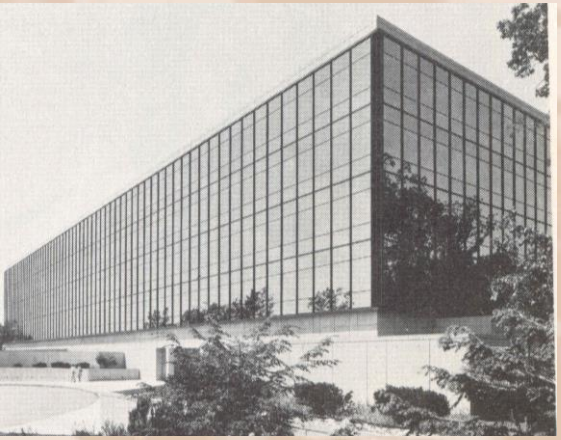
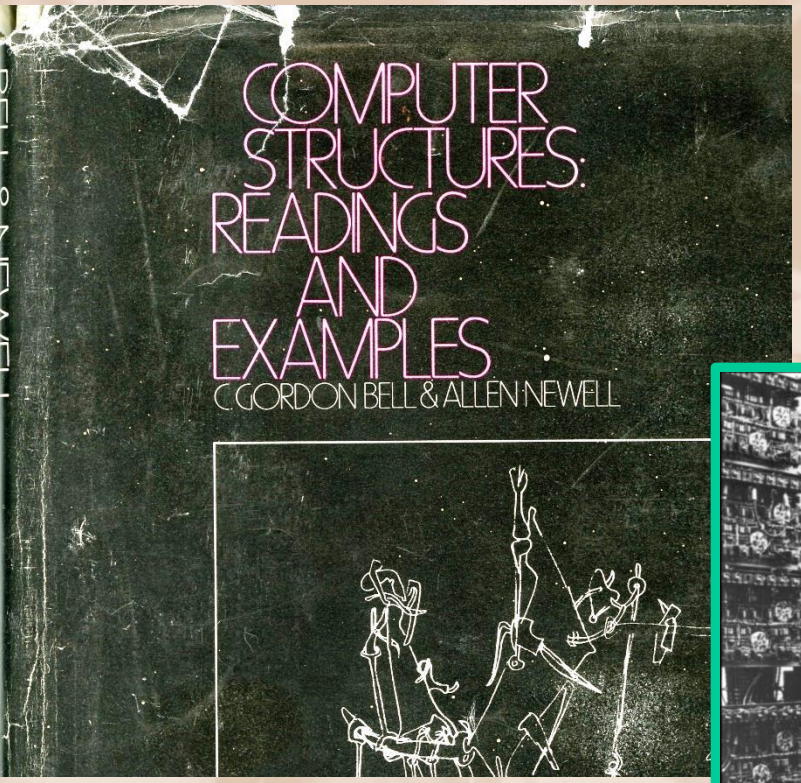
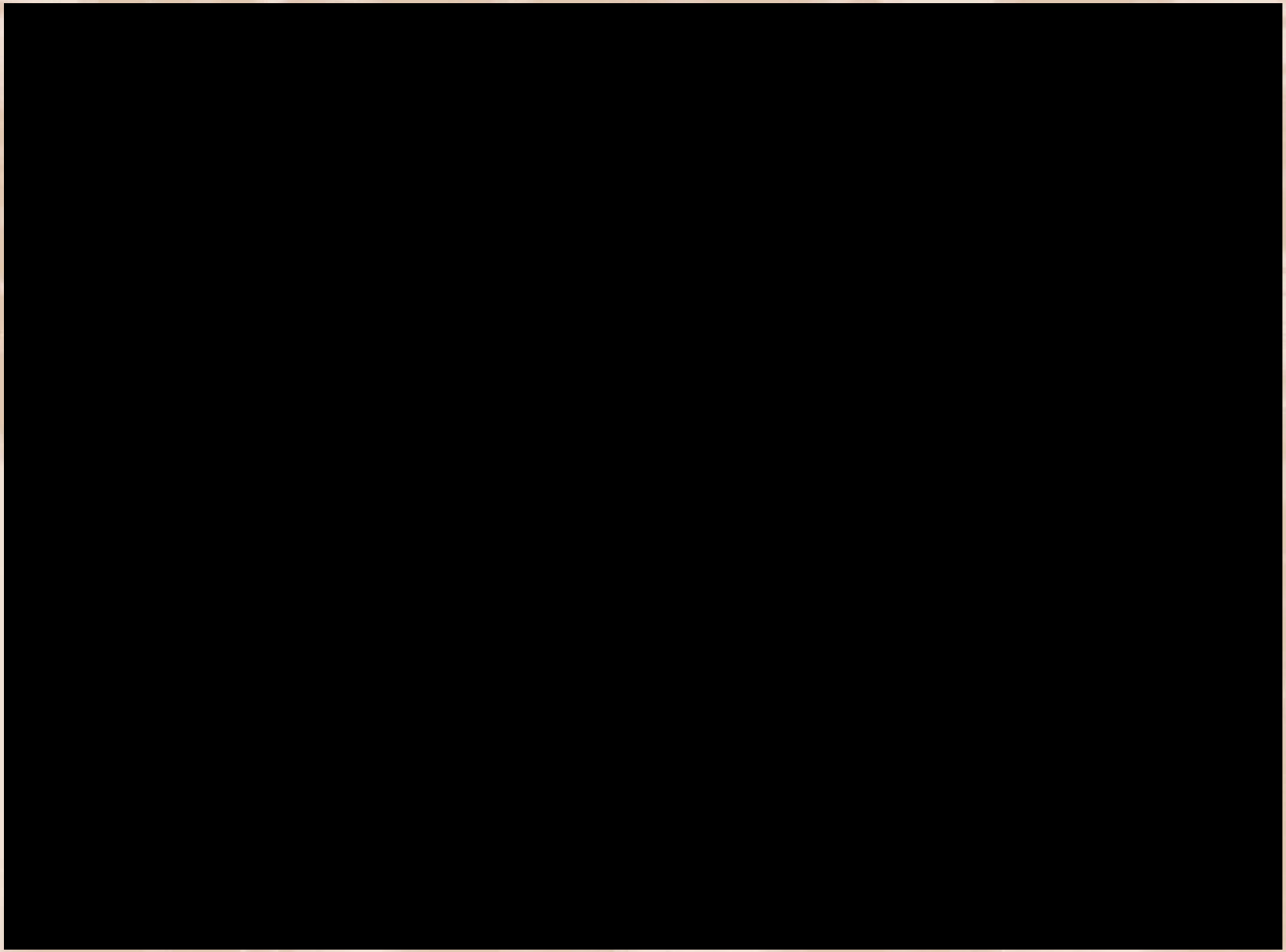


The history of the **Computer History Museum** *…in pictures*



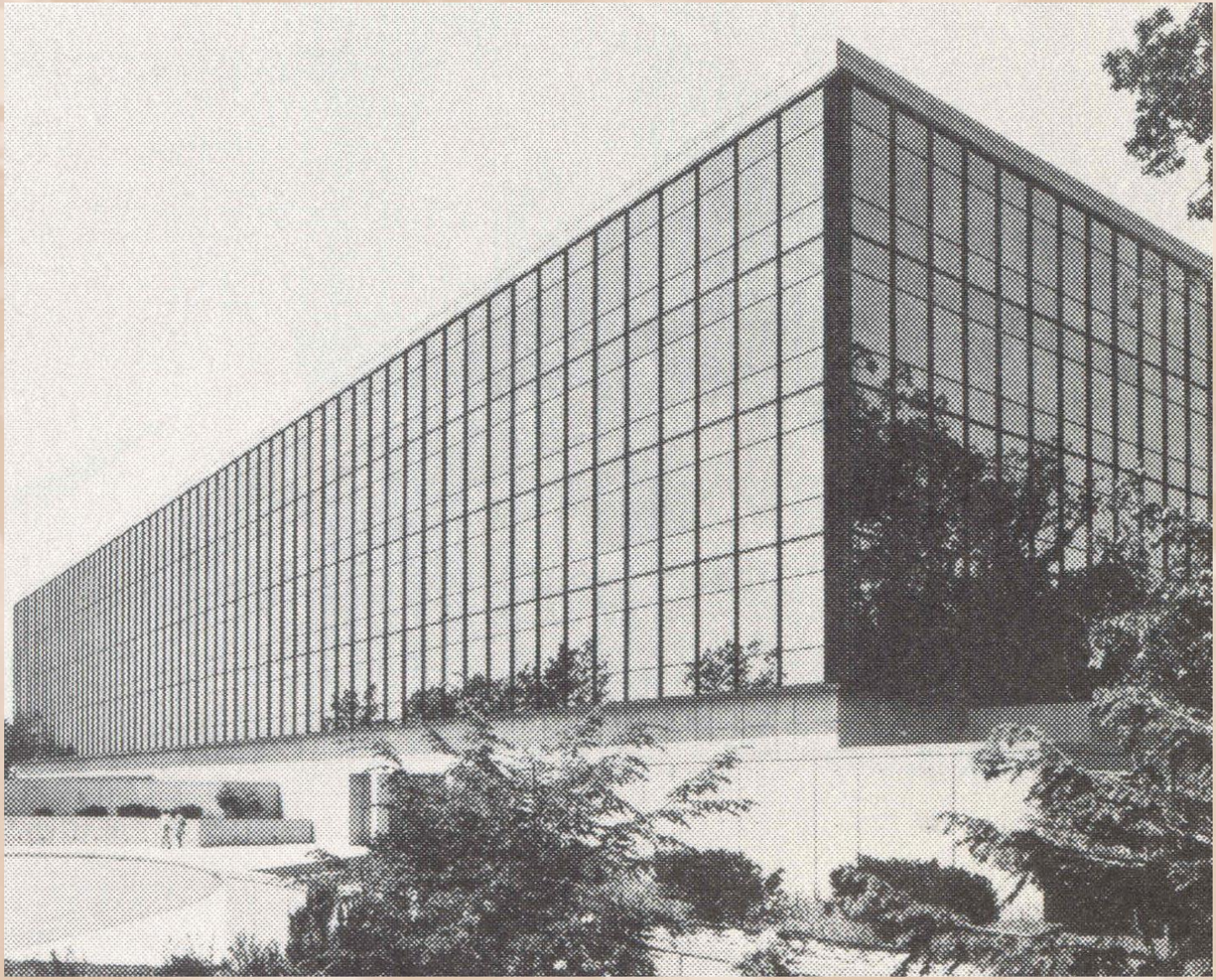
who will preserve the historic computers?

