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newsletter



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WELCOME

We wish to welcome the faculty and students who are new to UNC-CH and our old friends who are returning for the new school year. Our goal is to provide you with the computing resources you need, and to help you use these resources easily and productively. To help both new and experienced computer users, we offer the following publications and services.

- New User Packet—a document which provides an introduction to the UNC Computation Center (UNCCC) facilities and services.
- Educational Materials and Short Courses—The fall 1984 schedule for our short courses is given in UNCCC Memo #11. This document is updated before each fall and spring semester and is announced in the UNCCC *Newsbrief*.
- Index of Computer Programs and Facilities Documentation at TUCC—a keyword index to the documentation for programs, subroutines, and services available in the Triangle Universities (UNC, DUKE, NCSU) community.
- UNCCC *Newsletter*—a quarterly publication containing informative articles of general interest and a review of important changes since the last *Newsletter*.
- UNCCC *Newsbrief*—a weekly publication containing announcements, UNCCC and TUCC news items, and programming suggestions that are useful on a day-to-day basis.

Each of these documents is available free from the Center's Administrative Office in room 37 Phillips Hall. A complete listing of the Center's documents, including UNCCC Memoranda which describe the policies, procedures, and services of the UNC Computation Center, is available online from TUCC WYLBUR by using 'DO REVIEW IXTITLE' after you have logged on. You can print this list offline by using 'DO DOCPRINT IXTITLE'.

The UNCCC *Newsbrief* is available to campus users by subscription from the Administrative Office in Phillips Hall. The *Newsbrief* is also available in three other places: from our Administrative Office; posted on the bulletin board between rooms 28 and 30 in Phillips Hall; and in the online data set at TUCC named UNCCC.NEWSBREF using TSO or WYLBUR.

On our staff we have qualified applications analysts who are experienced in system design, systems analysis, and a variety of programming languages and software packages. The Center provides limited free consulting at the User Service office, located in room 38 Phillips Hall. User Service is provided by the Center's full-time programming staff from 9 a.m. until noon and 1 p.m. to 5 p.m. on weekdays. More extensive consultation or full analysis and programming services are available on a contract basis.

We also provide a microcomputer laboratory, Optical Character Recognition (OCR) data entry, and a lab for the visually handicapped.

There are local user groups for several microcomputers: the Apple, the IBM PC, and the Magna SL word processor. If you are interested in any of the campus user groups, contact the appropriate sponsor:

USER CAMPUS ADDRESS/PHONE	USER GROUP SPONSOR	USER GROUP SPONSOR
Apple	Bill Thompson	266 Phillips, 962-3022
PEM -	Joseph Wittig or Bill Luckey	518 Greenlaw, 962-4050 256 Rosenau, 966-4091
Magna SL	Barbara Wagner	500 NCNB Plaza, 962-2001

UNCCC 25TH ANNIVERSARY CELEBRATION

You are invited to join us, the employees of the Computation Center, in celebrating our 25th Anniversary. As part of our celebration of 25 years of computing at UNC-CH, we are inviting faculty, staff and students of the University of North Carolina at Chapel Hill as well as the general public to expand their knowledge of computers through demonstrations and lectures.

Computer Demonstrations

On August 29 and 30 (Wednesday and Thursday) in the Great Hall of the Student Union, there will be demonstrations of a large variety of computing equipment, including software, output displays, and computer-to-computer communications.

Lecture Series

Also on August 29 and 30, there will be a series of four presentations, all in the Great Hall of the Student Union, as follows:

- *The Future of Computing in Education and Research:*

Wednesday, August 29, at 3 p.m. in the Great Hall of the Student Union.

- *How Advances in Technology Have Changed the Use of Computers:*

Wednesday, August 29, at 7:30 p.m. in the Great Hall of the Student Union.

- *The Information Explosion and the Future of the Office:*

Thursday, August 30, at 3 p.m. in the Great Hall of the Student Union.

- *Computer Animation:*

Thursday, August 30, at 7:30 p.m. in the Great Hall of the Student Union.

The speakers will try to keep their presentations non-technical to be of interest to students, faculty, and staff who are not familiar with computers.

For more information, contact Judy Hallman, Manager of Information Services, UNC Computation Center, 304 NCNB Plaza, Chapel Hill, NC 27514. Telephone: (919) 962-9107.

