

(Mr. Lovett left the meeting during consideration of this item.)

56981

2005
MIT
Computation Center

It was, on motion,

RESOLVED that the sum of Ninety-eight thousand four hundred
RF 56199 dollars (\$98,400), or as much thereof as may be
necessary, be, and it hereby is, appropriated to
the MASSACHUSETTS INSTITUTE OF TECHNOLOGY for use
under the direction of Professor Philip M. Morse,
Director of its Computation Center, toward the costs
of exploring the potential uses of high-speed com-
puting equipment in the solution of theoretical and
applied problems in the social sciences, during the
three-year period beginning July 1, 1957.

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The above action was taken after an oral presentation of the project by Mr. Buchanan and following discussion.

Among the considerations presented were:

Social Sciences: Development of Social Science Disciplines

Previous Interest: None for this purpose.

General Description: The newly established Computation Center at the Massachusetts Institute of Technology (Professor Philip M. Morse, Director) has recently acquired from the International Business Machines Corporation a digital computer of the most advanced type, under terms by which IBM provides the machine and the costs of its maintenance and repair. To man this machine, which potentially has a wide variety of uses in all branches of science, including the social sciences, involves a salary budget of approximately \$100,000 per year. To be used effectively the machine needs not mere technicians, but scientists familiar with the actual problems in particular disciplines, with the machine's potential, and with a good deal of imagination. The services of the machine are to be available to universities and colleges throughout the New England area.

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The equipment to be supplied by IBM is described - at least for those who are knowledgeable in these recondite matters - by Professor Morse as follows: "The computing equipment of the Center, which will be furnished by the IBM Corporation, will primarily consist of a 704 computer and the related peripheral equipment. This machine is an up-to-date, fast, general-purpose electronic digital computer. The basic machine code includes over 80 instructions, including those for arithmetic operations with floating-point numbers. The basic operating time is 24 microseconds for most instructions, with a normal maximum of 240 microseconds. The 704 to be installed will have a magnetic core memory with a storage capacity of 8,192 words, each word containing 36 binary digits. (The storage capacity will be increased to 32,768 registers in 1958.) The computer will also have, as an additional storage device, a magnetic drum with a 8,192 word capacity. As with most modern computers, magnetic tape is used both for additional storage and for input-output requirements. The installation will have 13 tape units (at most 10 under computer control), each unit storing up to a maximum of 900,000 words.

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"In addition to the magnetic tape units, the input-output equipment which will be under direct computer control will be a punched card reader, a line-by-line printer, a card punch, and a photographic oscilloscope unit. In addition there will be units, not attached to the computer directly, for recording card information on magnetic tape and for reading information from magnetic tape and printing or punching cards. Finally, for card preparation purposes, there will be the usual assortment of standard IBM accounting machines, including key punches, printer, reproducer, sorter, etc."

For many research projects for which the machine can be used, or is potentially useful, the available funds (frequently Government funds) are such that Professor Morse can charge the project budgets for machine services rendered. Professor Morse estimates that about \$70,000 of his necessary \$100,000 salary budget for

machine technicians with intimate knowledge of the scientific disciplines can be so covered. He feels strongly, however, from discussions with his MIT colleagues in the social sciences that the potential uses of this new computer in the social sciences are very great indeed. He realizes, however, that few social science research projects have large enough funds to permit any appreciable contribution to his salary budget. Even more important perhaps is his conviction that considerable experimentation will be necessary before the potentialities of the machine for social science problems can be known with much certainty. In other words, he would like to use the machine experimentally on problems in the social sciences where there is a suspicion that the machine might be exceedingly useful. It is obvious, of course, that for linear programming problems, input-output analysis, and certain problems in communications the machine can be used. Professor Morse suspects, however, that the potential of the machine is very much greater.

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The grant requested would enable Professor Morse to add to his machine staff annually for three years a maximum of three men already familiar with different social science disciplines, who would acquire the necessary familiarity with the machine's workings so that they could explore with social scientists the machine's full potential. Since use of the machine is open to any qualified scientist in the New England area, a condition stipulated by IBM, Professor Morse proposes to have an advisory committee of distinguished social scientists from the region which would pass upon requests for work on particular problems.

Finances: The proposed grant of \$98,400 would be allocated annually approximately as follows:

Salaries

Senior scientist (1 full-time or 2 part-time)	\$ 9,000
Junior scientist (1 full-time)	7,000
Technicians (2)	10,800

	Brought forward	\$26,800	MASSACHUSETTS
Equipment		1,000	INSTITUTE
Supervisory, secretarial and contingencies. . . .		4,000	OF
Travel.		500	TECHNOLOGY -
Publication of reports.		500	COMPUTATION
	Annual Total	\$32,800	CENTER
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Comment: While it is conceivable that the potential uses of the machine for theoretical and applied problems in the social sciences will turn out to be less extensive than now anticipated, the probabilities are rather the reverse. In any case, the wise course appears to be to allow the MIT Computation Center to explore the possibilities of this new and exceedingly powerful machine within the social sciences.

Future Implications: If success attends the present venture, new possibilities for still further fruitful advance may open up.
