NO DECEMBER NEWSLETTER

There was no newsletter published for December, 1969, because of
the move into the new Computer Center building. The entire move took
place during Thanksgiving vacation. Full services were restored
December 1 at 8:00 a.m. as scheduled.

REGIONAL COMPUTER CENTER PROJECT DIRECTORS MEETING

The conference will be held January 15 & 16 at Portland State Uni-
versity with concentration on business and economics computer curricu-
lum materials. Speakers are planned for discussing the project, several
business applications, and specific areas of interest to participants.
Dan Couger of Business Research at the University of Colorado has been
invited to speak on uses of the computer in the business curriculum.
He is the editor of Computing Newsletter for Schools of Business which
is designed "as a vehicle to share ideas and experience concerning
computer curriculum and computer uses." Examples of applications have
been prepared, as well as programs and problems for hands-on experience.
We hope to generate interest in development of curriculum materials and
get some specific problems, programs, or ideas on which to work.

NEW COMPUTER CENTER PUBLICATIONS

cc-69-20   A Resource Set: Computer Programs in Science for Secon-
    dary Schools. Walter Bell, September, 1969.

cc-69-21   A Resource Set: Computer Programs in Mathematics for
    Secondary Schools. Charles Geldaker, September, 1969. (Avail-
    able in approximately six weeks)

cc-69-22   A Resource Set: Computer Programs in Business for Sec-

ondary Schools. Phil Collins, September, 1969. (Available in approximately six weeks)

cc-69-23   Report on OSU Computer Materials Project (NSF GJ 116). Catherine Porter and Judy Edwards, September, 1969.

cc-69-24   OSCAR: A User's Manual with Examples (2nd Edition). Baughman, Berryman, Davis, September, 1969. (Available in about six weeks)

cc-69-25   A Brief Description of OSCAR (Third Revision). Davis, Bachelor, September, 1969.

cc-69-26   Regional Computer Center Summer Institute, Sept. 8-12, 1969. Jo Ann Baughman, October, 1969.

cc-69-27   Commercial Fisheries Abstract Author Index, Fran Spigai, December, 1969. (Available in approximately six weeks)

cc-69-28   Regional Computer Center Project Directors Meeting. Jo Ann Baughman, November, 1969.

cc-69-29   A Resource Set: Computer Programs in Mathematics for Secondary Schools (Student Exercises). Charles Geldaker, December, 1969.

FALL TERM GRADES

During the last two weeks of December the Computer Center processed more than 70,000 final grades and printed grade reports and mailers for approximately 14,800 students. Over 90% of the grades were run on Sunday, December 29, six days later than originally planned. The delay was caused by a combination of late submission of many grades, a break for the Christmas holiday and continued problems with the Fall Term data base.

Grade processing for future terms is expected to become more routine with the introduction of improved controls on the course data. The cleaner data base should also result in fewer delays in the submission of grades to be processed. Work will continue throughout the coming weeks to develop more efficient procedures for collecting and processing the grades.

NEW COMPUTER CENTER DIRECTORY

Ext.

AMES, Mildred; CC 207 2033

ATKINS, Sandra; CC 202 2494

AVERY, Keith; CC 203 2494

BACHELOR, Gilbert; K 144 1726

BALLANCE, Jeffrey; K 141 2062

BARNES, Roger; CC 209 2033

BAUGHMAN, Jo Ann; K 150 2062

BELL, Norman; K 142 2062

BERRYMAN, Mary Lynn; K 141 2062

BOERGER, James; CC 209 2033

BOGUMIL, Lois; CC 226 2494

BRANTNER, Thomas; CC 224A 2494

BRENNE, Robert; K 144 1726

BRENNER, Terese; CC 202 2494

BROWN, Dorothy; CC 217 2494

BROWN, Ronald; CC 226 2494

CABRERA, Abraham; CC 209 2033

CARLSON, Janice; K 138 2062

CHOU, Shu-Chih (Billy); K 69 2526

CLUNES, Beverly; CC 217 2494

DAVIS, Ronald; CC 224B 2494

DAYTON, Fred; CC 227 2494

DeCAPIO, Donald; CC 209 2033

DUMON, Jozef; K 142 2062

DUMONT, Brian; K 74 1620

EARP, John; CC 211 3474

EBERSOLE, Linnea; K 130 2062

EBERSOLE, Mark; K 141 2062

ELLIS, Karin; CC 209 2033

FALK, David; CC 211 3474

FARMER, Laurie; CC 224 2494

FRYKLUND, James; CC 224D 2494

FUHRER, David; K 141 2062

GAIBLER, Kathleen; CC 217 2494

4.

Ext.

GROSSNESS, Gail; CC 225	2494
HANNON, Dale; CC 209	2033
HEIDEN, Tim; CC 216	2494
HOLMES, Connie; CC 203	2494
HOSELTON, Gary; CC 211	2494
HUNTER, Larry; CC 217	2494
JANSSEN, Larry; CC 225	2494
KARAMBELAS, Rita; CC 202	2494
KING, Larry; K 74	1620
KUNTZ, Irish; CC 217	2494
KUNTZ, Robert; CC 216	2494 *2946*
LAIRD, Gregory; K 142	2494
LECOUVRE, Ronald; CC 211	2494
LEE, Linda; CC 202	2494
LEWIS, George; CC 227	2494
LEY, Yvonne; CC 217	2494
LIGGETT, Arthur; CC 211	2494
MAHAN, Thomas; K 136B	2062
McCUNE, Brian; CC 203	2494
MEEKER, James; CC 227	2494
MONROE, Jane; CC 203	2494
MURRAY, Janet; K 74	1620
MURRAY, RJay; CC 203	2494
MYERS, Bill; CC 211	3474
NIESS, David; CC 203	2494
OCHS, Lyle; K 141	2062
PIELSTICK, Dean; K 141	2062
PINNEO, Robert; K 142	1726
PORTER, Catherine; K 140	2062
RICHEY, Lester; CC 226	2494
ROSE, George; CC 224C	2494
SANDERS, John; CC 209	2033
SCHEURMAN, H. Lynn; K 69	2526
SCHOENBORN, Roland; K 142	2062

DIRECTORY (Continued)

These high schools are testing the Computer Materials Project packages:

High School	CPU (hrs)	WCT (hrs)	Printer	Numbered Log-ons	Saved File Blocks
Madison (Business)		NO TIME USED			
Corvallis (Business)	.0283	5.42	0	30	0
Neah Kah Nie (Business)	.0081	2.19	0	30	27
Jackson (Science)	.0732	11.49	148	122	57
Neah Kah Nie (Science)	.012	1.79	0	29	38
Corvallis (Science)	.062	6.45	0	36	16
Lake Oswego (Math)	.182	31.96	0	347	21
Neah Kah Nie (Math)	.118	14.6	0	85	39
Corvallis (Math)	.015	9.44	0	35	19
Ashland (Math)	.058	19.06	0	77	5
Adams (Experimental)	.031	7.35	0	94	21
Lake Oswego (Experimental)	.025	1.92	0	32	7
Neah Kah Nie (Experimental)	.095	11.19	0	88	89

P R O G R A M M I N G   T I P S

When copying or creating saved files using the EDITOR, it is recommended that the FILE and COUT commands be used. These commands take less saved file space than the OUT command and are more economical for the user.

VIDEO TAPE COURSES

The Winter schedule for the Computer Center videotape courses is as follows:

Introduction to FORTRAN, January 19-23, Kidder 292, Channel 5.

Introduction to OS-3, January 26-29, February 2-5, Kidder 292, Channel 5.

WINTER TERM REGISTRATION

Winter term registration proved to be a much more relaxed experience for Computer Center personnel than Fall term. Class schedules and bills were generated for nearly 14,000 students well within the schedules established for preparation of these reports. All features of the scheduling system worked as specified. In fact, students with complex schedules were provided 25,000 attempts to satisfy their schedule instead of the prescribed 5,000.

As a result of Winter term operations the University now is aware of the true demand for courses. As a matter of fact, the section enrollment summaries were available a full day prior to the start of classes.

Despite the continued heavy load of drops and adds, the integrity of the Winter term data base has been maintained. Future reports, including class lists and grade summaries, should reflect considerable improvement over Fall term.

INTERPRETING COSTS

The Computer Center has a new IBM Interpreter (557) that will interpret at the rate of 100 cards/minute. It is equipped with 11 special characters from the Fortran character set. The other IBM Interpreter (543) printed at the rate of 60 cards/minute and only had 3 special characters. Interpreting cost will be $5.00/hour effective February 1, 1970.

PROGRAM LIBRARY

The Computer Center requests that documentation of general pro-
grams and subroutines which would be useful to other departments or
individuals be submitted to the Center so that they may be made avail-
able as part of the Computer Center Program Library. Documentation of
programs may include such items as (1) references (publications that
might be of assistance to the user), (2) description (including purpose,
program limitations, definition of parameters, input formats, etc.),
(3) flowchart, (4) sample problem, (5) listing, (6) source language
deck, and (7) binary object deck. For further information or con-
tributions, call Brian McCune at 2494.

All Program Library materials can be obtained by any user of the
OSU Computer Center by filling out a Library Program Request Form,
available from the Computer Center Office, Room 217. Programs cur-
rently available are listed in the OSU Computer Center Program Library
Catalog, publication cc-69-4.

SIMCMP IS NOW AVAILABLE

An article in the September, 1969 issue of the Communications of
the ACM describes a "simple compiler", called SIMCMP. SIMCMP is
actually a "macro expander", which first reads a set of macro defini-
tions and then reads a "source" program or text which is to be expanded.
The macro definitions describe the formats of the source lines, and
also show what the translated forms should be. SIMCMP can be used to
translate a simple programming language into another language (such as
COMPASS or FORTRAN). It can also be used as a text editor, since lines
that do not match any of the macro definitions are copied unchanged.

SIMCMP is now available to OS-3 users under the name *SIMCMP.
Anyone who is interested in using SIMCMP should refer to the article
mentioned above. (A Base for a Mobile Programming System. Richard J.
Orgass and William M. Waite. Comm. ACM, September 1969.) *SIMCMP
works essentially as described in the article, with the following
exceptions:

1. A file mark (end of file) can be used to terminate the macro definitions and/or source text, in place of the notations described in the article.

2. Macro definitions and source text can be read from two different units, if desired.

3. Untranslated lines (which may be errors) can be listed, if desired, on a separate output unit.

*SIMCMP is called by a control statement of the form:
*SIMCMP,M=(lun or name),I=(lun or name),O=(lun or name),D=(lun or name).
The "M" unit is the one from which macro definitions are read. If no M unit is specified, macro definitions will be read from the input (I) unit.

The "I" unit is the one from which the source text is read. (Macro definitions, also, if there is no M unit.) If the I unit is omitted, unit 60 is used.

The "O" unit is the output unit for the translated text. If the O unit is omitted, unit 61 is used.

