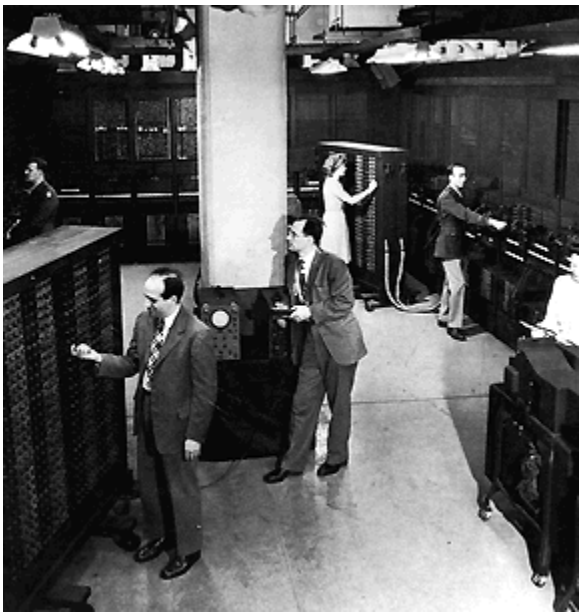
COMPUTERS - The 1940's

1945 - EDVAC

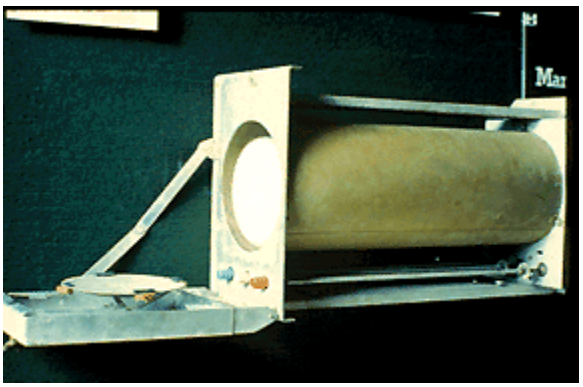
The "First Draft of a Report on the EDVAC," by John von Neumann outlined the architecture of a stored-program computer. Previous methods had been clumsy; electronicly storing the programmed information and data was much more organized and advanced.

1946 - ENIAC



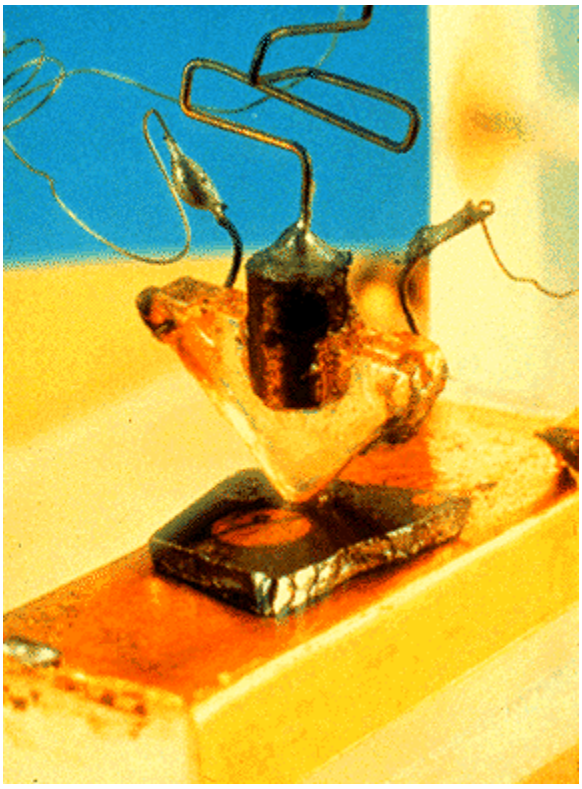
The leaders of building the ENIAC were John Mauchly and J. Presper Eckert. This computer was known for its speed, 5,000 operations per second. It took 3 years to build this computer. It took up 1,000 square feet of floor space. Input and output was controled by cards, lights, switches, and plugs.

1947 - Williams Tube



Sir Frederick Williams of Manchester University modified a cathode-ray tube to display dots and dashes which represented binary ones and zeros. The IBM 701 and other vacuum tube computers used the Williams tube for memory.

1947 - Point Contact Transistor



William Shockley, Walter Brattain, and John Bardeen successfully tested this point-contact transistor.

1949 - EDSAC

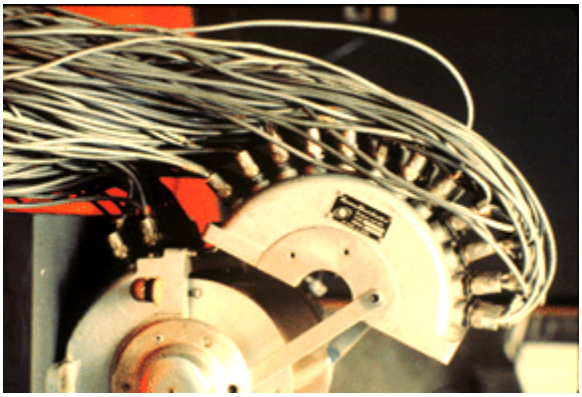
Another early stored-program computer was the EDSAC, in 1949. This was made by Maurice Wilkes, at Cambrige University. The EDSAC could complete 714 operations per second.

1949 - Manchester Mark I

The two year building project of the Manchester Mark I computer was lead by Frederick Williams and Tom Kilburn. This computer filled a medium - sized room. It composed of 1,300 vacuum tubes. Paper tape, switches and a teleprinter were the mediums of input and output.

COMPUTERS - The 1950's

1950 - ERA 1101



The ERA 1101 was the first commercially produced computer. It was built by the Engineering Research Associates of Minneapolis. It's storage device was a 1 million bit magnetic drum, that registered information in magnetic pulses. The US Navy was the first to use the ERA 1101.

1950 - SEAC

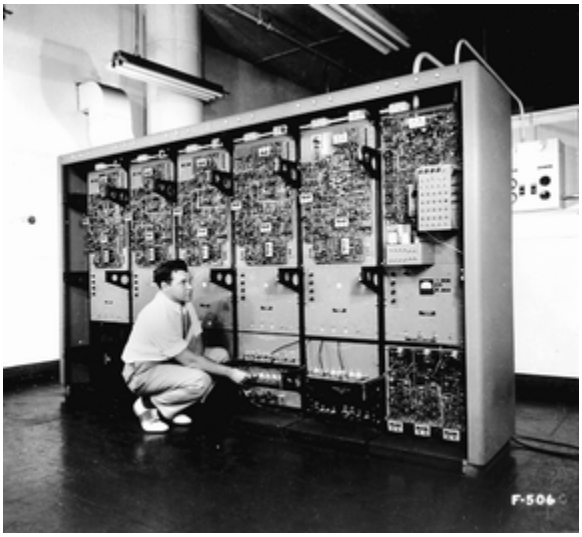
The Standards Eastern Automatic Computer was built by the National Bureau of Standards in Washington to test component and systems. It was the first computer to use all-diode logic, as opposed to vacuum tubes. It was also an early stored-program computer. Program information, coded subroutines, and numerical data was stored on magnetic tape in the external storage units.

