

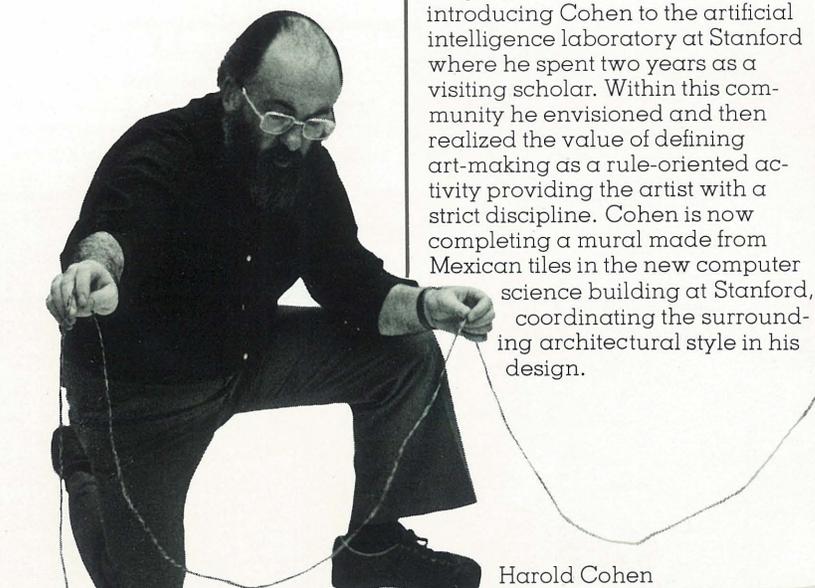
September 1-23

Art By Computer An Exhibition

This exhibition of 45 selected computer-generated works from the first major international display in London ten years ago and updated at the Lawrence Hall of Science, Berkeley, in 1978, provides a comprehensive viewing of the development of computer art.

The aesthetic potential of computer generated graphics was first recognized by scientists working on machines with graphic displays. Both Whirlwind and TX-0, for example, led to a variety of experiments with computer graphics in the nineteen-fifties at MIT. At the same time, the medium—in a rather simple form using plotters and CRTs—was adopted by a school of artists and eventually applied to textile design, sculpture, theatrical set design, drawing and painting. Generally the works presented are characterized by serial imagery, randomization, rotation, and distortion. The exhibit includes a computer and graphics tablet lent by the Apple Corporation allowing visitors to create their own computer-aided art and learn about the special characteristics of the medium.

Art by Computer was curated by Grace Hertlein, Department of Computer Science, California State University, Chico, and distributed by the Association of Science and Technology Centers, Washington, D.C.



Harold Cohen

September 23 5 PM

Lecture/Demonstration Harold Cohen Museum Mural Artist

Professor Harold Cohen, University of California San Diego, has developed a unique bridge between computer science and art, using the theories of artificial intelligence, a computer, and his own hand, eye, and intellect to create paintings. During September he will paint a nine by seventeen foot mural on one of the museum's balcony walls. His visit culminates with a celebration/lecture/demonstration on September 23rd at 5 PM.

Cohen creates his works using a PDP-11/45, a Tektronix display terminal and a 'turtle' that draws from directions by a sonar navigation system. Cohen's program, which steers the turtle, can differentiate between figure and ground, open and closed forms, insiderness and outsiderness, and a number of other cognitive constants. It is 'event driven' in the sense that the rules it follows refer to what has been completed. During the execution of these rules, some randomizing gives a variety and richness associated with human-executed drawings.

Cohen considers the computer as a philosophical peer whose principal function is to oblige Cohen to ask questions and insist on clear answers. On moving to California he became increasingly absorbed with investigating the computer as a tool in the creative process. Ed Feigenbaum was instrumental in introducing Cohen to the artificial intelligence laboratory at Stanford where he spent two years as a visiting scholar. Within this community he envisioned and then realized the value of defining art-making as a rule-oriented activity providing the artist with a strict discipline. Cohen is now completing a mural made from Mexican tiles in the new computer science building at Stanford, coordinating the surrounding architectural style in his design.

November 11 5 PM

Fourth Pioneer Computer Lecture Dr. John Atanasoff

The first U.S. Digital Computer: The Atanasoff/Berry Machine

In 1937, John Atanasoff, then Professor of Physics at Iowa State College in Ames, decided to build a digital computer for his physics students to solve large systems of linear algebraic equations. He and C. E. Berry, a graduate student, designed and built the machine that they in turn showed to Presper Eckert in 1938. The Atanasoff/Berry machine is now judged to be the first electronic digital computer.

Dr. Atanasoff promises to tell the tale of the machine from its inception in a bar room in Moline to its use at Iowa State.

Digital Computer Museum

Volume 1
Number 2

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For the preservation of computing history.

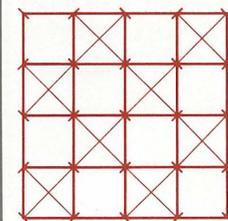
Coming Events

January Professor J. H. Wilkinson discusses the ACE, the National Physics Laboratories pioneer computer, designed after the war by a team led by Alan Turing.