A BRIEF HISTORY OF THE UNC COMPUTATION CENTER

The Computation Center of the University of North Carolina at Chapel Hill first began operation in August, 1959, but its history dates to 1951 when the University made its first efforts to acquire a high-speed digital computer. In that year, Professor of Mathematics W.M. Whyburn proposed an electronic computer project to UNC-CH Chancellor Robert House. Dr. House solicited the support of Consolidated University President Gordon Gray, and efforts to acquire a computer for UNC-CH were instigated. During 1952-1955, Dr. Whyburn and other faculty members canvassed the University community to determine the nature of potential needs for computing service and considered several possible avenues for satisfying them. In 1955 the Bureau of the Census contacted the Consolidated University administration about co-operating in the acquisition effort in exchange for use of the computer in the 1960 census. Representatives of the Consolidated University administration, the University of North Carolina at Chapel Hill, N.C. State University, the Census Bureau and two possible vendors, IBM and Sperry-Rand, started to confer in the fall of 1956 with definite timetables for the computer's acquisition in mind. In addition the University actively sought financial support from the National Science Foundation. By late 1958 the University and the Census Bureau had concluded that the Sperry-Rand proposal was preferable because the Sperry-Rand machine, the Univac 1105, was compatible with the Census Bureau's in-house hardware systems. In December of 1958, John W. Carr, III, was appointed the first Director of the Computation Center and to the faculty in the Department of Mathematics. The development of the Center was made possible financially by the State of North Carolina which contributed to the initial operating expenses of the Center, the Bureau of the Census and the National Science Foundation which contributed \$700,000 and \$500,000 respectively toward the computer's purchase, and the Sperry-Rand Corporation which contributed 50 percent of the computer's list price of \$2,450,000. To compensate for its contribution, the Census Bureau used the computer to process statistics involved in the 1960 census survey of population and housing for two shifts per day and defrayed the associated operating costs.

The Univac 1105 Inaugurates Computing at UNC-CH

The Univac 1105 was installed in the basement of a new addition to the University's math and physics building, Phillips Hall, and began operation in August, 1959. The new "Computation Center" was staffed with four full-time programmers, six operators, and ten UNC-CH maintenance personnel assigned to service the system. The hardware consisted of 8K words of fast core (later expanded to 12K) and 32K words of drum storage (each word consisted of six six-bit bytes), 17 magnetic tape drives, a 600 lines-per-minute printer, and both punched paper tape and punched card readers. The program for the Center's dedication in March, 1960, reported the Univac's processing capacity as 40,000-50,000 additions per second, 20,000 multiplications per second, and 10,000-20,000 divisions per second. As noted in a Center brochure of the time the software consisted of:

"...various versions of the IT (Internal Translator) Compiler, with complete simplified input-output and symbol manipulation facilities; a GAT (Generalized Algebraic Translator) system; and the standard USE compiler-assembly systems."

The brochure also reported that work was proceeding on an ALGOL translator, a COBOL compiler, and an IPL-VI information processing system as well as systems identical or similar to COMIT and LISP and the operating system/monitor.

During the shift in which the computer was available to the University, it was put to a variety of educational and research uses including computer-oriented mathematics, automatic programming, numerical analysis and statistical analysis. Departments as diverse as Chemistry, Business Administration, City and Regional Planning, and Forestry at N.C. State quickly made use of the Center's resources. In 1963 William Hanson replaced John W. Carr, III, as Director.

The System 360 and the Founding of TUCC

By 1964 the Census Bureau's work was completed, its financial support was withdrawn, and the computer was turned over completely to the University. The Center staff had grown by this time from the original twenty employees to over thirty. During the 1964-65 academic year, the University moved its payroll function from punched cards to the Univac 1105. To facilitate the development of new administrative and business applications, the University appointed its first Director of Electronic Data Processing Systems (EDP), Erwin Danziger, in June, 1965. Shortly thereafter two professional systems analysts were added to his staff. Concurrently, the cost of servicing and maintaining the Univac, a vacuum tube machine, had increased significantly. As a result of the introduction of the System 360 by IBM in 1964, the Univac was approaching economic and technical obsolescence. Moreover, both Duke University and N.C. State University were experiencing rising computing costs and substantial increases in the demand for computing resources. During 1964 and early 1965 representatives of UNC-CH and the other two schools considered the possibility of a cooperative venture in research and educational computing. In January the National Science Foundation made a grant to the Computation Center to support its participation in the proposed joint venture. In May, 1965, the Triangle Universities Computation Center (TUCC) was formed. It was organized as "...a non-profit corporation, separate and distinct from the three universities but controlled by them to ensure that its activities are in full concurrence with their objectives of teaching and research."