Computer History Museum

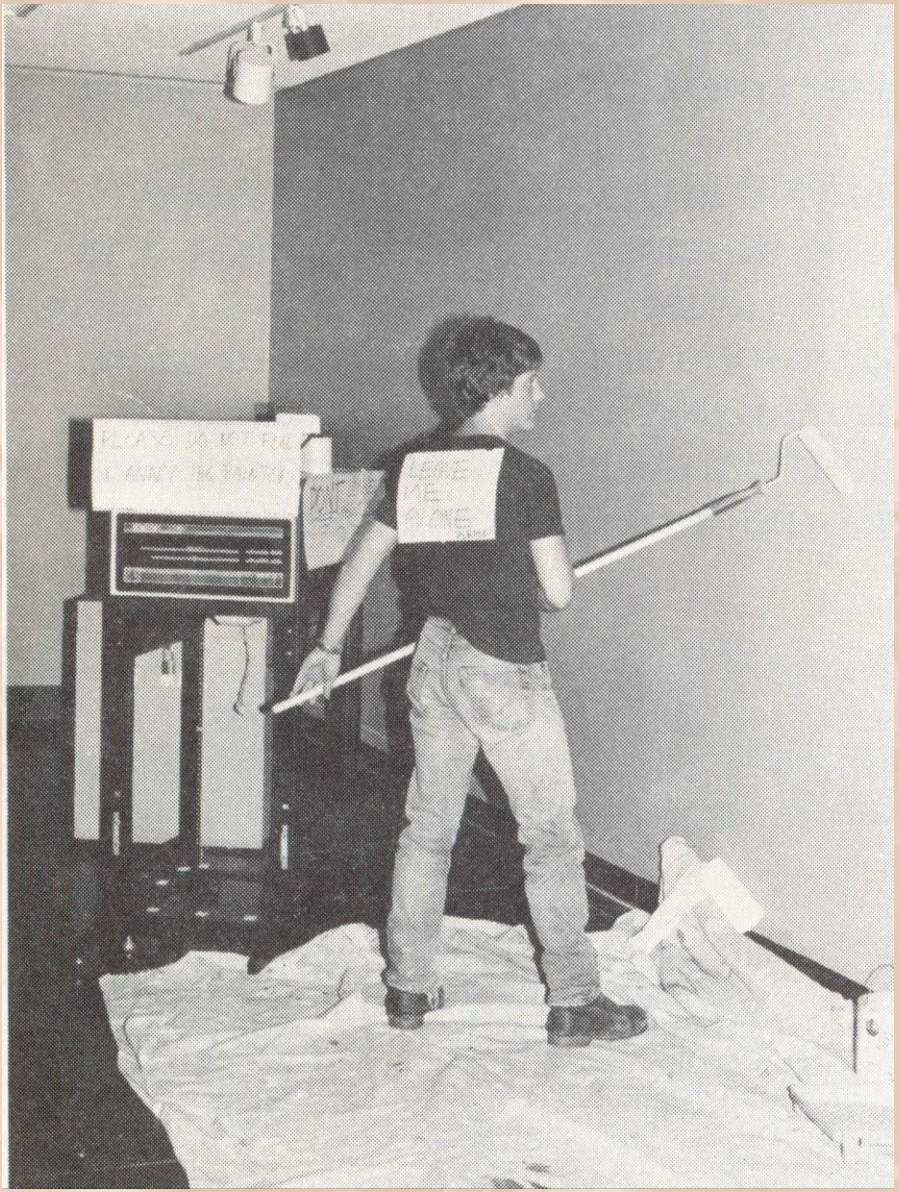


Computer museums before 1979

Computer History Museum

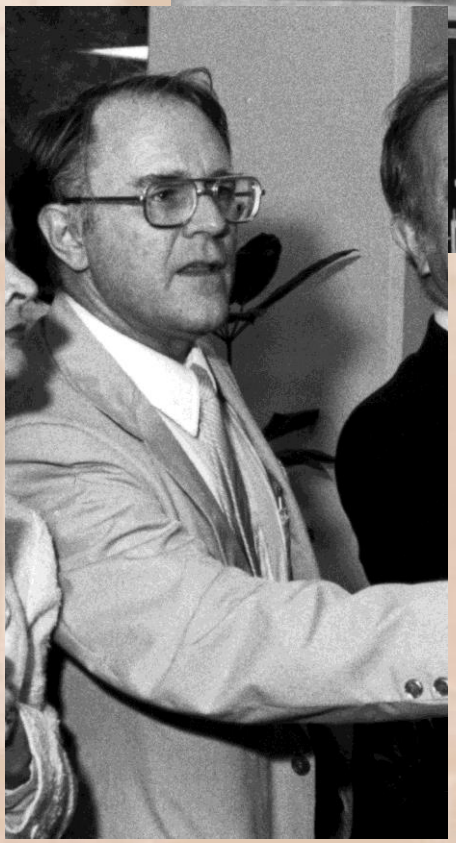


Digital Equipment Corporation, Marlboro MA



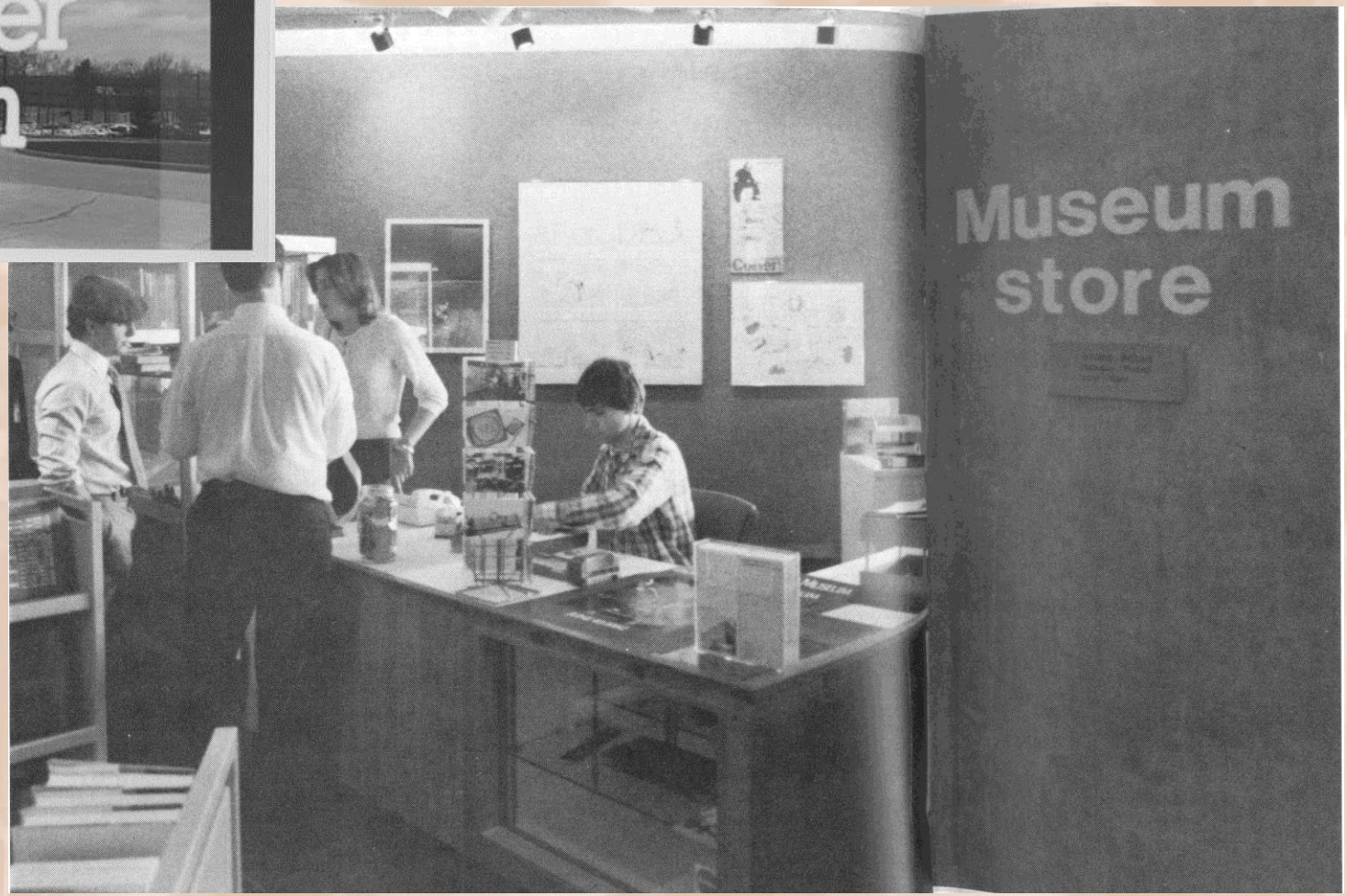
Interns preparing the space

Gwen Bell



