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BENCHMARKS Reader/User feedback is encouraged.
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All people mentioned below may be contacted by calling (617) 565-2324:

**Information and Project Numbers** - Carolyn Goodman in the Computing Center reception Area, ISB 119.

**Test Scoring and Analysis** - Carolyn Goodman.

**Newsletter Questions/Contributions/etc.** - Claudia Putnam.

**Statistical/Research Support** (provided for graduate students and faculty members) - Bob Brookshire, George Morrow, Claudia Putnam, and Mohamad Salahshoor.

**Non-Research Student Programming Problems** - student consultants from the Computer Science Department, found in ISB 134A near dispatch and the user keypunch area. Student consulting provided by the College of Business is available at the BA Computing Access Facility.

**JCL and Debugging Problems** - Mohamad Salahshoor.


**Data Entry to MUSIC, Keypunch Requests and Questions** Regarding layout of keypunch sheets; Interpreting - Betty Grise, ISB 227.

**Academic Time-sharing Information and/or Problems** HP/2000 and AS/5000 MUSIC (McGill University System for Interactive Computing) information and problems, including terminal problems - Mohamad Salahshoor.

**Administrative Applications** - Coy Hoggard.

**AS/5000 Computer Hardware/Software/Billing Problems** - Sandy Franklin.

**JOB Submission and Retrieval** - RJE Operators.

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**Spring Computing Hours**

Computing facilities will be open during the following times throughout the Fall semester (not applicable to holidays):

**Computing Center RJE:**

- 7 AM-4 AM, Monday-Friday; 8 AM-MN Saturday; Noon-MN Sunday.

**College of Business RJE:**

- 8:15 AM-MN, Monday-Saturday;
- 12:15 PM-MN, Sunday

**Media Library (GAB):**

- 8 AM-MN, Monday-Thursday; 8 AM-6 PM Friday; 11 AM-5 PM Saturday; 4 PM-10 PM Sunday

The Computer Room and student keypunch/terminal area (ISB) are open 24 hrs/day Mon.-Fri., 8 AM-MN Sat. and Noon-MN Sun. System Backups (see this issue for schedules) and backlog processing are done between the hours of 8 AM and Midnight, Mon.-Sat..
OS/MVT disk packs (Academic and Administrative) are backed up daily, Tuesday through Saturday, from 4-6:30 AM, and Sunday from Midnight to 3 AM. A backup of all the operating systems and their contents is done once every two weeks at some low activity period over the weekend.

**SPRING BREAK HOURS**

The following hours will be in effect over Spring Break, 1983:

**Computing Center RJE**
- CLOSE Midnight, March 11;
- OPEN 8 AM - Midnight, March 12;
- OPEN Noon - Midnight, March 13;
- OPEN 8 AM - Midnight, March 14-19;
- OPEN Noon - Midnight, March 20 - resume regular hours.

**College of Business RJE**
- CLOSE Midnight, March 11;
- REOPEN 8:15 AM, March 19 - resume regular hours.

**Media Library**
- CLOSE 5 PM, March 11;
- OPEN 8 AM - 5 PM, March 14 - 18
- REOPEN 11 AM, March 19 - resume regular hours.

**COMPUTING STATUS REPORT**

A number of related activities which affect the entire University community are now coming into focus. The new computer operations room on the fifth floor of the General Academic Building is nearing completion with an occupancy date of about March 1. The procurement of the new IBM compatible system is close enough to being finished so that we can assume that the machine will be delivered sometime in April. Three new Digital Equipment Corporation VAX 11/750 computers are scheduled for delivery on or about March 1 and may be available to the public as early as April 1. Finally, major components of the cable television based local area network should be in place and ready for use during March. The trunk-line (six miles worth) of the cable system is almost finished and wiring of the first eight buildings will commence shortly. Those buildings are the Information Science Building, the General Academic Building, Business Administration, Wooten, Music, Physics, Speech, and the Administration Building. The contract is about to be let for the next 20 or so buildings and we are working on the bid specifications for the remaining buildings (for a total of 54). All buildings should be on-line by the middle of the summer. The cable system will, of course, carry both computer communications and television. By May or June most users of computer services will have access to the major new facilities now being put in place.
Those of you who think the Computing Center staff are basically illiterate, take this:


2. Steve Minnis' article "A CP/M Chain Routine" was published in the February issue of *Microsystems* (Volume 4, Number 2).


So there!

**CONSULTING SERVICES AVAILABLE TO STUDENT PROGRAMMERS**

The Computing Center offers research and statistical programming consultation to graduate students and faculty members, and will provide JCL and debugging help on a limited basis to anyone who needs it. The type of help often needed by Computer and Information Science undergraduate students, however, must be sought elsewhere.

The Computer Science Department hires student consultants who are on duty in ISP 134A approximately 20 hours each week beginning the 4th week of the semester. Their primary function is to help students in CSCI classes 110, 111, 232, 201, 340 and 370 with program design and syntax errors in BASIC, PASCAL, FORTRAN, 360 Assembly, SNOBOL and PL/I. They do, however, insofar as they are able, consult with any student from any department. When there are people waiting, consulting time is limited to 5-10 minutes per student. The consulting hours this semester are:

<table>
<thead>
<tr>
<th>Day</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>no hours scheduled</td>
</tr>
<tr>
<td>Tuesday</td>
<td>8 AM - 10 AM, 3 PM - 6 PM</td>
</tr>
<tr>
<td>Wednesday</td>
<td>8 PM - 10 PM</td>
</tr>
<tr>
<td>Thursday</td>
<td>2 PM - 4 PM, 6 PM - 10 PM</td>
</tr>
<tr>
<td>Friday</td>
<td>Noon - 2 PM</td>
</tr>
<tr>
<td>Saturday</td>
<td>1 PM - 6 PM</td>
</tr>
<tr>
<td>Sunday</td>
<td>to be announced</td>
</tr>
</tbody>
</table>

No consultants are scheduled during final week. Any questions regarding the Computer Science consultants should be directed to Susan Rulon, Microcomputer Lab Director, GAB 330A, ext. 2810.