The "D" unit is for output of "diagnostics" (untranslated lines). Lines that do not match any macro definitions will be copies to the D unit, with a sequence number at the left. If the "D" is specified, but no unit is given, diagnostics will be written on unit 61. If "D" is omitted, no diagnostics are written. (Note: untranslated lines are always copies unchanged to the output unit (O), whether the D option is used or not.)

For further information, see Gil Bachelor, Kidder Hall 144.

LIST PROCESSOR (BLIP) IS NOW AVAILABLE

A Basic List Processor (BLIP) has been implemented and is now available to users of OS-3. The BLIP language is a very simple, relatively "low level" language. Using BLIP, one can construct and manipulate lists and list structures of any desired complexity. The

basic data items are integers or characters. Recursive subroutines are easily written in BLIP. Subprograms can be compiled separately, to be linked at time of loading.

At present, there is no BLIP compiler. The BLIP language is defined by a set of macro definitions, which is used by the macro expander *SIMCMP to convert a BLIP program into a COMPASS assembler is used to translate the COMPASS program into machine form (relocatable binary).

A preliminary reference manual for BLIP is now in preparation and should be available in the near future.

For further information, see Gil Bachelor, Kidder Hall 144.

REGIONAL COMPUTER CENTER PROJECT WINTER CONFERENCE

The Winter Conference of the Oregon Regional Computing Center Project was held at Portland State University January 15 and 16. The NSF funded project to develop and appraise instructional uses of computing facilities provided through computer terminals on-line to a time sharing central computer is well into its second year.

The facilities have proved to be effective and economical as a means of meeting the instructional computing needs of the smaller Oregon colleges and community colleges. From this, there is evolving a Regional Educational Computing Activity which serves as a statewide vehicle for the presentation, discussion, and dissemination of curricular materials dealing with the use of a computer to enhance the instruction process at the undergraduate level.

The conference in Portland was attended by Business faculty from Portland State University, Oregon State University, Eastern Oregon College, Southern Oregon College, Oregon Technical Institute, Lane Community College and Pacific University. Speakers included Dr. Clifford Gray, Oregon State University, "Business Games and Instruction"; Dr. Linn Soule, Oregon State University, "Operations Simulation"; Dr. Shannon Pratt, Portland State University, "The Investment Analysis

Center"; Dr. LeRoy A. Hewitt, Dr. O'Rourke, "Accounting Routines"; and Mr. Grover Rodich, Portland State University, "Management Information Systems".

A report containing sample computer materials which were disseminated at this meeting will be published by the Computer Center in the near future.

ATTENTION: INSTRUCTORS

If you wish to order manuals for use in your classes, please contact the OSU Bookstore and request the number of manuals you need. It takes at least three weeks to print these, so be sure to get your orders in early.

CHARGES FOR MANUALS

Until now the Computer Center has not charged for manuals. Due to the large number of manuals that are required, publication costs have become a major expense for the Center. Consequently, the following charges have been initiated to help cover publication costs:

cc-68-27	Free Form Input for OS-3 Fortran: Massie, Dayton	.40
cc-68-33	*SORTER - A Simulated Card Sorter for OS-3: CC Staff	.50
cc-68-35	Plotter Subroutines for OS-3: A Description: Dayton	.40
cc-68-37	SORT/MERGE for OS-3: Sullivan	.50
cc-68-39	Fortran: Entering, Editing, and Running from Remote Units Under OS-3: Schwendiman	1.00
cc-68-42	OS-3: A Users Manual with Examples: Baughman, Berryman, Pielstick	1.50
cc-68-44	DECKEDIT Routine for CDC 3300/OS-3, Version 2.0: Bachelor	.50
cc-69-1	DEFINE and DIRECT (for CDC 3300/OS-3): Bachelor	.50
cc-69-2	*KWOC - Automatic Indexing by Keyword: Rose, Spigai	.50
cc-69-3	DECKLIST Routine for CDC 3300/OS-3, Version 2.2: Bachelor	.50
cc-69-4	OSU Computer Center Program Library Catalog	2.00
cc-69-5	MIMIC A Digital-Analog Simulator	1.00
cc-69-7	RADAR (Revised): Meeker	.75

cc-69-8	Using the Plotter: Documentation and Examples (Revised): Pielstick, Baughman	1.50
cc-69-9	An Introduction to the ATHENA Computer: Dumont	1.00
cc-69-10	Computer Center User's Manual (R): Davis, Porter	1.00
cc-69-11	Algol: A User's Manual with Examples: Baughman, Berryman (not yet available)	1.50
cc-69-13	Operations Manual for NEBULA Fortran System: Murray	1.50
cc-69-16	Home Economics Inst. Management Demonstration Package: Yapp, Baughman	.50
cc-69-17	ECAP - Electronic Circuit Analysis Program as Applied to the CDC 3300: Amort	1.00
cc-69-18	*EZPLOT: Fuhrer, Baughman	.50
cc-69-19	The CORE Package: Self-Learning Package for Computer Programming using a Time-Sharing Terminal: Pinneo	1.50
cc-69-20	A Resource Set: Computer Programs in Science for Secondary Schools: Bell	1.50/set
cc-69-21	A Resource Set: Computer Programs in Mathematics for Secondary Schools: Geldaker	1.50/set
cc-69-22	A Resource Set: Computer Programs in Business for Secondary Schools: Collins	1.50/set
cc-69-24	OSCAR: A User's Manual with Examples (Second Revision): Baughman, Berryman, Davis	1.50
cc-69-25	A Brief Description of OSCAR (Third Revision): Davis, Bachelor	1.00
cc-69-27	Commercial Fisheries Abstract Author Index: Spigai	15.00
cc-69-29	A Resource Set: Computer Programs in Mathematics for Secondary Schools, Student Exercises: Geldaker	1.50/set
cc-69-30	A Resource Set: Computer Programs in Business for Secondary Schools, Student Exercises: Collins	1.50/set

COMPLIMENTARY COPIES OF MANUALS

Two complimentary copies of any new manuals or reports published after January 1, 1970 are to be made available on a departmental basis without charge. If you wish your department to receive two free copies of new manuals published after January 1, 1970, please complete the form at the end of this newsletter. Free copies will be distributed only to the departments who complete this form. Please do not contact us by phone; send this form to us instead. The copies will be mailed to departments only, and not to specific individuals within a department. Private users must purchase all manuals, and are not eligible for complimentary copies.

NEW PDP-10 DUE IN JUNE AT U OF O*

The University of Oregon has completed a computer evaluation process of a months' duration, and has decided to request purchase of a PDP-10 from Digital Equipment Corporation for the Computing Center. Delivery is projected for mid-June of 1970. The purchase is made possible by the recently announced award of the Science Development renewal grant to the University.

Acquisition of the PDP-10 will enable development of interactive computing at the University; U of O users will be able to communicate directly with the PDP-10 from teletype terminals in the Computing Center or in their own offices and laboratories. Also, laboratory computers may request detailed analyses by the PDP-10 that are beyond the capacity of the small computers, and get results back in a short time. The PDP-10 will also have the capability of operating in a batch mode like the IBM 360/50, which will continue to be the primary batch-processing computer.

NEW JOB RESPONSIBILITIES

Jan Carlson, Assistant in the Computer Center has been appointed the Editor of all Computer Center publications and manuals. She will edit and review all new Computer Center publications.

Dean Pielstick, formerly a student programmer, has been hired as an Assistant in the Computer Center. He will be working in the business area on the Regional Computer Center Project and the Computer Materials Project.

---

*From the De Bug newsletter, University of Oregon, January 23, 1970

P R O G R A M M I N G   T I P S

SAVE

The SAVE routine on the Fortran library has been altered so
that non-standard identifiers may not be used as file names. Also,
there is now an optional third parameter, which may be used to
allow the calling program to decode the error conditions. For
example:

```
     call save (2,8HNULL        ,IERR)
```
will set IERR=6   <illegal name>,   where
```
     call save (2,8HNULL        )
```
will terminate the calling program with a message.

OS-3 VERSION 3.1

OS-3 version 3.1 is due to be released in the near future. Since
it allows tape drives to be used from remote jobs, it is necessary
to add one more control card to jobs that use tape drives. If a job
uses three tape drives, a control card of the form
```
                         *TAPES,3
```
should be inserted immediately after the job card. This card should
have a 7/8 punch in column 1 and should be added to decks under the
present version of OS-3.

TWO COMPLIMENTARY COPIES OF MANUALS

Please add my department to the mailing list to receive complimentary copies of new manuals published after January 1, 1970.

DEPARTMENT _____

COLLEGE OR UNIVERSITY _____

CITY _____

ZIP _____

REQUESTED BY _____
                              Signed

Computer Center
217 Computer Center Bldg.
Oregon State University
Corvallis, Oregon   97331

OREGON STATE UNIVERSITY
COMPUTER CENTER NEWSLETTER

NEW VERSION OF OPERATING SYSTEM (OS-3, VERSION 3.1) AVAILABLE SOON

Version 3.1 of OS-3 will be released in the near future. Many
significant changes will not be apparent to users as they are internal
changes to the operating system. For example, Version 3.1 will dynam-
ically allocates mass storage buffers in accordance with core require-
ments.

Under Version 3.1 the user will be able to equip magnetic tapes
from his remote terminal using the remote job entry feature. Charging
structure for magnetic tapes will be based on tape drive time instead
of number of words transfered and thereby will be cheaper than current
rates.

Detailed announcements will be given at the time of release of
the new version.

BASIC COMPILER TO BE ADDED TO OS-3

An advanced BASIC compiler is being developed under OS-3. The
compiler is being tested currently by Computer Center personnel and
is expected to be released within the next 30 days. This version of
BASIC is compatible with the standard industry BASIC compilers. The
ability to handle matrix arithmetic is included in the BASIC version.

Anyone who wants a particular syntax added to the system should
contact Dave Skinner, extension 2494.

NEW CONTROL MODE MANUAL

The new Control Mode Manual will be released soon and will appear
under the title of "The OS-3 Reference Manual" ccm-70-8.

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NEW EDITOR MANUAL

The OS-3 Editor Manual, ccm-70-7 is in print and will be released in April.

CDC 3500 APPROVED BY STATE EMERGENCY BOARD

On February 19 the Emergency Board approved a CDC 3500 which will upgrade the Computer Center facility. The 3500 will be installed in the fall of 1970. Newer versions of the disk files (841) will be delivered shortly after the installation of the new system. When the new disk files are installed there will approximately twice the present amount of on-line file storage.

The new disks will be two to four times as fast as the present 814 files.

KEYPUNCH PAMPHLET AVAILABLE

"Instructions for Operating the Keypunch Machine" is now available in the Computer Center Office. The price is 10¢ per copy. This pamphlet should be of use to beginning students who have no knowledge of keypunch operation.

NEW COMPUTER CENTER HOURS

The new hours for using OS-3 are:
     7:30 a.m. - 11:00 p.m. Monday through Friday
     7:30 a.m. - 5:00 p.m. Saturdays
These hours became effective February 16, 1970.

