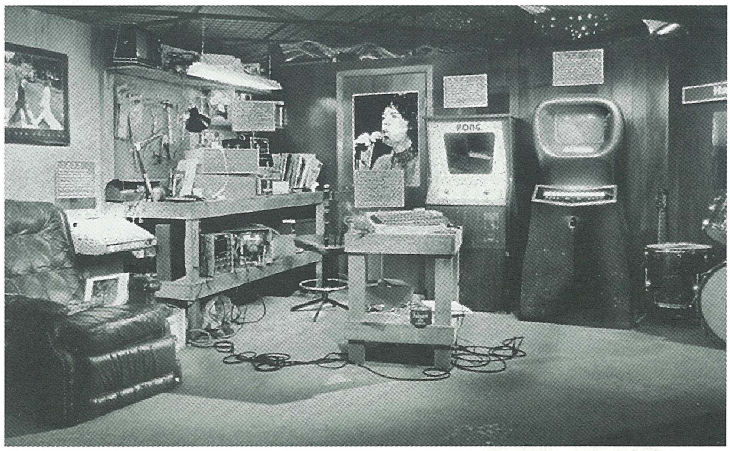
The Computer Museum NEWS

Summer 1997

Snapshots of a Revolution

New Exhibit Captures Pivotal Moments in PC History

It was March 1996, and Intel was searching for an appropriate way to commemorate the 25th anniversary of the microprocessor at the upcoming Fall COMDEX. Intel Museum Curator Jodelle French remembered a retrospective exhibit The Computer Museum had curated for Data General at the 1995 Fall COMDEX. French sought out Gwen Bell at The Computer Museum to brainstorm ideas for creating the milestones of the microprocessor. That began a rare, cooperative relationship in the museum world: a corporate museum pairing with The Computer Museum. The partnership ultimately resulted in a historic personal computing exhibit, parts of which were recently installed in the Museum in Boston.



Photograph: Copyright The Production Network Inc., Seattle, Wash.; courtesy SOFTBANK COMDEX

The Garage not only features vintage PC artifacts, but also has nearly everything a 1970s' hacker might want—from an oscilloscope (to test the boards) to a Barcalounger to take a snooze. Can you find the Apple I?

"I knew we couldn't curate this exhibit by ourselves," recalls French. "We could do an exhibit about microprocessors but what we were really talking about was the 25th anniversary of a revolution." French and Bell worked side by side to curate the "Museum at COMDEX," co-sponsored with SOFTBANK COMDEX, Motorola and Ziff-Davis. French recalls of the co-curating relationship, "If it had been anyone else but Gwen, we would have gotten bogged down in lists of artifacts."

Intel's foresight to form the partnership assured an inclusive retrospective that highlighted the advancements made by a variety of microprocessors. The "Museum at COMDEX" attracted 30,000 people, or 10 percent of the attendees, in five days. When it was over, Intel and SOFTBANK donated the vignettes from the exhibit to The Computer Museum. Installation in Boston was sponsored by Museum Board members Michael Simmons and David Nelson. Subsequently, The Intel Museum became a founding corporate supporter of The Computer Museum History Center. A win-win situation for all.

Nostalgic Journey

The most popular COMDEX vignette installed at The Computer Museum is a life-sized re-creation of a 1970s' hacker's garage, which captures the essence of this era.

"We were a group with a purpose: the revolution of home computers," Steve Wozniak, co-founder of Apple Computer, reflected in 1986 at The Computer Museum. "I couldn't afford a computer so I started to think about building one for myself." Woz built his computer, the Apple I, in 1976, testing it in the now-legendary garage of his friend and Apple co-founder, Steve Jobs. The Hacker's Garage was unveiled in June, with enhancements to two existing 1980s' vignettes that re-create early uses of the IBM PC and Apple Macintosh.

