

## IBM HIGHLIGHTS, 1985 -1989

<b>Year</b>	<b>Page(s)</b>
1985	2 - 7
1986	7 - 13
1987	13 - 18
1988	18 - 24
1989	24 - 30

February 2003

## **1985**

### **Business Performance**

IBM's gross income is \$50.05 billion, up nine percent from 1984, and its net earnings are \$6.55 billion, up 20 percent from the year before. There are 405,535 employees and 798,152 stockholders at year-end.

### **Organization**

IBM President John F. Akers succeeds John R. Opel as chief executive officer, effective February 1. Mr. Akers also is to head the Corporate Management Board and serve as chairman of its Policy Committee and Business Operations Committee.

PC dealer sales, support and operations are transferred from the Entry Systems Division (ESD) to the National Distribution Division, while the marketing function for IBM's Personal Computer continues to be an ESD responsibility.

IBM announces in September a reorganization of its U.S. marketing operations. Under the realignment, to take effect on Jan. 1, 1986, the National Accounts Division, which markets IBM products to the company's largest customers, and the National Marketing Division, which serves primarily medium-sized and small customer accounts, are reorganized into two geographic marketing divisions: The North-Central Marketing Division and the South-West Marketing Division. The National Distribution Division, which directs IBM's marketing efforts through Product Centers, value-added remarketers, and authorized dealers, is to merge its distribution channels, personal computer dealer operations and systems supplies field sales forces into a single sales organization. The National Service Division is to realign its field service operations to be symmetrical with the new marketing organizations.

The Information Systems and Technology Group is realigned into two new organizations: the Information Systems and Storage Group — consisting of the Data Systems Division and the General Products Division — and the Information Systems Technology Group — consisting of the General Technology Division and the Systems Technology Division.

IBM Educational Systems is formed as a business unit to provide computer systems, educational courseware and services to elementary, secondary and vocational-technical schools.

Development and manufacturing responsibility for the IBM System 9000 computer is transferred from IBM Instruments, Inc., a wholly-owned subsidiary, to IBM Engineering Systems Products, an independent business unit.

IBM announces in June that the Entry Systems Division will move a portion of its headquarters from Boca Raton, Fla., to Montvale, N.J., and that the Systems Technology Division headquarters organization will move from Endicott, N.Y., to the Danbury, Conn., area. Three months later, IBM says the headquarters staffs of the IBM Credit Corporation and the Real Estate and Construction Division, along with the IBM pension fund staff, will move to Stamford, Conn., in 1986 and 1987.

ROLM Credit Corporation, previously a subsidiary of ROLM Corporation, becomes a subsidiary of IBM Credit Corporation

### **Products & Services**

IBM strengthens its high-end 308X computers with a number of enhancements and adds two new processors: the IBM 3090 Models 200 and 400. The company begins installations of its newest large computer in August with shipment — three months ahead of schedule — of the first IBM 3090 Model 200 processor (to Texaco Inc.'s data center in Bellaire, Texas). First announced in February, the 3090 can process information almost twice as fast as a comparable IBM 3081 in commercial applications. A vector processing feature is introduced for the IBM 3090 to enable it to run many computation-intensive programs between 1.5 and 3 times faster than previously possible.

IBM announces two desktop versions of its Series/1 computer. The new models each consist of two cards — one of them with a Series/1 processor on a chip — and either an IBM PC AT or a modified IBM PC XT.

The IBM 4700 Personal Computer, a new model of the IBM PC XT, is introduced, to combine data from standalone PC programs with applications which reside in a host IBM 4700 Finance Communication System. Also announced is the IBM 4702 processor, to handle a range of financial processing tasks at branch or remote offices.

Other hardware announcements include: the System/36 PC, to enable customers to share programs and data from both the PC and System/36 families; the IBM 3270 Personal Computer AT workstation and two graphics workstations — the 3270 PC AT/G and AT/GX; and a new model of the Personal Computer AT featuring a 30-megabyte fixed disk drive.

IBM adds two new models to its 3380 family of direct access storage devices (DASD). Models of IBM's advanced high-capacity DASD introduced in 1985 offer up to five billion characters of storage, twice as much as before.

The company also announces in 1985: two new ASCII display stations; the first color graphics capability for the IBM 3179 terminal; two low-cost desktop printers for the personal computer (the Proprinter, for high-speed impact printing, and the IBM Color Jetprinter for color charts, graphs, spreadsheets and text); three new industrial computers, including an entry-level model of the IBM 5531 Industrial Computer, and the IBM 7531 and 7532 Industrial Computers, to provide greater data processing power and flexibility for a broad spectrum of manufacturing uses; the IBM 9003 industrial computer, designed to handle a wide variety of manufacturing and process control tasks; and the IBM System/88, a fault tolerant computer system, to provide uninterrupted service to online terminal users in banking, retailing, manufacturing and other industries.

Among the software offerings announced in 1985 are: new program products for the System/38; 24 new education software products, including a series of 10 biology applications, and additions to IBM's Earth Science and Private Tutor Series; DisplayWrite 3 Version 1.10; COBOL Structuring Facility, to use artificial intelligence techniques to structure existing programs written

in the COBOL language so they can be maintained and modified more easily; Expert System Environment/VM, a development tool for constructing and using knowledge bases; and VM Programming in Logic, used for artificial intelligence research and development. IBM extends the capabilities of its Personal Decision software series with the announcement of several enhancements to provide the business/professional user with greater flexibility in a wide range of data processing applications. In addition, four new products that extend the capabilities of the IBM Assistant series are introduced.

A new network conversion unit and enhancements to the IBM 3710 network controller are announced to enable certain terminals and workstations to communicate more easily with host computers employing IBM's Systems Network Architecture.

IBM says that it will adopt the ROLM PhoneMail system, for voice messaging in the United States and Canada.

IBM introduces — six months ahead of its earliest forecast — the major elements of its token-ring local area network for sharing computers, printers, files and devices in a building or building complex. Also announced are two PC products that provide a range of telephone directory, answering and advanced voice command functions; and two modems — the IBM 3833 and 3834.

Other products launched in 1985: the IR/38, an advanced, benchtop spectrometer developed and marketed by IBM Instruments, Inc.; the IBM 9630 gas chromatograph, a powerful analytical tool designed for use in the chemical, pharmaceutical and food industries; the IBM Actionwriter 1 Typewriter, the company's lowest-price electronic typewriter; four new IBM Selectric System/200 typewriters — the IBM Wheelwriter System/20 and System/40 and the IBM Quietwriter System/20 and System/40 models — and the Quietwriter printer model 2, to provide added flexibility for text processing and graphics.

The Federal Systems Division wins a U.S. National Aeronautics and Space Administration (NASA) contract for the definition and preliminary design of the data management system for the first permanently manned U.S. space station. NASA also awards ROLM Corporation — a wholly-owned IBM subsidiary — a contract to install a business communications system to serve the Johnson Space Center, near Houston, Texas. The U.S. Federal Aviation Administration (FAA) awards IBM's Federal Systems Division a contract valued at \$197 million to upgrade the computer systems which support 20 air traffic control centers in the United States. The contract calls for installation of two IBM 3083 BX 1 systems at each center, and is regarded as a major step in the FAA's program to modernize the air traffic control system.

IBM Japan announces the nationwide Network Management Service for users who are establishing enhanced services networks for such activities as on-line banking and order entry. IBM Europe announces the formation of the European Networking Center in Heidelberg, Germany, to perform studies in telecommunications and networking with emphasis on Open Systems Interconnection.

### **Alliances**

IBM, Aetna Life & Casualty and MCI Communications Corporation agree that MCI will acquire substantially all the assets and operations of Satellite Business Systems.

IBM completes its divestiture of the ROLM Corporation's Mil-Spec Computer Division. The division was acquired by the Loral Corporation.

IBM Japan Ltd. and Nippon Telegraph and Telephone Corporation establish an equally-held joint venture in Japan called Nippon Information and Communication Corporation. The new venture, to begin operations in January 1986, will offer telecommunications services, including a system that provides users access to remotely located computers via telephone lines for exchange of text, computerized images and graphics.

IBM Italy and the ELSAG-Stet Group complete in September the formation of a joint venture company called SEIAF. The joint venture is to market products for flexible and integrated automation of manufacturing processes.

### **Science & Technology**

IBM mathematician Benoit Mandelbrot, who developed the theory of fractal geometry, is awarded the Bernard Medal for Meritorious Service to Science by Columbia University.

Scientists at IBM's Zurich Research Laboratory in Switzerland develop a compact scanning tunneling microscope that shows how atoms are arranged on a variety of surfaces. The unit is the latest development of a microscopy technique invented by the scientists in 1981.