SWAC (Standards Western Automatic Computer was also built by the National Bureau of Standards, at the Institute for Numerical Analysis in Los Angeles. SWAC was used for computing, not for testing technology.

1950 - Pilot ACE

The two year building project of Pilot ACE was lead by J. H. Wilkinson. The computer used 800 vacuum tubes and took up 12 square feet of floor space. Input and output were achieved through cards. It's delay-line memory size was 352 32 digit words. It's add-time was 1.8 microseconds.

1951 - MIT Whirlwind



The Whirlwind was a six year long project, but the result was good. It's add- time was only .05 microseconds. Input and output devices included a cathod ray tube, paper tape, and magnetic tape. It's cathode ray tube, and magnetic drum memory size was 2048 16 digit words. The computer took up 3,100 square feet of floor space, and uncluded 4,500 vacuum tubes along with 14,800 diodes. The project was lead by Jay Forrester and Robert Everett

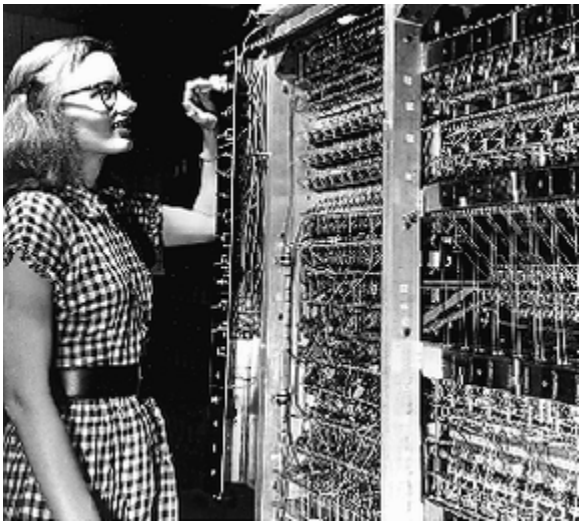
1951 - LEO

England's first commercial computer, the Lyons Electronic Office, was designed to solve scheduling problems tor the Lyons tea shops. It was modeled after the EDSAC. Because of its sucess, Lyons began manufacturing computers.

1952 - UNIVAC I

A UNIVAC I was borrowed by CBS news to predict the outcome of the presidential elections between Dwight D. Eisenhower and Adlai Stevenson. Its results from analysing early retearns, was quite different from what the opinion polls had shown. UNIVAC predicted victory for Eisenhower, while opinion polls predicted a landslide win for Stevenson.

1952 - MANIAC



The MANIAC at Los Alamos Scientific Laboratory, along with , the ILLIAC at University of Illinois, the Johnniac at Rand Corp., the SILLIAC in Australia, and others, was a clone of John von Neumann's IAS computer. The IAS's contract with the Institute for Advanced Studies in Princeton, N.J. allowed other research institutes to use the designs.

1953 - IBM 701

IBM's first electronic large computer was the 701. Nineteen machines were sold over a three year span to the federal government, and research and aircraft companies. It could perform 17,000 instructions per second.

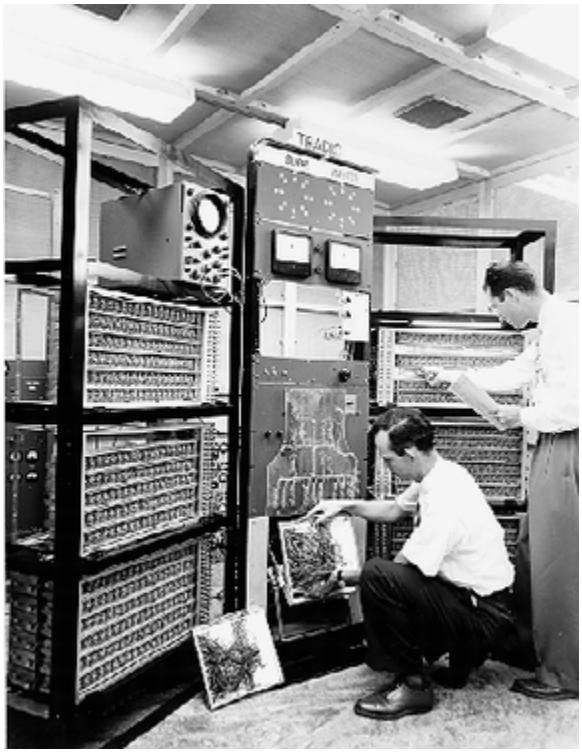
1954 - IBM 650

The IBM 650 magnetic drum calculator was the first mass-produced computer. 450 were sold in one year. Its magnetic data-storage drum allowed faster access to stored material. The drum spun at 12,000 revolutions per minute.

1954 - Silicon junction transistor

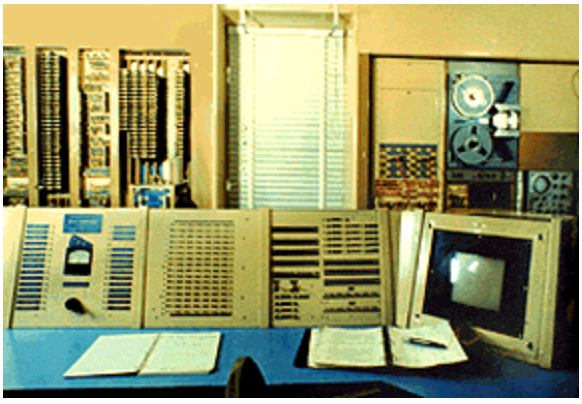
Gordon Teal of Texas Instruments Inc. modified a silicon-based junction transistor, in a way that allowed its price to be lowered to $2.50. A Texas Instruments news release from May 10, 1954, included in the description, "first commercial production of silicon transistors kernel-sized substitutes for vacuum tubes."

1955 - TRADIC



TRADIC, made by AT&T Bell Laboratories, was the first fully transistorized computer. At a size of 3 cubic feet, the computer used almost 800 transistors instead of vacuum tubes. Being fully transistorized allowed the computer operate on less than 100 watts of power, which was about twenty times faster than the vacuum tube computers. In this picture, J. H. Felker (on the left) gives instructions through a plug-in unit and J. R. Harris places numbers into the machine by flipping simple switches.