Located in the Museum's historical exhibit, *People and Computers: Milestones of a Revolution*™, the three vignettes highlight important aspects of the PC revolution, which was spurred on by the invention of the microprocessor by Intel in 1971. By 1974, hobbyists were using microprocessors such as the Motorola 6800, Intel 8008 and RCA 1802 to assemble their own "home-brew" computers in workshops similar to the Hacker's Garage. The two 1980s' milestones represent the next steps in the revolution: the personal computer's commercialization and vastly expanded use by individuals and large organizations.

"It was an incredible time," says Dan Bricklin, co-inventor in 1979 of *VisiCalc*, the first electronic spreadsheet written.

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The Many Themes of the Museum

In preparing a strategic plan for the Museum's exhibits in 1988, the Exhibits Committee diced the universe of computing into the following themes:

1. evolution
2. technology (how computers work)
3. applications and social impact
4. people of computing

By 1992, we had created large-scale exhibits on the first three themes, later adding upgrades (such as the 1995 redesign of *The Walk-Through Computer*™) and new application areas (such as *The Networked Planet*™ in 1994). Although these exhibits were successful, we still were searching for a compelling way to present the *people* of computing.

Serendipity intervened when Tony Rea, a long-time supporter of the Museum, introduced founding president Gwen Bell to his childhood friend Louis Fabian Bachrach III, from the renowned family of portrait photographers. Louis was intrigued by the Museum. It wasn't long before he and Gwen came up with *Wizards and Their Wonders: Portraits of Computing*, a project toward which he would devote a full year making portraits of the people in the forefront of computing in America. As a result, the Museum will at last have a top-quality exhibition on the people of computing! The exhibit, which will incorporate artifacts from the collections and will be chronicled in an elegant coffee-table book, opens at the National Academy of Sciences in Washington, D.C., in October, and at the Museum in November. (See article on page 4.)

Evolving Interest in History

In 1984, when the Museum opened in Boston, its exhibits featured the historical collections. As time went on, hands-on, educational exhibits became our hallmark, with artifacts playing a lesser role. Nevertheless, our collections activities continued, albeit in the "back room."

Recent years, however, have witnessed a broad awakening of interest in the history of computing. For one thing, there is more history than there was 15 years ago (remember, the first digital electronic computer was built only 51 years ago). Furthermore, many people who participated actively in the early years of computing have now reached the age where they begin to look back over their careers.

In 1996, the Museum began to expand its historical activities, creating The Computer Museum History Center in Silicon Valley. We are now concentrating more resources on the history of computing and expanding our exhibit programs on the subject. Already completed is a full-size "hacker's garage," a brand-new milestone in the Museum's permanent historical exhibit, *Milestones of a Revolution*™. (See article on page 1.)

A series of historically themed, artifact-rich exhibits are also being developed and displayed on both coasts. The first, *25 Years of the Microprocessor*, will open in Boston in January. Based on an exhibit curated by the History Center for last October's Microdesign Resources Conference in Silicon Valley, it includes many of the important microprocessors, starting with the 1971 Intel 4004 and ending with the multi-million transistor chips that power today's personal computers and workstations. Early personal computer and other microprocessor-based devices, from watches to running shoes, are also included.

Recent years have witnessed a broad awakening of interest in the history of computing.

The History of Computing timeline on our website is being expanded to the year 1990, and will include strands that pick out milestones in the evolution of the Internet and in the development of robots and artificial intelligence. The website will also feature "This Day in History," which will highlight a different nugget of computer history every day of the year.

A good portion of the Museum's collections are now accessible at the History Center's storage site at Moffett Field in Mountain View, Calif. We invite you to visit, but please call/e-mail first (415-964-1231 or 415-604-2575/collections@tcm.org), as you need a security badge to enter the area.

I hope you'll come and see our new exhibits on the evolution of computing, in Boston, in Silicon Valley, or at www.tcm.org. As always, if you think you have something we should be saving for posterity, contact us at collections@tcm.org.