An engineer at the Fishkill plant develops a better method for measuring time intervals required to turn on or off circuits on very large scale integration chips then in production within IBM.

U.S. President Ronald Reagan awards the National Medal of Science to retired IBM Fellow Herman H. Goldstine, and the National Technology Medal to retired employees Erich Bloch, Frederick P. Brooks and Bob O. Evans.

A new one-million-bit computer memory chip that operates twice as fast as the company's previously announced one-million-bit chip is fabricated by engineers at IBM's Burlington, Vt., laboratory. The experimental chip occupies two-thirds of the space of the previous memory chip. Researchers at IBM's Yorktown, N.Y., research center fabricate the densest integrated circuits yet reported on two types of experimental integrated circuit chips. The novel fabrication process allows scientists to shrink electronic circuits into an area 16 times smaller than possible with then current semiconductor manufacturing technology.

Yorktown researchers are working with scientists from the New York University's Courant Institute of Mathematical Science to design RP3, an experimental computer consisting of up to 512 processors, linked in parallel and connected to as many as two billion characters of main memory. Over the next five years, IBM is to provide more than \$30 million in products and support to a supercomputer facility established at Cornell University in Ithaca, N.Y.

**Facilities**

Projects completed in 1985 include a semiconductor manufacturing building in East Fishkill, N.Y.; manufacturing buildings in Kingston, N.Y., and Rochester, Minn.; a laboratory facility in Yamato, Japan; and expansions of the Greenock, Scotland, plant and the Zurich Research Laboratory.

**Corporate Citizenship**

The Summer Youth Employment Program, initiated by IBM and pilot-tested in 10 U.S. cities in 1984, is expanded to provide employment for 400 youths in 18 cities.

IBM awards 36 U.S. universities planning grants of up to \$12,000 each as part of a program to improve research and graduate education in the materials and processing sciences. IBM also announces that 13 universities would share \$27 million in cash and equipment grants from IBM to enhance graduate-level education in the management of information systems.

The IBM Faculty Loan Program grants leaves to more than 100 employees to give full-time assistance at educational institutions.

IBM announces a five-year program to enhance reading and writing skills among black South African children. IBM is to supply 250 South African schools with "Writing to Read" laboratories, at a cost of approximately \$10 million, for use by more than 37,000 black elementary school children per year. The company also says that it would make grants totaling \$5 million over the next five years for programs to foster black enterprise in South Africa.

IBM sends two planeloads of medical supplies and rescue equipment aboard a C-130 cargo aircraft to help earthquake recovery efforts in Mexico City.

IBM establishes the Product Initiatives for Persons with Disabilities project office to be the focal point for IBM product development activities aimed toward helping disabled people, and the National Support Center for Persons with Disabilities to provide information on how the disabled could use IBM products.

Of the more than 10,250 new employees hired in the United States in 1985, over 45 percent are women and over 22 percent are minorities. About 5,200 women and 3,600 minority employees hold management positions at year-end, and of those, almost 500 women and 500 minorities are in the top 20 percent of U.S. management jobs. The company also purchases more than \$125 million in products and services from some 850 minority-owned firms, over \$70 million from more than 700 firms owned primarily by women, and over \$17 million from more than 70 companies employing handicapped workers.

IBM Europe establishes a new scientific computing facility at the company's scientific center in Rome. The center provides the European academic and scientific communities the free use of advanced computing tools for experimental work in computation-intensive science and engineering research.

IBM Australia contributes equipment, software and training to the Department of Chemical Engineering at the University of Queensland in Brisbane in support of university programs and research in the field of advanced control systems.

In all, IBM's contributions of cash, equipment and other resources to social, cultural and educational programs worldwide amount to more than \$188 million in 1985.

## 1986

### **Business Performance**

IBM's gross income is \$51.25 billion, up 2.4 percent from 1985, and its net earnings are \$4.78 billion, down 26.9 percent from the year before. There are 403,508 employees and 792,689 stockholders at year-end.

### **Organization**

John R. Opel, IBM chairman of the board, relinquishes that post and retires on June 1. John F. Akers is elected to succeed Mr. Opel as chairman, and continues to serve as president and CEO.

The Information Systems Group (ISG) in the United States is consolidated, with the group headquarters staff and the headquarters staffs of the North-Central and South-West Marketing Divisions combined into a single national support organization. More than 2,000 headquarters employees are to be redeployed into field marketing and direct customer support positions. A new ISG software and business services organization is formed to place additional emphasis on software service support, planning and packaged offerings. Several headquarters functions of the National Distribution Division also are to become part of the ISG's national support organization. IBM Information Services is transferred into ISG.

In addition, IBM begins implementing a consolidation of manufacturing and development (M&D) headquarters staffs, leaving intact the existing M&D groups and eight divisions. Cross-group organizations are established for personnel, communications, headquarters operations and information systems.

An IBM Europe Chairman's Office is established, consisting of the chairman of the EMEA board of directors and president directeur general, IBM Europe, and the directeur general, IBM Europe.

IBM announces plans to sell its South African subsidiary to a new company established for the benefit of IBM South Africa employees. The newly independent company will fulfill IBM South Africa's contractual responsibilities. It will market products, parts and services from IBM and may represent other suppliers as well.

The IBM World Trade Americas/Far East Corporation is reorganized into two IBM World Trade groups: IBM World Trade Americas Group, responsible for company operations in Canada and Latin America; and IBM World Trade Asia/Pacific Group, responsible for operations in Japan, Southeast Asia, China, Australia and New Zealand.

The Publishing Systems Business Unit, a new independent business unit headquartered in White Plains, N.Y., is established, with worldwide responsibility for designing and developing products for use in the publishing industry.

IBM says that the Engineering Systems Products and Manufacturing Systems Products independent business units will be combined into the Industrial Systems Products unit.

IBM and MCI Communications Corporation announce that effective February 28, MCI completed its purchase of substantially all the assets and operations of Satellite Business Systems. The SBS Real Estate Communications Company (RealCom) — which specializes in business communication for large office buildings — becomes an IBM subsidiary with the completion of the merger.

In all more than 12,000 people in U.S. and World Trade operations are being redeployed as part of an effort to restructure and substantially reduce staffs. An early retirement incentive is launched to help reduce the U.S. employee population by more than 12,000 in 1987, and similar incentives are announced in Canada, France, the Netherlands and United Kingdom.

### **Products & Services**

New IBM 3090 models 150 and 180, which feature a single central processor with the same advanced technology and architecture as the more powerful models 200 and 400, are announced in February. Also announced are four high-performance processors for the 4381 systems, offering up to 35 percent more computing power than current 4381 processors and at a lower cost. The first IBM 3090 Model 150 mainframe is delivered in June (to Lockheed Aircraft Service Co. in Ontario, Calif.).

IBM says in April it has begun shipping 3090 processors, manufactured at Poughkeepsie, Montpelier and Yasu, with one-million-bit memory chips in their central storage. Also announced in April are a larger expanded storage capability for the IBM 3090 models 200 and 400, the general availability of the 3090 vector processing feature and several software products designed to improve the productivity of 3090 and 4300 processors.

The company begins shipping in August system upgrades that will enable IBM 3090 Model 200 processor users to convert them to Model 400 processors, the most powerful general purpose computer made by IBM.

New models of the System/36 and System/38 computers are introduced in June to provide customers with up to a 100 percent performance improvement in certain office applications. Also announced are enhancements to System/36 and System/38 operating systems and support programming. With a new programming facility — Advanced Peer-to-Peer Networking — customers can attach midrange systems and Personal Computers to networks of System/36 computers and communicate without a controlling System/370-based computer. The 100,000th IBM System/36 is delivered in May (to Continental Insurance in New York City).

The IBM 9370 Information System — a series of four midrange processors that provide the balanced commercial and engineering/scientific performance of mainframe computers but are compact and quiet enough to operate within office environments — is launched. One-million-bit chips are introduced in the 9370.

IBM introduces in January the IBM RT Personal Computer line of high-speed workstations intended for technical professionals. The RT is the first workstation to use the Reduced Instruction Set Computer (RISC) architecture originated by IBM researchers. Four months later, the IBM PC Convertible, IBM's smallest, full-function personal computer, is announced in the United States. The unit weighs less than 13 pounds. Also announced in April are more powerful models of the IBM PC XT and Personal Computer AT, and two new series of accounting software packages. The IBM Personal Computer XT Model 286, which can operate up to three times faster than earlier models of the PC XT in most applications, is introduced in September. Also debuting then is a new desktop model of the IBM RT Personal Computer.