March 4 Konrad Zuse describes his designs for the Z1, a 1936 electromagnetic program-controlled calculator through the Z3, a programmable computer installed in 1941, and the Z4 built after the war.



Struggle Between Good and Evil, by William Kolomyjec, is one of the computer-generated works on display September 1-23 at the museum.



Dr. George Stibitz Lecture on the Bell Labs Pioneer Relay Computers

May 8, 1980



Photo by Lee Parks

George Stibitz, now a working professor emeritus of the Dartmouth School of Medicine, recounted his design and development of the Bell Labs relay computers from 1939-1943.

"Would the users at Bell Labs or the army say, go ahead and put in memory if there is an order of magnitude in improvement in speed?"

Professor Andy Van Dam

"We couldn't have done that. We could do pretty well with the punched tape program because the operation of the rest of the system was pretty slow. We had an independent table searching mechanism that operated by itself while the rest of the computer was off on its own business and they would get together when the data was found."

Dr. George Stibitz

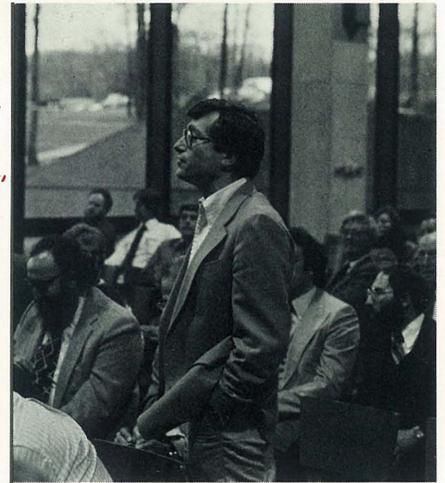


Photo by Lee Parks

Professor Andy Van Dam, Brown Department of Computer Science, questions Stibitz on design aspects of his machines, while Professor Joel Moses, MIT Department of Electrical Engineering and Computer Science, Ted Paull, National Science and Technology Museum of Canada, and others listen.

Professor Stibitz was the center of attention as he fielded more questions at the reception held in the museum.



Photo by Lee Parks

The MIT/ Lincoln Lab TX-O

Putting it
Back Together and
Bringing it
Up to Speed

In 1959, Gordon Bell worked as a research assistant in Professor Ken Steven's Speech Laboratory at MIT, programming the TX-O to do speech research. The two Japanese graduate students shown here, Osamu Fujimura and Hiro Fujisaki, are now active in computing in Japan. They may have been prophetic when Gordon walked into the computer room one day as they were having trouble with the venetian blinds in the background. Gordon said, "Ah, cheap Japanese product," and one of them replied, "No, cheap American copy of Japanese product."

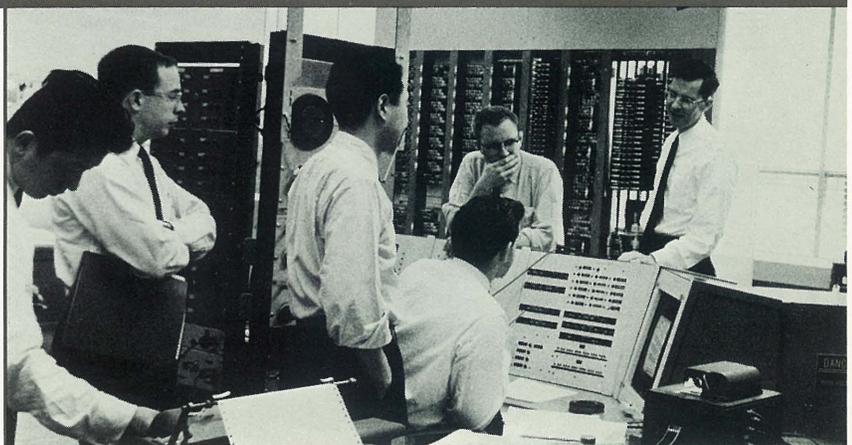


Photo courtesy of MIT

Jay Forrester, chief designer of Whirlwind, and Dave Packard, former member of Forrester's Systems Dynamics Group at the Sloan School and now in DEC's corporate operations. Jay Forrester presented the Third in the Museum's series of lectures on Pioneer computers describing the process of arriving at the configuration of Whirlwind from its inception in the servo-mechanisms laboratory at MIT.



Photo by Steve Spelman

Museum Memories of the Whirlwind Celebration

June 2, 1980



Photo by Steve Spelman

Ken Olsen, introducing Jay Forrester, reminisced about his days on the Whirlwind team: "The machines were so big then that they had walk-in consoles."



Photo by Steve Spelman

Professor and Mrs. Gordon Brown looking at the Whirlwind display in the museum. Professor Brown was head of the Servo-mechanisms laboratory and then the Electrical Engineering Department at MIT during the development and use of Whirlwind.



Photo by Steve Spelman

The authors of *Project Whirlwind: The History of a Pioneer Computer* at the Museum reception honoring the publication of their book by Digital Press. **Kent C. Redmond**, Professor (retired) of the History of Technology, Fairleigh Dickinson University, and **Thomas M. Smith**, Professor of the History of Science, University of Oklahoma, Norman, analyzed the conduct of the project from 1945 until 1956.

