an understanding of the 10 most commonly used interface signals.

Module 6: Basic Concepts in Data Link Control. In module 5 you will • learn the concepts necessary to understand any data line control protocol • learn the similarities and differences between a telephone conversation and computer communications and be shown the functions of DLC, includ-

ing message framing, character framing, block framing, direction control, flow control, acknowledgment, error detection, and recovery.

Module 7: Start-Stop Data Link Control. In module 5 you will

- receive a brief review of interchange codes and the use of start and stop bits to frame a character
- become familiar with parity and how parity checking is used to detect transmission errors
- compare synchronous and asynchronous transmission and the functions of RS-232-C signals
- become familiar with advantages and disadvantages of Start-Stop DLC.

LAN-WAN Internetworking

Internetworking Local Area Networks and Wide Area Networks offers benefits and challenges: products from different manufacturers are not always compatible and special equipment and software are often needed. This course requires basic familiarity with data communications. Some knowledge of transmission lines is also helpful. Modules 1-6 each take approximately 1 hour to complete.

Module 1: Functions of Internetworking. In this module

- you will see that defacto and dejure standards set the groundwork for interoperability
- you will explore the 7-layer OSI model and how it relates to the TCP/IP protocol stack
- the functions of transmission control protocol and the Internet protocol will be described
- you will watch a message travel from source to destination, illustrating functions such as repeaters, bridges, routers, and gateways
- you will see that SNMP (simple network management protocol) allows requests and responses for communication of management data; and that MIB (management information base) defines what information can be gathered.

Module 2: LAN Configurations. In this module • you will learn about LANs for three basic structures: the bus, the ring, and the star • you will explore Ethernet's CSMA/CDS method of access • variations of the Ethernet LAN will be described: 10BASE-5 (Thick), 10BASE-2 (Thin), 10BASE-T (Twisted Pair), and 10BASE-F (Fiber) • you will learn about several proprietary LANs and encounter the FDDI LAN • you will see how NOS (the networking operating system) allows printing, E-mail and file transfer between a user and a server • you will learn about tools for efficient operation of a LAN, such as the cable tester and packet monitor.

Module 3: Linking Devices: Repeaters and Bridges. In this module • you

- will be introduced to the devices that link LANs together to form larger networks
- you will gain an understanding of each of the 7 layers in the OSI models and the roles these layers play in the transmission of a packet
- you will see that the data link layer can be divided into two sub-layers: MAC and LLC
- the OSI model will help you conceptualize the transmission of a packet and help in understanding how each linking device operates
- you will receive a brief explanation of the role of protocols and how they can be categorized as high or low level in relation to the OSI model
- you will be introduced to the first linking device, the repeater and see how its features can be used to extend the physical limits of a LAN
- you will explore the various types of bridges and how simple, learning, and multi-port bridges differ.

Module 4: Linking Devices; Routers and Gateways. In this module • you will explore a layer 3 protocol: IP (Internet Protocol) and learn the major fields in the IP header and how they assist the IP software in moving a packet across the Internet • you will examine the router and see how it maintains a routing table and uses this table to select the best path to the destination • you will be introduced to some of the common routing protocols used by routers to maintain their routing tables • you will look at the media that make up a WAN and take a close look at HDLC, a low level protocol used with WAN media • you will see how PPP (point-to-point) uses HDLC to provide interoperability within a network • you will learn about gateways and how they are used to convert protocols so that different computers, such as an SNA host and a DEC host, can communicate • you will learn about hybrid devices, such as Brouters and Multi-protocol routers.

Module 5: Transmission Using TCP/IP. In this module • you will learn

- how the Internet address is structured and how the DNS (domain name system) provides user access
- you will explore the TCP protocol function to see how it provides reliable end to end transmission
- TCP transmission will be demonstrated to illustrate segmentation of the message, sequence fields, acknowledgments, and retransmission
- you will see that TCP at the destination can provide flow control with changes in the window field
- by examining port fields, you will see how TCP can send a message to a specific application
- you will see how the UDP and ICMP protocols work
- learn how application software works in conjunction with some other specific protocols
- learn how Telnet helps achieve remote login and that FTP facilitates file transfers.

Module 6: Network Management: SNMP, OSI Based Systems. In this module • you will learn about the various functions of NMS (the network management system) and how it communicates • you will explore the TCP/IO based and OSI based network systems and the software used for each • you will receive a brief overview of the various hardware required by a network system • through a series of hypothetical situations you will explore some routine network problems and see how they are solved by the NMS.