In July, 1965, Duke University, N.C. State University, and UNC-CH proposed to the National Science Foundation that it fund computing services for each campus and a joint computing center designated the Triangle Universities Computation Center. The main features of the proposal were the installation of a large central computer system, an IBM System 360/75 in the Research Triangle area and of an IBM System 360/30 on each campus as a high-speed remote terminal for the central machine and as a stand-alone system for the school. The IBM 360/30 was installed at UNC-CH in early 1966, and the Center staff began the task of learning about the new machine and converting programs from the Univac 1105. On June 16, 1966, the UNC 360/30 was connected as a terminal to the TUCC machine, a Model 360/40 which was upgraded to a 360/75 three months later. In September, the first research jobs were processed at TUCC. Concurrently, the administrative functions formerly performed on the Univac were converted to the IBM 360/30.

Paralleling the development of the TUCC system in 1963-64 was the establishment of a Department of Computer Science in 1964 under the leadership of Dr. Frederick Brooks, Jr., who had managed the development of OS/360, the operating system for the IBM System 360 series of computers. The department began offering graduate courses in computer science in 1964-65.

Both TUCC and its member universities experienced a large number of start-up problems in communications software and programming systems. These problems resulted in the systems at N.C. State and UNC-CH being upgraded to 360/40s in 1967. Thus, in 1967 the UNC Computation Center was operating an IBM 360/40H with 256K of main memory, eight 2314 disk drives, two nine-track tape units, and a single high-speed printer. TUCC was operating a 360/75I with 512K of memory, 2M of low-speed extended core memory, and sixteen 2314 disk drives.

Administrative Data Processing Separates From the Center

By the summer of 1967 the Electronic Data Processing Group was using one full shift on the 360/40. UNC Chancellor Sitterson and Center management decided to separate the group from the Center. By October the group had been renamed Administrative Data Processing (ADP), had leased an RCA Spectra 70/35, and had moved out of Phillips Hall to the basement of Hanes Hall. Two years later, ADP acquired an RCA 70/46 after receiving a large educational contribution from RCA. ADP moved from Hanes Hall to its present location at 440 West Franklin Street in April, 1974. In 1981 it acquired an IBM 4341-M2 which was replaced in 1983 with an IBM 3083.

UNCCC Expands Services

In the fall of 1968, Paul Oliver replaced William Hanson as Center Director. The year 1968 saw the beginning of some of the Center's first user information services with the inauguration of the Center *Newsletter* in September and the first short courses which were taught during the fall semester. The courses were "Introduction to JCL," "Introduction to TSAR," "Introduction to FORTRAN," and "PL/I for FORTRAN Programmers." The Center also upgraded its operating system to the MFT/II version of OS/360. TUCC installed the MVT-HASP version of OS/360 in the fall of 1969. Responding to the rapid increase in the number of jobs run at TUCC, TUCC made available an additional 512K of fast memory in 1970. One indication of the growing demand for computing during this period was the number of jobs run on the 360/40 at UNC-CH and on the TUCC computer as UNC-CH's share. The total went from 75,000 in 1967-68 to 224,000 in 1969-70, an increase of 200 percent in two years. To meet the challenge posed by this trend, the Center acquired a 360/50 with 384K of fast memory to replace the 360/40. The 360/50 was approximately twice as powerful as its predecessor.

In 1970 James Batter became Director of the Computation Center. The continued expansion of demand for service at both UNC-CH and TUCC led to TUCC upgrading to an IBM 370/165 with 2M bytes of fast core to replace the 360/75. The Center then acquired the Model 75 to replace its own Model 50. When it was installed at UNC-CH, the Model 75 was equipped with 256K of fast memory and 1M of extended core memory which was later replaced with 2M of Ampex extended core memory in 1973. Three items from UNCCC *Newsletters* of this period are of particular note. In September of 1972, TUCC placed the IBM Time Sharing Option (TSO) into production. With this first general purpose interactive facility, users had access to a 90K partition. The service could accommodate approximately 30 users at a time. The Center installed its first general purpose interactive facility, CALL-OS, in 1973. The presence of these systems allowed a larger number of academic departments and research institutes to conveniently connect to the two mainframes at reduced cost. Following this trend toward more interactive service, the Center installed its first two terminal clusters outside of Phillips Hall in 1974. Each cluster had six Model 38 Teletypes. The clusters were located respectively in Connor Dormitory on North Campus and Hinton-James Dormitory on South Campus. South Campus access to computing was enhanced further in 1974 when a card reader, medium speed printer and keypunches were placed in Morrison Dormitory and in 1975 when a cluster of four Model 38 Teletypes and two Hazeltine-1000 CRT terminals were placed in Craige Dormitory.