Oliver Strimpel
Executive Director
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To Reach Us

General Information	(617) 423-6758
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The Computer Clubhouse	x347
Functions	x340
Membership	x432
Museum Store	x306
Public Relations	x341
Volunteer Program	x433
Fax (Museum Offices)	(617) 426-2943
History Center Offices	(415) 604-2575
Collections	(415) 604-2578
Fax (History Center)	(415) 604-2594

For Museum staff, e-mail: ***<lastname@tcm.org>***
For general Museum information, e-mail: ***<computer_info@tcm.org>*** with ***request*** in subject line and ***send help instructions*** as the body of the message.

Via World Wide Web:
<http://www.tcm.org/>

Summer Hours: Open daily, 10am-6pm, through Labor Day.

Winter: Open Tuesday-Sunday, 10am-5pm. Closed Mondays, except Boston School holidays and vacations. Closed Thanksgiving, Christmas, and New Year's Day.

Admission: Adults $7.00; seniors, students, and children $5.00. Half price Sunday 3-5pm. Free to Museum members and children two and under.

The Computer Museum *NEWS* (Summer 1997) Contributors: Zoe Allison, Gail Breslow, Meghan Frost, Marilyn Gardner, John Marchiony, Angela Meyer, Christopher Morgan, Julie Rackliffe, Betsy Riggs, Dag Spicer, Oliver Strimpel, Carol Welsh
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Museum's Clubhouse Expands Its Horizons

New Satellites Open in Boston and Stuttgart, Germany

Five years ago, the Computer Clubhouse was little more than a dream.

Now, the Clubhouse reaches thousands of inner-city youths in Boston and in Germany with four Clubhouse satellites and new programs enabling kids to expand their horizons using computers. Alex Owumi, 12, of Dorchester, Mass., sums it up: "Before coming to the Clubhouse, I had nothing to do. I just played video games. Here, there's a wonderful feeling—with a bunch of computers, smart people, peace, no gangs, no fights. Learning about computers has given me a new world."

Photograph: AnnMarie Rowlands; Courtesy USES

USES President Frieda Garcia watches as Boston Mayor Thomas M. Menino talks with kids at the USES Clubhouse.

In 1993, The Computer Museum, in collaboration with the MIT Media Laboratory, founded the Clubhouse to serve kids with little access to computers at home or in school. Every weekday afternoon and on Saturdays, the Clubhouse comes alive, as youths aged 10 to 18 work with adult mentors to explore sophisticated software and computer technology, creating animations, music, robotic devices, science simulations, and Web pages.

Building a Network

Since last summer, the Museum has helped launch satellite versions of the Clubhouse at three inner-city community centers in Boston: the Roxbury Boys and Girls Club, the Patriots' Trail Girl Scout Council, and United South End Settlements (USES). In March, demonstrations of Clubhouse kids' computer expertise brought Boston Mayor Thomas M. Menino, TV crews, and over 100 Clubhouse families and supporters to USES.

Setting up satellites in Boston is the Museum's first step in supporting a Clubhouse network around the world. In April 1997, the Computer Clubhouse Esslingen (outside Stuttgart, Germany) became the first non-U.S. addition. Other satellites are in the works at The Brooklyn Children's Museum in New York, in a community-based organization in Worcester, Mass., and on a Native American reservation in the Midwest.

Beyond Black Boxes

In addition to expanding geographically, the Clubhouse is creating new programs. One, organized with the Patriots' Trail Girl Scout Council, MIT Media Lab, and Wellesley College, enables inner-city girls to open up the "black box" of science, get their hands on scientific tools, and gain confidence using scientific concepts. Funded in part by the Massachusetts Cultural Council, "Beyond Black Boxes" lets Clubhouse Girl Scouts build instruments using LEGO, sensors and "Crickets," tiny programmable devices developed at the MIT Media Lab. Then, working with women mentors who serve as role models, the girls use these tools to gather and analyze data.

For example, one group designed a weather balloon with a Cricket "pouch" to explore atmospheric conditions at different altitudes. Two other girls developed an "active goldfish bowl" to track how often a fish swam through a tiny house inside the bowl. "We thought it would be fun," says sixth-grader Jennifer Juste, "but we didn't know if it would work." Project partner Woodline Maignan adds, "At first, it was hard to program, but it's easy now because we worked on it a lot."