Managing a Novell Network

Novell's NetWare is one of the most popular network operating systems. Module 1 examines NetWare 3.11 concepts. Modules 1-5 take approximately one hour to complete and provide information that network managers need to know.

Module 1 lays the foundation for Novell concepts and terminology. Modules 2 and 3 demonstrate how to install and configure your LAN and explain many concepts that will give you a greater understanding of the operation of your LAN.

Topics pertaining to network management and troubleshooting are covered in Modules 4 and 5. Module 4 explores a variety of management utilities, such as PCONSOLE, FCONSOLE, and the Security Command. It also examines the factors involved in adding new applications to a LAN. Module 5 teaches how to troubleshoot a variety of network components including cables, network interface cards and printers."

Get it on Gopher

USDA Statistics



In December 1993 computer users were able to access more worldwide agricultural data thanks to a joint venture between two groups: the Albert R. Mann Library at Cornell University and the U.S. Department of Agriculture, Economic Research Service, National Agricultural Statistics Service.

This information is available on Internet Gopher. Below are excerpts from a document called *About This Gopher* from the USDA/Mann Library Gopher. You'll find that document and other helpful information in the Gopher section called *USER GUIDES: How to Search and Save Data Sets*.

The system includes more than 140 agricultural data sets, most in Lotus 1-2-3 (.wk1) format. Searching the system, you can find data on subjects such as:

- * worldwide textile fiber production
- * farm production expenses
- * European Community wheat supply
- * milk and dairy product sales
- * food spending in American households
- * U.S. meat supply and consumption
- * fertilizer use
- * ozone records for the Northeast
- ... and many more

...The majority of the data files are in binary format (Lotus 1-2-3 files); they cannot be read on the screen. You need to save them on your own machine, and retrieve them using a Lotus 1-2-3 compatible spreadsheet package.

Use Lotus or Excel to View the Data

We downloaded two files to a Macintosh and used Excel's *File/Open* command to open the documents. Figure 1 shows excerpts from the information we retrieved.

Accessing the USDA/Mann Library Gopher

You can access this Gopher in several ways. One way is to follow this path

- Other Gopher and Information Servers
 - North America
 - USA
 - New York
 - Cornell University, Albert P. Mann Library

Figure 1: Expenditures of Food, Beverages, and Tobacco

switzerl.wk1		R	S	T
1	A			
2	SWITZERLAND AT CURRENT PRICES	1986	1987	1988
3	(in millions of Swiss francs)			
4				
5	Gross Domestic Product	243350	254685	268755
6	Disposable Personal Income	168770	177575	188545
7	Private Final Consumption Expend	145405	150715	157555
8	Food, Beverages and Tobacco	40135	41000	42410
9	Food	29360	29945	31035
10	Non-alcoholic Beverages	10775	11055	11375
11	Alcoholic Beverages	0	0	0
12	Tobacco	0	0	0
13	Net Savings	23365	26860	30990
14				
15	RESTAURANTS, CAFES AND HOTELS	0	0	0
16				
17	POPULATION in thousands	6552	6573	6659
18	POPULATION in millions	6.552	6.573	6.659
19	EXCHANGE RATE	179890	149120	150400
20				
21	EXPENDITURES (in millions of U.S. \$)	1986	1987	1988
22				
23	Gross Domestic Product	135277	170792	178693
24	Disposable Personal Income	93818	119082	125362
25	Private Final Consumption Expend	80830	101070	104757
26	Food, Beverages and Tobacco	22311	27495	28198
27	Food	16321	20081	20635
28	Non-alcoholic Beverages	5990	7413	7563
29	Alcoholic Beverages	0	0	0
30	Tobacco	0	0	0
31	Net Savings	12988	18012	20605

The system includes more than 140 agricultural data sets, most in Lotus 1-2-3 (.wk1) format.