During this period the software at UNC-CH and TUCC proliferated. By 1974 TUCC reported having over 1100 routines, packages and programs on its catalog. The most popular languages were FORTRAN IV and PL/I, statistical packages included SPSS and early versions of SAS, and a variety of programs also had been developed to fill in the gaps left by IBM utilities in data and program management. The growth in available software and the number of users led the Center to publish its first comprehensive user handbook, *Communicating with System 360*, in 1974. The presence of the computing facilities at UNC-CH and TUCC was instrumental in establishing several research institutes and projects.

In 1976 both the Center and TUCC added second computers—an IBM 370/155 at UNCCC and a second IBM 370/165 at TUCC. A measure of the increased computing capacity available to users of the Center's computers was the classification of jobs by size which was published in the November *Newsletter*. Small jobs were those requiring 100K or less, medium jobs were those requiring 200K or less, and large jobs were those needing 300K or less. Jobs with over 500K at UNCCC and 1000K at TUCC required special arrangements for execution. The

Center continued to extend remote computing service for campus users in 1977 by installing an additional terminal cluster which contained CRTs, hardcopy terminals, and a card reader and printer in Cobb Dormitory. The changes at the Center and TUCC since 1974 required the first revision of *Communicating with System 360*.

In 1978 the Center installed another terminal cluster, card reader and medium speed printer at Ehringhaus Dormitory. During 1979 TUCC added an Amdahl 470/V7 with eight megabytes of main memory with one of the 370/165s configured as a "slave" machine. The other 370/165 was used as a test machine for system and program development. Social concerns about computer security and ethical computer use were reflected by the *Newsletter* in the form of a user survey on the ethics of computer use.

The 1980s: From Microcomputers to Supercomputers

TUCC continued its system upgrades and moved to an Amdahl 470/V8 in 1980. This was the first year that the presence of microcomputers on campus was sufficiently strong for the Center to publish a "Microcomputer Directory" of computers and users at UNC-CH. The interest in microcomputers led to the formation of several users groups including the Apple Users Group and the IBM PC Users Group. The Center and the Department of Computer Science established a Microcomputer Laboratory in Phillips Hall in 1981. The "Micro Lab" originally was equipped with eight Apple IIs with 48K of memory each. An additional ten Apple IIs arrived at the end of the fall semester and they were configured into a network with a 20 megabyte Corvus hard disk. Also in the late fall, TUCC replaced its 470/V8 with an IBM 3081D and removed one of the two 370/165s.

The need for more timely and formal information on hardware and software changes at the Center and TUCC led the Center to begin publishing a weekly *Newsbrief* in 1982 as well as continuing to publish the quarterly *Newsletter*. During this year, TUCC replaced its remaining IBM 370/165 with a 370/168 and the Center added sixteen more Apple IIs to the "Micro Lab," thereby making a total of 24 available.

In 1983 James Kitchen became Acting Director. This year saw several major changes at the Center and at TUCC. In February, the Center's IBM 360/75 was replaced with an IBM 4341 L-1 with four megabytes of storage, and in April, the IBM 370/155 was replaced with an IBM 4341-M11 with eight megabytes of memory. In June, the 4341-L1 itself was replaced with a 4341-M2 with eight megabytes. Thus, the total memory available at UNCCC had increased from 4.5M to 16M. The Center also installed a terminal cluster in the basement of Gardner Hall to relieve overcrowding in Phillips Hall.

In February, the "Provost's Committee on the Study of Computing Resources and Services at the University of North Carolina at Chapel Hill" made its report to the Provost and the University. The Committee made an extensive survey of UNC-CH computing needs including equipment, communications networks, interactive services, and large scale computing. A number of the recommendations of the Committee have since been implemented by the Center.