From Clubhouse to College and Career

Another initiative, "Clubhouse-to-College/Clubhouse-to-Career," launched with the support of the NYNEX Foundation and American Express, helps kids leverage their Clubhouse experience and skills, exposing them to professional and academic opportunities that might not otherwise be available. Field trips take Clubhouse members to colleges and companies such as Lotus and BankBoston for an inside look at professionals using technology in real situations. At the Clubhouse, they learn how to create a resume, interview, plan and set goals, while applying for internships in various fields.

"We treat youth more like colleagues," says Mitchel Resnick, Clubhouse advisor and co-founder, and associate professor at MIT's Media Lab. "We give them genuine feedback and push them to consider new possibilities."

Some young people have already found jobs based on their Clubhouse experience and skills. One Clubhouse "alum," a senior at Morehouse College in Atlanta, is doing a fellowship at the MIT Media Lab this summer. He hopes to set up a Clubhouse for low-income kids when he returns to Atlanta in the fall.

When high school senior Steve Osemwenkhae came to the Clubhouse two years ago, he says, "I didn't know anything about computers." Recently, he applied for a graphics internship at a top-notch Cambridge, Mass., PR firm. "They seemed to really like my portfolio. I hope I get it, but even if I don't, it gives me something to shoot for." This summer, Clubhouse members were invited by the PBS program *P.O.V.* to submit art to its website for a show on street violence and its impact on kids' lives. Steve's work was selected and featured on *P.O.V.* Interactive in June.

(continued on p.5)

Snapshots of a Revolution *(continued from p.1)*

"The Garage is really a metaphor for a way of thinking—that anyone could do it—a kind of grassroots entrepreneurial spirit. Actually, Bob Frankston and I worked on *VisiCalc* in his attic, which was more typical of the East Coast. Out West, hackers worked in garages, owing to the earthquake risk."

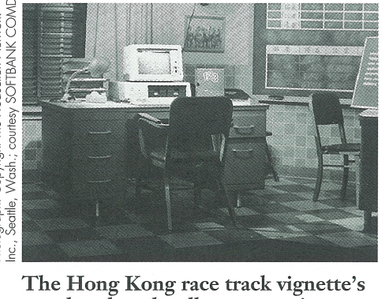
The '70s: Hobbyist Heaven

The Museum draws on artifacts from its collections, including the Apple I and Altair 8800, to furnish the Garage. Rich in period detail, it includes a 1960s' Model 33 Teletype (widely used before keyboards and printers were standard), an oscilloscope, a ham radio, an old TV tube, a drum set, a guitar, and posters of a young Mick Jagger and the Beatles.

Sitting on a worktable in its own homemade wooden box is Woz's Apple I board. One of the rarer items, the Apple I was used primarily for developing programs, playing games or running BASIC. Buyers supplied their own cases for this easy-to-assemble single-board computer that ran on an MOS Technology 6502 microprocessor. When Steve Jobs got the first order from the Byte Shop for 100 Apples at $500 each, he and Woz plugged in a keyboard, TV, and transformers and tested every board with an oscilloscope. They sold about 200 out of Jobs' garage before 1977 when they announced the Apple II.

Photograph: The Computer Museum Collection

This arresting photo graced *Computer Space*'s advertising brochure in 1971.



Photograph: Copyright The Production Network Inc., Seattle, Wash.; courtesy SOFTBANK COMDEX

The Hong Kong race track vignette's woodwork and walls were meticulously chipped and aged to look seedy.

The MITS Altair 8800 (1975) was featured on the January 1975 cover of *Popular Electronics* and sold as a hobbyist's kit for $439. MITS sold more Altairs the first day than it expected to sell during the product's lifetime. The first computer to offer BASIC on an Intel 8080 microprocessor, the Altair had 64K of memory, and was programmed via toggle switches. Bill Gates and Paul Allen wrote a 4K BASIC interpreter for its 4K memory board; the signed and dated original is on display.

