PARENTS & KiDS

The Computer Clubhouse

By Karen Brown
TAB Correspondent

The yellow ant crawls out of the nest to gather food for the colony. The ant lion devours him but he is reborn. Returning home, the yellow ant finds an invader in the nest.

"A red ant! The enemy!" gasps Rudel Christopher, tapping the computer mouse frantically to fight the invasion on the screen. "Fight him! Beat him up! Kick his butt!"

SimAnt, a computer program that recreates insect life, is one of many programs at the Computer Clubhouse, a drop-in center for ages 10-16 at The Computer Museum in Boston.

Museum staff and volunteer "mentors," some graduate students and computer professionals, guide youths through scientific simulation, electronic music, computer-controlled devices, "virtual reality," multimedia and game design.

"For the younger kids, computers are cool," says Noah Southall, mentor coordinator. "Kids see computers as a diversion, as something you can spend time sort of playing with and exploring." Adolescents use the PC more as a tool; composing stories, designing greeting cards, even writing love letters, observes Southall.

Mentor Mike Lee, 18, left Cambridge Rindge and Latin High School because he was unmotivated, although he took art courses and always hoped to attend art school. His mother encouraged him to volunteer at The Computer Clubhouse even though he had no experience

with personal computers. Now, Lee's designs appear on Clubhouse posters. He is studying for the G.E.D. and plans to major in commercial art in college. Lee persuaded friends to come to the Clubhouse and is also recruiting students to participate and exhibit their art at the museum and art galleries.

"We want to serve an unlimited number of people and the only way we can do that is by modeling what we've done, and that really is what this space is about," says Sam Christy, Clubhouse Manager. Software starter kits — which are still in the planning stages but will eventually be distributed nationally to museums, community centers and schools — spread the idea.

The Clubhouse is open Tues.-Fri., 2-5:30 p.m., Sat., 10 a.m.-4 p.m. For more information, call (617) 426-2800.

One for the Road
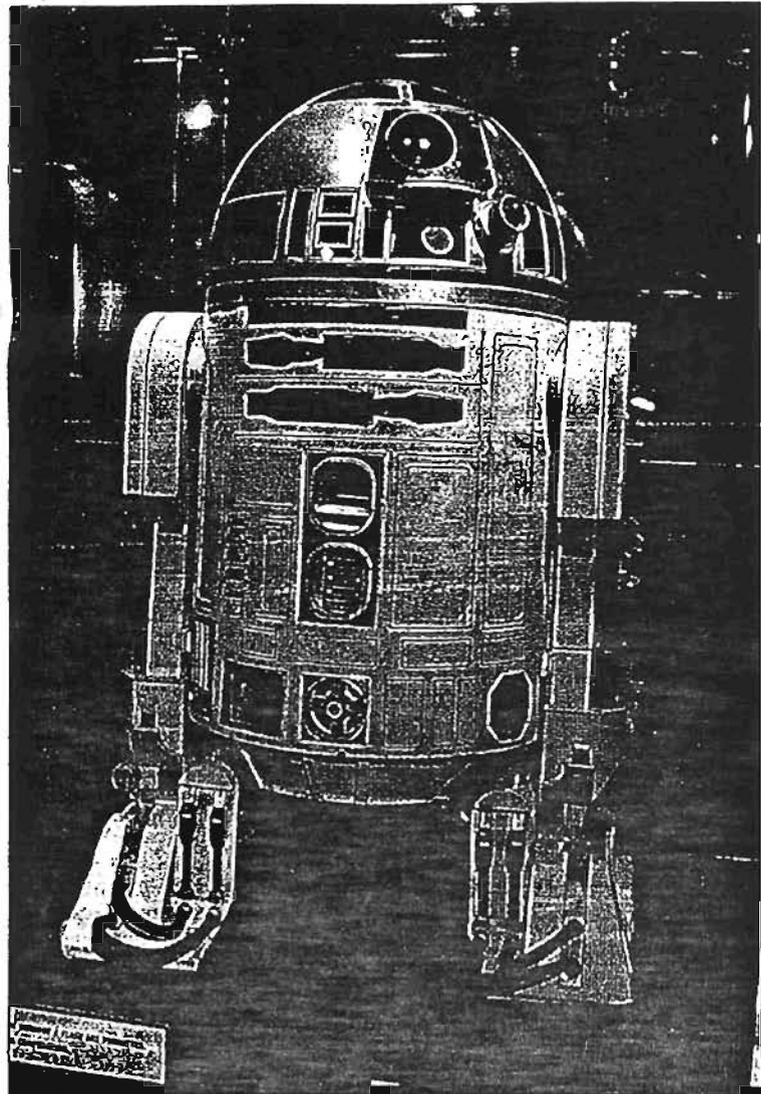
Syd Kearney / Chronicle

In a museum filled with interactive exhibits, there's one wallflower that draws a crowd. It's "R2-D2" of *Star Wars* fame. The squatty computer hero is not a machine, but a costume worn by a petite actor.

Tap into electronic fun at Computer Museum

$078

By SYD KEARNEY
Houston Chronicle Travel Writer

BOSTON, Mass. — You don't need a modem to tap into the electronic playground known as The Computer Museum. A sense of fun and a few free hours will connect you with the world's first museum dedicated to robotics and the electronic brain.

The Computer Museum, while adjacent to Boston's Children's Museum, is definitely not just for kids. In fact, during a December visit, playful adults outnumbered children two to one.

The museum, in a nondescript warehouse adjacent to the touristy Boston Tea Party site, is accessible by a glass-encased service elevator Riding to the warehouse's fifth and sixth floors, visitors get a dramatic view of downtown Boston and the wharf area.

Everything is big at The Computer Museum. A humongous floppy disc. A giant mouse that encourages kids to work it with their bellies as they climb on top. A massive keyboard nearby requires two hands to press down the keys. These pieces of hardware are linked to a large video display and are part of a program that computes travel distances

_ Spread throughout the museum are computer work stations where visitors can mouse around with simple games such as helping a man

find his dog and elaborate programs such as designing an ecosystem.

Everywhere adults and children are taking a seat and tackling a task. Visitors can create a cartoon or put their photo in front of the Taj Mahal. They can listen to music and decide: Is it Mozart or just a good computer-generated sound-alike? Visitors also can create electronic art or challenge a chess master.

Even folks who consider themselves computer illiterate quickly master the keyboards in this silicon sandbox. Helpful staffers are around to rescue the confused.

A fine exhibit, *People and Computers. Milestones of Revolution,* traces the evolution of computers. From humble beginnings in the 1930s as the U.S. government strove for efficiency with the keypunch machine to the introduction of the personal computer in the 1980s, computer history comes to life through photos, hardware and song.

The '90s, according to the exhibit, will be known as the era of the "Incredible Shrinking Machine."

The Computer Museum is located at 300 Congress St. To get there, take Boston's Red Line subway to South Station and walk across the Congress Street Bridge. Winter hours are 10 a.m. to 5 p.m. daily. The museum is closed Mondays. Admission is $7 for adults, $5 for students and senior citizens Children age 4 and under are free. Call (617) 426-2800 for information.

MUSEUM *News*

On-Line: Washington

Even if you're not an "FOB" (Friend of Bill, in Washington parlance), you can become the president's electronic pen pal. "Letter to the White House," a new interactive exhibit at Boston's Computer Museum, lets visitors zap a message to either President Clinton or Vice President Gore via computer network.

The exhibit, which is open until mid-February, connects Boston to Washington through Internet, a noncommercial computer network that links up to 30 million people in more than 130 countries. Museum-goers decide to write to either Clinton or Gore, compose their letter, and send it off to the White House with the click of a mouse. Computer-animated and other special effects simulate a satellite's view of the message as it bounces from the museum to a "gateway" in Boston and through cyberspace before landing at 1600 Pennsylvania Avenue. A print-out acknowledges the White House's receipt of each message, lists e-mail addresses for Clinton and Gore, and provides information on network communication use at home, school, or work.

Electronic correspondents at the Computer Museum may elect to keep their letter private or share it with subsequent users. About two-thirds of the visitors opt for confidentiality, says Director of Exhibits David Greschler. "People feel very personal about the letters," he says, perhaps because "Letter to the White House" requires a larger investment of energy and emotion than most exhibits. "It's a big commitment," he says. "This exhibit starts with a blank sheet."

Users who aren't shy might end up seeing their letters in *The Boston Globe*. The newspaper and the museum are cohosting an "electronic town meeting" that uses visitors' letters as an informal opinion poll on the Clinton administration. In one sam-
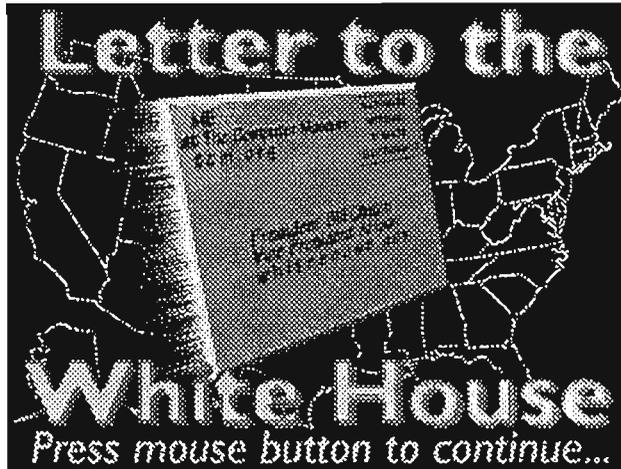
Dear Bill, Dear Al: E-mailing to the White House, and learning about technology's impact on democracy.

pling of letters published in November, writers addressed a broad range of topics and adopted a generally encouraging tone. "I was wondering, when you and Mrs. Clinton have the chance, can you do a little research and see why child care is so expensive?" wrote Martha Dickerson, a single working mother from Dorchester, Mass. A postscript advised the president to "tell Mrs. Clinton happy belated birthday." Other correspondents told Clinton to buck up under criticism in the media, congratulated him for his working partnership with the First Lady, and urged him to pursue a "National Day of Service."

"Letter to the White House" goes beyond a purely technical discussion of computer networks to ponder philosophical issues. Visitors learn something about the process of democracy in the United States and how it is influenced by the recent boom in network technology. The exhibit encourages museum-goers to contemplate the significance of their right to actually write to the president—a freedom unheard of in autocratic governments. Reading other people's letters also encourages an exchange of ideas that typifies the exercise of democracy.

Developed by William Tremblay, the exhibition design helps emphasize the connection between the American people and their president. The computer is installed in an oak desk meant to resemble Oval Office furnishings. An American flag rests nearby, along with letters from Clinton and Gore to the museum stressing the growing importance of network communications in modern society and thanking visitors for writing. "For the first time in history, a presidential administration is linked, electronically, with you," Clinton wrote in his letter. "Innovative technology like electronic mail is paving the way to a better informed, more responsive government." He said he hopes to answer electronic mail messages individually within a year.

The exhibit serves as a preview to "The Networked Society," a 5,000 square-foot, $1.5-million project scheduled to open at the Computer Museum in late 1994. The hands-on exhibit will give a broad view of how computer networks influence areas of daily life such as government, health care, education, and finance. It will explore moral and ethical issues raised by widespread network computer use.

—Susannah Cassedy O'Donnell

Panorama

If you're hungry for more, journey to The Computer Museum for a taste of the latest electronic technology featured in a new interactive exhibit, "Letter to the White House."

Go on-line to the White House and let President Bill Clinton or Vice President Al Gore know what you think about health care or any other governmental issue; it's as easy as the simple click of a mouse.

Your message is routed through a web of machines that are part of Internet, a noncommercial computer network linking up to 30 million people in over 130 countries. Computer-animated special effects offer a simulated "satellite's view" of your message as it travels from the Museum through cyberspace to its final destination—the White House.

President Bill Clinton believes that "innovative technology, like electronic mail, is paving the way to a better informed, more responsive government." He hopes to answer electronic mail messages individually within a year. In the meantime, you'll receive an acknowledgement from the White House that your message will be read. See photo on page 16.

For more information regarding the aforementioned exhibits refer to the *Museum* section under *Currently*.
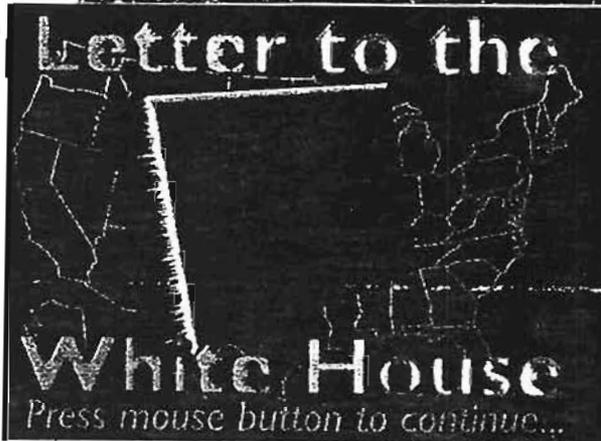
Superstar at the Wang Center

Letter to the White House

Press mouse button to continue...

THE OFFICIAL GUIDE TO BOSTON

BOSTON

Residents use exhibit to send greetings to the president

A new exhibit at the Boston Computer Museum allows visitors to jump onto the electronic highway and tell resident Clinton and Vice President ore what is on their minds. The Letter to the White House" connects museumgoers to Washington via a worldwide computer network known as the Internet

From time to time, City Week-ly will run a mpling of letters from residents of oston, Brookline, Cambridge and omerville. The exhibit, open 10 a.m. 5 p.m., Tuesday through Sunday, ill run through February.

Dear Mr. President,

My name is Bob LaVallee. I just finished organizing all 235 projects for the City Year Serve-a-thon. It was an amazing day of 10,000 people coming out from their homes – be they in suburbs or urban developments – to serve the communities they share. We built a playground in Somerville, ran a carnival for kids in Charlestown and painted elders' apartments in Dorchester.

For a day, people of all colors and backgrounds got a glimpse of what community can really mean.

I offer this as a vision to you, sir. My dream is to see a "National Day of Service" to complement National Service itself. I believe Costa Rica is already doing this. Events like the serve-a-thon are happening all across the country.

I invite you to witness one of them to better understand the explosion of idealism that they detonate. Thank you for your time.

BOB LAVALLEE
Boston

Dear President Clinton:

How are you and your family? My name is Martha Dickerson, and I am from Dorchester. Mass. I'm writing to tell you I think you and Mrs. Hillary are doing a great job in the White House.

Mr. President, I'm a single working parent trying to make ends meet, but child care expenses are a little too much for me. I was wondering, when you and Mrs. Clinton have the chance, can you do a little research and see why child care is so expensive? I know I want good care for my son, but sometimes I can't afford it. I will very much appreciate it if you can write me back and tell me what you think.

My family says hello.

P.S. Tell Mrs. Clinton happy belated birthday, and again, keep up the great work.

MARTHA DICKERSON
Dorchester

Dear President Clinton:

I wanted to let you know that I appreciate what you are trying to do – in bringing health care to everyone, in strengthening the economy and in coping with the complexities of creating a sound foreign policy.

What you are trying to do is heroic. I think that the media are treating you unfairly in many cases. What distinguishes your administration from the previous two administrations is that you are trying to make things better for people without privilege and that you do care.

Thank you for trying.

JANE SMITH
Cambridge

Mr. President,

Four points and a correction:

■ When I think of you, I imagine the clamor – demands, needs and wishes: strivingness, anger and pain; manipulation, flattery and lies – that must be always around you. We see you being pulled in many directions. I hope you can find the courage to be both popular and unpopular. I hope you can find the strength to return again and again to answers that lie within what must be your own very good heart.

Stay with your vision. You cannot please everyone. There are more of us than you know who reflect on you

enclosed away from us and who hope for you the clarity that may come from any moment of silence.

■ Surely a time will come when we realize that our business is to help each other live our own brief lives that blow away like leaves in the wind. I may be a primitive and a dreamer, but isn't there a chance that if everyone had food to eat and a safe bed for sleeping and healing for ills, our energies could turn to whatever must be – eventually – the uses of life? Think how many talents could be liberated. We need all of them.

■ In your remarkable life, I'm sure you must sometimes have thought that the most remarkable thing you ever did was to join your life to Hillary's. I am happy we have the two of you – for numerous reasons but primarily because I think this example of regard and equality between a man and woman, this example we see so clearly every day, speaks more than a whole library of words. And *example* itself, as someone wiser than me once said, is "our only teacher and we will learn from no other."

■ Fourth, please think as deeply as you can about the other animals

and beings who are our coinhabitants on the planet.

■ My suggested correction: Because I am your elder and your fellow human being who holds you in affectionate regard, I offer one explicit correction you may consider for your public speeches. Please think of using an alternative to "God bless you." Consider "May blessings come to all of us" or "May the blessings of your god come to you" or some other variation.

Two reasons, having to do with meaning itself and acknowledgement of a larger world view: 1. You were not elected as a pope or other office of religion. 2. Your listeners throughout the world have many religions and many expressions of spirituality.

Why not a neutral phrase that allows room for whatever spiritual gifts there may be and also acknowledges that we humans may seek them one by one in our own way?

In the wish that every one of us will bring peace to the world, I am sincerely yours,

CHINA ALTMAN
Boston

Disk-Drive Democrats

In the Clinton White House, where electronic mail is seen as the new political high ground, megabytes are nearly as important as sound bites.

By PHIL PATTON

"**I** THINK of myself as a kind of digital postmaster general," said Jonathan P. (Jock) Gill, who coordinates electronic communications at the White House. It is an analogy strengthened by his assertion that Benjamin Franklin, America's first Postmaster General, is an ancestor.

"I'm the first man to ever have an E-mail address on his White House business card," Mr. Gill added.

Just beneath the embossed Presidential seal are the words "Office of Media Affairs." And the medium with which this Administration seems to be having its most passionate affair is electronic mail. Just as the Kennedy Administration was infatuated with counterinsurgency and the Reagan Administration with the Laffer tax-growth curve, the Clinton Administration is in love with computer communications.

"Innovative technology like electronic mail is paving the way to better informed, more responsive government," declared a Nov. 4 White House report, "Technology for Economic Growth," which, thanks to Mr. Gill, you can peruse on your computer.