Today, **Stan Schultz** of field service and **John McKenzie**, retired TX-O technician, are rigorously testing each segment in reassembling the machine. Alan Kotok and Gordon Bell are on call for advice.

TX-O Alumni:

When the machine begins to run we would like to document anyone who has a test program or would like to replicate a program that they had run on the machine. If interested, please contact Professor Jack Dennis at MIT or Alan Kotok at Digital.

TX-O Memorabilia:

Chairs, old venetian blinds, programs, pictures, films, documents, and other articles of this period will help recreate and preserve the TX-O display. Call Gwen Bell or Jamie Parker at the Museum.



Photo by Jamie Parker

Acquisitions And Requests

Fred Hertrich presenting the first prototype of Digital's RL01/RL02 Disk Drives to Gwen Bell. This fully functional unit was built on a cherry wood baseplate that was attached to a PDP-11 in the summer of 1975 and has been in operation at Hertrich Development, Inc., Boulder, Colorado, who have lent it for display.



Photo by Jamie Parker

4th Computer Generation (1972-80)

VAX modules gathered from the engineers who helped celebrate the fifth birthday of the machine by bringing significant artifacts to the museum.

Grip strength test on the MINC, devised and maintained by Jim Andrews, Laboratory Data Products, Marlboro. The grip was constructed by Dan Groleau at Maynard Metals in the mill.

2nd Computer Generation (1958-1966)

PDP-4, number 9, was installed in 1962 in Digital's module manufacturing and remained in service until 1980. We believe that this unit is the first computer controlled tester. The design was made possible by the Tektronix Sampling Oscilloscope.

PDP-7 was given by Worcester Polytechnic Institute where it had been in the Electrical Engineering Department and used under the direction of Professors Ray Scott and Don Eteson. David Desroches, a junior at WPI, is doing a full term research project on the development of the PDP-7. It will provide background documentation for the museum and nicely serve his graduation requirement to carry out independent research on the value of technology to society.

Model 19 Teletype—the forerunner of various computer typewriters—from Dick Eckhouse's (of Corporate Research) basement.

Wanted: LGP 30 or TRW 300

Wanted: Bendix G15

Wanted: CDC 160

Auto Pilot Assembly used in the Hawk Missile given by Joe Kuprevich, Terminal Products Group.

Fixed Head Disk Memory from Autonetics Minuteman Guidance Computer presented by Aron Insinga, LSI Computer Aided Design.

1st Computer Generation (1945-1958)

Vacuum tubes from the personal collection of Gary Papazian, Diagnostic Engineering.

Memory modules and photographs from Atlas I, Dr. Robert Hopgood, Rutherford Laboratories, Oxfordshire, England.

Photographs of Whirlwind from the archives of MITRE Corporation.

Wanted: Photographs, including color slides, of early computers in use.

2nd Pre-Computer Generation (1890-1930)

A Burroughs mechanical calculator taken apart and put back together by Frank Bowmil under the supervision of George Gerelds of the Mill model shop. It illustrates the mechanics of addition.

Edison patent Mimeograph Machine, c. 1900.

Wanted: Other Edison inventions dealing with communications.

Wanted: Elliott Fisher Bookkeeping Machine, c. 1912

Wanted: Dalton 10-key calculator, c. 1923

Wanted: Printing Burroughs adding machine.

Wanted: Marchant calculators.

Wanted: Baldwin brass calculator.

3rd Pre-Computer Generation (1800-1890)

A replica of **Charles Babbage's 1858-59 notebook** with preliminary sketches for the analytical engine on one year loan from the British Science Museum.

Boucher calculator in the shape of a pocket watch on loan from Gordon Bell.

Tates Arithmometer, 1884, the manufacturing model of the Thomas Arithmometer, on loan from Gordon Bell.

