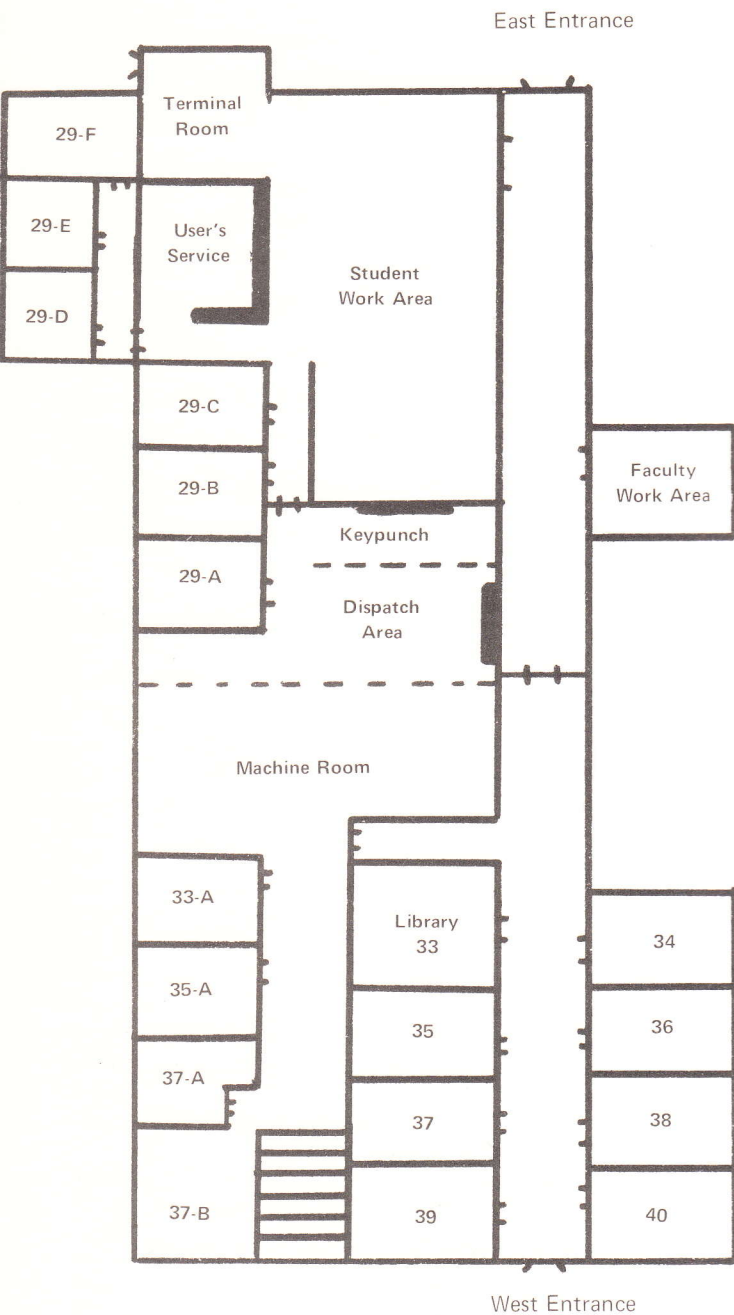


THE
COMPUTATION
CENTER



UNIVERSITY OF
NORTH CAROLINA AT
CHAPEL HILL

UNC COMPUTATION CENTER FLOOR PLAN



THE COMPUTER AT CHAPEL HILL

The University of North Carolina Computation Center began operation in August 1959, to provide the University with the capabilities and power of a modern computing system for use in research and education. The State Government, Remington Rand (Univac), The National Science Foundation, and The Bureau of the Census purchased a Univac 1150 computer. This computer was replaced in July 1966 by an IBM System/360 model 30. The model 30 was in use for approximately 1 year and was replaced by a larger model 40 in the 360/system. The model 40 was used for three years and was up-graded to a model 50 in October 1970. The model 50 is being rented from IBM and is now in operation at the Computation Center on a 24 hour, 7 day week basis.