Gordon Bell

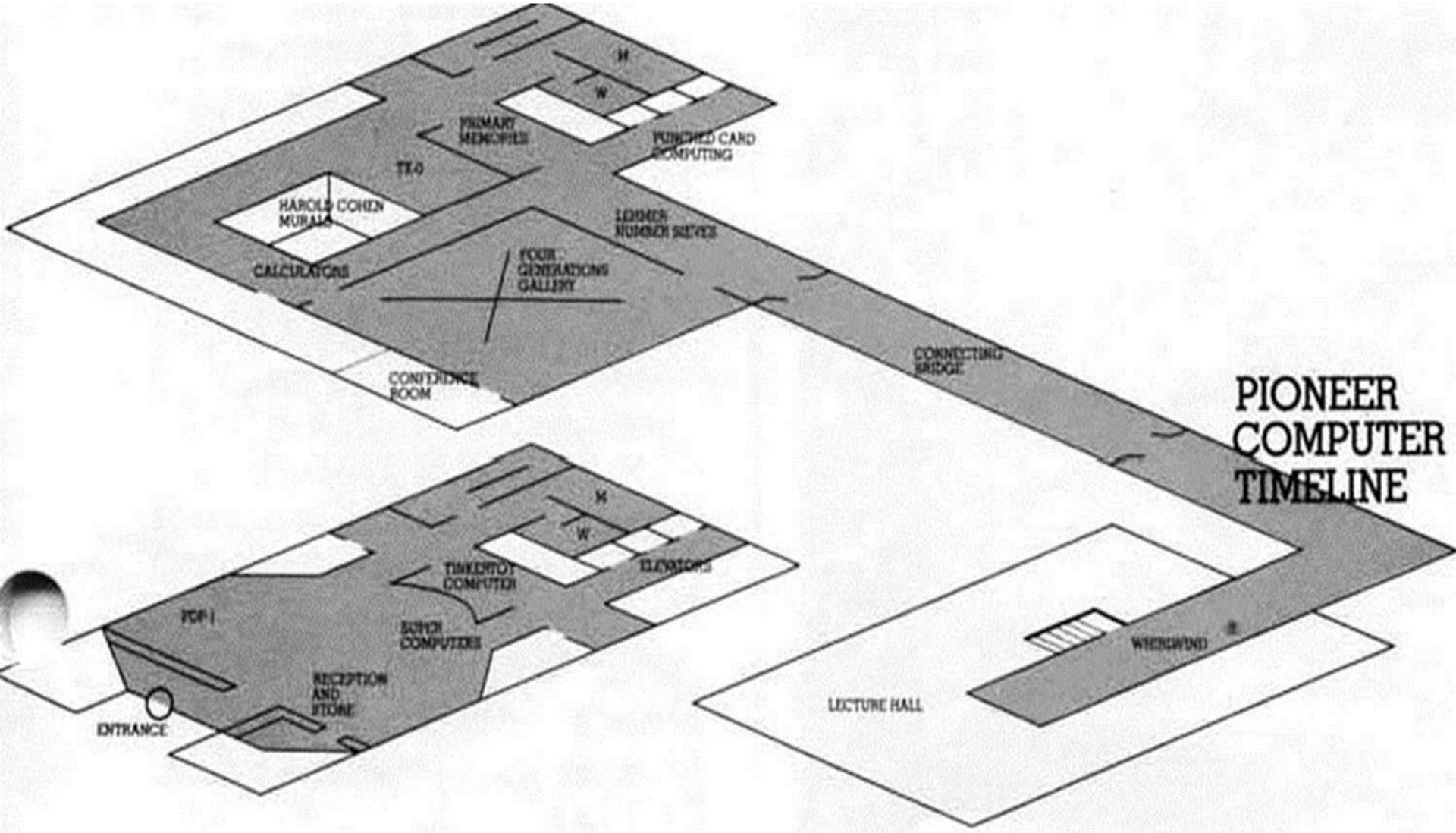
Computer History Museum

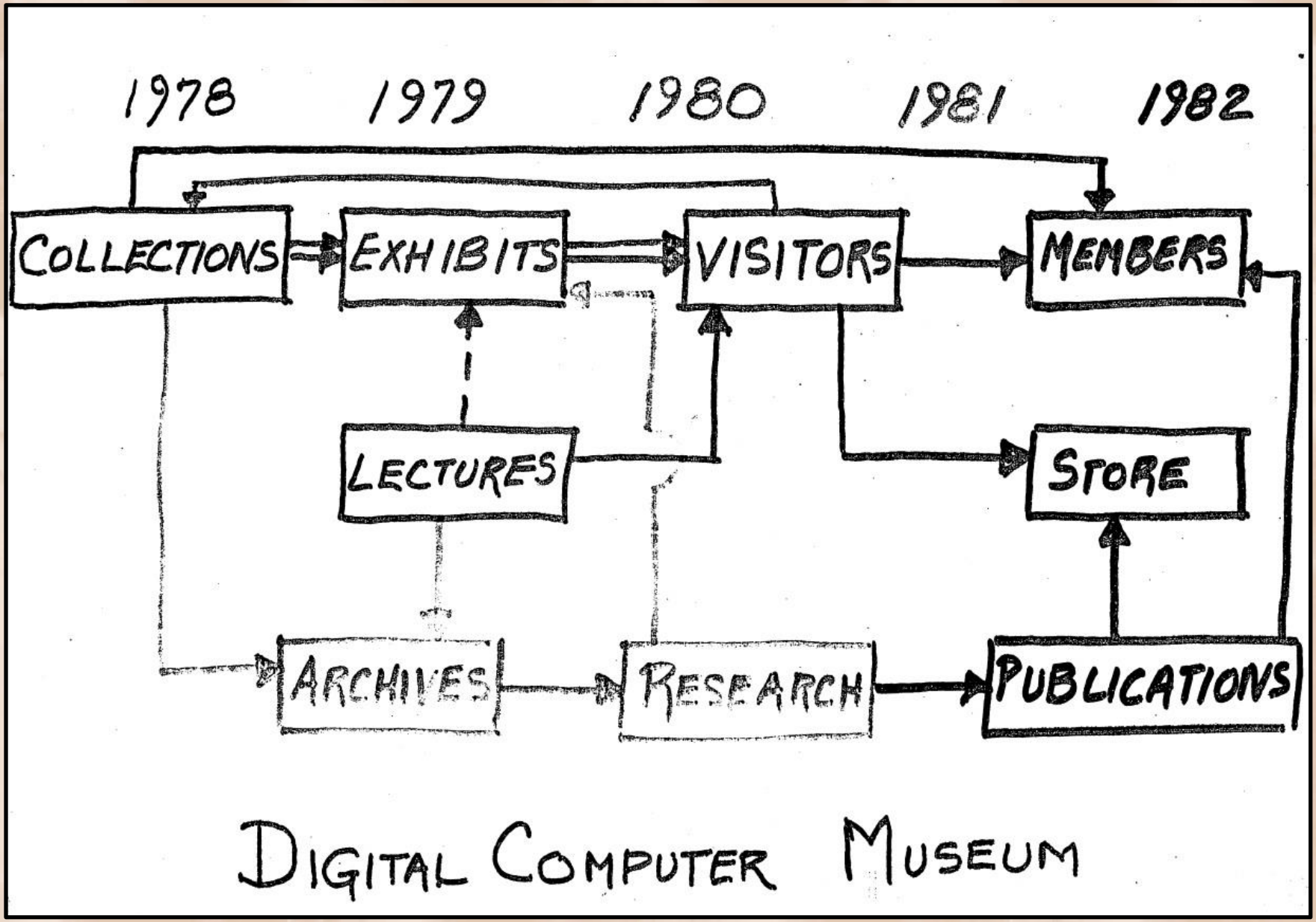


Digital Computer Museum, 1979-1983

Computer History Museum

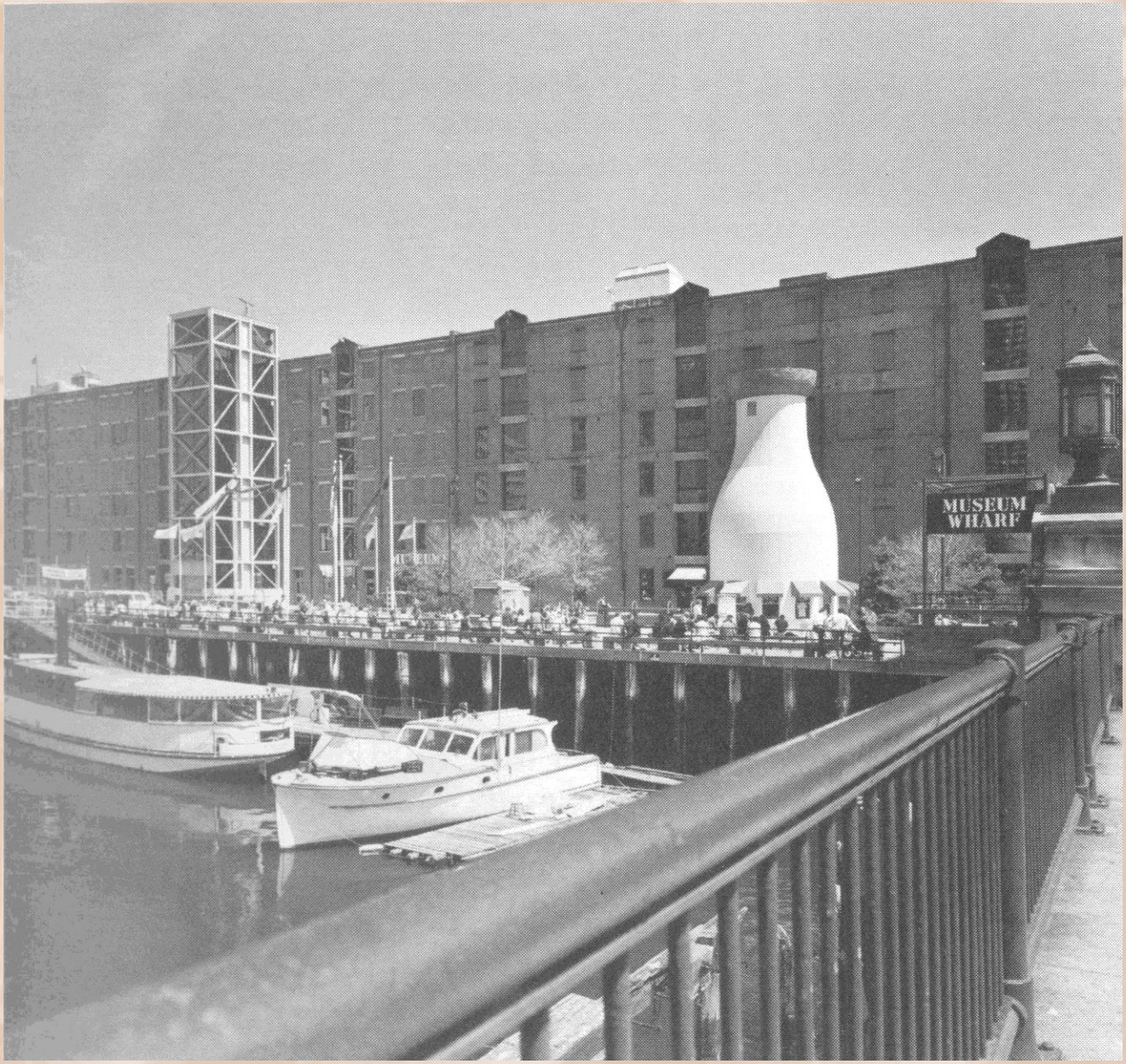
The Digital Computer Museum, Marlboro MA
6,000 sq. ft. of exhibits