The College of Business computing facility is divided into three areas: the Microcomputer Lab, the Minicomputer Lab, and the area that is operated by the Computing Center (the BA RJE). According to Cengiz Capan, manager of the Business Departmental Computing Center, there is at least one student consultant stationed in each area at all times. Their duties in order of priority are:
1. To monitor the area, schedule terminal time, etc.

2. To help students with problems such as logging-on, setting terminals, using modems, etc.

3. To consult with students on programming problems. This service has the lowest priority, and will only be offered if the consultant has completed the above mentioned duties. An exception to this is in the Microcomputer Lab, where there are two consultants, one to help with programming problems, the other to take care of the "housekeeping."

The Operations section of the Computing Center provides the following services at its Remote Job Entry Stations, located in the Information Sciences Building (room 134) and the Business Administration Building (room 152). Services marked with an asterisk (*) are available only at the ISB RJE.

1. Distribution of output routed to RJE printers. *Punched output distributed.

2. Information on individual job processing status.

3. Job submission: instructing new users in operation of the RJE card readers, and ascertaining validity of the JOB card. *Reading in card decks for users when the system has been down, or the card reader is inoperative.

4. Basic guidance in the use of the keypunch machines and program drums. *Assisting users in logging onto a display or hard-copy terminal.

5. Running 80/80 listings and *performing card utilities.

6. Sample JCL setups for the most frequently used languages, and *manuals for all current languages, user guides, and a collection of BENCHMARKS for reference.

7. *Special handling requests for jobs, such as punched output or special forms can be phoned in at 565-3860.

8. *A Diablo printer is available for use by computer users to print mUSic/SCRIPT files and other documents which require high-quality upper and lower case typewriter-like print.

TAPE MANAGEMENT SYSTEM INSTALLED

The Computing Center has installed UCC ONE (known as TMS), an automated tape management system. TMS will control tapes used under MVT and will provide a number of benefits to those who process tapes under MVT (or, later, MVS) as well as to those who must keep up with the tapes in the Center library. In order to take full advantage of the features of TMS, the Center will make some procedural changes and may ask a few extra things of those people who use tapes. In return, the Center will offer
better protection against inadvertant loss of tape data and better management of the tapes in the library.

IBM's OS and OS/VS operating systems maintain information about tapes in a standard label, written on the tape itself. TMS maintains most of this information, along with some other useful data, in a disk database. This database, called the Tape Management Catalog (TMC), is updated each time a tape volume is mounted and dismounted. Since TMS has the data available without even mounting the tape, security levels can be raised.

The information in the TMC for each tape volume includes the following items which are also in a standard OS label: volume serial; jobname and stepname which created each file; creation date, expiration date, block count for the file; record format, logical record length, blocksize, and tape density. In addition, an OS label contains only the last seventeen characters of the dataset name; TMS maintains the full name (up to the system-allowed maximum of 44 characters) in the TMC. This feature also allows an added measure of file security.

The TMC record for a volume also includes the following information not recorded by OS: creation time and last-used date and time; dataset passwords (if desired); job which last used the volume; unit addresses of the tape drives which created the volume and which last used the volume; number of times the file has been opened; number of read and write errors encountered in using the tape; and project number and programmer name from the job card for the job creating the tape file.

The expiration date in the TMC is independent of the one on the tape itself, and TMS makes no modifications to the label on the tape. Tapes used under TMS control at NTSU can be taken to other installations with no danger of unexpected results induced by TMS.

The Computer Operations group of the Computing Center will have access to information in the TMC and will use the information to manage the tape library. TMS allows tape users to specify retention periods and expiration dates to automatically return tapes to scratch status, providing a continuous flow of scratch tapes to be available for users.

When a job calls for a new output tape to be created, the system operator will mount a tape from a pool of scratch tapes. Before the tape can be written on, TMS will check its database (TMC) to be sure it is a scratch tape. If a non-scratch tape has been mounted by mistake, TMS will dismount the tape and issue a new mount message to the operator. This feature provides absolute protection for all TMS volumes against accidental destruction of data due to operator error.

New tapes will usually be created with a default retention period. A daily job will scan the TMC and print a list of volumes whose expiration dates have been reached that day, and Operations will add those tapes to the scratch pool.

TMS functions best when all OS volumes are under its control, and when all volumes contain standard IBM labels. To this end, the Center has implemented a policy requiring all user-owned tapes to be copied to standard-label library tapes owned and stored by the Center. Jobs which call for non-library tapes will be cancelled unless special arrangements have been made. Users who need to copy tapes should contact Operations (in the Dispatch area of the Computing Center) for more information. Follow-
ing this procedure will provide better protection for your data from others and will allow you to keep your own tape as a backup against your own inadvertent mistakes.

If you need to create a new tape file, you have several options. If you want to add a file to an existing tape, just call for the tape by volume serial number and include the file number in the JCL as always (keep in mind the Standard Label restriction). Specify a hold criterion as outlined in the summary below.

If you need to create a new output tape, follow the instructions in the summary. The current default retention period is 540 days from the creation date; however, that is likely to be shortened sometime this semester, so it would be wise to specify a retention period or expiration period in your JCL. Please note that unnecessary use of permanent hold could result in a shortage of tapes or in increased tape handling charges. This option will be restricted to faculty tapes only.

The TMC will eventually contain all information now available via such utilities as SAS PROC TAPELABEL. Users of PROC TAPELABEL may now encounter some problems (see related article in this issue). To request information on a tape in the library or to change the TMC information on a tape, contact Operations through Dispatch. You will be required to provide information which verifies ownership of the tape.

USE OF UCC ONE (TMS)

To read data on an existing library tape volume:

//ddname DD DSN=dsname,UNIT=TAPE9,VOL=SER=volser,DISP=OLD

No JCL change is necessary, unless TMS password protection has been requested. You still provide DSN= and (if the dataset is not catalogued) VOL=SER= on your DD card. TMS will not affect READ processing.

To create a new tape file:

//ddname DD DSN=dsname,UNIT=TAPE9,DISP=(NEW,KEEP),
//     LABEL=(n,SL,EXPDT=yyddd),
//     DCL=(dcl information)

You will not need to specify VOL=SER= on your DD card. Just code DSN=, DCL information, and UNIT=TAPE9. TMS will call for a scratch tape for your use. Your SYSOUT listing will include the volume serial number which was used, so you can reference the file in the future. Code EXPDT=yyddd, where yyddd is the Julian date you desire the tape to be scratched, or RETPD=nnn, where nnn is the number of days you want to keep the tape. For other retention information, see below. Your new file will have an expiration date associated with it as described below. If that is not acceptable, the procedures for changing the date are also described below.