The Clinton Administration has become the first to accept electronic mail from the public and to disseminate its documents over the wires. Since June 1, using such computer services as Prodigy, Compuserve, America On-Line and the Internet, anyone can send messages instantly to the President. (The addresses are America On-Line: ClintonPZ; Compuserve: 75300.3115; Genie: WHITEHOUSE; MCI Mail: 5895485; Internet: President@Whitehouse.gov.)

Several computer on-line services also electronically publish information from the White House, including speeches, news releases and the President's daily itinerary. They also have forums, or bulletin boards, that allow members to discuss issues.

E-mail may be the "fireside chat" of the 1990's. The ability to sit down late at night in front of a flickering computer screen and peruse the National Performance Review, Vice President Al Gore's blueprint for streamlining Government, and fire off a comment, offers an immediacy of contact comparable to that felt by people hearing President Franklin D. Roosevelt's full tones in their Depression living rooms.

"Electronic mail seems somehow easier and more direct," said Gail Jennes, public relations director of the Boston Computer Museum, which offers a special exhibition on sending E-mail to the White House. "There's something empowering about it."

To most citizens, President Clinton's health-care plan in print looks as intimidating as the Manhattan phone book. But to Mr. Gill, whose office will download it to your computer on request, "it's just a meg," a veritable handful of electrons on the Internet. "All in all," he said, "this country is doing eight terabytes a month on the Internet."

A terabyte is a million megabytes, the equivalent in written data of a million of the health-care reports. Eight terabytes represents a crowd — and crowds draw politicians.

Cyberspace may be the new political high ground. Like the post office, last century's seat of patronage and communications, it could give an advantage to the party that uses it effectively. (Among leading Republicans, only Representative Newt Gingrich of Georgia is known as a dedicated on-liner.)

Although the E-mail numbers are relatively small — 1,000 letters a day versus 40,000 paper letters a week received at the White House — they are growing rapidly and involve a key constituency: the computer literate. And Mr. Gill said, the number of computer modems is increasing tenfold a year.

On Compuserve, the Presidential discussion forum is among the 10 busiest of the service's 250 bulletin boards. And after the President's health-care speech, America On-Line received particularly heavy use.

"Every American should have access," Mr. Gill said. "And any leader should be able to inform people about his ideas, unfiltered."

MR. GILL, a former Lotus Software executive who started his own high-technology company and then joined the Clinton campaign, puts the President's documents on line. Incoming E-mail is handled by his colleague, Steve Horn, a computer professional with a touch of a drawl, whose office is decorated with a copy of the cartoon "Foxtrot" that brought the White House Internet address to readers of the comics.

E-mailers might be disappointed to see where E-mail ends up, but taxpayers should be gratified. There is nothing very high-tech or high-style about Mr. Horn's windowless basement room in the Old Executive Office Building, next to the White House. Mr. Clinton's promise to run a frugal White House, Mr. Horn said, means he must make due with a staff made up mostly of a dozen volunteers.

A lot of electronic mail, to be sure, comes from college students, and much of that is sophomoric digital cartoons and visual Bronx cheers. And there are the "E-mailers from hell," as Mr. Horn's staff calls them, recidivist on-liners, usually critics. A recent, crudely typed example, copied into one on-line forum: "His intentions are to ruin the count try. AT least that is the eventional economic and moral effect of his proposals."

Electronic love letters come in, too. One fan declared he found Chelsea Clinton "far more attractive than are the Gore girls."

But Mr. Horn said, "We get a lot of suggestions: don't forget to look at this or that."

Computers acknowledge all E-mail automatically and immediately. That is part of the appeal: knowing that the rock or rose you've lobbed at the White House has landed.

But no citizen should labor under the misapprehension that the leader of the free world kicks back after a day dealing with world crises to log on and browse the E-mail. It, like the paper mail, is summarized, counted, and winnowed for a weekly report to the Oval Office with a sample of actual letters.

By January, Mr. Horn and Mr. Gill hope to be running a special sorting program that will direct mail to the proper aides and offer personalized responses within 48 hours. But for now, most replies are form letters or "roboresponses."

As much as the incoming mail, however, it is the outgoing that is making this the first electronic Presidential Administration. Mr. Clinton's speeches and documents are available all over the world on the Internet. At the University of North Carolina at Chapel Hill, work is under way on a "virtual Presidential library" of digitally stored documents.

Working from an office as decrepit as Mr. Horn's but upstairs, near the health-care plan "war room," Mr. Gill provides Presidential documents without cost to such services as Prodigy and America On-Line, which can then add indexing or other features.

Putting the White House on line is only part of the Administration's larger goal of creating electronic access to the whole Government. "Any society needs a commons," Mr.

The White House E-mail system is run by Steve Horn, left, and Jonathan P. Gill.

TWO CENTURIES OF HIGH-TECH POLITICS

1775 Benjamin Franklin, the Continental Congress's Postmaster General, asserts the colonies' rights to keep the mails open to *newspapers of all political views.*

1803 British troops destroyed many of his papers when he was Governor of Virginia during the Revolutionary War, so Thomas Jefferson experiments with copying letters on pantographs and letter presses.

1829 Andrew Jackson, assailed by scandal mongering in the press (he was called, among other things, a bigamist), makes the newspaper magnate Amos Kendall a member of his kitchen cabinet. Mr. Kendall, the David Gergen of his era, directs a panoply of Administration-controlled newspapers. He later becomes Postmaster General, supervising political patronage.

1863 Communicating with his generals by telegraph helps make Abraham Lincoln a stickler for taut prose, according to Garry Wills.

1866 Andrew Johnson installs the White House's first telegraph.

1879 Rutherford B. Hayes installs the first White House telephone. It is rarely used until the first Administration of Grover Cleveland, starting in 1885; he often answers it himself.

1913 Woodrow Wilson holds the first formal Presidential news conference, crowding 200 reporters into his office.

1924 Calvin Coolidge makes the first Presidential radio speech.

1933 Franklin D. Roosevelt inaugurates the "fireside chat" to speak intimately to people at home — and bypass a hostile press. Social Security and other New Deal programs benefit I.B.M., whose punchcard systems and, later, computers are necessary for administering the vast data bases they require.

1939 Roosevelt takes delivery of the first White House television set and makes the first Presidential television appearance at the New York World's Fair.

1952 On election eve, a Univac computer predicts the Eisenhower landslide, but the television networks refuse to believe it.

1961 Buoyed by his performance in the debates, in which television viewers thought he had won and radio listeners thought Richard M. Nixon had won, John F. Kennedy initiates live, televised news conferences.

1965 To watch the network news programs simultaneously, Lyndon B. Johnson installs

Associated Press

Jimmy Carter tried to revive the "fireside chat" on television in 1977.

three television sets in a huge cabinet, the ugliest piece of Oval Office furniture ever.

1970 The Xerox machine, used to disseminate the Pentagon papers, enrages President Nixon, whose downfall is guaranteed by the Oval Office taping system.

1977 Jimmy Carter attempts to revive the "fireside chat" on television, pushing his energy program while wearing a cardigan sweater in front of a real fireplace. Perhaps proving Marshall McLuhan's dictum that radio is a hot medium (and thus suitable for firesides), while television is a cool one, the public reaction is tepid.

1981 Ronald Reagan pioneers retro media, returning to weekly radio addresses. The White House hooks up to an E-mail system, which Oliver North shows can be erased faster than paper can be shredded.

April 1991 George Bush becomes the first President with a computer terminal but shows no sign of using it.

June 1993 White House goes on the Internet.

August 1993 A Federal appeals court judge, Charles Rickey, rules that White House E-mail has the status of official Government documents and orders it preserved.

Gill said. And in America, it is electronic E-mail can be a way to create community, which Mr. Gill promptly points out belongs with "responsibility" and "opportunity" in the trinity of Clinton values.

"Right now, the mass media are one-directional," he said. "There's a multi-lane superhighway to you, but just a cow path back to the center."

Congress has begun accepting E-mail, and the President has promised, "We will make it possible for people to communicate with Federal agencies using electronic as well as conventional mail." He has laid out a vision of terminals in shopping malls and post offices. To begin this process, Mr. Gill has established ACE — Americans Communicating Electronically — a service that makes computers in Agriculture Department extension service and Small Business Administration offices available to individuals.

Politically, E-mail has other functions, though. It can be seen as a high-tech successor to Mr. Clinton's campaign interviews on MTV or his Elvis imitation on the "Imus in the Morning" radio show: a way to make end runs around the established news organizations and what press secretaries consider oversimplifications. The on-line megabyte is the response to the television sound bite.

The electronic soapbox may also offer a countervailing power to, say, the $8.5 million that insurance companies are spending on television advertising to attack the Administration's health-care plan.

The Clinton Administration is not the only group aware of E-mail's potential political power. Several software programs for electronic lobbying have already appeared, including one called Political Action.

And a Sunnyvale, Calif., city councilman was elected this fall with 60 percent of the vote after campaigning almost exclusively on the Internet — suggesting that the electronic age may reverse one old saw. In Silicon Valley, at least, all politics are global.

4TH HARVARD CUP HUMAN versus COMPUTER CHESS CHALLENGE
MEDIA REPORT
*Listed in Chronological Order

PUBLICATION	DATE	CIRCULATION
Boston Globe (City Weekly)	October 31, 1993	150,000
Patriot Ledger (Quincy, MA)	November 2, 1993	87,018
The Tab	November 2, 1993	156,475
Mass High Tech	Nov 2-14, 1993	30,000
Boston Phoenix	November 5, 1993	135,000
Boston Globe	November 6, 1993	508,867
Cambridge Chronicle	November 6, 1993	15,000
Somerville Journal	November 6, 1993	13,000
Watertown Press	November 6, 1993	4,297
Boston Sunday Globe	November 7, 1993	798,298
Boston Sunday Herald	November 7, 1993	235,084
Middlesex News	November 7, 1993	44,846
Middlesex News	November 9, 1993	35,326
Harvard Univ. Crimson	November 9, 1993	14,000
Boston Business Journal	November 12, 1993	36,876
Middlesex News	November 14, 1993	44,846
Mass High Tech	Nov 15-28, 1993	30,000
Boston Sunday Globe	November 21, 1993	798,057
Boston Phoenix	December 3, 1993	135,000
Chicago Tribune	December 5, 1993	1,109,622
Computor Edge	December 31, 1993	150,000
Boston Sunday Herald	January 2, 1994	223,190
Moscow Times		50,000

STORIES VIA ASSOCIATED PRESS:

Providence Sunday Journal	November 7, 1993	269,472
Waterbury (CT) Sun. Repub	November 7, 1993	76,614
Haverhill (MA) Gazette	November 8, 1993	12,881

TOTAL: **5,163,776**

ELECTRONIC

PROGRAM/STATION	AIR DATE	AUDIENCE
ABC News NIGHTLINE	November 19, 1993	8,000,000
Voice of America	November 9, 1993	
WSSH-FM, Boston	November 5, 1993	
WBZ-AM, Boston	November 6, 1993	110,000

TOTAL: **8,110,000**

TOTAL PRINT & ELECTRONIC: **13,273,769**
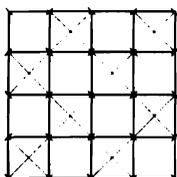
Computers are gaining on human chess players

For now, though, man is still king at Harvard tourney

By Sally Jacobs
GLOBE STAFF

Man sat down with machine at half a dozen checkered brown chessboards yesterday and by day's end stood up the victor. But only barely.

"Overall, I am still a better chess player than any computer in the world," insisted US chess champion Patrick Wolff of Somerville, seconds after being beaten by a computer in the first round of the Fourth Harvard Cup Human Versus Computer Chess Challenge. "That will definitely come to an end, but today is not the day."

Some observers were secretly betting – although not too much – that the computers would trounce their human opponents, signifying a major milestone in the development of artificial intelligence. But at the end of six rounds, pitting six chess grandmasters against six computers, it was 27 for the humans and 9 for the computers.

And to some who mutely watched the game for hours, several logging the moves on to personal computers, the tally signified no less than their own continuing dominance upon the planet.

"We're all rooting for the humans. I mean, it's solidarity of the species," exclaimed Jeremy Martin, 18, president of the Harvard Chess Club, looking up from a computer balanced on his knees. "When you see that our best chess players can still beat their best chess players, it's very reassuring. It shows we haven't been taken over by the machines. Yet."

It was a grueling fight. On the human side were some of the chess greats: Wolff, former Soviet chess champion Boris Gulko, defending Harvard Cup champ Michael Rohde, New England champion Alexander Ivanov.

On the computer side were hardware and software of equal heft: Socrates Exp, Kasparov's Gambit, BattleChess 4000 SVGA, M-Chess Professional, Renaissance SPARC, ChessSystem R30.

The Cup founders, Harvard graduates Daniel Edelman, 24, and Christopher Chabris, 26, hovered around the six playing tables at The Computer Museum and claimed neutrality as the scores were posted throughout the day. But early on they predicted the computers' chances were better than ever in part because of faster processing enabling the computers to consider greater numbers of move options.

Since the first Harvard Cup in 1989, computers have brought in steadily rising scores, their take of the total possible points increasing from 9 percent to 28 percent last year.

"Chess has always been seen as the last bastion of hope on the human frontier, as the last game where the human mind could exceed the ability of the machine," said Chabris, a graduate student in psychology. "But when the computer wins 50 percent of the points, that indicates that technology has equaled human capacity and is ready to move on. It may not happen today, but we think it's just a question of when."

Not to say that it was a shoo-in for the grandmasters who had to work hard to maintain their preeminence. They hunched over the table, head in hands.

"The computer is good, but it is not great," exclaimed Gulko, rising triumphantly from his match

GLOBE STAFF PHOTOS / JANE FLANDT

US chess champion Patrick Wolff of Somerville plays against a computer at the Computer Museum.

with ChessSystem R30. "The computer has no fantasy, no inspiration, no soul. It can only calculate, calculate, calculate."

While virtually all of the grandmasters acknowledged that computers are steadily improving at the game and might one day trounce them, few seemed particularly concerned that computers would displace humans from the game altogether.

As the grandmasters battled it out for the prizes – Joel Benjamin, a former US champion, took $1,000 for first place and Ivanof won $500 for second place, while the triumphant software Socrates Exp and ChessSystem R30 won fame alone – the next generation of

chess players battled it out on a huge black-and-white floor board. And many of them confessed they got their early training on a computer.

Christine Loreth, for example, learned to play chess at age 3 by mimicking the moves of the computer that her father played against. Now 7, she checkmated her father in six moves recently. She has a chess tutor. And next month she will appear in her first chess tournament with other humans.

But a computer, she says, is quite another thing.

"Eventually computers will win," said Loreth, pivoting about a large white pawn. "They're just smarter than us."

Chess

By Shelby Lyman
SPECIAL TO THE TRIBUNE

Beginner's corner

Black draws

Hint: Stalemate is the key

At the recent 4th Harvard Cup Human vs. Computer Chess Challenge held at the Computer Museum in Boston, a team of six grandmasters triumphed easily (27-9) over a team of six computers.

A sign of a still prevailing one-sided superiority by humans?

Surprisingly not, if we look beyond the overall numbers.

Although four of the machines got trounced, the two strongest did remarkably well. Socrates Exp scored 3-3 against a group of humans that included the current U.S. Champion Patrick Wolff; a former USSR champion, Boris Gulko; a former U.S. Champion, Joel Benjamin; and a former U.S. Open Champion, Michael Rhode. ChessSystem R30 fared only a little worse with a 2½-3½ score.

Perhaps, a prediction made a few years ago by computer expert David Levy of Scotland is not as far-fetched as it once sounded. "Someday," he said, "you will be able to buy a world chess champion in the supermarket for five or ten dollars."

Both, Socrates, a software package for personal computers, and ChessSystem R30, a dedicated device, are in fact commercially available: Socrates for about $150 and ChessSystem for $2,000.

What distinguishes these machines from much larger "brute force" counterparts is their clever programming. Using Intel Pentium chips, they are able to search up to 20,000 positions a second, a large number by human standards, but small compared to the expected billion positions per second that Deep Blue, the king of chess computers, is expected to be able to process when it is completed sometimes next year.

Computer expert Chris Chabris, an organizer of the Boston event, notes that the human players have been making important adaptations to the machines. "They seem less uncertain than they were in previous years. They know more about how to play the computers in the middlegame and endgame."

Below is a game from the tournament.

ChessSystem	Rohde
1. d4	Nf6
2. c4	e6
3. Nf3	Bb4ch
4. Bd2	c5
5. Bxb4	cxb4
6. g3	0-0
7. N(b)d2	Nc6
8. Bg2	d6
9. 0-0	e5
10. Qc2	Bg4
11. e3	a5
12. dxe5	dxe5
13. R(f)d1	Qe7
14. Ne4	R(a)d8
15. h3	Bf5
16. N(f)d2	Kh8
17. g4	Bg6
18. R(a)c1	Rd7
19. g5	Ng8
20. Nf1	R(f)d8
21. N(f)g3	h6
22. h4	f5
23. Rxd7	Rxd7
24. h5	fxe4
25. hxg6	Qxg5
26. Bxe4	Nf6
27. Bf5	Rd8
28. Kf1	Nh5
29. Nxh5	Qxh5
30. Be4	Ne7
31. Bxb7	Nxg6
32. c5	Nh4
33. c6	Qg4
34. c7	Qh3ch
35. Ke1	Rc8
36. Rd1	Black resigns

Solution to Beginner's Corner: 1. Nxg6! 2. Qxg6 Qf3ch! 3. Kxf3 stalemate (from Karpov 1987).

ROBERT ZIMMERMAN

Who Holds the Key to the E-Mailbox?

Computers: Messages are not always secret

REPORTERS ARE PAID TO BE NOSY. BUT there are limits, at least if you work at the Los Angeles Times. Earlier this month Times editors recalled a reporter in the paper's Moscow bureau because they believed he was repeatedly reading his colleague's electronic-mail messages, according to sources at the Times. The reporter, Michael Hiltzik, was caught in a sting operation using phony messages. Hiltzik, back in Moscow temporarily, would not comment and editors at the paper said they couldn't discuss a "personnel matter."

Whatever the details of the case, it's clear that technology has created new opportunities for the old-fashioned office snoop. A few years ago he or she might have rifled through a colleague's desk. But with the advent of E-mail, overly curious co-workers can peek at everything from confidential performance evaluations to billets-doux in an office romance without ever getting out of their own chairs. Passwords create an illusion of privacy. But computer-systems administrators must maintain complete lists of those codes: who guards the guardians of the network? Would-be hackers can experiment endlessly trying to crack a colleague's code. And too often, the secret word is something easy to guess.