THE HARDWARE

The IBM system/360 incorporates the most advanced philosophies of the large-scale computers into a modular system economical enough for smallscale users and powerful enough for highest performance requirements. The model 50 here at the center has a 384-K byte core storage with the access time of 0.5 microseconds. The main storage read/write cycle time is 2.0 microseconds. The central processing unit contains the facilities for addressing main storage, for retrieving or storing information, for arithmetic and logical processing of data, for sequencing instructions in the desired order, and for initiating the communications between storage and external devices. The card reader is used for input only and reads cards at the speed of 1000 cards per minute. The card punch, used for output punches cards at the speed of 300 cards per minute. The disk units are used for storing information, and work similar to a record player. The disk packs have 20 surfaces that can be used for reading or writing data, 29.5 million bytes of information can be stored on one disk with access time of 60 milliseconds, data transfer to the processor is 312,000 bytes per second. The disk rotate at 2400 rpm. The printer is used for output only and prints at the speed of 1100 lines (132 characters) per minute, this is approximately 24,000 words per minute. The tape drives are used for input and output to the computer. Reading and writing on these units is very similar to an audio tape recorder. Each tape unit has a

nine track read/write head and reads and writes 800 characters per inch of tape. These magnetic tape reels hold 2400 feet of tape, which amounts to 15,000,000 bytes of information per reel.

The most unique feature about the model 50 is the teleprocessing unit. The model 50 is connected by telephones lines to the model 75 computer which is located at the Research Triangle Park. The teleprocessing unit acts as a telephone exchange between the computers. Data can be transmitted at the speed of 5100 characters per second.

SYSTEM/360 MODEL 75 AT TUCC

The Triangle University Computation Center (TUCC) is a facility organized by Duke University, North Carolina University at Chapel Hill, and North Carolina State University at Raleigh. The IBM System/360 model 75 is housed in the Sciences and Technology Research Center Building at the Research Triangle Park. This computer is being rented from IBM by the 3 universities. Located on each campus is a model 40 or 50 IBM computer, these computers are linked to the model 75 by telephone lines. Programs can be teleprocessed (sent via telephone lines) to the model 75 from the computers located on either campus. The model 75 is one of the larger computers in the computing field, for example, it can add one million ten-digit numbers in less than a second. It has a 1 million byte fast core and a 2 million byte slow core storage units, three 2314 disk units, five tape drives, 1 card reader, and printer. Perhaps the most significant feature of the Model 75 is its programming versatility. By the use of multiprogramming, TUCC runs remote batch job processing concurrently with on-line terminal facilities.

ORGANIZATION OF THE COMPUTATION CENTER ADMINISTRATION

The administrative staff of the Computation Center consists of a director, two associate directors, librarian, secretarial and clerical personnel. The director reports to the provost.

PROGRAMMING STAFF

The programming staff at the Computation Center is divided into 2 groups, systems, and applied programming. The systems programming group is charged with the procuring, implementation, and maintenance of operating systems, language processors, special purpose systems, and utility systems. The applied programming group is charged with assisting the users of the center in successfully carrying out their computer work. Members of the staff are expected to work in many areas, including programming and analyzing both user and internal projects, maintaining and developing computer program libraries, instructing and teaching users on various computer related topics, providing general advice and assistance to users problems and preparing and issuing documentation.