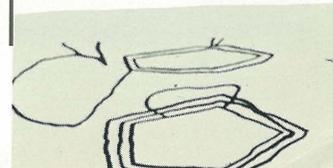
Wanted: Bollée calculator

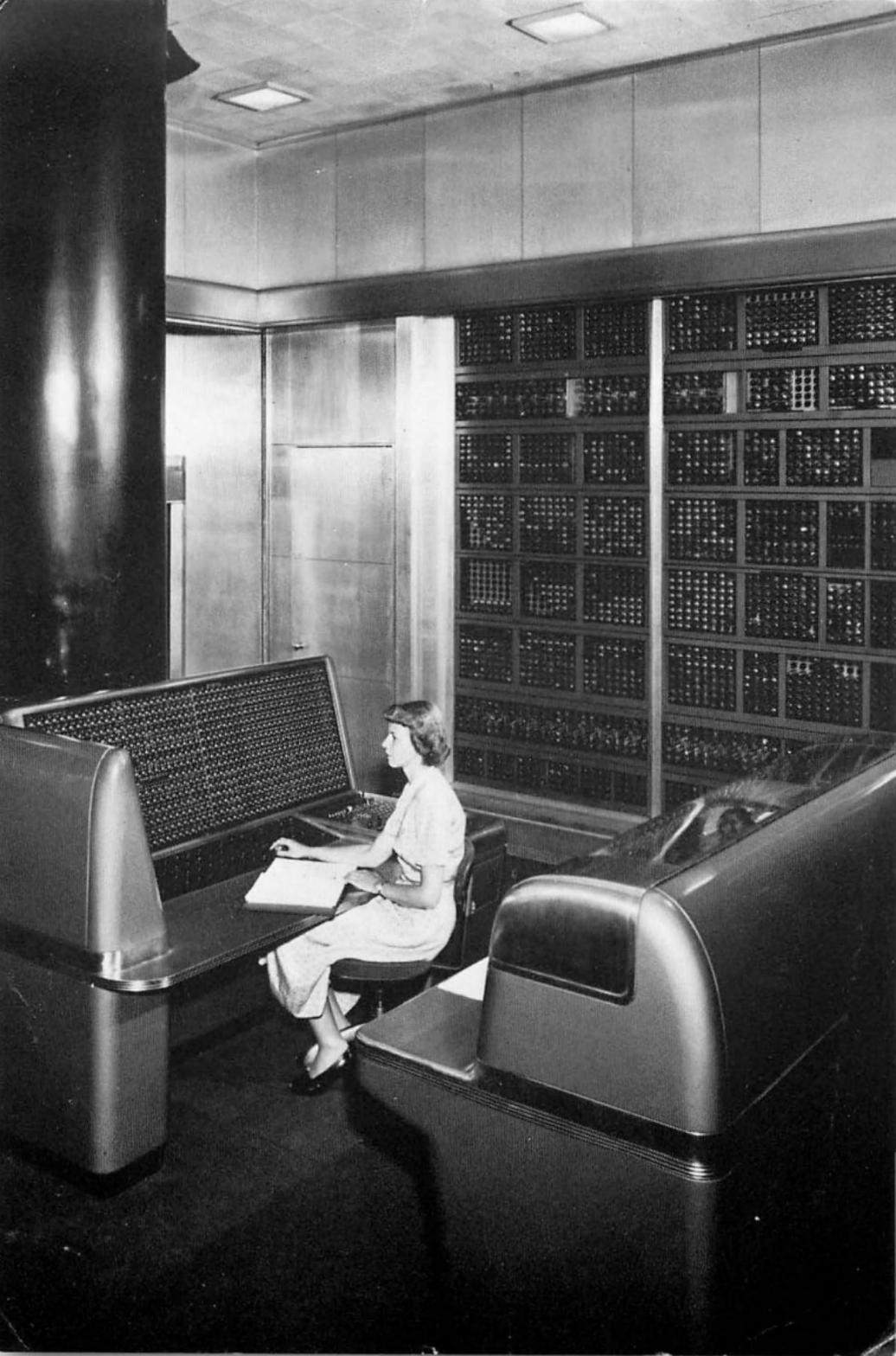
Wanted: Early telegraphy equipment.

Digital Computer Museum

One Iron Way
Marlboro, MA
01752
(617) 467-4036

The Museum is open Monday through Friday from 8:15 to 5 p.m. Special group tours are arranged on request. Holdings are cataloged and explained in a directory that can be queried on a computer terminal connected to a local VAX 11/780.





**The
Computer
Museum**

Watson Scientific Laboratory
Organized by Thomas J. Watson, Sr.
and Wallace Eckert, the Watson
Scientific Laboratory from 1945 to
1950, made major contributions to
computing - including the
development of S.S.E.C. and NORC.

The
Computer
Museum

The Sieve Process

D.H. Lehmer's electromechanical number sieve, designed in 1936 to solve complex problems in number theory. Part of an exhibition on "The History of the Sieve Process".

Join Now!

Please fill in:

- Individual** \$25
Individual Members and above receive all the benefits listed on page 2.
- Founder** \$250
Founders and Contributors joining before June 1984 will be recorded in the Museum archives as Founding Members.
- Contributor** \$500
- Patron** \$1000
Patrons, Associates and Benefactors also receive a set of original modules, illustrating the first four computer generations.
- Associate** \$2500
- Benefactor** \$5000
Benefactors will be recognized as contributing to the establishment of the Museum at its new location in downtown Boston.

Please make checks payable to The Computer Museum. If you would like to pay with MasterCard or Visa, indicate your card number below. Gifts to the Museum are tax-deductible within legal limits.