Computer Space, the first coin-operated video game, developed in 1971 by Atari founder Nolan Bushnell, adds a fantasy factor to the Garage. Inspired by *SpaceWar!*, a game available on university research computers, *Computer Space* was a bit too complicated for most consumers. A modest failure, the game sold only 2,000 copies, despite ads that hailed its "beautiful, space-age cabinet" and "the reality of controlling your own rocket ship in gravity-free outer space."

On the other hand, *Pong* (standing beside *Computer Space*) was a runaway hit. Introduced by Bushnell in 1972, this simple game ushered in the era of video arcades and home game machines. In 1974, a home version debuted, made possible by a drop in microchip prices.

The '80s: PCs Go Commercial

More than any other personal computers, the IBM PC (1981) and Apple Macintosh (1984) transformed how organizations and people thought about and used computers. Each machine has its own recently enhanced vignette. The IBM display re-creates an early use of a Lotus *1-2-3* spreadsheet running on an IBM PC at the Hong Kong Jockey Club. It was used to track race-course statistics from more than 5,000 ticket windows across Hong Kong.

The vignette on the Macintosh features Granada High School in Livermore, Calif., where students used a Mac 512 running early *PageMaker* software to create their school newspaper. Both vignettes also include interactive stations where visitors can experiment with spreadsheets on a PC and create postcards on a Mac.

Book Honors Wizards and Their Wonders

This fall, the Museum and the Association for Computing (ACM) will co-publish *Wizards and Their Wonders: Portraits of Computing*, a new book by Christopher Morgan. It features color portraits by famed photographer Louis Fabian Bachrach, with biographical sketches of 200-odd innovators representing America's central role in computing.

While unabashedly American in slant, the book does not gainsay the considerable contributions of international innovators like Charles Babbage and Alan Turing. We hope in the future to create a companion tribute to the many international computer innovators.

The Museum began by identifying winners of the National Medal of Technology and other prestigious awards. That group helped nominate others. The list grew from inventors to include entrepreneurs, policy-makers, commentators, venture capitalists and bankers.

Like almost no other industry, computing depends nearly as much on entrepreneurs and policy-makers as it does on inventors. The constant updating of software and hardware requires teams of people from many disciplines working in synergy. The inventors spur on the entrepreneurs, who feed their energies back to the inventors. America's post-World War II economy nourished an extraordinary confluence of inventors, entrepreneurs, visionary venture capitalists, and a society eager to embrace technology. The results were staggering. The IBM 360, the integrated circuit and the Internet are examples.

The *Wizards* list juxtaposes familiar names such as Bill Gates with others familiar only to "insiders" and students of computing. The book also honors "forerunners" such as John von Neumann and Grace Murray Hopper.

The book grew out of an exhibit called *Wizards and Their Wonders*, sponsored by The Computer Museum History Center and featuring one-of-a-kind computer artifacts and photographs of 60 inventors by Bachrach. The exhibit was unveiled in March 1997 in San Jose, Calif., in conjunction with the ACM97 Conference and Exposition on "The Next Fifty Years of Computing," a celebration of the ACM's 50th anniversary.

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The book is being published in conjunction with the Museum's exhibit *Wizards and Their Wonders*, scheduled to open on October 5 at the National Academy of Sciences, Washington, D.C., and at the Museum in November.

By Christopher Morgan. Morgan is president of Christopher Morgan Communications, a consultant to the ACM, and a TCM overseer.

This Year's Computer Bowl Scores Many Important Firsts for the Museum

It was both a momentous night for the West Coast and a defining moment in the history of The Computer Bowl™ event, the Museum's major fundraiser for its educational programs.

On April 18, for the third consecutive year, the West Coast team beat the East Coast, with a final score of 230 to 140. The Computer Bowl MVP Awards, sponsored and presented by Ziff-Davis, were won by two West Coast team players, Steve Kirsch of Infoseek and Steve McGeady of Intel, and East Coast player Sam Whitmore of Ziff-Davis.