To specify hold criteria:

If you do not specify RETPD= or EXPDT= in the JCL when you create a tape file, it will be assumed the default retention period.
To specify a hold criterion, code your JCL as follows:

LABEL=( RETPD=nn) will set the retention period to nn days
LABEL=( EXPTD=yyddd) will set the expiration date to Julian date yyddd (unless yyddd is one of the keyword values described below).
LABEL=( EXPTD=99365) puts the tape on permanent hold. Please use this option with discretion.
LABEL=( EXPTD=99000) puts the tape under catalog control. When the dataset name is uncataloged, the tape will be eligible for scratch.
LABEL=( EXPTD=99ccc) puts the tape under cycle control. ccc is the number of cycles (copies) of the dataset that will be kept in the library.
LABEL=( EXPTD=98ddd) will keep the tape file for ddd days since its last use. On the ddd+1 day after the dataset is accessed, it will be eligible for scratch.

To change the hold criterion for a library tape:

The TMC can be updated online or via batch by authorized personnel. Contact Operations with such requests. You will need to provide the volume serial and dataset name on the tape, and your project number.

To release a tape for scratch use:

If catalog control is used, just uncatalog the dataset. If not, notify Operations and the tape can be scratched by updating the TMC. Again, you will need to provide volume serial, dataset name, and project number.

To get information about a library tape:

Contact Operations. Information to verify tape ownership will be required.

To use a 'work' tape:

Tapes designated as work tapes can be used and instantly returned to scratch status as described below.

To use a work tape, code at least one of the following on the DD card for the tape file:

DISP=(NEW,DELETE)
LABEL=( RETPD=0)
DSN= &name (temporary dataset name)
no DSN specified (temporary dataset name provided by system).
The Computing Center has acquired a newer and much more dependable Diablo printer for computer users to utilize in printing SCRIPT files and other documents.

In order to insure proper use of the Diablo, it will be set inside the Computing Center Remote Job Entry station area (ISB 134). Remote Job Entry personnel have been trained in operating the Diablo, and will perform all functions such as changing ribbons, paper, print wheels, and print spacing for users. Persons desiring to use single sheets for their output will receive assistance in readying the first sheet. A MUSIC/SCRIPT manual will be placed by the machine for reference use.

A sign-up sheet will be available to allow users to sign up on a first-come, first-served basis. Users will be allowed access to the Diablo all hours that the RJE area is staffed. During periods of high demand, one hour will be the maximum length of time for use. Succeeding one hour periods must be separated by four hour breaks. You may sign up one day ahead to reserve time on the Diablo. A reserved slot will be held for the user until 10 minutes after it was to begin, at which time a waiting person will be allowed to sign up for that time. Signing on to the Diablo, executing a file, and then leaving it unattended while it prints will not be permitted. RJE personnel will set the machine up, and the user is responsible for monitoring his/her output as it is printed.

Since the Diablo is in demand for printing hard copies of documents that specifically require its upper and lower case typewriter like print, the Diablo will not be used for editing or output of programs that do not require these features.

PRINT SHOP NOW ACCEPTING CP/M FILES

The MTSU Print Shop, through the acquisition of some additional software, now has the capability to use CP/M text files as input to their typesetting system. The idea is this: if you have been using some particular CP/M text file and need to have the Print Shop do something with it, you can send them the diskette that contains the file(s) and they will be able to process it faster and more efficiently. This method saves time and probably increases the accuracy of reproductions. The following guidelines should be adhered to in order to prepare your CP/M text files for sending to the Print Shop.

1. Diskettes should be of the 8 inch "SSS" variety. ("SSS" means "Single-sided, Single-density, Soft-sector")

2. Diskettes must be CP/M format.

3. Any special control characters used by your editor (such as in Wordstar) must be removed from the file using the "Z" option of the PIP command.

4. Right justification must be turned off.

- 8 -
5. Processing instructions and/or a sample print-out of the document(s) must be included.

If you have any questions concerning anything mentioned above, feel free to contact either Steve Randall at the Print Shop (565-2005) or Academic Computing (565-2324).

DATASETS PURGED

During the academic disk pack cleanup procedure most of the datasets on ACAD01 were purged. If you did not specifically request that your dataset be saved, it was purged on January 27. If your job abnormally terminates and you are referencing a dataset on ACAD01 that was not specifically tagged for retention, you probably are the victim of a System 213-04. This means that your dataset could not be found. If you need your dataset restored or have other questions concerning disk datasets, contact George Morrow at the Computing Center (565-2324).

MICRO'S AT A DISCOUNT

The University store has the following new offerings in the way of microcomputers:

1. Commodore 64 and VIC 20's.

2. IBM personal computers at a 25 percent off list price to faculty/staff and students.

3. An agreement has been signed with Digital (DEC) to provide the full line of Digital personal computers starting in the middle of March.

For more information, please call 565-2592.

DEDUCTIONS FOR PERSONAL COMPUTERS MAY BE A REALITY*

Depending on your personal and professional circumstances, it may be possible for you to deduct up to the full purchase price of a computer and related equipment from your federal income taxes over several years, thus saving hundreds or even thousands of dollars. Individual circumstances may also enable you to save even more on such purchases in the first year by claiming investment tax credits.

Tax lawyers and other specialists who were consulted by the Chronicle of Higher Education stressed that savings are allowable only for those who satisfy specific requirements of the law. At a minimum, they agreed, the equipment would have to be used for work, not play. According to one lawyer, tax officials could be expected to draw a clear distinction between a simple home computer used mainly for games and a more sophisticated-
ed "business" computer or word processor. However, the experts agreed that individual circumstances common to many professional employees in higher education would be adequate to support tax write-offs for computer purchases.

There are two main approaches to qualifying for tax deductions in such cases.

1. Claim a deduction in connection with a separate income-producing business, such as consulting, that you do in your home or place of work.

