

# Anthologies Tell the Story

*Life is the time-space continuum of human interactions!*

## INTRODUCTION

Webster defines anthology as a published collection of poems or other pieces of writing. This paper summarizes a collection of website writings. The general topic is the Information Technology (IT) industry; specifically, the IT legacy spawned by Engineering Research Associates - a post WW II electronics company. Our anthology theme, *with Wikipedia-like detail links*, is 'people engineering computers and systems at locations' in Minnesota and the world, <http://vipclubmn.org/Legacy.html>.

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<i>Edited with Microsoft Word, December 31, 2020</i>	

**Background:** In late 2005, Lockheed Martin Corporate, motivated by the realization that their current company was created from over 20 predecessors, asked the various operating units to “capture their legacy” without a real concept of what was to follow. In Minnesota, Dick ‘Ole’ Olson was tasked to respond; he formed an ad hoc group of volunteers and contacted the VIP Club Board for retirees help.

“The group quickly realized that the history of Engineering Research Associates (ERA), continuing to the present, was a remarkable story of technological innovation and contribution to the computer industry in general and to Minnesota in particular. This story, especially the early years, has never really been completely told; e. g. ATHENA missile launchings. To be sure, there are accounts written from the business history perspective, from various customer and user perspectives, and partial documentation in many places. However, we are unaware of any account, which properly gives credit to the ingenuity, vision, and hard work of ERA and its successor company employees, and their contributions to Minnesota and the world.” By *Harvey Taipale*, November 2007 - VIP Club president, 2018-2021.

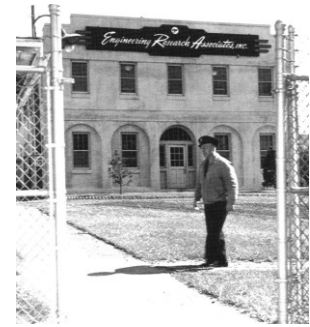


<sup>1</sup> Click on any section title for a quick scroll thereto.

Established in 1980

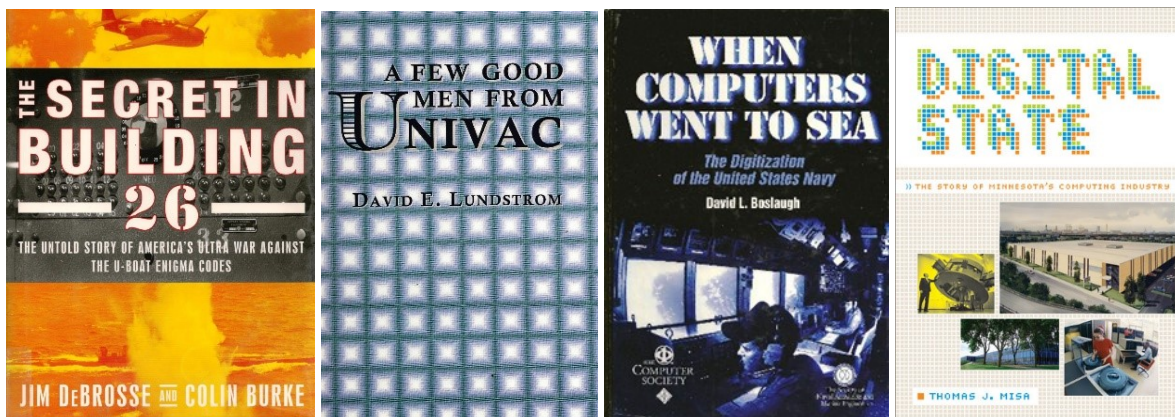
## 75-YEARS AGO - January 8, 1946

On January 8<sup>th</sup>, 1946 Engineering Research Associates opened for business at 1902 Minnehaha Avenue in St. Paul Minnesota. The founders were Howard Engstrom, Ralph Meader, William Norris, and John Parker. Engstrom, Meader, and Norris had worked for a classified WWII Navy unit called Communications Supplement Activity-Washington. Parker headed Northwestern Aeronautical Corporation that built WWII Army Air Corps gliders in a St. Paul, MN factory. They filed Minnesota incorporation papers on December 27<sup>th</sup>, 1945. Many Americans recognize one of the founders, William 'Bill' Norris, as a co-founder of Control Data Corporation (CDC) in the 50s. Most do not know that CDC was his 2<sup>nd</sup> Minnesota company!



ERA's first public delivery was *High Speed Computing Devices* published by McGraw Hill in May 1950. There is a 1983 Reprint Series for the History of Computing by Tomash Publishers, digital version: [http://vipclubmn.org/BitsBakUp/ERA%20High%20Speed%20Computing%20Devices%20Book%20\(1950\).pdf](http://vipclubmn.org/BitsBakUp/ERA%20High%20Speed%20Computing%20Devices%20Book%20(1950).pdf).

