‘Legacy’ at the University of Minnesota

On January 19th, 2010, the VIP Club signed a one-year exhibit agreement to display legacy artifacts and information in the Walter Library at the University of Minnesota. The exhibit uses a two-sided University display board with dual display cases – located in the reference desk hall as shown in this first photo.

Club President, Tom Turba (right side of photo 1), and Vice President, Lowell Benson, set up the display on January 20th, 2010. The University’s Walter library facility manager, Kristia Davern, facilitated the agreement and installation on behalf of the University. Thanks also to Paula Beck (ECE) and Janet Fransen (Walter Library) at the University who guided us into the Walter Library location.

We plan to update the posters and artifacts in May for the summer school session – again in September for the fall semester.
The primary side of the display (photo 3) uses two large posters generated by a VIP Club sponsor, Lockheed Martin. The top ‘ERA Minnesota’s Technology Wellspring’ poster and center time-line chart were originally created for the Club’s 2008 sesquicentennial displays. We credit the design of these two charts to retired Unisys Fellow Quint Heckert, who is also a Club Director and our membership database manager.

Lowell Benson authored the ‘text’ posters for this exhibit with editorial feedback from Bernie Jansen, Dick Lundgren, John Skonnord, and Tom Turba. Further credits are on page 8. Both exhibit sides have one poster in common (below), to recognize exhibit participation.

The other two other 8½” x 11” posters on this side of the exhibit are shown below.
Very appropriate on this ‘history’ side of the display is the University’s relationship to the ERA legacy. This is identified on an 8 ½ x 14” poster at the top right of the primary board, the text thereon is:

**U of MN and the ERA IT Legacy**

- **Since 1946**: Thousands of University graduates have worked for ERA, Remington Rand UNIVAC, Sperry UNIVAC, Sperry, Burroughs, UNISYS, Loral, and Lockheed Martin.
- **1958**: Remington Rand Univar donated an 1103 computer to the University of Minnesota, the beginning of the Computer Science department under Dr. Marvin Stein in the school of Electrical Engineering.
- **1977**: Former ERA engineer/manager Erwin Tomash and wife Adele founded the International Charles Babbage Society, renamed the Charles Babbage Institute (CBI) in 1979, and then moved to the University of Minnesota in 1980.
- **1989**: With support from industry and individuals, the University established the *Engineering Research Associates Land-Grant Chair in the History of Technology*, initially held by CBI Director Arthur Norberg. Under Dr. Norberg’s leadership, CBI developed into the world’s leading research center for the history of information technology.
- **~2005**: A University ‘Wall of Discovery’ display item is the Remington-Rand UNIVAC Nike-Zeus missile launch computer block diagram credited to Mr. Rolland Arndt, a 1948 U of MN BEE graduate hired by ERA in 1952.
- **2006**: CBI Director Norberg retired, Dr. Tom Misa was hired as his replacement, now holds the ERA Land-Grant Chair. Dr. Misa is also an advisor to our VIP Club Legacy Committee.
- **September 2008 through May 2009**: A lecture series “Minnesota’s Hidden History of Computing” presented by Dr. Misa of the Charles Babbage Institute, started with ERA.
- **January 2009**: VIP Club representatives put documents reflecting the University relationship to the ERA Legacy into Minnesota’s bicentennial time capsule.
In the display case on the primary side (photo 4) we laid out two pages of the January 3rd St. Paul Pioneer Press article “The almost Silicon Valley” written by Tom Webb. For the edification of those who have not seen the article, the Pioneer Press article’s first page is copied on the last page of this report. A link to the full article is available on-line from our web site as the February 2010 ‘Article for the Month’, section of http://vipclubmn.org/documents.aspx.

Just at the head of the Pioneer Press pages, we’ve placed a small poster (left) to show our involvement with the article.

In the right side of this primary display case, we’ve also put a 1986 Sperry booklet (right). This booklet’s sub-title provided our sesquicentennial theme “The wellspring of Minnesota’s computer industry.” Unfortunately, the commemoration plaque (poster at left) was lost after the original plant was closed in the 90s.

In addition to the printed items, the display case has a couple of trinkets showing some former corporate names.
The obverse side of the exhibit (Photo 5) has the theme of memory evolution and the beginning or our product continuity. The top right of this side also displays the contact poster used on the primary side.

The centerpiece on this side of the display is the first half of the Sperry Univac Computer Genealogy chart, printed 22” wide by the LMCO artwork department.

To provide information about this genealogy chart, we provided two explanatory posters.
At the left of the genealogy chart is an 8 ½ x 14” poster with a few points about memory evolution.

**Computer Memory Technologies.**

*See display case and genealogy chart*

- The ERA Drum prototype is in the *Minnesota’s Greatest Generation* exhibit at the Minnesota History Center, St. Paul.
- ERA drum patents were licensed to IBM for some of their early computers.
- The 1946 ERA Magnetic Drum Technology can be tracked to today’s PC hard drives produced by Seagate.
- Drum units similar to the one in the display case were used in the ATLAS, 1102, and other early computers.
- Core memory planes (similar to the display case artifact) were assembled into core stacks beginning with the 1103 (ATLAS II) computers in 1953.
- 1955 Computers, such as the AN/USQ-17 NTDS, used only core memory.
- 1961 Computers began the use of film memory;
  - ADD 1000 missile-borne guidance computer.
  - Early use of photolithography, deposition, and etching technologies.
  - Higher density and faster access than core memory.
- 1976 Computers began the use of 6”x9” semi-conductor memory boards.

Memory storage outside of computers evolved through several technologies: Paper tape, punch cards, magnetic tape, magnetic disks, chips, USB sticks, etc.
The drum theme is continued with two topical posters.

**Multiple Drum Sizes**

*Above - Don Weidenbach, engineer from 1946 to 1976 at ERA, UNIVAC, & Sperry.*

*Right - Drum in 1103A Computer*

**A Drum Patent**

Octogenarians and former ERA employees: Gerry Williams, Jim Wright, & Don Weidenbach

Gerry Williams is patent holder of the drum circuitry shown at right.

Gerry Williams and Don Weidenbach were both cited in Tom Webb’s January 3rd, 2010 Pioneer Press Article!
The initial exhibit intent was to focus on the drum artifact to be placed in the display case. Because of the weight limit of 30# per display case, we just put a photo of one of our drums. Larry Bolton made the descriptive tags for the artifacts.

Artifact items in the obverse display case are (top to bottom, left to right):

- A souvenir mug labeled with Sperry Bubble Memory airborne and shipboard unit photos.
- A semiconductor memory board from the AN/UYK-43 with label.
- The drum memory unit photo on poster paper (right).
- Two core memory planes, from the CP-890 computer with label.
- A hard drive disc and a ‘Lockheed Martin’ USB port memory stick. An identical memory stick is in the Minnesota bicentennial time capsule.
- A 1024-bit mated-film memory plane with label.
- A roll of paper tape containing a test program.
- An AN/UYK-7 computer core memory stack with label.
- A few trinkets showing some legacy corporate names.

**Credits:** Many credits are listed within this report’s text. Lowell Benson took photos 1 through 6, the drum picture above, the Minnesota Historical Society drum picture (page 6), and the Gerry Williams patent picture (page 7). The ‘Formation of Unisys’ slide (page 2) came from Ron Q. Smith. The three octogenarians’ photo (page 7) came from Bernie Jansen. All other photos came from the Club’s Legacy Committee files or CBI.
End of exhibit description.