The museum's plan – then and now

Computer History Museum



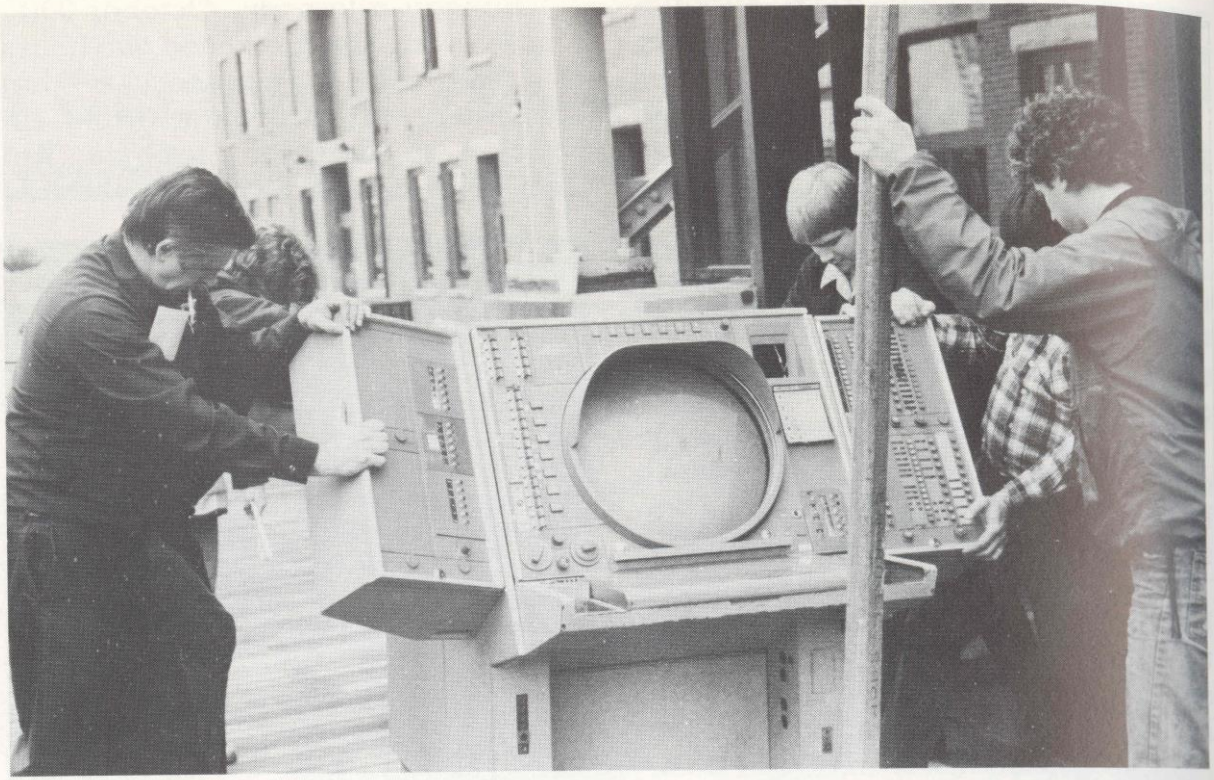
“Museum Wharf” in Boston

Computer History Museum

The Computer Museum, 1984-1999

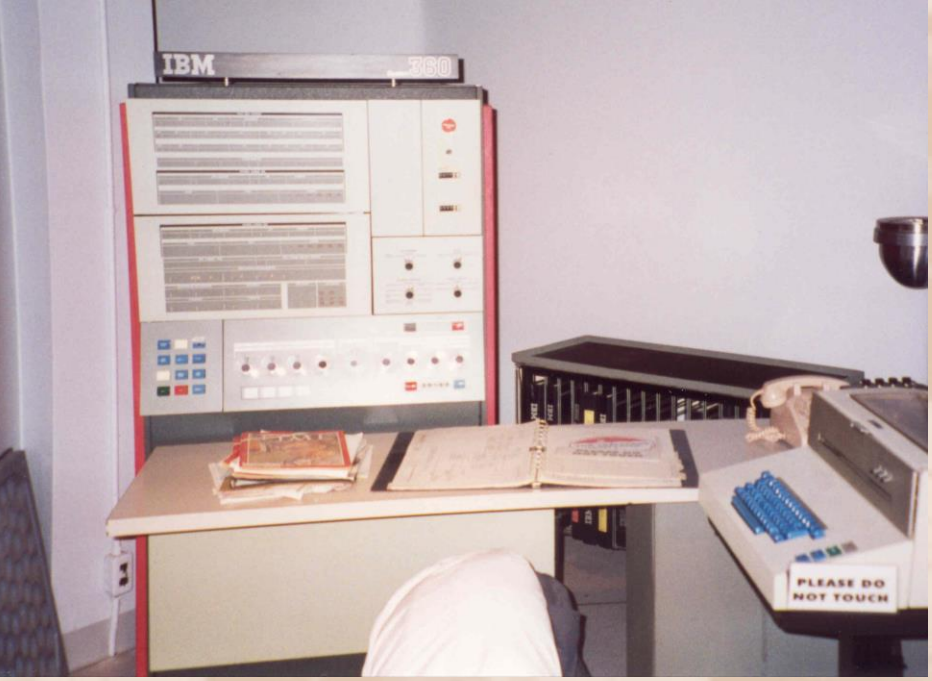
Computer History Museum

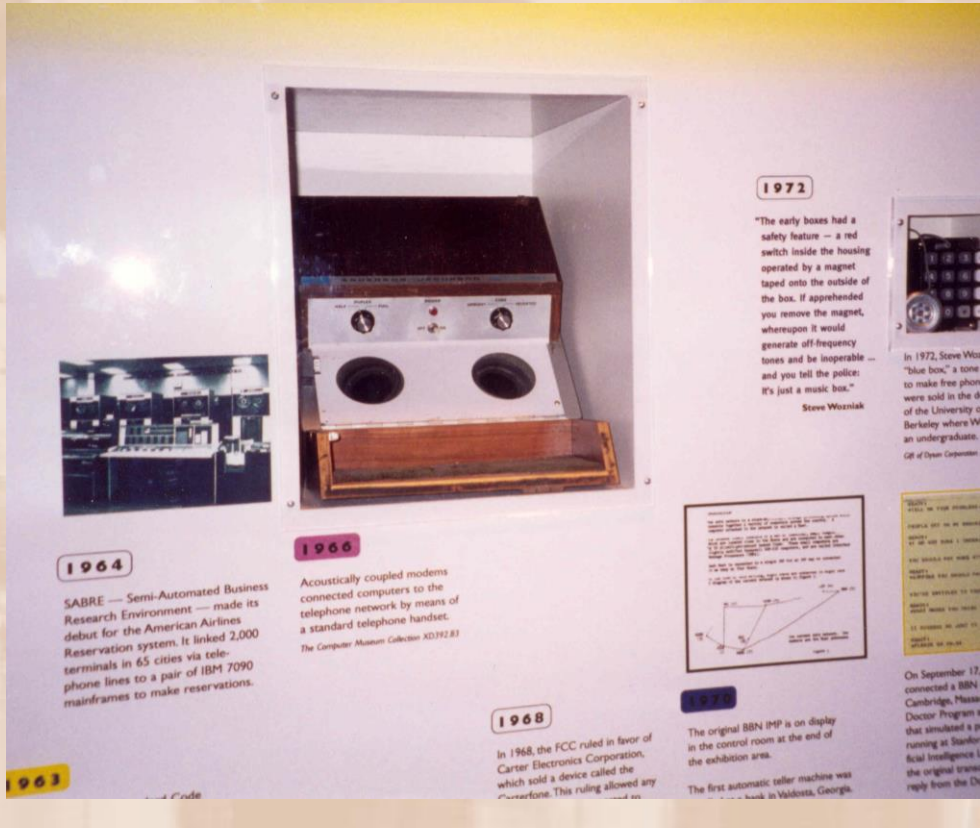
The Sage Arrives. *Cooperation of the Museum Wharf staff, the exhibits department and the movers were needed to heft a console of the SAGE Air Defense System into the elevator at the Museum's new quarters in Boston. The SAGE was the first machine to use command and control CRT display consoles on which operators identified targets by pointing at them with light pens. A total of 40,000 pounds of SAGE components were delivered in October. They will be used to recreate the SAGE installation at The Computer Museum.*