In 1983 IBM awarded a three-year \$750,000 grant to the College of Arts and Sciences for the development of computer-aided instructional materials. Under the leadership of Associate Dean of General Education Dr. William Graves of the Department of Mathematics, the program is seeking to find new applications for computing technology in a variety of disciplines. The project has placed 53 IBM Personal Computers on campus for both faculty and student use.

Because of the growing interest in supercomputing in the TUCC community, TUCC began conducting seminars in supercomputing in April, 1983. The seminars consisted of presentations by researchers on supercomputing and vendors of supercomputing and vector processing equipment including Control Data, Cray, IBM, Floating Point Systems and Fujitsu. The interest in the field led to the installation in March, 1984, of an FPS-164 attached processor for fast floating-point array calculations at TUCC and to arrangements for user access through TUCC to a CDC Cyber 205 at Colorado State University.

The last few months of the Center's history are covered separately below, but they have proved to be almost as exciting as the first few after its founding in 1959. In an accompanying article, Provost Morrow extends present

trends into the near future to suggest ways in which the combination of new technologies and methods of applying them will affect the educational and research missions of the University. A measure of how far computing has come is to note that an IBM Personal Computer of today has at least the equivalent power of the Univac 1105. One can only speculate about the distant future. The rate of change has been great in the last twenty five years and seems to be accelerating. Thus, no trends seem reliable except that the pace of change and growth will increase.

Twenty Five Years of Progress

		1984
Computer	Univac 1105	IBM 4381-P2 (UNCCC) IBM 3081K (TUCC) IBM 370/168 (TUCC)
Technology	Vacuum tube	Microelectronic LSI
Main	8K bytes	16M-bytes (UNCCC) 24M-bytes (TUCC)
Auxilliary Storage	144K bytes (fast drum)	9G-bytes (UNCCC) 33G-bytes (TUCC) (3350 and 3330 disk)
Operating System	Monitor	Multiprogramming with Virtual Storage
Cycle Time	2×10^{-5}	26×10^{-9}
Staff	20	50

UNC-CH Computation Center Directors 1959-Present

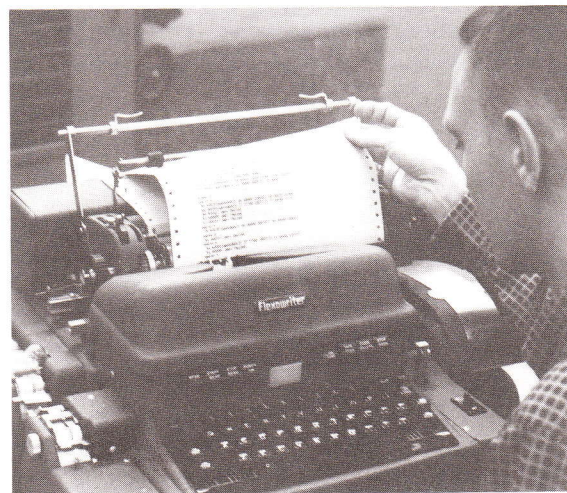
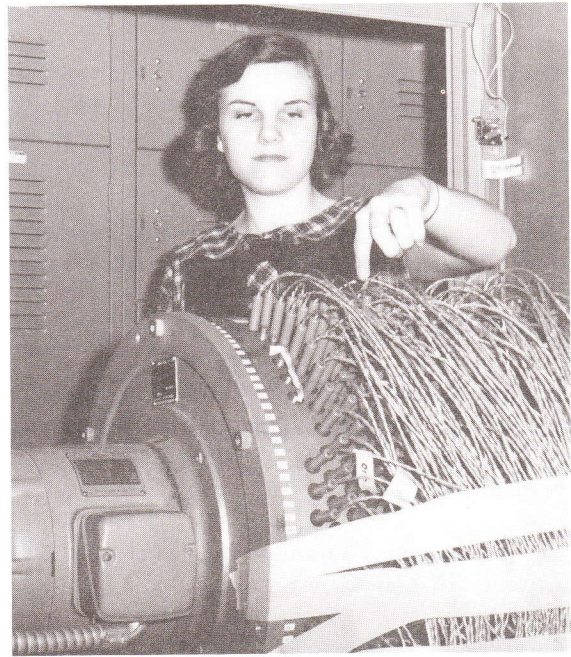
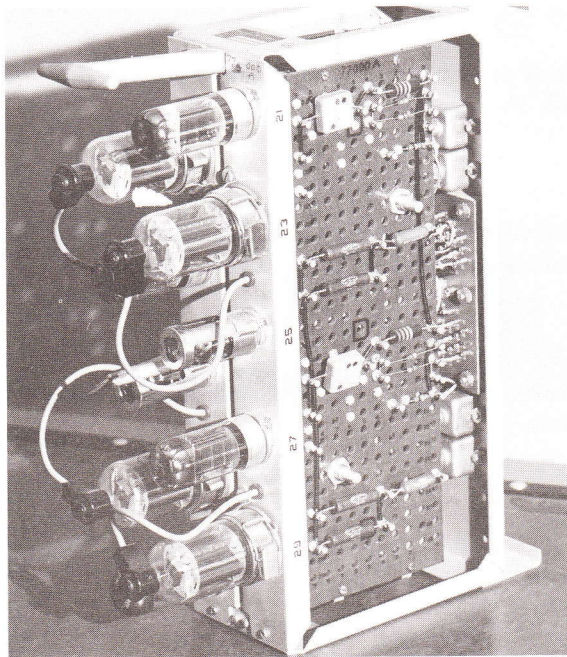
John W. Carr,III
December 1958-August 1963