Dr. A. Norberg<sup>2</sup> wrote: *Computers and Commerce: A study of Technology and Management at Eckert Mauchly Computer Company, Engineering Research Associates, and Remington Rand, 1946-1957*. Published by MIT Press, this book talks about management but little about the technology innovations. Four other books also tell parts of our story: for example, ERA and LCDR/Mr. Norris are discussed in each.



- *The Secret in Building 26* is about building Bombe electronics, the US approach to breaking the WW II German codes. That group worked closely with British code breakers at Bletchley Park near London. Several engineers became ERA employees as the Navy phased out their Indiana facility.
- *A Few Good Men from UNIVAC* relates Dave Lundstrom's career working for Univac then Control Data corporation. His career focus was as a peripheral equipment engineer. He was a long-time participant at the [Unihogs gatherings](#) and a VIP Club member, Dave passed away 9/11/2020.
- *When Computers Went to Sea* authored by David Boslaugh (Capt. US Navy ret.) covers UNIVAC computers, systems, and programming. Also therein are Litton and Hughes displays and Collins communication equipment. U of MN graduates were key officer/engineers in parts of this book.
- *Digital State* by Dr. Tom Misa relates the ERA/UNIVAC/Sperry/UNISYS/Lockheed Martin chronology, Control Data, Honeywell, IBM, and the U of MN during half a century. Tom was U of MN's 2<sup>nd</sup> Charles Babbage Institute Director and the club's legacy advisor for a decade.

<sup>2</sup> Dr. Norberg was the first Director of the Charles Babbage Institute at the University of Minnesota.

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**41-YEARS AGO - July 24, 1980**

**Mildred Gignac was the first Sperry female director!** As she worked closely with employees getting ready to retire, she observed that many were reluctant to break the "Sperry-tie". So, in the fall of 1979 she and her staff started planning a clubroom for retirees.

In early 1980 they started plan implantation. They had a clubroom opening ceremony July 24, 1980 - Bob McDonald, who had just retired as President & Chief Operating Officer of Sperry Corporation, attended the ceremony to cut the ribbon. He was delighted to be included. {Editor's note: *This photo shows our first Club President, Al Mueller, with Mr. McDonald, and Millie.*}



The first general meeting was held on September 3<sup>rd</sup> with about 75 in attendance. Officers were elected; plans were made for future monthly meetings and club operating rules were created.

Club members were advised they would have to abide by Company regulations, but other than that they were on their own -- it was their club -- even as far as room clean-up was concerned. A well-written constitution and by-laws were drawn up which protected the Club and the Company. The Club Room was to be open 24 hours a day. Al Mueller started a newsletter to keep members informed of activities.

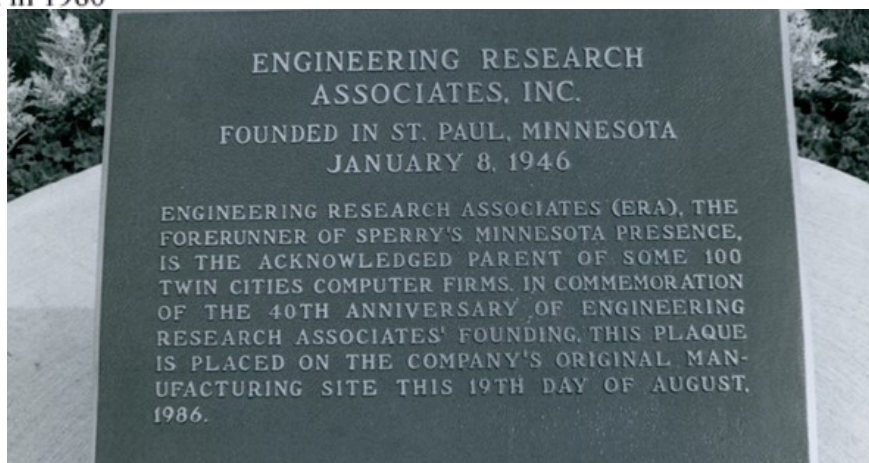
Club officers since then are listed at <http://vipclubmn.org/History.html#Officers>. Club milestones are listed at <http://vipclubmn.org/History.html#Milestones>. Significant among those are:

- In 1987, the plant 1 club room was closed and the club 'business' files were moved to Roseville.
- In 2000, Lockheed Martin joined UNISYS as a sponsor of the retirees' club.
- In 2005 we celebrated 25 years at our annual picnic.
- In 2007 the IRS accepted the Board's resolution to change the VIP Club name from "Sperry Retirees Club" to "**VIP CLUB**". We also merged the club's website with the Legacy Anthology site.
- In 2008 we celebrated Minnesota's sesquicentennial with a legacy booth at the State Capitol and at the State fair, <http://vipclubmn.org/Articles/It'sAWrap.pdf>. Page 13 hereunder has a large poster that was developed for the legacy booth display.
- In 2010 we celebrated VIP Club's 30-years with a club history booklet, <http://vipclubmn.org/Articles/30yrBooklet.pdf>, distributed to members at a recognition program in the UNISYS, Roseville facility. CBI's Dr. Tom Misa was the featured speaker. Thanks to Quint Heckert for developing the booklet, thanks to LMCO for the printing and binding.