OPEN HOUSE SCHEDULED FOR NEW COMPUTER CENTER

An open house will be held in the new Computer Center building in April. It is open to the public, and visitors are welcome. There will be special displays, demonstrations and tours throughout the day. A special announcement will be made shortly as to the exact date of the open house.

COMPUTER MATERIALS PROJECT

January 1970

SCHOOL	CPU	WCT	PRINT	PLOT	LOGON	SFBLKS
Madison (Business)	.0333	13.6	0	0	136	20
Corvallis (Business)	.0121	2.73	0	0	9	0
Neah Kah Nie (Business)	.0263	1.77	0	0	27	14
Jackson (Science)	.0118	2.85	0	0	48	55
Neah Kah Nie (Science)	.0280	4.86	0	0	30	18
Corvallis (Science)	.0358	2.99	0	0	38	29
Lake Oswego (Mathematics)	.4030	52.47	261	0	559	70
Neah Kah Nie (Mathematics)	.0561	8.34	0	0	53	32
Corvallis (Mathematics)	.1602	25.10	0	0	139	69
Ashland (Mathematics)	.0433	9.03	0	0	70	8
Adams (Experimental)	.1186	31.95	0	2	199	37
Lake Oswego (Experimental)	.3897	50.13	318	0	419	37
Neah Kah Nie (Experimental)	.0346	6.83	0	0	55	76

VIDEOTAPES TO BE REVISED

The Computer Center videotapes on Fortran and OS-3 are to be retaped. Any suggestions from users and students will be appreciated. To submit suggestions, contact Jan Carlson, extension 2494.

NEW COMPUTER CENTER PUBLICATIONS

ccm-70-1   General Manual on the Nebula Computer by Murray (available soon)

ccm-70-2   SORT/MERGE for OS-3 by Sullivan and Skinner (available soon)

ccr-70-3   OS-3 ARAND Software System for Analysis of Random Data by Baughman

ccr-70-4   OS-3 ARAND System: Documentation and Examples Vol. I by Ochs, Ballance, and Baughman (to be published)

ccm-70-5   Glossary of Important Terms for the Nebula Computer by Dumont and Domke

ccm-70-6   COSY for OS-3 by Skinner (to be published)

ccm-70-7   OS-3 Editor Manual by Dayton (available in April)

ccm-70-8   OS-3 Reference Manual by Skinner (available soon)

ccm-70-9   RADAR by Meeker

ccm-70-10 Basic List Processor (BLIP-I) Preliminary Reference Manual by Bachelor (available soon)

ccm-70-11 *LINPRO (A Conversational Simplex Linear Programming Model) by Pielstick

PROGRAMMING TIPS

EOD

EOD (End of Data) function will be removed from the FORTRAN library. It will be replaced by EOT (End of Tape). Using this function (EOT) for anything other than a tape will result in the job aborting.

BOGGING

Due to extremely heavy loads, many people have been complaining about response time. Users are reminded that this problem can be made less severe by keeping I/O operations to a minimum and by referencing arrays so that the right most subscript varies most rapidly.

For example:

```
        DO 100 I = 1,100
        DO 100 J = 1,100
100     ZIP (J,I) = 0

        DO 100 J = 1,100
        DO 100 I = 1,100
100     ZIP (J,I) = 0
```

Of the two examples, the first one is preferable because of its storage allocation. It is less likely to be swapped out and therefore will execute faster.

It has been mentioned that EDITOR and COSY files save file space; their use also makes jobs run faster since there are fewer I/O operations being processed.

Jobs can also be submitted by remote job entry, therefore shortening on-line time of the user. The new control manual, "OS-3 Reference Manual" ccm-70-8 contains statements concerning the implementation of remote job entry.

A user may use either EDITOR or COSY as input to a Fortran compiler or as input to a running program because the associated I/O routines automatically unblock the records so they look like 80-column Hollerith images.

Under extreme bogging conditions, the system only stores up to 200 characters ahead of where the program is processing. If a user is reading a paper tape longer than 200 characters, he may lose characters if the machine puts him in control mode. While the machine is heavily loaded, the user should probably restrict using the tape read-in-feature in order to insure not losing these characters. The user can also manually pause by stopping the tape after 15 seconds of reading in data. This will give the computer time to return to the user. Then the tape reader can be turned on again for another 15 seconds and then stopped again.

TO COPY FILES ON MAGNETIC TAPE

It has been called to our attention that many users do not know the cost advantages of storing large infrequently referenced disk files on magnetic tape. A magnetic tape can be rented for $1.00/month as opposed to 15¢/file block/month for disk storage.

Files can be copied to magnetic tape using the following Control Cards:

$\frac{7}{8}$Job Number, User Number, Identification

$\frac{7}{8}$Equip,lun=MT,(tape number)

$\frac{7}{8}$Copy,I=(file name),0=lun

$\frac{7}{8}$Copy,I=(file name),0=lun

A COPY CARD should be supplied for each file being copied onto magnetic tape.

$\frac{7}{8}$Copy,I=(file name),0=lun

$\frac{7}{8}$Logoff

It should be noted that the COPY command will copy everything within the file and this includes file marks if you have one or more in the file.

NEW FORTRAN MANUAL BY CDC

In the new Fortran manual published by CDC, chapters 9 and 10 are not completely compatible with OS-3. A supplement for OS-3 is being written to furnish this information and will be available this spring.

KEELING KENNETH
OCEANOGRAPHY

VIDEOTAPES TO BE SHOWN

The OSU computer videotape series will be shown again Spring term.

        Introduction to FORTRAN, April 13-17
        Introduction to OS-3, April 20-23, April 27-30

The series will be shown from 4-5 p.m. in Kidder 20; channel 5 on the cable.

The series is open to any interested faculty member or student.

OPEN HOUSE

The open house for the new Computer Center building will be held Tuesday, April 28, from 2:00 p.m. until 9:00 p.m. Demonstrations and tours will be conducted during the entire time period. Visitors are welcome and cordially invited to attend the open house.

MORE CORE MEMORY TO BE ADDED

In April the Computer Center will install an additional 16K of core storage in the CDC 3300 system. This will raise the total amount of core memory to 98K. The addition is being made as an interim measure to provide better response time under heavy loading until the CDC 3500 is installed in the Fall of 1970. This additional memory and Version 3.1 of the operating system (when it is released) will materially aid in main-

taining good response time during periods of peak demand.

WINTER GRADES

The computer grading system functioned smoothly in generating Winter term grades. No difficulties were encountered and grades went out on schedule.

OPERATING STATISTICS

For the dates March 1 to March 27, OS-3 usage was as follows:

No. of batch jobs run:	10,866
No. of console runs (LOGON-LOGOFF):	26,383
No. of console hours used:	7,883
CPU time used - console and batch:	160.5 hours
Total number of hours OS-3 was on the air:	
(15 hrs. Mon. - Fri.; 9 hrs. Sat.)	327 hours
Average number of console users:	24.1
Amount of CPU time used by an average user for 1 hour of console time:	46.3 seconds

FREE MANUALS

A point of clarification is in order regarding the notice in last month's newsletter covering distribution of Computer Center manuals to schools and departments. System manuals such as the OS-3 Reference Manual, OS-3 User's Manual, OSCAR User's Manual, OS-3 Editor Manual, will be sent out free of charge. Reports and most other manuals will not be furnished on a complimentary basis.

OFFICE OF COMPUTING ACTIVITIES VISIT

On March 31, 1970, two representatives from the Office of Computing Activities of the National Science Foundation visited Oregon State Uni-

versity. John Lehmann and Kent Curtis met with Oregon State University faculty members to discuss the instructional uses of the computer at OSU.

REGIONAL COMPUTER CENTER CONFERENCE TO BE HELD

The Regional Computer Center Conference will be held April 9-10 at Oregon State University. Project directors from each participating school will attend.

PSYCHOLOGY DEPARTMENT INSTALLS PDP-12 IN MARCH

The Psychology Department has installed a PDP-12A for use in research and laboratory control. The Department of Psychology is planning to use the PDP-12 in neuro-physiological research programs as well as research in biochemical bases for retardation and other biochemical measurements.

COMPUTER MATERIALS PROJECT   (HIGH SCHOOL USAGE)

February 1-15, 1970

SCHOOL	CPU**	WCT**	PRINTER	PLOTTER	LOGONS	SFBLKS
*Madison (Business)	.0073	3.01	0	0	5	0
Corvallis (Business)	.2490	51.85	7,493	45	183	19
Neah Kah Nie (Business)	.1044	13.24	0	0	62	16
*Jackson (Science)	.3097	32.90	0	127	294	105
Neah Kah Nie (Science)	.0287	3.12	0	0	12	4
Corvallis (Science)	.1381	16.49	727	0	99	42
*Lake Oswego (Math)	.1916	22.52	1	0	261	109
Neah Kah Nie (Math)	.0172	2.62	0	0	16	8
Corvallis (Math)	.3014	45.00	2,022	2	318	91
Ashland (Math)	.0152	3.48	0	0	17	2
*Adams (Experimental)	.0442	6.81	0	0	40	25
*Lake Oswego (Exp.)	.0515	10.15	0	0	91	35
TOTALS	1.4583	211.19	10,243	174	1,398	456

*In Portland area

**CPU time is in minutes

WCT is wall clock time in hours

COMPUTER MATERIALS PROJECT (HIGH SCHOOL USAGE)
February 16-28, 1970

SCHOOL	CPU	WCT	PRINTER	PLOTTER	LOGONS	SFBLKS
Madison (Business)	.0017	.6656	0	0	3	2
Corvallis (Business)	.0097	1.74	0	0	4	0
Neah Kah Nie (Business)	.0941	11.04	0	0	81	39
Adams (Business)	NO TIME USED					
Jackson (Science)	.0937	14.68	0	0	92	52
Neah Kah Nie (Science)	.0564	7.84	0	0	38	10
Corvallis (Science)	.0532	16.18	498	0	88	16
Lake Oswego (Math)	.0818	13.10	0	0	144	50
Neah Kah Nie (Math)	.0095	1.53	0	0	10	8
Corvallis (Math)	.0363	4.27	0	0	29	19
Ashland (Math)	.0435	8.17	0	0	36	11
Adams (Math)	.1147	18.98	0	0	81	0
Lake Oswego (Experimental)	.1370	19.35	0	0	178	65
Adams (Experimental)	NO TIME USED					
TOTALS	.7316	183.44	498	0	784	272

COMPUTER PROGRAM VIRTUOUSLY ELIMINATES MACHINE ERRORS*

Spokesmen for a local electronics firm have announced a computer program that -- through fresh application of an old technique -- virtually eliminates lost time due to malfunction of computer components. Called OREMA (oh-RAY-ma, from the Latin "oremus", meaning 'let us pray'), the program offers prayers at selected intervals for the continued integrity of memory units, tape transports, and other elements subject to depravity.