William Hanson
September 1963-August 1968

Paul Oliver
September 1968-January 1970

James J. Batter
February 1970-March 1983

James O. Kitchen
(Acting Director)
March 1983-Present



Twenty Five Years Ago—The Univac 1105 in Pictures

(1) View east of the machine room in Phillips Hall showing the Univac 1105 including, from foreground to background, tape drives, the console, and the processing and memory units. The drum storage unit is not in view; it was located to the far left rear of the room. (2) Chassis assembly from the processing unit reveals the 1105's vacuum tube technology. The 1105 had 7200 tubes. (3) Gloria Burnham, UNCCC programmer, points to the read/write heads of the magnetic drum unit. The device could store 32K words or the equivalent of 144K bytes. (4) Close-up of Flexowriter paper tape machine which was used as the operator's console terminal and for program and data entry. The paper tape reader and punch are on the left. (5) As one of the largest computer installations in the U.S., the Center attracted many outside groups for tours and demonstrations. Here, the console is explained to a local high school science club.

RECENT CHANGES IN THE UNCCC AND TUCC SYSTEMS

Since the publication of the April *Newsletter* the Center and TUCC have made several important hardware and software changes. They are summarized below.

- *4381-P2 Installed at UNCCC:*

During July, the IBM 4341-M2 with eight megabytes of memory and the IBM 4341-M11 with eight megabytes of memory were replaced with an IBM 4381-P2 with 16 megabytes of memory.

- *Plotter Replaced:*

A four-pen CalComp 3051 plotter was installed at UNCCC in June and the Broomall plotter was removed in July. This change required relinking all software that uses the plotter.

- *IBM 3725 Installed:*

During August, an IBM 3725 communications controller was installed at UNCCC. This will allow the Center to provide full-screen support for 3270-type terminals.

- *T1 Circuit Installed:*

During August, a T1 circuit was installed at UNCCC that greatly increases the Center's communications capacity to TUCC.

- *Gandalf PACX Increased in Size:*

During August, the size of the Gandalf PACX communications equipment was increased by 50%. This required that the PACX and all the communications equipment be moved to a new location on the machine room floor.

- *IBM PCs Added to Microcomputer Lab:*

During August, ten IBM PCs were added to the Center' Microcomputer Laboratory in Phillips Hall. The PCs are configured with either 640K or 256K of memory, color graphics adapter, color display, printer adapter, and graphics printer. Software available for them includes DOS, Basic, Turbo Pascal, several editors and compilers, and a spreadsheet program.

- *Logon Procedures Simplified:*

During August, two changes were made to the UNCCC logon procedures.

First, acronyms were installed to identify interactive services. The acronyms are TTSO (for service class 11), TWYL (for service class 17), UWYL (for service class 7), UDTS (for service class 5), and UDTS48 (for service class 6). The backspace character is not recognized currently in the logon procedure. Therefore, if you make a typing error, hit return and then retype the service acronym.

