Events and Sightings

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Project Whirlwind Reunion and Collection Transfer

A reunion of the Project Whirlwind team took place on June 30 at Le Meridien Hotel in Cambridge, Massachusetts. The event featured a ceremony marking the transfer of documents detailing pioneering digital computing research conducted in the 1940s and 1950s from MITRE (www.mitre.org) to the Massachusetts Institute of Technology, where the contents are now available to the public for the first time through the MIT Libraries and Institute Archives. Guests of honor included Jay Forrester, a professor of management at MIT and pioneer of the field of system dynamics, and Robert Everett, MITRE's first technical director and later president from 1969 to 1986. Together, Forrester and Everett led the 70-member Whirlwind research team at MIT's Digital Computer Laboratory (see Figure 1) as director and associate director, respectively.

Whirlwind I, the first digital computer at MIT and the fastest of its time, was completed in 1951. It took up 3,300 square feet within a two-story building. The precursor to modern-day computers, Whirlwind's fingerprints are evident in today's software and hardware, including parallel digit processing, random-access memory, magnetic-core memory—which made the initial launching of commercial computers possible—and the interactive visual computer display. In operation until 1959, Whirlwind's groundbreaking design also laid the foundation for simulation and real-time technology and formed the basis for the US Air Force's Semi-Automatic Ground Environment (SAGE) air defense system, the development of which led to MITRE's creation. MITRE assumed custody of the Whirlwind collection in 1958, upon Everett and other Whirlwind researchers' move from MIT's Lincoln Laboratory to MITRE—then a newly established not-for-profit corporation formed to provide the Air Force with ongoing systems engineering support for North America's air defense.

Judy Clapp, a member of Project Whirlwind and a MITRE retiree, headed the committee that organized the reunion. Speaking at the event, MITRE President and CEO Alfred Grasso commented on the collection transfer, calling it "a fitting tribute—particularly after celebrating our 50th anniversary last year—to return this significant piece of history to the academic home of MITRE's roots." MIT President Susan Hockfield praised MITRE's stewardship of the collection. Andrew Gerber, associate division head of Air and Missile Defense Technology at Lincoln Laboratory, also attended the event, during which the collection's website was demonstrated.

Three years ago, with input from Everett, MITRE's Corporate Archives started the process of digitizing and getting public release approval for 1,800 Whirlwind memos and summary reports. Key documents are now available online through the MIT Libraries' digital repository. (See http://dome.mit.edu/handle/1721.3/37456 for information.) "Realizing that MIT has one of the pre-eminent technical archives in the world, with resources to support public research, and realizing that the Whirlwind collection was created under the auspices of MIT, the logical conclusion in the public interest and in the interest of archival provenance was to transfer the papers and copies of the newly digitized collection over to MIT," said MITRE's Manager of Corporate Records and Archives George Despres, who led the effort to transfer the historic materials. Despres recognized Clapp and Tom Rosko, head of MIT Archives, for their assistance with the transfer.

The MIT Libraries support the institute's programs of study and research with extensive collections that

IEEE Computer Society Awards

In June 2009, IEEE Computer Society honored three pioneers with its Computer Pioneer and Computer Entrepreneur Awards. Jean Jennings Bartik received the Computer Pioneer Award, "For pioneering work as one of the first programmers, including co-leading the first teams of ENIAC programmers, and pioneering work on BINAC and UNIVAC I." Bartik holds a BS in mathematics from Northwest Missouri State Teachers College (now Northwest Missouri State University), an MS in english from the University of Pennsylvania, and an honorary doctor of science from Northwest. Northwest also established the Jean Jennings Bartik Computing Museum to house a the history of computing and its emphasis is on PCs, Digital's PDP-11, ENIAC, BINAC, and Univac. Her speech at the award ceremony is available at http://www2.computer.org/portal/web/csvideos/home/-/blogs/1326132?_33_redirect=%2Fportal%2Fweb%2Fcsvideos.

Adobe founders Charles M. Geschke and John E. Warnock received the Computer Entrepreneur Award, "For inventing PostScript and PDF and helping to launch the desktop publishing revolution and change the way people engage with information and entertainment."