thailand.wk1		R	S	T
1	A			
2	THAILAND AT CURRENT PRICES	1986	1987	1988
3	(in millions of Thai baht)			
4				
5	Gross Domestic Product	1094679	1234030	1465736
6	Disposable Personal Income	0	0	0
7	Private Final Consumption Expend	713138	789375	898768
8	Food, Beverages and Tobacco	278478	293940	327711
9	Food	211809	222667	247159
10	Non-alcoholic Beverages	23379	26294	28952
11	Alcoholic Beverages	25221	26138	31241
12	Tobacco	18069	18841	20359
13	Net Savings	92086	105360	132463
14				
15	RESTAURANTS, CAFES AND HOTELS	63423	79133	95848
16				
17	POPULATION in thousands	52699	53646	53644
18	POPULATION in millions	52.699	53.646	53.644
19	EXCHANGE RATE	2629870	2572270	2524000
20				
21	EXPENDITURES (in millions of U.S. \$)	1986	1987	1988
22				
23	Gross Domestic Product	41625	47974	58072
24	Disposable Personal Income	0	0	0
25	Private Final Consumption Expend	27117	30688	35609
26	Food, Beverages and Tobacco	10589	11427	12984
27	Food	8054	8656	9792
28	Non-alcoholic Beverages	889	1022	1147
29	Alcoholic Beverages	959	1016	1238
30	Tobacco	687	732	807
31	Net Savings	3502	4096	5248

We downloaded two files to a Macintosh and used Excel's File/Open command to open the documents.

Bargains

MacTCP 2.0.4



Macintosh users who have LocalTalk (AppleJack), Ethernet (EtherJack), or SLIP access to the Internet, may want to upgrade to MacTCP 2.0.4, Apple Computer's TCP/IP driver. This driver is available free to members of the University community.

Compatible with 6.0.7 and Above Required for System 7.1!

Version 2.0.4 is for use with computers using system 6.0.7 and above. If you are using System 7.1 you must use MacTCP 2.0.4.

Earlier versions of MacTCP had some problems associated with setting lower bounds for retransmission times on TCP connections. Version 2.0.4 corrects this. The problem with earlier version was particularly apparent when using MacTCP over serial (phone) lines which tend to have long round trip times and corrupt packets. The Readme document that accompanies this new release discusses other improvements.

Disk Cache Settings

When set to large sizes, the disk cache included in System 7 and 7.1 does not work well with networking. For optimal network performance, we recommend that MacTCP users set their disk cache size to 128k or less. This should be fixed in a future release of the Mac operating system.

Obtaining MacTCP

The software is available on the *information* volume of the Mac Information Server. Those who have LocalTalk (AppleJack) or Ethernet (EtherJack) connections will find preset configurations by working their way to the proper MacTCP folder by following this path:

- Communications
 - Network Software
 - MacTCP v2.0.4

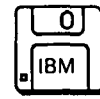
The folder *MacTCP v2.0.4* is divided into four folders. Each folder is configured for a campus and is not intended to be used on other campuses. One difference is that the beginning of the IP address is campus dependent, as shown in Table 1.

The ReadMe document that accompanies MacTCP has detailed instructions for installing a new copy of MacTCP or updating an old copy. If you are upgrading, an important step is to drag all copies of *MacTCP* and *MacTCP Prep* out of your System folder. For temporary safe keeping, create a folder, for example Old MacTCP, for these files. Tip: System 6.x users can use *Find File* and System 7.x users can use *File...* to help them locate files with MacTCP in their name.

SLIP Users

SLIP users also need MacTCP. You can pick up MacTCP 2.0.4, new SLIP modem scripts, and SLIP-compatible MacTCP settings in any Microcomputer HelpLine.

OS2 Internet Resources



IBM OS/2 (Operating System 2) users can get information, utilities, and fixes from some internet sources. The two sources listed below have drivers for some new CD-ROM drives.

Almaden Gopher Server

The IBM Almaden Gopher is an experimental Gopher server. It provides information about the IBM Almaden Research Center as well as some other IBM organizations and products.

IBM Almaden has a section called

OS/2 Information

In this section you will find information such as *OS/2.1 Fixes and Drivers* and *Frequently asked questions about OS/2 for Windows*. To find this Gopher you can follow this path:

- Other Gopher & Info Servers
 - North America
 - USA
 - California

Anonymous FTP from Watson

OS/2 fixes are also available via anonymous FTP from this host and directory

software.watson.ibm.com
/pub/os2/os2fixes

Table 1: For LocalTalk and Ethernet users the beginning of the IP address is campus dependent.

128.101.xxx.xxx	Minneapolis, St. Paul, Rochester, Crookston
134.84.xxx.xxx	Minneapolis, St. Paul
146.57.xxx.xxx	Morris
131.212.xxx.xxx	Duluth

Help: Computer and Information Services

▷ Computer and Information Technologies

Phone

Help Line Hours

Central Systems

These systems require a user name and password, which you get when you open an account.

Qualified users can apply for grants to cover some computing-related costs.