The second change is the elimination of speed sense characters. These characters were 'H' for TUCC services, the caret for 1200 baud terminals, and the slash for 300 baud terminals. Now, after receiving 'service class start' from the PACX, you may log onto TSO by typing your userid only; and you may log onto WYLBUR by typing 'Y' or 'y'. You should no longer type the 'h' for TUCC or the caret or slash for 1200 baud or 300 baud. When you get 'service class start' for TSO, type your userid; for WYLBUR, type 'Y' or 'y'.

Please note that the speed sense character still will be required for logging onto TUCC directly through 549-6011 for TSO and 549-8881 for TUCC WYLBUR. However, it will not be required when using 929-9911 to log onto TTSO, TWYL or UWYL through the PACX.

- *Disk Changes:*

In August, the Center's online disk storage was converted from 3330s to 3350s. This involved moving all the data sets and recataloging them.

As the disks were converted, the Volume Table of Contents (VTOCs) were changed to indexed VTOCs. This is a new format for the VTOC that allows data sets to be accessed faster.

Another four 3350 spindles were installed in August.

- *K Upgrade at TUCC:*

On March 31, TUCC's 3081 was upgraded from a D model to a K model machine. This upgrade was expected to increase throughput by about 20 percent. However, the 3081 is now running 41 percent faster, as measured by the stream of benchmark jobs TUCC uses for evaluation.

- *Floating Point Systems Attached Array Processor:*

In April, TUCC inaugurated service on a Floating Point Systems FPS-164 scientific attached processor. The FPS-164 is a fast FORTRAN computational machine which is attached to the IBM 3081K mainframe. The FPS-164 consists of the following components: the attached processor two million 64-bit words of memory, two 135-megabyte disk drives and 16K words of table memory RAM. Jobs are compiled and link edited on the 3081K and transferred to the FPS-164 for execution.

- *Access to the Cyber 205 at Colorado State University:*

During May, TUCC installed a 9600 bps leased line to enable users to access a Control Data Cyber-205 computer located at the Institute for Computational Studies at Colorado State University. The machine is a large scale vector processor capable of extremely fast floating point calculations. Jobs may be built at TUCC and sent via the leased line to Colorado State for compilation and execution.

- *Operating System Changes at TUCC:*

The SP 1.3.3 version of JES2 was installed at TUCC in June. The entire TUCC Operating System is now at the 1.3.3 level. UNCCC is at the 1.1.1 level but expects to convert to the 1.3.3 level this fall.

- *TSO Session Costs Now Reported:*

A new feature was installed with the new version of JES2 at TUCC. When you logoff TSO, you now get a detailed report of the cost of the session. (Unfortunately, it does not appear likely that this information will be provided for a WYLBUR session in the near future.)

- *Seven-Track Tape Drive Removed from TUCC:*

TUCC's last seven-track tape drive was removed on August 1. However, arrangements can be made for converting seven-track tapes to nine-track tapes and vice versa through our Tape Librarian.

- *TSO 300 Baud Dial in Number Changed:*

The telephone number for TSO at 300 Baud at TUCC was changed during July from 549-8811 to 549-6011.

- *SPSS Removed:*

SPSS and SPSSM have been replaced by SPSS-X at both UNCCC and TUCC (See TUCC Document LS-102). The SASSTAT procedure for running SPSS on SAS files has not yet been converted to SPSS-X (See TUCC Document LS-102).

- *LISREL Installed:*

LISREL has been installed at TUCC (not at UNCCC) and runs under SPSS-X (See TUCC Document LS-102).

- *Three New Commands for WYLBUR:*

Three new commands were installed in WYLBUR at UNCCC and TUCC this summer.

1. SET CACHE

adds passwords to a cache that is supplied when jobs are RUN from WYLBUR.

2. SHOW DSLIST

displays combined qualification levels of data set names below the specified level. It is similar to the TSO LISTC command.

3. SHOW FULLACT

is used to display the account code in use by the WYLBUR session.

THE FUTURE OF COMPUTING AT UNC-CH

by
Charles Morrow

Dr. Charles Morrow is Provost of the University of North Carolina at Chapel Hill where he also is Professor of Chemistry. Dr. Morrow has used UNCCC's computers since the Computation Center was first formed in 1959.