**35-YEARS AGO - August 19, 1986****A 40-year Plaque**

**On August 19<sup>th</sup>, 1986** Sperry celebrated 40 years of St. Paul operations by installing a plaque adjacent to 1902 Minnehaha Avenue, <http://vipclubmn.org/Locations.html#Commemorated>. LMCO retiree and club volunteer Keith Myhre found and scanned several ceremony snapshots in the local museum files.





1. This plaque set two points in time – before the Burroughs buyout of Sperry.



2. Rolland Anderson, Bill Geiger, Jack Nichols, and Bob MacDonald - two unidentified ladies.



3. Joe Freely from plant services reviews the plaque - guests listened to speeches.

Unisys and the Navy left the building in 1991, <http://vipclubmn.org/Locations.html#Closing>. Unfortunately, the plaque disappeared sometime thereafter. Although we have communicated with a dozen people including former Navy officers – nobody knows where the plaque disappeared to. **Do You?**

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## Minnesota's Technology Wellspring

Sperry management published a booklet commemorating 40 years since ERA started, <http://vipclubmn.org/Articles/ERA40thAnniversary.pdf>.

ERA engineers Irwin Tomash and Arnold Cohen. Mr. Tomash and his wife are credited with being the founders of the Charles Babbage Institute, Cohen's name is listed on drum patents. Dr. Cohen went on to teach at the U of MN.

An excerpt from the booklet: "Engineering Research Associates (ERA) shipped an ATLAS computer via railcars to Washington, D.C. in October 1950. "It's my belief that the ATLAS I was the first American stored-program electronic computer to be delivered - delivered in finished, working condition." observed Dr. Arnold Cohen. Titled ERA 1101 for commercial sales, existence of the ATLAS application was classified into the late 60s."



ERA engineers Irwin Tomash, left, and Arnold Cohen discuss an early computer design at 1902 West Minnesota Avenue.



Navy ceremonies at the ERA plant were not infrequent and usually attended by the plant's civilian personnel.

4. Although labeled as ERA, the building was the property of the US Navy; leased by ERA, UNIVAC, Sperry, Unisys....

Another excerpt: "The Navy kept ERA Busy. By the end of its first fiscal year, October 31, 1947, the company reported revenues of \$1.5 million and a profit of \$34,000." "A month later, at the National Electronics Conference at Harvard University, ERA made its first presentation at a public meeting: a report on magnetic drum storage by John M. Coombs, director of development engineering." See the reprint - <http://vipclubmn.org/Articles/DrumPrototypeDesign.pdf>. {editor's note: A year or so later, Mr. Coombs left ERA for IBM employment – heading up their computer drum development. There was a no-cost patent agreement for IBM to use the ERA/Navy drum inventions in their computers!}

The wellspring was the plethora of new companies that were formed as engineers and management people left to form them. Those are illustrated on the next page, a scan of the booklet's page 5 – CDC spinoffs are included.



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# A Legacy of Technology

The genealogical tree of Minnesota's computer companies begins with a single root: Engineering Research Associates, Inc. (ERA).

ERA is the state's original computer company and is as old as the computer industry itself. "I don't know the percentage of computer-related jobs in the Twin Cities that are traceable to ERA, but it's a high percent," says Bill Drake, an ERA employee who later formed his own Minneapolis company, Data Card Corporation, of which he is chairman emeritus and a director.

"ERA is the wellspring," adds Bill Norris, who founded the company in 1946 with three others. "In fact, there are many companies not necessarily identified as computer companies that have their origins in technology that was developed by ERA."

ERA was founded in the Twin Cities not as the result of long analysis but because of the presence there of co-founder John Parker's Northwestern Aeronautical Corporation facility. Parker is today retired in Washington, D.C.

"We picked St. Paul because there was a roof there for us," says Norris, the recently retired chairman and CEO of Control Data Corporation. "But it turned out that we couldn't have picked a better spot." The reason? ERA provided a stimulating environment and a close home for many University of Minnesota electrical engineering graduates. "Remember, there weren't that many opportunities in those days, especially locally, for electrical engineers," observes Norris.