1956 - TX-0

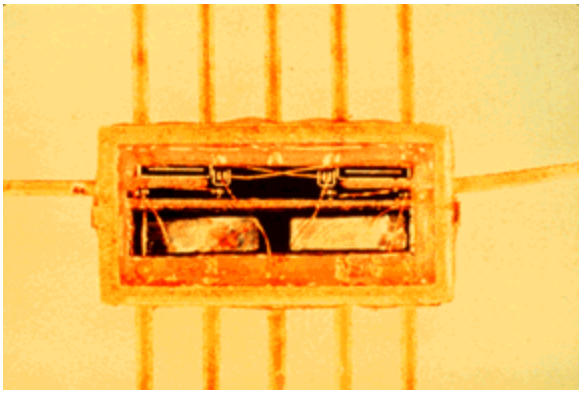


The TX-0 was the first general-purpose, programmable computer built with transistors. It was created by MIT researchers.

1956 - RAMAC

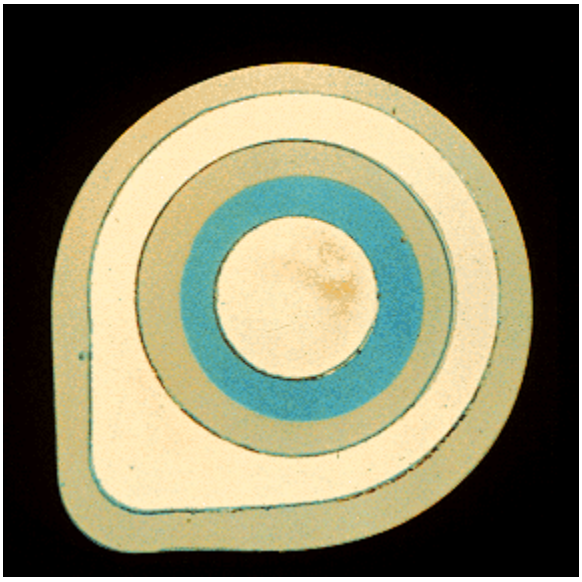
Random Access Method Accounting and Control, made by IBM, had a disk file that served as the storage component. This disk file was made of 50 magnetically coated metal platters stacked upon one another. Each platter could hold up to five million bytes of data.

1958 - Integrated Circuits



The first integrated circuit, created by Jack Kilby of Texas Instruments, was made up of a silver of geranium with five components linked together by wires. This proved that resistors and capacitors could exist on the same piece of semiconductor material.

1959 - Practical Integrated Circuits

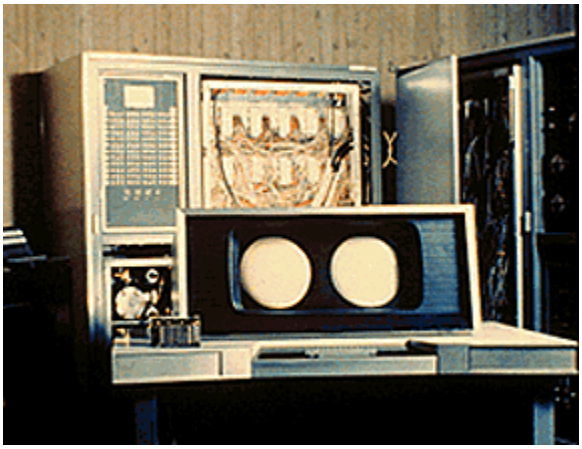


Robert Noyce of Fairchild Camera and Instrument Corp. constructed the practical integrated circuit, which allowed conducting channels to be printed directly on the silicon surface.

1958 - SAGE

The Semi-Automatic Ground Environment linked hundreds of radar stations in the United States and Canada. It was the first large-scale computer communications network. Input was entered by touching a light gun to the screen. Its central computer was the AN/FSQ-7, known as Whirlwind II, and developed at MIT. Each computer had 55,000 vacuum tubes, 175 diodes, and 13,000 transistors, and required 1 megawatt of power. The system weighed 113 tons.

1959 - IBM 7030



The IBM 7030, also known as the "Stretch," was one of the 7000 series made by IBM. These computers were the company's first transistorized computers. Seven IBM 7030s were sold, to scientific users and national labratories. This computer, with 64 bits a word, could complete 1 million instructions per second.

COMPUTERS - The 1960's

1960 - DEC PDP-1

The PDP-1 sold for $120,000. MIT wrote the first video game, Space War! for it. A total of 50 were built. Each had a cathode ray tube graphic display.

1961 - IBM 1400 Series

The 1401 mainframe, the first in the 1400 series, used transistors instead of vacuum tubes, and had a magnetic core memory. More than 12,000 of the 1401 computers were sold.

1962 - LINC

The LINC (Laboratory Instrumentation Computer) was made for laboratory data processing. In the picture, the LINC's designer, Wesley Clark of Lincoln Laboratories, stands with the LINC, and its processor on the left.

1962 - Virtual Memory

Virtual memory allowed a computer to use its storage capacity to run outside software and switch rapidly between any programs opened simontaneously. It came about at the University of Manchester from a group led by Tom Kilburn.

1964 - IBM System/360

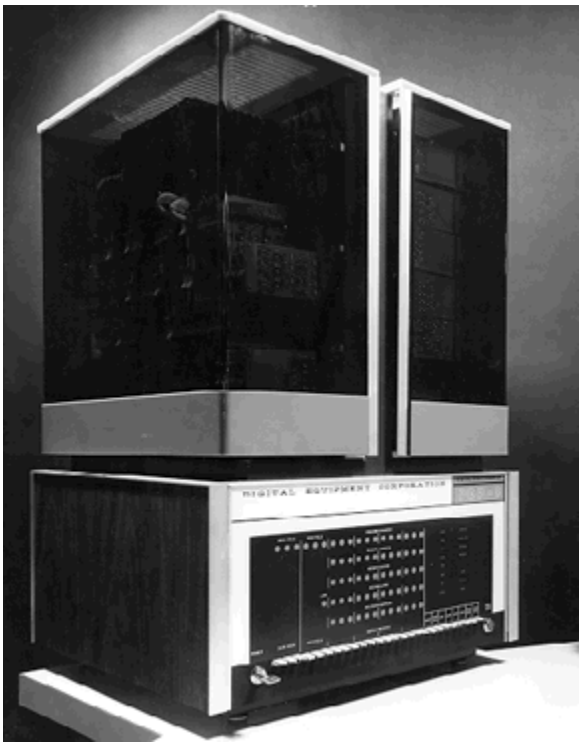
IBM's System/360, a family of computers with a great variety of combinations of speed, memory, and power. All the computers in the system were compatible, meaning they could work together, and exchange software or hardware. This computer family was a good investment for IBM. Within two years, they were getting 1,000 orders each month. month within two years.

