



## Contribute To The VIE

April 21, 2016.

Here is VIE 6.02, originally intended to be sent February 16! I was hard at work on February 13, finishing up the issue when my illness intervened and I was unable to finish it.

But there were some stories that I think are worth getting out so here it is. I have not tried to update it to include new information after Feb 13 except that it did seem silly to include Coming Events that had already happened so I updated that.

Thanks to all who contributed: John Hollar, Katharina McAllister, Chris Garcia, Caroline Evans and photographers Erik Klein and Paul Laughton.

Jim Strickland

jlstrick@aol.com

## CHM Blog

Recent CHM Blog Entries

*Kirsten Tashev keeps us up-to-date on new CHM blog entries.*

- [The Analytical Engine, the machine that Lovelace and Babbage collaborated on, written by our great volunteer and resident Babbage expert, Tim Robinson.](#)
- [And from Jenny De La Cruz-- CHM's Letters to Lovelace competition](#)
- [From Len Shustek --The 1986 ACM Conference on the History of Personal Workstations](#)
- [Second in a series about the groundbreaking Boston Computer Society by guest blogger and BCS founder Jonathan Rotenberg:](#)
- [March 14 is also Silicon Valley's birthday! Learn more with David Laws excellent blog post:](#)

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## Links You Might Enjoy

- [If you are near College Station, Texas, visit this computer museum.](#)
- [Gene Rodenberry's computer – what was it?](#)
- [Story and video of finding and booting a 1984 Apple II.](#)
- [This old tech: TRS-80 MC-10 Micro Color Computer lives to play again](#)
- [Super Bowl Ads featuring \(now\) vintage computers](#)
- [Ready for a nostalgia kick? Usborne has put its old computer books on the web for free. Landmark 1980s tutorials now available for download](#)
- [When Computers Started Beating Chess Champions](#)
- [Here's what the old-school computer viruses from the '80s and '90s looked like](#)
- [Here's a nice explanation of the Colossus that just came out, including the rebuild at TNMOC \(UK\)](#)
- [70 years ago, six Philly women became the world's first digital computer programmers](#)

## Babbage DE 2 Wake

The wake was well attended in keeping with the fame of the departing.

Monday evening, Jan 25, scores of docents, volunteers and staff gathered to remember the life of Difference Engine number 2 (DE 2) and to honor the many dedicated volunteers who installed, maintained, and demonstrated it over its eight year life at the CHM.

Many thanks to Kate McGregor for setting up the event on very short notice and for emceeing.

John Hollar (right) thanked all those who were involved, especially Tim Robinson, (left) Babbage historian, demonstrator, and maintainer extraordinaire.

He also thanked Nathan Myhrvold on behalf of the 500,000 visitors who have seen the DE over those eight wonderful years. He presented a gift to each of the Babbage team, a copy of the graphic novel The Thrilling Adventures of Lovelace and Babbage by Sydney Padua.



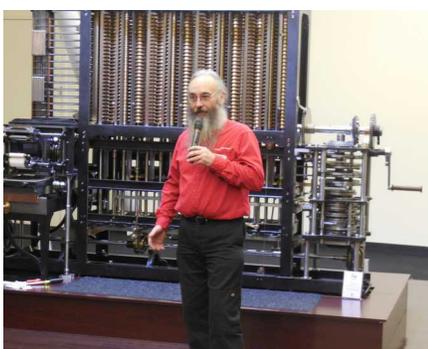
Photo by Erik Klein

## FROM JOHN HOLLAR

We were extraordinarily fortunate to have had the original 1-year loan from Nathan Myhrvold become a 7-year visitor experience unlike any other in the world.

I'm also quite confident that our Babbage team, led by Tim Robinson, now knows more about the operation and idiosyncrasies of the Babbage Engine (if not Babbage himself) than any other group in the world. The impromptu celebration we held together was only one small way that we marked the impact on CHM and on us as a team.

There is, of course, a small groundswell of support for building our own Engine, and as I said at the "sendoff party," I wouldn't get between our chairman, Len Shustek, and the goal line of funding such a project. For now I'm just happy that we were able to share in this extended moment of magic, and thankful for all of the volunteers who made the Engine's stay such a memorable, impactful experience for nearly half a million visitors.