New models of the IBM Series/1 computer and disk subsystem, along with new printers and enhanced program products for the Series/1, are announced in June.

IBM extends its leadership in disk technology, introducing IBM 9332 and 9335 direct access storage devices for midrange systems with the highest recording densities in the industry — more than 25 million bits of information per square inch. One-million-bit memory chips are introduced in IBM 3880 Models 21 and 23 storage control units. The IBM 3422 magnetic tape subsystem, a compact tape unit for data storage for users of IBM 43XX and System/38 customers, is announced.

Among the other new products entering the marketplace in 1986 are: the IBM 4234 Dot Band Printer and IBM 4224 printer for use with IBM intermediate systems; the IBM 4202 Proprinter XL dot matrix printer for wide-paper applications; the IBM 3162 display station that can display almost twice as many characters per screen as other displays in the IBM 316X family; the IBM 7552 Industrial Computer, IBM's first plant floor computer that monitors and controls manufacturing operations without operator assistance; the IBM 7575 and 7576 Manufacturing Systems, two new industrial robotic systems using a new model of the IBM 7532 Industrial Computer configured for robotic control for precision electronic or light mechanical assembly applications; the IBM 4680 Store System featuring modular point-of-sale terminals; workstations that attach to both IBM and other computers, and offer the ability to display multiple applications at the same time; the top-of-the-line IBM Series III Model 85 Copier/Duplicator that can generate up to 70 copies a minute; Models 50 and 70 of the Series III copier; the IR/44 Fourier Transform-Infra Red Spectrometer to be used by scientists for the analysis of chemical composition; the "Wheelwriter" 6 and "Quietwriter" 8 electronic typewriter models; and the IBM Personal Computer 2400 BPS Modem and IBM 5842 2400 BPS Modem that transmit data at up to 2,400 bits per second in full-duplex mode.

IBM introduces in October eight innovative packages designed to help customers who are installing new applications become productive more quickly. Known as SolutionPacs, the packaged sets include applications and services for specific system configurations. Five of the

new SolutionPacs are geared to retail stores, colleges, financial institutions and manufacturing plants.

In other 1986 software announcements, IBM rolls out: Virtual Machine/Integrated System, combining the VM operating system capabilities with 28 prepackaged software products to provide an integrated base for business, office, database and engineering/scientific applications; Enhanced Connectivity Facilities, a series of programs that provides a uniform structure for IBM PCs to exchange data with IBM System/370 processors; Release 2 of the DATABASE 2 relational database program; RT Publishing Software, a new high-function desktop publishing application program developed for IBM by Interleaf, Inc., for the RT Personal Computer line; and the IBM InfoCourse: Principle of the Alphabet Literacy System (PALS), an advanced computer-based system to address the problem of adolescent and adult illiteracy.

In networking and telecommunications, IBM introduces new and enhanced data communication controllers, modems and network management software that extend both the function of the company's telecommunications offerings and the flexibility of central computer operators to configure and manage IBM networks. Also announced are: enhancements to its local area networks that significantly expand the connectivity of large and intermediate IBM computers systems to the company's Token-Ring Network; IBM Intercontinental Information Services to make it easier for companies with operations in the United States, Europe, Asia, the Middle East and Africa to manipulate information and transfer data between offices; NetView/PC, to expand the network management capabilities of Systems Network Architecture; the ROLMbridge 5250 Link Protocol Converter, to provide a low-cost way to connect certain workstations and other devices to System/36 and System/38 computers; the Redwood fully-digital telephone system for small businesses and branch offices; and the Phone Mail/VM Host Link, to enable IBM PROFS and messaging system users to receive notification of waiting PhoneMail voice messages on their terminal screens.

United Airlines selects IBM to develop its comprehensive "Enterprise" travel agency management system. Built around IBM's 4300 and PC architectures, the new system will make use of IBM's Token-Ring concept to tie together terminals within agencies.

An IBM-developed exhibit is helping baseball fans visiting the National Baseball Hall of Fame and Museum in Cooperstown, N.Y., to gain new perspectives on the 196 players, umpires and managers enshrined there. The exhibit consists of two kiosks equipped with an interactive presentation system using an IBM Personal Computer AT, touch-activated screens and a videodisc system.

### **Alliances**

IBM and Sears, Roebuck and Co. say they will become equal partners in TRINTEX following a decision by CBS to withdraw from the enterprise. TRINTEX was formed by the three companies in 1984 to develop and market a nationwide transaction and information network accessible through personal computers.

IBM and the Ford Motor Company announce in April that they will participate in a joint study to develop broadband network support for IBM Personal Computers used in Ford's North American automotive manufacturing locations.

IBM and Carnegie Mellon University of Pittsburgh, Pa., state in August that they will participate in a three-year joint study into the science of artificial intelligence. In support of the study, IBM will provide Carnegie Mellon with over 200 IBM RT Personal Computers and associated operating system software. Three months later, Andrew, a campus-wide network jointly developed by a team from IBM and Carnegie Mellon University, is inaugurated to give users rapid access to a range of state of the art, computer-based education, research and administrative applications.

IBM and Merrill Lynch announce in December that International MarketNet (Imnet), a joint venture, will cease operations over the next few months. (Imnet was formed in 1984 to develop and market an advanced information delivery and office automation system for the financial services industry.)

Effective June 30, NYNEX Business Information Systems Co. acquires IBM's Product Centers in the United States. The Centers will continue to market IBM Personal Computers, typewriters and related equipment and supplies as authorized IBM dealers.

Ground is broken for the first phase of an IBM-Maguire Thomas Partners joint venture real estate development to be built in Westlake and Southlake, Texas.

### **Science & Technology**

IBM Fellows Gerd K. Binnig and Heinrich Rohrer of the IBM Zurich Research Laboratory win the 1986 Nobel Prize in Physics for their work in scanning tunneling microscopy. Drs. Binnig and Rohrer are recognized for developing a powerful microscopy technique which permits scientists to make images of surfaces so detailed that individual atoms may be seen.

Scientists from the Thomas J. Watson Research Center in Yorktown Heights, N.Y., and the company's development site in East Fishkill, N.Y., develop an experimental computer chip for fiber optic communications that operates four times faster than earlier chips. It is capable of receiving the full text of 20 volumes of an encyclopedia in less than three seconds.

Watson researchers also demonstrate an experimental system built around a modified IBM Personal Computer AT that can transcribe human speech into letters, reports and other office documents. It features a microprocessor chip developed by IBM's Zurich Research Laboratory in Switzerland and the company's development laboratories in La Gaude and Essonnes, France.

IBM scientists fabricate a 32-bit microprocessor that contains on a single chip most of the functions necessary to run System/370 programs.

IBM announces that it is increasing its support for engineering/scientific computing on large systems, establishes a vice president, engineering/scientific computing in the Data Systems

Division, forms two new centers for numerically-intensive computing (NIC) and realigns its NIC marketing operations in the Information Systems Group.

Retired IBM Fellow Reynold B. Johnson receives the National Medal of Technology from U.S. President Ronald Reagan for his pioneering work in developing the IBM 350 RAMAC (Random Access Method of Accounting and Control) disk file, an advance that helped make possible on-line computing systems.

Benoit B. Mandelbrot, IBM mathematician and creator of fractal geometry, receives the 1986 Franklin Medal.

### **Facilities**

The Almaden Research Center in San Jose, Calif., is dedicated in May as IBM's newest science and advanced technology research laboratory. One of the world's most advanced semiconductor manufacturing facilities is dedicated at East Fishkill, N.Y. Also dedicated in 1986 is the Communications Programming Center in Research Triangle Park near Raleigh-Durham, N.C.

IBM announces in October plans to relocate the headquarters for all its U.S. manufacturing and development groups and divisions into a new IBM facility then under construction in Somers, N.Y. Scheduled to begin in early 1988, the relocation will improve operating efficiency while reducing the staffs.

The company says in April its Boulder, Colo., facility will become a major information systems and distribution and development center. Most of the site's manufacturing operations will be consolidated in Charlotte, N.C. and Lexington, Ky.

IBM Mexico announces that it will begin manufacturing Personal Computers at its El Salto, Jalisco, plant near Guadalajara. First customer shipment of the PC XT begins in March. About 90 percent of the Personal Computers manufactured in Mexico will be exported to Latin America and other international markets.

The Systems Technology Division assumes all manufacturing and site support functions at IBM's Austin, Texas, facility.

IBM announces plans to: transfer its Federal Systems Division operations in Westlake Village, Calif., to IBM Boulder; transfer its Communication Products Division development operations in Kingston, N.Y., to its development laboratory in Research Triangle Park, N.C.; and close its Greencastle, Ind., facility and consolidate IBM activities there with existing operations in Mechanicsburg, Pa., and Lexington, Ky.