Amount enclosed _____ Date _____

Charge it to Visa MasterCard

Account Number _____

Expiration Date _____

Signature _____

If your company will match your gift, please check here:

Name _____

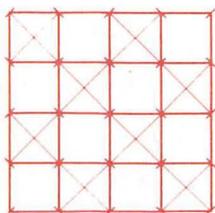
Address _____

City/Town _____

State _____ Zip _____

Please mail this membership form to:

Membership Coordinator
The Computer Museum
One Iron Way
Marlboro, MA 01752

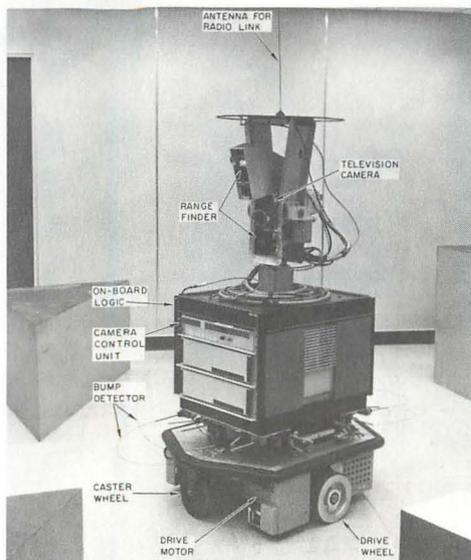


The Computer Museum

an international museum for the history of information processing

The Collection and Exhibits

The Museum's collection of original artifacts includes Napier's bones, a pocket-sized calculating device from 1617; Whirlwind, the first computer with core memory, circa 1951, and **Shakey-the-Robot**, the first mobile robot with artificial intelligence, 1969.



Exhibits cover information processing from the abacus to the silicon chip. Computing history is illustrated through machines, applications, manufacturing technology and the lives of inventors and pioneers.

Archives/Library/Research

The unique archives include videotapes, films, printed materials and photographs on the history of computing. The Museum sponsors research by scholars and advanced students.

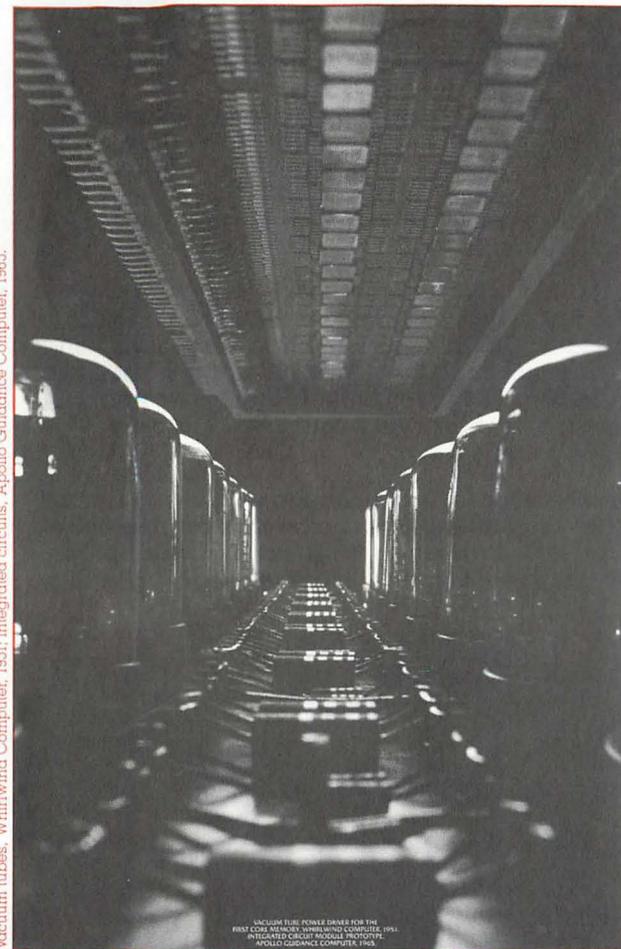
Programs

Museum programs include lectures by computing pioneers; gallery talks on exhibits; symposia; yard sales; excursions; and films.

Publications and Education

Museum publications include the quarterly report with contributing authors such as EDSAC inventor Maurice Wilkes. Slides, historic modules and other educational materials are also available through the Museum's store.

MEMBERSHIP



Vacuum tubes. Whirlwind Computer, 1951; integrated circuits, Apollo Guidance Computer, 1965.

The Computer Museum

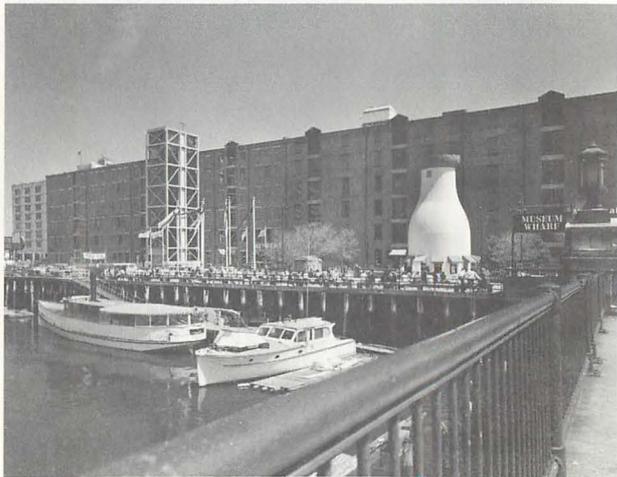
The Computer Museum

is the only institution of its kind in the world, chronicling the evolution of information processing from the abacus to the silicon chip through exhibitions, publications, historical research and programs.

Opened in Marlboro, Massachusetts in 1982, the Museum is moving to Boston's Museum Wharf in 1984. The new location multiplies the Museum's space fivefold and is easily accessible to downtown Boston, Cambridge and Logan International Airport.