Tim Robinson told us some of the history of the machine at the CHM, and added his thanks to the maintenance team and the demonstration team.

And of course there was the FIRST!

For the first time ever, the DE printed its results.

Many of us have seen the print mechanism move and pretend to print during a demo, but

that evening, the mechanism was inked and we could see the results actually being printed on a long strip of paper. It will be a long time before that happens again—it's a whole lot of work to ink and then to clean up afterwards. Many thanks to Tim and the maintenance team for going to all that extra work so we could see the whole process.

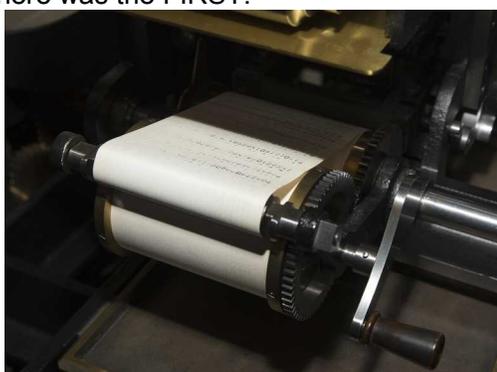


Photo by Erik Klein

Len Shustek shared some little known history about the problems, beginning in 2002, of getting the DE for and then to the CHM. He had researched his (huge) email history and read from some of the many related emails.

He also shared his dream—that in time the CHM might sponsor the building of DE 3. He emphasized that it was a dream and that many obstacles both bureaucratic and monetary stood in the way. But he also had hope, in that a new project would not have to be built to 1840 technology standards but could use 21<sup>st</sup> century manufacturing techniques. The existing DEs proved that it could have been built.





The evening was capped off with a slice of the Analytic Engine cake.



Photo Taken Feb 4, 2016

## The Shustek Center

JOHN HOLLAR

The new Shustek Center in Fremont represents the Museum's third major real estate acquisition in the last 15 years and now gives CHM 200,000 square feet of space under active management. More than that, however, the Shustek Center represents our significant expansion in two strategic directions.

The first direction is the activation of the collections, preservation and interpretive elements of our new Center for Software History. This Center will help CHM become a leading institution in helping the world understand the enormous impact of software on society and allow us to explore the technological, economic and social implications for the future. At the Shustek Center we will house our leading collection of thousands of code and code-related artifacts, continue building our major digital repository, launch a major digitization lab and expand the space available to staff and outside researchers. We will also add storage capacity for other large sections of our existing non-software collection, including documents.

The second direction is in the area of interpretive research. The Shustek Center will include dedicated workspace for our curatorial staff and non-Museum scholars. This kind of facility is very important in

## IN MEMORIAM

Marvin Minsky



1927 -2016

Marvin Minsky was born in New York, New York, in 1927. He holds a B.A. from Harvard University and a Ph.D. from Princeton University, both in mathematics.

Minsky has been a leading figure in computer science since the 1950s and was one of the founders of the field of artificial intelligence (AI).

Minsky left his imprint on generations of students and colleagues.

Minsky, pioneered intelligence-based mechanical robotics and telepresence, designed some of the first mechanical hands with tactile sensors as well as visual scanners and their software and computer interfaces. He also is the inventor of the widely used confocal scanning microscope.

Among the honors he has received are the ACM Turing Award (1969), the Japan Prize (1990), and the Benjamin Franklin Medal (2001).

[Minsky is a fellow of the CHM.](#)

[His Obituary in the Washington Post.](#)

*In general we are least aware of what our minds do best. -- Marvin Minsky*

attracting the best researchers in the field. As such, its opening is a landmark event in CHM's history and a major step forward for us as an educational and interpretive institution.

At 50,000 square feet, the Shustek Center is probably suited to our needs in these areas of work for the next 10 years. We are only occupying half of the space today and leasing the other half to a technology company. One day we will occupy the entire building, and it's nice to know the space is there when we need it. It was a very brave decision by the board of trustees to take this step financially and, in essence, to purchase twice the amount of space we needed today. But the board has always been forward-looking, which is one reason we are the successful institution we are today. I believe the Shustek Center is just the latest evidence of that.

## Introducing Katharina MacAllister

I grew up in Duesseldorf, Germany and attended Heinrich Heine University with a major in American Literature. In the course of my studies I had a chance to participate in a work and study program that brought me to California and after finishing my Masters degree I decided to move to San Francisco in the spring of 2002.