1964 - CDC 6600

CDC's 6600 supercomputer was designed by Seymour Cray. It could perform up to 3 million instructions per second. The 6600 was considered the fasted computer in the

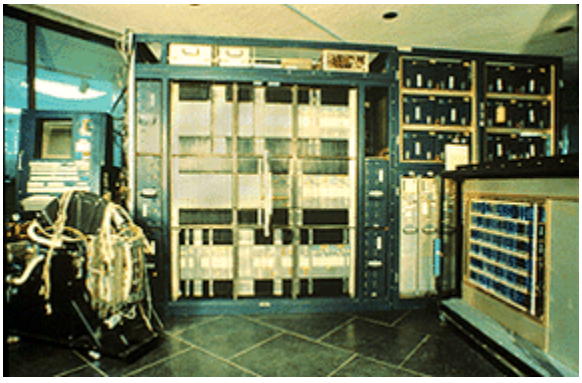
world until 1968, when the CDC 7600 was completed. The CDC 6600 was designed with 10 "peripheral processors," or small computers that passed data to a large central processing unit. This design was responsible for the speed of the computer.

1965 - PDP-8



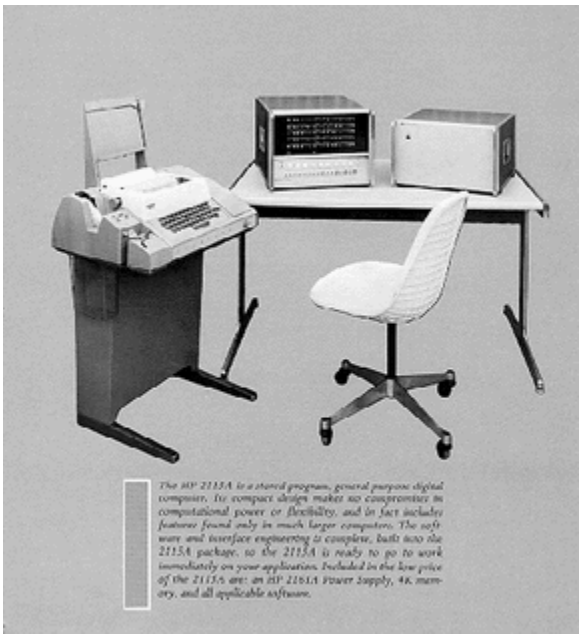
The PDP-8, made by Digital Equipment Corp., was considered the first commercially successful minicomputer. It's price was $18,000. This reasonable price, along with speed, and small size, is what made it successful. Costumers included manufacturing plants, small businesses, and scientific laboratories.

1966 - ILLIAC IV



The ILLIAC IV was built by the University of Illinois, at the request of the Department of Defense Advanced Research Projects Agency. The ILLIAC IV was not operational until 1972 contracted the University of Illinois to build a large-scale array, parallel processing computer. This computer can complete 200 million instructions per second. This picture shows one of the ILLIAC's 13 Burroughs disks, the debugging computer, the central unit, and the processing unit cabinet with a processing element.

1966 - HP-2115



Hewlett-Packard's HP 2115 was a computer built to make computations with the power previously found only in larger computers. It supported many languages,

including BASIC, ALGOL, and FORTRAN.

1968 - Nova

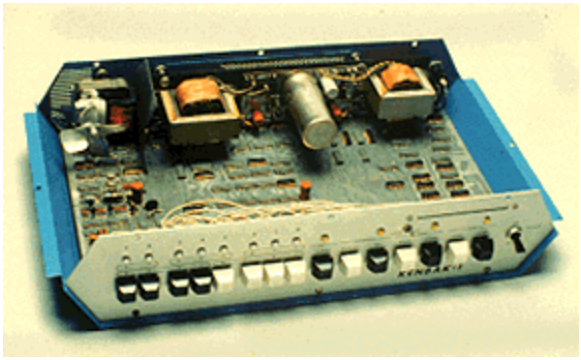
The Nova minicomputer was created by Data General Corp., a group started by engineers that had left Digital Equipment Corp. The Nova, had 32 kilobytes of memory, and sold for $8,000. In the picture is Ed deCastro, president of the then new company, sitting with a Nova. This computer's simple architecture is the inspiration of the Apple I board, in 1976.

1968 - Apollo Guidance Computer

The Apollo Guidance Computer orbited the Earth on Apollo 7. The next year, it steered Apollo 11 to the lunar surface.

COMPUTERS - The 1970's

1971 - Kenbak-1



The Kenbak-1 was designed by John V. Blankenbaker, using integrated circuits. It was considered the first personal computer. Switches performed the input, and lights displayed the output. It had a 256 byte memory. It's price was about $750. After two years, when only 40 machines had been sold, Kenbak Corp. decided not to sell them any more.

1971 - 8" Floppy

The 8-inch floppy diskettes were invented by a group of workers at IBM. They were used for both programs and as data storage mediums. They allowed information to be easily transferred from one computer to another.

1973 - TV Typewriter

The TV Typewriter was designed by Don Lancaster. It was the first machine to provide the first display of letters and numbers on a regular television set. It could generate and store 512 characters in 16 lines. Information could also be stored on 90 minute cassette tapes, about 100 pages fitting on each.

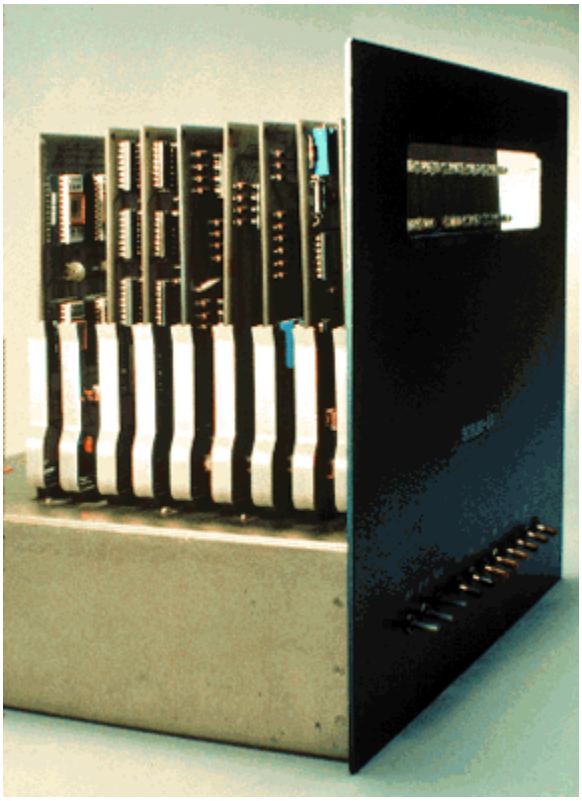
1973 - Micral

The Micral was a personal computer based on the Intel 8008 microprocessor. Thi Truong, founder and president of the French company R2E, made the computer for those that didn't need high performance. Philippe Kahn developed the software for the computer. Because of it's price of $1,750, the US computer users did not take interest in Micral.