### **Corporate Citizenship**

IBM opens a National Support Center for Persons with Disabilities in Atlanta to provide information to agencies and institutions on how computers and attached devices can aid persons with disabilities to lead more productive lives.

The company gives a \$1 million grant to the Smithsonian Institution for an exhibition called “The Information Revolution” scheduled to open at the Smithsonian, in Washington, D.C., in 1989, and selects 12 universities to share \$24 million in cash and equipment grants for graduate-level research in advanced computer component materials and processing sciences.

IBM announces that it will participate as the lead company in Summer Jobs ‘87, a program that provides jobs for needy young people in New York City. By year-end 1986, more than 19,500 people in the United States have received training in information processing and office skills at IBM-sponsored job training centers since 1968.

During the year, IBM supports numerous programs that address community, social, and human needs, and contributes more than \$187 million in cash, equipment and other resources to social, cultural and education programs worldwide.

Of the nearly 3,500 new employees hired in the United States in 1986, over 45 percent are women and 21 percent are minorities. About 6,000 women and 3,900 minority employees hold management positions at year-end, and of these, nearly 600 women and more than 500 minorities are in senior management positions. The company also purchases more than \$100 million in products and services from some 750 minority-owned firms, over \$60 million from more than 725 firms owned primarily by women, and over \$15 million from more than 650 companies employing primarily handicapped workers.

## **1987**

### **Business Performance**

IBM’s gross income is \$54.2 billion, a 5.8 percent increase over 1986, and net earnings grow by 9.8 percent over the prior year to \$5.25 billion. There are 389,348 employees and 787,988 stockholders at year-end.

IBM Chairman John F. Akers adds a new goal — “to enhance our customer relationships” — to the goals established in the early 1980s. The five goals now are: to enhance customer relationships; to be the leader in products and services — excelling in quality and innovation; to grow with the industry; to be the most efficient; and to sustain profitability, which funds growth.

### **Organization**

The corporate marketing and corporate service staffs are consolidated.

ROLM Corporation’s domestic direct sales, operations and service divisions are combined with the IBM Information Systems Group (ISG) telecommunications marketing and support staffs to form a new telecommunications marketing and service organization within ISG. At the end of the year, IBM announces that ROLM Corporation, a wholly-owned subsidiary since 1984, will become the ROLM Systems Division (RSD) of IBM, effective December 31. RSD will maintain its headquarters at Santa Clara, Calif., its manufacturing and development facilities at Santa Clara, Austin, Texas, and Colorado Springs, Colo.; and its development facility at Boca Raton, Fla.

The Application Systems Division is established within ISG to develop and acquire application software for use across the IBM product line.

The Customer Education Business Unit is formed in Atlanta to develop, market and provide customer education.

IBM Instruments, Inc., a wholly-owned subsidiary that markets analytical instruments in the United States, ends operations.

The manufacturing of the Information Product Division's low-end printers, including Proprinter products, is transferred from Charlotte, N.C. to Lexington, Ky., and the manufacturing of the division's IBM Series III Copiers is moved from Boulder, Colo. to Charlotte.

IBM announces in February that the General Technology Division's semiconductor manufacturing operations planned for its Manassas, Va., facility will be centralized at GTD's Burlington, Vt., facility.

IBM World Trade Asia/Pacific Group establishes a Hong Kong operating unit called Line Operations to provide support to IBM organizations in 17 countries outside of Japan.

IBM Europe restructures its Areas Division countries into three new units, effective Jan. 1, 1988: Southern Unit, consisting of Israel, Portugal, Area South and Distribution; Central Unit, consisting of Austria, Regional Office for Europe Central & East, Belgium, Netherlands, Spain and Switzerland; and Northern Unit, consisting of Denmark, Iceland, Finland, Ireland, Norway and Sweden.

### **Products & Services**

The IBM 3090 Model 600E is introduced in January as the new top-of-the-line processor. It features six processing units, and can deliver up to 60 percent more computing power than the company's largest previous model. Also introduced are a model with three processing units — the IBM 3090 Model 300E — and enhanced versions of four previously announced 3090 models, the 150E, 180E, 200E and 400E. Four months later, the IBM 3090 Model 120E is announced, with a base price of less than \$1 million. The Model 120E provides between 70 and 80 percent the performance of the next largest 3090 model in commercial applications, and users can incrementally expand the 120E up to the Model 600E, IBM's largest processor. (The University of Illinois at Chicago in September is the first U.S. customer to receive the Model 120E.)

Four new extended-performance IBM 4381 processors, offering up to 30 percent better performance compared with current 4381s, are introduced.

Volume shipments of the IBM 9370 Information System are begun in July, nearly two months ahead of schedule. The American Federation of Information Processing Societies names the 9370 the "Hardware Product of the Year." The System/36 product family is expanded with the introduction of a new entry-level model and three other new models, along with new products and enhancements to increase the capabilities and functions of the System/370 midrange

computer line, including the 9370. Two high-performance models of IBM Series/1 are announced.

A powerful new generation of personal computing products — the IBM Personal System/2 (PS/2) — is introduced in April. It includes four processor models: the Model 30 and Model 50 compact desktop workstations, and the Model 60 and Model 80 floor-standing systems. The high-end Model 80 is three-and-a-half times faster than the IBM Personal Computer AT. Four months later, IBM announces the Personal System/2 Model 25 for students, teachers and school administrators. It takes up to 40 percent less space and is more than twice as fast as the IBM Personal Computer. A new version of the PS/2 Model 80 is equipped with an optional disk drive that can store the equivalent of more than 332,000 double-spaced typewritten pages of information. (By November, IBM has shipped one million IBM Personal System/2s, in just over six months after its introduction. By comparison, it took 28 months to ship one million of the original IBM Personal Computer product line. Worldwide, IBM is now shipping about 9,000 Personal System/2s a day.)

New models of RT Personal Computer are introduced, with a 32-bit microprocessor, an IBM-invented program compiler, an IBM-invented one-megabit chip, and a new high resolution display. Several new enhancements for IBM PC Convertible, including a new 256K Memory Card that allows customers to expand the PC Convertible's user memory to 640K, are announced in January, and in July, the PC Convertible Model 3, featuring a more readable, back-lit liquid crystal display and longer battery life, is unveiled.

Also announced in 1987 are two new top-of-the-line models, 85 and 86, of the System/88 processor, the fault-tolerant computer used by the financial, retail, manufacturing and communications industries; and the IBM Personal Typing System, which combines features of typewriter and the personal computer in a single system.

A new storage subsystem is rolled out, featuring two new models (K and J) in IBM's 3380 series of direct access storage devices (DASD). The new subsystem can store 50 percent more information in the same space than was possible with previous IBM DASD.

During 1987 IBM introduces Systems Application Architecture, which is designed to make application programs look and work in the same manner across the entire range of the company's personal computing systems, midrange processors and System/370 processors.

In support of the new family of PC systems, IBM introduces in April a new operating system — IBM Operating System/2 (OS/2) — which gives users of IBM PC systems access to multiple applications, very large programs and data, while concurrently communicating with other systems. OS/2 is the first offering in IBM's Systems Application Architecture. The first release of OS/2 is available ahead of schedule, beginning in December 1987.

Among the other software products introduced in 1987 are: The SolutionPac Office Series that uses new and existing IBM software to provide customers with text processing, electronic mail, calendar and decision support functions; a new Virtual Machine/Extended Architecture System

Product; enhancements to the IBM Database 2 and IBM Structured Query Language/Data System relational database managers; new releases of IBM's Data Facility family of software products, DISOSS 370 and DisplayWrite/370; two artificial intelligence software products — Expert System Environment and IBM Common LISP — for use in business, industry and scientific research; three new CADAM products and updates to the entire line of CADAM software; and expansion of desktop publishing solutions for the Personal System/2 and new publishing solutions for larger systems.

In networking and telecommunications, IBM announces improvements to Advanced Communications Function/Virtual Telecommunications Access Method, the primary communications software for System/370 products. IBM extends its Advanced Program-to-Program Communications protocol to virtually all IBM systems in the second quarter. Also announced are: a new release of the NetView network management application program and a new program for the ROLMbridge 5250 Link Protocol Converter; a connectivity enhancement that allows System/36 computers to communicate with IBM 4680 Store Systems; the IBM 9750 Business Communications System for customers in 24 countries that can serve establishments with 100 to 20,000 lines; and the IBM 8750 Business Communications System for European customers.