OPERATIONS STAFF

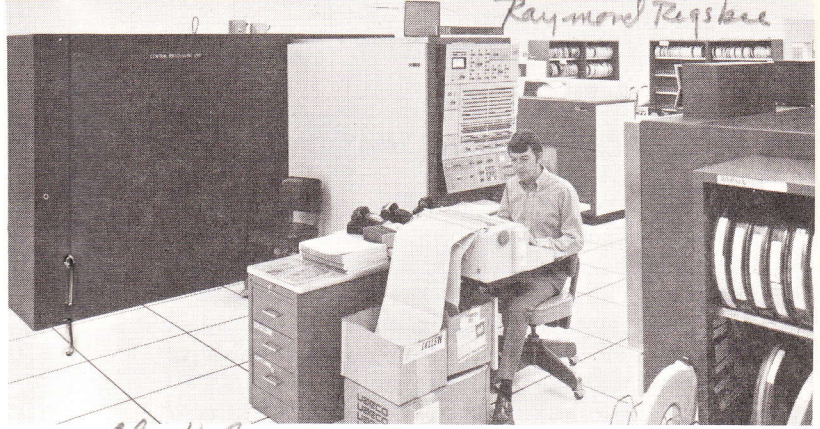
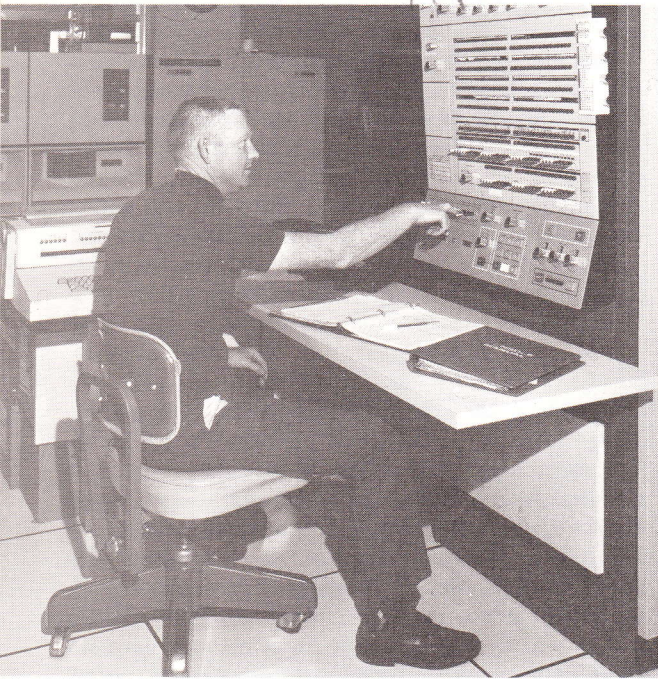
The operations staff consists of specialists trained in the operation of the computer and its associated auxiliary equipment. Once the programs and data for the computer have been prepared, this group takes control and handles all elements of processing which require the use of any hardware. The center maintains a key punch section where programs and data are prepared for the computer by transferring the information to punch cards. The dispatch area which is located next to the computer is where all programs are submitted to be processed on the computer.

UNIVERSITY USES OF THE COMPUTER EDUCATIONAL ACTIVITIES

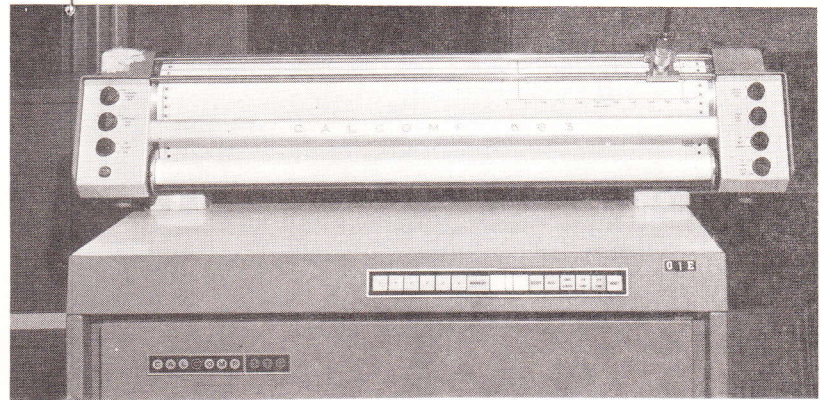
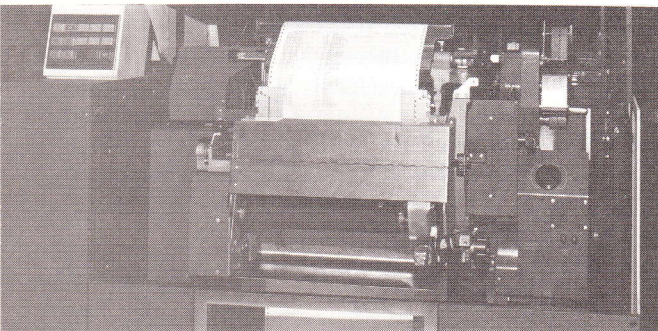
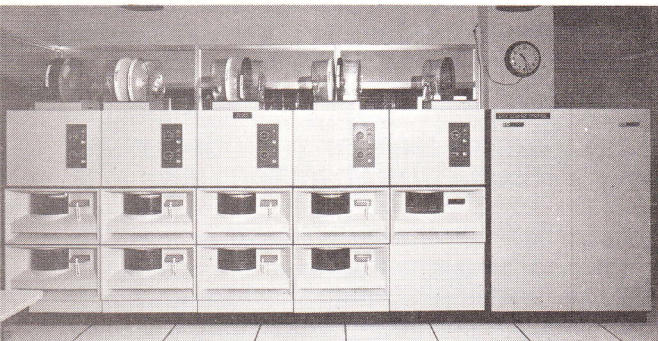
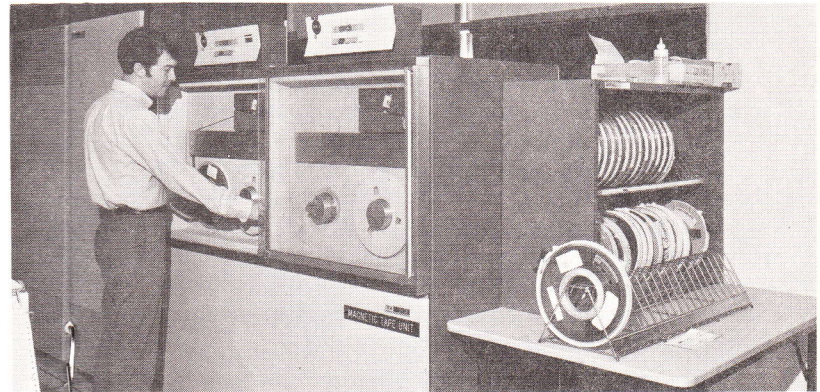
Courses designed for students especially interested in high-speed computation or data processing are taught in the department of Information Science. Center personnel also instruct other departments in which the computer is used as a tool for problem solving. The computer is also a valuable teaching aid; for example, students in the school of Business Administration practice management decision making using the "Management Game," a program which simulates the detergent industry with a complexity which would be impossible without a large scale computer.