1974 - Alto

The alto was the first work station with a built-in mouse for input. It used windows, menus, icons, and could link to a network. It was created by Researchers at the Xerox Palo Alto Research Center. The Alto was never sold commercially, but given to universities.

1974 - Scelbi 8H



Scelbi's 8H computer, was based on Intel's 8008 microprocessor. The computer was available both in kit form and fully assembled. It had 4 kilobytes of internal memory and a cassette tape. It came with both teletype and oscilloscope interfaces. Just one year later, Scelbi came out with 8B, which had 16 kilobytes. The company sold about 200 machines, and lost $500 per unit.

1976 - 5 1/4-inch Floppy

The 5 1/4" flexible disk drive and diskette, made by Shugart Associates, was created because the 8 in. floppy drives were considered to large for desktop computers. Within two years, more than 10 manufacturers were producing 5 1/4" floppy drives.

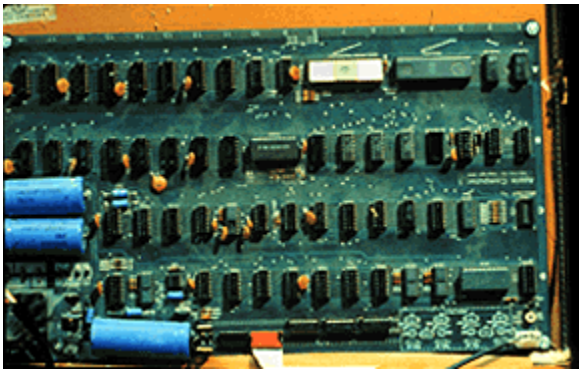
1975 - Altair 8800

The Altair 8800 computer kit, based on Intel's 8080 microprocessor. It was invented by Ed Roberts. The manufacturing company, MITS, sold many machines, at a price of $297 or $395 with a case. Bill Gates and Paul Allen licensed BASIC as the software language for the Altair. The computer had 256 bytes of memory (expandable to 64K) and an open 100-line bus structure that evolved into the S-100 standard. Two years later, MITS was bought by Pertec, which continued producing Altairs for one more year.

1975 - Visual Display Module

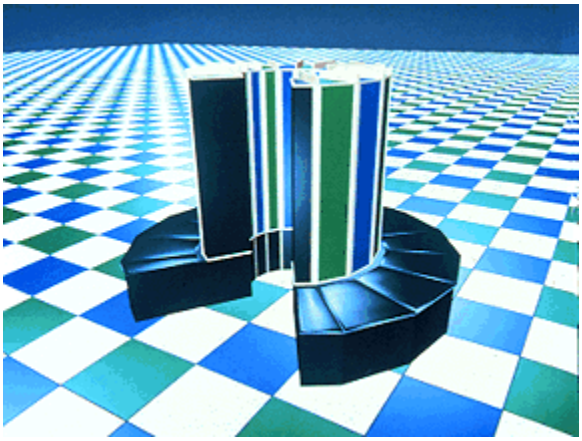
The visual display module (VDM) prototype was designed by Lee Felsenstein. It was a memory-mapped alphanumeric video display for personal computers. The visual display module allowed use of personal computers for interactive games.

1976 - Apple I



Steve Wozniak designed the Apple I, a single-board computer, using the 6502 microprocessor. The Byte Shop ordered 100 boards at $500, to begin the business for Wozniak and Steve Jobs. In this photograph, the upper two rows are a video terminal and the lower two rows are the computer. About 200 Apple Is were sold before the Apple II, a complete computer was announced.

1976 - Cray I



The Cray I was considered the first commercially successful vector processor. At the time it came out, it was the fastest machine. It's C shape allowed the wires to be a bit shorter, lessening the time for signals to travel them. It's speed was 166 million floating-point operations per second. The designing of the Cray I took four years to accomplish. It is 56 cubic feet in size, and weighs 5,300 pounds. It's made using integrated circuits.

1977 - Commodore PET

The Commodore Personal Electronic Transactor came fully assembled, with two built-in cassette drives and a keyboard. It was considered easy to operate, and had a choice of 4 or 8 kilobytes of memory.

1977 - Apple II

The Apple II came with a printed circuit, motherboard, switching power supply keyboard, case assembly, manual, joystick, A/C power cord, and cassette tape with the computer game "Breakout." Even though it did not include a monitor, it could be connected to a television set. It had 16 K of memory.

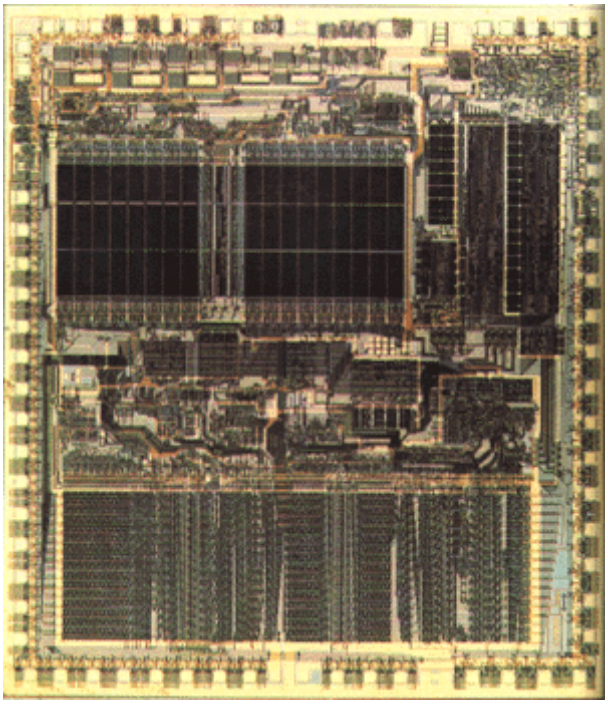
1977 - TRS-80

Tandy Radio Shack's first desktop computer cost $599.95. 10,000 machines were sold in one year, far better than predicted 3,000. The TRS-80 was based on the Z80 microprocessor, had 4 KB of memory, and cassette storage. It came with video display, the language BASIC, and well written manuals.

1978 - VAX 11/780

The VAX 11/780, made by Digital Equipment Corp., had 4.3 gigabytes of virtual memory, much more than the minicomputers of its time.