IBM Europe announces programming to support an X.400 message handling system. It is the first IBM product to support the entire seven-layer Open System Interconnection model developed by the International Organization for Standardization.

Among the other products introduced in 1987 are: a desktop publishing system featuring a compact laser printer; an optical disk drive with the storage capacity of 550 standard 360KB diskettes, enhanced models of the IBM Proprinter and a new Quietwriter Printer offering; five monochrome, color and color graphics models of the new IBM 3192 and 3197 display stations; new models of IBM 3174 controller; enhancements to the NetView family; a new expert systems development package called KnowledgeTool; enhancements to the IBM 4700 Finance Communication System with new displays, printers, connectivity and extensions to its operating system; the IBM 4732 Personal Banking Machine, which replaces IBM's previous generation automated teller machine; and the IBM 3892 document processor.

AMADEUS — a consortium of Air France, Lufthansa, Iberia and SAS — awards IBM a contract to provide more than \$100 million in equipment and systems software for a global Travel Information and Distribution system.

IBM is selected to develop an advanced banking system for the Westpac Banking Corporation, based in Sydney, by consolidating Westpac's existing independent computer systems into one integrated system.

### **Alliances**

IBM reaches agreement with Chrysler Motors Corp. for the joint development and testing of an in-plant system to track and monitor parts and materials used in manufacturing. The National Science Foundation announces that IBM will take part in a five-year cooperative project to

enhance the U.S. national supercomputing network. IBM, MCI and Merit, Inc., will work together to upgrade the performance and capacity of current research networks connecting the country's scientific research centers. IBM and Supercomputer Systems, Inc., state their intention to form a partnership for the development of advanced computing systems.

IBM Japan, Ltd. and Nissan Motors Co., Ltd. establish Nissan Systems Development, a jointly-owned company to provide systems engineering services. In Europe, Fiat and IBM Italy form Iniziative Telematiche per Servizi Applicativi, a joint venture company to market value-added services in Italy.

### **Science & Technology**

J. Georg Bednorz and IBM Fellow K. Alex Mueller of IBM's Zurich Research Laboratory receive the 1987 Nobel Prize for physics for their breakthrough discovery of high-temperature superconductivity in a new class of materials. This is the second consecutive year the Nobel Prize for physics has been presented to IBM researchers.

A new one-million-bit memory chip developed at IBM's Essex Junction, Vt., facility operates almost twice as fast and occupies about one-third less space than earlier IBM-developed one-million-bit memory chips. IBM engineers develop an experimental computer chip that can store four times more data (more than four million bits of information) than memory chips now used in the company's most advanced computers yet is only one-third larger and 18 percent faster than one-million-bit chips currently in volume production.

Researchers at the Thomas J. Watson Research Center extend the boundaries of silicon-based computer chip technology by developing a powerful experimental transistor. The device, with features one thousand times thinner than a human hair, sends the strongest and clearest electronic signals ever measured in silicon transistors of such size. Yorktown researchers also produce and measure the world's shortest electrical pulses lasting half of one trillionth of a second, and demonstrate the feasibility for blind computer users to read information directly from Personal Computer screens with the aid of an experimental mouse. Other IBM researchers announce they have fabricated the first thin-film superconducting devices to operate at temperatures high enough to be of a practical use, and demonstrate new ceramic superconducting materials which carry 100 times more electrical current than previously observed.

Scientists at IBM's Almaden Research Center produce experimental magnetic disks with tracks that are 20 millionths of an inch (half a micron) wide. At such dimensions, future 3.5-inch disks used in computer storage could each hold 10 billion bits of information (10 gigabits), or 620,000 double-spaced typewritten pages — 50 times more than 1987's densest disks.

IBM receives the 1987 Corporate Innovation Recognition of The Institute of Electrical and Electronic Engineers (IEEE) for innovative development and expansion of the magnetic disk storage concept for computers.

Frances E. Allen, John A. Armstrong, Richard C. Chu, James Economy and Janusz S. Wilczynski are elected members of the National Academy of Engineering.

### **Facilities**

The Entry Systems Division (ESD) headquarters and ESD support functions move from Montvale, N.J., to White Plains, N.Y. The Real Estate & Construction Division headquarters and support staffs move from White Plains to Stamford, Conn. IBM announces that the headquarters of the South-West Marketing Division will relocate from Atlanta to White Plains, N.Y., in 1988.

### **Corporate Citizenship**

IBM receives from the U.S. National Alliance of Business special recognition for its nearly 20 years of job training efforts for the economically disadvantaged. More than 19,500 people in the U.S. have received training in information processing and office skills at IBM-sponsored job training centers since 1968.

IBM becomes a corporate sponsor of “Odyssey of the Mind,” a problem-solving competition for students from kindergarten through college.

In Europe IBM announces a \$40 million program over two years to encourage advanced education in supercomputing. The program will also establish more than five special centers of supercomputing competence within European universities and research institutions.

Of the nearly 8,000 new employees hired in the United States in 1987, 40 percent are women and 21 percent are minorities. About 17 percent of the total U.S. employee population are minorities and 29 percent are women. Women hold more than 18 percent of the company’s management positions, while minorities hold approximately 12 percent. Of these, more than 600 women and 500 minorities are in senior management positions.

## **1988**

### **Business Performance**

IBM’s revenue is \$58.6 billion, an eight percent increase over 1987, and net earnings grow by 10.4 percent over the prior year to \$5.8 billion. Earnings before tax in 1988 are impacted by an \$870 million charge related to consolidations of manufacturing and headquarters operations. There are 387,112 employees and 833,785 stockholders at year-end.

The IBM Suggestion Plan celebrates its 60th anniversary. Thomas J. Watson, Sr., began the program in 1928 in Endicott, N.Y., to help cut costs and boost productivity. Since 1981, the worldwide program has awarded more than \$100 million for employee suggestions and has saved IBM over \$600 million.

### **Organization**

In the most significant restructuring of its business in more than 30 years, IBM establishes seven lines of business and a new organization — IBM United States. Under the realignment, six independent systems and technology businesses are created in January with responsibility for worldwide product development, profitability, marketing plans and U.S. manufacturing for specific product families. The six new lines of businesses are: Enterprise Systems — IBM’s System/370 products, high-end storage, and related printers and operating systems software;

Application Business Systems — IBM's System/3X product line, related operating systems software and low-end storage; Personal Systems — personal systems, workstations, most printers, displays, typewriters, copiers, publishing and consumer systems and related operating systems software; Communication Systems — communications products and related operating systems software; Technology Products — semiconductors and packaging for systems and technology products; and Programming Systems — Systems Application Architecture, data management software, programming languages and software for application development.

Also announced is a new organization — IBM United States — to oversee the six new businesses and the IBM United States Marketing & Services Group (M&SG). IBM United States is to be responsible for U.S. revenue and profits, as well as for the compatibility, connectivity and quality of IBM's product line. In addition, IBM forms in April the Application Solutions line of business within M&SG. Application Solutions is to focus on providing integrated solutions to customers in the federal and commercial marketplace.

IBM announces that as part of its continuing decentralization, it will further reduce its Corporate, U.S. Marketing & Services Group and World Trade Americas Group headquarters staffs in Westchester County, N.Y., and elsewhere. The ROLM Systems Division and the Communication Products Division are to be integrated into the structure of the Communication Systems line of business.

Certain Real Estate and Construction Division functions are consolidated within a newly-formed corporate staff and the remaining real estate responsibilities are assigned to IBM operating units.

Line Operations, the IBM World Trade Asia/Pacific Group operating unit responsible for A/PG operations outside Japan, is renamed Asia/South Pacific Area.

IBM acquires PacTel Spectrum Service, a division of PacTel Communications Companies, a subsidiary of Pacific Telesis Group, to become part of IBM National Service Division.

Contel Corporation acquires RealCom Communications Corporation, a wholly-owned IBM subsidiary. IBM acquired RealCom in 1986 when Satellite Business Systems was acquired by MCI Communications. RealCom had been a subsidiary of SBS.

Maxwell Communication Corporation plc purchases Science Research Associates, which is a wholly-owned subsidiary of IBM that creates and publishes educational materials, achievement and vocational tests, and industrial training programs.

### **Products & Services**

IBM announces in July the Enterprise System/3090 Model 600S — the industry's most powerful general purpose processor — to provide customers with up to 56 percent greater application processing power and a 15-to-25 percent price/performance improvement. The Model 600S leads a new 10-model S series of advanced mainframe computers that take advantage of IBM's Enterprise Systems Architecture/370, Multiple Virtual System/ESA and Virtual Machine/Extended Architecture operating systems and data management software. In February

the company rolls out two new models of the IBM 3090E processor — the 280E and 500E, and two new models of the IBM 4381E processor — the 91E and 92E.