- EPX (UNIX), NVE (NOS/VE), UZ (Ultrix), VX and VZ (VMS) 626-5592 Monday-Friday 9 am to 4 pm
1 Nicholson Hall Walk-in Consulting Monday-Friday 10 am to 4 pm
- VM1 (IBM/CMS), 99B Coffey Hall Walk-in Consulting 624-6235 Monday-Friday 9 am to 4 pm
- MEDLINE (MinnesotaMEDLINE on NVE) 626-8366 Monday-Friday 9 am to 4 pm

Distributed Systems: Microcomputers, Workstations, LANs

Software, hardware, peripherals, local area networks 626-4276 Monday-Friday 9 am to 4 pm

- East Bank 152 Shepherd Labs above above above
- West Bank 93 Blegen above Monday-Friday 1 pm to 4 pm
- St. Paul 99B Coffey Hall above Monday-Friday 1 pm to 4 pm

E-mail, Statistics, and LUMINA

- E-mail: call for help using your University account 626-7676 Monday-Friday 9 am to 4 pm
Forgot your password? Students must go to the Computer Facilities in 14 Folwell, 26 Lind, 305 McNeal, or HHH 50.
Staff must call 626-5592.
- Statistics: Microcomputer and Central Systems 626-5592 Monday-Friday 9 am to 4 pm
- LUMINA: call if you have trouble connecting 626-2272 Monday-Friday 9 am to 4 pm

Computer Services Information 625-1555 any day any time

General Information

Associate Vice President and

Associate Provost Academic Affairs

Donald R. Riley, Professor 626-9816

Williamson Book Center Computer Department ... 625-3854
also Gopher's Microcomputer Prices/Electronic Ordering

Computer and Information Services


Central Computing Services (CCS) Lee Croatt
Distributed Computing Services (DCS) Shih-Pau Yen
Engineering Services (ES) Don Clark
St. Paul Computing Services (SPCS) Mel Sauve
University Networking Services (UNS) Larry Dunn

Admin. Info. Services (AIS) Customer Assistance .. 624-0555
Central System Accounts, IBM CMS 4-7788
EPX, NVE (includes MEDLINE), UZ, VX, VZ 6-8366
Computer Facilities (also call individual facilities) 5-1300
_FolH 5-4896/Lind 6-0856/McN 4-5367/HHH 4-6526/+ more
Data Entry, Minneapolis 6-8351
Data Entry, St. Paul 4-7297
Disability and Computing Services, voice 6-0365
TDD 6-0569
Equipment Repair and Warranties (Engr. Serv.) 5-1595
Faculty Resource Center (to make an appointment) ... 5-1300
Gopher Server Set up (available for a fee) 5-2303
Kodak Printer Service (Central Computing) 6-1661
Network Addresses (130 Lind) 5-8888
Statistics Services (available for a fee) 5-2303 or 4-0758
Supercomputer Center Help (3030 SCC) 6-0808
Tape Librarians
EPX, NVE, UZ, VX, VZ (Lauderdale Comp. Facility) .. 6-1838
VM1 (IBM/CMS in St. Paul) 4-3482
Telecommunications, Networking Services
Information 6-7800
Repair 5-0006
Training, Course Registration (DCS, 190 ShepLab) 5-1300



Access Information

SLIP: 2400/9600 626-1920


SLIP: ADI-100 and ITE (with MKO) 3-0291

-  Terminal settings for these systems are 8-1-N (8 data bits, 1 stop bit, no parity) unless otherwise noted. The number you dial may depend on the modem's bps or baud rate.
- ▷ Dial-in Server: 626-0300, -1200, 2400, 9600
 - At 9600 Telecomm supports V.32 and MNP level 5 error correction.
 - On campus ADI-100 and ITE setups use 626-2400.



 Internet addresses.

LUMINA: 300/1200/2400 625-6009 
LUMINA.LIB.UMN.EDU 



E-mail and Internet Servers, Twin Cities

_GOLD.TC.UMN.EDU and MAROON.TC.UMN.EDU 




Gopher, alternate access (log in as gopher)

300, 1200, 2400, 9600 see Dial-in Server 
CONSULTANT.MICRO.UMN.EDU 



Consulting via E-mail: low priority Central System ques
Format ____CONSULT@MACHINE.NAME.UMN.EDU

PUBINFO SecureID 19.2 V.32 or V32bis .626-1061 
PUBINFO.AIS.UMN.EDU 





EPX, NVE (includes MEDLINE), UZ, VX, VZ

300, 1200, 2400, 9600 see Dial-in Server 
300/1200/2400 at 7-1-even 626-1630 
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