1979 - Motorola 68000



The Motorola 68000 microprocessor was constructed. It was much faster than other microprocessors of that time. It was used commonly used for graphics-intensive programs.

COMPUTERS - The 1980's

1980 - Microcomputer Hard Drive

The first hard disk drives for microcomputers, made by Seagate Technology, held 5 megabytes of data (as opposed to a standard floppy's 1MB). It was metallic platter coated with magnetic material, which store the data.

1980 - Optical Data Storage

The first optical data storage disk was developed by Philips. It had 60 times the capacity of a 5 1/4-inch floppy disk. A laser beam, in the track of a spiral, burned marks onto the disk to store the data. Until 1982, when Philips created magneto-optic disks (erasable optic disks), optic disks could not be overwritten. They were very useful for large amounts of data that did not need to be revised. On erasable optical disk, instead of recording information permanently by melting holes in the metal, the laser heats a spot to just below the metal's melting point, so that a magnet can reverse the direction of the metal.

1981 - IBM PC

IBM's first PC ran on Intel's 4.77 MHz 8088 microprocessor. It came with Microsoft's MS-DOS operating system.

1981 - Osborne I

Osborne I, created by Adam Osborne, was the first portable computer. It weighed 24 pounds, and could fit under an airplane seat. It had a low price of $1,795, considering it

came with software worth almost $1,500. It had 64 KB of memory, and two 5 1/4 inch floppy disk drives. The screen's size seemed to be the only downfall, at 5-inches.

1981 - Apollo DN100

DN100, a workstation, was a powerful computer with a much lower price than minicomputers.

1981 - 3 1/2-inch Floppy

The first 3 1/2" floppy drives and diskettes were created by Sony. It was used by Hewlett-Packard in 1982, which helped it be the surviving format instead of the other tried possibilities, such as the 3 1/4", 3", and 3.9" formats.

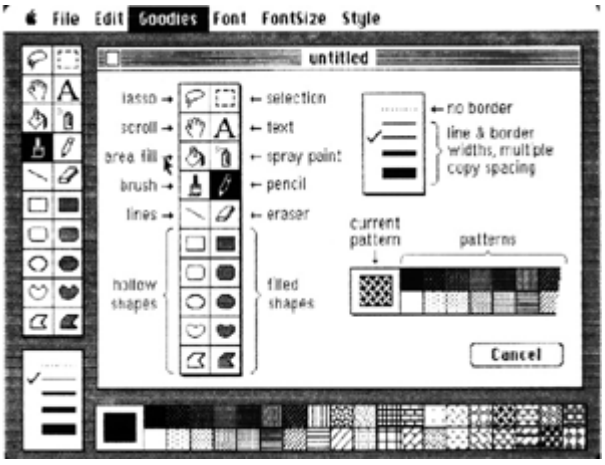
1983 - Apple Lisa

Lisa was the first personal computer with a graphical user interface. It was based on Motorola's 68000 microprocessor. It came with 1 MB of Random Access Memory, a 12 inch monochrome monitor, two 5 1/4 in floppy disk drives, and a 5MB hard drive. The Lisa was too expensive, at $10,000, for success.

1983 - Compaq Computers

The Compaq Computer was the first to make PC clones. These clones could use the same software as the IBM PC. Compaq Computer Corp. had $111 million worth of sales the first year, more than any other business in America, for one year. These computers were nearly 100 percent compatible with the IBM PC.

1984 - Apple Macintosh



Macintosh, was considered the first successful mouse-driven computer with a graphic user interface. It was based on the Motorola 68000 microprocessor, and included many of the qualities the Lisa had featured. It was a much lower price than the Lisa, at $2,500. The Macintosh also came with MacPaint and MacWrite software, both of which used the mouse. MacWrite was a "what you see is what you get" word processing program.

1984 - IBM PC Jr. and PC-AT

IBM released both PC Jr. and PC-AT. The PC Jr. was unsuccessful, but the PC-AT did very well. It was based on the Intel 80286 chip. The PC-AT was several times faster than, had more storage capacity than, included more RAM than the original PC. It's price was $4,000.

1985 - CD-ROM

CD-ROMs, made by Philips and Sony, have so much capacity, that they are rarely filled. They can hold 550 megabytes of prerecorded data. "Grolier's Electronic Encyclopedia," came out the same year. The encyclopedia only filled up 12 percent of the space allowed.

1986 - Connection Machine

The Connection Machine, developed by Daniel Hillis of Thinking Machines Corp., was a big advance in artificial intelligence. It could complete several billion operations per second. Each of 16,000 processors had its own memory linked with others. The way the processors could work together was a key point in the high artificial intelligence of the machine.

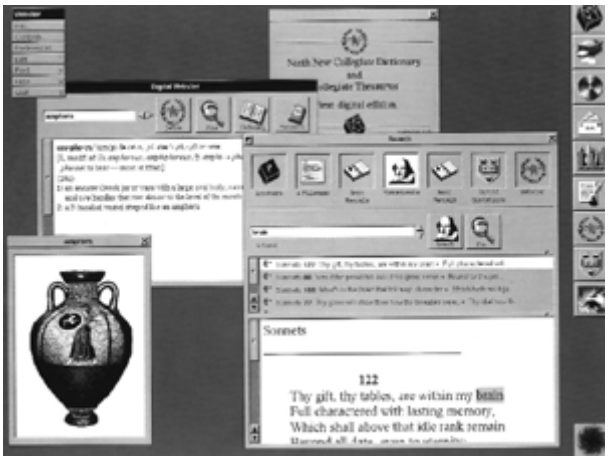
1986 - IBM PC/RT

IBM's first RISC-based workstation, the PC/RT had 1 megabyte of RAM, a 1.2-megabyte floppy disk drive, and a 40-megabyte hard drive. It could perform 2 million instructions per second.

1987 - IBM PS/2

IBM's PS/2 computers included a 3 1/2-inch floppy disk drive and a video graphics array, and was based on Intel's 80386 chip. At the same time, IBM introduced OS/2 and operating system that allowed use of a mouse with IBMs. More than 1 million machines were sold by the end of he year. the company had shipped more

1988 - NeXT



The NeXT, produced by Steve Jobs (who had left Apple to form a new company), at a price of $6,500, was too slow to be very successful. It was, however recognized as an important step in the construction of computers. The NeXT was the first personal computer with a drive for an optical storage disk, a digital processor allowing voice recognition, and object-oriented languages. The NeXT was based on Motorola's 68030 microprocessor, had 8 megabytes of RAM, and a 256-megabyte read/write optical disk storage.