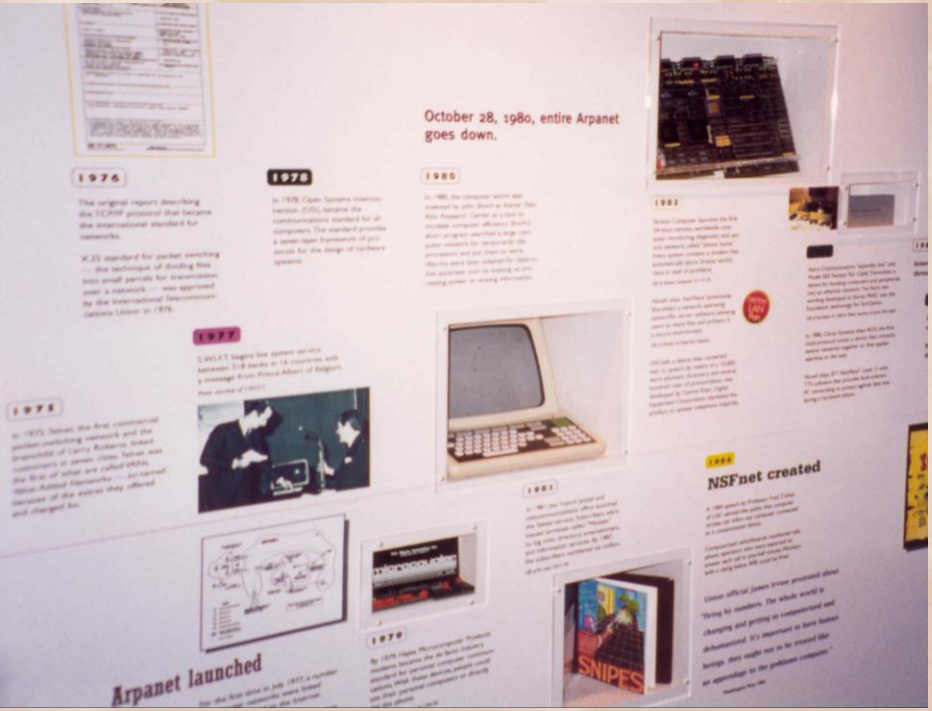


Moving the collection

Computer History Museum







exhibiting…

Computer History Museum

… with old-style dioramas

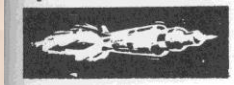
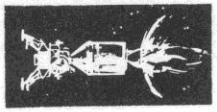
Computer History Museum

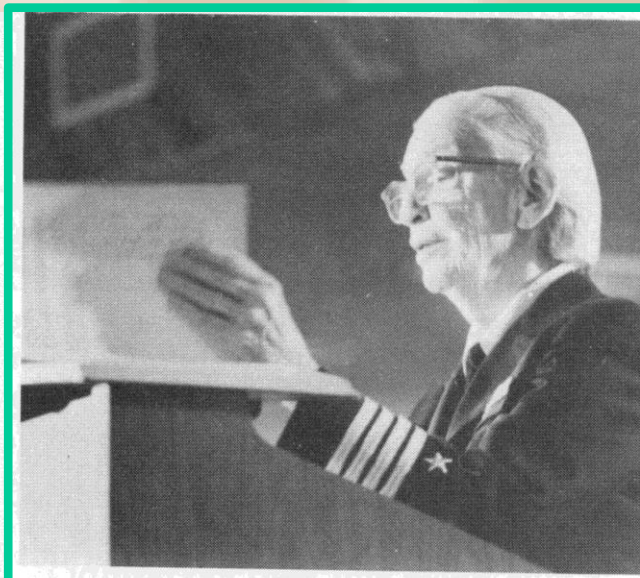
The Computer Museum Bits and Bites

Bits of history and bites for sustenance
Eight Sunday Afternoons

At 2 pm, a guided tour will cover the highpoints of the Museum.

AT 3 PM, TALKS ON...

March 20 **3 pm**	**Oliver Selfridge**	**Ruminations on the Beginnings of AI and What Ought to Lie Ahead**	As a young assistant to Norbert Weiner, and as one of only ten participants in the first conference on Artificial Intelligence at Dartmouth, Oliver Selfridge has been involved in the development of AI from the beginning. It is from this perspective that Selfridge asks the questions, what were the early developers dreaming of in the 50's and are we dreaming the same things today?
March 27 **3 pm**	**Steve Russell, Shag Graetz, and Alan Kotok**	**Spacewar! The First Video Game** 	Russell, Graetz, and Kotok were graduate students at MIT when the new PDP-1, the first small-scale, interactive computer arrived. What started out as a demonstration of its resources turned into the development of a computer-based video game—Spacewar! Russell, Graetz, and Kotok, tell how their shared passion for sci-fi movies, games and computers drove them to invent the first video-game that is the grandfather of contemporary games. And of course, the game will be demonstrated and you will have an opportunity for a match with the past masters!
April 3	**Museum closed for Easter**		
April 10 **3 pm**	**Ramon Alonso and Albert Hopkins** 	**Designing AGC: The Apollo Guidance Computer** 	When NASA wanted MIT's Draper Lab to design, construct, and deploy a computer for the Apollo mission, mini-computers were a thing of the future. What was developed was the AGC, a user-friendly computer measuring one cubic foot, that flawlessly guided the Apollo mission to the moon. Alonso and Hopkins, two of its key architects discuss how size, weight, and layout of the space capsule affected the AGC's design.
April 17 **3 pm**	**Ted Bonn** 	**Early Technical Innovations at UNIVAC**	As a member of the UNIVAC I team Ted Bonn will describe its pioneering role in the development of thin film for magnetic recordings and early computer peripherals.
April 24 **3 pm**	**Donald Davies**	**Early History of Cipher Machines**	Dr. Donald Davies, of England's National Physical Laboratory, will talk about cipher machines, in particular the little-known Siemens T52 (used in France and Norway after World War II). He will relate it to both earlier code machines and lessons relevant to contemporary data security.
May 1 **3 pm**	**Charles Adams and Jack Gilmore**	**Whirlwind for the Small-scale User**	Charles Adams and Jack Gilmore, who were responsible for developing software for MIT's Whirlwind, the first real-time computer, tell how it was not only used for large-scale problem solving for the Office of Naval Research, but also put to practical everyday use. They will reveal how it became the first, largest, and most expensive word processor ever.
May 8 **3 pm**	**Grace Morton**	**The Computer as Poet**	Grace Morton is a Cambridge-based computer programmer experimenting with a new application of computer technology—generating poetry. Mother's Day provides the inspiration for her work in self-generating poetry and poetry based upon user interaction.

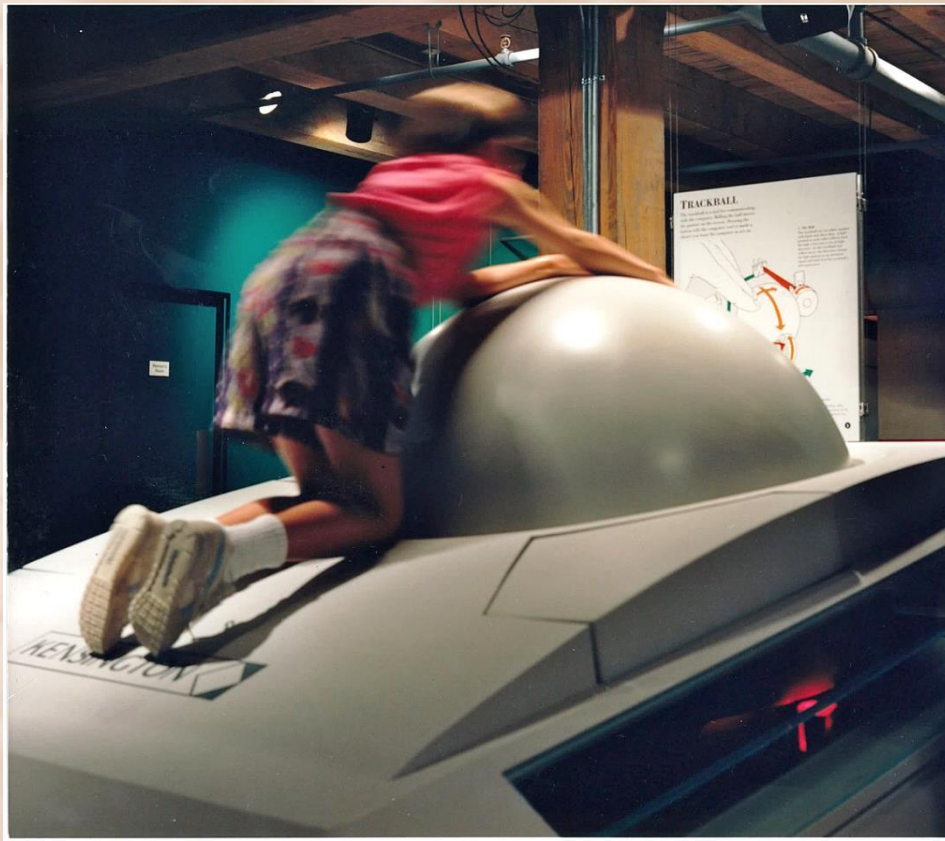


Commodore Grace Murray Hopper, speaking at The Computer Museum, April 14, 1983.

Fellows
Awards

Lectures

Computer History Museum



Attracting kids?

For lots of details: http://tcm.computerhistory.org

Computer History Museum

ELECTRICAL ENGINEERI

EE282° Computer Architecture and Organization

Course Objective

To introduce the design principles and to discuss the design issues of associated with microprocessor based systems.

Course Description

Structure of systems using processors, memories, input/output (I/O) devices, and I/O interfaces as building blocks. Computer system instruction set design and implementation, including memory hierarchies and pipelining. Issues and tradeoffs involved in the design of computer system architectures with respect to the design of instruction sets.