Basically liturgical in structure, OREMA uses standard petitions and intercessions stored on magnetic tapes in Latin, Hebrew, and FORTRAN. It holds regular Maintenance Services thrice daily on an automatic cycle; and operation intervention is required only for mounting tapes and making responses, such as 'And with thy spirit', on the console typewriter.

Prayers in Hebrew and FORTRAN are offered directly to the CPU but Latin prayers may go to peripheral equipment for transfer to the CPU by internal subroutines.

Although manufacturer-supplied prayer reels cover all machine troubles known today, the program will add punched card prayers to any tape, as needed, after the final existing Amen block. Classified prayer reels are available for government installations.

In trials on selected machines, OREMA reduced by 98.2% the average downtime due to component failure. The manufacturer's spokesmen emphasized, however, that OREMA presently defends only against malfunctions of hardware. Requestor errors and other human blunders will continue unchecked until completion of a later version, to be called SIN-OREMA.

*Dr. William (Bill) S. Minkler
Nuclear Engineer and columnist
NUCLEAR NEWS

OS-3 VERSION 3.1 IS SCHEDULED TO BE RELEASED IN MAY

The OS-3 Version 3.1 of the operating system is scheduled
to be released this month.

The major features of this system include:

Vastly improved PDP-8 handling, including Radiation Center and
capability for many high-speed terminals.

Provisions for paper tape and punch.

Magnetic tape capabilities from Remote Batch Job Entry.

Dynamic allocation of mass storage buffers in accordance with
core requirements. This also includes several mechanisms
to alleviate mass storage bottlenecks.

Centralization of the definition of equipment configuration.
This allows for easy modification of channel and equip-
ment assignments.

Elimination of several inadequacies concerning multiple users
of the same account/user pair.

Different magnetic tape accounting (tape drive time instead of
words transferred).

OPERATING STATISTICS

For the dates April 1 to April 28, OS-3 usage was as follows:

Number of batch jobs run:	10,092
Number of console runs (LOGON-LOGOFF):	23,954
Number of console hours used:	6,438
CPU time used - console and batch:	140.25 hours
Total number of hours OS-3 was on the air:	
(15 1/2 hrs. Mon. - Fri.; 9 1/2 hrs. Sat.)	348 hours
Average number of console users:	18.5
Amount of CPU time used by an average user for one hour of console time:	48.0 seconds

DOWNTIME COMPARISON

In the April newsletter from Dartmouth College, statistics on the reliability of the Dartmouth time sharing system were published. Dartmouth has developed an extensive time-sharing system and is well-known for the development of BASIC. We thought the newsletter readers would be interested in a comparison of the Dartmouth and OSU system from a reliability viewpoint. We did not go back into the records to determine statistics from a year ago, rather, the months of March and April are listed. It should be noted that the amount of downtime for March was well above average due to a file problem that reoccurred several times.

Dartmouth

	March 1969	March 1970
Number of Times Down - Mo	113	98
Average Times Down per Day	4.0	3.3
Average Hours Down per Day	.59	.51
Total Hours Down per Month	67.7	50

Oregon State University

	March 1970	April 1970
Number of Times Down - Mo	12	7
Average Times Down per Day	.46	.27
Average Hours Down per Day	.4	.06
Total Hours Down per Month	10.5	1.7

COMPUTER CENTER OPEN HOUSE

The Computer Center Open House on April 28 was an unqualified success. Approximately 500 visitors became acquainted with the Center's facilities and services. It was especially gratifying that nearly 60 persons came to see us from out of town.

Following is a tabulation of the 486 visitors who registered during the course of the Open House.

	Married		Single	
	M	F	M	F
Students	36	6	75	24
Faculty or Staff	38	26	10	26
Corvallis	36	42	55	53
Out-of-Town	28	8	18	5
Totals	138	82	158	108

CORE INSTALLED

The additional 16K of core storage arrived and was installed. Users now have 98K to dabble in.

NEW CRT's ORDERED

Ten new Cathode Ray Tube (CDC 211-21) display stations have been ordered. These will place the older models (CDC 211's). The new CRT's are less expensive and are able to be connected at sites up to 3,000 feet from the computer. The locations of the new CRT's will be:

4.

Terminal	Location
1	Library
1	Business Office
1	Admissions Office
1	Statistics Department
1	Kidder Hall
1	Computer Center Office
1	Computer Room
1	Classroom, Batchellor 105
2	Computer Center Building

REGIONAL CONFERENCE HELD APRIL 9-10

The Regional Computer Conference was held April 9-10 in Corvallis. The agenda included:

Discussion of regional facilities
Status of the multiplexing network
TTY operation and impact on each campus
Report on evaluation
Preventive maintenance techniques on TTY's
Discussion of the regional extension proposal
Reports on the Dale Chall Readability program
Report on the ARAND system

The name, Regional Computer Center Project, has been changed to the Regional Educational Computing Activities Project.

ON THE LIGHT SIDE

An anonymous staff member, tired of writing proposals and other tedious efforts at high level report writing, has developed the following program:

```
    #*TECHRIT                                    C=Computer
  ┌ TYPE ANY 4 NUMBERS 0 TO 9 (CR) (LF)          U=User Response
C ┤              TYPE "STOP" TO QUIT
  └ OK
U ·  7531
```

C

> BASED ON INTEGRAL SUBSYSTEM CONSIDERATIONS, THE FULLY
> INTEGRATED TEST PROGRAM ADDS EXPLICIT PERFORMANCE LIMITS
> TO THE SOPHISTICATE HARDWARE
> OK

U 1357

C

> IN PARTICULAR, THE CHARACTERIZATION OF SPECIFIC CRITERIA
> REQUIRES CONSIDERABLE SYSTEMS ANALYSIS AND TRADE OFF
> STUDIES TO ARRIVE AT THE EVOLUTION OF SPECIFICATIONS OVER
> A GIVEN TIME PERIOD
> OK

U STOP

By typing any four digit number, the user can generate short (?) phrases to include in any report to make it fatter and more academic.

This could come in handy for term papers, so instructors, watch out!

*DEFINE REVISED

A new version of *DEFINE has been released. The changes are listed below. A revised version of the "DEFINE and DIRECT" manual (cc-69-1) is now being prepared.

1. DEFINE now recognizes lower-case letters and treats them the same as the corresponding upper-case letters. For example:

        *DEFINE,3=prog   means the same as
        *DEFINE,3=PROG

2. When one is attempting to save a file with DEFINE (using the form lun=name$), it is easy to destroy the file by forgetting to type the "$". To reduce the chance of this happening, the meaning of the form (lun=name) has been altered. DEFINE will now first try to save the (lun) under the specified (name). If it succeeds, it rewinds the file. If it does not succeed, it

will process the argument as in the previous version of DEFINE.
(Unequip the lun, if necessary, and equip it to the name,
creating an empty saved file, if necessary.)

NOTE: One should not rely on this feature to save files
since there are several reasons that may prevent DEFINE from
saving the file. One should still use the form (lun=name$)
to save a file. The "$" causes DEFINE to attempt to save the
file. If it can't, it won't do anything but print a message
giving the reason.

3. Another way to lose a file with previous versions of
DEFINE was to attempt to change the name of a file (using the
form name1/name2) when SFBLKS is greater than or equal to
SFBLKLIM. (Yes, this can happen!) In such a case, DEFINE
would equip the file, delete the old name, and then be unable
to save the file under the new name (or any name) because of
the saved file block limit. The new version of DEFINE checks
SFBLKS and SFBLKLIM before trying to delete the old name.
If SFBLKS $\geq$ SFBLKLIM, DEFINE leaves the name unchanged and
prints a message of the form
      NOT ENOUGH FILE SPACE FOR (name1)

4. If file names are referenced in a *DEFINE statement,
and the user has a directory file but it cannot be updated,
DEFINE prints the message
      CANNOT UPDATE DIRECTRY
A message of this form is also printed if the user specifies
a non-existent file as a directory (D=name).

Reasons for not updating a directory are:
a. The directory is busy.
b. The directory is protected.
c. The directory is abnormal or unavailable.
d. SFBLKS+1 $\geq$ SFBLKLIM

5. DEFINE's "system error" message now has the form
          *SYSTEM ERROR (octal number)
The octal number is the address of the location in DEFINE where
the error was detected. A system error means that a bug has
occurred in DEFINE or in OS-3; however, the system error message
can also occur if DEFINE is interrupted during its processing
and the status of the program or of logical units is altered
before allowing DEFINE to continue.

AN INTRODUCTION TO OS-3 ARAND

The software development comprising the OS-3 ARAND System is
in part a result of the Themis Project at Oregon State University.
This is a joint effort between the Computer Center and the Oceano-
graphy Department. It has as its research objectives: (1) a
long-range program to explore and develop design criteria, systems,
configurations and analytical techniques for using the "on-line"
computers and computer driven displays for data analysis in en-
vironmental research activities and (2) a specific investigation
of the transfer of momentum between the atmosphere and the surface
of the ocean.

Computer Center personnel are currently engaged in the devel-
opment of a general programming package, OS-3 ARAND (OS-3 Analysis
of Random Data), for the comprehensive analysis of time series
data. This type of data occurs routinely in such application areas
as vibration, acoustics, oceanography, seismology, structural dy-
namics, biomedical research, atmospheric science and many other
fields. The OS-3 ARAND System is based on a modular programming
approach using the FORTRAN subroutine capability and is made ef-
ficient by the capabilities of the OS-3 operating system. OS-3
uses the "executive" hardware of the CDC 3300 and sophisticated
software techniques to provide each user with a simulated computer
that has 65,536 words of storage and a reliable easy-to-use input/
output file-handling system.

ARAND allows the user to carry out a large variety of numerical calculations on large groups of random data in any order he wishes with a minimum of programming. The overall principle has been to achieve a system that is efficient to operate, flexible to use and easy to modify. A subsidiary principle has been to reduce to automated routine the correction of data and the data reduction processes in order to speed up data report preparation and its related calculations, thus freeing the scientist for more advanced forms of analysis.

The current ARAND Modules are listed below:

Data Manipulation	Time Series Analysis
Numerical Filtering	Profile Analysis
Amplitude Statistics	Oceanographic Analysis
Statistical Analysis	Numerical Modeling
Plot Analysis	

The basic philosophy was to develop a highly modular and easily modified or extended system designed for Real-Time and On-Line data analysis.

For more information on these programs see ccr-70-4 "OS-3 ARAND System: Documentation and Examples (Volume 1)" by Lyle Ochs, Jo Ann Baughman and Jeff Ballance.