Network History

1960 - Dataphone

Dataphone was the first commercial modem. It coud convert digital computer data into anolog signals. These signals could then be sent across a network.

1964 - SABRE

The SABRE was a networking system that connected 65, cities to two IBM 7090 computers for American Airlines. The two IBM 7090s provided information on any flight within three seconds of the request.

1964 - JOSS

JOSS is a time-sharing service. It started on Rand's JOHNNIAC computer.

1966 - Acoustically Coupled Modem

John van Geen of the Stanford Research Institute improved the acoustically coupled modem so that it could reliably detected bits of data. The acoustically coupled modem connected computers to the telephone network by putting rubber cups over the earphone and microphone of the then standard telephone.

1970 - ARPANET

Four nodes, computers connected to a network, were established for the ARPANET. They were: the University of California-Santa Barbara, UCLA, SRI International, and the University of Utah. The purpose of the network was to share resources, sharing of hardware services, software, and databases.

1972 - "Blue Box"

The "blue box," made by Steve Wozniak was a tone generator that could make free phone calls. He sold them in dormitories at the University of California-Berkeley where he was as an undergraduate. If one removed the magnet taped onto the outside of the box, the box would create "off-frequency tones," and would not work. When askeed, users then reported to the police it was simply a music box.

1973 - Ethernet

Robert Metcalfe of Xerox Palo Alto Research Center devised the Ethernet, a method of network connection.

1975 - Telenet

Telenet, the first commercial packet-switching network, was born. It linked customers in seven cities. Telenet offered extra services to linking computers.

1980 - Computer "Worm"

John Shoch of Xerox Palo Alto Research Center invented a program that searched a network for idle processores. The purpose was to allow the computers to run more efficiently, but it turned out that the the computer "worm," what his program was called, invaded network computers, threatening security.

1985 - NSFNET

The NSFNET (formed by the National Science Foundation), linked five supercomputer centers together: Princeton University, Pittsburgh, University of California at San Diego, University of Illinois at Urbana-Champaign, and Cornell University. In 1991, the NSF began to allow commercial use of the Internet. In 1995, it left the Internet as a self-supporting industry.

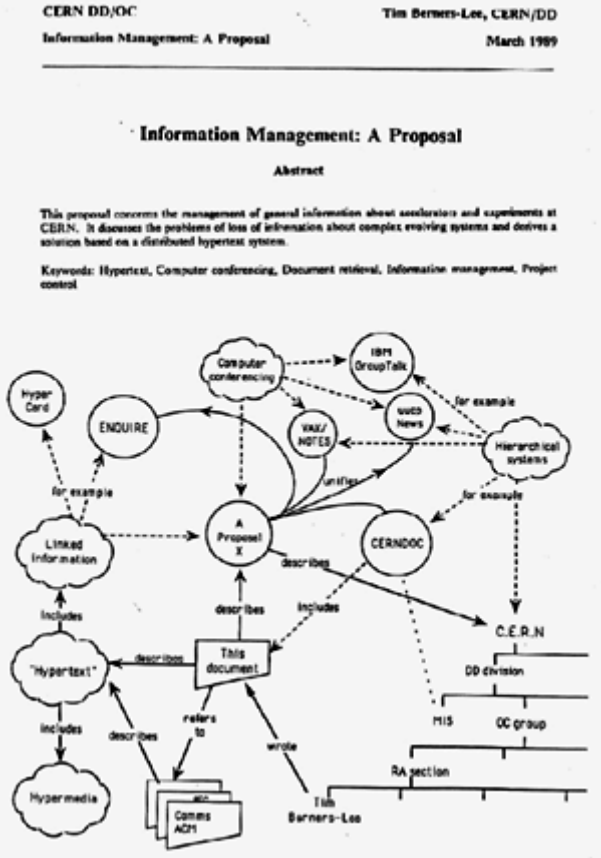
The NSFNET initially transferred data at 56 kilobits per second, much faster than the ARPANET. In 1987, the network was improved, and could transfer1.5 megabits per second. In 1992, the network was upgrades, allowing information to be transmited at about 45 megabits per second.

1988 - ARPANET Worm

The first intended network worm was created by Robert Morris, 23-year-old son of a computer security expert for the National Security Agency. It was created difficulties for about 6,000 out of the 60,000 hosts.Motivated by boredom, Morris designed the program to reproduce itself and computer files, eventually filling up and disabling the memory.

In consequesnse, Morris was sentenced to three years of probation, 400 hours of community service, and a fine of $10,050.

1990 - The World Wide Web


CERN DD/OC

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Information Management: A Proposal

March 1989

Information Management: A Proposal

Abstract

This proposal concerns the management of general information about accelerators and experiments at CERN. It discusses the problems of loss of information about complex evolving systems and derives a solution based on a distributed hypertext system.

Keywords: Hypertext, Computer conferencing, Document retrieval, Information management, Project control

Tim Berners-Lee of CERN high-energy physics laboratory in Geneva developed HyperText Markup Language (HTML), creating the World Wide Web. It used specifications he developed such as URL (uniform resource locator) and HTTP (hypertext transfer protocol). The World Wide Web continues today to serve its purpose, allowing people to work together by combining their knowledge in a global web of hypertext documents. Berners-Lee also designed the first World WideWeb server and browser, which were available to the general public in 1991.

Software History

1945 - Plankalkul

Plankalkul, the first algorithmic programming language, was created by Konrad Zuse.

1948 - The Mathematical Theory of Communication

Claude Shannon wrote a book called "The Mathematical Theory of Communication" for engineers. His book described how to code data in a way that they could check for accuracy.

1953 - Speedcoding

John Backus programmed IBM's 701 computer using speedcoding. Speedcoding requires more memory and compute time, but made it easier to program.

1955 - Logic Theorist

Logic Theorist software, created by Herbert Simon and Allen Newell, had rules of reasoning and proved symbolic logic theorems.

1956 - GM-NAA I/O

GM-NAA I/O, the first operating system for the IBM 704, allowed batch processing, which is a simple way to combine existing commands into new commands. It was created by Bob Patrick of General Motors and Owen Mock of North American Aviation.

1956 - Keyboard Input

At MIT, researchers started to experiment with using keyboards as a direct input into the computer.

1957 - MATH-MATIC

MATH-MATIC was a new version of compiler for the UNIVAC. This compiler, as well as its predecessor [the A-0 compiler], was designed by Grace Hopper. The creation of this compiler led to the construction of FLOW-MATIC in the same year. FLOW-MATIC was the first English-language business data processing compiler.

1957 - FORTRAN

FORTRAN (formula translator), used loops to allow the user to type in a single set of instructions to have the computer perform a repetitive task.

