

From the Office of Public Relations
Massachusetts Institute of Technology
Cambridge 39, Mass.

For Release in MORNING Papers
of MONDAY, November 3, 1958

IBM 704
NEW
CORE
MEM.

Note to Editors: Photos of new core memory of IBM 704 can be made. Please call Public Relations Office for arrangements, if you wish to assign a man.

The hardest working and most complex "student" at the Massachusetts Institute of Technology--the IBM 704 Computer--now has a vocabulary greater than that of Sir Winston Churchill, long considered to be one of the most erudite men in the world.

Recent modification on the high-speed data-processing machine located in M.I.T.'s Karl Taylor Compton Laboratories has provided the computer with the ability to remember approximately 60,000 English words, according to officials of the Computation Center. This is considerably greater than the scope of the British statesman's command of the English language. Sir Winston has been credited with the ability to use 50,000 words.

A crew of six experts from the International Business Machines Corporation spent slightly more than two weeks at the task of modifying the computer. The major change involved was the replacement of the original magnetic core memory by a larger memory with approximately four times the previous capacity. Additional speed for the computer also was gained, officials reported.

The IBM 704, in common with other large-scale computers, stores its information in the binary system, which counts by two's rather than ten's, and expresses words as well as numbers in binary digits

(more)

IBM 704 - M.I.T.

2.

known as "bits." Until the recent improvement, the computer was capable of recalling up to 8,192 words of as many as 36 bits. Now its enlarged memory has enabled the IBM 704 to hold a total of 32,768 words of this length.

Information theory experts at M.I.T. say that by using a scale based on the number of binary digits in an average English word, and taking other factors such as redundancy (repetition) of certain speech characteristics into consideration, the computer now is capable of a maximum vocabulary of about 60,000 English words.

Although the physical appearance of the Computation Center remains almost the same, the modification was an expensive operation, requiring skilled work in installing sensitive and complex storage plates. The memory grids, about six inches wide, are made up of thousands of fine wires, on which are strung many pinhead size magnetic elements that are the memory cells. Grids are stacked like pancakes in a small area. A total of 1,179,648 memory cells are now contained within the stacks.

Because small particles of dust can disturb the tiny electronic components, all work had to be performed under an air-tight plastic cocoon. It was also necessary to install air ducts to maintain a constant temperature within the apparatus. The completed equipment, including protective covers and insulation is about five feet high, twelve feet long, and three feet wide. The actual performing instrumentation within this takes up about five cubic feet of space.

The additional capacity and increased speed of the 704 will allow even more varied use of the computer, according to Professor Dean N. Arden, who is in charge of programming research for the facility.

(more)

IBM 704 - M.I.T.

3.

"We are nearing the time when the improved IBM 704 will be in use 24 hours a day," Professor Arden said. "As a teaching and research instrument, the computer has proved extremely satisfactory, and has resulted in a noticeable increase of interest in this field among students."

Professor Arden pointed out that modification of the equipment has resulted in a considerable speed-up in processing information. "The computer now has a much larger rapid access store capacity," he said. "This means that we can now have information available in a matter of millionths of a second, which previously was accessible only in thousandths of a second or longer. When very complicated calculations are furnished the computer--involving problems that may take hours to solve--this speed-up becomes important."

More than two dozen New England colleges and universities are using the 704 computer on a wide variety of problems ranging from improved methods of long-range weather predictions to a study of old English poetry. Students and staff of nearly every department at M.I.T. are conducting important non-classified research with the aid of the prodigious capabilities of the machine.

"It is only in the matter of speed that the computer is superior to the human being," Professor Arden said. "While it is possible to make electronic devices that have great memory capacities, they are still inferior to the human brain. The famed scientist, Dr. John Von Neuman, once estimated that the human brain has a memory capacity that is approximately 10,000 times that of the best computer now in existence. The brain is by far the finest of all computing mechanisms."

One of the most significant findings during the past year's work

(more)

IBM 704 - M.I.T.

4.

with the computer--which was installed at M.I.T. without charge by the IBM Corporation--is a need for developing a generation of students who can attain the skills needed to work with intricate data-processing machines.

"The role of the 704 at M.I.T. is primarily an educational one," Professor Arden said, "and computers can only reach their fullest potential through the development of people who are more familiar with them in the sophisticated sense. The next generation of college graduates will supply the crop of mathematically and logically inclined personnel that are needed. The successful application of high-speed computers introduces a need for a precise logical approach to problems, which is most easily developed at an early stage in the educational process. New students will have to be better trained, especially in the fields of mathematics and logic."

Interest in computers has spread to many areas. One letter of inquiry that arrived recently at M.I.T. came from a prisoner in Leavenworth, Kans. "The man showed a high degree of knowledge in the field, and asked pertinent and intelligent questions," Professor Arden said. "We answered the letter, too," he added.

Approximately 50 persons are currently assigned to the Computation Center at M.I.T. Dr. Philip M. Morse, Professor of Physics, is director of the center. Assistant director is Dr. Frank Verzuh. Professor Arden and Dr. Fernando J. Corbato, who is in charge of the graduate student program, are assistants to the director.

The recent modification brought the total value of the computer and its supporting facilities to more than three million dollars. It is the most versatile machine devoted entirely to educational purposes in any educational institution in the world.