2. Claim a deduction for a personal expense directly related your job.

Of course, one should always remember that they may be called upon to substantiate their claims in an I.R.S. audit.

If you are interested in the possibilities of attaining such a deduction from your income tax, you might want to review several documents generally available without charge from I.R.S. offices.

- Publication 529 Miscellaneous Deductions
- Publication 587 Business Use of Your Home
- Form 2106 Employee Business Expenses
- Schedule A Itemized Deductions
- Schedule C Profit or (Loss) from Business or Profession

Publication 529 notes that taxpayers who itemize their deductions on Schedule A may deduct a variety of legitimate employee expenses, including those incurred for using a part of their home "regularly and exclusively in work," "research expenses of a college professor," "small tools and supplies," and "subscriptions to professional journals." The purchase of a personal computer qualifies as a deductible employee expense as long as you can show that it is required in your employment and that your employer did not provide it or reimburse you for it.

An I.R.S. spokesman stated that "The law says you can deduct whatever is ordinary and necessary," adding that the taxpayer would make the initial decision as to whether or not the purchase of a personal computer is ordinary and necessary. The Internal Revenue Service would then decide whether to accept or question the deduction, depending on the "facts and circumstances" of a particular taxpayer's claim.

* Adapted from an article by Robert L. Jacobson, Washington, which appeared in the October 6, 1982 issue of The Chronicle of Higher Education.
This article is the ninth in a series of articles on computing and data analysis. The previous articles appeared in BENCHMARKS Volume 3, Numbers 2 - 9.

Why Save an SPSS File?

Although not strictly necessary for data analysis with SPSS, the facility for saving SPSS files is often useful, especially when you have a large number of variables, transformations, variable or value labels, or other SPSS statements that consume a large number of cards or lines in a file. All the information that you have given SPSS with these commands can be stored on magnetic disk and retrieved any time you wish to use them again. In addition, SPSS stores your data, so that you do not have to keep submitting large card decks or long program files for processing. This becomes important when you must perform many analyses of the same data.

The SAVE FILE Statement

The command that signals SPSS to create a disk file saving all of the previously defined variables, variable labels, value labels, missing values, data, etc., is the SAVE FILE command. This statement is usually the next-to-last SPSS program control statement, coming just before the FINISH statement. The words SAVE FILE form the control field for this statement, while the specification field contains a file name of up to 8 characters in length. This name may not begin with a number. You decide what file name to assign to your SPSS system file, and you will use this name every time you retrieve the file.

The FT04F001 DD Statement

When you create a system file with the SAVE FILE statement, you must include a DD statement in the job control language portion of your program which tells SPSS:

- what the name of the file will be,
- that the file will be stored on a magnetic disk,
- which magnetic disk it should be stored on,
- how much space on the disk should be allocated for the file, and
- that the file is new, and should be retained after the program has finished running.

Each of these characteristics are specified by a parameter in the DD statement (see BENCHMARKS, Vol. 3, No. 6, or the user's guide Using OS/VT by George Morrow for more information about the DD statement).
This DD statement must have the ddbname FT04F001, to direct SPSS to the proper statement in the job control language to find the characteristics of the file. The DSN= parameter tells the system what name to store the newly created file under, and should conform to the naming convention for OS/MVT disk data sets (described in **Benchmarks**, Vol. 3, No. 6, and in the guide **Using OS/MVT**). It is prudent to use, as the last part of the disk data set name, the file name that you use as the specification field in the **SAVE FILE** statement. The parameter UNIT=SYSDA tells the system that this file will be stored on magnetic disk. The VOL=SER= parameter should specify on which disk you want to store the file. Since this file is being created, its disposition is described by the parameter DISP=(NEW,KEEP,DELETE) which indicates that the file is new, and should be kept if the job runs successfully, and deleted otherwise.

In addition to these parameters, which were introduced previously in the discussion of DD statements in the last article in this series, you must allocate some space on the disk for the new file. This is accomplished through the SPACE= parameter. The SPSS Manual (p. 595) recommends SPACE=(2012, (1000,100), RLSE) as the characteristics of the SPACE= parameter. This tells the OS/MVT system that you want your file to be created in blocks of 2012 bytes, that you want 1000 of these blocks allocated initially, and that if this is not enough space, up to 15 additional allocations of 100 blocks can be made. Finally, you will release (RLSE) any of this requested space that is unused by your file so that it may be used by others. **Table 1.16** shows an example of the FT04F001 DD statement.

<table>
<thead>
<tr>
<th>TABLE 1.16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example FT04F001 DD Statement to Accompany the SAVE FILE Command</td>
</tr>
<tr>
<td>//FT04F001 DD DSN=USER2.D1234.P5678.CLASS,UNIT=SYSDA,</td>
</tr>
<tr>
<td>// VOL=SER=ACAD02,SPACE=(2012,(1000,100),RLSE),</td>
</tr>
<tr>
<td>// DISP=(NEW,KEEP)</td>
</tr>
</tbody>
</table>

In this example, the information in the SPSS program control statements will be stored in a file named USER2.D1234.P5678.CLASS on the magnetic disk ACAD02. All the other parameters follow from the discussion above. Note that this DD statement is continued twice, and that the continuations contain at least one blank space between the slashes (//) and the parameters.

**Example Output From the SAVE FILE Command**

Suppose that, in the previous example run, we had included the FT04F001 DD statement in **Table 1.16** in the job control language, and as the next-to-last SPSS statement, included the command **SAVE FILE**, with the filename CLASS. **Table 1.17** shows how SPSS would report the successful completion of the **SAVE FILE** command.
TABLE 1.17

Example Output From the SAVE FILE Command

ANALYSIS OF RESEARCH METHODS CLASS DATA 03/03/82

CPU TIME REQUIRED.. 0.15 SECONDS

19 SAVE FILE CLASS
FILE CLASS HAS BEEN SAVED WITH 9 VARIABLES..
SEQNUM SUBFILE CASWGT STUDENT GENDER TEST1 TEST2 TEST3 AVERAGE

THE SUBFILES ARE..

NO OF
NAME CASES
CLASS 20

20 FINISH
CPU TIME REQUIRED.. 0.20 SECONDS

NORMAL END OF JOB.
20 CONTROL CARDS WERE PROCESSED.
0 ERRORS WERE DETECTED.