NEW COMPUTER CENTER PUBLICATIONS

ccr-70-12   A First Report on an Exploratory Program of Regional Cooperative Computing Activities by Project Directors.

ccm-70-13   TEKPLOT   A Subroutine Package for the Tektronix T-4002 Graphics Display Terminal by G. Rose.

ccr-70-14   Course Outline for Introduction to Computers for Teachers Ed 507 Developed Under NSF Grant GJ116 Computer Materials Project by Kay Porter. (to be published)

ccr-70-15   A Final Report on the Oregon State University Computer Materials Project (NSF GJ116) by Kay Porter. (to be published)

COMPUTER MATERIALS PROJECT

(High School Usage)

March 1970

SCHOOL	CPU**	WCT**	PRINT	PLOT	LOGON	SFBLKS
*Adams	.0127	4.20	0	0	13	0
*Madison (Business)	.0335	20.73	0	0	67	18
Corvallis (Business)	NO TIME USED					
Neah Kah Nie (Business)	.1206	23.65	0	0	147	79
*Jackson (Science)	.1907	26.09	0	0	182	66
Neah Kah Nie (Science)	.0958	9.57	0	0	59	21
Corvallis (Science)	.1592	43.96	0	0	158	39
*Lake Oswego (Mathematics)	.2076	27.72	0	0	242	83
Neah Kah Nie (Mathematics)	.0085	1.41	0	0	5	7
Corvallis (Mathematics)	.0975	17.20	28	0	87	36
Ashland (Mathematics)	.0358	22.32	0	0	33	15
*Adams (Mathematics)	.1904	34.41	1	0	113	65
*Adams (Experimental)	.2370	41.53	0	0	143	41
*Lake Oswego (Experimental)	.3070	37.39	0	0	272	127
TOTALS	1.6963	310.18	29	0	1521	597

*In Portland area

**CPU time is in hours

  WCT is wall clock time in hours

P R O G R A M M I N G   T I P S

ATTENTION: PLOTTER USERS

The COMMON statement in subroutine COG3 will be changed
with the release of the new plot manual which will be released
in a month or two. The statement will be made compatible with
MLTIPLT,LOG1, and LOG2.

REX MANUAL

The REX Manual is now available at the Computer Center Office.
It provides a description of the Linear Programming System which
was developed for the MSOS and MASTER operating systems. A limited
version of REX is available on OS-3. Information concerning the
OS-3 version will appear in a later issue of the Newsletter.

SPRING REGIONAL COMPUTER CENTER CONFERENCE

The Spring Regional Computer Center Conference was held May
21-22 in Corvallis. Among the items discussed by the participating
regional schools were: new proposals, current financial reports,
control and validation of use of a time-sharing facility, NSF
evaluation forms, report on the Interinstitutional Computer Com-
mittee, problems faced by regional centers and final reports. The
regional schools will meet again in the fall.

OS-3 VERSION 3.1

The release of Version 3.1 of the OS-3 Operating System has
been delayed from its scheduled May release date. Sufficient time
for testing was not available due to the end-of-the-year computing
load to complete the check-out and isolate remaining deficiencies.

*SUMMARY NOW AVAILABLE

A new program called *SUMMARY is now available to OS-3 users.
*SUMMARY reads a file, counting the records (BCD or binary) and
file marks, and prints a "summary" of the file structure. A typ-
ical print-out from *SUMMARY is shown below.

```
89 BIN
 1 FM
10 BCD
 1 FM
EOD
```

The summary shown above indicates that the file contained 89 binary
records, then a file mark, followed by 10 BCD records and another
file mark. EOD means "end of data". If *SUMMARY encounters an
abnormal/unavailable condition while reading a file, it will print
A/U instead of EOD at the end of the summary.

*SUMMARY is called by a control statement of the form:

*SUMMARY,I=(lun or name),L=(lun or name).

If the input unit (I) is omitted, lun 60 is used. If the output
unit (L) is omitted, lun 61 is used. Units are rewound if unit
numbers in the range 50 to 59 are used, or if names are used.
The input unit should be a file. If it is a random-access file,
only the word RAF is printed. If it is an output device, the word
EOD is printed.

The output unit can be a teletype, line printer, file, CRT,
etc. If it is a CRT, the summary is displayed on the screen, up
to 20 lines at a time.

ADDITIONS TO THE OS-3 ARAND SYSTEM

A number of new routines have been completed and their documenta-
tion is currently being prepared for printing. As this documentation,
and that of routines currently under development, will not be scheduled
for printing until August, anyone wishing a copy of the new programs
and their writeups should contact Lyle Ochs or Jeff Ballance at the
Computer Center, phone 754-2494. A short abstract of each new ad-
dition is given on the next pages.

Conversational Routines

CPLT1 } These are two main programs which will replace the
CPLT2 } CONPLOT1, CONPLOT2 conversational programs when the
next printing of ARAND routines takes place. They
are designed to produce plots of such things as
frequency response functions and autospectra. Any
arithmetic progression of frequencies can be handled.

SPECT1 This main program is a conversational routine designed
to estimate, output, and plot the autocorrelation and
autospectral functions of a single time series. On
file *PROLIB1 are stored compiled versions of SPECT1
and the subroutines it calls.

SPECT2 A conversational routine to estimate, output and plot
the correlation functions, power, coherence and phase
spectra of two time series.

TTYCON This Compass language routine, while not a conversa-
tional one, is the routine used in the four programs
above to make them conversational. It prints a
message then accepts an alphanumeric string or
numeric information.

Plot Routines (for the Calcomp plotter)

AUTOPLT A subroutine for plotting autocorrelation (or covari-
ance) functions.

CROPLT The cross correlation function of two time series is
plotted by this subroutine.

PLTFRQ } These two programs are modifications of existing
PLTSPC } ARAND routines (PLOTFRQ and PLOTSPC). They allow
the plotting of, for example, frequency response
functions and autospectra versus any arithmetic pro-
gression of frequencies. The old routines always
assumed equally spaced frequencies from zero to
one-half cycle per data interval.

4.

All of the following plot routines have the option of plotting estimates versus any arithmetic progression of frequencies.

LOGPLT   Designed to plot the base ten logarithms of power spectrum estimates against frequency.

COHPLT   COHPLT accepts squared coherency spectrum values and plots coherency on a hyperbolic arctangent scale which allows a constant length confidence interval to be constructed.

PHAPLT   Accepting phase spectrum estimates (and the associated squared coherency terms), PHAPLT produces a plot of the phase spectrum, including approximate confidence intervals.

Time Series Analysis Routines

NOIZT   The routine tests a time series to determine if it can be considered a realization of a white noise process. The test is a frequency domain test involving the integrated spectrum of the series. The results are plotted with 80% and 95% confidence regions.

ACFFT }
CCFFT }   These are fast-correlation (or covariance) routines, i.e. they employ the convolution property of the discrete Fourier transform in conjunction with a fast-Fourier transform algorithm to compute mean-lagged products. ACFFT and CCFFT compute respectively, the autocorrelation (covariance) function of a single time series and the correlation (covariance) functions of two time series.

COPH   COPH is similar to the ARAND routine AMPHCO. COPH computes squared coherence and phase estimates given the power, co-, and quadrature spectrum estimates.

TFORM1   TFORM1 computes power spectral estimates at any
TFORM2   arithmetic progression of frequencies between zero
and one-half cycle per data interval, given the auto-
correlation functions of a time series (similar to
the TRANFR routine) TFORM2 accepts the cross cor-
relation (or covariance) functions of two time series
and produces co- and quadrature spectrum estimates,
again at any arithmetic progression of frequencies
on [0,1/2].

COMPUTER MATERIALS PROJECT
April 1970

SCHOOL	CPU*	WCT*	PRINT	PLOTTER	LOGONS	SFBLKS
Adams (Business)	.3352	55.35	0	0	179	58
Madison (Business)	.0170	4.52	0	0	75	6
Corvallis (Business)	.0388	9.89	0	0	44	29
Neah Kah Nie (Business)	.2539	36.86	87	0	174	105
Jackson (Science)	.2410	31.76	0	22	317	95
Neah Kah Nie (Science)	.0427	2.85	0	0	16	7
Corvallis (Science)	.0301	6.28	0	0	74	25
Lake Oswego (Mathematics)	.4785	46.30	0	0	444	118
Neah Kah Nie (Mathematics)	.0176	2.77	0	0	12	8
Corvallis (Mathematics)	.1104	11.34	0	0	91	48
Adams (Mathematics)	.4363	64.78	510	0	245	87
Ashland (Mathematics)	.0613	10.91	0	0	79	14
Adams (Experimental)	.3859	34.93	0	0	186	83
Lake Oswego (Experimental)	.2238	28.69	159	0	295	173

*Time in hours

COMPUTER MATERIALS PROJECT

May 1970

SCHOOL	CPU*	WCT*	PRINTER	PLOTTER	LOGONS	SFBLKS
Madison (Business)	NO TIME USED					
Adams (Business)	.1433	23.60	0	0	108	78
Corvallis (Business)	.1175	21.06	0	0	101	34
Neah Kah Nie (Business)	.0794	12.25	0	0	92	86
Jackson (Science)	.4483	56.59	8733	312	383	137
Neah Kah Nie (Science)	.1045	5.91	0	0	31	21
Corvallis (Science)	.0145	2.56	0	0	22	7
Adams (Mathematics)	.1153	20.13	0	0	89	70
Lake Oswego (Mathematics)	.1746	21.35	701	0	248	110
Neah Kah Nie (Mathematics)	.0299		0	0	5	8
Corvallis (Mathematics)	.1613	22.76	0	0	126	70
Ashland (Mathematics)	.0623	22.15	0	0	61	14
Adams (Experimental)	.2535	48.18	0	0	116	55
Lake Oswego (Experimental)	.1299	21.11	0	0	178	99

*Time in hours

8.

P R O G R A M M I N G   T I P S

ATTENTION: PLOTTER USERS

The COMMON statement in subroutine LOG3 will be changed with
the release of the new plot manual which will be released in a
month or two. The statement will be made compatible with
MLTIPLT,LOG1, and LOG2.

REMOTE BATCH JOBS

Batch jobs usually involve submitting a card deck. However, OS-3 also allows batch jobs to be initiated from Teletypes and other remote terminals. Card images are read from a TASK unit rather than from the card reader.

There are several steps to initiating a Remote Batch Job:

1.   Log in, as usual, with your job number and user code.
2.   EQUIP a LUN to a TASK. For example: #EQUIP, 15=TASK
3.   Put into the TASK unit a file of card images that will run the job. One may use the EDITOR to create them, or copy previously prepared card images from other files. In any case, the first card image should be a JOB control card.

IMPORTANT: OS-3 control card images should contain a right bracket (], shift M) in column one. Through subsequent code transformations this is equivalent to the usual $\frac{7}{8}$ punch on actual cards.
4.   UNEQUIP the TASK unit, or LOGOFF.

The system will then queue the job for execution at an unspecified later time.

Printed output (including all control cards) will be printed on the line printer unless otherwise designated. To change this, the job card should be in the following format:

```
]JOB,<JOB NUMBER>,<USER CODE>,61=<NAME>,<USER IDENTIFICATION>
```

This reassigns the standard output unit (lun 61) to the named file.