Under the federal Electronic Communications Privacy Act of 1986, E-mail gets most of the same protections as letters and phone conversations. Outside agencies, such as the FBI or the police, cannot read an individual's E-mail without a warrant.

But the law is hazy on whether bosses can read their employees' E-mail. Some employees have sued when managers read their E-mail, and pending court cases may help define the legal limits of electronic spying, but the issue of what employers can read "is still up for grabs," says David Greschler, director of exhibits at the Boston Computer Museum. Greschler is preparing a show on computer networks and privacy, to open next year. "A company can say, 'We own everything you write'," Greschler says. "If you're using your company's E-mail system, you're using their resources."

Prying bosses and offended workers run into trouble when they work at companies that have not announced explicit rules governing E-mail. Some legal experts argue that without clear guidelines employees expect that no unauthorized eyes can see what they write. If a company allows managers "to read employee E-mail, employees should be made aware so they can use the system appropriately," says Shari Steele of the Electronic Frontier Foundation, an advocacy group.

The best advice for employees is to be cautious. "Don't put anything in writing that you wouldn't want other people to read," advises Bill Moroney, executive director of the Electronic Messaging Association, a trade group. In other words, if you can't say anything nice, don't say anything. Someone may be watching—or reading.

BARBARA KANTROWITZ with
BETSY MCKAY in Moscow

One Step Ahead of the Law

Games: The industry moves for ratings

TIPPER GORE HAD NOTHING TO DO WITH it. Neither did Jack Valenti. But Joseph Lieberman might have. Last week, just hours before the Democratic senator from Connecticut testified on his proposed legislation for rating videogames, members of the $6 billion, unregulated industry announced that they will begin policing themselves. Under fire for violence and sex in home videogames, companies intend to form a board to establish guidelines for rating games within the year.

Last summer, acknowledging that new games with live action are more frightening than older games' cartoons, Sega of America began rating its product. (Mortal Kombat, in which aggressors rip off heads and brandish the bloody trophies, got an MA-13: not for young children.) While the predatory Night Trap (which features underclad teenage girls) may be fine for post-pubescents, a Sega spokesperson said, "it's very scary for 6-year-olds who don't like the idea of getting the blood sucked out of them." Nintendo of America, aiming at a younger market, already bans what it considers graphic violence and explicit sex. That policy probably cost them: the company estimates that it lost $10 million by taming down its own version of Mortal Kombat.

Worried parents might take some comfort in a new British study that found that videogames do not breed violence among children. Those surveyed had no trouble distinguishing a game from real life. "We may be appalled by something," says psychologist Guy Cumberbatch, but kids "know its conventions and see humor in things that others wouldn't." If that's true, the next time your kids become videogame avenging angels, you can just smile. ∎

JACQUES M. CHENET—NEWSWEEK

Information superhighway users search for rules of the road

By STEPHANIE SCHOROW

You'd certainly never open a letter addressed to a fellow employee if it were accidentally left on your desk. But would you read a co-worker's e-mail if it

were accidentally routed to your computer terminal?

The answer to this and other tricky electronic questions lies in the escalating debate over "cyberethics" — the emerging moral codes

of the much-touted information superhighway.

The electronic frontier of computer networks, 500-channel TV and worldwide data bases is a virtual Wild West of ethical dilemmas.

MacWorld magazine reported that 22 percent of 301 companies surveyed in 1993 searched employee computer files and voice mail. Viruses cause an estimated $3 billion in damage a year.

On the computer network Internet, 20 million users exchange everything from philosophical arguments to dirty jokes and pornography. A California network

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Cyberethical standards are slowly emerging

From Page 1

user got "hung up to dry," when he was found to be courting several women at once, noted Patrick Sullivan, director of the Washington D.C.-based Computer Ethics Institute.

"He didn't think the same rules of fidelity applied in cyberspace. He found he was wrong," Sullivan said.

Within the officially dubbed National Information Superstructure, "we have a whole new media developing," said Steve Miller, a Boston-based board member of Computer Professionals for Social Responsibility. "You have people wandering around learning to talk to each other. Like any exploration, people are figuring out the rules as they go."

Some believe cyberspace should be regulated as little as possible to further the free flow of information. Others, such as Rep. Edward Markey (D-Mass.) call for a legal "virtual reality check."

But many computer professionals and academics say the electronic frontier needs a preacher as well as a sheriff. Like non-virtual reality, cyberspace needs self-regulating codes of behavior, the restraints that keep many of us halted at a red light even at 4 a.m. with no traffic and no cop in sight.

Currently, cyberspace is imbued with the hacker's logic and something Sullivan calls the "Nintendo fallacy." He developed the concept after hearing one of his young sons declare to his brother during an argument: "You can't cheat — the machine won't let you." Like his son, many cybernauts believe that the system won't let them do something that's wrong and, conversely, if they can do it, it must be all right.

But "there is no technological fix for ethics," Sullivan said. Just because most people can easily alter their phones to monitor other cellular conversations does not make it OK.

In 1992, the Computer Ethics Institute created the "Ten Commandments for Computer Ethics." Like the original, these new commandments are open to broad interpretation. Take the rule, "Thou shalt not interfere with other people's computer work." How might this apply to the emergence of mass-marketing e-mail?

"Junk faxes are bad enough," institute president Ramon Barquin noted. "In electronic mail, someone, with one key stroke, can send out thousands of pieces of mail. What kind of restraints do you want on that? On the other hand, you don't want to restrain free speech."

Richard Sclove, an Am-

herst-based computer consultant, sees increased commercialization of cyberspace. Lawyers, accountants, even psychologists may soon set up shop on computer networks, further undercutting downtown business districts where such services are traditionally clustered. Such "malling of cyberspace" raises ethical questions of whether electronic access should be guaranteed to all economic groups.

On a more basic level, proliferation of computer networks, such as Internet, is creating new rules for social interchange — or "netiquette."

In cyberspace, no one can hear you scream — or sneer, or laugh, or tell where you come from by your accent. But even without normal vocal cues, in "virtual communities," people are arguing, wooing and kibutzing — and creating new language and grammar. Say something offensive and you might be "flamed" or deluged with biting, insulting responses. Further complicating conversation, Internet users can conceal their identity, using an address like: "jfkjr."

"You can sign on as anything you want — men as women, children as adults, blacks as

THE 10 COMMANDMENTS OF COMPUTER ETHICS

1. Thou shalt not use a computer to harm other people.

2. Thou shalt not interfere with other people's computer work.

3. Thou shalt not snoop around in other people's computer files.

4. Thou shalt not use a computer to steal.

5. Thou shalt not use a computer to bear false witness.

6. Thou shalt not copy or use proprietary software for which you have not paid.

7. Thou shalt not use other people's computer resources without authorization or proper compensation.

8. Thou shalt not appropriate other people's intellectual output.

9. Thou shalt think about the social consequences of the program you are writing or the system you are designing.

10. Thou shalt always use a computer in ways that insure consideration and respect for your fellow humans.

Source: Computer Ethics Institute   Staff graphic/Michael Bertrand

white. It makes for some interesting social dynamics," Miller noted.

Such anonymity has raised safety concerns. An Indiana parent discovered the "youngster" her child befriended on a teen chat line was a 42-year-old pedophile.

"Within those communities on the 'Net, standards of behavior are starting to grow the way culture evolves among people who have a similar interest," said Albert Teich of the American Association for the Advancement of Science.

Boston's Computer Museum is planning an exhibit on computer networks in November 1994 which also will explore cyberethics. Museum-goers will create their own "paper trail," revealing how computers can track our habits. The entire exhibit may be on line for "visitors" to explore via computer while never leaving home. Museum officials hope to expose children to the need for electronic morality.

Computers are "not just collectors of information, they're transformers of information," said David Greschler, the museum's director of exhibits. "They change the rules ever so slightly."

Memorandum

DATE: January 28, 1994

TO: Board of Trustees
             Board of Overseers

FROM: Oliver Strimpel

SUBJECT: Board of Trustees Meeting on February 11;
             Dinner on February 10

Enclosed please find the agenda for the Board of Trustees meeting on Friday, February 11, 1994. The meeting, which will run from 8:30 a.m. until noon, will be held in the Museum's auditorium on the fifth floor. A continental breakfast will be served at 8:00 a.m., and a light lunch will follow adjournment. All Overseers are cordially invited to attend.

Among other items, we shall discuss recommended slates for the Museum's Boards of Trustees and Overseers. Background materials from the Nominating Committee will be sent separately.

We also have scheduled an informal dinner meeting for Trustees and Overseers at the Museum the night before the Board meeting — on Thursday, February 10, from 6:00 p.m. to 9:30 p.m. The purpose of the dinner is to have some additional time to discuss the Museum's Long-Range Plan. We hope that you can attend this as well.

Please take a moment to fill out the RSVP form included in this packet and return it as soon as possible to my assistant, Mary McCann.

I look forward to seeing you on February 10 and 11!

Enclosures:
- Agenda
- RSVP form
- Draft Long-Range Plan

For Trustees:
- December financials
- Minutes from December 17 and January 11 Executive Committee meetings
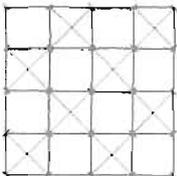
AGENDA

The Computer Museum

BOARD OF TRUSTEES MEETING
February 11 1994
8:30 a.m. - 12:00 p.m.

8:30	Call to Order of Meeting of the Members of the Corporation
	Election of Members to the Board of Trustees
	Meeting Adjourns
8:40	Call to Order of Meeting of the Board of Trustees
	Set/Confirm Dates and Format for Next Board Meetings
	Election of Members of the Board of Overseers
	Museum Operations Update
	The Networked Society Committee Report
	Education Committee Report and Discussion
	Development Report & Discussion
	Collections Report
10:30	Break with Tour of Collections Spaces
	Strategic Plan—Discussion Based on First Draft of Plan
12:00	Meeting Adjourns
	Lunch with the NEH Advisory Committee for *The Networked Society* Exhibit
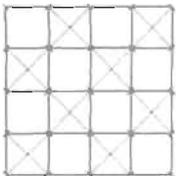
THE COMPUTER MUSEUM
STATEMENT OF REVENUE & EXPENSE
6 Months Ending 12/31/93

	OPERATING FY94 Actual	Budget	OPERATING FY93 Actual	CAPITAL/EXHIBIT Actual	Budget	ENDOWMENT Actual	Budget	COMBINED Actual	Budget	$ VARIANCE	ANNUAL BUDGET FY94	FORECAST FY94
SUPPORT/REVENUE												
Restricted Support:												
Clubhouse	138,758	61,150	50,400					138,758	61,150	77,608	287,900	306,800
Exhibit Related		45,200	15,519	160,000	262,000			160,000	307,200	-147,200	732,000	541,800
Govt & Foundation	10,286		46,479					10,286		10,286		34,466
Endowment												
Unrestricted Support:												
Capital Campaign				113,580	276,200			113,580	276,200	-162,620	726,200	352,050
Corporate Membership	63,575	75,850	72,750					63,575	75,850	-12,275	205,000	192,725
Foundation			1,000									
Computer Bowl	216,500	176,500	150,000					216,500	176,500	40,000	388,000	388,000
Membership Fund	104,684	100,540	77,852					104,684	100,540	4,144	178,000	178,000
Admission	285,195	285,713	264,375					285,195	285,713	-518	536,841	536,323
Store	153,567	169,536	125,853					153,567	169,536	-15,969	332,395	281,885
Functions	96,460	79,200	90,221					96,460	79,200	17,260	140,352	156,316
Exhibit Sales	9,597	30,000	37,640					9,597	30,000	-20,403	90,000	45,000
Other:												
Interest Income	1,734	3,400	1,514			2,625	3,510	4,359	6,910	-2,551	12,000	5,333
Rental Income			5,100								4,000	2,020
Program Income		1,200	658						1,200	-1,200	2,500	1,300
Collections	75	2,100	1,700					75	2,100	-2,025	4,000	1,975
TOTAL SUPPORT/REVENUE	1,080,431	1,030,389	941,061	273,580	538,200	2,625	3,510	1,356,636	1,572,099	-215,463	3,639,188	3,023,993
EXPENSES												
Exhibit Development	32,905	51,515	6,178	77,148	177,174			110,053	228,689	-118,636	580,485	461,400
Exhibit Maint/Enhancement	25,262	20,968	25,527	1,381	13,092			26,643	34,060	-7,417	69,578	79,822
Exhibit Sales/Kits	9,704	17,610	42,802					9,704	17,610	-7,906	52,610	36,524
Collections	32,025	31,190	31,760					32,025	31,190	835	62,400	63,235
Education & Admission	127,387	146,365	139,011					127,387	146,365	-18,978	292,570	273,592
Clubhouse	106,737	113,980	7,964					106,737	113,980	-7,243	236,000	236,000
Marketing	140,227	132,780	86,113					140,227	132,780	7,447	229,190	236,637
Public Relations	44,842	46,720	37,065					44,842	46,720	-1,878	93,334	91,455
Store	130,720	143,144	108,663					130,720	143,144	-12,424	268,932	219,559
Functions	38,980	35,530	38,439					38,980	35,530	3,450	69,402	72,853
Computer Bowl	19,087	19,270	14,517					19,087	19,270	-183	135,324	135,141
Fundraising	26,176	32,610	25,579	55,024	111,620			81,200	144,230	-63,030	286,585	150,000
Membership Fund	23,209	41,820	17,399					23,209	41,820	-18,611	83,611	65,000
Museum Wharf												
Op Exp	144,955	151,002	150,698					144,955	151,002	-6,047	302,000	316,923
Mortgage				64,338	64,337			64,338	64,337	1	126,977	126,977
General Management	124,676	111,184	109,811					124,676	111,184	13,492	213,271	231,113
TOTAL EXPENSE	1,026,892	1,095,688	841,526	197,891	366,223			1,224,783	1,461,911	-237,128	3,102,269	2,796,231
NET REVENUE	53,539	-65,299	99,535	75,689	171,977	2,625	3,510	131,853	110,188	21,665	536,919	227,762

THE COMPUTER MUSEUM
STATEMENT OF REVENUE & EXPENSE
OPERATING FUND

	12/31/92 ACTUAL	FOR THE SIX MONTHS ENDED --------- 12/31/93 ---------				FY94 BUDGET	FY94 FORECAST
		ACTUAL	BUDGET	VARIANCE	PERCENT		
REVENUES:							
Clubhouse	50,400	$138,758	61,150	77,608	127%	287,900	306,800
Exhibit Related	15,519		45,200	-45,200	-100%	100,000	91,800
Govt & Foundation	46,479	$10,286		10,286	100%		34,466
Corporate Membership	73,750	$63,575	75,850	-12,275	-16%	205,000	192,800
Computer Bowl	150,000	$216,500	176,500	40,000	23%	388,000	388,000
Membership Fund	77,852	$104,684	100,540	4,144	4%	178,000	178,000
Admissions	264,375	$285,195	285,713	-518	0%	536,841	536,300
Store	125,853	$153,567	169,536	-15,969	-9%	332,395	281,885
Functions	90,221	$96,460	79,200	17,260	22%	140,352	156,300
Exhibit Sales	37,640	$9,597	30,000	-20,403	-68%	90,000	45,000
Interest Income	1,514	$1,734	3,400	-1,666	-49%	7,000	5,333
Other	7,458	75	3,300	-3,225	-98%	10,500	5,295
Total Revenues	941,061	1,080,431	1,030,389	50,042	5%	2,275,988	2,221,979
EXPENSES:							
Exhibits Development	6,178	32,905	51,515	-18,610	-57%	102,730	79,900
Exhibits Maintenance	25,527	25,262	20,968	4,294	17%	43,250	53,490
Exhibit Sales	42,802	9,704	17,610	-7,906	-81%	52,610	36,525
Collections	31,760	32,025	31,190	835	3%	62,400	63,235
Education & Admissions	139,011	127,387	146,365	-18,978	-15%	292,570	273,592
Clubhouse	7,964	106,737	113,980	-7,243	-7%	236,000	236,000
Marketing	86,113	140,227	132,780	7,447	5%	229,190	236,637
Public Relations	37,065	44,842	46,720	-1,878	-4%	93,334	91,455
Store	108,663	130,720	143,144	-12,424	-10%	268,932	219,559
Functions	38,439	38,980	35,530	3,450	9%	69,402	72,853
Computer Bowl	14,517	19,087	19,270	-183	-1%	135,324	135,141
Fundraising	25,579	26,176	32,610	-6,434	-25%	64,854	58,420
Membership Fund	17,399	23,209	41,820	-18,611	-80%	83,611	65,000
Musuem Wharf	150,698	144,955	151,002	-6,047	-4%	302,000	302,000
General Management	109,811	124,676	111,184	13,492	11%	213,271	231,113
Total Expenses	841,526	1,026,892	1,095,688	-68,796	-7%	2,249,478	2,154,920
NET REVENUES(EXPENSES)	$99,535	$53,539	-65,299	118,838	-2	26,510	67,059

THE COMPUTER MUSEUM

EXECUTIVE COMMITTEE MINUTES

December 17, 1993

Present were Dick Case, Gardner Hendrie, Jim McKenney, Tony Pell, Nick Pettinella, Ed Schwartz, Charles Zraket, Tom Franklin, Clerk, and Oliver Strimpel, Executive Director. The meeting was called to order at 8:10 a.m.

I. Oliver Strimpel presented an operations update. Documentation of DEC's gift of the building has been completed and Betsy Riggs is working with DEC to plan an appropriate recognition event, probably a dinner in May. The Networked Society exhibit funding has continued with a $10,000 gift from Cisco Systems, with $5,000 from John Morgridge personally, for a total committed to date of $415,000 with approximately $500,000 of outstanding proposals, which we hope will yield another $200,000 by year-end. Intel is close to making a $250,000 grant for updating the Walk-Through Computer exhibit, which would bring that funding to a total of $300,000. The Rich Tennant cartoon show is mounted in the Skyline Room and the Harold Cohen painting robot is under development, if successfully for opening next summer.

The Travelling Electronic Classroom proposal for NSF funding was reviewed and discussed. Dr. Strimpel was asked to obtain the recommendation of the Education Committee, particularly with reference to the trend toward greater networking and less reliance upon locally sited equipment. An attendance report indicating increased attendance and attendance revenue compared to the year-earlier November was favorably received. Searches for an Education Director and Marketing Director have been advertised and some candidates already have been interviewed.