 Published by the IEEE Computer Society 1058-6180/09/$26.00

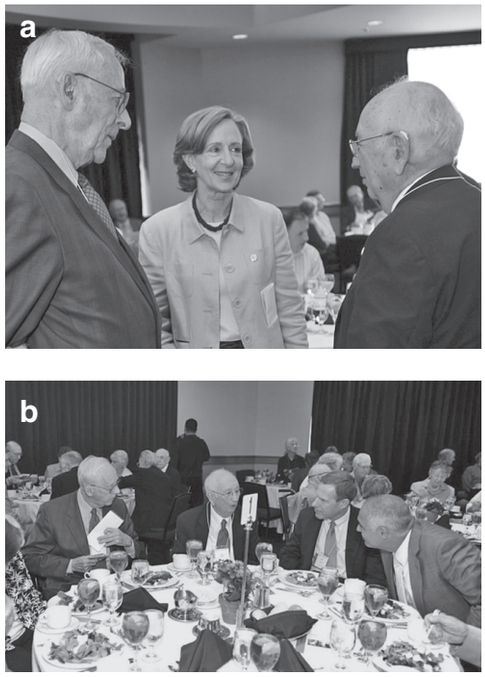

Figure 1. Reunion of the Project Whirlwind team. (a) From left to right: Project Whirlwind member Jay Forrester, MIT President Susan Hockfield, and Project Whirlwind member Robert Everett. (b) Project Whirlwind member Jay Forrester, Project Whirlwind member Robert Everett, Andrew Gerber of Lincoln Laboratory, and MITRE President and CEO Alfred Grasso.

include more than five million items in print and digital formats. The addition of the Project Whirlwind materials is in keeping with the libraries' commitment to preserve MIT history and promote learning, discovery, and the advancement of knowledge at MIT and beyond.

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Sac State 8008: The First Microcomputer?

The DigiBarn Computer Museum, located in the redwood-forested Santa Cruz Mountains next to Silicon Valley in Northern California, specializes in the medium of personal, interactive computing and features artifacts as diverse as early 20th century manual Comptometers, the LINC of the 1960s, Xerox workstations such as the Alto, the homebrew computing revolution of the 1970s, and the commercialization of personal computing and networks from the 1980s to the present. The artifacts in the physical collection are supplemented by a large-scale cyber-artifact and oral history project on the project website (http://www.digibarn.com).

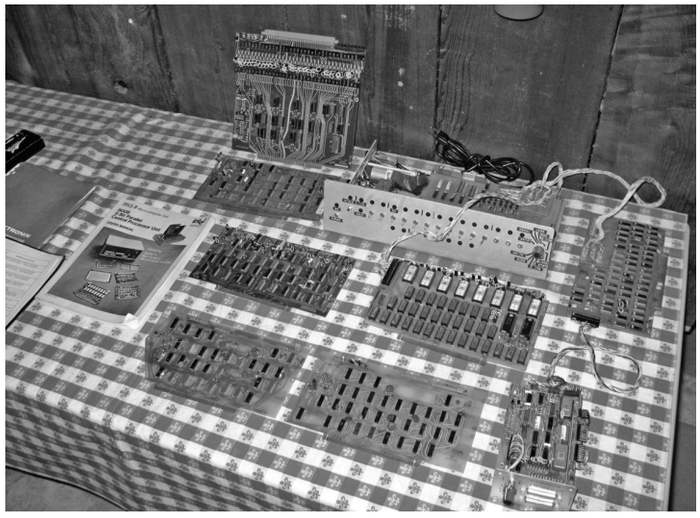

Figure 2. The complete Sac State 8008 artifacts donated by Bill Pentz.

One of the most exciting new donations arrived in the summer of 2008 when Bill Pentz paid a visit. Pentz has had a long career in computing, and during one phase in the early 1970s, he claims to have lead a project to create what he thinks might have been the first completely built-out computer based on a microprocessor, a kind of ''ur-microcomputer.'' I was impressed with his story, and when Pentz later returned with the actual artifacts (discovered decades later in friend's basement), the story got even more interesting.

Pentz donated several of the sole surviving artifacts from the original machine to the DigiBarn collections, including the boards for a complete system, but with no peripherals (see Figure 2): front panel, processor board with Intel 8008, and a board housing 8 Kbytes of RAM as well as 1702 PROMS. Pentz explained Pentz explained the PROMS had contained an IBM Basic Assembly Language (BAL) emulation and a primitive disk operating system (DOS) supporting drivers for a 3-MByte removable hard drive, serial communications interface, tape interface, TTY interface, and most importantly, the then-new Tektronix 4023 color raster graphics terminal housing all the boards in an L-shaped extender. Because this project was carried out at California State University Sacramento, I took to calling this the Sac State 8008.