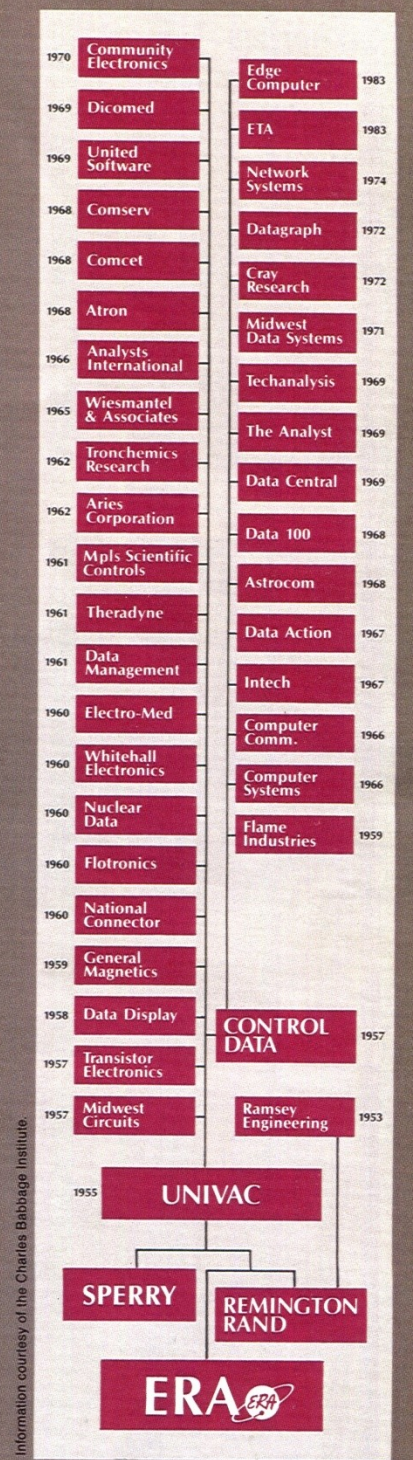
ERA's life as ERA lasted less than 10 years (founded in 1946, purchased in 1952 by Remington Rand, which merged with the Sperry Corporation in 1955, then consolidated with other RemRand divisions into Sperry's Univac Division) but its legacy is widespread and very alive. Several spinoffs from the Univac Division took place between the late 1950s and early 1960s, and later spinoffs from those spinoffs, and so on.

Perhaps the best-known of these are Control Data, founded in 1957 by such ERA veterans as Norris, Drake, Frank Mullaney, Seymour Cray, Bob Kisch, Bill Keye and Arnold Ryden; and Cray Research, founded by Cray in 1972.

Among the other spinoffs started by ERA personnel are: General Kinetics, Inc., founded by Walter L. Anderson and Robert Gutterman; Ramsey Engineering, founded by John Riede and later joined by Jack Hill; Engineering Products Assoc., founded by Bill Butler; and Data Products Corp., started by its now retired chairman Irwin Tomash.

Why did so many ERA veterans start their own successful companies? "Looking back, it's easy to see how so many individuals came out of the ERA experience as entrepreneurial doers," says Drake. "It was a time in which you thought you could do it—and you didn't know enough to know you couldn't—and so more often than not it worked. We'd tackle anything."

Thanks to ERA, Sperry and hundreds of other computer companies in Minnesota and across the country are still doing their share of tackling.



5. Hi-resolution scan curtesy of Computer History Archives Project.



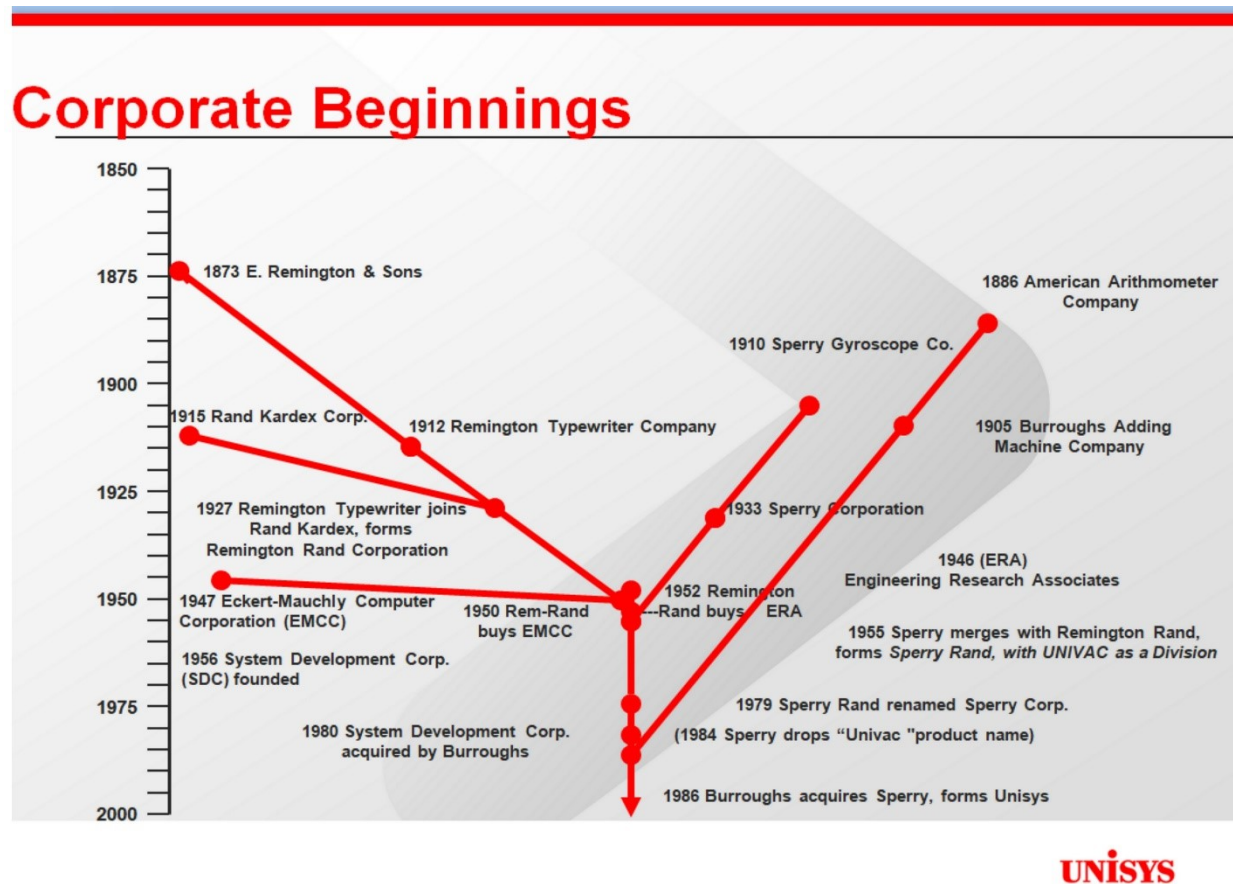
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## Burroughs Bought Sperry