Exhibitions will offer visitors a chance to play the first computer game, to hear the Kurzweil Reading Machine for the blind read aloud, and to walk through the SAGE, the largest vacuum tube computer ever built. Lectures, seminars and classic films will be featured in a new auditorium.

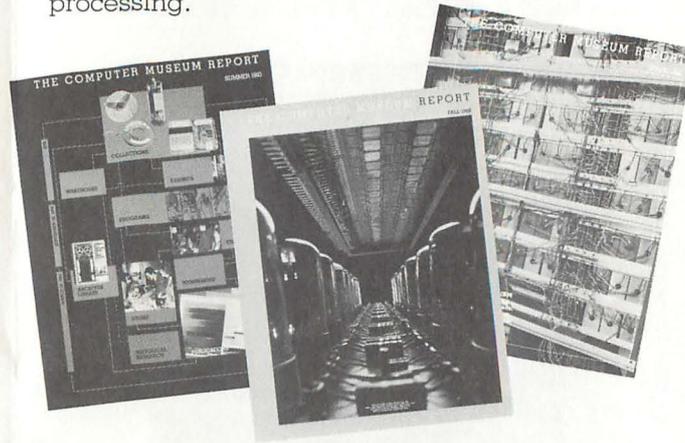
The Museum will continue to actively collect the most valuable artifacts, films and print materials on information processing history for its library and future exhibitions.



Museum Wharf

Become a Member Now

and participate in the formative period of the Museum. If you are far from Boston, the Museum will keep you up to date and let you in "behind the scenes" via its quarterly magazine. If you live nearby, you can also enjoy many preview opportunities. But, no matter where you live, as a member you will be counted as contributing to the preservation of the history of information processing.



Member Benefits

All Members receive:

- a subscription to the quarterly Computer Museum Report. An illustrated magazine filled with lively reminiscences by computing scholars and the inventors themselves; synopses of Museum lectures and events; and articles on artifacts, archives and exhibits.
- a full-color Computer Museum Store catalog and a 10% discount on all merchandise. Ideal gifts for computer buffs include chocolate calculators, computer jewelry and sweatshirts sporting the first flip-flop ever designed.
- invitations to Museum events and lectures.
- an opportunity to participate in the development of the Museum by advising on acquisitions and programs.
- priority admission to special lectures, events and exhibits.
- free admission to The Computer Museum.
- full library privileges with access to the Museum's extensive print and video archives.
- a chance to be part of the Members Association that assists with Museum activities.

Member Categories

Join at the most appropriate level:

Individual \$25
Individual Members and above receive all the benefits listed on the preceding page.

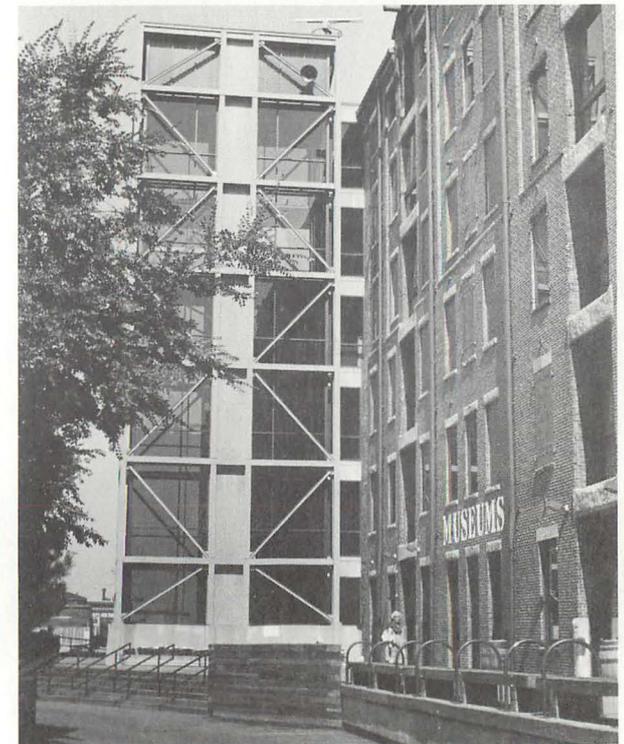
Founder \$250
Founders and Contributors joining before June 1984 will be recorded in the Museum archives as Founding Members.

Contributor \$500

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Patrons, Associates and Benefactors also receive a set of original modules, illustrating the first four computer generations.

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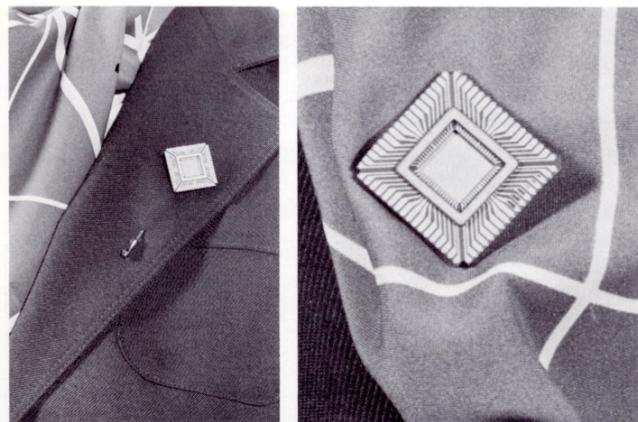
Museum Wharf

Expressly for "The Computer"—defined in the nineteen thirties as a girl who carried out calculations on a Monroe or Friden.