Photograph: Joe Czop

Bowl Celebrity Host Robert Urich (third from the left), congratulates the West Coast on their victory. Team from the left: Steve McGeady, Nathan Myhrvold, Team Captain Steve Kirsch, Kim Polese, and Grant Saviers.

At the same time, the Bowl rose to a new plateau for other reasons. Ziff-Davis was the 1997 Computer Bowl Presenter, along with the Museum. Just prior to the event, Ziff-Davis made a commitment to present the Bowl again in 1998 and placed its support behind the mission of The Computer Bowl. "Ziff-Davis looks forward to a long-term partnership with this important industry institution. We support the important educational work of The Computer Museum and encourage other leaders of the computing and Internet communities to participate in The Computer Bowl," said Eric Hippeau, CEO of Ziff-Davis.

Additionally, actor Robert Urich, star of ABC-TV's critically acclaimed series *Vital Signs*, served as host of the game. (He is also a principal of Computer Sentry Software, makers of computer security software.) Urich graciously added his celebrity to the game, which brought renewed interest in the Bowl. Urich has also agreed to host the 1998 Bowl.

Another first for the Bowl is the early selection of the 1998 West Coast Bowl team: Marc Andreessen, Netscape; Denise Caruso, *Technology & Media Newsletter*; Scott Cook, Intuit; Bill Krause, Storm Software; and Mike Slade, Starwave Corporation. The East Coast team will be selected soon.

This year's West Coast team included Captain Steve Kirsch; Steve McGeady; Nathan Myhrvold, Microsoft; Kim Polese, Marimba; and Grant Saviers, Adaptec. The 1997 East Coast team consisted of Captain Sam Whitmore; Chuck Digate, MathSoft; Frank Ingari, Shiva; Ilene H. Lang, AltaVista; and Steve Vana-Paxhia, Inso. John Doerr of Kleiner Perkins Caufield & Byers, Mitchell Kertzman of Sybase and Eric Schmidt of Novell served as judges.

Reflecting on the West Coast's victory, Captain Steve Kirsch said, "After winning three straight, I think it's fair to call this a 'dynasty.' The East put up a good fight, but ultimately they were no match for the West Coast brain power."

"The West Coast squad certainly rose to the occasion and, on that basis, deserves the victory," said East Coast Team Captain Sam Whitmore. "But I remain confident that the East is a superior team, just as it is a superior coast." The West Coast's victory brings that coast's lead to 3-0 in the second generation of Computer Bowl games and 6-3 overall since the first Bowl in 1988.

The Computer Bowl aired nationally in June, as a special edition of the award-winning public television show *Computer Chronicles*. The program is seen on 313 PBS stations and in 144 countries worldwide. The Bowl also aired on the nationwide cable network, Knowledge TV.

This year for the first time, the Bowl was broadcast live on the Web as it was played. People who had an Internet connection, 28.8Kbps modem, sound card, and speakers heard an audio webcast of the game by *PC Week* Radio.

The 1997 Computer Bowl was presented by Ziff-Davis and underwritten jointly by Bay Networks and Intel. Official sponsors include ACM, Adaptec, AltaVista, Computer Sentry Software, Coopers & Lybrand, LLP, Internet Shopping Network, Kleiner Perkins Caufield & Byers, MathSoft, Shiva, Silicon Valley Bank and Stratus. *Fortune* magazine is the lead media sponsor for the Bowl. Over nine years, The Computer Bowl has raised $3 million in donations and in-kind support for The Computer Museum's educational programs.

Clubhouse Expands *(continued from p.3)*

Beyond Black Boxes and Clubhouse-to-Career will be rolled out to all Clubhouse sites after a pilot period. The Museum has also developed an Operations Manual, an Educational Activities Guide, a Mentor Handbook, and other materials for community centers, museums, schools, libraries, and other community-based organizations interested in being Clubhouse host sites. An online network for members to collaborate on design activities, share computer-based projects, and exchange information over the Internet is also being developed.