The people celebrating 40 years in August of '86 likely wanted to plant their roots before the impending merger occurred. At that time, the Defense Systems Division (DSD) operations were 40% of Sperry's revenue while Burrough's defense operations, Systems Development Corporation (SDC), were 5% of their revenue. The head of Burroughs, Mike Blumenthal, put the SDC head, Fred Jenny, in charge of Unisys defense operations. Unisys management then began to divest itself of many of the Sperry groups.

The corporate name, UNISYS, came out of a naming contest – an acronym for **United Information Systems**. In 1986 there were over 120,000 employees at locations throughout the world. At that time there were about 15,000 employees in the Twin Cities of Minneapolis/St. Paul, working in 28 facilities, <http://vipclubmn.org/TwinCities.html#TablePlt>.

The corporate ancestry tree leading up to the union of these computer systems' companies is illustrated hereunder, thanks to Unisys Fellow Ronald Q. Smith.



We have listed seven decades of corporate IT milestones at <http://vipclubmn.org/Milestones.html>.

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## 15-YEARS AGO – January 12, 2006

On January 12<sup>th</sup>, 2006, a fledgling legacy committee met with Dr. Arthur Norberg, Director of the Charles Babbage Institute (CBI) at the University of Minnesota, <http://vipclubmn.org/Articles/FirstVisitToCBI.pdf>. The committee began at the October 2005 VIP Club board meeting. Richard 'Ole' Olson representing LMCO and Lowell representing the Club volunteered to be co-chairs. Dick Lundgren arranged this meeting with Dr. Norberg. Endowed by U of MN private donations, the CBI Director holds the '*ERA Land Grant Chair for the History of Technology*.' The Legacy Committee initiative set three priority objectives:

- to capture whatever remaining material and information we can,
- to catalog and archive all the material collected, and
- to publish/publicize our history and heritage in a way that could interest others within our industry and our fellow Minnesotans.

Ole took on the goal of asking current and former employees for their stories. Dick said he would edit items and Lowell said he would create a web site. Many volunteers quickly joined the committee, both Unisys and LMCO management supported the initiative. Although both Ole and Dr. Norberg retired, their replacements continued the initiative – John Westergren, LMCO and Dr. Tom Misa, U of MN.

## IT Legacy Anthology

The most prolific anthology writers are/were Larry Bolton, Jim Rapinac, Dick Lundgren, Lyle Franklin, and Don Mager. Although the committee considered using Wikipedia, we decided to organize stories and tidbits as if we were writing a book and to organize writings into the theme topics. Combined with the club's social site, a table of contents is at <http://vipclubmn.org/SiteMap.html>. Although a Minnesota museum exhibit was an early goal, that took an Eagan plant closing and influence of club *member emeriti* to bring to fruition.

## People – thirteen chapters

Almost 200 career entries (mini bios) range from two lines to 15 pages:

✚ **People A-B:** [20] Dennis Abbott, John Alton, Don Arnold, Alden Allen, Jim Andrews, Warren Becker, Keith Behnke, Scott Benjamin, Lowell A. Benson, John 'Jack' Blackmer, Don Blattie, Manny Block, Larry Bolton, Ed Bower, Jim Bougie, Bob Bro, Mike Bukovich, Tom Burns, Warren Burrell, and Bill Butler.