While working as a history interpreter for the Alcatraz Night Program I researched, developed and presented programs about Robert Stroud, the Birdman of Alcatraz (by the way, a complete misnomer, he never had birds on the island), about the military prison era and about the American Indian Occupation of 1969. One of the most fun parts of my job was also to demonstrate the famous Alcatraz cell doors, or the Sound of the Slammer. And if you ever watched Star Wars (I'm preaching to choir, I know...) or Jurassic Park, you have heard the sound before.

In the spring of 2012 I was part of the development team for the 75<sup>th</sup> Anniversary Celebrations of the Golden Gate Bridge and managed a brand new visitor experience that included walking tours of the bridge and a green screen photo program in the Round House, the strange round all glass building at the bridge toll plaza. When Alcatraz island hosted an art exhibit for the Chinese dissident artist Ai Weiwei in the fall of 2014, I was once again on the development team that created the interpretive experience. The *@Large: Ai Weiwei on Alcatraz* exhibition was a unique collection of seven artifacts specifically created to represent the concepts of incarceration, freedom of expression and political protest represented by the island's history. This exhibit offered the great opportunity to expand a highly successful visitor program with a project that brought the Golden Gate National Recreation Area to the forefront of public engagement. The artwork provoked visitors to think about the broader social implications of incarceration and the possibilities of art as an act of conscience. It also exposed many interpretive opportunities that have not been explored before and challenged the interpreters to find innovative ways to present Weiwei's contemporary artwork within the context of Alcatraz history.

As a long term history interpreter I understand interpretation as an opportunity to develop a strong

sense of stewardship for a site and its mission by showing visitors the significance of the resource in relation to their own lives. Great interpretive programs are engaging and provocative and it is the stories they tell that make the resource come to life and become meaningful. The *Revolution* exhibit is full of artifacts that represent exciting stories of people who have pushed the boundaries of technological progress. I look forward to working with our volunteers and CHM colleagues on uncovering these stories and developing new interpretive opportunities in the future.

### Cloud Bistro opens at Computer History Museum

*We have a new vendor for the lobby cafe. Larry Gottfried is the manager and writes the following.*

Cloud Bistro is now open with a new menu and longer hours. We feature a tasty bistro-style breakfast menu, housemade soups, sandwiches, salads, seasonal specials and freshly baked pastries. We proudly serve Four Barrel Coffee and De La Paz Espresso. We offer all volunteers a 15% discount and freshly brewed drip coffee for only \$1.00. We look forward to getting to know you all of you.

#### Cloud Bistro Hours

**Wed-Thur: 8 AM - 5 PM    Fri: 8 AM - 7 PM**

**Sat & Sun 10 AM - 5 PM**

**2016 Summer Cafe Hours Tuesdays 8 AM - 5PM / June 21st - August 30<sup>th</sup>**



Fine Catering for *Sierra Valley*

## Recent Acquisitions

CHRIS GARCIA

Harold Cohen - AARON Painting,

Harold Cohen's life in the arts dates back to the 1950s. His career as a painter earned him wide praise, shows at major galleries, purchases from major museums, and he even represented Britain in the 1966 Venice Biennale. In 1968, Cohen became a visiting professor at the University of California at San Diego, whose computer science department had long been cross-pollinating with the creative arts. While at UCSD, Cohen became interested in computer programming. Computer users had been using computers to create artworks since the early 1950s, though seldom were those works created by recognized artists. Cohen's entry into the world of computer art marked the first time an internationally recognized artist had begun to work not only with computers to create art, but to also generate art.

In 1971, Cohen moved on to the Stanford Artificial Intelligence Lab, where he worked with the likes of Ed Feigenbaum, to create a series of image-creating programs. At first, these programs were merely a collection of abstract forms that the computer could manipulate, but the process became more and more complex. By the mid-1970s, Cohen had developed a drawing system that used a 'turtle' to draw lines on large pieces of paper. These pieces were strictly black-and-white forms, and Cohen would then color them by hand. He retired the turtle in the 1980s, moving to a dedicated paint system using a robotic arm. This was the first AARON paint system, and it allowed Cohen to create large-scale images, such as "Primavera in the Spring," a mural at the Computer Museum's original home in Marlborough, Massachusetts. It would still be only creating black and white forms that Cohen colored, but it could create much more complex and composed images.