The proposed The Computer Museum Guide to the Best of Kids Software book project was discussed. The Committee was concerned that a process be established to assure that the work would reflect well upon the Museum, and that a projection of costs and estimated return be prepared. November 30 financials were reviewed. The Committee requested an additional form of presentation showing budget, actual and forecast numbers for the operating fund alone, and showing corporate and individual gifts to date. Mr. Pell reported on annual giving which currently stands at $64,000.

Mr. Schwartz presented a brief history of the Museum Wharf building, which is summarized in an addendum to these minutes.

II. Dr. Strimpel for Ms. Bodman presented a report of the Nominating Committee. The nomination of Sam Fuller for election to the Board of Trustees representing Digital Equipment Corporation was warmly and unanimously approved. Nominations for the Board of Overseers to be elected at the February meeting of

the Board will be made by the Nominating Committee at their January meeting, before which suggestions will be solicited from this committee by mail.

III. Mr. Franklin presented a brief report on a dispute with the Liberty Science Center in New Jersey concerning ownership of the trademark "Tools & Toys". He requested and was granted authority to settle the matter without incurring significant additional legal cost, with retention of the Museum's right to use the mark on its existing products and preferably with ownership of the mark and a limited license of use of the mark to the Liberty Science Center or their agreement to use a variant form of the mark such as "The Tools & Toys Box".

IV. The Strategic Plan was discussed in terms of contributing constituencies during the period from the present to next summer. Discussion emphasized the need for the process to build support for the planned products, and for the plan to assume a high probability of achieving planned results during the initial three years.

Mr. Zraket left the meeting at 9:45 and discussion continued only until 9:50 when the meeting was adjourned. The next meeting of the executive committee will be January 11, 1994.

Respectfully submitted,

J. Thomas Franklin, Clerk

THE COMPUTER MUSEUM

EXECUTIVE COMMITTEE MINUTES

January 11, 1994

Present were Gwen Bell, Lynda Bodman, Dick Case, Gardner Hendrie, Ed Schwartz, Charles Zraket, Tom Franklin, Clerk, and Oliver Strimpel, Executive Director. The meeting was called to order at 8:13 a.m. Messrs. Kaplan and Pettinella joined the meeting at 8:35 a.m.

I. Oliver Strimpel presented an operations update. A recognition dinner for DEC has been scheduled tentatively for 6 p.m. March 28th at the Museum. It will be attended by members of the DEC contributions committee, possibly Robert Palmer, and the Museum's Boards of Trustees and Overseers as well as large donors. Spouses will be invited.

Mr. Hendrie reported on the status of the Networked Society exhibit. Funding of $415,000 has been committed to date. The NSF proposal is outstanding. Mr. Case volunteered to look into reapplying to IBM, which initially declined to fund the program. Exhibit content has not been resolved but the committee has more ideas than can be included.

Renovation of The Walk-Through Computer exhibit has been funded by Intel in the amount of $250,000, half payable immediately and the balance later this year.

Dr. Strimpel distributed a report on attendance over the year showing modest improvement over the year earlier.

Dr. Strimpel also reported on the initial search efforts for Directors of Education and Marketing. Discussion concerned the latter position and its importance to Museum funding. Dr. Strimpel was authorized to employ a search firm to assist him and to consider a salary higher than the current range of $45 to $50 thousand if necessary to attract a specific and strong candidate. Incentive compensation for the position was discussed; several members considered it inappropriate for a non-profit organization.

Dr. Strimpel distributed an exhibit kits sales document that shortly will be mailed to other science centers.

Financial statements for the six months ending December 31 were distributed in the usual and in a new format, the latter condensing capital and exhibit development items and displaying previous year actual and current year forecast items, which latter format was approved for future use. Operating results were below budget in both revenue and expense but significantly above budget in net income.

II. Ms. Bell reported on the status of The Computer Museum book series. Several publishers have expressed interest, particularly Crown Publications. Working with our broker the rights will be auctioned unless a clearly favorable contract can be negotiated. Misses Bodman and Bell will coordinate a proposal to Houghton Mifflin.

III. Ms. Bodman for the Nominating Committee reported that they will meet in a few days and expect to submit additional candidates for Overseer.

IV. Dr. Strimpel reported that Ms. Riggs is preparing a plan to increase and improve solicitation of individual donors by Overseers and Trustees.

V. The agenda for the February 11 Trustees meeting was reviewed and discussed; education and development and strategic planning will be the most substantial issues. A dinner and informal discussion among members of both Boards will be held the previous evening at 6 p.m.

VI. Strategic planning issues concerning the building were discussed. It was agreed to defer consideration of radical changes for 6 to 12 months but to continue to monitor the Childrens' Museum's plans.

The meeting was adjourned at 10:10 a.m.

Respectfully submitted,
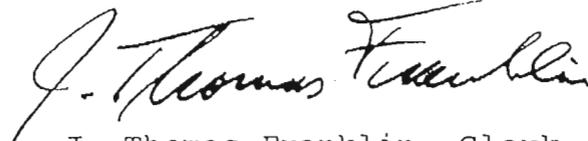
J. Thomas Franklin, Clerk

The
Computer
Museum

300 Congress Street
Boston, MA 02210

(617) 426-2800

## Memorandum

DATE: January 28, 1994

TO: Board of Trustees
            Board of Overseers

FROM: Oliver Strimpel

SUBJECT: Museum's Strategic Plan

The attached packet contains the following items:

1.   Original Schedule for Strategic Planning
2.   Draft Framework for the Strategic Plan
3.   Draft Introduction
4.   Draft of Three-year Onsite Programs Section
5.   Outline of Three-year National & International Programs Section
6.   Draft of Ten-year Building Scenarios

As the schedule shows, the emphasis so far has been on the programmatic aspects of the Museum plan. Unfortunately, scheduling difficulties have not permitted the Exhibits, Education, and Collections Committees to provide input yet, but meetings of these Committees will be held within the next few weeks.

I look forward to our discussions on February 10 and 11.

Strategic Planning Schedule

	Dec 1	Jan 1	Feb 1	Mar 1	Apr 1
Staff		discuss Ex, Ed, Col, B, C →	first draft	revise B,C, Ex, Ed, Col draft Mkt, D, F&A plans	
Committees		Ex, Ed, Col Cttee 5-year planning		Finance, Development Marketing Committees 5-year planning	
Executive Committee		Exec Cttee B, C discussion			
Board of Trustees			Review draft at Feb 11 mtg		
Board of Overseers		E & W Coast long range discussions	Feb 10 joint mtg with Trustees		
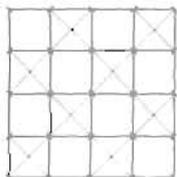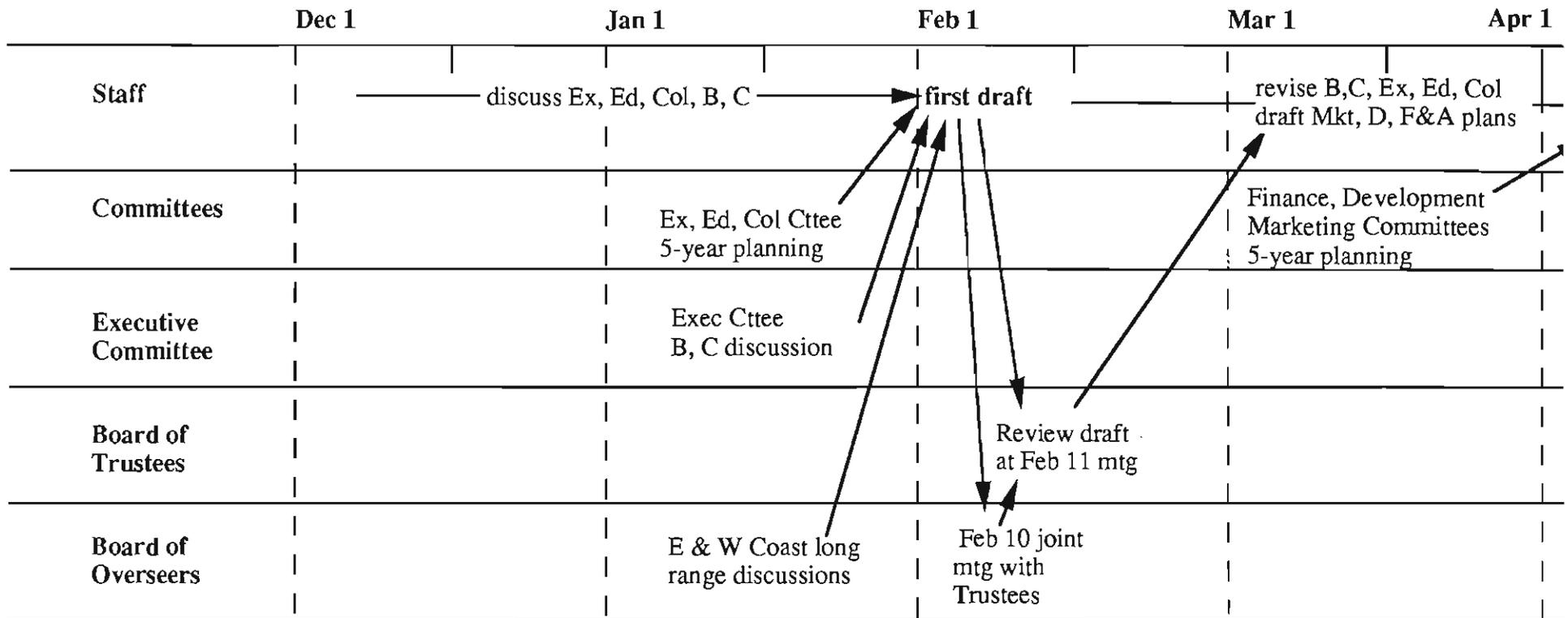
Overall Plan has key sections coded as follows:

B: Building: plan for new physical site for the Museum in the 10-15 year time frame.

C: Cyberspace: Museum's "electronic" presence and dissemination via global networks.

Ex: Exhibits: plan for new exhibits onsite and offsite, temporary & permanent.

Ed: Education: education programs onsite, nationally, and internationally and development of Museum materials, eg. books, CD-ROMs, videos, software, kits,& other educational products for mass dissemination.

Col: Collections : historical collections: acquisition policy & strategy (eg. Hall of Fame), documentation, and management.

Mkt: Marketing: Museum positioning, promotion, and development of earned revenue streams including functions & merchandising.

D: Development: plan for building support from individuals, corporations & foundations to support Museum's development.

F&A: Finance & Administration: plan for financing and administering Musuem throughout growth.

Strategic Planning Schedule

	May 1	Jun 1	Jul 1

2nd draft integrated with Mkt, D, F&A —revise integrated plan→ final draft

strategic plan

review draft integrated plan

review final draft

discuss & adopt plan at annual mtg

review final draft

discuss plan at annual mtg
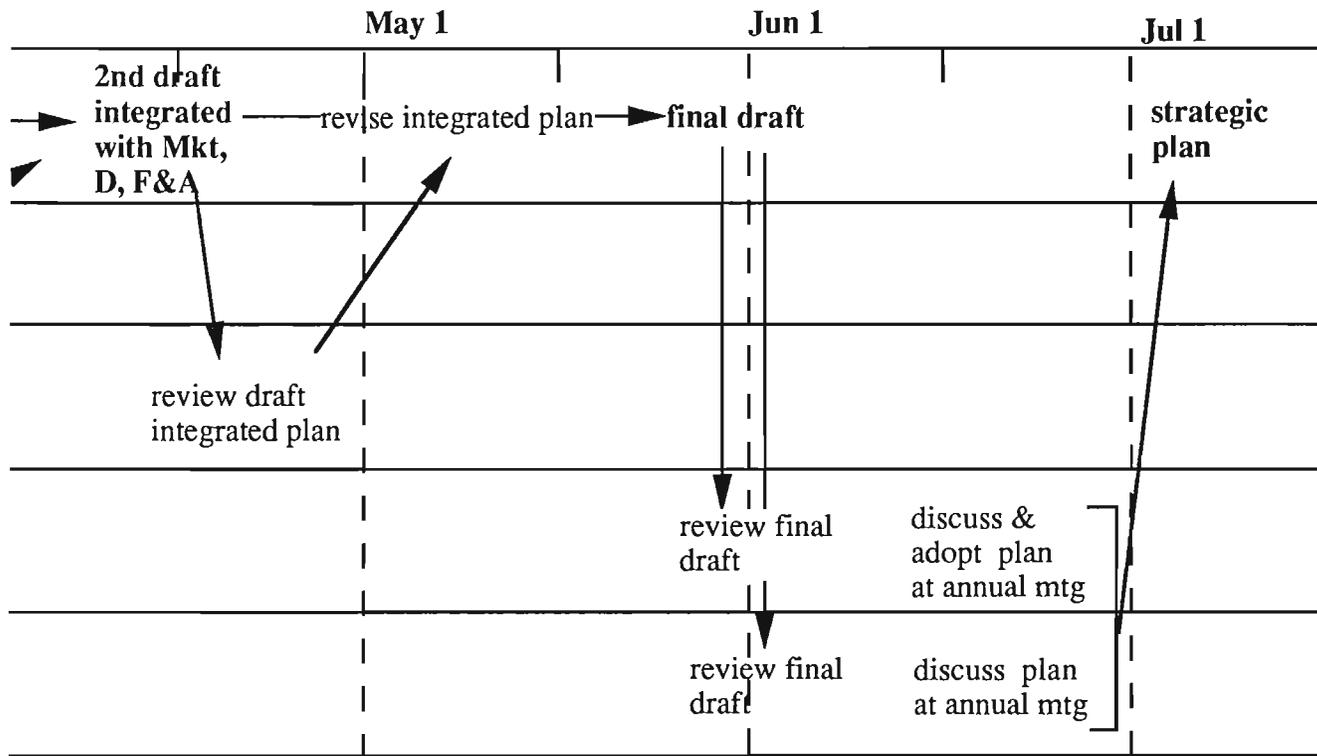
FRAMEWORK FOR THE COMPUTER MUSEUM'S STRATEGIC PLAN

Introduction (enclosed)

Museum Mission
Strategic Analysis
Strategy
Ten-year Objectives

THREE-YEAR PLAN FY95-97

I. Onsite Programs (enclosed)
A. Exhibits: permanent, temporary; includes new exhibit development and renovation of existing exhibits
B. Overall visitor experience: apron, lobby, signeage, parking, visitor services, exhibit maintenance
C. Education programs: The Computer Clubhouse, teacher development, visitor services.
D. Special events
E. Research

II. National & International Programs (enclosed)
A. Exhibit sales, traveling exhibits, offsite exhibits
B. Clubhouse dissemination — traveling exhibit, satellite Clubhouses, software starter packages
C. Computer Museum Materials: Book Series, Videos, CD-ROMs, teacher materials
D. National Events: Hall of Fame, Computer Bowl
E. "The On-line Museum"

III. Collections Plan (enclosed)
Plan for new acquisitions, collections management, and documentation.

IV. Marketing Plan (to come)
Marketing plan supports the institutional positioning, financial, and audience impact goals. Includes a discussion of Museum's earned revenue plans from existing streams and new streams.

V. Institutional Advancement (to come)
Three-year plan for building the Museum's base of support from individuals, corporations, and foundations. Addresses future of Capital Campaign.

VI. Finance (to come)
Three year financial plan that reflects all planned activities; includes projections for all of Museum's operating and capital revenues and expenses.

VII. Administration (to come)

Three-year plan that addresses administrative needs to support the plan, including office and personnel requirements.

TEN YEAR PLAN

The ten-year plan describes how the Museum will achieve its ten-year objectives.

Building Scenarios (enclosed)

Onsite Programs (to come)

National & International Programs (to come)

Marketing (to come)

Institutional Advancement (to come)

Finance (to come)

Administration (to come)

Appendix 1 (enclosed)

THE COMPUTER MUSEUM: DRAFT STRATEGIC PLAN

INTRODUCTION

1. Museum Mission
The Computer Museum's mission is to:

I.   educate and inspire people of all ages and backgrounds from around the world through dynamic exhibitions and programs on the technology, application, and impact of computers

II. preserve and celebrate the history and promote the understanding of computers worldwide

III. be an international resource for research into the history of computing.

2. Strategic Analysis

Milieu

- The usage of computers is skyrocketing as the cost/performance ratio continues to drop.
- The media are focusing attention on the fusion of the telecommunication, entertainment, and information industries.
- Computer applications and usage continue to change rapidly.
- Society and industry often focus on the new, next generation of products and services. The essence of the changes and the long view can get lost in the din of fast-paced incremental change.
- As information technology becomes recognized as the key technology of our era, interest in the origins of the information revolution will increase.
- Adoption of new technologies is very uneven across society, with many being excluded and feeling "left behind."
- Computers enable more people to work at home, increasing work flexibility and communications, but also increasing people's physical isolation.
- Life-long informal education is becoming more important as a way of staying abreast of changes.

As computers become more mainstream, new opportunities to learn about and interact with them exist. Products and services that overlap and partially compete with the Museum include:

- easy-to use, multimedia computer-based applications offered at libraries, schools, and other museums, and over networks
- school usage of computers as tools to support education in all fields.
- sophisticated home-based educational, game, and productivity software, increasingly exploiting multimedia and network connections
- theme parks that make increasing use of computers with special emphasis on immersive, virtual-reality-style experiences

The Need for the Museum's Mission: I : To Educate and Inspire

People increasingly are coming into contact with computing, often thrust into the role of users of specific applications. Everyone is an unwitting user of networks of computers in performing routine activities, such as traveling, shopping, or communicating.

But computing is changing rapidly. People experienced in one computer application have no knowledge or confidence in another. And many feel excluded as they learn of technological marvels they cannot fully grasp or afford. The problem is particularly acute in underserved communities.

Science and technology museums have a well-established image as accessible places where visitors can explore in a relaxed fashion. They are also trusted as objective, non-commercial presenters of material. Most important, they provide a mixture between education and entertainment, a place for fun *and* learning. They are places that welcome groups and promote intergenerational group interaction.

These characteristics give the Museum an educational opportunity that formal educational institutions cannot pursue and that entertainment-oriented venues are not interested in. The Museum's image enables it to reach populations that have no other recourse as a first step.