✚ **People C-F:** [16] Greg Casey, Bob Chappelear, Dennis Christ, C.P. 'Chuck' Covington, David E. Cross, Keith Davis, Larry Debelak, Michael Doll, Jim Donaldson, Hank Dotzler, Dave Duncan, Allan Edwards, John Enstad, Dr. John Esch, George Fedor, and Lyle Franklin.

✚ **People G-H:** [19] Bill Geiger, Millie Gignac, Jay Gildemeister, Kevin R. Giles, Tom Goulding, Lee Granberg, Paul Gregory, Thomas Grendzinski, Bruce Grewenow, Burton Gunderson, Nancy Gunther, Glen Hambleton, Bob 'RC' Hanson, John Hartmann, Al Heiden, Ralph Hileman, Kevin Hoffman, Paul Hove, and Jim Hyslop.

✚ **People I-L:** [15] Ron Irwin, Pierre Iskos, Clint Jurgens, Bill Kenny, Dick Kistler, Steve Kloner, Bruce Klugherz, Dave Kolling, Tom Kratz, Dick Kuhns, Steve Koltes, Archie Lahti, Bob Langer, Ernie Lantto, and Don Lovely.

✚ **People M-O:** [20] Don Mager, Ben Manning, Gene McCarthy, Frank McKenna, Ed Michaud, Don Moe, Joyce Mortison,



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Lyle Mozak, Kieth Myhre, Pat [nee Bailey] Myhre, Bob Myller, Mert Nellis, Ed Nelson, William 'Curt' Nelson, Kathy Nelson, Hans Neukom, Don Neumann, Richard 'Ole' Olson, Jim Overocker, and Jim Olijnek.

✚ **People P-R:** [16] Bob Pagac, Larye Parkins, Dr. Peter Patton, Richard Petschauer, Jane Pesja, Phil Phipps, Mark Plait, David Quiggle, Gerald Pickering, Richard Prokop, Jim Rapinac, Jerry Raveling, Al Reiter, O. Wynn Roberts, Dick Roessler, and Tom Rougier.

✚ **People S:** [15] Duane Sandstrom, Vernon Sandusky, Norb Santoski, Jack Sater, Bob Scholz, Rollie Schwitters, Tom Sinkula, Tom Soller, John Spearing, Woody Spitzmueller, Jim Stephenson, Bernie 'Mike' Svendsen, Gary Sloan, Larry Schmidt, and Dale Suckstorff.

✚ **People T-Z:** [12] Harvey Taipale, Ed Tilford, Joel Tofteland, Roy Valentini, Sam Walzer, Don Weidenbach, Eldon Weinhold, John Westergren, Tom Widenkopf, Monte Widdoss, Mike Wold, and Dr. Steve Yahr.

✚ **Oral Interviews:** [16] Fred Hargesheimer, Jim 'Rapp' Rapinac, and Marc Shoquist.

**ERA Guys:** William 'Bill' Butler, James 'Jim' Wright, Gerald 'Gerry' Williams, Edwin 'Ed' Nelson, Jack Ross, Bernard 'Bernie' Jansen, Bob Wesslund, Leo Bock, Alden Allen, Phil Phipps, Charles 'Chuck' Homan, Gale Jallen, and Warren Burrell.

✚ **They Flew:** [11] Jack Anderson, Lowell Benson, Bob DuBrall, Quent Fabro, Bob Herbster, Tom Kratz, Oscar Lundbeck, Gerry Nickell, David Noyes, Jim Rossman, Fred Svenson, Ronald Tomsich, and Andy Vitale.

✚ **Deceased:** [23] Rolland Arndt, Jim Bergum, Bob Blixt, Pat Casey, Dr. George Champine, Arnie Cohen, Fred Hargesheimer, Grover Higgenbotham, Jack Hill, Charles 'Chuck' Homan, Dick Huberty, Earl C. Joseph Sr., Bill Keye, John Markfelder, Bob McDonald, Jack Reid, Dr. Sid Rubens, Erwin Tomash, Robert 'Bob' Wesslund, Frank Kucera, Don Ream, Dr. Abraham Franck, and Edward 'Pete' Zimmer.

✚ **Diversity:** [3] Cliff Cunningham, Robert 'Bob' Green, and Ray Pleasant.

✚ **911 Experiences:** [5] Mike Doll, Chuck Halls, Tom Reischel, Paul Roselle, and Eric Taipale.

Your name not listed above? Please send your mini-bio to the [webmaster](#), updates are welcome.