1959 - ERMA

ERMA, the Electronic Recording Method of Accounting, digitized checking for the Bank of America by creating a computer-readable font. A special scanner read account numbers preprinted on checks in magnetic ink.

1960 - COBOL

Common Business Oriented Language (COBOL), was developed by a team of computer manufacturers and the Pentagon for business use. It was hoped to have run on any computer that had a compiler, which worked with a few exceptions. Howard Bromberg, one of the creators, made the tombstone in this picture, fearing the language had no future. COBOL is still used to this day.

1960 - LISP

LISP, created by John McCarthy, was the first computer language designed specifically for writing artificial intelligence programs.

1962 - SpaceWar!

Space War! was considered the first interactive computer game. It was created by students at MIT: Slug Russell, Shag Graetz, and Alan Kotok. The display featured interactive graphics that inspired future video games. Using early versions of joysticks, players fired at each other's spaceships and navigated their ship away from the sun and the enemy's ship.

1963 - Sketchpad

Sketchpad, developed by Ivan Sutherland as his MIT doctoral thesis, is a real time computer drawing system. In this program, using a light pen, the user could draw and rearrange figures on the screen.

1963 - ASCII

A	1	0	0	0	0	0	1
B	1	0	0	0	0	1	0
C	1	0	0	0	0	1	1
D	1	0	0	0	1	0	0
E	1	0	0	0	1	0	1
F	1	0	0	0	1	1	0
G	1	0	0	0	1	1	1
H	1	0	0	1	0	0	0
I	1	0	0	1	0	0	1
J	1	0	0	1	0	1	0
K	1	0	0	1	0	1	1
L	1	0	0	1	1	0	0
M	1	0	0	1	1	0	1
N	1	0	0	1	1	1	0
O	1	0	0	1	1	1	1
P	1	0	1	0	0	0	0
Q	1	0	1	0	0	0	1
R	1	0	1	0	0	1	0
S	1	0	1	0	0	1	1
T	1	0	1	0	1	0	0
U	1	0	1	0	1	0	1
V	1	0	1	0	1	1	0
W	1	0	1	0	1	1	1
X	1	0	1	1	0	0	0
Y	1	0	1	1	0	0	1
Z	1	0	1	1	0	1	0

American Standard Code for Information Interchange (ASCII) set a standard for the binary values of the alphabet, numbers, and other symbols, or functions.

1964 - BASIC

BASIC is an easy-to-learn programming language, created by Thomas Kurtz and John Kemeny for their students at Dartmouth College. It is still used today.

1965 - Simula

Simula, an object oriented language, was created by Kristen Nygaard and Ole-John Dahl. It grouped data and instructions into blocks called objects.

1967 - LOGO

LOGO is a computer language, designed by Seymour Papert, for children. It controlled the actions of an electronic turtle to make drawn designs on a video display monitor.

1969 - UNIX

UNIX is an operatidn system created by AT&T Bell Laboratories programmers. UNIX combined many the timesharing and file management features. The UNIX operating system broadly accepted among engineers and scientists.

1972 - Pong

Nolan Bushnell created Pong, introducing his new company, Atari video games. To see our version of Pong, go to the games section.

1976 - C/PM

Command	Function
nA	append lines
:B	begin bottom of buffer
:nC	move character positions
:nD	delete characters
E	end edit and close files (normal end)
nF	find string
H	end edit, close and reopen files
I	insert characters
nJ	place strings in juxtaposition
:nK	kill lines
:nL	move down/up lines
nM	macro definition
nN	find next occurrence with autoscan
O	return to original file
:nP	move and print pages
Q	quit with no file changes
R	read library file
nS	substitute strings
:nT	type lines
:U	translate lower to upper case if U, no translation if -U
nW	write lines
nZ	sleep
:n<cr>	move and type (:nLT)

CP/M, created by Gary Kildall, was an operating system for personal computers. It allowed one version of a program to run on a variety of computers.

1977 - IBM DES

IBM's data encryption standard, DES. It required an eight-number password for scrambling and unscrambling data, allowing for 70 quadrillion possible combinations.

1979 - VisiCalc

VisiCalc, (visible calculator), created by Daniel Bricklin Robert Frankston, was created for the Apple II. It could automatically recalculate values within a spread sheet. More than 100,000 copies sold in one year.

1981 - MS-DOS

The Microsoft Disk Operating System (MS-DOS) was written for the IBM PC. Microsoft and IBM would continue to work in partenership.

1982 - Lotus 1-2-3

Lotus 1-2-3, an operating system for IBM created by Mitch Kapor, ran much faster than other operating systems of its time. It had good spreadsheet, graphics, and data retrieval capabilities.

1983 - Microsoft Word

Microsoft Word, originally called Multi-Tool Word, was developed at the same time as Microsoft's Windows. Windows, however was not available until 1985. Microsoft distributed 450,000 disks with a demo version of the Word program in PC World magazine.

1985 - PageMaker

PageMaker, made by Paul Brainerd, founder of Aldus Corp., was a desktop publishing program for Macintosh computers. Users of PageMaker could easily combine graphics and text. Two years later, an IBM version came out.

1985 - C++

The C++ programming language, created by Bjarne Stroustrup of AT? Bell Laboratories, established itself as the main object-oriented language used in the computer industry. In the preface of his book, "The C++ Programming Language," Stroustrup wrote, "C++ is a general purpose programming language designed to make programming more enjoyable for the serious programmer. Except for minor details, C++ is a superset of the C programming language. In addition to the facilities provided by C, C++ provides flexible and efficient facilities for defining new types.... The key concept in C++ is class. A class is a user-defined type. Classes provide data hiding, guaranteed initialization of data, implicit type conversion for user-defined types, dynamic typing, user-controlled memory management, and mechanisms for overloading operators.... C++ retains C's ability to deal efficiently with the fundamental objects of the hardware (bits, bytes, words, addresses, etc.). This allows the user-defined types to be implemented with a pleasing degree of efficiency."

1989 - SimCity

SimCity, made by Maxis, is a video game. This game allows user to create a new city, starting by creating a landscape, then: constructing buildings roads, and waterways; providing services to the community; and dealing with disasters. A number of other simulation games were created in the series, including SimEarth, SimAnt, and SimLife

1989 - Virtual Reality

The Silicon Graphics booth at Siggraph's convention featured virtual reality, a computer-generated 3-D environment that allows the user to interact with it. Virtual reality was soon used in video games, education, and travel, and design.

1990 - Microsoft Windows 3.0

Windows 3.0, created by Microsoft, supported graphical applications and allowed multiple programs to run simontaneously. Many applications that would run under Windows 3.0, including versions of Microsoft Word and Microsoft Excel, were designed in advance. PCs became more "user-friendly," increasing their popularity.