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FOR A.M. NEWSPAPERS OF
SUNDAY, APRIL 5, 1964

Time-sharing of a computer over intercontinental distances has just been demonstrated between Edinburgh, Scotland, and Cambridge, Mass.

In the demonstration, a scientist appearing before the annual meeting of the British Computing Society at Edinburgh, was connected -- via a telegraph and trans-oceanic cable line -- to an IBM 7094 computer at the Massachusetts Institute of Technology.

At the same time he was demonstrating his trans-oceanic use of the computer to his colleagues at Edinburgh, four other individuals at consoles in various parts of M.I.T. also were using the same machine to deal with their own individual research problems.

The Scotland-to-Massachusetts demonstration was carried out between 4:22 a.m. and 5:24 a.m. (Cambridge time) Friday (April 3) under auspices of M.I.T.'s Project MAC. There could have been up to 23 other individuals at remote consoles around M.I.T. using the computer at the same time it was in use from Scotland, but because of the early hour in Cambridge there were only four others on the system. During regular working hours, the MAC system operates almost continuously at its present capacity of 24 simultaneous users.

MAC is part of a major national program of research on advanced computer systems being sponsored at several locations by the Advanced Research Projects Agency

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MAC
INTERCONTINENTAL

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of the Department of Defense. MAC itself is supported under a contract from the Office of Naval Research on behalf of ARPA.

The scientist who carried out the demonstration in Edinburgh was Dr. M.V. Wilkes of the University of Cambridge, England. He communicated with the M.I.T. computer through a teleprinter machine set up in an auditorium room where British Computing Society technical meetings were being held. Closed circuit television permitted everyone in the meeting room to obtain a clear view of Professor Wilkes' console and his dialogue with the MAC computer.

Dr. Wilkes, who spent several months working at M.I.T.'s Project MAC as a visiting researcher on leave from his university post, presented a technical paper on time-sharing before the society and, during his talk, illustrated time-sharing by his trans-oceanic use of the MAC computer.

The telegraph link between Edinburgh and the cable switching center in London was provided by the British General Post Office. The trans-oceanic cable link from the British Isles to New York City was provided by Western Union International, Inc. The connection from New York City to Cambridge was provided by the Western Union Telegraph Co. through its Telex service.

In all cases, only regular and normal commercial telegraph and cable channels were employed in the demonstration.

In the Project MAC laboratory (545 Technology Square, Cambridge), the telegraph line was tied into the IBM 7094, enabling Dr. Wilkes in Edinburgh to use the giant machine directly as if he were in the same room with it. A teleprinter monitoring Dr. Wilkes' dialogue with the computer was installed in the M.I.T. laboratory so scientists

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there could observe the demonstration. But this monitoring set was not necessary to the operation and Dr. Wilkes operated the computer directly.

For demonstration purposes, Dr. Wilkes worked with a small compound interest computing program such as might be used by banks and with an electrical filter design program. He wrote the compound interest program himself and began the demonstration by typing the program into the computer via the long-distance link. He solved several hypothetical problems with the program, then went back and made changes in the program to show how easily and conveniently he could edit it and continue working. Next, he demonstrated the use of an electrical filter design program that was already in the MAC computer memory. Professor Wilkes communicated with the computer in a machine language called FORTRAN (for Formula Translator).

At the conclusion of the demonstration, Dr. Wilkes went off the computer link and typed out to MAC Assistant Director Richard Mills the message:

"All this absolutely magnificent. Edinburgh computing conference sends warmest thanks to Project MAC for a most successful demonstration."

Mills replied:

"It has been our pleasure. For your information, during most of the demonstration, there were four additional users on the system. The small number is due to the early hour. Project MAC sends regards and best wishes to the British Computing Society."

A similar intercontinental time-sharing demonstration is planned for mid-April when another former visiting researcher at MAC, Lars Monrad-Krohn of the Division of

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Electronics of the Norwegian Defense Research Establishment, will operate the M.I.T. computer from Oslo, Norway, in a demonstration for his colleagues there. Mr. Monrad-Krohn will use Norwegian Telephone Co. lines in Norway, RCA Communications, Inc., trans-oceanic cable facilities, and Western Union domestic lines in the U.S.

Professor Robert M. Fano, Project MAC director, said that, except for the fact that Dr. Wilkes was on the other side of the Atlantic, his use of the MAC computer while others were using it too, was nothing more than a normal routine for the MAC machine.

"The MAC computer daily is in use simultaneously by numerous different people at remote consoles here in Cambridge," he said. "The only real difference in this case was that the wire to Dr. Wilkes' console was longer than usual."

Time-sharing of a computer--that is, the simultaneous use of a single computer by many different individuals working on many different problems -- has been under development at M.I.T. for more than two years. Heart of the M.I.T. time-sharing system is a master computer program--called the Compatible Time Sharing System (CTSS) program--which was developed at M.I.T.'s Computation Center and which is being enlarged and pushed forward at both the Center and at Project MAC.

Basic purpose of time-sharing is to bring the ultimate user of the computer into direct and intimate communication with the computer at the user's convenience. At the present stage of CTSS development, the M.I.T. Computation Center's IBM 7094 is capable of being used simultaneously by up to 16 different individuals located at remote teleprinter consoles. The Project MAC IBM 7094, which Dr. Wilkes used, is capable of being used by up to 24 individuals at remote teleprinter consoles simultaneously.

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The remote consoles at M.I.T. are located in laboratories, study areas, offices and classrooms, giving researchers and students almost instant access to large-scale computational facilities.

The objective of Project MAC is to exploit time-sharing by pushing forward both the art of computer usage and the technology of computer hardware in order to make the computer a powerful tool to enlarging man's creativity. The acronym MAC stands for both machine-aided cognition, which expresses the broad objectives of the project, and multiple-access computers, which describes the project's major tool.

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