This page of the printout informs us that the file CLASS has been created at the location specified in the DD statement in Table 1.16. Note that it contains the variable AVERAGE which we created with the COMPUTE statement, as well as the variables STUDENT, GENDER, TEST1, TEST2 and TEST3 from the original data. In addition, SPSS creates three variables, SEQNUM, SUBFILE and CASWGT, which contain sequencing information for the data, the characteristics of the subfile structures in the data, if any, and any weights that have been assigned to the cases (see the SPSS Manual for descriptions of these variables). SPSS also reports the number of cases of data that it has saved. Notice that SPSS does not report the location of the saved file on the OS/NVT disk. You must keep track of this with your Ft04F001 DD statement.
The GET FILE Command

After an SPSS file has been saved, the GET FILE statement is used to retrieve the information in the file for further use. The GET FILE statement is usually the first of the SPSS program control statements in a job in which it is used.

The format of the command is simple: the control field contains the words GET FILE, and the specification field contains the one to eight character name that was assigned to the file when it was created. Thus, the GET FILE statement is a perfect complement to the SAVE FILE statement.

The GET FILE statement, because it summons all the information in the saved file that it retrieves, replaces all of the data definition statements that would normally be used to describe the data. Therefore, when the GET FILE statement is used, you can omit the DATA LIST, INPUT MEDIUM, N OF CASES, and any data modification statements, like RECODE, COMPUTE or SELECT IF that were in effect when the file was saved. Likewise, you can omit the VAR LABELS and VALUE LABELS statements, if used (see the SPSS Manual, pp. 59-63, for more information on these statements). You can also omit the READ INPUT DATA statement, since SPSS stores the data in the system file, as well as the data description statements.

The FT03F001 DD Statement

Like the SAVE FILE statement, the GET FILE statement requires a DD statement in the job control language portion of the program which describes the location of the file to be retrieved. This DD statement has the ddname FT03F001, and should include the DSN= and VOL=SER= parameters to describe the OS/MVT name and disk of the file. The UNIT=SYSDA parameter is also required. For the FT03F001 statement, the disposition of the file should be described as DISP=(OLD,KEEP), since the file was previously created, and should be retained.

Example Input and Output for the GET FILE Statement

Suppose that, having saved the class data and its description as in the previous example, we then wanted to investigate whether there is a significant difference between the mean average scores of the men and women. We could do this with an analysis of variance, using GENDER as the grouping factor and AVERAGE as the dependent variable, in the ONeway procedure. Table 1.18 shows how we could do this using the GET FILE statement.

The first two lines of the example program are MUSIC commands, as in the example in Table 1.14. Next follows the JOB and EXEC statements, also in the same format as Table 1.14. Then comes the FT03F001 DD statement, which describes the location of the saved file. It provides the same information as the DD statement in Table 1.16, except that here the disposition of the file is (OLD,KEEP), and we do not need to specify a SPACE= parameter. Next is the SYSIN DD statement, after which come the SPSS program control statements.

All that we need to do to retrieve all of the information in our previous program is to issue a single GET FILE command. After SPSS executes
this, we are ready to perform the analysis of variance. We have decided not to include any OPTIONS or STATISTICS with this analysis, so we end the program with the FINISH statement. The advantages of the SAVE FILE and GET FILE statements are clear from this program. After saving the information in the file, we have reduced the length of our program considerably, which means that our processing time is also reduced. Any subsequent analyses that we wish to make of the class data can be made in this manner, without repeating any of the data description statements that were necessary in the first example program.

### Table 1.18

Example Program Using the GET FILE Statement

```plaintext
/INC OSJE
SYSTEM='OS',TYPE='STUDENT',RETURN
//MU99GET JOB (1234-5678,:10,1), 'ADAMS, JOHN', CLASS=A
// EXEC SPSS
// FT04F001 DD DSN=USER2.D1234.P5678.CLASS,UNIT=SYSDA,
// VOL=SER=ACAD02,DISP=(OLD,KEEP)
// SYSIN DD *
GET FILE CLASS
ONEWAY AVERAGE BY GENDER (1,2)
FINISH
```

Table 1.19 shows the output from this program. The first page of the printout, besides showing the usual information discussed in Table 1.15, indicates that SPSS has found the correct file. We note that it has the same number of variables and cases as when it was saved. Next, SPSS begins the ONEWAY procedure.
TABLE 1.19

Output From the Example GET FILE Program

SPSS BATCH SYSTEM
03/08/82 PAGE 1

SPSS FOR OS/360, VERSION M, RELEASE 9.0, JUNE 10, 1981

CURRENT DOCUMENTATION FOR THE SPSS BATCH SYSTEM
ORDER FROM MCGRAW-HILL: SPSS, 2ND ED. (PRINCIPAL TEXT)
SPSS UPDATE 7-9
SPSS POCKET GUIDE, RELEASE 9
SPSS PRIMER

DEFAULT SPACE ALLOCATION ALLOWS FOR 102 TRANSFORMATIONS
WORKSPACE 71680 BYTES
TRANSANCE 10240 BYTES

1 GET FILE CLASS

FILE CLASS HAS 9 VARIABLES

THE SUBFILES ARE:

NO OF
NAME CASES
CLASS 20

CPU TIME REQUIRED: 0.08 SECONDS

2 ONEWAY AVERAGE BY GENDER (1,2)

* * * ONEWAY PROBLEM REQUIRES 64 BYTES WORKSPACE * * *

Page 2 of the output shows the results from the analysis of variance. Note that, since we did not provide a RUN NAME for this program, SPSS substitutes the name SPSS Batch System at the top of the printout. We can also see that, according to the results of the analysis of variance, there is no significant difference between the class averages of men and women. We did not include a STATISTICS command in this program, so we did not get any output beyond the ANOVA table.
Table 1.19

Output From the Example GET FILE Program Continued

SPSS BATCH SYSTEM

FILE CLASS (CREATION DATE = 03/03/82)

- - - - - - - - - - - - ONEWAY - - - - - - - - - - - -

VARIABLE AVERAGE
BY VARIABLE GENDER

ANALYSIS OF VARIANCE

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>D.F.</th>
<th>SUM OF SQUARES</th>
<th>MEAN SQUARES</th>
<th>F RATIO</th>
</tr>
</thead>
<tbody>
<tr>
<td>BETWEEN</td>
<td>1</td>
<td>259.1877</td>
<td>258.1875</td>
<td>0.670</td>
</tr>
<tr>
<td>WITHIN</td>
<td>18</td>
<td>6967.3240</td>
<td>387.0735</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>19</td>
<td>7226.5078</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The third page of the output shows that the ONEWAY procedure took only 0.11 seconds of processing time, and that the program had no errors. Notice that this program took much less computer processing time than a comparable program without the GET FILE statement would have taken.