Club membership is not required to contribute stories to the legacy anthology. The following 223 people have written 554 items for our Legacy Anthology, supplementing various career summaries:

Dennis Abbott, Clyde Allen, John Alton, David Andersen, Jorgen Andersen, Curt Anderson, Larry D. Anderson, Sally Anderson, Josh Barret, Tom Bayless, Jean Batik, Keith Behnke, Ron Belanus, Lowell Benson, Bill Bergen, Robin Bjorklund, Don Blattie, Bob Blixt, Larry Bolton, John Booher, Capt. David Boslaugh, Bobby Brewer, Dan Brophy, Tom Brusehaver, Mike Bukovich, Warren Burrell, John Byrne, Lauren Cady, Dan Carlson, Dr. George Champine, John Champine, Joseph Chapline, Paul Chinitz, Dennis Christ, Curt Christensen, Marwood Clement, J. M. Coombs, Tom Coner, Bill Corson, Clinton D. Crosby, David Cross, Larry Debelak,

Gerry Del Fiocco, Anil Deodhar, Gish Devlaminck, Mark DiVecchio, Mike Doll, Dennis English, Dick Erdrich, Steve Ernst, Tom Eykyn, Quent Fabro, Les Fairall, Andrew Fox, Art Francis, Lyle Franklin, Jim Frazier, Jacinda Frost, Bill Galle, Art Gehing, Bill Geiger, Millie Gignac, Lyle Gilbertson, Harry Goldbacher, Alan Goldstein, John Gould, Ken Graber, Lee Granberg, George T. Gray, Bob Grueschow, Chuck Halls, Glen Hambleton, Ron Handy, Fred Hargesheimer, Quint Heckert, Al Heiden, Carroll Hershey, Bradley Hinman, Curt Hogenson, Dieter Hoffmann, Gary Hokenson, Lee Holck, Chuck Homan, James A. Howe, Ned Hunter, Bruce Hyslop, Jim Hyslop, Jim Inda,

Ron Irwin, Gary Isiefson, Bob Jablonski, Peter Jankowiak, Bernie Jansen, Glen Johnson, Bob Keenan, Ralph Kerler, Dick Kistler, Jim Ketchum, Frank Kline, Bill Klingner, Elwood 'Woody' Knight, Michael Knight, Mike Kokesh, Dave Kolling, Tom Kratz, Jim Kucera, Dick Kuhns, Dr. Vipin Kumar, Archi Lahti, Andy Lang, Bob Langer, Ernie Lantto, Jack Lavers, Capt. Donald Leichtweis, James P. Lenfestey, Jacques Lignieres, Earl Lillstrand, Paul Lindquist, Tom Lindquist, Mike Lins, Don Lovely, Dick Lundgren, David E. Lundstrom, Don Mager, Kristen Maloney, Ben Manning, Tony Mannucci, John Markfield, Gene McCarthy, Jack Metzger, Ed Michaud, Dr. Tom Misa, Herbert Mitchell, Bengt Monson, Tom Montgomery, Roger C. Morris, John Mulhern, Sherm Mullen, Keith Myhre, Tricia Myhre, Ed Nelson, Curt Nelson, Ken Nelson, Les Nelson, John Nemanich, Donald Nesheim, Craig Neudahl, Don Neuman, Ben Nilsson, Ronald Niziolek, Dr. Arthur Norberg, David Noy, Dick 'Ole' Olson, Wayne Olson,

Rick Orozco, Lowell Palacek, Norm Palzer, Jeff Parker, Layre Parkins, Charles Parmele, Ken Pearson, Wes Peters; Al Peterson, Dick Petschauer, Dale Phelps, Ed Phillips, Gerald Pickering, Larry Pierson, Michael Pluimer, Jerry Proc, Lee Purrier, Jim Rapinac, John Rego, Thomas Reischel, Al Reiter, Bill Rhode, Gary Rist, Dick Roessler, Al Rollin, Paul Roselle, Doug Ross, Bob Russell, Vernon Sandusky, Jack Sater, Dave Saxerud, Ray Schleski, Lou Schlueter, Bob Scholz, Ron Schroeder, Joe Schwarz, Bill Sharf, Ed Sharpe, Dave Shelander, Marc Shoquist, Jon Simon, John Skonnord, Ron Q. Smith, Jerry Smolian, Samuel S. Snyder, Arlyn Solberg, Craig Solomonson, Gary Stanull, Mike Svendsen, Eric Taipale, Harvey Taipale, John Thalhuber, Todd J. Thomas, Tom Turba, and Glen Turner, Willis Unke, Tom Van Keuren, Earl M. Vraa, Tom Webb, Cal Webster, Don Weidenbach, Paul Welshinger, Douglas C. Wendall Jr., John Westergren, Manfred Wiese, Gerry Williams, Lou Wilson, Harry Wise, and Mike Wold.

### Engineering – ten chapters

Not just computer engineering: stories are told about antenna couplers, components, field service, interfaces, memory, patents, peripherals, software, and training. What is an antenna coupler? The cash cow for the company during the lean years of the 50s & 60s. Thanks to Marc Shoquist for those entries.

The Memory Engineering chapter has data about drum memory invented at ERA, these are the forerunner to hard drives still in use in many computers. The drum prototype is at the Minnesota History museum.