IBM introduces in June the IBM Application System/400, a new family of easy-to-use computers designed for small and intermediate-sized companies. As part of the introduction, IBM and IBM Business Partners worldwide announce more than 1,000 software packages in the biggest simultaneous applications announcement in computer history. The AS/400 family includes six processor models, offering a 24-fold growth range in main memory, a 48-fold storage capacity range and a 10-fold performance range, as measured in commercial transactions processed per hour. It offers double the performance of the System/38 and five times that of the System/36. (By the time the first AS/400 shipment is shipped, more than 2,500 applications are available, along with unprecedented support, education and follow-on products. Meanwhile, IBM has sold more than 250,000 System/34, System/36 and System/38 computers worldwide, making it the most widely-used midrange family in the industry.)

Three new models — Models 130, 135 and B35 — of IBM's Reduced Instruction Set Computer (RISC) Technology workstation series are announced. The RT system — previously called the RISC Technology Personal Computer or RT PC — is a full-function, 32-bit workstation for use as an independent system or connected to a host computer. Also announced is a new 310-million-character disk storage device and several program products for the AIX/RT operating system.

IBM adds seven new desktop machines in the Personal System/2 family. The most advanced of the systems — the PS/2 Model 70 386 — executes programs 1.5 times faster than the previous top-of-the-line model.

Among the products introduced in 1988 are: the IBM 3745 high-speed communication controller, featuring logic chips that can hold up to 40,000 circuits each; two new models of the fault-tolerant IBM System/88; the IBM 3827 and IBM 3835 page printers; two models of the IBM 6262 impact line printer; the Quickwriter Printer, a high-speed dot-matrix printer capable of producing true letter-quality text and graphics; the IBM Wheelwriter Series II family of upgradeable typewriters, including two that feature a 25-line screen display; the entry-level Personal Wheelwriter Typewriter; a new version of the Quietwriter 8 Typewriter; and two models of the Personal Typing System and related software.

New software products include: Enterprise Systems Architecture/370, to give customers with large systems access to 8,000 times more virtual storage than IBM's previous architecture; extensions to the Advanced Interactive Executive (AIX) operating system family to include the company's largest computers with the announcement of AIX/370; enhancements to Multiple Virtual Storage software subsystems that use the new Enterprise Systems Architecture/370 announced in February; a new version of the DATABASE 2 relational database management system; DOS 4.0, a new, easier-to-use version of the Disk Operating System; new X.25 data transmission software products; and new publishing offerings, based on software applications by Interleaf, Inc., for use with the IBM Personal System/2 Model 80 and IBM RT Personal Computer.

IBM introduces in September nearly 50 new and enhanced telecommunications products that will make it easier for customers to operate and manage their computer networks and to communicate with non-IBM networks. The offerings include three products that take advantage of Open Systems Interconnection standards; network management products, such as a new release of IBM NetView; voice/data applications, such as the IBM 9270 Voice Response Unit; network hardware products, such as the IBM 7860 series of modems; and the new Telecommunications Services, Network Support (TSNS) to provide customers with network management and problem determination assistance from an IBM Network Support Center.

The IBM Personal System/2 Screen Reader is announced in January. It permits blind or visually impaired people to hear the text as it is displayed on the screen in the same way a sighted person would see it. This is the first in the IBM Independence Series of products for computer users with special needs.

The IBM 4737 Self-Service Transaction Service is introduced in most World Trade countries.

IBM also unveils ImagePlus, an image-processing technology system that allows businesses to scan information into a computer database, and IBMLink, a new online electronic support service that brings together many offerings on one screen and enables customers to do business with IBM more efficiently.

The U.S. Federal Aviation Administration awards IBM's Systems Integration Division a \$3.55 billion contract to develop, install and service the Advanced Automation System. AAS is a major portion of the FAA's National Airspace Systems plan, a comprehensive strategy for modernizing the U.S. air traffic control system. The U.S. Postal Service awards IBM a nearly \$200 million contract to supply up to 900 IBM 9370 Information Systems and 4381 processors to manage a variety of administrative activities. The contract also includes installation of several hundred IBM 3270 and ASCII terminals.

Galileo, a European consortium of 10 leading airlines, places one of the largest orders for IBM equipment ever signed by IBM in Europe. IBM will supply four IBM 3090 Model 280S systems and will upgrade Galileo's two existing 3090 Model 180Es to 280S specifications.

IBM Korea installs the most advanced information system in Olympic history for the 1988 Games held in Seoul, September 17 to October 2. The equipment includes one IBM 3090 processor, two IBM 4381 processors, 47 IBM System/36s, and more than 600 workstations to run 70 different software programs in 87 locations within Korea. IBM France is selected as the information technology sponsor of the 16th Winter Olympic Games to be held in Albertville and Savoy, France, in 1992.

Eastman Kodak Company acquires IBM's copier service business and existing sales agreements in the United States, and Kodak agrees to buy IBM's existing copier service, sales and lease agreements in 16 countries outside the United States, including France, Germany, Italy, the United Kingdom, Argentina, Australia and Canada.

### **Alliances**

IBM and Siemens announce plans in December for a series of joint activities in telecommunications products for private networks, including: establishing a marketing and services company, ROLM, jointly owned by IBM and Siemens; establishing ROLM Systems Inc., a wholly-owned development and manufacturing subsidiary of Siemens; marketing of a Siemens-manufactured PBX product in Europe by IBM subsidiaries; continued marketing by IBM of the 9750 Business Communications System and other ROLM products in Canada, Japan, Hong Kong and other countries; and joint design of advanced voice/data telecommunications applications. ROLM Systems Inc. is to include IBM's ROLM development and manufacturing operations in Santa Clara, Calif., and Austin, Texas. IBM's manufacturing and development facility in Colorado Springs, which provides circuit cards for ROLM Systems products, will be phased out in 1989.

SEMATECH, a research consortium, selects IBM's four-million-bit memory chip design as one of its vehicles for investigating and developing advanced semiconductor manufacturing process technologies. IBM is one of the member companies of the consortium.

IBM and Metaphor Computer Systems agree to jointly develop advanced software systems to aid business professionals in decision-making.

IBM Japan, Ltd., Nippon Information and Communication Corporation and a group of 40 Japanese financial institutions form Nippon Information and Communication International Corporation to offer economical information services.

IBM joins seven U.S. and European companies in the Open Software Foundation to develop and provide an open software environment, and announces its membership in X/Open, an international organization working to create a common application environment.

IBM forms real estate joint venture partnerships with: Prentiss Properties Ltd., Inc., to develop One Franklin Square, an office building to be constructed in Washington, D.C.; Opus Corporation, to develop an office and retail project in Minneapolis; Maguire Thomas Partners, for the ownership and further development of Colorado Place, a retail and office complex in Santa Monica, Calif.; Prentiss/Copley Investment Group, to develop a building in the Park West office complex northwest of Dallas; and T. Rowe Price Associates Inc., to develop an office and retail project in Baltimore.

Other alliances and joint ventures around the world include relationships with Fiat and Ericsson in Europe; Mitsubishi Bank in Japan; and Sears, NeXT and Supercomputer Systems, Inc., in the United States.

### **Science & Technology**

U.S. President Ronald Reagan presents the National Medal of Science to IBM Fellow Ralph E. Gomory and the National Medal of Technology to IBM Fellow Robert H. Dennard. IBM Fellows Rolf Landauer and Heinrich Rohrer are elected to the U.S. National Academy of Sciences for their achievements in original research.

IBM researchers fabricate the fastest dynamic memory computer chips yet reported. The experimental chips can retrieve a single bit of information in 20 billionths of a second, four times faster than the current generation of dynamic random access memory (DRAM) chips. IBM engineers also report that they have developed a state-of-the-art static random access memory (SRAM) chip that can retrieve information in 11 billionths of a second and an experimental one-million-bit SRAM chip, the densest chip of its kind yet reported.

### **Facilities**

IBM says that it is establishing a supercomputer facility that will connect supercomputers at IBM research centers in New York, California and Switzerland.

IBM Japan announces the opening of the Yasu Technology Application Laboratory to develop semiconductors and packaging technologies for small and midrange computers, workstations and related products. This brings to three the number of IBM laboratories in Japan.