TABLE 1.19

Output From the Example GET FILE Program Continued

SPSS BATCH SYSTEM

CPU TIME REQUIRED... 0.11 SECONDS

3 FINISH
NORMAL END OF JOB.
3 CONTROL CARDS WERE PROCESSED.
0 ERRORS WERE DETECTED.
SHOULD WE KEEP BMD?

The Computing Center now has, for all practical purposes, the equivalent of two biomedical computing packages, BMD and BMDP. BMD is an older version of BMDP. In an effort to conserve resources, it has been proposed that BMD be removed from the system. If you have any objections to this proposal, please notify someone in Academic Computing (565-2324). The decision will be announced in the next issue of BENCHMARKS.

* * * * * * * * * * * *
* SAS *
* * * * * * * * * * * *

TAPELABEL and TAPECOPY Inoperative Under TMS

The SAS Procedures TAPELABEL and TAPECOPY are no longer available for general use. Instead of using SAS and invoking these procedures, users should use the JCL and procedures outlined below to achieve the same results.

Information obtained from PROC TAPELABEL is now stored in the Tape Management Catalog (TMC). It can be accessed without mounting the tape by using the statements below. Please note that this is now a class A job with short CPU time requirements.

```
//jobname JOB (xxxx-yyyy,:01,1),name,CLASS=A
// EXEC TMSINFO
//SYSIN DD *
VOL=ZZZZZZ
/*
```

where ZZZZZZ is the volume serial number of the tape.

This job will provide information for each file on the volume, including expiration dates, dataset names, names of the job and step which created the file, creation date and time, tape unit used to create the file, name of the last job to access the file, tape unit last used to access the file, date of last access, DCG information (record and block lengths, etc.), and temporary error information.

PROC TAPECOPY will no longer be generally available. The JCL below can be used to copy single-file tapes, and can be used repeatedly to copy multi-file tapes. Please note that the input tape must be under TMS control and that the output tape begins as a scratch tape and then becomes a new TMS-controlled volume. Please contact Academic Computing to handle non-TMS volumes.
where oldname is the name of the file to be copied, newname is the filename for the new tape (it can be the same as oldname), and xxxxx is the volume serial number of the old tape.

To copy file other than the first, change the LABEL=1 to the desired value. In that case, you should also supply volume serial number on the SYSUT2 statement.

If this copy JCL does not work for your tape, please consult Academic Computing at 565-2324.

Staff Attends SAS Convention

Bob Brookshire and Claudia Putnam (your fearless editor) attended the annual meeting of the SAS User's Group International (SUGI) in New Orleans, January 16-18. The meeting was attended by over 2,000 SAS users from industry and academia, and by representatives from SAS Institute, Inc.

Papers were presented in the areas of Education and Consulting, Statistics, Information Systems, Interactive Techniques, and Computer Performance Evaluation. Bob and Claudia gave a presentation entitled "Analyzing Congressional Career Patterns Using SAS." Tutorials on using SAS were presented, and several vendors of graphics equipment, including Tektronix and IBM, demonstrated their latest hardware using SAS/GRAPH.

SAS Institute provided demonstrations of all of their products, including the new system, "Portable SAS," which will soon be available on non-IBM mainframes.

Bob and Claudia took this opportunity to investigate the capabilities of several recent developments in stand-alone interactive graphics systems, including Joust, Pac Man Pinball and Punk Rock Pinball. They report that while Joust can be very intimidating for the new user, Pac Man Pinball and Punk Rock Pinball, due to their compatibility with older, more familiar systems, are easy to use. In fact they claim scores as high as 980,000 on Pac Man Pinball.
MUSIC Backup Hours

Following are the scheduled hours for the MUSIC backup. A message will be sent to all users signed-on to MUSIC approximately 10 minutes before the backups are begun, and will be in the form: **MUSIC SHUT DOWN AT XXXXXX AM - SCHEDULED BACKUP**. To find out the backup hours while signed-on to MUSIC, enter HELP HOURS.

<table>
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<tr>
<th>Day</th>
<th>Time (for about hours)</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuesday</td>
<td>3 AM</td>
<td>Weekly Backup</td>
</tr>
<tr>
<td>Wednesday-Saturday</td>
<td>4 AM</td>
<td>Daily Backup</td>
</tr>
<tr>
<td>Saturday</td>
<td>Midnight (for about 2 hours)</td>
<td>Daily Backup</td>
</tr>
</tbody>
</table>

MUSIC System Upgraded

MUSIC has been upgraded from Release 5.0 to Release 5.1 as of JAN 16, 1983. All COMMANDS, COMPILERS, UTILITIES and PROCEDURES under Release 5.0 are in effect under the new release.

Release 5.1, however, does provide additional facilities, especially for the CONTEXT EDITOR (see related article below). Updates for the MUSIC USER'S GUIDE will be available as soon as possible, and will be sent to all those who have previously purchased the Version 5 manual and have sent in the update request form. In the meantime, below are some items that may affect general users:

1. Up to 24 unique PF keys can now be established. There are now default definitions for most of the 24 PF keys, and the editor can handle the situation of being on a terminal with 12 PF keys with an edit profile set up for 24.

2. An alternate INPUT mode allows users to enter a group of lines without coming out of edit mode. A range delete command can remove a block of lines marked with a special character.
3. The regular INPUT mode has been changed slightly to encourage the use of the new line key after each line, instead of the ENTER key.