NEW VIDEO TAPES BEING PRODUCED

The video tape series, "Introduction to OS-3", and "Introduction to
FORTRAN", are being revised and produced this summer. The tapes include
the updated information now available under the OS-3 System. These new
tapes will replace the old ones which the Computer Center has shown for
the past two years. The new tape series will be shown at the beginning
of each new term as usual. The tapes will be first shown in October, 1970.
The schedule will be announced in the Newsletter.

STAFF DESK FOR PROGRAMMING HELP

Programming assistance will be available to faculty and staff users
in room 211 in the Computer Center beginning September 1. The hours will
be 1 p.m. to 5 p.m. Monday through Friday. Users wishing to call with
questions or for an appointment can call extension 2126 after September 1
between 1 p.m. and 5 p.m. This assistance will be available only to users,
not to students enrolled in programming classes.

DCE COURSE IN COMPUTERS FOR TEACHERS NOW AVAILABLE

The DCE course, "Introduction to Computers for Teachers", Ed. 507,
is now available from DCE on any campus in Oregon. The course was devel-
oped by the OSU Computer Center staff under an NSF grant, GJ116, the
Computer Materials Project. The course is purely an introductory one and
is oriented toward the average classroom teacher, rather than the mathe-
matician or science teacher. Any teacher or administrator interested in
having this course taught at his school next year should contact:

William Beck
DCE, 304 Covell Hall
Oregon State University
Corvallis, Oregon 97331
ph: 754-1266

REFUNDS FOR BULK RATES

Refunds for bulk rate will not be given during the month they are requested but will be given the following month.

OPERATING STATISTICS

For the dates June 1 to June 28, OS-3 usage was as follows:

Number of batch jobs run:	7,619
Number of console runs (LOGON-LOGOFF):	18,778
Number of console hours used:	5,403
CPU time used - console and batch:	140.55 hours
Total number of hours OS-3 was on the air: (15 1/2 hrs. Mon. - Fri.; 9 1/2 hrs. Sat.)	342 hours
Average number of console users:	15.8
Amount of CPU time used by an average user for one hour of console time:	60.8 seconds

OSU STAFF MEMBERS ATTEND MEETINGS

Jo Ann Baughman and Kay Porter attended the "Conference on Computers in Undergraduate Curricula" held in June at the University of Iowa in Iowa City.

Conference papers were presented in many areas including Humanities, Statistics, Engineering, Mathematics, Economics, National Sciences, Social Services, Physical Services, and in Computing Services. After the conference, they visited the Illinois Institute of Technology in Chicago and the University of Illinois in Urbana to survey the use of computers in instruction on these campuses. At the University of Illinois they were given a demonstration on the PLATO system.

Dr. Larry Hunter, Director of the Computer Center, will attend the Regional Computing Activity Project Directors Meeting at Dartmouth College in Hanover, New Hampshire, August 5-7. This annual meeting for all the directors of regional projects was held at OSU last year.

CONFERENCE ON COMPUTERS IN UNDERGRADUATE SCIENCE EDUCATION

A conference is being held August 17-21 at Illinois Institute of Technology in Chicago. Dr. Tim Kelley, of the OSU Physics Department, will present a paper and a demonstration which illustrate some techniques of the use of a Tektronix graphics terminal in science education.

REPORTS TEMPORARILY OUT OF STOCK

The Computer Center publication, CCR-70-12, "A First Report on an Exploratory Program of Regional Cooperative Computing Activities" based on the project directors meeting at OSU, July 8-10, 1969, is temporarily out of stock. More copies have been ordered and will be available in September.

COMPUTER CENTER MANUALS INDEX

A preliminary version of a program to provide users with information pertaining to Computer Center manuals is now available. The Computer Center would appreciate any suggestions concerning this program. Please direct your comments to Jo Ann Baughman, OSU Computer Center. To use this program, type *MANUAL.

```
#*MANUAL

    *** COMPUTER CENTER MANUALS INDEX ***
INPUT CONSISTS OF ONE KEYWORD THAT DESCRIBES THE TYPE OF MANUAL THAT
YOU ARE REQUESTING.  A BACKSLASH MAY BE USED TO DELETE PREVIOUS CHARAC-
TERS (ONE CHARACTER PER BACKSLASH).  TERMINATE KEYWORD WITH A CARRIAGE
RETURN.  ANSWER ANY QUESTION WITH A YES OR NO.  A NO WILL CAUSE EXECUTION
TO BE TERMINATED.  ENTER KEYWORD.

    TERMINAL

    BEGINNER'S OS-3 USER MANUAL (EXPLAINS TTY USAGE).

    CC-68-12
```

FORTRAN: ENTERING, EDITING, AND RUNNING FROM REMOTE UNITS UNDER OS-3

CC-68-39

OS-3 EDITOR MANUAL.

CCM-70-7

TEKPLOT A SUBROUTINE PACKAGE FOR THE TEKTRONIX T-4002 GRAPHICS
DISPLAY TERMINAL.

CCM-70-13

THE "CORE" PACKAGE: A SELF-LEARNING PACKAGE FOR COMPUTER PROGRAMMING
USING A TIME-SHARING TERMINAL.

CC-69-19

OSU COMPUTER CENTER PROGRAM LIBRARY DISTRIBUTION POLICY

EFFECTIVE: August 1, 1970

Programs currently available to all Computer Center users through the
Program Library are listed in the OSU Computer Center Program Library
Catalog, publication CC-69-4. Library materials are available as speci-
fied in the catalog and may, but not necessarily, include write-ups, flow-
charts, sample problem, listing, source deck, and binary deck.

Write up and flowcharts can be obtained by filling out a Library Pro-
gram Request form, available from the Computer Center Office, Room 217.
There will be a charge of five cents (5¢) per page to cover the cost of
reproducing documents.

Source deck, listing, and sample problem can be obtained from magnetic
tape 1376, which has been created using the COSY (Compressed Symbolic) pro-
cessor.

The following jobs illustrate the COSY options to create a Hollerith
source deck and/or a listing of the desired program.

6.

1) Punch a Hollerith source deck:

$^7_8$JOB,<job number>,<user code>,<user identification>

$^7_8$*TAPES,1

$^7_8$EQUIP,1=MT,1376 AT 556 NO RING

$^7_8$LABEL,62/<user identification>

$^7_8$COSY,LOG

   <deckname>   DECK/   I=1,H=62

7 7
8 8

$^7_8$LOGOFF

2) Create a line printer listing:

$^7_8$JOB,<job number>,<user code>,<user identification>

$^7_8$*TAPES,1

$^7_8$EQUIP,1=MT,1376 AT 556 NO RING

$^7_8$COSY,LOG

   <deckname>   DECK/   I=1,L

7 7
8 8

$^7_8$LOGOFF

3)   Punch a Hollerith source deck and create a line printer listing:

$^7_8$JOB,<job number>,<user code>,<user identification>

$^7_8$*TAPES,1

$^7_8$EQUIP,1=MT,1376 AT 556 NO RING

$^7_8$LABEL,62/<user identification>

$^7_8$COSY,LOG

<deckname>   DECK/   I=1,H=62,L

77
88

$^7_8$LOGOFF

The following points should be noted:

a)   The blanks before and after the word "AT" in the EQUIP control statement are mandatory.

b)   The letter "D" in DECK/ begins in column 10. The I, L, and H parameters begin in column 20.

c)   The deckname is an eight-character identifier which specifies the program desired. The deckname always corresponds to the first eight characters of the program identification found in the Program Library Catalog. For example, the deckname to be used in obtaining a source deck of C2-UCSD-VIETA is "VIETA____". The deckname for a sample problem is always formed by appending the first six characters of the program identification to the letters "SP". Thus, the deckname for the sample problem concerning D1-CODA-COLTCHEB is "SPCOLTCH".

d)   Any number of DECK/ cards may be included in one call to COSY. If a source deck of a program and the sample problem for the same program are both desired, the DECK/ card for the sample problem should come after that of the source deck.

Binary decks are obtained by compiling or assembling the source deck.

P R O G R A M M I N G   T I P S

HOW TO SORT A FILE DIRECTORY

*DIRECT does not sort the file names in a file directory. When printing the directory, it first prints all the file names that begin with A, then the B's, etc., and finally the ✝ files and * files last. This is all right for small directories, but some users have rather large file directories. Such users may find it helpful to sort their directories. (New names added to the directory will not be placed in alphabetical order, but the directory can be re-sorted from time to time.) The following sequence of control statements uses *SORT to sort a directory. (This assumes that logical units 1 and 2 are not currently in use.)

```
#*DIRECT     (Hit break after it starts printing.  The purpose of
                doing this is to "clean up" the directory.)
#COPY,I=DIRECTRY,OUT=1
#WFM,1
#REWIND,1
#EQUIP,2=FILE
#*SORT
   IN 1 OUT 2 K 9 8 1 END        (Wait for printout form *SORT)
#*DEFINE,DIRECTRY /, 2=DIRECTRY$
#UNEQUIP,2
#UNEQUIP,1
```

The directory is sorted into reverse alphabetical order, because *DIRECT scans from the end toward the beginning while printing.

REMOTE BATCH JOBS

A remote job entry capability is currently available under the OS-3 operating system. This feature allows batch jobs to be initiated from remote terminals. It is less expensive to submit a remote batch job than to remain on-line while your job is running. Remote batch submission is particularly recommended for longer jobs in which interaction with the running program is not required. In addition, running jobs in this fashion helps balance the computing load on the CDC 3300.

Magnetic tapes may be used by a remote batch job. Due to tape scheduling problems, a remote batch user is normally limited to one tape. Users who wish to run jobs that require multiple tapes must call the Computer Center I/O Room (extension 2033) and schedule such jobs in advance.

In order to submit a batch job from a remote terminal, the user simply outputs a file of card images to a logical unit (LUN) equipped to be TASK. These card images in the TASK unit are automatically copied by the operating system to a remote batch queue when the TASK lun is unequipped. For this reason, it is essential that the file of card images submitted as a TASK be identical to the deck structure for a card reader job. A left bracket ([) (shift K) is used for the $\frac{7}{8}$ punch on a card.*

---

*In last month's Newsletter, a right bracket (]) was mistakenly printed for a left bracket. SORRY!

The following example shows how the editor, EDIT, may be used to create
and submit a remote batch job:

```
#EDIT
]INPUT
 00001:[JOB,695000,XXXX,SAVE FOR JOHN SMITH                 1
 00002:[FORTRAN,L,R                                         2
 00003:    PROGRAM EXPL
 00004:    WRITE (61,11)
 00005:    DO 10 I=1,10
 00006:    I2=I*I
 00007:    I3=I*I2
 00008:    WRITE (61,3)I,I2,I3                               3
 00009:3   FORMAT(3I10)
 00010:10  CONTINUE
 00011:11  FORMAT(9X,'X',6X,'X**2',6X,'X**3')
 00012:    END
 00013:[[
 00014:[LOGOFF                                              4
 00015: (ALT MODE) or (ESCAPE)                              5

]OUT,TASK
#LOGOFF                                                     6
```

Comments:

1)   This corresponds to the user's job card; it will be read by the
     operator at the time his remote batch job is run.