A Growing Community

The growth of the Clubhouse network has provided opportunities for several members of the Clubhouse community. Marlon Orozco, a former Clubhouse member and mentor, now manages the Museum's Clubhouse, while Mike Lee, also a former member and mentor, now has a job at the USES satellite in addition to managing the Museum's Clubhouse on Saturday. Both Lisa Evans and Amin Abdullah began as mentors. Lisa now manages the USES Clubhouse and Amin coordinates the Beyond Black Boxes project at the Patriots' Trail Girl Scout Council.

The Clubhouse was "a real turning point" for Ingeborg Endter, who is entering graduate school at the MIT Media Lab this fall. "My mentoring experience helped me decide to pursue a Master's and gave me the chutzpah to apply to MIT," she says. Velda Lashley, formerly a Bank-Boston trades services rep, took advantage of her bank's offer to support her mentoring at the Clubhouse, and found it so rewarding that she now has a new job—as Clubhouse Coordinator mentoring and providing crucial administrative support.

Support

The Computer Clubhouse is supported entirely by contributions from corporations, foundations, government agencies, and individuals. Major supporters in the past year include the NYNEX Foundation, State Street Foundation, YouthALIVE! (a program of the Dewitt Wallace-Reader's Digest Fund), the Massachusetts Cultural Council, and the Reebok Foundation. For more information and to see examples of Clubhouse kids' work, visit the Clubhouse's website (www.tcm.org/clubhouse) or contact Gail Breslow, Computer Clubhouse director, at (617) 426-2800 x421 or e-mail (breslow@tcm.org).

By Gail Breslow. Breslow is director of the Computer Clubhouse.

Education

Education Program Center Addresses Teacher Needs

Through a major contribution from Digital Equipment Corporation, a brand-new Education Program Center (EPC) has been established to further the Museum's mission to educate all ages about computer technology.

The EPC addresses two issues of national concern: educational reform and gender equity. Large equipment donations to schools as well as initiatives such as NetDay (a nationwide grassroots effort by states to bring the Internet to schools) increasingly challenge teachers to integrate technology into their curricula. The EPC will teach educators new technologies to take back to their classrooms.

Gender-equity workshops will help educators engage girls in technology at an early age. The EPC will also challenge teachers to re-examine gender stereotypes to ensure that computing is no longer viewed by children as a male-centric pursuit.

Digital Equipment Corporation, in its continuing partnership with the Museum, has awarded $5,000 in cash and a $79,000 equipment grant to the EPC. Jane Hamel, corporate contributions manager at Digital, says, "As a technology leader, we believe teachers must have the expertise to help students prepare for the technological challenges of the 21st century. We are pleased to work with the Museum to ensure this happens."

Other contributors to the 1,200-square-foot facility include the New England Hi-Tech Charity Foundation, the Boston Computer Foundation, and The Children's Museum.

The official opening of the Education Program Center is scheduled for September 18, 1997.

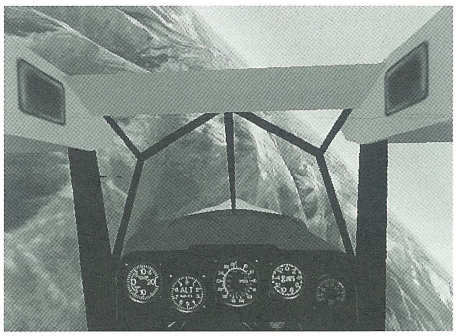
Up and Running

New Flight Simulator Mimics the Thrills of a Stunt Pilot

Museum visitors can now pilot a stunt aircraft over photo-realistic terrain by using a state-of-the-art flight simulator. The award-winning simulator, custom-designed for the Museum by Looking Glass Technologies, offers a demo of flight fundamentals plus the opportunity to fly solo. Using a joystick and keyboard, visitors learn how a plane moves and how to control it, executing simple aerobatic maneuvers such as tailslides, barrel rolls, and flips, as well as landing without crashing.