The University of North Carolina at Chapel Hill has made good use of computers during the twenty-five years since the founding of the Computation Center. The people associated with the University expect to make more and more use of computing equipment. The pace of technical development makes the distant future hard to discern, but the University's computing goals for the near future are well known. These goals, the first steps toward which the University has already taken, are:

1. acquisition of more microcomputers;
2. completion of the campus broadband network;
3. provision of electronic access to bibliographic information in the University libraries;
4. installation of extremely large and extremely fast computers;
5. nontraditional use of computers.

Greatly increasing the number of microcomputers in the University will encourage students to put the impressive power of these small machines to work in all parts of the regular course of study. These microcomputers will enable students further to develop any knowledge of microcomputers they bring with them at the time of enrollment and will encourage students to increase their mastery of computer techniques. Teachers will revise course plans to take advantage of microcomputers, if the machines are widely distributed and readily available to students. One can expect the capacity and speed of small computers to increase in coming years, so that planning for their use cannot be a static matter.

The campus broadband network is already transmitting video signals for certain joint University of North Carolina at Chapel Hill-Duke classes. In the near future, computer users can expect to use the network to communicate with the Computation Center, the Triangle Universities Computation Center (TUCC), the Microelectronics Center of North Carolina (MCNC), and with one another. The clear intention of the University is to extend the broadband network beyond the first phase, the backbone of which is now in operation. The immediate next step is to provide the relatively short lines which will connect the existing backbone with the buildings near it. Following that is the extension of the large capacity coaxial cable system toward the Davis Library and points beyond it. The eventual goal is to have the broadband network reach all parts of the campus.

Many persons in the University anticipate with understandable eagerness the simultaneous provision of the broadband network and the online union catalog of the libraries at Chapel Hill, Duke, and North Carolina State. Testing of the online catalog system is currently underway. Before long it will be available to library users, although necessarily at first they will have to go to Davis Library to use it. The next step is to arrange for remote electronic consultation of the catalog. Bibliographic access includes much more than just inspection of the catalogs of the three Triangle libraries, impressive as they are. The national networks to which these centers belong will provide even greater quantities of information and power for searching.

With the installation of the FPS-164 at TUCC and the availability through TUCC of the Cyber 205 at Colorado State University, users may now consider solving very large computing problems here rather than on high capacity equipment elsewhere. The availability of this new equipment will undoubtedly stimulate important new research at UNC-CH.

The coming increase in access to computing equipment, the improvement of software, the provision of training in computer usage, plus an entering student body with ever greater familiarity with computing—all this will foster the use of computers in new ways. New applications will appear not just in areas where computers are relatively unfamiliar but also in areas like the natural sciences, in which computer applications have for some years been an accepted part.

The University community looks forward to putting new computational resources to work as it continues striving to give students an environment with the greatest possible intellectual stimulation.

REVISION OF CENTER USER HANDBOOK ANNOUNCED

There is no doubt that IBM's Job Control Language (JCL) is difficult to learn and difficult to use. Stan Kelly-Bootle defines this language as:

“A deliberately abstruse software barrier set up to prevent ordinary programmers from running their own programs.

As the name partly implies, JCL was devised to create jobs for otherwise displaced intellectuals, and to thwart the gloomy predictions of computer-induced unemployment made in the 1950s.”

(The definition above is reprinted with permission from *The Devil's DP Dictionary* by Stan Kelly-Bootle, p.72, published by McGraw Hill Inc., copyright 1981.)

UNCCC Programming Services has completely rewritten the guide to using JCL and the mainframe computers at UNCCC and TUCC and renamed it *Communicating with MVS*. Copies should be available from the Administrative Office in Phillips Hall by the time fall classes start.

Communicating with MVS was written for two particular types of computer users:

1. The “one-time” user who doesn't want to learn anything more than is necessary to complete a particular task using the IBM mainframe computers at the UNC Computation Center (UNCCC) or the Triangle Universities Computation Center (TUCC).
2. The beginner who wants to learn but doesn't know where to begin.

For the “one-time” user, we prepared many examples of complete jobs to perform a variety of tasks hoping that one can be modified to suit your needs. In addition, we provided a detailed index to help you find the information you need.

For the interested beginner, we tried to present the information you are most likely to need, together with examples, explanations, and pointers to more complete documentation.

The book is organized as follows:

Chapter 1 contains a brief overview of the operating system.

Chapter 2 describes the syntax and rules for coding Job Control Language (JCL) statements and Job Entry Subsystem 2 (JES2) statements.

Chapter 3 covers how to use the cataloged procedures for the most frequently used programs, including the compilers.