2)   This is a standard call to the FORTRAN compiler.

3)   A FORTRAN program.

4)   An end of file (EOF) card. (Without this card, the FORTRAN com-
     piler has no way of knowing where your program ends.)

5)   The LOGOFF card for the remote batch job.

6)   The user causes the editor to output lines 1-14 to a logical unit
     equipped to be a TASK.

NOTE: The user must use OUT here in order to assure that his state-
       ments are written to the TASK unit as BCD card images.

Printed output that is directed to the standard output unit (LUN 61) will
be printed on the line printer unless otherwise designated. Such printed

output may be directed instead to a file by changing the job card as fol-
lows:

      [JOB,695000,XXXX,61=MYOUTPUT,SAVE FOR JOHN SMITH

This causes the standard output unit to be reassigned to the file named
MYOUTPUT.

For further information about the structure of remote batch job decks
the user is referred to the description of batch decks in the OS-3
Reference Manual, CCM-70-8.

NEW EDITOR ON OS-3

A new version of EDIT has been released. This version includes several
additional features as follows:

1)   Inserted lines that are listed prior to resequencing are identified
     by a relative line number enclosed in parentheses.

2)   CRT users no longer lose the information on their screen when the
     editor cannot recognize the EDIT command that occurs on the first
     line of the screen. Instead, EDIT replaces only the first line (that
     contained an illegal editor command) with an error message and pre-
     serves the remaining information. This allows the user to correct
     the command, reposition the cursor beyond the last character of the
     last line, and then depress SEND.

3)   The editor no longer automatically trys to equip and update the user's
     directory file. If the user does have a directory file named DIRECTRY
     he can cause the editor to equip and update the file by calling the
     editor with a comma after the word EDIT, i.e.,

        #EDIT,
     should be used. In addition, if a user is maintaining a directory
     called by some other name, e.g., ALTNAME, he can cause the editor to
     recognize this latter file as his directory by using

        #EDIT, ALTNAME
     when calling the editor.

4) Note that a few minor changes have been made in editor commands. For example, the command REPLACE is called by REP; the command TABS is called by TAB. The changes are covered in the new manual, OS-3 EDITOR MANUAL, CCM-70-7.

STAFF DESK FOR PROGRAMMING HELP

For programming assistance between the hours of 1 p.m. and 5 p.m. Monday through Friday, users should call:

extension 2126

or go to room 211 in the Computer Center. This assistance is available for all staff members but is not intended for students enrolled in programming classes.

FACULTY TRAINING WORKSHOP TO BE HELD

There will be a Faculty Training Workshop held on the OSU campus during the week of September 8-11 for institutions participating in the Oregon Regional Computing Network. Sessions will be held in beginning and advanced programming in FORTRAN, OSCAR, BASIC, EDITOR, Library Programs and Plotting. For further information, call the Computer Center, ext. 2494.

INSTRUCTORS - ORDER YOUR MANUALS NOW

OSU Instructors - if your are planning to use Computer Center manuals in your classes Fall term, please place your orders for manuals now with the Bookstore. This will allow for 3-4 weeks for delivery.

Off-campus instructors - schools off-campus should place their orders for manuals with the OSU Computer Center as soon as possible. You should also allow 3-4 weeks for delivery.

NOTE: The Computer Center office does not sell manuals directly to students, so instructors must place orders early for the manuals necessary for their courses.

TAPE CHARGES

For users using tapes there will be a $.50 tape mounting charge. The channel time charge of 3.4¢/sec. will be reduced to 3.0¢/sec. These charges will become effective beginning September 1, 1970.

NOTE: Properly blocked tapes will be less expensive to users than improperly blocked tapes, since less channel time is required in the processing of well blocked tape records.

The new tape charges will result in lower overall tape charges for jobs using effective blocking techniques.

OPERATING STATISTICS

For the dates August 1 to August 31, OS-3 usage was as follows:

Number of batch jobs run:	5,374
Number of console runs (LOGON-LOGOFF):	18,706
Number of console hours used:	4,110
CPU time used - console and batch:	144.52 hours
Total number of hours OS-3 was on the air: (15 1/2 hrs. Mon.-Fri.; 9 1/2 hrs. Sat.)	373 hours
Average number of console users:	11
Amount of CPU time used by an average user for one hour of console time:	82.8 seconds

NEW COMPUTER CENTER PUBLICATIONS

cc-69-11   ALGOL: OS-3 User's Manual by Baughman, Berryman, and Yapp.

CCM-69-21(R)   A Resource Set: Computer Programs in Mathematics for Secondary Schools by Geldaker and Firey.

CCR-70-15   A Final Report on the Oregon State University Computer Materials Project (NSF GJ116) by Porter and Pinneo.

To be released soon:

CCM-29-20(R)   OSU A Resource Set: Computer Programs in Science for Secondary Schools (Final Version) by Bell and Firey.

CCM-69-22(R)   OSU A Resource Set: Computer Programs in Business for Secondary Schools (Final Version) by Collins and Firey.

Reports temporarily out of stock:

The Computer Center publication, CC-69-24, OSCAR: A User's Manual with Examples (Second Revision), is temporarily out of stock. More copies have been ordered and will be available late in September.

COMPUTER REGISTRATION - SEPTEMBER 26

The computer will be dedicated to OSU registration all day Saturday, September 26. No other interruptions of regular time-sharing services are anticipated.

COMPUTER RATES AS OF SEPTEMBER 1, 1970

Minimum Charge

$1.00 minimum charge for computational services.

OS-3 Charges (prime time)

CPU time	$300/hour
Tape	$.50/tape (tape mount charge) + $.03/sec (channel time)
Elapsed time at Teletype	$2.00/hour
On-line disk storage	$.15/block=$.30/track/month
Punch cards	$.25/100 records
Input cards	$.15/100 records
Line printer	$.125/100 records
Plotter	360 blocks/hr. @ $10/hr.

OS-3 (non-prime time)

Special rates for volume work in non-prime time. (Non-prime time is the time when the teletypewriters are not on the air). Special

forms for volume work must be used and are available at the input desk.

CPU	$300/hr for the first 10 minutes CPU, then, $200/hr for CPU time over 10 minutes
Punch cards	$.25/100 for the first 2,000 records, then, $.15/100 for all cards thereafter
Input cards	$.15/100 for the first 2,000 records, then, $.05/100 for all cards thereafter
Line printer*	$.125/100 for the first 5,000 records, then, $.05/100 for all records thereafter

Master Charges

$240/hour hand-logged time (wall clock time)

Bulk users with unusual requirements should contact the Computer Center.

Other	Without Operator per hr charge	With Operator per hr charge
CALMA 302 Digitizer	$ 5.00	$ 7.50
IBM 407 Tabulator	6.00	10.00
IBM 083 Sorter	2.00	6.00
Keypunching	no charge	6.00
Verifying	not available	6.00
Interpreter		5.00
Burster & Decollator		5.00
NCR Paper Tape Converter	7.50	10.00
3300 Computer		30.00
Programming		Programmer 6.00 Senior Prog. 9.00 Prog. Analyst 12.00
Magnetic Tape Reels	1.00/month (.25 minimum)	

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* These rates are for one-part paper only. If users want multi-part paper or special forms, they will be charged for the materials used.

REMOTE JOB ENTRY

Users are reminded that the RJE feature of the OS-3 system is less expen-
sive to use for programs where user interaction is not required. Output
can be referred to either the printer or a named file which can be
accessed from a remote terminal. Consult your September 1 Newsletter
for the explanation of how to initiate an RJE program.

NOTICE - THE DAYS OF AN UNREFERENCED FILE ARE NUMBERED

Beginning November 1, the lifetime of an unreferenced on-line file will
be sixty days. If any file is not referenced during a sixty-day period,
it will be automatically deleted from on-line storage.

The policy will release additional file space for users and help control
the "forgotten file" problem. At the present time, approximately half
of the available on-line storage is comprised of short files. Since the
monthly storage costs for these small files is very low, there is little
motivation to delete old files even after they are no longer needed.

In order to protect users the Computer Center will temporarily store all
deleted files on a back-up tape. If a user wishes to recover a deleted
file, he may do so by making a special request at the Center. A charge
for the cost of transferring the file back into on-line storage will be

made. This charge will include all standard computer costs associated with searching the back-up tape for the file which is to be recovered. Note that this charge is variable depending on the location of the file on the tape and can be relatively expensive.

STAFF CONSULTING DESK

The staff desk for programming assistance began operation on September 1. A member of the Computer Center programming staff will be at the desk Monday through Friday between the hours of 1 and 5 p.m.

Users can call extension 2126 or go to room 211 in the Computer Center. This assistance is available for all staff members but is not intended for students enrolled in programming classes.

VIDEOTAPE SERIES TO BE SHOWN

The Computer Center videotape series, "Introduction to OS-3" and "Introduction to FORTRAN" will be shown from 4-5 p.m. October 26 through November 6 on Channel 5 (cable TV) and in room K292 on Monday, October 26 and November 2, and in room K278 Tuesday through Fridays.

        October 26-October 30   "Introduction to OS-3", 4-5 p.m.,
                                Monday K292
                                Tuesday-Friday K278
        November 2-November 6   "Introduction to FORTRAN", 4-5 p.m.,
                                Monday K292
                                Tuesday-Friday K278

The OS-3 series is a new series which was filmed this past summer.

The FORTRAN series is the same series we have shown in the past. A new FORTRAN series is now being filmed and should be ready for viewing Winter quarter.

COMPUTER CHARGES

A complete list of computer charges was printed in the September 1 News-letter. If you missed reading last month's Newsletter, you may pick up a copy in the Computer Center Office.

ADDITIONAL DISK CONTROLLER ADDED

The Computer Center will add a second disk controller to the CDC 3300 system during the latter part of October. This will allow dual access to the disk, and will effectively double the disk transfer capacity. This addition will result in a marked improvement in overall system per-formance, particularly during periods of heavy loading.

HAVE YOU LOST ANY FILES LATELY?

During the recent purge of old files from the system, a few file direc-tories were not updated. If you referenced your files during the week of September 14-18 and still lost them, you may recover them by giving Ron Davis (extension 2494) the necessary information. The files are stored on a back-up tape and can be restored to the system.

HAVE ANY NEW PROGRAMS?

The Computer Center would like to encourage users to send in a brief description of newly developed programs which might be of interest to other users. Descriptions of these programs will be published in sub-sequent Newsletters.

REGISTRATION

Oregon State's 1970 Fall Term registration proceeded on schedule without any significant problems over the weekend of September 25-27. During that

period the Computer Center processed 127,943 punched card input records for 14,741 students. The scheduling operation resulted in 67,553 course enrollments, an average of 4.6 per student.

