

For Release:

Tuesday, March 24, 1970

INTERNATIONAL BUSINESS MACHINES CORPORATION
ARMONK, NEW YORK 10504
ROBERT A. MORRIS 914/765-6436

International Business Machines Corporation
Armonk, New York 10504
Robert A. Morris 914/765-6436

TWO IBM EMPLOYEES
RECEIVE DISK STORAGE UNIT PATENT

ARMONK, N.Y., March 24 . . . Two employees of International Business Machines Corporation today received a patent on the movable-head computer disk storage unit.

United States Patent Number 3,503,060, which has been assigned to IBM, was issued to William A. Goddard of IBM's San Jose, California laboratory and John J. Lynott of the company's laboratory at Los Gatos, California.

In recognition of their invention, Mr. Goddard and Mr. Lynott recently shared an \$80,000 IBM Outstanding Invention Award, which was in addition to a \$20,000 award previously shared by the co-inventors. The \$100,000 total is the second largest amount ever presented by IBM for an invention.

The disk storage unit provides large-capacity storage of data outside a computer, which is directly accessible at high speed. Before it was developed, such data could be stored and retrieved only by relatively slow serial methods.

IBM/2

The disk storage unit holds data on the many "tracks" or recording paths of its magnetic disks. Its recording heads go selectively to any track on a disk surface to swiftly record or retrieve information. This concept is the basis for many direct access storage products made by IBM and others.

The patent issued today covers a broad range of disk drives as well as the combination of the drives with components necessary for a complete disk storage unit.

IBM will make available to others non-exclusive licenses under the patent.

IBM's first direct access storage product, the RAMAC 305 system, was introduced in 1956. Many advances have been made in the field since then. For example, RAMAC could store 2,000 bits of information per square inch of disk surface. IBM's largest disk storage product, the 2314 direct access storage facility, can store 220,000 bits per square inch.

#



For Release:

Tuesday, March 24

IBM CORPORATION
ARMONK, NEW YORK 10504
TELEPHONE 914/765-6436
TELETYPE 914/765-6436
FACSIMILE 914/765-6436
CABLE 914/765-6436
INTERNET 914/765-6436
WWW 914/765-6436
MAILING LIST 914/765-6436
SALES 914/765-6436
SERVICE 914/765-6436
RESEARCH 914/765-6436
DEVELOPMENT 914/765-6436
OPERATIONS 914/765-6436
FINANCE 914/765-6436
LEGAL 914/765-6436
HUMAN RESOURCES 914/765-6436
GENERAL INVESTIGATIVE DIVISION 914/765-6436
SECURITY 914/765-6436
COMPLIANCE 914/765-6436
ENVIRONMENTAL HEALTH AND SAFETY 914/765-6436
QUALITY MANAGEMENT 914/765-6436
CORPORATE COMMUNICATIONS 914/765-6436
PUBLIC AFFAIRS 914/765-6436
COMMUNITY RELATIONS 914/765-6436
LABOR RELATIONS 914/765-6436
INVESTOR RELATIONS 914/765-6436
REGISTRATION 914/765-6436
SECURITIES 914/765-6436
MUTUAL FUNDS 914/765-6436
PENSION FUNDS 914/765-6436
RETIREMENT FUNDS 914/765-6436
EMPLOYEE BENEFITS 914/765-6436
HEALTH CARE 914/765-6436
LIFE INSURANCE 914/765-6436
ANNUITIES 914/765-6436
MUTUAL FUNDS 914/765-6436
PENSION FUNDS 914/765-6436
RETIREMENT FUNDS 914/765-6436
EMPLOYEE BENEFITS 914/765-6436
HEALTH CARE 914/765-6436
LIFE INSURANCE 914/765-6436
ANNUITIES 914/765-6436

International Business Machines Corporation
Armonk, New York 10504
Robert A. Morris 914/765-6436

ARMONK, N. Y., March 24 . . . A patent on the movable head computer disk storage unit was issued today to two IBM employees and assigned to IBM. Receiving the patent were William A. Goddard, left, of IBM's San Jose, Calif. laboratory, and John J. Lynott, of the company's Los Gatos, Calif. laboratory. Disk storage units, like the IBM 2314 direct access storage facility in the background, provide large-capacity storage of computer data which is accessible at high speed. The inventors hold one of the magnetic disks on which the units store computer information and one of the recording heads used in recording or retrieving the information. In recognition of their invention, Mr. Goddard and Mr. Lynott recently shared an \$80,000 IBM Outstanding Invention Award. This was in addition to a \$20,000 award previously shared by the co-inventors. The \$100,000 total is the second largest amount ever awarded by IBM for an invention.