Tiny Chip Post Earrings. $\frac{5}{16} \times \frac{1}{4}$ " ceramic chip carriers truly give the impression of the computer "on your ear." 24K gold plated edges on 14K gold filled posts. Pierced ears only.
Order: TIEAR \$11.95 (members \$10.75)

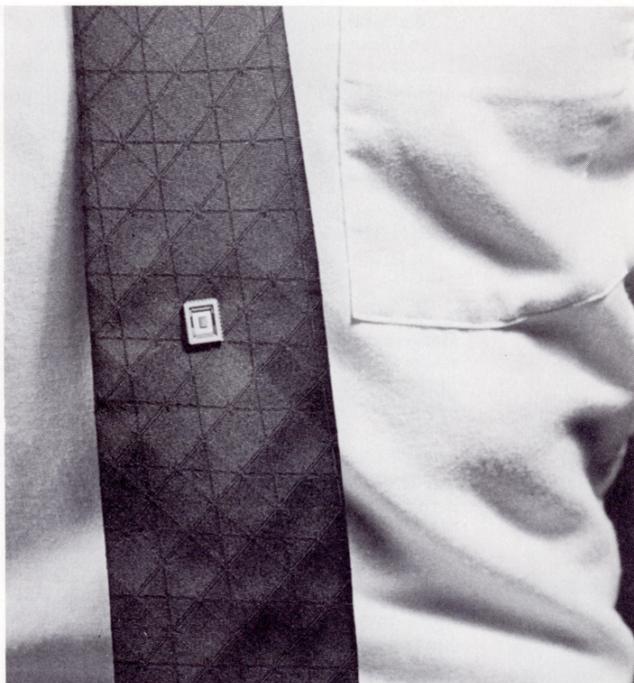
Chip Carrier Post Earrings. 24K gold plated, $\frac{1}{2} \times \frac{5}{8}$ " ceramic chip carriers with an IC Center on 14K gold filled posts. Pierced ears only.
Order: CHEAR \$15.95 (Members \$14.35)



Core Plane Scarf. The 27" square polyester scarf has the core memory pattern silk-screened in white on a grey background.
Order: SCA83 \$16.50 (Members \$15.00)

Chip Carrier Pin. One inch square, this 24K gold plated chip carrier is available as both a bar pin and a stick pin.
Order: BRPIN \$17.95 (members \$16.15) or STPIN \$17.95 (members \$16.15)

For The Well-Dressed (male-gender) Computer Engineer, Scientist, Historian, Programmer, Marketeer, Salesman, Hacker, User, . . .

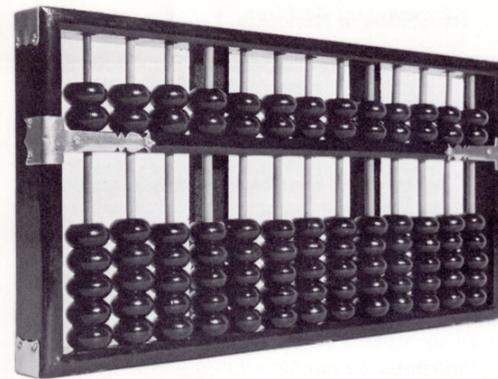
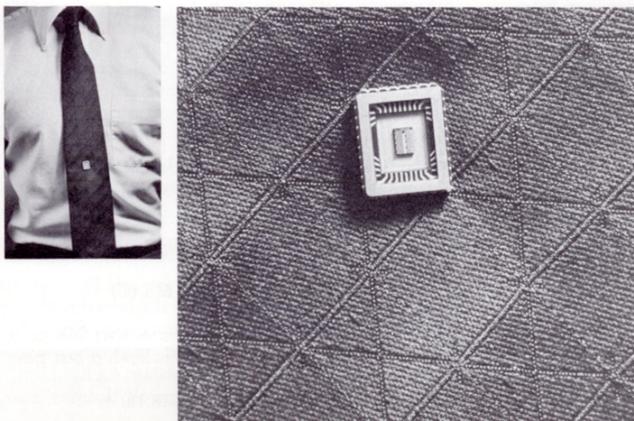


The latest in software . . .

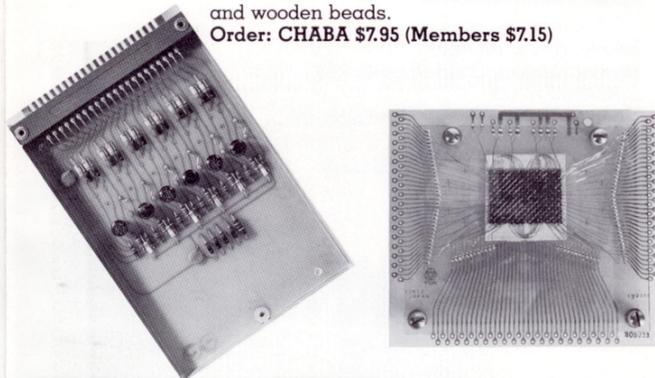
Core Memory Tie. Maroon core memory pattern woven on a navy blue background. Fully lined polyester/silk blend tie with standard 3" width.
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And the latest in hardware . . .