This processing was accomplished with very little disruption of normal Computer Center activities, although the OS-3 system was dedicated all day Saturday, September 26. The principal reason for this one dedicated period was the requirement for 14 hours of printing to produce the student schedule forms and the class lists.

OPERATING STATISTICS

For the dates September 1 to September 30, OS-3 usage was as follows:

Number of batch jobs run:	5,608
Number of console runs (LOGON-LOGOFF):	17,652
Number of console hours used:	4,877
CPU time used - console and batch:	195.48 hours
Total number of hours OS-3 was on the air: (15 1/2 hrs. Mon.-Fri.; 9 1/2 hrs. Sat.)	363 hours
Average number of console users:	13.4
Amount of CPU time used by an average user for one hour of console time:	85.5 seconds

REGIONAL COMPUTER CENTER WORKSHOP HELD

Oregon State University Computer Center, in cooperation with the Oregon Regional Computer Center Project, sponsored a faculty training workshop the week of September 8-11. The purpose of this workshop was:

1) To provide basic training in the development of computer skills in FORTRAN, BASIC, OSCAR and the OS-3 time-sharing system.

2) To provide training in the development of user skills which will facilitate use of the computer within an academic area.

These include the use of the plotter, files, *CATALOG programs, OSCAR, BASIC, and Library programs.

A faculty workshop was set up to provide the faculty with concise instruction, examples of use and an opportunity to receive actual hands-on use of the computer under the direction of an instructor.

Four different terminal laboratory areas were set up providing workshop participants one terminal for every two participants. There was one lab instructor assigned to each terminal area and responsible for approximately six terminals. The Computer Center staff, Regional staff, workshop instructors, and campus coordinators were also available for assistance in the terminal laboratories.

The workshop was organized on an informally structured basis with a one to two hour lecture-recitation session followed by a laboratory period. This provided the faculty with an opportunity to work problems assigned and to discuss their solutions at a follow-up lecture-recitation.

Faculty were provided with general Computer Center manuals and special instructional materials.

COMPUTER MATERIALS PROJECT

The Computer Materials Project, NSF GJ116, will be completed November 30, 1970. The materials produced by the grant are:

CCM-69-19R	The CORE Package: Self-Learning Package for Computer Programming using a Time-Sharing Terminal, by Robert Pinneo	$ 1.50
CCM-69-20R	A Resource Set: Computer Programs in Science for Secondary Schools, by Walt Bell and Brook Firey	1.50/set
CCM-69-21R	A Resource Set: Computer Programs in Mathematics for Secondary Schools, by Chuck Geldaker and Brook Firey	1.50/set
CCM-69-22R	A Resource Set: Computer Programs in Business for Secondary Schools, by Phil Collins and Brook Firey	1.50/set
CC-69-23	Report on the Oregon State University Computer Materials Project (GJ116)	no charge

CCR-70-14   Course Outline for the Course, <u>Introduction to</u>
               <u>Computers for Teachers</u>, Ed 507, April, 1970   no charge

CCR-70-15   A Final Report on the Oregon State University
               Computer Materials Project (GJ116), August, 1970 no charge

These materials can be purchased or obtained from:

> Computer Center
> Oregon State University
> Corvallis, Oregon 97331

The DCE course, "Introduction to Computers for Teachers", Ed 507, is now available from DCE on any campus in Oregon. The course is an introductory one, and is not scientifically or mathematically oriented. Any teacher or administrator interested in having this course taught at his school next year should contact:

> Mr. William Beck
> Division of Continuing Education
> 304 Covell Hall
> Oregon State University
> Corvallis, Oregon 97331
>
> Phone: 754-1266

OS-3 ARAND SYSTEM

The OS-3 ARAND system, a programming system to handle a wide variety of time series analysis problems, has a number of new additions.

A group of multivariate spectral analysis programs has been developed. The spectral estimation technique is the standard one which involves transforming a tapered covariance (or correlation) function, and this function is computed using a fast correlation algorithm. Other characteristics include:

1)   The ability to handle any reasonable number of time series, each of maximum length 3000.

2)   Choice of output that includes the covariance (or correlation) matrix, the spectral matrix, or both.

3)   Programs to compute squared coherence and phase given the spectral matrix.

4) The system is file based, although a version suitable for use with magnetic tape has also been developed. The disk file oriented package uses random access files, requiring both input (user's data) and output (covariance and/or spectral matrix) to be in this form.

Recently, work has been completed on a routine that employs the "chirp z-transform" algorithm to evaluate the z-transform of a finite sequence of real or complex numbers. Evaluation is possible at discrete sets (with equal angular frequency spacing) of points that lie on circular or spiral contours in the complex plane. A special contour of some interest is the unit circle in which case the z-transform reduces to a Fourier transform. While the chirp z-transform algorithm employs the fast Fourier transform, it has none of the limitations associated with fast Fourier transform algorithm, although it is slower than the FFT.

In the near future, a special library that includes all current FORTRAN library routines plus all ARAND subroutines (FORTRAN) and ARAND COMPASS language routines will be available. To use any ARAND subroutine or COMPASS language routine, one need only equip LUN 63 to *ARAND prior to load time. The *ARAND library also includes all the conversational I/O routines discussed in the forthcoming manual, "Aid to Conversation Programming" by Mark Ebersole.

P R O G R A M M I N G   T I P S

BASIC

The BASIC compiler can now be called simply by typing:

> #BASIC   (CR)

It is no longer necessary to type *B.

UNREFERENCED FILES

Remember, beginning November 1, the lifetime of an unreferenced file
will be 60 days. If any file is not referenced during a 60-day period,
it will be automatically deleted from on-line storage.

In order to protect users, the Computer Center will temporarily store
all deleted files on a back-up tape. If a user wishes to recover a
deleted file, he will be charged for the cost of transferring the file
back into on-line storage.

EXPERIMENTAL SYSTEMS ARE RUN ON SATURDAY

New systems are run experimentally on Saturdays. Occasionally there
may be problems. Although this doesn't happen very often, users should
exercise caution when running important or large jobs on Saturdays.

All systems are thoroughly tested before they are run during normal
operating hours. However, it is difficult to fully simulate the con-
ditions of a full operating load. Saturdays appear to be the most
desirable time to implement major changes and improvements to the OS-3
operating system.

STAFF CONSULTING DESK

The staff desk for programming assistance is available for all staff members. Users can call extension 2126 or go to room 211 in the Computer Center Monday through Friday between the hours of one and five p.m.

VIDEO TAPE SERIES

The Computer Center video tape series, "Introduction to Electronic Data Processing", "Introduction to OS-3", and "Introduction to FORTRAN" can be selectively scheduled by instructors. Professors can contact Classroom Television (extension 2675) to arrange the showing of any of these tapes to their classes.

OPERATING STATISTICS

For the dates October 1 to October 31, OS-3 usage was as follows:

Number of batch jobs run:	9,469
Number of console runs (LOGON-LOGOFF):	25,911
Number of console hours used:	5,714
CPU time used - console and batch:	173.01 hours
Total number of hours OS-3 was on the air:	
(15 1/2 hrs. Mon-Fri; 9 1/2 hrs. Sat.)	388.5 hours
Average number of console users:	14.7
Amount of CPU time used by an average user for	
one hour of console time:	63.23 seconds

ANNUAL FALL CONFERENCE HELD BY REGIONAL COMPUTER CENTER PROJECT

The Fall conference for project directors of the Regional Computer Center Project was held October 8 and 9. The purpose of the conference was to review operational procedures available to the regional participants and to review and evaluate regional reports and the faculty workshop. Project directors for the participating regional schools attended the conference.

COMPUTER USAGE

From January through October, 131,384 logon-logoffs and 49,028 batch runs have been entered into the system. Each logon-logoff usually accounts for more than one job run, since users tend to run several jobs each time they log on and off.

TELETYPES HERE AND THERE

	33KSR	33ASR	35KSR	35ASR	37KSR	TOTAL
Computer Center Owned	43	25	1	1	2	72
Owned by Other Departments	15	26	1	4	_	46
TOTAL ON THE OSU CAMPUS	58	51	2	5	2	118
Regional Network*	12	22		12		46
Eastern Oregon College	2	1		2		5
Portland State University	1	7		2		10
Oregon Technical Institute	1	2		2		5
Southern Oregon College	1	2		2		5
Pacific University	2					2
Lewis and Clark College	1					1
Linn-Benton Community College	1					1
U of O Medical School		6				6
Linfield College		1				1
Clatsop Community College	1					1
Oregon College of Education	1	2		2		5
Lane Community College	1	1		2		4
Other						
Chemekata Community College		1				1
Lake Oswego High School		1				1
State Forestry Department	1	_	_	_	_	1
TOTAL OFF CAMPUS	13	24	0	12	0	49
TOTAL TTY's ON OS-3 SYSTEM	71	70	2	17	2	167

* 16 schools in Regional Network including OSU

NEW OSU COMPUTER CENTER PROGRAM LIBRARY CATALOG, CCM-70-21

The OSU Computer Center Program Library Catalog has been expanded and completely revised. The new catalog is being published as ccm-70-21 and should be available by November 1 at the Computer Center Office, CC217. This catalog makes the previous catalog completely obsolete. Some points of interest:

1) Many errors and omissions in the abstracts have been corrected.

2) The number of programs in the library now numbers four hundred five, including all routines available from loader libraries (FORTRAN Library, *SYSLIB, *KEITHLB, and *REGLIB), as overlays (*SCOOP, *DEFINE, *DIRECT, *TTT, etc.), and from saved files of the source programs.

3) All source decks and sample problems for programs available only through the Program Library (i.e., programs not on-line) have been written on a magnetic tape to insure easy access for all users. Procedures for accessing this tape have been included in the catalog.

4) Updates to the catalog will be made available from time to time through the Computer Center Office. Announcement of updates will be made in the Computer Center Newsletter. The old Program Library mailing list will be abolished.

OSU COMPUTER SYSTEM IMPROVEMENTS

A second disk controller was added to the CDC 3300 system during November. This controller plus a sophisticated, new disk driver has doubled the disk transfer rate and relieved the major bottleneck which occurs under heavy systems loading.

ARAND SYSTEM LECTURES

A series of informal lectures will be presented dealing with the use of the OS-3 ARAND System, a programming system for time series analysis. The discussions will include introductory time series analysis material as well as indicating the details of using the various ARAND routines. Tentative plans are to begin the series of lectures November 19, 1970. Interested parties should contact Henry Crew, Oceanography Dept., or Jo Ann Baughman, Computer Center.

ADDITIONS TO THE OS-3 ARAND SYSTEM

The ARAND System, a programming system for time series analysis,
has a new addition: FIVET, a digital filter design program.
The design of a wide variety of symmetrical nonrecursive filters
is possible with the design specifications including 1) the desired
frequency response function, 2) the maximum allowable deviation from
the desired response function, and 3) the bandwidth of transitions
occurring in the achieved response corresponding to points of dis-
continuity in the desired response function.