4. Some commands now have a FLIP option to reduce the number of PFK definitions otherwise required.

5. V5 BASIC programs can now chain to programs written in other languages.

6. One retry is allowed after an incorrect password is entered at sign on time. User will be prompted with the message: * INCORRECT! TRY AGAIN...

7. The PASSWORD is blanked out after it is entered on an ASCII CRT TERMINAL, to protect the user's ID-CODE.

8. Program output is no longer held, waiting for the spool buffer to fill up, if a job enters a cpu intensive section of code. (If you don't understand this, don't worry).

9. Other UTILITY programs or ADDITIONAL OPTIONS will be available and announced after being tested by the computing center.

Some Changes in the Context Editor in Version 5.1

* The editor now always assumes a record length of at least 10, even if the file being edited has a record length of less than 10. The file's record length will be increased to 10 if a SAVE, FILE, or EXEC operation is done.

* ENTER now terminates input mode if one line or less was entered on the screen. If more than one line was entered in input mode, the ENTER key continues input mode, providing space for more lines.

* The context editor now allows for the use of 24 PFK keys, taking advantage of 24 PFKs available on some new 3270 type terminals. The PFKs are divided into two groups:

1. Primary (or "pad") PFKs (PFP1 to PFP12):

These are the PFK numbers which appear on the 4 by 3 key pad (if you have one) at the right hand side of the keyboard, otherwise, they are located along the top row of the keyboard. They are used for the basic editing operations such as TOP, BOTTOM, UP PAGE, DOWN PAGE.

On a terminal with only 12 PFKs (e.g., IBM 3277), the primary PFKs are PF1 to PF12.

On a terminal with 24 PFKs (e.g., IBM 3278), the primary PFKs are PF13 to PF24.

The primary PFKs can be referred to on the define command as PFPn. For example, DEFINE PFP1 UPWINDOW 10. PFP13 has the same meaning as PFP1, PFP14 the same as PFP2, etc.
Alternate PFKs (PFA1 to PFA12):

These are the "extra" PFKs, used for less basic operations such as changing the WINDOW columns or turning line numbering on or off.

On a terminal with only 12 real PFKs, the alternate PFKs are obtained by moving the cursor one space into the left margin (of the displayed lines or of the command area) and then pressing one or the keys PF1 to PF12. For example, to get PFA1 (the imaginary PF13 key) move the cursor into the margin and press PF1.

On a terminal with 24 real PFKs, the alternate ones are PF1 to PF12, and are located along the top row of the keyboard (the ALT key must be held down while pressing the PF key). The technique of putting the cursor into the left margin before pressing a primary PFK also works on these terminals. For example, to get PFA1 you can either press "ALT" and "PF1", or put the cursor in the margin and press "PF13".

The alternate PFKs can be referred to on the DEFINE command as PFA1n. For example, DEFINE PFA1 NUM. PFA13 has the same meaning as PFA1, PFA14 the same as PFA2, etc.

The primary PFKs have the same default meanings as they had in Version 5.0, except for PFP8 and PFP9 (PF8 and PF9) which were previously undefined.

1. PFP8 ("SPLIT") now splits a line into two lines. The character at which the cursor is positioned becomes the first character of the second line.

2. PFP9 ("LOCATE") now locates the next occurrence of the character string on the last LOCATE, SEARCH, FIND or HUNT command.

Following are the default definitions of the Alternate PFKs:

1. PFA1 ("QUIT") terminates the editor session without performing any save operation. If you have made changes to the file but have not issued a FILE command to make the changes permanent, you will be prompted for permission to end the edit session. Enter YES or Y to end the session, or NO or N to cancel the PFA1 operation and continue editing.

2. PFA2 ("WINDOW FLIP") shifts the displayed window to the extreme left or right, whichever is further from the existing window setting.

3. PFA3 ("NUM FLIP") causes line number to appear for each line of the file if the numbering was previously absent, or causes line numbering to be turned off if the numbers were previously present.

4. PFA4 ("NULLS FLIP") causes blanks to be displayed at the end of each file on the screen if null characters were previously displayed, or causes null characters to be displayed if blanks were previously displayed. The NONULLS mode (i.e., blank displayed is indicated by a ") character at the end of the tab line.
5. PFA5 undefined
6. PFA6 undefined

7. PFA7 ("MULTIPLE DELETE 40 LINES" or "MDELETE 40") has a dual function. It deletes unused lines left over from the MINsert command (without the "B" option), and can also delete a group of lines. First, lines in the neighbourhood of (40 lines above and below) the current line which have the delete character in column 1, followed by blanks, are deleted. (The delete character, ";" by default, is as defined by the DELCHAR command described in the editor command section.) Then, if lines were found with the delete character in column 1 and 2 (i.e., the line begins with ";:"), all lines between the first and second such lines, inclusive are deleted. Thus, to delete a group of lines, put delete characters in columns 1 and 2 of the first and last lines of the group, then press PFA7.

8. PFA8 ("JOIN") causes the next line to be joined to the end of the current line, and deletes the next line. The second line is added after the last nonblank character of the first line, a single blank being placed between them. Only the "ZONE" parts of the lines participate (refer to the ZONE command in the editor command section).

9. PFA9 ("DUPLICATE") causes the current line to be duplicated once.

10. PFA10 ("INSERT 2 BLANK LINES" or "MINsert 2 B") causes two blank lines to be inserted after the current line. The first line inserted becomes the new current line.

11. PFA11 ("MULTIPLE INSERT 10 LINES" or "MINsert 10") causes 10 lines to be inserted, each with the delete character in column 1, after the current line. This can be used as a substitute for the INPUT mode. Once the lines are inserted, simply type the new text over them. Use PFA7 to delete any unused lines left over.

12. PFA12 undefined

- To find the command string assigned to a user defined PFK, press the PFK, then place the cursor at the tab line and press ENTER. This will display the PFK command string in the command area. The SHOW command can also be used to display the current definition of PF keys or the X command.

- There are editor commands which correspond to some of the standard PFK operations, in addition to the obvious ones like TOP, LAST, DELETE, INSERT, and INPUT. These commands are useful when redefining PFKs with the DEFINE command.
<table>
<thead>
<tr>
<th>Command</th>
<th>Associated PPK</th>
<th>Abbreviations</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPWINDOW n</td>
<td>PFP1</td>
<td>UPW</td>
</tr>
<tr>
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</tr>
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<tr>
<td>CMDPFK</td>
<td>PFP12</td>
<td>CMDPF</td>
</tr>
</tbody>
</table>

For example, if you wish PFP1 to move the window up 4 lines instead of the standard 6 lines, use DEFINE PFP1 UPWINDOW 4.