Prerequisites

EE182

Topics

1. Architecture design principles (2 classes)
2. Measuring cost and performance (2 classes)
3. Instruction set design (4 classes)
4. Processor implementation techniques (1 class)
5. Pipelining (4 classes)
6. Memory Hierarchies (4 classes)
7. I/O systems (2 classes)

Instructor

Leonard Shustek

Email: shustekl@smtplink.NGC.COM

The Case for a Silicon Valley Computer History Center

The computer was not invented in the San Francisco Bay area, nor are most of the world's computers built here. But few would argue with Silicon Valley's claim to the title of intellectual capital of the computer business. The confluence of established companies, startups, venture capital firms, technology-friendly universities, and media coverage has caused the center of gravity to shift to this area.

Perhaps because the early development of computers was centered elsewhere, an appreciation of the history of computers has not been much expressed here until recently. That has changed, however, and the objective of this paper is to show that **now is the time, and Silicon Valley is the place, to establish a major computer history center and the world's premier display collection of computer memorabilia**.

Why now?

The awakening of interest in computer history is fueled in large part by the sudden awareness that history not preserved is history lost. We can see that two important things are being lost at an accelerating rate: old computers, and people.

The new model of computing based on small distributed machines is quickly becoming dominant, and the mainframes and minicomputers on which the previous generation was based are disappearing. Machines from the 40's and 50's are no longer available for preservation, and those from the 60's and 70's are going fast. Unless significant specimens are saved, they will be lost forever. In fifty years no one will have any sense of

In the meantime, in Silicon Valley…

Computer History Museum

The Computer Museum NEWS
Winter 1997
Special History Center Issue

Museum Opens Computer History Center in Silicon Valley

On an Indian-summer day last September in Mountain View, Calif., four 18-wheelers completed their cross-country trek to deliver 100,000 pounds, or one-half, of the Museum's collection from Boston to the NASA Ames Research Center. The Museum was not turning its prize jewels over to the government, but, rather, NASA was generously donating valuable warehouse space for the collections. The Museum was taking a giant leap forward in advancing the third leg of its mission to be "an international resource for research into the history of computing." The warehouse space on NASA's Moffett Field was the beginning of the creation of The Computer Museum History Center.

The Computer Museum History Center's charter is to continue to build the 15-year-old collection proactively and be a resource for research into the history of computing. At the same time, the Center and the Museum will liberally share the collections, and a historical context will continue to infuse Boston exhibits. The collection is also available for use by publications as well as scholars, educators, researchers, engineers and journalists.

The Epiphany

Initial underwriting for the Center was provided by Gwen and Gordon Bell and Dr. Leonard J. Shustek. Shustek is co-founder and fellow of Network General Corporation, a Computer Museum board member, and serves as chairman of the Center. Shustek became involved in the History Center

Shustek joined the "work in progress," playing a key role in establishing the History Center. He was at the Moffett Field warehouse—Building 126, a former furniture showroom—the day the moving vans arrived. Taking in the collection was a back-breaking reminder of how far the industry has come. All the raw processing power in those four vans can now be held in two hands.

Collection Highlights

Some of The Computer Museum History Center's collection was donated by NASA Ames, such as the ILLIAC IV supercomputer and Robert Morris' Worm. Artifacts include a complete collection of Seymour Cray's computers from NTDS 17 (1957) to the Cray 1 (1976); Whirlwind (1951); UNIVAC 1 (1952); the PDP-1 with original *SpaceWar* game (1962); and more than

East Meets West

Computer History Museum

Free Space!

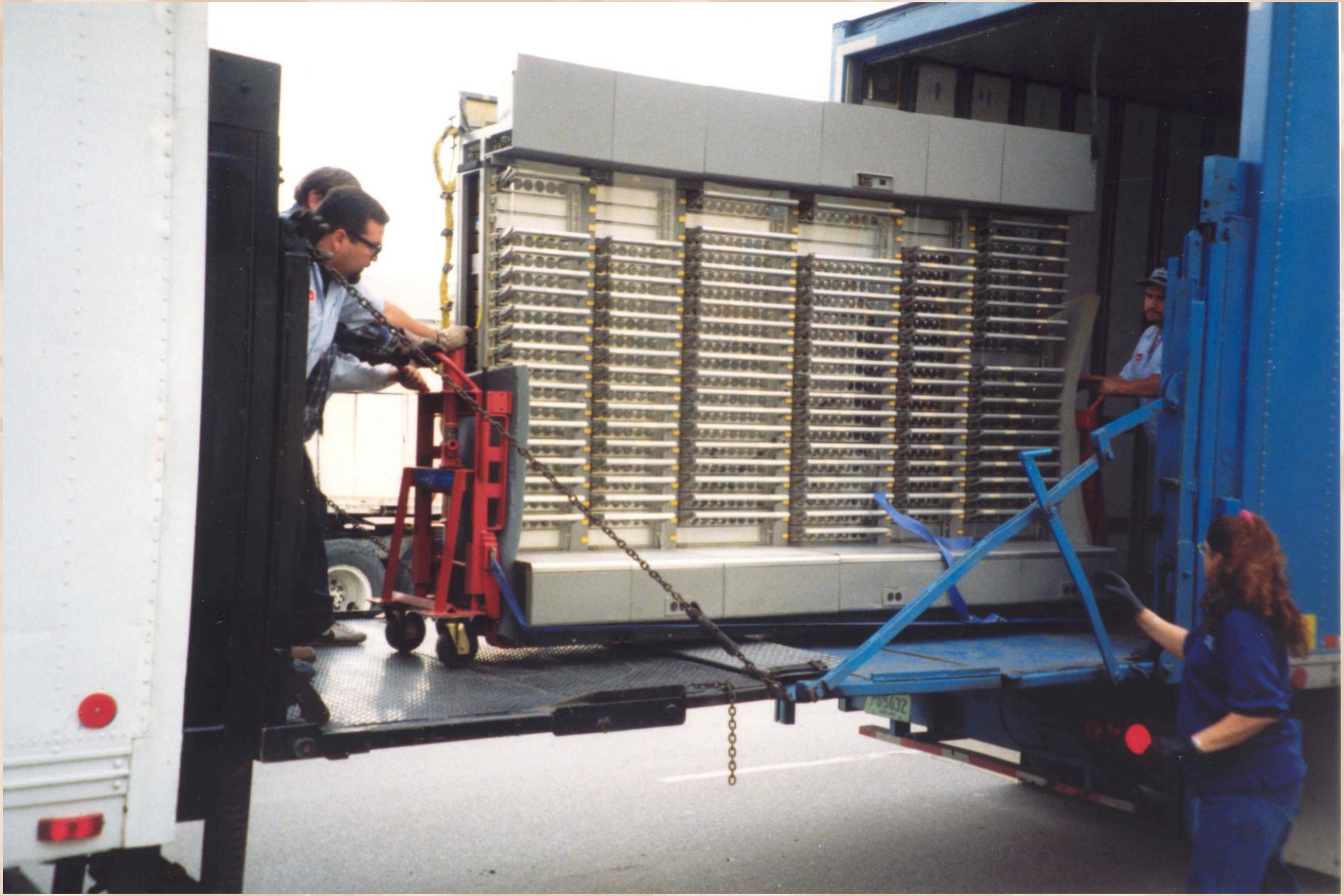
Computer History Museum

Sept 1996: Moving the collection again

Computer History Museum

Some are easy

Computer History Museum

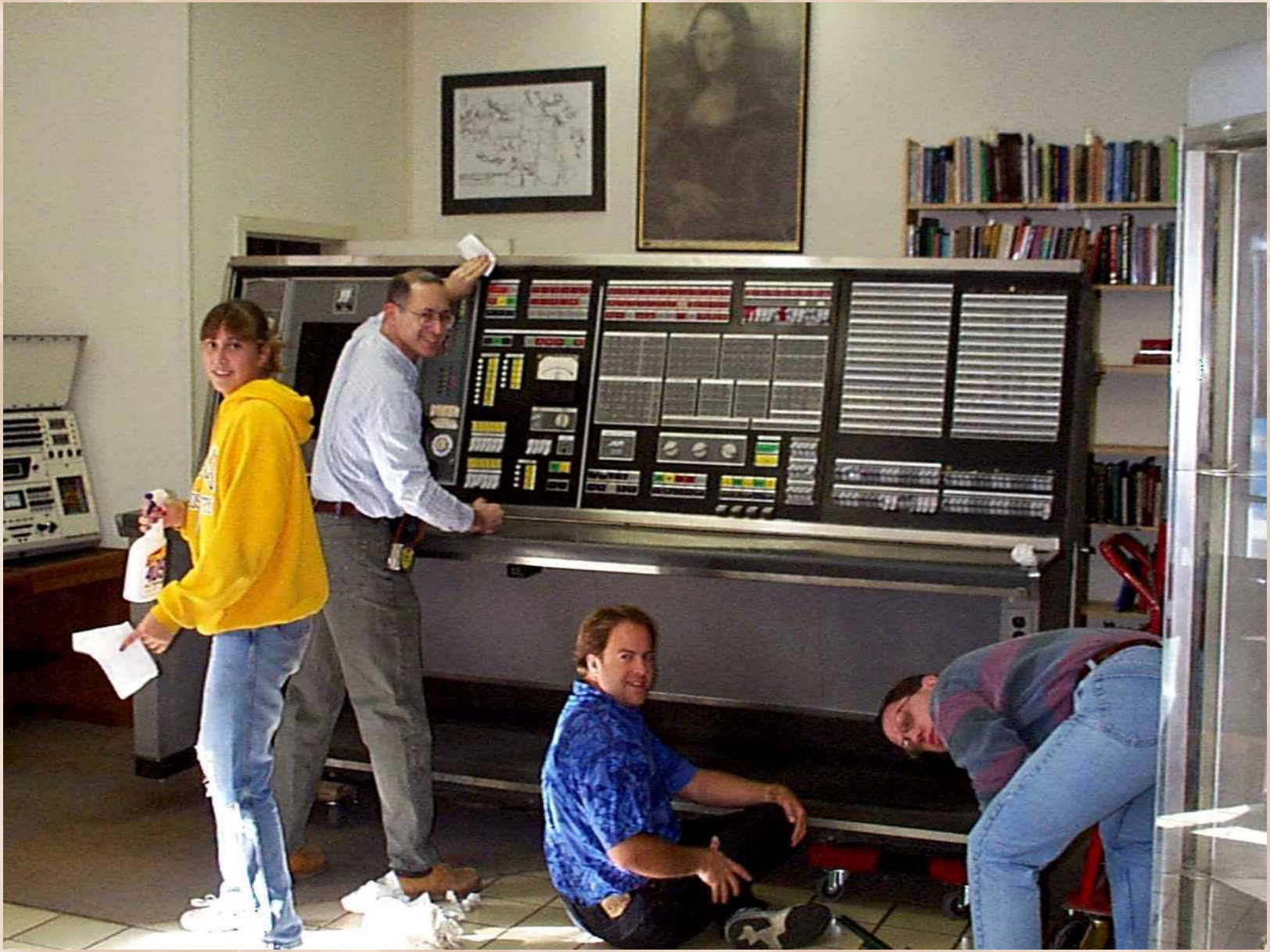


Some are hard

Computer History Museum

Even into the dirigible hanger!