Chip Tie Tack. $\frac{1}{2} \times \frac{5}{8}$ " 24K gold plated ceramic chip carrier with an IC center.
Order: TITAC \$9.95 (members \$9.00)



Abacus and users manual, "Fundamental operations in bead arithmetic or How to use a Chinese Abacus." Classic eleven column abacus in a 13" x 6" black wooden frame with bamboo bars and wooden beads.
Order: CHABA \$7.95 (Members \$7.15)



PDP-1 Module. Circa 1963 PDP-1 logic module in excellent condition. This 5" x 7" board with its discrete transistors and resistors in shades of blues and rusts makes an interesting conversation piece, and provides a useful reminder of computer components.
Order: PDP1M \$5.95 (members \$5.35)

Core Plane. TDK electronics 18 x 24 bit plane mounted on a printed circuit board covered by plexiglass. This 4" x 4.5" plane clearly illustrates the technology of core memories.
Order: COREP \$4.95 (Members \$4.45)

The Computer Museum **Flea Market.** A number of items have been donated to the Museum that are already in our collection. These are made available for sale at the store. These include secondary memory disks, early books on computing and calculating, slide rules, delay lines, calculators, typewriters, old manuals, and other antiques of the rapidly evolving industry.

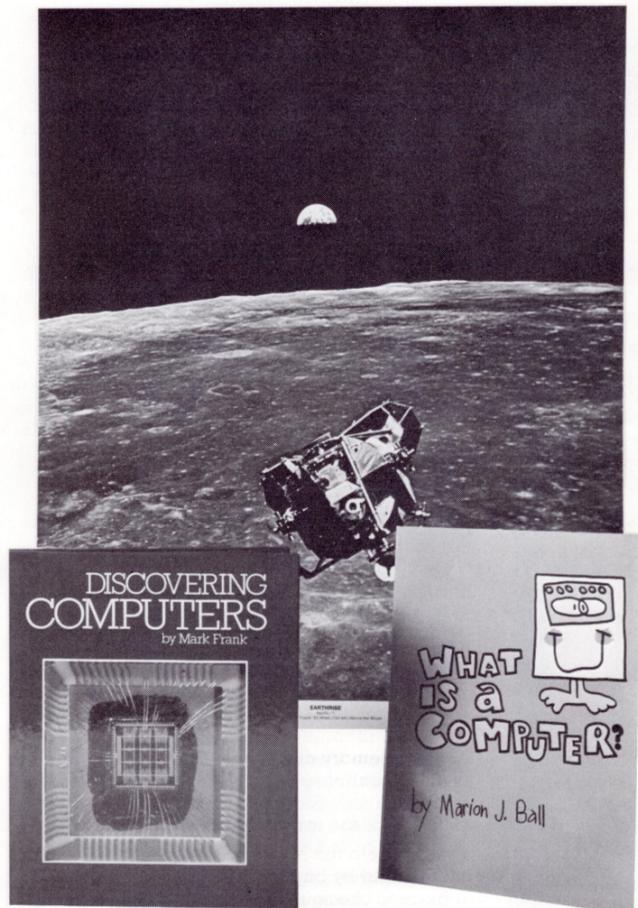
You can help the Museum by donating to the flea market and by buying from it. The order form has a place to check to receive the current listing of available items, and we'd be delighted to accept whatever treasures with which you are willing to part. Your donations are tax-deductible!

Expressly for Children

What is a Computer? by Marion Ball is a delightfully illustrated book for the primary school age. It's also an introduction to computer history with explanations of cards and core memory. Soft cover, 92 pages.
Order: BAL72 \$10.00 (members \$9.00)

Discovering Computers by Mark Frank. The best we've found for junior high level with no background in computers, math or science. Hard cover, 96 pages with 104 color illustrations and photographs.
Order: FRA80 \$9.95 (members \$9.00)

Earthrise Poster. 23" x 29" color photograph of the Apollo 11 lunar module sixty miles above the moon with the earth rising in the distance above the lunar landscape.
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The Computer Museum

1983 Spring-Summer Catalog

One Iron Way
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Memorabilia
Posters
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Paperback Books
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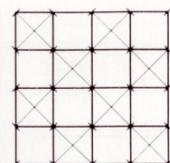
Applicable until October 1, 1983



Computer Museum **T-Shirts** of Ada and Pascal—especially for history buffs and programmers. Heather grey, high quality Hanes 75% cotton and 25% polyester shirts with black and white silk screen portraits of either Ada or Pascal. Machine wash and dry but allow for slight shrinkage.

Adult sizes only
Small (34-36)
Medium (38-40)
Large (42-44)
X-large (46-48)

For Pascal order: PATEE \$7.95 (Members \$7.15)
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The Computer Museum

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