By the 1990s, Cohen's system had grown and progressed to the point where it could deal with color, partly due to changing from writing in C to programming in LISP. His last dedicated hardware AARON system used a robotic arm to paint in full color. This is the system that is currently on-display in Revolution, and the museum also holds a turtle, and an earlier, black-and-white version.

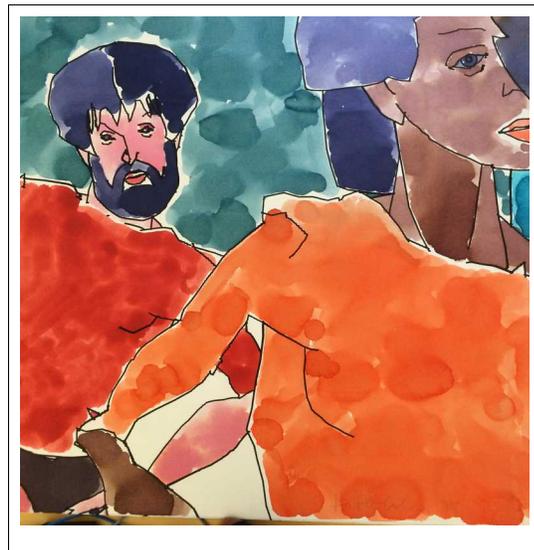
This painting was the first to be created by Cohen's color version of AARON. It was purchased by Cathy Sulgit as a part of an auction during The Computer Bowl on April 20th, 1995. Leading up to the auction, The Today Show covered AARON's work, interviewed Harold Cohen, and even plugged the event. After purchasing the painting, Cathy allowed The Computer Museum to display it at Intel for several months.

The painting shows exactly how far AARON'S development had gone. Not only was it in color, but the forms are more natural, with the woman in this image

seeming particularly realistic; a far cry from the abstract forms of the earlier versions.

AARON still exists today, though as a strictly software program. For several years Ray Kurzweil's website hosted a version of AARON that would create an image every minute.

Harold Cohen AARON Painting, US, 1994  
X7699.2016, Gift of Kathy Sulgit



## 1401 Filming

CAROLINE EVANS

I work with outside film crews who wish to film on site at the museum. We have a good number of film crews wishing to film on site!

[Criminal](#) is the production company that filmed on site this past Saturday. They were hired by [SalesForce](#) to produce a video. Part of the video had to do with computer history. As of right now I do not know exactly how the film will be used (for a conference, company promotion, internal presentation etc). Criminal reached out to me to film on site.

When they learned about IBM 1401 they fell in love with it and who could blame them? They wanted to film IBM 1401 and even begged to have it operating. Paul Laughton was generous with his time to come in early and help the crew.

On Saturday the film crew and myself arrived on site at 7:00 am for the load in/set up to begin. I personally loved seeing the 1401 right beside the new film equipment the team had! Paul arrived on site at 8:00 am to warm up the 1401. Filming took around two hours (8:00 am-10:00 am). Once filming was done 20 minutes later all the film equipment was removed from the room and it looked like no one was ever there!

The production team all had a great time and loved the experience!

They loved the experience so much that they made a donation to the museum. They had to pay to film on site and have Paul operate it, but they were so thankful they wanted to made an additional donation. I was touched by their generosity.

*Photos by Caroline Evans and Paul Laughton*



## The Golden Screwdriver

JIM STRICKLAND

Recently, I talked with a visitor. He had gone to a college where the computer science instructor told this story.

The professor was early in the computer game and at one time leased from IBM an early (date and name unknown) computer with a disk (number or size unknown.)

After getting it he realized he needed more disc space and called IBM to order a second disc. "How soon can I get it?" he asked.

"How about next Friday?"

"Wow! That soon? Yes, come out Friday."

When the Customer Engineer arrived he took out a screwdriver and in a few minutes removed "a plate" allowing the disc heads to travel farther along the surface thereby doubling the disc capacity in a few minutes.

[In VIE 1.3, Jeff Katz wrote of a similar Univac strategy on the 1004. In VIE 1.4, I added my take on IBM Series 50 unit record equipment.](#) But I had never heard of this on disc drives. So, I asked some of our volunteers for their thoughts.