Computer History Museum



Cleaning up

Computer History Museum

What is all this stuff?

Computer History Museum

Visible Storage, V1.0

Computer History Museum

Not many labels, just stuff

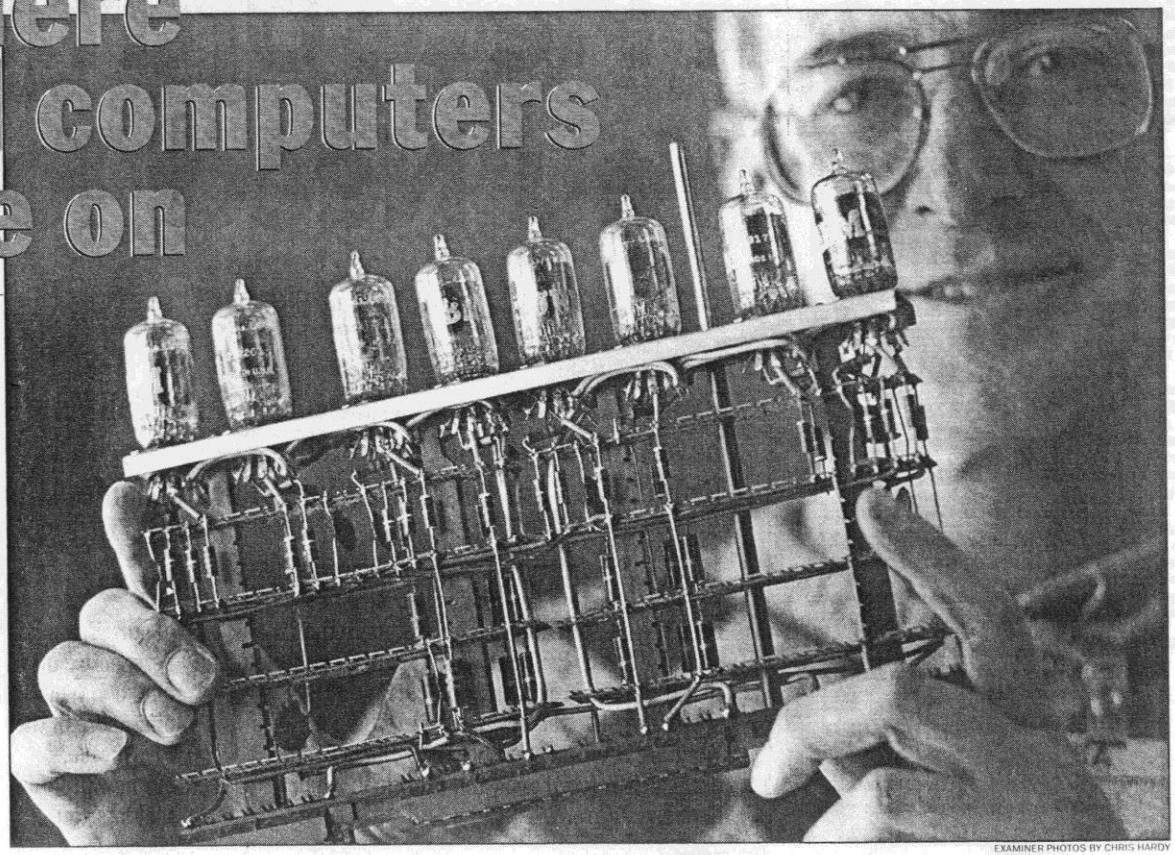
Computer History Museum

San Francisco Examiner ★ ★ Sunday, December 22, 1996 B-5

COMPUTERS & TECHNOLOGY

Where old computers live on

Permanent home being sought for Silicon Valley's ode to gigabytes



EXAMINER PHOTOS BY CHRIS HARDY

Getting the word out

Computer History Museum

NASA's plan

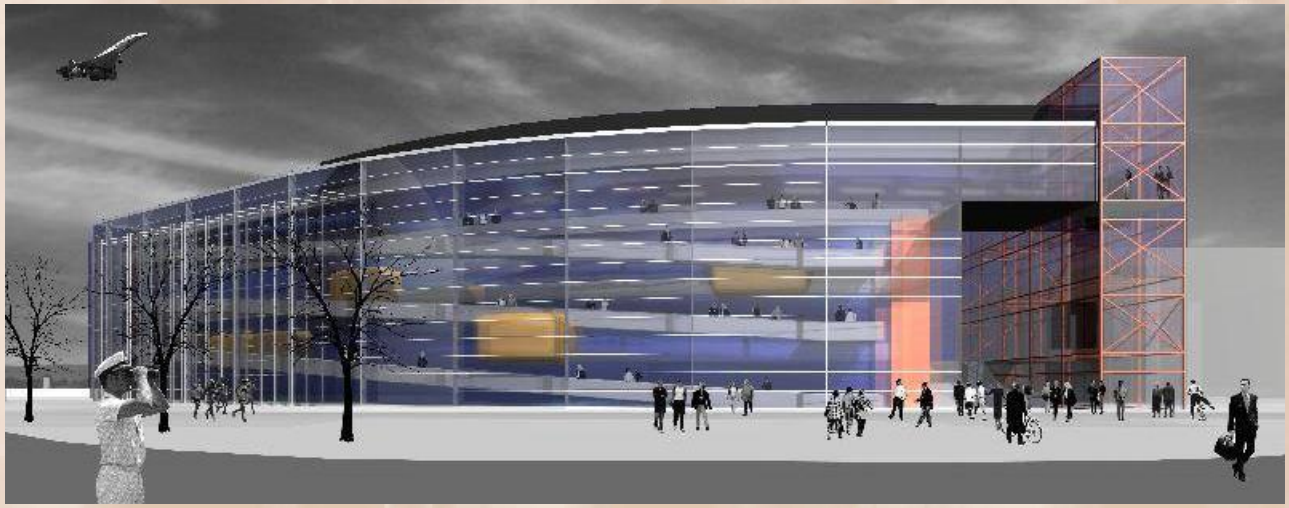
Computer History Museum

California Air & Space Center

Inspiring Education for the Next Millennium

Our proposed “beta” building

Computer History Museum



Dreaming of the final building

Computer History Museum

The dot-com bust to the rescue

Computer History Museum

NEW ISSUE — BOOK-ENTRY ONLY

Rating: Moody's: Aa2/VMIG 1
(See "Ratings" herein)

In the opinion of Quint & Thimmig LLP, San Francisco, California, Bond Counsel, under existing statutes and court decisions and assuming continuing compliance by the Authority and the Corporation with certain conditions imposed by applicable federal tax law as described herein, interest on the Bonds is not included in gross income for federal income tax purposes and is not treated as a specific item of tax preference for purposes of the federal alternative minimum tax on individuals and corporations. Such interest, however, is included in the adjusted current earnings of certain corporations for purposes of computing the alternative minimum tax imposed on such corporations. Interest on the Bonds is exempt from present State of California personal income taxes. See "TAX MATTERS" herein.

$25,000,000

ABAG FINANCE AUTHORITY FOR NONPROFIT CORPORATIONS
VARIABLE RATE DEMAND REVENUE BONDS
(COMPUTER HISTORY MUSEUM)
SERIES 2002

Dated: Date of Delivery

Due: October 1, 2032

This cover page contains certain information for general reference only. It is not intended to be a summary of the security or terms of this issue. Potential investors are advised to read the entire Official Statement to obtain information essential to the making of an informed investment decision. Capitalized terms used on this cover page not otherwise defined shall have the meanings set forth herein.

The Bonds will initially bear interest at a Weekly Rate payable on the first Business Day of each month, commencing November 1, 2002. The Bonds may be converted to a Term Mode or a Fixed Rate Mode. The Bonds are being issued pursuant to an Indenture, dated as of October 1, 2002 (the "Indenture"), by and between the ABAG Finance Authority for Nonprofit Corporations (the "Authority") and Wells Fargo Bank, National Association (the "Trustee"). The Authority will lend the proceeds of the Bonds to the Computer History Museum (the "Corporation"), pursuant to a Loan Agreement, dated as of October 1, 2002 (the "Loan Agreement"), between the Authority and the Corporation. The Bonds are limited obligations of the Authority payable solely from and secured by certain Revenues pledged under the Indenture, consisting primarily of Loan Payments made by the Corporation under the Loan Agreement and certain other funds as provided in the Indenture.