1. Computer Area
2. Computer Console
3. Card Reader
4. Magnetic Tape Drives
5. 2314 Disk Unit
6. High Speed Printer
7. Calcomp Plotter

Wally Jones



Clark Gurganus



RESEARCH APPLICATIONS

The computer has been used extensively for faculty research, student theses, and dissertations in such fields as Chemistry, Physics, Biostatistics, City Planning and Business Administration, and is being applied in increasingly broader areas of investigation. Among its more unusual applications is a news editing program, produced by the departments of Journalism as an aid in its research in communications. The news editing program produces a "Newspaper" which is quite easy to read. In the field of Library Science a program called KWIC (key work in context), which indexes publications and documents by important words in their titles, is available. The program has indexed in areas such as medicine, applied mathematics, and chemical patent research.

CAREERS IN THE COMPUTING FIELD

The computing profession is approximately twenty six years old. From its beginning with the construction of the first automatic digital computer, the Harvard Mark I (Harvard IBM Automatic Sequence Controlled Calculator) in 1944, it has experienced a phenomenal growth, paralleling the computer "Population Explosion." There were about 39,000 automatic digital computers in operation in this country in 1967, today there are approximately 55,000. The demand for design engineers, programmers, operations, maintenance, and sales personnel is greatly increasing. Anyone with an interest in mathematics, puzzle solving, games such as bridge, checkers and chess, will find programming a challenging profession. A student's interest in radio building indicates that a career in designing or maintaining computers might be enjoyable.

Access Time:	The time interval between the instant at which information is called for from storage, and the instant at which delivery is completed.
Binary:	A number system which uses two digits, zero and one, in arithmetic process instead of the digits zero through nine as in the decimal system.
Bit:	The abbreviation for binary digit.
Byte:	The smallest addressable unit in the system. (8 binary digits)
Compiler:	A computer program which translates instructions written in a problem oriented language into an equivalent program in the machine language of a particular computer.
Core:	A magnetic material capable of assuming one of two magnetic states and thus representing a binary digit.
Data:	A collection of facts represented by numbers, letters, and symbols, which is processed or produced by the computer.
Flow-Chart:	A schematic representation of the logical steps necessary to solve a particular problem. Symbols are frequently used to represent the operations such as compute, substitute, compare, jump, copy, read, etc.
Hardware:	The physical equipment or devices forming a computer.
Machine Language:	The code which is used to represent program and data within the computer.
Memory:	The section or units within the computer or peripheral equipment where information is stored pending future use.
Microsecond:	One millionth of a second.
Millisecond:	One thousandth of a second.
Nanosecond:	One billionth of a second.
Program:	The precise sequence of operations which the computer must perform on the data in order to solve a given problem.
Programmers:	A person who analyses a given problem and prepares the program necessary for its solution by a computer.
Software:	The computer programs furnished by the computer manufacturer which aid in the use of the physical equipment (Hardware). The software includes the control programs such as the supervisor, the programs which translate our program from the language in which they were written into machine language; and common usage programs such as a program to sort data.