The Need for the Museum's Mission: II and III: To Preserve, Celebrate, and Conduct Research

Computing is the defining technology of our age, and its history is a key part of the world's heritage. The Museum is one of a very small handful of institutions that is seriously preserving the evolution of computing. These institutions are not competitive but collaborate, to ensure that their collective resources preserve as much of the significant record of computing as possible.

The loss of the computer pioneers themselves will reinforce the importance of the collections. Researchers increasingly will seek access to the original materials held by the Museum.

As key computing anniversaries and other milestones occur, the public seeks information about the event, and the media look for a focus to "locate" their coverage. The computer industry also needs a non-competitive forum to come together and celebrate the achievements of the field and gain perspective.

3. Strategy

The Museum's strategy is to develop authoritative and spectacular exhibits and programs that will achieve high international visibility and public awareness.

High visibility of a limited number of flagship elements will assist the development and dissemination of all Museum programs. The flagship could be the Museum's main site, or a highly successful program or publication. Different flagships can serve to reach different segments of the public and the computer industry. The Museum will build upon its spirited approach to informal education, as exemplified in its exhibits and education programs.

The Museum will seek to leverage every activity to extract maximum value and achieve the greatest possible impact. Exhibits will be leveraged with books, CD-ROMs, exhibit licensing and traveling components; education programs will be designed as national models; events such as The Computer Bowl or the Hall of Fame awards program will be leveraged with television programs.

4. Ten-Year Program Objectives

1. Become a world-class attraction offering exciting exhibits and special events that exploit and explain the latest technologies.

2. Become a significant provider of books, television programming, and other informal educational materials about computer history, technology, application and impact.

3. Develop innovative uses of computers in informal education. Become a provider, catalyst, supporter, mentor for museums, community organizations, schools and other groups seeking to establish their own informal exhibits and programs about computers. Actively support the national education reform movement.

4. Define and implement the "on-line" Computer Museum.

5. Provide an internationally recognized forum for the celebration and recognition of key developments in the evolution of computing

6. Maintain and enhance the historical collections and their documentation as one of a small number of internationally recognized definitive collections of the history of electronic computing. Establish the Museum and its collections as a premier resource for research into the history of computing.

The following three-year plan represents the first steps toward the achievement of the ten-year objectives.

I. ONSITE PROGRAMS

A. EXHIBIT PROGRAM

The following considerations on exhibit content, exhibit approaches, and available gallery space provide the basis for the onsite FY95-97 exhibit plan. A specific list of proposed exhibits is presented in Appendix I.

Content

The Museum's 1989-94 Exhibit Plan addressed the three questions:

How do Computers Work?
How did Computers Evolve?
What do Computers Do?

With updating, the *Walk-Through Computer* and *People and Computers* can continue to address the first two questions satisfactorily. *Tools & Toys, Robots & Other Smart Machines* and *The Networked Society* (opening November 94) address the third question.

It is the applications of computing that are affecting all members of society. New applications are continually in the news. Last year, virtual reality was the hot topic. This year, it is the information superhighway. The next exhibit plan will, therefore, shift increasing focus onto the third question and broaden its scope to deal more fully with the social impact of computing.

A significant application area of tremendous public interest is the application of computing to the arts. The arts have the ability to reach out to diverse audiences, and to help the Museum shed its image as a place for technology buffs. Exhibits that relate to the computers in the arts, including the performing arts, will, therefore, be a component of the next plan.

The Museum should plan for some flexibility in its exhibit programs so as to be able to address topics while public interest is high. "Rapid response" exhibits will require a new approach to exhibit development and funding.

Visitor research points out two areas the public would like addressed:
1. The future: visitors seek access to cutting-edge technology and applications
2. Resource guides: visitors want specific information about computer use and purchasing.

The first point is addressed in the plan (Appendix I) in several exhibits. The second will be addressed by incorporating resource materials in exhibits wherever possible.

Exhibit Approach

To achieve greater impact and visibility, the Museum needs to mount some spectacular exhibits. Examples include larger-than-life exhibits (*Walk-Through Computer*), environmental exhibits, or group virtual-reality experiences. The plan calls for a major renovation of *The Walk-Through Computer*, which, as well as updating it, will increase its visual impact from the exterior and its immersive, environmental quality in the interior.

Increased provision for contact between visitors and Museum staff can provide a means of increasing visitor engagement, especially for groups. Scope for presentations and performances in exhibits should be planned into exhibit spaces.

Space

The Museum Wharf site is almost completely developed. *The Networked Society* will replace the closed graphics gallery, leaving one undeveloped large (4,000sf) bay. (Collections currently stored there will move offsite.) This plan proposes that 2,500sf of this bay be developed as an exhibit lab and as a topical issues gallery. Other exhibit development will replace existing exhibits.

With space in short supply, future major exhibits will occupy 2-3,000sf (smaller than previous major exhibits). This should not affect the exhibits' overall impact, but will affect visitor capacity.

Conclusions: Framework for Exhibit Plan

1. Develop one medium/large (2-3,000sf) exhibit per year
2. Renovate or replace all existing exhibits by the end of FY97
3. Exhibits should contain elements that are spectacular and cutting-edge
4. Exhibits provide for presentations and performances
5. A "rapid response" gallery will address topical issues

Appendix I contains a detailed exhibit plan.

B. OVERALL ONSITE VISITOR EXPERIENCE

The Museum's three-year plan seeks to raise the quality of a visitor's overall experience of the Museum visit. It is improvement of the overall experience that will move the institution along the path set out in the first ten-year objective — namely, to become a world-class attraction.

Visitors' experience of the Museum is significantly affected by the apron, lobby, external signeage, and parking facilities. Additional factors of great importance include visitors' contact with Museum staff in the lobby, galleries and store, and the quality of exhibit maintenance.

Apron
A new apron park is planned as part of the Waterfront Project being developed jointly with The Children's Museum. If these plans go ahead, the apron will become much more

attractive and will provide a pleasant approach to the Museum. The overall cost of the new apron park would be $1 million.

Lobby
Plans for the "Wave," which will serve as a new entry lobby for The Computer Museum and The Children's Museum, are well developed. In order to exploit the Wave, the Museum will need to adapt its own existing lobby and store at an approximate cost of $200,000. An "attract visitors" lobby exhibit will be needed to draw visitors into the Museum from the Wave, at a cost of $30,000.

Signeage
External signs on the site and lobby will be an integral part of the Waterfront Project. A new integrated internal sign system is needed to enable visitors to find their way round the galleries. This will be implemented in FY95 at a cost of $10,000.

Parking
The Central Artery/Tunnel project and the new Federal Courthouse have reduced nearby parking space. Although some new parking garages have been constructed (e.g. Farnsworth Street), visitors are finding it harder to park. Efforts will be made to make parking arrangements with existing and new sites.

Visitor Services
Visitor research indicates that contact with members of Museum staff (either paid or volunteer) greatly affect the perception of the Museum. A gradual overhaul of Museum visitor services programs is planned to give floor staff specific roles as visitor greeters, information booth staff, and "performers" of demonstrations and theater-style presentations. These roles will make visitor service staff more accessible, visible, and better equipped to respond to visitor needs and enhance the quality of the visit. Increased use of volunteers on the floor is planned, rising to 50% of floor staff by FY96.

Exhibit Maintenance
The Museum's hands-on interactive exhibits are the primary experience at the Museum. The quality of the visitor experience degrades rapidly if exhibits are out of order. Over the past few years, the availability has ranged from 80% to 100% with an average around 90%. The goal is to maintain 97% or better of the exhibits in working order at any time. This will be achieved through a detailed operational plan that involves increased staff resources, more training for all floor staff, and daily status reviews. Exhibit planning will continue to allow flexibility so that malfunctioning exhibits can be seamlessly removed from the floor.

C. ONSITE EDUCATION PROGRAMS

Onsite education programs include The Computer Clubhouse, the establishment of a pilot teacher development program, and the visitor services program in the Museum exhibit galleries.

The Computer Clubhouse
The next three years will see refinement of Clubhouse programs as experience with participants is evaluated. New projects will be adopted as new mentors are attracted to the Clubhouse. New technologies will be integrated as they become available, including the use of high-speed networks.

Selection of communities served will be made on the basis of their ability or interest in setting up their own projects derived from the Clubhouse model.

The long-term financing strategy for the Clubhouse will involve a mix of earned revenue and multi-year grant support and/or endowment.

Teacher Development Program
The establishment of a teacher development program furthers the Museum's objective to support the national education reform movement.

Starting in FY95, the Museum will test a pilot teacher education program within the Computer Clubhouse. Teachers will develop their own projects within the Clubhouse, while learning how to initiate similar activities in their own classroom. Collaborations on the development and implementation of this program will be pursued, including deepening ties with Lesley College, Technical Education Research Centers (TERC), and other organizations serving pre-service and in-service teachers.

Approximately $30,000 is needed to establish the program. Experience with the pilot program will determine the nature and scope of a permanent teacher development program.

Visitor Services Program
Visitor services currently developed at the Museum include gallery tours and hands-on collaborative activities. As indicated in the previous section, staff presentations can enhance the visit. In *The Networked Society* several group activities will be led by visitor assistants. *The Walk-Through Computer 2.0* will provide a fine setting for Museum theater. Special activities will also be planned for temporary exhibits.

D. ONSITE SPECIAL EVENTS

The Museum has hosted special events such as the Loebner Prize Competition (Turing Test), the Harvard Cup (Computer Chess Championship), and MIT student robot contests. Though labor-intensive, such events have proven very successful in raising visibility for the Museum. Many museums have an annual event, such as Inventor's Day at the Boston Museum of Science, that garner great media interest and large crowds.

The Museum should continue to host events that are of public interest and that illustrate exciting and intriguing uses of computers. The contests should be conducted in partnership with other organizations to achieve greater leverage.

Funding requirements range from a minimum of $5,000 for a small event organized mainly by an outside body (such as the Harvard Cup), to $50,000 for a complex event with major Museum involvement (such as the Loebner Prize).

E. RESEARCH

The Museum will establish an exhibit lab that will be used for three kinds of research:
1. Evaluation of Computer Museum exhibits in progress

2. Development and testing of Museum-developed applications of technology to informal education. The NSF-funded virtual-reality research currently underway is an example.
3. Public testing and evaluation of educational software and other educational research projects being conducted at academic research institutions.

II. NATIONAL AND INTERNATIONAL PROGRAMS

This section presents the plan to serve audiences primarily beyond the Museum's walls.

Outline Only

Exhibit Licensing

Sales plan for museums and for-profit venues
Integration of exhibit sales with new exhibit development

Clubhouse Dissemination

Clubhouse Tour Software: A virtual interactive exploration view of the Clubhouse. Includes information on projects in the Clubhouse and explains how other educators can start similar projects in their own after-school, communirt, or school site.

Teacher guides: Clubhouse Project Guides will provide information and resources needed to develop specific Clubhouse projects.

Establish Offsite Clubhouse program: assist in the creation of offsite Clubhouses, starting in the greater-Boston area.

Develop and travel national Electronic Classroom Exhibit: this exhibit (see below) will contain elements that are closely based on material in the Clubhouse.

Clubhouse video to inspire and assist others to develop similar centers
Clubhouse book

Traveling Exhibit Plan

Electronic Classroom (developed FY95-97). The Computer Museum will collaborate with the New York Hall of Science and the Oregon Museum of Science and Industry to develop the Electronic Classroom, a traveling exhibit designed to educate parents, teachers, administrators, students and other members of the general public about how computers can support science, math, and technology educational reform. The Computer Museum will take the lead on the content and will develop all the interactive elements of the exhibition. The exhibit has a particular focus on reaching parents, teachers, and young people from underserved communities.

Computer Museum Products and Educational Materials

Computer Museum Book Series
First three titles: *Computer Museum Guide to the Best Kids' Software*
Computer Bowl
Walk-Through Computer 2.0
CD-ROM, Videos and Software based on exhibits and collections
Educational materials for teachers including updated teacher packet to cover new Museum exhibits

National Events

These support the Museum's objective to provide an internationally recognized forum for the celebration and recognition of key developments in the evolution of computing.

The Computer Bowl: Develop and hold a second series of annual Computer Bowls to feature the next generation of industry leaders and modify the format to allow for the production of a higher-impact television show.

International Computing Hall of Fame Awards Program: inaugurate the program in the 50th anniversary year of computing. A television program will be an integral part of the Hall of Fame Awards program.

"The On-Line Museum"
With over 15 million people already connected to the Internet and a further three million connected to commercial on-line services, a "network presence" would significantly increase the Museum's international visibility.

As part of *The Networked Society* exhibit development, the Museum will establish a bulletin board system containing general museum information, selected exhibit text, graphics, video clips, and interactive software samples.
The Computer Clubhouse will disseminate information and present works created in the Clubhouse via MOSAIC.
The Museum store will develop an on-line catalog.
Museum collections catalogs will be placed on-line.

III. COLLECTIONS PLAN
Plan for new acquisitions, collections management, and documentation.

Continue the focus on acquisition of integrated circuits and film/video
Complete the illustrated integrated catalog of collections
Improve the availability of collections through establishment of on-line databases.

BUILDING SCENARIOS

Plan A: No Expansion

After *The Networked Society* opens in November 1994, all exhibit and educational programming space will be fully developed. New exhibits will need to replace existing exhibits.

Up to 4,000 square feet (sf) of additional public space could be created if Museum collections storage areas and some offices were moved offsite. This would allow space for one major new gallery, or allow for a small gallery and a space for education programming.

In this scenario, the Museum must focus on expanding its impact and reach through outreach and offsite activities including: the development and distribution of educational materials, traveling exhibits, and the exploitation of global networks. Further expansion includes enhanced exhibit sales and merchandising. The proportion of resources applied offsite increases each year.

The impact and scope of the Museum's outreach would be enhanced by entering into collaborative relationships with other organizations, such as museums, schools, and community organizations.

Advantages:
- Museum already owns the building
- Concentrate on programs with national and international reach
- Central downtown site with access by public transportation
- Area improving with Courthouse and new public transportation
- Location awareness built up over ten years

Disadvantages:
- Exhibit scope limited by ceiling heights, space
- Attendance limit is approximately 175,000 visitors/year; school group visitation limited to about to about 35,000/year
- Artery work and limited parking make car access difficult
- Museum Wharf is not a landmark unless Wave is built
- Limited synergy with Children's Museum and confusion as to Museum's identity & location
- Space does not attract high-prestige or large-scale functions and events

Plan B: Museum Wharf Expansion: Seventh Floor

A seventh floor could be built on the roof offering up to 20,000 sf, increasing the Museum's total square footage by one third. (Total space increases from 44,000sf to 64,000sf; public program space for exhibits and education increases from 24,000sf to 38,000sf.)

A second elevator would be needed to increase the Museum's attendance capacity. With two elevators and 33% more floor space, attendance capacity could increase 33% to about 250,000 people per annum.

Advantages
- Provides some scope for custom-designed spaces, both for public and for other museum constituencies
- Additional space offers Museum more scope without the need to move
- Central downtown site with access by public transportation
- Area improving with Courthouse and new public transportation
- Continuity: build on site awareness built up over ten years

Disadvantages
- Entire building may need costly earthquake-proofing
- Access: artery work and limited parking make car access difficult
- Site: limited synergy with Children's Museum and confusion as to Museum's identity & location; need to fit with Museum Wharf building and Wave is limiting
- Further onsite expansion is very limited

Budget for Seventh-Floor Expansion

Capital Costs for Seventh Floor		
Total new square feet for 6 bays	20,000	
	per sf	**Cost**
Planning & design	$15	$300,000
Seventh floor construction	$100	$2,000,000
Second elevator for public & staff		$300,000
Building-wide earthquake-proofing (100,000sf)	$10	$1,000,000
Exhibit/offices fabrication & installation	$130	$2,600,000
TOTAL Capital Cost	**$255**	**$6,200,000**
Operating Revenue Changes	**per head**	
Annual visitation capacity increase		70,000
Admissions revenue potential increase	$5	$350,000
Merchandizing net revenue (15% of gross)	$0.30	$21,000
Functions net increase		$40,000
TOTAL Operating Revenues Increase		**$411,000**
Operating Direct Cost Increase	**per sf**	
Exhibit/program maintenance (14,000sf)	$4	$56,000
Educational staffing (14,000sf)	$5	$70,000
Marketing/PR support (14,000sf)	$3	$42,000
Building operating costs (additional 20,000sf)	$8	$160,000
TOTAL Annual Operating Costs Increase	**$20**	**$328,000**
Net Operating Change		**$83,000**

Plan C: Museum Wharf Expansion: Building on the Apron

Currently planned for the Museum's apron is a four-story-high "Wave" entrance foyer. The Wave serves as a landmark and expanded foyer but does not provide additional program space.

In the event that the Wave is not built, another possible expansion could take place on the apron that could accommodate a state-of-the-art, modern function room/auditorium, offices, board room, and other facilities. This would vacate approximately 8,000 square feet in the main building for additional gallery space. A plan for a multi-purpose auditorium and office building was created in 1985-6 jointly with The Children's Museum.

An expansion on the apron would offer an additional 10,000sf, bringing the Museum's total space to 54,000sf, an increase of about 20%. Public program space (exhibits & education) would increase by 8,000sf but with no additional elevator, attendance capacity would increase only to about 200,000 per annum. A second elevator would increase capacity to approximately 230,000 per annum.