The company decides that manufacturing operations at the Boca Raton, Fla., and Tucson, Ariz., sites will be phased out. Personal System/2 manufacturing in Boca Raton will be moved to IBM's facility at Research Triangle Park, N.C. Data storage manufacturing at the Tucson site will be relocated to other plants. ROLM Systems telecommunications manufacturing in Santa Clara, Calif., and Austin, Texas, will be consolidated into nearby IBM manufacturing sites. IBM's Charlotte, N.C., and Austin sites will assume some of the assembly work done in Toronto, Canada. In turn, the Toronto lab will assume more programming development responsibility. The Brooklyn, N.Y., facility will diagnose and process electronic components, work done previously at several locations.

IBM's manufacturing plant in Greenock, Scotland, ships in March its two millionth personal computer product, an IBM Personal System/2, and in October, the IBM plant in Wangaratta, Australia, ships IBM's three millionth Personal System/2 — just 18 months after the PS/2 family of products was introduced in April 1987.

Park Tower Realty Corp. purchases IBM field facilities in Charlotte, N.C.; Columbus, Ohio; Hamden, Conn.; Norwalk, Calif.; Pittsburgh; and Sacramento, Calif.

### **Corporate Citizenship**

The President's Committee on Employment of the Handicapped honors IBM as 1988 Employer of the Year for its active efforts in hiring, training and promoting people with disabilities.

At the Fourth International Conference on AIDS, the World Health Organization (WHO) announces that IBM will donate equipment, software and support, valued at \$1.5 million, to WHO for use in its fight against AIDS. IBM makes a \$65,000 contribution to the American Foundation for AIDS Research. IBM's contributions reflect its concern about the growing effects of AIDS and the importance of increased education efforts.

The IBM Job Training Program celebrates its 20th anniversary. The program has 74 major centers in the United States offering classes in computer programming, PC operations, data entry, word processing and other office skills.

IBM and the University of California at Los Angeles embark on a two-year, \$5 million project to develop an advanced network to integrate UCLA's diverse multivendor computer systems and functions, ultimately extending the new campus network to 10,000 workstations and all buildings on campus.

IBM Europe/Middle East/Africa Corporation donates equipment worth some \$6.5 million to the United Nations Environment Program. The equipment will be used to support the Global Resource Information Database, a computer-based environmental information service operated by UNEP. IBM also donates ten PS/2 Model 60 computers to be used in the Armenian earthquake disaster relief effort.

In the Asia/Pacific Group, IBM Japan's Braille Forum project has become a model for using information technology to assist the handicapped. Researchers at the IBM Tokyo Research Laboratory have developed a software system that converts English or Japanese katakana characters into Braille far faster than previous systems.

To improve child health in Latin America, the IBM World Trade Americas Group makes a grant to the International Child Health Foundation and establishes a partnership with the Instituto de Investigación Nutricional in Lima, Peru. The objective is to train public health experts in the use of IBM computers to coordinate diarrheal disease programs, and to provide health education for parents in poor and rural areas.

In all, IBM contributes \$42.7 million in cash, equipment and other support to educational institutions in the United States, and \$69.7 million in support to education worldwide during 1988. In addition, IBM's current contracts, joint studies and sponsored research represent a cash commitment of \$127 million worldwide.

Of the nearly 7,300 new employees hired in the United States, about 36 percent are women and 24 percent are minorities. Women hold 20 percent of the company's management positions, while minorities hold 12 percent. Women fill nearly 11 percent of the senior management positions while minorities hold almost 9 percent. The company also purchases more than \$155 million in products and services from over 800 minority-owned firms, over \$90 million from more than 1,000 firms owned primarily by women, and over \$25 million from more than 70 companies employing primarily handicapped workers.

## **1989**

### **Business Performance**

IBM revenue reaches \$62.7 billion, an increase of 6.9 percent over 1988, and net earnings fall to \$3.7 billion, a decline of 35 percent from a year earlier. 1989 earnings are impacted by a \$2.4

billion pre-tax charge for actions taken to reduce costs, expenses and structure. There are 383,220 employees and 815,580 stockholders at year's end.

### **Organization**

Jack D. Kuehler becomes president of IBM.

IBM announces a series of restructuring initiatives, including consolidations and capacity reductions at some U.S. locations; the elimination of selected positions in manufacturing, development, marketing, service, administration and headquarters at most U.S. locations; and other actions with respect to joint ventures, alliances, technology and software investments.

Effective March 1, IBM's China & Hong Kong Operations changes its name to IBM China/Hong Kong Corporation. It also merges its two basic business operations, IBM World Trade Corporation Hong Kong branch and IBM China Corporation, into a single organization. The unit will be headquartered in Hong Kong, with a representative office in Beijing. Responsibility for IBM World Trade Asia/Pacific Group's product line management—Personal Systems and product line operations support is transferred to Personal Systems.

IBM completes the sale of ROLM manufacturing and development activities to Siemens AG. A newly-formed company jointly owned by IBM and Siemens will market and service Siemens telephones, telephone switching systems and other telecommunications products in the United States.

### **Products & Services**

A new ES/3090 model is introduced featuring a three-way multiprocessor that can be partitioned so that the system acts as two computers. Entry level models of the ES/3090 and ES/4381 processors also are announced. The ES/9370 Information System family is expanded, adding two new models and a new release of a distributed processing operating system.

Early in 1989, IBM introduces the B70, a new high-end model of the Application System/400, which offers a faster processor and main memory, and the ability to expand disk storage and attach more local workstations and communications lines. Also announced are enhancements that make it easier for customers to expand other AS/400 models, the B10 and B20. The company also increases the memory capacity available with entry-level models and introduces three higher-speed matrix printers for use with the AS/400 family. Later in the year, two new Application System/400 processors that can operate at speeds up to 20 percent faster than earlier, comparably-priced models, are rolled out, along with an improved operating system that simplifies the migration of software from less powerful IBM System/3Xs to the AS/400. Also announced are three new AS/Entry processors that offer the disk storage and memory technology of the AS/400 and the ease-of-use and price of the entry-level System/36.

IBM becomes the first company in the industry to use Intel's powerful new i486 microprocessor in a product — an upgrade to the IBM Personal System/2 Model 70-A21. The new Model 70 486, which also uses the i486 microprocessor, can process numerically intensive applications up to three times faster than systems based on the earlier 386 processor. Also announced are two new models of the Personal System/2: a new portable model and the Model 55SX. IBM Japan

introduces the Personal System/55 family to address special needs of the marketplaces of Japan, Korea and Taiwan.

The 3390 Direct Access Storage Device, is introduced and shipped in 1989 as the industry's fastest high-performance storage product — 40 percent faster and capable of storing as much data as its predecessor (the IBM 3380K) in one-third the space. The company announces three models of IBM's low-end and mid-sized communication controller family, nine models of IBM's establishment controller family, and a new family of compact InfoWindow display stations for use with System/370, AS/400, and System/3X processors which features screens that are easier to read.

IBM introduces a series of significant new software products: OfficeVision, a family of easy-to-use applications for document preparation, filing, electronic mail and calendars, and the first major product developed using Systems Application Architecture; AD/Cycle, a series of products, tools and services and programming languages developed by IBM and its Business Partners; and CIM Advantage, a package of hardware and software products that provides a comprehensive approach to computer-integrated manufacturing.

Also rolled out in 1989 are: software enhancements to increase the productivity of Enterprise Systems Architecture/370; supercomputing systems extensions — IBM Clustered Fortran, IBM High Speed Channel and IBM Parallel Input/Output Access Method — for the most powerful models of the ES/3090 computer family, to enable customers to execute jobs across as many as 12 processors, to transfer bulk data at rates of up to 100 million characters a second, and to read and write files across multiple DASDs at the same time; new versions of Operating System/2 Standard Edition and OS/2 Extended Edition to allow users to work with and view several applications simultaneously on one screen; a new release of IBM's premier data sorting program — Data Facility Sort — that reduces the time it takes to sort data by up to 25 percent; enhancements to Customer Information Control System, IBM's leading transaction processing program, to permit the processing of high-volume transactions between terminals and host computers up to 95 percent faster; and Audio Visual Connection software and two new PS/2 adapter cards which allow PS/2 users to combine and edit high quality stereo sound, still pictures and text.

In addition, IBM in 1989: introduces Business Recovery Services, an offering that enables a business to continue operations in the event of an unplanned outage or disaster; says that it and Eastman Kodak Company have entered into an agreement under which IBM will design, build and manage a new state-of-the-art data center for Kodak in Rochester, N.Y.; announces the IBM Store System to provide affordable back-office and point-of-sale solutions for retailers with small stores; consolidates its U.S. service offerings into a one simplified service contract called ServicePlan; introduces products such as IBM CallPath that integrate voice and data applications to make possible communications between mainframes and business telephone systems; works with Burger King Corporation to develop a customized order-entry station and deliver specialized displays, cash drawers and tills and enclosures; and signs a service contract with Hibernia National Bank to operate and maintain its computer systems and provide information processing support throughout the organization.