#

Lab Freedom Spins New Technology

Two engineers receive key patent, awards of \$100,000 for disk storage invention

In the spring of 1953 a large tombstone was hauled into the fledgling IBM research and engineering laboratory in downtown San Jose, Calif., and placed on an experimental magnetic disk. It was not a gag to mark the demise of an idea gone awry. Someone had suggested that the tombstone might be the right size and weight to laminate and flatten metal disks. But it wasn't.

"We weren't just trying out all sorts of wild ideas—there was a great feeling of freedom and creativity generated in the lab by the manager, Reynold B. Johnson," William A. Goddard recalls. "People were trying to store information on the sides of square rods, on continuous loops of tape, on pieces of tape, and even on steel piano wire. One thing was certain: It had become too time-consuming in many data processing applications to use reels of magnetic tape from which information has to be retrieved sequentially.

"Some ideas worked and some didn't and, finally, the first workable direct access storage file was developed."

Goddard managed the project to develop the file during the early Fifties; John J. Lynott was the mechanical engineer.

Last month, two events underscored the importance of the work they did 17 years ago. Goddard, now 56 and manager of Personnel Resources and Development at San Jose's Systems Development Division laboratory, and Lynott, 46, a senior engineer in Los Gatos' Advanced Systems Development Division laboratory, shared a supplemental \$80,000 Outstanding Invention Award for their work on the disk storage device. Previously, they had shared



William A. Goddard and John J. Lynott, who share invention award for disk storage file.

a \$20,000 award for the invention. Then, on March 24, the United States Patent Office issued Patent No. 3,503,060. The invention it covers is an important ingredient in today's \$250 million-a-year disk file industry.

The patent covers a broad range of disk drives as well as the combination of various drives with the components necessary to constitute a complete disk storage system.

Goddard and Lynott joined IBM in 1952 when Reynold Johnson, now an IBM Fellow, organized a laboratory at 99 Notre Dame Street in San Jose to

examine new technologies. Goddard, a slight, puckish man whose conversation is peppered with humor, majored in mathematics and physics at Occidental College, and taught school in Los Angeles before designing instruments for North American Aviation there.

Lynott came to IBM from a food machinery company in San Jose, where he designed machines for food processing. A native of Endicott, N.Y., he attended Syracuse University, where he switched from an engineering curriculum to liberal arts on the advice of

—The Disk

a counselor who said he had no potential as an engineer. Says Lynott, who has 19 patents in the areas of magnetic memory, photo-optical devices, printers, keyboards, and scanners: "I wish I still had that counselor's letter."

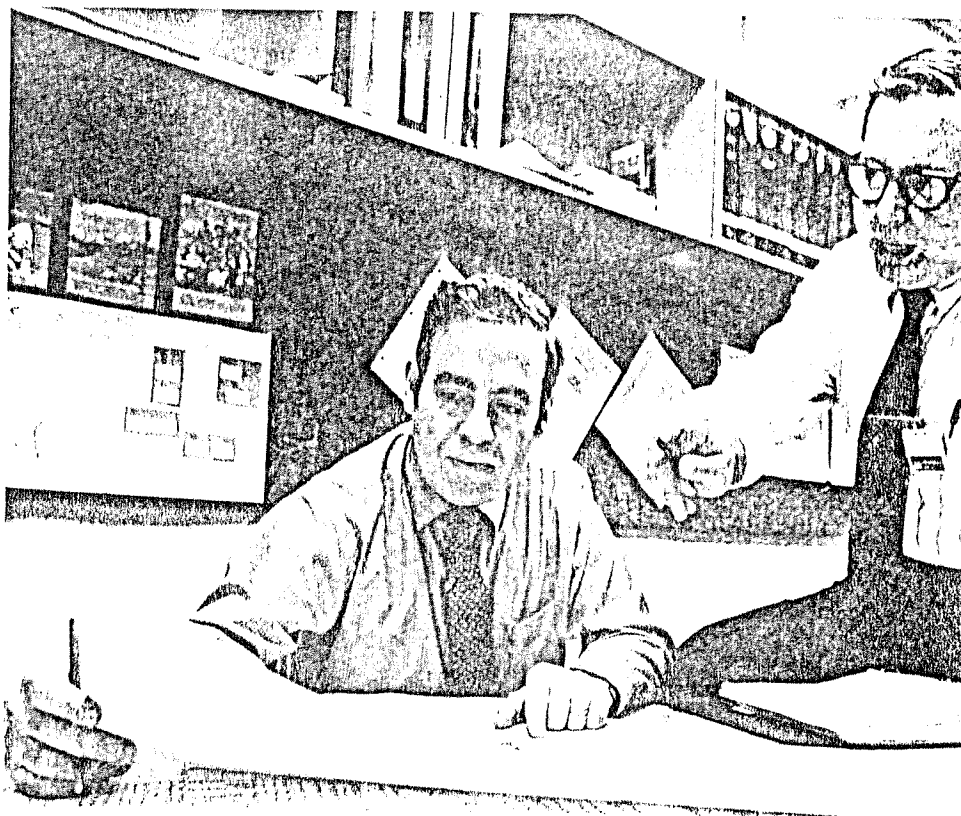
When the project team began to pursue the magnetic disk project in early 1953, they faced lots of problems. "We really improvised," Goddard says. "Parts for a prototype machine were scavenged from a junkyard in San Jose, and the first disks were cut out of aluminum with a router borrowed from someone's garage woodworking bench."