Advantages
- New space could offer facilities to allow greater range of public programs, and private functions
- Additional public space allows Museum to grow without moving
- Apron building could be designed to be a landmark
- Central downtown site with access by public transportation
- Federal courthouse expected to improve the area
- Continuity: build on site awareness built up over ten years

Disadvantages
- No apron construction is possible if Wave is built
- Site is shared with Children's Museum which may have other priorities
- Access: artery work and limited parking make car access difficult
- Further onsite expansion is limited

Budget

Capital Costs for Apron Expansion		
Total TCM square feet	10,000	
	per sf	Cost
Planning & design	$15	$150,000
Building construction	$150	$1,500,000
Second elevator for public & staff		$300,000
Equip new facilities	$50	$500,000
Develop new exhibits in vacated space (8,000sf)	$130	$1,300,000
TOTAL Capital Cost	**$215**	**$3,750,000**
Operating Revenue Changes	**per head**	
Annual visitation capacity increase		50,000
Admissions revenue potential increase	$5	$250,000
Merchandizing net revenue (15% of gross)	$0.30	$15,000
Functions net increase		$60,000
TOTAL Operating Revenues Increase		**$325,000**
Operating Direct Cost Increase	**per sf**	
Exhibit/program maintenance (8,000sf)	$4	$32,000
Educational staffing (8,000sf)	$5	$40,000
Marketing/PR support (8,000sf)	$3	$24,000
Building operating costs (additional 10,000sf)	$8	$80,000
TOTAL Annual Operating Costs Increase	**$20**	**$176,000**
Net Operating Change		**$149,000**

Plan D: Create Offsite Branches

While retaining its primary site at Museum Wharf, the Museum could expand its programs and impact by developing and installing exhibits in other locations. In contrast to the piecemeal exhibit sales approach, such locations would have at least 2,000sf devoted to a Computer Museum-developed exhibition. Hosting organizations could be other museums or conference centers.

The Computer Museum would be responsible for exhibit planning, fabrication and installation, and for ongoing updating and change. The hosting entity would be responsible for the operation and maintenance of the exhibit, and would be the beneficiary of revenues, both from admissions and merchandizing, associated with the branch.

Advantages
- Museum can serve additional new audiences, including those geographically removed from the Museum's primary location
- Museum's presence in other locations enhances Museum's visiblity in new communities, making it easier to grow base of support

Challenges
- Identification of a partner with an interest in serving as a Museum branch
- Adaptation of exhibitions for offsite use
- Quality control in a remote site

Budget

Capital Costs	per sf	Scenario 1	Scenario 2
exhibit size in square feet		$2,000	$4,000
Exhibit planning	$20	$40,000	$80,000
Exhibit fabrication & installation	$150	$300,000	$600,000
TOTAL Capital Cost	$150	$340,000	$680,000
TCM Operating Revenue & Expense			
Revenue			
License fees	$5	$10,000	$20,000
Annual fee for support	$7	$14,000	$28,000
TOTAL Annual Operating Revenues		$24,000	$48,000
Expense			
Exhibit Support (excludes routine maintenance)	$5	$10,000	$20,000
Administration	$2	$4,000	$8,000
TOTAL Annual Operating Costs	$2	$14,000	$28,000
Net Operating Surplus (Deficit)		$10,000	$20,000

Summary Table

Scenario	Status Quo	Seventh Floor	Apron Expansion	Branch
Additional total space (square feet)	0	20,000	10,000	4,000
New public program space (square feet)	0	14,000	8,000	4,000
Capacity w. single elevator (ppl/yr)	175,000	200,000	200,000	40,000
Capacity w. two elevators (ppl/yr)	190,000	250,000	230,000	n/a
Capital Cost	0	$6,200,000	$3,750,000	$680,000
Change in Net Operating Surplus	0	$83,000	$149,000	$20,000

Appendix I: Exhibit Development Plan

Permanent Exhibits

Opening Date	Exhibit	Content	Size	Fundability Ranking 1(least) - 5(most)	Target Audiences	Approach	Location
Nov 94	The Networked Society	Large scale computing, networks, impact of computer age	Large	Rank: 4 Corporate NSF NEH	Adult Youth Students Interest in Networks	Interactive (15) 2-Dimensional Video VA interaction Demonstrations	Replace Graphics Gallery
June 95	The Walk-Through Computer 2.0	How computers work	Large	Rank: 5 Corporate	General	3-Dimensional Environment Learning Stations(8) Video	Revision of Original Walk-Through
June 96	Computers in Entertainment	Applications in movies and popular music	Medium	Rank: 3 Corporate	Youth Adults	Interactive (15) Video Demonstrations Process oriented	Replace Tools & Toys

Temporary Exhibits

FY95							
Sept 94	The Computer in the Studio	How artists are using computers in their work.	Small	Rank: 2 NEA Corporate	Art Interest Students	2-Dimensional Talks Symposium	Skyline Room
April 95	The Electronic Book	New media- CD-ROM & other large storage media, self publishing	Small	Rank: 3 Corporate	Adults Youth Arts	Interactive (5 stations) 2-Dimensional Objects	Skyline Room
FY96							
Nov 95	Computer Animation	Work of John Lasseter of Lucasfilm/Pixar to coincide with release of full-length feature movie	Small	Rank: 2 Corporate	Adults Children	2- Dimensional	Skyline Room
Feb 96	Computing at Fifty	Pinnacles of computing technology & applications on computing's 50th birthday	Small	Rank: 3 NSF Corporate	Future-oriented	2-Dimensional Interactive Video	Reconfigure 2nd bay of People and Computers
June 96	Topical Issue Space: The Computer in the Olympics	Computers in the Olympics -- in conjunction with Atlanta Olympics First topical issue gallery	Medium	Rank: 4 Corporate (Coke, other Olympic sponsors)	Sports Adult Youth Interest in Olympics	Interactive 2-Dimensional Video	Topical Issue Gallery: Recovered from old office bay

FY 97							
May 96	The Machine as Model: Artists' views of the computer	How artists portray the computer.	Small	Rank: 3 NEH Corporate State Arts	Arts	2 and 3-dimensional	Skyline Room
Oct 96	Topic Issues: Yet to be determined	Current trend	Small	requires endowment	to be determined	Interactive Process oriented	Topical Issue Gallery
Feb 97	Group virtual reality	Immersive virtual reality experience	Small	Rank: 2 Corporate	General	Simulated environment	Skyline Room
FY98							
Sep 97	The Electronic Classroom	Technology as tools for student expression, communication, collaboration etc.	Medium	Rank 4: NSF Corporate	Teachers Students Parents	Interactive (12) Video Demonstrations Process oriented	Temporarily replace Robots & Other Smart Machines

EXHIBIT

Kit
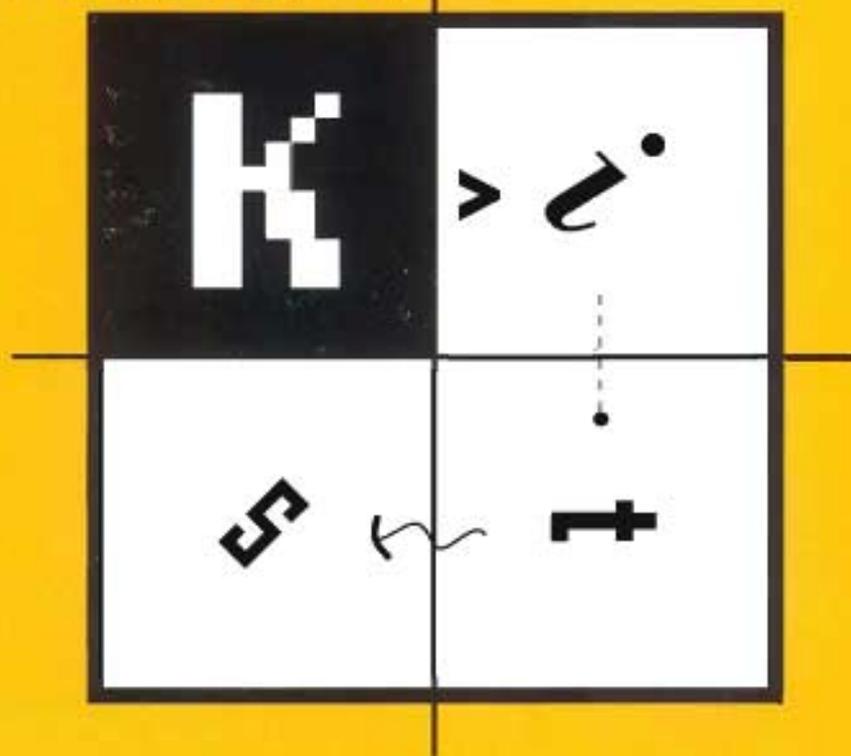
The Computer Museum

The Computer Museum's Exhibit Kits

The Computer Museum's Exhibit Kits are "plug and play" exhibits that include software, supporting documentation, and suggestions for exhibit layout and signage. Some Kits also include specialized hardware. The Exhibit Kits have been extensively evaluated and refined in The Computer Museum's exhibit halls to ensure that visitors understand the point of the exhibit and have fun in the process. Development of The Computer Museum's Exhibit Kits was supported in part by the National Science Foundation.

TOOLS & TOYS: THE AMAZING PERSONAL COMPUTER

Design Your Own Newsletter*
DESKTOP PUBLISHING

Learn the basics of desktop publishing while designing a newsletter. Then print out the design to take home.

DinoDraw!
COMPUTER DRAWING

Use basic computer drawing tools to manipulate a dinosaur image. Then print out the drawing to take home.

Explosive Experiments
CHEMISTRY/EARTH SCIENCE

Safely experiment with dangerous chemical reactions by viewing them with a videodisk. Watch an explosion in slow motion or even run it backwards!

Fly a DC-10
FLIGHT SIMULATION

Discover how computers can simulate flight. Soar the skies in a computer simulated DC-10.

Make Your Own Cartoon
COMPUTER-ASSISTED ANIMATION

Find out how computer-assisted animation works by creating a short cartoon using three animated characters.

Alphabet Noodle Soup*
WORD PUZZLE

Choose a word in English or Spanish and use its letters to see how many new words can be made.

Special Effects*
IMAGE PROCESSING

Experience being covered in liquid metal or dancing in a rainbow of colors. Try different image-processing effects on your own moving picture. Discover how meteorologists give weather reports by projecting computer images behind them.

Spend a Million Dollars*
COMPUTER SPREADSHEETS

Learn how spreadsheets work by "spending" a million dollars.

What's Your Type?
PUBLISHING TOOLS

Explore how computers create typefaces. Samples, including Braille and Egyptian hieroglyphics, can be printed to take home.

* AVAILABLE IN SPANISH
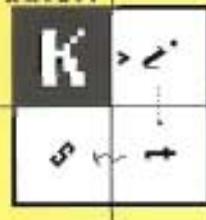
ROBOTS & OTHER SMART MACHINES

Color The States
SPEECH RECOGNITION

This program obeys your spoken commands to paint a map of the U.S. Follow its rules to ensure bordering states are not the same color.

Eliza:
The Computer Psychologist*
COMPUTER INTELLIGENCE

An introduction to computer-based response. Eliza's questions coax you to talk about yourself.

Haggle With a Computer
Fruit Vendor
EXPERT SYSTEMS

Bargain with a computer-simulated fruit vendor over the price of a box of strawberries.

How Computers Play Games
DECISION MAKING

Challenge a computer to a game of "5 in-a row." Observe as the computer contemplates its next move.

How Tall Are You?*
ULTRASONIC MEASUREMENT

Let a computer measure your height. The computer may respond with humor, or purposely make a mistake and correct itself. Users of all ages delight in fooling the computer.

The Talking Computer
COMPUTER SPEECH

This exhibit reads what you type, and allows you to change the computer's voice.

PEOPLE AND COMPUTERS: MILESTONES OF A REVOLUTION

How Fast Are Computers?*
COMPUTER SPEED

Compare your own computation speed to that of computers. Find out how long it takes a person or a computer to update a global weather forecast.

Maze Programming*
COMPUTER PROGRAMMING

Learn the basics of programming by instructing an animated robot car to navigate through a maze.

VIRTUAL WORLDS

Electronic Mail to
The White House
ELECTRONIC MESSAGING

Learn about electronic mail and communications through an interactive multi-media presentation. Send electronic mail to the White House through an on-line connection such as the Internet.

The Virtual Reality Chair
VIRTUAL REALITY

An unassisted system for viewing virtual reality. Experience playing in a virtual field, or walk through a virtual house.

***AVAILABLE IN SPANISH**

Letter To The White House

ELECTRONIC MAIL

Exhibit Description:

This multi-media exhibit describes the use of electronic communications, and Electronic Democracy in today's society. Visitors learn about electronic mail, Electronic Democracy, and can write and send an electronic message to President Clinton or Vice President Gore.

Visitors Will Learn:

- History of electronic communications in the White House
- What electronic mail is and how it is used
- How Electronic Democracy is effecting society
- How to write and actually send electronic mail to the White House

This Kit Includes:

- Complete software and licensing
- Kit Installation and Maintenance Manual
- Suggestions for exhibit signage, furnishings, and layout

The Customer Must Provide:

- Apple Macintosh Quadra 650 or higher with at least 16 MB RAM and an 80 MB or larger hard disk
- System 7.0 or higher
- Color 16" (or larger) monitor
- Apple compatible keyboard
- Apple compatible mouse
- Link to electronic mail service (Internet, Compuserve, Prodigy)
- Signs, enclosure, other site-specific materials

Site Requirements:

The exhibit site needs to be set up to provide power for the computer, and to allow visitor access to the computer monitor, mouse and keyboard. A telephone or network line needs to be installed to connect the exhibit to an electronic mail service.
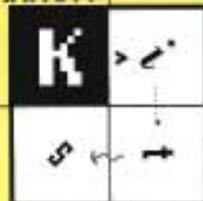
Design Your Own Newsletter
DESKTOP PUBLISHING

Exhibit Description:
Visitors experience how graphic design software helps people create
intricate and attractive documents. Users can design the layout of a
newsletter by choosing the number of columns, the size and number
of headlines, the location of articles, and the placement of images.
Visitors can print out their newsletter and take it home as a souvenir.
Newsletter text can be customized to include information about the
sponsoring museum or science center.

Visitors Will Learn:
- Basic desktop publishing terminology
- How to create an attractive document
- How a computer can assist in the design of a page

This Kit Includes:
- Complete software and licensing
- Kit installation and maintenance manual
- Suggestions for exhibit layout and signage
- Customized newsletter text that references your institution

The Customer Must Provide:
- Apple Macintosh Quadra 605 or higher, with at least 8 MB of
  RAM, and a 40 MB or larger hard disk
- System 7.0 or higher
- Radius Pivot Monitor (monochrome)
- Macintosh compatible laser printer (optional)
- Signs, enclosure, and other site-specific materials

Installation Requirements:
The exhibit site needs to be set up to provide power for the
computer, monitor and laser printer (optional). Visitors need access to
the computer's mouse and monitor.

* *This Kit is Available in Spanish*
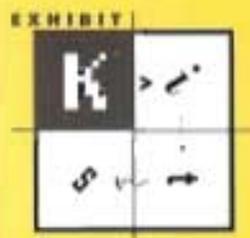
DinoDraw!
COMPUTER DRAWING

Exhibit Description:
DinoDraw! shows visitors how computers can be used as drawing tools. Visitors are led through the process of using electronic versions of familiar drawing tools: pens, an eraser, and a compass to make circles. There are also tools which are unique to drawing programs: instant enlargers, rotators, and finely controlled spray paint.

Visitors begin by adding features to a pre-drawn dinosaur. Once they become proficient with the drawing tools, they can add to (or subtract from) a selection of pre-drawn images or create entirely new drawings. The program allows visitors to print the drawings they create, giving them a personal souvenir of their visit.

Visitors Will Learn:
- How basic computer drawing tools let them create an image in just a few minutes
- How creative inspiration comes from the artist, not the computer
- Basic vocabulary for computer drawing

This Kit Includes:
- Complete software and licensing
- Kit Installation and Maintenance Manual
- Suggestions for exhibit layout and signage

The Customer Must Provide:
- Apple Macintosh LCIII with 8 MB of RAM , and a 40 MB or larger hard disk
- System 7.0 or higher
- 13" monitor
- Apple compatible mouse or trackball
- Macintosh compatible laser printer (optional)
- Signs, enclosure, and other site-specific materials

Site Requirements:
The exhibit site needs to be set up to provide power for the computer (and optional printer). Visitors need access to the computer monitor and mouse (and optional printer)
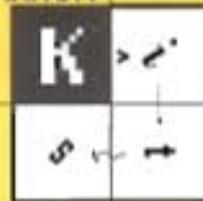
Explosive Experiments
CHEMISTRY/EARTH SCIENCE

Exhibit Description:
Explosive Experiments allows users to control videos showing a variety of dangerous chemical reactions. Visitors use a computer to manipulate a videodisk (developed by the American Chemical Society) which displays 22 different chemical reactions. The chemical formula for each reaction is displayed on the computer screen while the reaction is displayed on a separate video monitor. The computer menu allows the visitor to replay the video, in slow motion, or in reverse without the risk of injury or the release of toxic substances.

Visitors Will Learn:
+ What happens in 22 dangerous chemical experiments
+ How a computer is used to control a video disk system

This Kit Includes:
+ Complete software and licensing
+ Kit Installation and Maintenance Manual
+ Suggestions for exhibit layout and signage
+ One Redox videodisk (by the American Chemical Society)

The Customer Must Provide:
+ Macintosh Quadra 605 or higher with 8 MB RAM and a 40 MB hard disk.
+ System 7.0 or higher
+ Apple compatible mouse
+ 13" computer monitor
+ RS232 cable
+ Videodisk player with communications port (i.e. Pioneer LVD4800)
+ 18" or larger TV monitor (NTSC standard)
+ Signs, enclosure, and other site-specific materials

Site Requirements:
The exhibit site needs to be set up to provide power for the computer, computer monitor, videodisk player, and NTSC monitor. Visitors need access to the computer monitor, TV monitor and mouse.
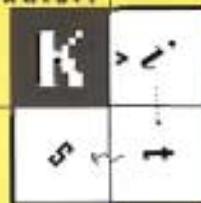
Make Your Own Cartoon
COMPUTER-ASSISTED ANIMATION

Exhibit Description:
This exhibit shows visitors how computers can be used to create cartoons. High-quality animation and digitized sound give visitors the thrill of making a professional-quality animation in just a few minutes. Visitors are first led through the process of making simple one-step cartoons involving a frog in a pond, controlling where the frog moves and what it looks like. Then, once they have mastered the process, they create new cartoons with a bird, a frog and a fly. Once the cartoons are created, the visitors can view them in their entirety.