The Bonds will finance (a) a portion of the costs of acquisition and renovation of a 119,000 square foot, two-story building located on 7.5 acres of land in Mountain View, California (the "Project") (b) capitalized interest on the Bonds through June 1, 2003 (estimated based on assumption of variable interest rates), and (c) certain costs of issuance of the Bonds. See "ESTIMATED SOURCES AND USES OF FUNDS" herein.

The Bonds will be issued in fully registered form only and, when issued, will be registered in the name of Cede & Co., as nominee of The Depository Trust Company, New York, New York ("DTC"). DTC will act as securities depository for the Bonds. Individual purchases will be made in book-entry form only. Purchasers of the Bonds will not receive physical certificates representing their beneficial ownership interests in the Bonds purchased. The Bonds will be issued in denominations of $100,000 or any integral multiple thereof while in the Weekly Mode. Payments of principal of, premium, if any, and interest on the Bonds will be paid by the Trustee to DTC, which is obligated in turn to remit such principal,

"you want to borrow money?!"

Computer History Museum

Moving again!

Computer History Museum

More stuff this time around

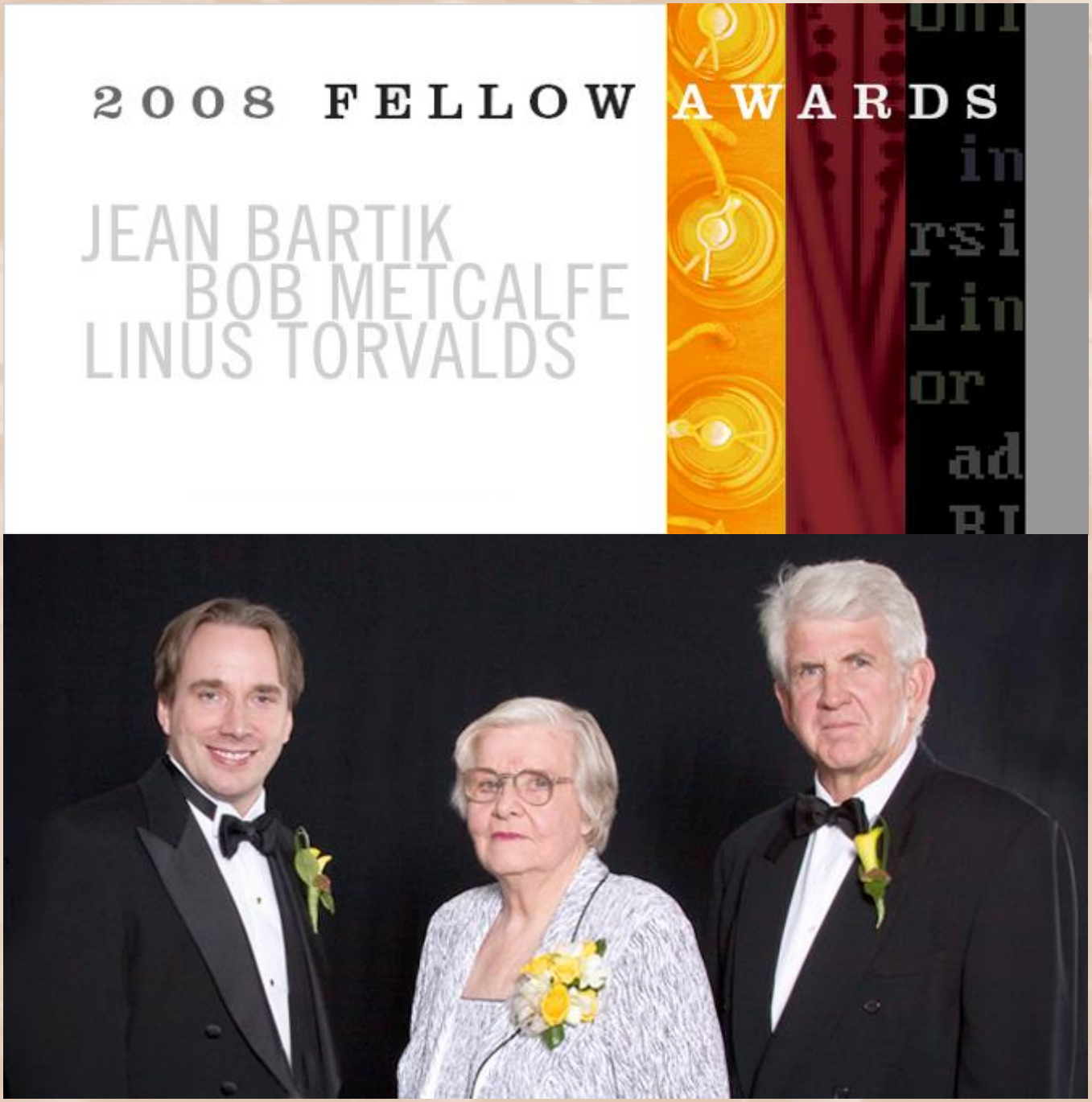
Computer History Museum

Visible Storage, version 2.0

Computer History Museum

restoring old computers

Computer History Museum



Reviving the Fellows Awards

Computer History Museum

Out of space? Buy a warehouse!

Computer History Museum

Temporary Exhibits

Computer History Museum

John Hollar arrives, and…

…finally, the professional exhibit we were dreaming of!

Computer History Museum

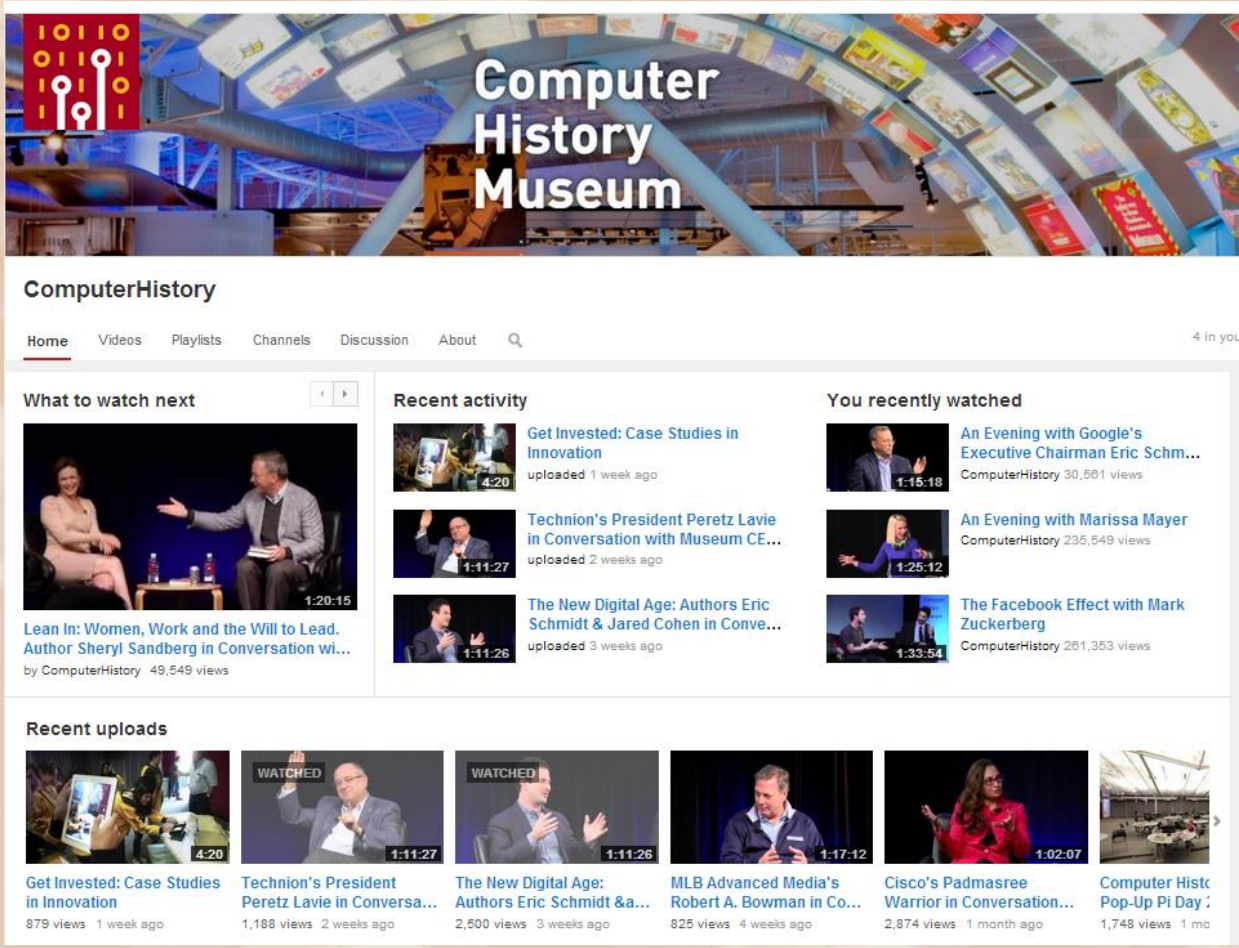
$20M permanent exhibition: "Revolution: The First 2000 Years of Computing"

- From the abacus to the iPhone
- 155 screens, 40 interactives
- 1,500 objects, 5,000 images, 200,000 words, 16 films, 4 theaters
- "The Valley's answer to the Smithsonian"– USA Today

Computer History Museum

The multi-platform Museum

- YouTube channels with 5M+ views of 160 programs; 30,000 subscribers
- Lecture series carried on PBS, NPR, C-SPAN
- Computerhistory.org: one of the most heavily trafficked museum sites in US



Computer History Museum

Facts & figures

- 125,000+ guests/year; Half are non-US visitors
- 110,000-item collection (world's largest)
- 80+ oral histories/year, 700+ in library
- $9.5M budget (2015)
- $100M+ raised since inception
- $30M endowment
- 350+ events/year
- Major speaker series distributed nationally
- Growing education program
- 200+ amazing volunteers

Computer History Museum