From Dave Bennet, docent and 350 expert.

I don't remember such a thing. With 3340 Winchester you could take out the data module and put in a bigger one, and there may be other examples like that, but to just take out a piece as the only change and have the capacity double, not that I know of.

From Carl Claunch of the 1401 Restoration team.

It was a very popular strategy – deliberately lowering the capability of a box in order to offer a low rental/sales price with the opportunity to recover margins on the 'upgrade'. Processors had idle cycles, different sized pulleys to change operating speeds of electromechanical devices, disabling entire processors solely by firmware on multicore chips in the newer machines, so this is not entirely impossible. I don't remember any such situation.

Some of the early detent based disks came in various technology version – double the tracks per inch, double the bits per inch – but outwardly identical looking cartridges and drives. I could imagine that production efficiency reasons might justify delivering newer 200 tpi [track per inch] mechanisms as if they were the older 100 tpi models, to hit the price point – if so, one could put in a block to stop the arm from moving past cylinder 203, in a mechanism that could have moved all the way to 406, to preserve the illusion that it was the older drive. Remove the plate, switch a jumper to identify as the larger model, and you get twice the capacity.

I am not claiming this happened, but it is quite

feasible and understandable if one switched the manufacturing to the newer heads and positioning mechanisms, where you might not want to build two types of heads and two types of positioning gear even though you continued to support a range of models to the market at different capacities and price points.

From docent Bill Worthington

I have no recollection of playing with disk storage in this fashion.

I do know that there were a variety of 1401 systems that were only card systems. There were some that had a slowed CPU cycle time. As I recall there were models starting with the 1401-00A going at least to the 401G and perhaps the 1401H.

So, while I love retelling visitor stories, sometimes you have to be careful.

### Where are all the 1401's?

In 1401 demos, we are often asked questions along this line: If there were so many 1401's made, why aren't there more still around?

Bart Cotton of our 1401 Restoration team writes the following:

When sent to Endicott [the IBM plant in upstate New York that designed the 1401] in late 1969 to learn and bring up the first 370/145's so we could take one to the LA Education Center for CE [customer engineer] training, we saw an interesting sight while there in early 1970. We went to an old building in the plant complex, and saw a large room of 1401 mainframes scattered about with several fork lifts running around the room like bumper cars. They were using the 1401's as the targets, and destroying them. It was a mystery at the time as to what the purpose was.

A few years later when I was working for ITEL (a computer leasing company) the reason for what we saw in Endicott came out.

IBM indeed didn't want the 1401's coming back as third party leased machines from companies like ITEL, competing with current systems (360) and such.

Thomas Watson Sr. had learned this lesson well from his days with NCR trying to crush the third party leased Cash Register business. He never forgot that lesson and passed it on to TJ Jr.

Just a tidbit from 1401 history.

This probably had a lot to do with the decline of the large 1401 inventory from the scene in later years,

#### Visitor Story: A Pres Eckert Miss

Presper Eckert, co-creator of ENIAC and Univac, was one of the best engineers of the twentieth century. Though he came to Remington Rand as part of their acquisition, he was also involved in projects of the other computer team, the team that came from ERA which was purchased by Remington Rand in 1952.

ERA's memory approach was based on drums rather than the mercury delay line technology used by Univac. In the mid-50s, the ERA team asked Pres Eckert to help find a way to make a lighter drum.

Eckert found a possible approach. The construction industry used hard, heavy cardboard forms to pour concrete pillars. The forms were just the right diameter so Eckert bought one, cut it to the right length and coated it with mylar film. Voilá! a magnetic drum. And it worked like a charm—until the cardboard began to absorb water from the atmosphere which changed the mechanical characteristics of the drum making it unreliable.

Even the best of engineers whiffs sometimes.

Coming Events ( <a href="#">Click for details</a> )			
Date	Day	Time	Event
Apr 26	Tues	06:30 PM	Alibaba and Jack Ma: Beyond E-commerce and China—Implications for Silicon Valley - Author Duncan Clark in Conversation with the Museum's Marguerite Gong Hancock
Apr 29	Fri	11:30 AM	The History (and the Future) of Software A Lecture by IBM Thomas J. Watson Research Center's Grady Booch