The Visitor Will Learn:
♦ The steps involved in creating a computer animation
♦ How inspiration comes from the artist, not the computer

The Kit includes:
♦ Complete software and licensing
♦ Kit Installation and Maintenance Manual
♦ Suggestions for exhibit layout and signage

The Customer Must Provide:
♦ Apple Macintosh Quadra 605 with 12 MB of RAM, and a 40 MB or larger hard disk
♦ System 7.0 or higher
♦ Radius Color Pivot monitor (624 pixels wide by 832 pixels tall)
♦ Apple compatible mouse.
♦ Optional speakers (the Mac's internal speaker may be used)
♦ Signs, enclosure, and other site-specific materials

Site Requirements:
The exhibit site needs to be set up to provide power for the computer. Visitors need access to the computer monitor and mouse.
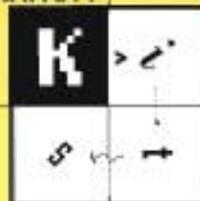
Alphabet Noodle Soup
## WORD PUZZLES

Exhibit Description
In this exhibit, visitors choose a word in English or Spanish and use its letters to see how many new words can be made. The computer lets the user know how many words can be produced, and will give hints about the words upon request. The computer provides instant feedback with each entry, and tracks the game's progress.

What Visitors Will Learn:
- Possible words derived from the letters in one word
- How computers are used to store game information and solutions

This Kit Includes:
- Complete software and licensing
- Kit installation and maintenance manual
- Suggestions for exhibit layout and signage

The Customer Must Provide:
- 486 PC compatible (ISA) or PS/2 computer with at least 8 MB of RAM, and a 40 MB or larger hard disk
- DOS 5.0 or higher and Windows 3.0 or higher
- 13" VGA monitor
- Microsoft or compatible mouse.
- Signs, enclosures, and other site-specific materials

Site Requirements:
The exhibit needs to be set up to provide power for the computer and monitor. Visitors need access to the computer mouse, keyboard and monitor.

* This Kit is Available in Spanish
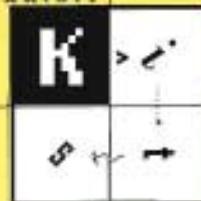
Special Effects
## IMAGE PROCESSING

Exhibit Description:
This exhibit demonstrates how computers are used in film and video
to create special effects. Visitors stand in front of a white screen and
choose one of several effects options from the keyboard. While the
computer processes the effect, the monitor displays an explanation of
how computers and video work together to create these effects. The
monitor then displays the combined image/effect. Some effects, such
as "Meteorologist," combine the visitor's image with a background
image of a weather map. Others, such as "Liquid Metal," distort the
visitor's image or change it radically.

Visitors Will Learn:
+ How effects are used in practical applications
+ How the computers and video work together
+ How meteorologists give weather reports with changing maps
  behind them

This Kit Includes:
+ Complete software and licensing
+ Kit installation and maintenance manual
+ Suggestions for exhibit layout and signage

The Customer Must Provide:
+ Commodore Amiga 2000HD with at least 8 MB of RAM, and a 100
  MB or larger hard disk
+ Video Toaster video board
+ NTSC video camera
+ Large NTSC video monitor
+ Speakers and amplifier (optionally, the computer's internal speaker
  may be used)
+ Signs, enclosures, and other site-specific materials

Site Requirements:
The exhibit site needs to be set up to provide power for the
computer, video monitor, and video camera. Visitors need access to
the computer keyboard.

* This Kit is Available in Spanish
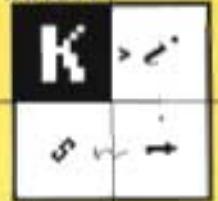
Fly a DC-10
## FLIGHT SIMULATION

Exhibit Description:
Visitors are invited to fly a simulated DC-10 from take-off to landing.
Participants can view the simulation from the pilot's seat or control
tower, and from behind the plane. Visitors can also control the
simulated weather. This exhibit is adapted for public use from one of
the top commercial computer flight simulators. As pilots, visitors find
the plane markedly responsive to their commands. They can explore
an island and even fly through an erupting volcano.

The Visitor Will Learn:
◆ How simulations are used in training and dangerous situations
◆ How a computer can generate an artificial reality
◆ What it is like to fly in a simulated environment

This Kit Includes:
◆ Complete software and licensing
◆ Kit installation and maintenance manual
◆ Suggestions for exhibit layout and signage

The Customer Must Provide:
◆ Apple Macintosh Quadra 610 or higher (running System 7.0 or
  higher), with at least 12 MB RAM, a 40 MB or larger hard disk and
  1 MB of VRAM
◆ System 7.0 or higher
◆ Mouse or Joystick
◆ 20" computer monitor (may require a video card)
◆ Stereo speakers
◆ Signs, enclosures and other site-specific materials

Site Requirements:
The exhibit site needs to be set up to provide power for the computer
and monitor. Visitors need access to the computer monitor and
mouse/joystick.
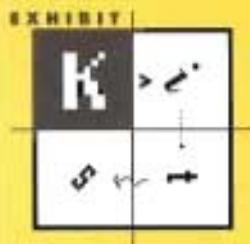
Spend a Million Dollars!
COMPUTER SPREADSHEETS

Exhibit Description:
This graphically captivating exhibit introduces visitors to spreadsheets and their uses by inviting them to spend a million dollars and track their purchases on a spreadsheet. The visitor must first account for taxes taken from the $1 million, then make purchases from several categories using the on-screen menu of choices. As visitors purchase mansions, sports cars, trips, even computers, or donate to charity, the spreadsheet keeps track of their expenses and how much they have left to spend. Visitors can also compare their spending habits to those of other visitors who have used the exhibit. The spreadsheet automatically creates pie charts illustrating how the visitor's purchases compare to other's.

Visitors Will Learn:
- How a spreadsheet is used to organize and calculate financial information
- Examples of spreadsheets

This Kit Includes:
- Complete software and licensing
- Kit installation and maintenance manual
- Suggestions for exhibit layout and signage

The Customer Must Provide:
- 386 or higher PC compatible (ISA) or PS/2 computer with at least 8 MB RAM and a 40 MB hard disk
- DOS 5.0 or higher and Windows 3.0 or higher
- Microsoft compatible mouse
- 13" VGA monitor
- Signs, enclosures, and other site-specific materials

Installation Requirements:
The exhibit site needs to be set up to provide power for the computer and monitor. Visitors need access to the computer monitor and mouse.

This Kit is Available in Spanish
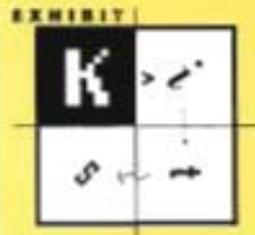
What's Your Type?
PUBLISHING TOOLS

Exhibit Description:

This exhibit encourages visitors to learn about the use of typefaces in traditional printing and in electronic publishing. Visitors write their name (or any other message) in Egyptian Hieroglyphics or Braille. Visitors can print their work and bring it home as a souvenir.

Visitors Will Learn:

- How typefaces are used in traditional and electronic printing
- What a message looks like in Hieroglyphics
- What a message feels like in Braille

This Kit Includes:

- Complete software and licensing
- Kit installation and maintenance manual
- Suggestions for exhibit layout and signage

The Customer Must Provide:

- Apple Macintosh Quadra 605 with at least 8 MB RAM, and a 40 MB or larger hard drive
- System 7.0 or higher
- 13" Apple compatible monitor
- Mouse or trackball
- Macintosh compatible laser printer (optional)
- Braille Blazer printer (optional)
- Signs, enclosures, and other site-specific materials

Site Requirements:

The exhibit site needs to be set up to provide power for the computer and printers (optional). Visitors need access to the computer monitor, keyboard, mouse and printers.
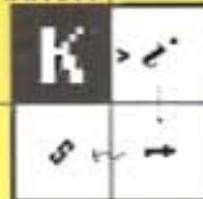
Color the States

SPEECH RECOGNITION

Exhibit Description:

Visitors are invited to color in a map of the United States using only four colors so that no two states with the same color share a common border. The only input device is a microphone - all commands are given by speech. Visitors first select a state and then select its color. There are many different ways to color the states successfully, but also many ways to be trapped into coloring two adjacent states the same.

Visitors Will Learn:

+ Speech recognition allows computers to obey spoken instructions
+ If the vocabulary is small, a computer can recognize the instructions of any speaker without any prior "training" with that speaker (Speech recognition is imperfect)
+ Visitors quickly get used to controlling the computer by spoken commands
+ Speech recognition allows the disabled, or people who must use their hands for other tasks, to operate computers

This Kit Includes:

+ Complete software and licensing
+ Kit Installation and Maintenance Manual
+ Dragon Systems Speech Recognition board
+ Suggestions for exhibit signage and layout

The Customer Must Provide:

+ PC-AT compatible computer, with at least 256 KB of RAM, and a 20 MB or larger hard disk
+ DOS 3.3 or higher
+ Color VGA monitor
+ Microphone and mount
+ Signs, enclosure, other site-specific materials

Site Requirements:

The exhibit site needs to be set up to provide power for the computer and to allow visitor access to the microphone and the computer monitor.

Eliza: The Computer Psychologist

COMPUTER INTELLIGENCE

Exhibit Description:

This exhibit is an implementation of a classic program developed by Joseph Weizenbaum at MIT in 1966. In offering to help the visitor with a problem, the program plays the role of a psychotherapist. The visitor types in a sentence, and the program responds by using one of a small repertoire of expedients. Examples include turning a statement into a question, responding to a key word such as "family," or simply asking the "patient" to elaborate. ELIZA's methods become quite apparent after a short interchange, and visitors can then trick ELIZA into repeating itself or asking nonsensical questions.

Visitors Will Learn:

+ Computer programs can simulate human conversations
+ Simple devices can trick you into believing a computer is intelligent when, in fact, it is simply reflecting your own words back at you
+ There is a world of difference between a simple program, such as ELIZA, and a truly intelligent program
+ We are still a very long way from knowing how to build a program that converses like a person

This Kit Includes:

+ Complete software and licensing
+ Kit Installation and Maintenance Manual
+ Suggestions for exhibit layout and signage
+ Available in Spanish

The Customer Must Provide:

+ PC-AT compatible computer, with at least 256 KB of RAM, and a 20 MB or larger hard disk
+ DOS 3.3 or higher
+ Color VGA monitor
+ Keyboard
+ Signs, enclosure, other site-specific materials

Site Requirements:

The exhibit site needs to be set up to provide power for the computer and to allow visitor access to the computer monitor and keyboard.

* *This Kit is Available in Spanish*
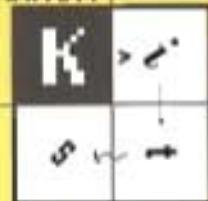
Haggle With a Computer Fruit Vendor

EXPERT SYSTEMS

Exhibit Description:

In this exhibit, visitors bargain with the computer over the price of a box of strawberries. First, visitors select one of three fruit vendors that range in sophistication from NOAH BUDGE (with only 10 bargaining rules) to NORA LOGICAL (with over a hundred bargaining rules). Visitors can type in offers for a box of strawberries, or make insulting or flattering remarks to the vendor. A display on the screen tracks the testing and firing of the rules as the computer generates a response. The computer may lower the price or return the abuse. A voice synthesizer allows the computer to reply audibly. The session ends when the computer and visitor close the deal or the visitor is "kicked out of the vendor's stall."

Visitors Will Learn:

+ A computer can follow a set of rules, giving it surprisingly human-like behavior
+ The more rules the computer has, the more sophisticated its behavior
+ The computer cannot improvise or use common sense to respond outside its particular area of expertise
+ Rule-based expert systems are growing in use, and are taking over some tasks formerly thought to require a human expert

This Kit Includes:

+ Complete Software and Licensing
+ Kit Installation and Maintenance Manual
+ Custom cables
+ Suggestions for exhibit layout and signage

The Customer Must Provide:

+ PC-AT compatible computer with at least 256 KB of RAM, and a 20 MB or larger hard disk
+ DOS 3.3 or later
+ Color VGA display
+ Keyboard.
+ Single-line DECtalk unit with serial cable, part number DTC01-AA, supplied by Digital Equipment Corporation
+ Signs, enclosure, other site-specific materials

Site Requirements:

The exhibit site needs to be set up to provide power for the computer, to allow visitor access to the computer's monitor and keyboard, and to hear the DECtalk's speech output.

How Computers Play Games
DECISION MAKING

Exhibit Description:
This exhibit allows visitors to challenge the computer to a game of five-in-a-row. During the game, the computer's "thought process" is shown graphically as it evaluates each possible move and selects the best one. Visitors observe how the computer applies its strategy in response to their moves. Visitors can also explore a more detailed explanation of each strategy.

Visitors Will Learn:
- Computers, by testing many moves rapidly, can compete with humans at certain tasks
- Computers can play games of strategy by using sets of simple rules to test many possible moves

This Kit Includes:
- Complete software and licensing
- Kit Installation and Maintenance Manual
- Suggestions for exhibit layout and signage

The Customer Must Provide:
- A 486/25 MHz or faster PC compatible computer with at least 640 KB of RAM, and a 20 MB or larger hard disk
- DOS 3.3 or higher
- Color VGA display
- Microsoft-compatible mouse
- Keyboard.
- Signs, enclosure, other site-specific materials

Site Requirements:
The exhibit site needs to be set up to provide power for the computer and to allow visitor access to the computer's monitor and mouse.
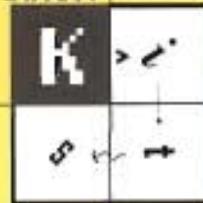
How Tall Are You?

ULTRASONIC MEASUREMENT

Exhibit Description:

The exhibit invites visitors in its proximity to have their height measured. When visitors move into the correct position (marked by feet painted at the base of the exhibit), their height is measured using an ultrasonic distance sensor. The results are announced via digitized speech such as "You seem to be about five feet, six and three quarter inches." Occasionally the exhibit entertains visitors by making a "mistake" and then correcting itself. Visitors delight in trying to fool the computer.

Visitors Will Learn:

* Ultrasonic sensors allow computers to detect and measure the distance to objects in their environment
* The keyboard and screen are not the only way to interact with a computer. Visitors who try this exhibit provide input by moving their bodies and receive the output via synthesized speech
* Mobile robots can use ultrasonic sensors to find the distance to walls and obstacles around them

Variations:

This kit can be applied in other settings such as:

* Comparing visitors to other objects such as mountains, whales or small objects
* A practical demonstration of the Doppler effect
* An audible and interactive attraction to a larger exhibit

This Kit Includes:

* Complete software and licensing
* Kit Installation and Maintenance Manual
* Suggestions for exhibit layout and signage
* Ultrasonic distance sensors, cables and driving hardware

The Customer Must Provide:

* Apple Macintosh computer (SE or higher) with at least 20 MB of hard disk space and at least 4 MB of RAM
* System 7.0 or higher
* Speaker, amplifier and all audio cables (to connect to the Macintosh's 1/8" mini phono plug)
* Signs, enclosure, mounting points for distance sensors, and other site-specific materials

Site Requirements:

The exhibit site needs to be set up to provide power for the computer. Visitors have no access to the computer. The speaker and four distance sensors are easily mounted, as described in the *Kit Installation and Maintenance Manual.*

* This Kit is available in Spanish and in Metric units of height
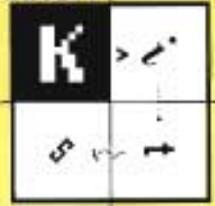
The Talking Computer
COMPUTER SPEECH

Exhibit Description:

The Talking Computer invites visitors to learn how a computer can speak and control the qualities of its voice. Visitors can experiment with the computer's diction by having it pronounce their name and other text they type. Visitors can also change the characteristics of the computer's voice. To illustrate one of the uses of voice output, the computer asks visitors to close their eyes and type while the computer reads to them what they have typed.

Visitors Will Learn:

♦ Computers can communicate with people by voice
♦ To synthesize speech, a computer must use a detailed set of rules to recognize words in written text and the sounds that combinations of letters spell
♦ Computer-generated speech is comprehensible but crude. It lacks the subtle inflections and accents important to human speech.
♦ Speech synthesis has many applications, including providing information over the phone and allowing the sight-impaired to use computers.

This Kit Includes:

♦ Complete software and licensing
♦ Kit Installation and Maintenance Manual
♦ Suggestions for exhibit layout and signage

The Customer Must Provide:

♦ Apple Macintosh LCIII (or higher) with 8 MB of RAM , and a 20 MB or larger hard disk
♦ System 7.0 or higher
♦ Apple compatible color monitor
♦ Apple compatible mouse
♦ Digital Equipment Corporation DTC-01 DECtalk text-to-speech converter
♦ Standard Macintosh modem cable (male 8-pin Mini-DIN to male DB-25)
♦ Signs, enclosure, and other site-specific materials

Site Requirements:

The exhibit site needs to be set up to provide power for the computer. Visitors need access to the computer monitor and mouse, and must be able to hear the speech output from the DECtalk.
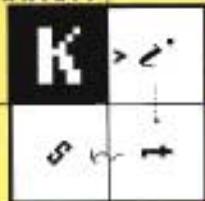
How Fast Are Computers?
COMPUTER SPEED

Exhibit Description:
The exhibit invites visitors to add five numbers, while the computer measures how long they take to arrive at the correct answer. It then displays how many similar calculations computers (from a PC to a supercomputer) could perform in the same amount of time. Visitors can then match any one of five computers (including themselves) to one of five tasks, ranging from balancing a checkbook to updating a global weather model. The program tells them how long the selected computer would take to solve the task. Many visitors will find that it would take them over 900 years to update the day's forecast!

Visitors Will Learn:
♦ Computers vary widely in their speed of calculation, but they are all much faster than people at numerical calculation
♦ Some tasks, such as adding a few numbers, take much less computing than other tasks, such as forecasting the weather
♦ It is important to choose a computer that is sufficiently powerful if a job is to be completed in a reasonable time
♦ The four standard ways of making computers run fast- parallel processing, RISC vs. CISC, fast clock speed, and pipelining

This Kit Includes:
♦ Complete software and licensing
♦ Kit Installation and Maintenance Manual
♦ Suggestions for exhibit signage and layout

The Customer Must Provide:
♦ PC-AT compatible computer, with at least 256 KB of RAM, and a 20 MB or larger hard disk
♦ DOS 3.3 or higher
♦ Color VGA display
♦ Keyboard
♦ Signs, enclosure, other site-specific materials

Site Requirements:
The exhibit site needs to be set up to provide power for the computer and to allow visitor access to the computer monitor and keyboard.

This Kit is Available in Spanish

Maze Programming
COMPUTER PROGRAMMING

Exhibit Description:
This exhibit challenges visitors to write a computer program that instructs a robot car to move through a maze. It guides visitors through the task in simple, incremental steps, introducing them along the way to concepts fundamental to computer programming. After learning what each instruction does, visitors write their own programs, and then execute them. High-resolution color and 3D images engage visitors as they watch the car obey their commands. The car's movements give visitors immediate feedback and a firm grasp of how their program functions.