To help visualize how this system might have looked in action, a colleague generated a 3D reconstruction (see Figure 3). Although

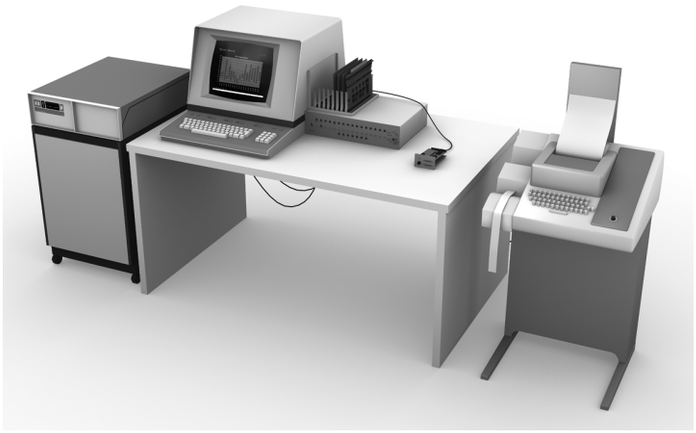

Figure 3. The 3D reconstruction of the Sac State 8008 microcomputer, circa 1972–1973. (Courtesy of Ryan Norkus, DigitalSpace)

Pentz explained that ''this looks way too clean, it was much messier,'' the basic components are correct, with (left to right) the Memorex 630 hard drive, the Tektronix 4023 with card extender and front switch panel to control the microcomputer, the serial interface, and ASR-33 with paper tape reader/punch and printer.

Pentz stated that the artifacts represented the fifth version of what began as wire wraps in the spring of 1972 to try to get the 8-bit Intel 8008 processor donated to the university to actually do something. Working with something so fast and new (with unpredictable timing) proved difficult until Tektronix, one of the best electronics firms in the world, stepped in and helped the Sac State team by engineering many of the boards and providing many more off the shelf parts including the 4023 terminal. No firm or hobbyist then experimenting with the 8008 (or 4004) had this level of support.

The project's goal was to support the Computerized Medical Records (COMERs) system commissioned by Garry Gordon, who was president of the American Medical Preventics Society. With the heroic efforts of many at the Sac State Computer Science/School of Engineering, Tektronix, and Intel, what emerged by spring or summer 1973 was a complete system able to support the management of tens of thousands of patient records on the hard disk, serial I/O to and from a mainframe, and display of color statistical outputs on the 4023 terminal. Indeed this system, fully two years before the arrival of the MITS Altair 8800 and the beginning of the Homebrew Computer Club, was in many ways a more complete microcomputer than would exist until the late 1970s.

I set about trying to test the veracity of Pentz's ''first PC'' claim by presenting the system and, in some cases Pentz himself, to historical players and experts in the community. An impromptu meeting at the Computer History Museum in Mountain View garnered some interest from the curators there. An open house at the Digibarn afforded myself and Pentz to meet Stan Mazor, who was a codesigner of the Intel 4004 and a contributor to the 8008. Stan was also impressed but didn't shed much light on Pentz's specific application of the 8008.

In April 2009, I presented a talk and exhibit on the Sac State 8008 artifacts to the attendees at the 35th Annual Asilomar Microcomputer Workshop. Following my talk, several people came into the demo room to inspect the artifacts. Among them were John Wharton (expert on Gary Kildall and early microcomputers), Bob Frankston (cocreator of Visicalc), and Lee Felsenstein. Lee had the best knowledge of the early microcomputer movement having chaired the Homebrew Computer Club starting in 1975. He was familiar with earlier systems such as Gordon French's attempts to build an 8008-based system. He was impressed by the artifacts stating ''this device was . . . obviously the first full computer built from a microprocessor, the 8008.'' Felsenstein went on to expound how the existence of this machine might or might not have changed microcomputer history. Pentz later viewed a video we posted on Felsenstein and Frankston's commentary and followed up with commentary of his own on how innovations from the Sac State project did propagate into the community, influencing Gary Kildall's CP/M, Bill Gates and Paul Allen's Basic, and much more. The discussion continues today on our website (http://digibarn.com/stories/bill-pentz-story/index.html), which includes full descriptions and interviews with Pentz and others, photographs of the artifacts, specs, and related history.

I invite anyone who has personal experience, artifacts, or other knowledge of this phase of early microcomputers to contact me directly.

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