On February 9, 1954, data was written on magnetic disks for the first time, and the patent was filed on December 24 of that year. "Many of the other people who worked on developing the first disk file are still making great technical contributions to IBM," Goddard says.

The first file held 100 bits per inch, or five million characters on the whole 50-disk file. Access time to the information was about one second. Today's disk pack, such as that used in the 2314 direct access storage facility, has 12 disks. They hold 29 million eight-bit bytes that can be retrieved in an average of 75 milliseconds.

In 1959, when ASDD was organized, Lynott joined the division. At about the same time, Goddard began working in engineering education at the San Jose SDD laboratory. Since then, Goddard has received six other patents, some related to other direct access inventions. The two waited longer for their key patent because the Patent Office had to settle two conflicting claims.

But as they waited, tangible proof of their technical contributions grew up around them: the 356-acre San Jose plant and laboratory complex, where several thousand IBMers work to produce disk packs and drives based on the ideas formulated at the little building at 99 Notre Dame. □



Eugene A. Moser and Albert J. Gerney find users favor new computer operator's guide.

So That Good Ideas Won't Die

For some time, Dr. Richard Norwood and a few of his colleagues at the Systems Development Division laboratory in Boulder, Colo., had been toying with an idea. They wanted to add a pneumatic logic device to IBM magnetic tape drives to measure the tape loop velocity. The project didn't really fit into the mission or budget of Norwood's department so he went to the laboratory's Creative Development coordinator.

"I submitted the idea and a few weeks later I was given a budget of \$2,500 and the time to work on the idea," Dr. Norwood says. "The pneumatic device should make it possible to either use the present reel motor at higher tape speeds or allow a smaller, lower-cost reel motor. We also hope to enable the motor to take up or supply tape more efficiently, to cut down on the number of emergency stops, and to operate with less power."

Dr. Norwood is one of more than 50 people in SDD and General Systems Division laboratories throughout the country who used Creative Development funds in 1969, the first year of the program. The number of projects is expected to double this year.

Kenneth E. White, SDD coordinator

for Creative Development, explains the program this way: "Some laboratories have always had small programs of their own to finance independent ideas, but formalizing the program has made more money available and spread the word that such projects are welcome."

Another Creative Development project involved Systems Publications Manager Albert C. Gerney and Programming Writer/Analyst Eugene A. Moser at the Poughkeepsie laboratory. They wanted to specify the procedures in the System/360 Operator's Guide. "We got the money from the lab's Creative Development fund," Moser says. The "Moser-Gerney Guide eliminates the brackets and braces normally used in notation by program designers. It also describes procedures more simply and uses illustrations.

Each laboratory sets its own ground rules for considering projects, and each has a program coordinator who determines whether an idea has enough merit to be funded as an independent project. The coordinator also tries to get time during regular working hours for people to concentrate on their projects. As Kean puts it: "We're sort of technical ombudsmen." □