IBM Australia is awarded a major five-year contract by Australia's Department of Defense to provide computing equipment for the Australian Defense EDP (electronic data processing) Systems Integrated Network Environment, a standard computing environment throughout Australia; and IBM Germany adds mobile services vehicles that can be dispatched anywhere in the country to respond to emergencies.

There are over 70,000 IBM marketing people working directly with customers around the globe, 23 percent more than three years ago (while reducing the overall employee population by 24,000 since early 1986).

### **Alliances**

IBM enters into a number of new business alliances as part of its continuing effort to augment and accelerate software development, leverage resources and acquire new technologies. Among these are new equity investments in American Management Systems, Inc., a systems integrator and application software provider; PCO Inc., an optoelectronics company and a subsidiary of Corning Glass Works; Policy Management Systems Corporation, a specialist in application software, services and products for the insurance industry; and investments in three companies that develop and market computer-aided software engineering products (Bachman Information Systems, Inc., KnowledgeWare Incorporated, and Index Technology Corporation). New joint ventures include a partnership with Baxter Healthcare Corporation to form a new healthcare information management company and IBM Japan's alliance with Toshiba Corporation to form a company that will manufacture large-sized color liquid crystal displays.

IBM joins six other members of the Semiconductor Industry Association in funding U.S. Memories, Inc., a corporation being formed to produce memory products in the United States. IBM and Microsoft Corporation announce a joint project to create an industry standard for developing multimedia applications for personal computers. IBM and Compaq sign a cross-license agreement on the use of each other's worldwide patent portfolios. IBM and Micron Technology Inc. agree that Micron will be licensed to use IBM's DRAM technology and will perform certain development work with IBM in various types of memory chips. Under the agreement, IBM will provide Micron with process technology and 4-megabit chip design developed by IBM at Burlington, Vt. IBM and Polygen Corporation agree that Polygen will enhance its software to run on large IBM computers and focus its application software for the chemical and pharmaceutical industries.

IBM joins a number of real estate joint venture projects in 1989, including: a partnership with Trammell Crow Company and Metropolitan Life Insurance Company to own NCNB Plaza, an office building in San Antonio, Texas; another with Barker-Patrinely Group and The Stadler Companies to develop and own an office complex in Coral Gables, Fla.; a third with Park Tower Realty Corp. to jointly own IBM's property in Bethesda, Md. and Leesburg, Va.; and a joint venture with C.J. Segerstrom & Sons for the development and ownership of an office building in Costa Mesa, Calif. In addition, IBM United Kingdom and Siebe PLC form a joint venture company called Robertshaw Intelligent Building Systems Limited to market, install and maintain advanced automation systems and products for building management and control.

IBM has relationships around the world with more than 10,000 joint marketers, systems integrators and Business Partners who reach and support the majority of IBM Application System/400 and Personal System/2 customers.

IBM and MCA Inc. enter into an agreement with wholly-owned U.S. subsidiaries of Pioneer Electric Corporation of Tokyo to sell Discovision Associates to the Pioneer subsidiaries. Discovision Associates is a joint venture equally owned by IBM and MCA. It was originally formed in 1979 to develop video disc systems and ceased manufacturing operations in 1982.

### **Science & Technology**

The IBM Academy of Technology is established to provide the technical community with the means to improve communications and advance the understanding of key technical areas.

IBM becomes the first company in the world to ship the industry's fastest microcomputer processor, the i486. IBM also introduces the first product in the industry to make use of a four-million-bit memory chip.

AT&T Bell Laboratories, IBM Research Division, Massachusetts Institute of Technology and MIT Lincoln Laboratories announce plans to form a consortium to explore electronic applications of high-temperature superconductivity.

An early version of the IBM computer system that will fly aboard the Space Station *Freedom* is delivered to the U.S. National Aeronautics and Space Administration. The system will be used to test designs for the space station's other subsystems and to write and test software programs.

A U.S. patent is granted to IBM for the world-record high-temperature superconducting materials invented by four scientists at the Almaden Research Center.

A team of IBM scientists and engineers set a world record in magnetic data storage density by successfully storing a billion bits of information — a gigabit — on a single square inch of disk surface using experimental components. This record data density is 15 to 30 times greater than that of current "hard disk" magnetic storage devices. A billion bits is equivalent to 100,000 double-spaced, typewritten pages — enough paper to make a stack 33 feet tall, about the height of a three-story building.

IBM scientists develop an experimental three-chip set made of gallium arsenide capable of moving a billion bits of data per second over fiber optic lines with high degrees of accuracy. Other IBM scientists and engineers make a practical prototype 128K-bit SRAM (Static Random Access Memory) with the fastest data rate — the ability to receive and send data — of any memory chip yet reported, more than six billion bits of data per second.

Dr. Niklaus Wirth, the inventor of the Pascal computer programming language, is named the 1988 recipient of the IBM Europe Science and Technology Prize.

IBM engineers and scientists work on a prototype color, flat panel computer display that is larger and clearer than any demonstrated so far. The experimental 14-inch diagonal panel has greater resolution than most current color computer displays. Researchers explore a way to use computers in which people simply write on a flat screen, much as they would using a pen and paper.

Researchers at IBM and Helsinki University of Technology in Finland have developed an experimental tool that can vastly improve the diagnosis of brain malfunctions, such as epilepsy, stroke and deafness.

### **Facilities**

IBM dedicates the Advanced Semiconductor Technology Center in East Fishkill, N.Y., a major new laboratory where the most sophisticated chips of the next decade will be developed and readied for mass production. The ASTC will house the nation's only privately owned synchrotron storage ring for X-ray lithography, a technology that permits the etching of extremely fine circuit lines on the surface of silicon.

IBM's component manufacturing facility in Sindelfingen, West Germany, begins fabrication of four-megabit dynamic random access memory (DRAM) memory chips, the first such chips in Europe to be processed in a production-line environment. A sister plant in Essex Junction, Vt., is already producing four-million-bit chips in volume.

### **Corporate Citizenship**

IBM announces a five-year, \$25 million grant program to help improve U.S. elementary and secondary education through more effective use of technology. During 1988, IBM contributes \$42.7 million in cash, equipment and other support to educational institutions in the United States, and \$69.7 million in support to education worldwide. In addition, IBM's current contracts, joint studies and sponsored research represent a cash commitment of \$127 million worldwide. In all, IBM contributes \$135 million in support of social, cultural and educational programs worldwide.

IBM also announces the establishment of special fund to be used by employees, spouses and retirees who volunteer their time to agencies and programs that directly assist victims of natural disasters. Up to \$2 million will be available through the IBM Fund for Disaster Recovery to provide additional assistance to victims of Hurricane Hugo in the Carolinas and the Caribbean and victims of the earthquake in the San Francisco Bay area.

The company donates more than \$1.5 million to community, national and international programs involved with conservation and pollution.

IBM supports volunteerism initiatives throughout the world by providing \$1 million in seed money for new programs and projects in Argentina, Brazil, Canada, France, Germany, Japan, Pakistan, the United Kingdom and the United States.

IBM enters into a joint research project with the University of Missouri School of Journalism to explore new uses for microcomputer technology in journalism. IBM has provided \$2 million in equipment and software in support of the program. Educators at Temple University in Philadelphia, Pa., collaborate with an IBM scientist to help adults improve their reading comprehension.

The company announces a plan to help job training centers establish adult literacy and basic skills programs for students who need remedial training before beginning their job training. In the United States, 128 IBM-supported community based centers are preparing students for careers in areas such as word processing, data entry, computer programming and operations.

IBM says that it will participate in a cooperative effort with AFRICARE — a Washington-based non-profit development organization — to help black South African students in the United States obtain relevant professional employment experience. IBM has made a grant of \$350,000 to Africare's South Africa Career Development Internship Program

IBM Korea enters a joint agreement with the Korea Advanced Institute of Science and Technology to create a Systems Engineering Center. The Instituto Autonomo Biblioteca Nacional, Venezuela's national library, initiates a joint project with IBM Venezuela to combine the library's bibliographic database with information contained in seven university libraries. IBM Canada and the government of Saskatchewan launch a cooperative project to address adult illiteracy in that province. IBM United Kingdom and IBM France both establish Support Centers for People with Disabilities.

Of the 11,200 new employees hired in the United States, about 38 percent are women and 24 percent are minorities. Women hold 20 percent of the company's management positions, while minorities hold 13 percent. Women are in nearly 12.6 percent of the senior management positions while minorities fill almost 10 percent of those posts.