- Some new editor commands are:

  1. DEFINE PFPn <commands> and DEFINE PFAn <commands> which were discussed previously.

  2. DELCHAR <x> <OFF> This command defines the delete character for use with the MINSERT and MDELETE commands. "x" is the delete character to be used. It must be a special character, not a letter or a digit. If "OFF" is specified, the delete character is made undefined. If the command is used without an operand, the current delete character is displayed. The default delete character is "::" (the colon).

When a Save Library file is saved by an editor SAVE, FILE or EXEC command, the editor looks for lines with the delete character in column 1 (followed by a blank or another delete character). If such a line is found, this probably means that you forgot to use MDELETE. The editor issues a warning message: "LINE WITH DELETE CHARACTER FOUND. CONTINUE SAVE?" Answer Y or YES if you wish file to be saved as is. Answer N or NO if you wish the save not to be done. You can then use MDELETE and redo the save operation.

  3. FILL <FLIP> The FLIP option of the FILL command reverses the current setting for the command; i.e., FILL FLIP causes blanks to be displayed at the end of each field if null characters were previously displayed, or causes null characters to be displayed if blanks were previously displayed.

  4. MDELETE <n> This multiple delete command has a dual function. It deletes unused lines left over from the MINsert command (without the "n" option), and can also delete a group of lines.

First, lines in the neighbourhood of the current line which have the delete character in column 1, followed by blanks, are deleted.

The delete character ("::" by default) is as defined by the DELCHAR command described above. Then, if lines were found with the delete character in columns 1 and 2 (i.e., the line begins with "::"), all lines between the first and second such lines, inclusive, are deleted.
Thus, to delete a group of lines, put delete characters into columns 1 and 2 of the first and last lines of the group, then use the MDELETE PFK.

The "n" operand of the command defines the number of lines above and below the current line to be searched for delete characters. A command such as MDEL 99999 will apply the delete to the entire file (the default value for n is 40).

The line after the last line deleted will become the current line.

5. **MINSERT <n> <b>** This multiple insert command causes the insertion of a number of lines following the current line. The first line inserted becomes the new current line.

"n" is the number of lines to be inserted. The default is 10 lines.

If the "b" option is specified after the number of lines, then blank lines are inserted. Otherwise, lines with the delete character (as specified by the DELCHAR) in column 1 are inserted.

This command can be used as an alternative to the INPUT mode for entering lines into a file.

6. **NOFILL <FLIP>** The FLIP option of the NOFILL command reverses the current setting for the command; i.e., NOFILL FLIP causes blanks to be displayed at the end of each field if null characters were previously displayed, or causes null characters to be displayed if blanks were previously displayed.

NOFILL is the default method of display at the start of an editor session. The opposite of this command is FILL.

7. **NONULLS <FLIP>** This command applies only to the 3270 full screen mode. It causes blanks to be displayed at the end of each field on the screen instead of null characters. An alternate name for this command is FILL.

The FLIP option reverses the current setting for the command; i.e., NONULLS FLIP causes blanks to be displayed at the end of the field if null characters were previously displayed, or causes null characters to be displayed if blanks were previously displayed.

Null characters are displayed by default at the start of an editor session. The opposite of this command is NULLS. NULLS

8. **NULLS <FLIP>** This command applies only to the 3270 full screen mode. It causes null characters to be displayed at the end of each field on the screen. An alternate name for NULLS is NOFILL.

The FLIP option reverses the current command; i.e., NULLS FLIP causes blanks to be displayed at the end of each field if null characters were previously displayed, or causes null characters to be displayed if blanks were previously displayed.
At the start of the editor session, null characters are displayed. The opposite of this command is NONULLS.

9. NUM <FLIP> This command is used to cause line numbers to appear whenever lines of the file are displayed. The FLIP option reverses the current setting for the command; i.e., NUM FLIP turns numbering on if it was off, and off if it was on.

At the start of the editor session, the line numbering is off.

10. WINDOW <FLIP> The FLIP option of the WINDOW command causes the window to be shifted to the extreme left or right, whichever is further from the existing window setting. FLIP can be abbreviated PL or P.

Note on the Full Screen EDITOR:

If you are a user of the FULL SCREEN EDITOR, make sure to check on the definitions of the PF keys. Enter the command SHOW PFKEY at your terminal while you are in EDIT MODE to find out the default definition of the PF keys. To define PF keys and to keep them in effect permanently, key in the following at your terminal:

```
EDIT EDITOR NEW
/INC *COM:EDITOR
DEFINE PF1 command
DEFINE PF2 Command
  . . .
DEFINE PFn Command
SAVE
```

Note that each "DEFINE PFn command" is used to define a PF key, for example

```
DEFINE PF2 WINDOW FLIP
```

will define PF2 to automatically shift the window to the extreme left or right, whichever is further from the existing window setting.

For more information on Full Screen Editing, refer to the MUSIC USER'S GUIDE, topic CONTEXT EDITOR.

SIM3270 Features

A new version of SIM3270 will be installed on Monday, February 14. The new version will fix bugs that are in the current version, support more terminal types, and have its own help facility. The help facility can be invoked by typing HELP. The terminal will temporarily go into "line" mode so that it can display the functions of various key strokes. The user then depresses the <ENTER/RETURN> key to return to full screen mode.
In addition to supporting the MIME-2A, SIM3270 will also support the ACT-V in ADA-3A mode. Documentation for this will be available under HELP.

HP 2000 Backup Schedule

Routine system backups are scheduled to be performed at the following times:

6:00 a.m. Monday through Friday for approximately 20 minutes.
4:00 p.m. Friday for approximately 1.5 hours.
INDEX TO PAST ISSUES

In order to utilize BENCHMARKS to its fullest capacity and avoid redundancies, an index of previous issues containing information considered still pertinent to the NTSU Computing Center is included in each issue.

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<th>PG</th>
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