Visitors Will Learn:
- Computers perform tasks by following a list of instructions, called programs
- Each program instruction is simple and explicit
- Rudimentary programming is not conceptually difficult, but requires attention to detail

This Kit Includes:
- Complete software and licensing
- Kit Installation and Maintenance Manual
- Suggestions for exhibit layout and signage

The Customer Must Provide:
- Apple Macintosh LCIII (or higher) with 8 MB of RAM, and a 20 MB or larger hard disk
- System 7.0 or higher
- Apple compatible color monitor
- Apple compatible mouse.
- Signs, enclosure, and other site-specific materials

Site Requirements:
The exhibit site needs to be set up to provide power for the computer. Visitors need access to the computer monitor and mouse.

This Kit is Available in Spanish

The Computer Museum
Selected Exhibit Kits
Customers

THE FRANKLIN INSTITUTE
Philadelphia, PA

THE NATIONAL HISTORY MUSEUM,
THE SMITHSONIAN INSTITUTION
Washington, D.C.

MUSEUM OF ART, SCIENCE & INDUSTRY
Bridgeport, CT

ST. LOUIS SCIENCE CENTER
St. Louis, MO

THE PACIFIC SCIENCE CENTER
Seattle, WA

EUREKA - THE CHILDREN'S MUSEUM
Halifax, England

THE CHILDREN'S HANDS ON MUSEUM
Olympia, WA

CENTRO DE CIENCIAS DE SINALOA
Mexico

THE TECH MUSEUM OF INNOVATION
San Jose, CA

NATIONAL AQUARIUM
Baltimore, MD
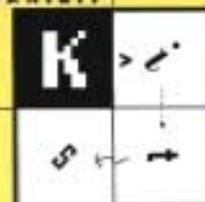
The Computer Museum
Exhibit Kit Pricing
AS OF JANUARY 10, 1994

Exhibit Kits	Price	Platform	Spanish Version
TOOLS AND TOYS: THE AMAZING PERSONAL COMPUTER			
Alphabet Noodle Soup	$1,500	IBM	
Design a Newsletter	$1,500	MAC	yes
DinoDraw!	$1,500	MAC	
Draw on the Wall	$700	MAC	
Explosive Experiments	$1,700	MAC	
Fly a DC-10	$3,000	MAC	
Make Your Own Cartoon	$2,500	MAC	
Outline and Organize	$750	IBM	yes
Record Your Voice	$1,500	IBM	
Spend a Million Dollars	$2,000	IBM	yes
Star in Your Own Commercial	$3,200	MAC	
Special Effects (photo)	$4,000	Amiga	yes
Wedding Planner	$1,250	IBM	
What's Your Type?	$1,000	MAC	
ROBOTS AND OTHER SMART MACHINES			
Color The States	$3,900	IBM	
Eliza: The Computer Psychologist	$1,400	IBM	yes
Haggle with a Fruit Vendor	$3,575	IBM	
How Computers Play Games	$2,700	IBM	yes
How Tall Are You?	$5,400	MAC	yes
The Talking Computer	$1,500	MAC	
PEOPLE AND COMPUTERS			
How Fast Are Computers?	$1,500	IBM	yes
Journey of a Keypress	$2,000	MAC	
Maze Programming	$2,500	MAC	yes
VIRTUAL WORLDS			
Letter To The White House		MAC	

EXHIBIT
K

Ten Year Program Objectives Based on 1/28/94 Draft of Strategic Plan

1. Become a world class attraction offering exciting exhibits that exploit and explain the latest technologies.

   Host computer-related special events of global significance.

2. Become a significant provider of

   - exhibits
   - books & CD-ROMS
   - television programming
   - informal educational materials about computing

3. Develop innovative uses of computers in informal education.

   Become a provider and mentor for museums, community organizations, schools and other groups seeking to establish their own informal exhibits and programs about computers.

   Actively support the introduction of computing technologies to support education reform.

4. Define and implement the "On-line" Computer Museum.

5. Provide an internationally recognized forum for the celebration and recognition of key developments in the evolution of computing.

6. Maintain and enhance the Museum's leading collections of the history of electronic computing.

   Establish the Museum and its collections as a premier resource for research into the history of computing.

Collections Plan

The first priority is to continue to capture significant artifacts, photographs, films, documents, and software when they are threatened with destruction by companies, individuals, and other museums. The Computer Museum has provided a parachute when missions change, companies merge or fail, and individual collectors pare down and move to smaller quarters, or die. In this way The Museum preserved a unique collection of Fairchild integrated circuits, the Whirlwind Computer from MIT, SuperPaint, the first paint program developed at CMU and Xerox Parc, and the first 'virtual reality' helmet. Quick reaction time and a unique focus and expertise that can determine the significant technology relating to computing are required to continue to serve in this capacity.

From the start of collecting efforts about 1970, the criteria for accession to the collection have stayed the same. Highest priority is given to collecting the important technological innovations with carefully selected documentation. The next priority is given to insuring that the classic or standard implementations of a technology are represented. In addition, the collections include examples of technologies that failed for technical or commercial reasons, of clones, and intermediary stages of evolution.

The collection is devoted to computing, including intelligent machines, particularly robots. It includes all levels of integration of both hardware and software. While the historic roots are in the domain of hardware including semi-conductors, the future emphasis will increasingly be software.

Each hardware artifact or piece of software needs to have a full complement of material in order to be understood. For example, the original SpaceWar Game (the first interactive computer game) software is represented by its paper-tape program, program listings, videos of SpaceWar being played, oral history with its authors, photographs, and the PDP-1, the computer hardware on which it was designed. Together these make up a complete story.

The second priority is to undertake specialized proactive collecting. The greatest gains have been made in the collections when there have been special projects, such as the personal computer contest and the Milestones of a Revolution exhibition. In the next three years two significant activities will lead to improved and new collections:

- Hall of Fame for computing technology will lead to in-depth collecting of all aspects of the honored technology: hardware, documentation, video, film, software, oral histories and marketing ephemera.
- "The Guide to the Best Kids' Software" project will gather a comprehensive set of all children's software and preserve it for the collection.

Collections space, use, and environmental preservation needs.

Due to the growth of exhibits on the Wharf, **an essential priority for 1994 is to locate and move 4,000 square feet of hardware artifacts to an off site warehouse .**

The previous plan included a goal to complete a catalog. This is in process and **a priority will be to complete an electronic catalog by January 97.**

- The artifact collection (including software per se -- not its documentation) is being integrated into the electronic catalog with the documents.
- The document listing and their placement in special acid-free boxes is almost up-to-date with on-going accessions.
- An electronic database of scanned photographs is underway and should be complete December 1994. The catalog allows photographs to be reviewed for use without touching the original which is preserved in an acid free environment. The images will be used more widely as a result.
- The film and video collection is problematical. Video of computer pioneers created in 1980 is deteriorating. The video content is being evaluated and the most information-rich transferred onto more long-lived media. A plan for this rich and important collection will be prepared by June 1995

THE COMPUTER MUSEUM
STATEMENT OF REVENUE & EXPENSE
7 Months Ending 01/31/94

	OPERATING FY94 Actual	OPERATING FY94 Budget	OPERATING FY93 Actual	CAPITAL/EXHIBIT Actual	CAPITAL/EXHIBIT Budget	ENDOWMENT Actual	ENDOWMENT Budget	COMBINED Actual	COMBINED Budget	$ VARIANCE	ANNUAL BUDGET FY94	FORECAST FY94
SUPPORT/REVENUE												
Restricted Support:												
Clubhouse	159,153	131,425	50,400					159,153	131,425	27,728	287,900	306,800
Exhibit Related	49,900	54,400	15,519	65,726	365,000			115,626	419,400	-303,774	732,000	541,800
Govt & Foundation	10,286		46,825					10,286		10,286		10,286
Endowment												
Unrestricted Support:												
Capital Campaign				123,388	309,200			123,388	309,200	-185,812	726,200	352,050
Corporate Membership	109,525	96,350	92,250					109,525	96,350	13,175	205,000	192,725
Foundation	24,180		1,000					24,180		24,180		24,180
Computer Bowl	221,500	215,300	180,000					221,500	215,300	6,200	388,000	388,000
Membership Fund	106,557	121,000	92,796					106,557	121,000	-14,443	178,000	178,000
Admission	300,940	307,692	283,599					300,940	307,692	-6,752	536,841	536,323
Store	161,518	192,314	136,806					161,518	192,314	-30,796	332,395	281,885
Functions	112,665	84,480	99,003					112,665	84,480	28,185	140,352	156,316
Exhibit Sales	17,997	40,000	42,290					17,997	40,000	-22,003	90,000	45,000
Other:												
Interest Income	1,984	4,000	1,784			3,070	4,095	5,054	8,095	-3,041	12,000	5,333
Rental Income			5,950								4,000	2,020
Program Income		1,400	658						1,400	-1,400	2,500	1,300
Collections	125	2,400	1,700					125	2,400	-2,275	4,000	1,975
TOTAL SUPPORT/REVENUE	1,276,330	1,250,761	1,050,580	189,114	674,200	3,070	4,095	1,468,514	1,929,056	-460,542	3,639,188	3,023,993
EXPENSES												
Exhibit Development	35,751	59,985	6,229	98,387	220,218			134,138	280,203	-146,065	580,485	461,400
Exhibit Maint/Enhancement	30,773	24,661	29,827	1,517	15,309			32,290	39,970	-7,680	69,578	79,822
Exhibit Sales/Kits	19,118	23,480	45,969					19,118	23,480	-4,362	52,610	36,524
Collections	40,278	36,380	37,352					40,278	36,380	3,898	62,400	63,235
Education & Admission	155,380	170,803	160,559					155,380	170,803	-15,423	292,570	273,592
Clubhouse	122,426	134,620	9,924					122,426	134,620	-12,194	236,000	236,000
Marketing	169,507	147,605	95,993					169,507	147,605	21,902	229,190	236,637
Public Relations	54,596	54,511	44,158					54,596	54,511	85	93,334	91,455
Store	146,714	162,747	122,222					146,714	162,747	-16,033	268,932	219,559
Functions	49,624	40,701	42,550					49,624	40,701	8,923	69,402	72,853
Computer Bowl	28,016	22,395	16,756					28,016	22,395	5,621	135,324	135,141
Fundraising	35,636	38,045	30,832	66,658	128,315			102,294	166,360	-64,066	286,585	150,000
Membership Fund	28,546	48,790	19,245					28,546	48,790	-20,244	83,611	65,000
Museum Wharf												
Op Exp	172,526	176,169	174,698					172,526	176,169	-3,643	302,000	316,923
Mortgage				74,896	74,894			74,896	74,894	2	126,977	126,977
General Management	154,459	131,608	131,429					154,459	131,608	22,851	213,271	231,113
TOTAL EXPENSE	1,243,350	1,272,500	967,743	241,458	438,736			1,484,808	1,711,236	-226,428	3,102,269	2,796,231
NET REVENUE	32,980	-21,739	82,837	-52,344	235,464	3,070	4,095	-16,294	217,820	-234,114	536,919	227,762

THE COMPUTER MUSEUM
STATEMENT OF REVENUE & EXPENSE
OPERATING FUND

FOR THE SIX MONTHS ENDED

	01/31/93 ACTUAL	01/31/94 ACTUAL	BUDGET	VARIANCE	PERCENT	FY94 BUDGET	FY94 FORECAST
REVENUES:							
Clubhouse	50,400	$159,153	131,425	27,728	21%	287,900	306,800
Exhibit Related	15,519	49,900	54,400	-4,500	-8%	100,000	91,800
Govt & Foundation	46,825	$34,466		34,466	100%		34,466
Corporate Membership	93,250	$109,525	96,350	13,175	14%	205,000	192,800
Computer Bowl	180,000	$221,500	215,300	6,200	3%	388,000	388,000
Membership Fund	92,796	$106,557	121,000	-14,443	-12%	178,000	178,000
Admissions	283,599	$300,940	307,692	-6,752	-2%	536,841	536,300
Store	136,806	$161,518	192,314	-30,796	-16%	332,395	281,885
Functions	99,003	$112,665	84,480	28,185	33%	140,352	156,300
Exhibit Sales	42,290	$17,997	40,000	-22,003	-55%	90,000	45,000
Interest Income	1,784	$1,984	4,000	-2,016	-50%	7,000	5,333
Other	8,308	125	3,800	-3,675	-97%	10,500	5,295
Total Revenues	1,050,580	1,276,330	1,250,761	25,569	2%	2,275,988	2,221,979
EXPENSES:							
Exhibits Development	6,229	35,751	59,985	-24,234	-68%	102,730	79,900
Exhibits Maintenance	29,827	30,773	24,661	6,112	20%	43,250	53,490
Exhibit Sales	45,969	19,118	23,480	-4,362	-23%	52,610	36,525
Collections	37,352	40,278	36,380	3,898	10%	62,400	63,235
Education & Admissions	160,559	155,380	170,803	-15,423	-10%	292,570	273,592
Clubhouse	9,924	122,426	134,620	-12,194	-10%	236,000	236,000
Marketing	95,993	169,507	147,605	21,902	13%	229,190	236,637
Public Relations	44,158	54,596	54,511	85	0%	93,334	91,455
Store	122,222	146,714	162,747	-16,033	-11%	268,932	219,559
Functions	42,550	49,624	40,701	8,923	18%	69,402	72,853
Computer Bowl	16,756	28,016	22,395	5,621	20%	135,324	135,141
Fundraising	30,832	35,636	38,045	-2,409	-7%	64,854	58,420
Membership Fund	19,245	28,546	48,790	-20,244	-71%	83,611	65,000
Musuem Wharf	174,698	172,526	176,169	-3,643	-2%	302,000	302,000
General Management	131,429	154,459	131,608	22,851	15%	213,271	231,113
Total Expenses	967,743	1,243,350	1,272,500	-29,150	-2%	2,249,478	2,154,920
NET REVENUES(EXPENSES)	$82,837	$32,980	-21,739	54,719	-3	26,510	67,059

THE COMPUTER MUSEUM
BALANCE SHEET
01/31/94

	OPERATING FUND	CAPITAL FUND	PLANT FUND	ENDOWMENT FUND	COMBINED TOTAL 01/31/94	TOTAL 6/30/93
ASSETS:						
Current:						
Unrestricted Cash	$251,328	-	-	$3,070	$254,398	$259,423
Restricted Cash	-	-	-	250,000	$250,000	250,000
Cash Equivalents	-	-	-	-		167
Investments	2,074	-	-	-	$2,074	2,074
Receivables	93,084	-	-	-	$93,084	48,868
Inventory	50,180	-	-	-	$50,180	49,137
Prepaid Expenses	20,266	-	-	-	$20,266	9,143
Interfund Receivable	3,070	202,775	-	-	$205,845	123,310
Total Current Assets	$420,002	$202,775		$253,070	$875,847	$742,122
Property & Equipment:						
Equipment & Furniture	-	-	$260,327	-	$260,327	$260,327
Capital Improvements	-	-	938,338	-	938,338	938,338
Exhibits	-	-	4,079,698	-	4,079,698	4,079,698
Construction in Process	-	52,908	-	-	52,908	52,908
Land	-	-	18,000	-	18,000	18,000
Less Accum. Depreciation	-	-	(2,962,311)	-	(2,962,311)	(2,962,311)
Net Property & Equipment		$52,908	$2,334,052		$2,386,960	$2,386,960
TOTAL ASSETS	$420,002	$255,683	$2,334,052	$253,070	$3,262,807	$3,129,082
LIABILITIES AND FUND BALANCES:						
Current:						
Accounts Payable	$61,855	$7,240	-	-	$69,095	$109,006
Accrued Expense	69,233	8,710	-	-	77,943	63,557
Deferred Income	158,647	129,273	-	-	287,920	194,919
Interfund Payable	202,775		-	3,070	202,775	123,310
Total Current Liabilities	$492,510	$145,223		$3,070	637,733	$490,792
Fund Balances:						
Operating	($72,508)	-	-	-	(72,508)	($108,566)
Capital	-	110,460	-	-	110,460	162,804
Endowment	-	-	-	250,000	250,000	250,000
Plant	-	-	2,334,052	-	2,334,052	2,334,052
Total Fund Balances	($72,508)	$110,460	$2,334,052	$250,000	$2,622,004	$2,638,290
TOTAL LIABILITIES AND FUND BALANCES	$420,002	$255,683	$2,334,052	$253,070	$3,262,807	$3,129,082

Notes on Statement of Revenue and Expense
for the Seven Months Ending 01/31/94

Operating revenues are 2% ahead of budget; expenses are 2.3% below budget.

1. <u>Clubhouse</u> revenue reflects actual expenses plus 30% taken as indirect cost. $72K of Clubhouse revenue is deferred. $76K of additional funding is committed for FY94. Additional funding is being pursued.
(See separate Clubhouse balance sheet, attached.)

2. <u>The Networked Society</u> revenue reflects actual expenses plus 18% taken as indirect cost. $179,308 of revenue is deferred. Additional funding is being pursued.

3. <u>Foundation/government</u> revenue reflects a Massachusetts Cultural Council General Operating Support grant of $24,180.

4. <u>Store</u> revenue and expense is forecast about $50K below budget owing to a catalog project that was budgeted but not executed.

5. <u>Exhibit sales</u> forecast is revised downwards owing to slower-than-anticipated staffing of exhibit sales position, and consequent lag in preparing sales materials; longer-than-anticipated sales cycles; and absence of a marketing director.

THE COMPUTER MUSEUM
COMPUTER CLUBHOUSE
7/1/93 - 1/31/94

REVENUE:

Corporate Contributions	278,201.00
Foundation Grants	30,000.00
Total:	308,201.00

EXPENSES:

Personnel Expense	136,106.00
Administrative Expense	20,950.00
New Exhibit Production	30,576.00
Other	47,894.00
Total:	235,526.00
Fund Balance	72,675.00
Expenses and fund balance	308,201.00

OUTSTANDING PLEDGES:

Intel Foundation	100,000.00
Fleet Bank	5,000.00
Sega Foundation	15,000.00
Mass Cultural Council	6,300.00
Total:	126,300.00