The keyboard controls the view (from inside or outside the aircraft) and the throttle, brakes, rudders, ailerons and elevators. The joystick lifts and lowers the aircraft and executes rolls. Dials on the cockpit's console show the changing airspeed, altitude and engine rpms. Stunning graphics and 3D photorealism recreate a sensation of flight highly accurate for a personal computer, says Mike Goulian, captain of the U.S. National Aerobatic team. "The exhibit duplicates the actual aerobatic sequences I perform at air shows."

"Most flight simulators are for fighter planes," says Alex Nolan, 11, of Dover, Mass. "This one is non-violent, perfect for any kid. It gives you a feeling of how to fly and what to do."



Photograph: Courtesy Looking Glass Technologies, Inc.

This screen shot shows the dials on the cockpit's control panel.

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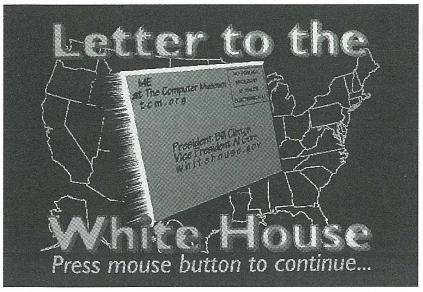
Upcoming Events & Programs 1997

August 1-September 1, Daily

M-Free



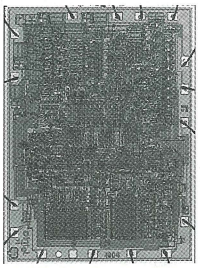
The Fun's Inside: Special Missions and Guided Activities

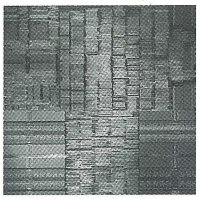
Different themes for self-guided tours provide an amazing and often surprising variety of ways to learn and have fun with computers. The "Let's Take a Trip" mission guides guests to all corners of the Museum's galleries to visit Paris and the Louvre on the Internet, navigate through virtual worlds, explore the inside of the human body, and lead a bicycle expedition across Africa. Choose "Let's Laugh" for exhibits that tickle your funny bone and "Let's Talk" to chat with computers, other guests, and people around the world on the Internet.

The Computer Museum Store

M-Discounts

To celebrate the 25th anniversary of the invention of the microprocessor, Micro-Design Resources and The Computer Museum History Center collaborated to create the "Microprocessor Evolution" poster. Beginning with the Intel 4004 and ending with the IBM P2SC, the poster shows 150 chips, enlarged to four times their actual size. Chips are connected to their upward-compatible descendants; others are connected to chips that share architectural relations. This unique, four-color poster is available from The Computer Museum Store and WebStore.





The "Microprocessor Evolution" poster chronicles the development of the microprocessor from its invention in 1971 to the present. At top: Intel 4004 (1971, 2,300 transistors) and IBM P2SC (1996, 15,000,000 transistors).

The Computer Museum Store
phone: (617) 426-2800 x307
fax: (617) 426-2943

The Computer Museum WebStore
www.tcm.org/store/
Open 24 hours a day, every day.

Attention MacWorld Registrants!

Wednesday, August 6-Friday, August 8

MacWorld Expo

The Computer Museum offers Internet education and presentations in MacWorld's Net Zone at the Bayside Expo Center in Boston. Staff and volunteers offer 30-minute presentations exploring "What's Hot," "Upgrades & Support: A Tech's View," "Web Marketing and Advertising," and "Personalization & Customization." All presentations are free with admission to the Expo. The Computer Museum booth also features several interactive exhibits and our most popular humor items, books, shirts, and custom buttons from the Museum Store.

Visit (www.tcm.org) for interactive activities, historic timeline and more

MEMBERSHIP

Members get free admission for one year; The Computer Museum *NEWS*, a newsletter of Museum activities; the *Annual* report; invitations to exhibit previews and members-only events; advance notice of exhibitions and lectures; and a 10% discount on purchases over $5 in the Museum Store. For more information, call the membership department at (617) 426-2800 x432 or e-mail: members@tcm.org.

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