### Computers – ten chapters

The 'name' of our computers varies greatly depending upon the situation. In many cases they are referred to by their company type number, i.e. 1100 series that started with the 1101 assigned to the public version of the then classified ATLAS computer. In other cases, the assigned military designation is used, i.e. the first Naval Tactical Data Systems computer was the AN/USQ-17. Some were known by the application, for example the S-3 carrier-based aircraft computer was the AN/AYK-10, UNIVAC type 1832 or the Minute-Man computer was the AN/UYP-11.

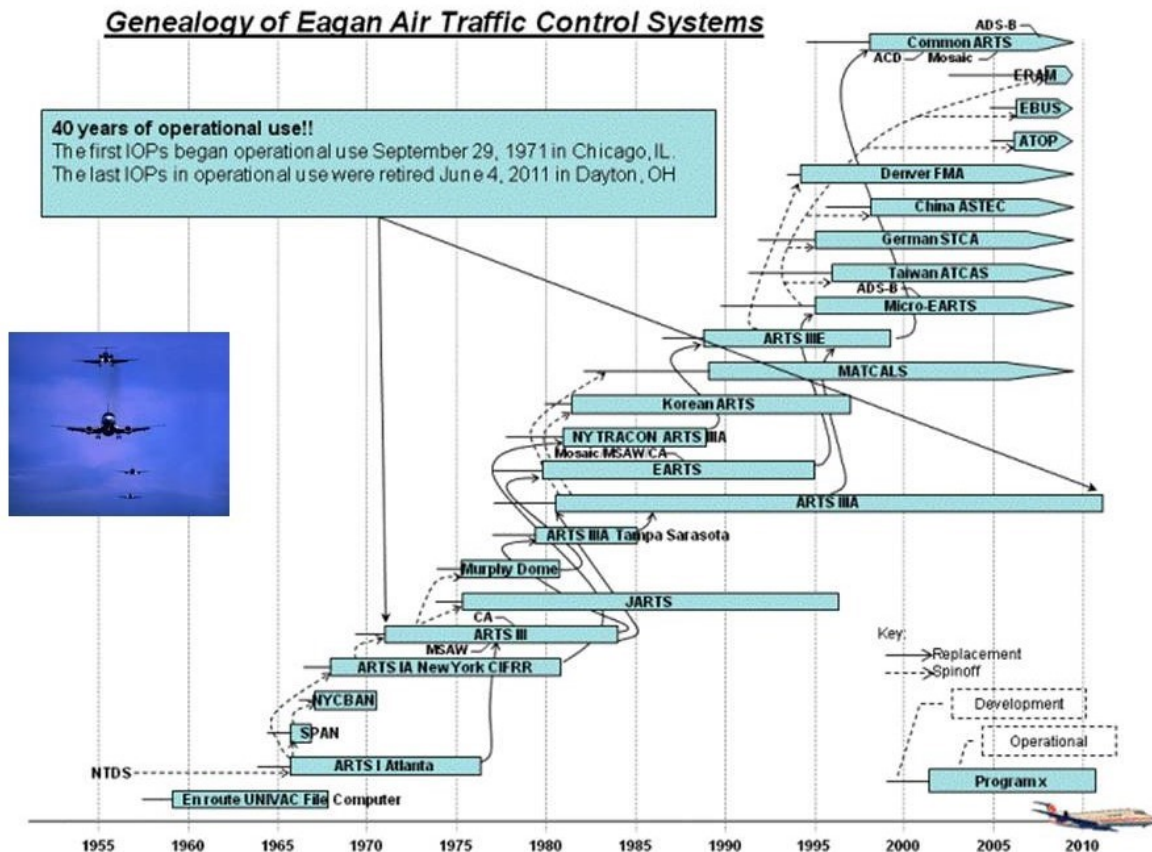
The computer stories are grouped by Instruction Set Architecture bit-lengths or application purposes. Genealogy charts in the chapters show ISA sequences, technologies drove new models - i.e. the Navy's 642A to 642B 30-bit processor type was a germanium to silicon transistors component change.



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## Systems – ten chapters

The [Air Traffic Control](#) (ATC) chapter is the most complete and detailed systems chapter, thanks to Tom Montgomery and Jack Sater. This has a legacy within our legacy, i.e. the 40 years of IOP unit operations! ATC systems engineering in Minnesota continues yet today as Lockheed Martin sold those operations to Leidos. If you have flown on a US flight since the mid-50s, our ATC systems have helped to keep you and your family travel safe.



The Navy chapter refers to the NTDS development is in the book "*When Computers Went to Sea*" by Capt. David Boslaugh. The Marines chapter is closely related to the Navy chapter in that USMC systems shared hardware systems and communicated with each other – long before the internet in use today.

The Airborne chapter primarily relates to Anti-Submarine Warfare, a 60+-year legacy within our legacy. Other systems chapters are Aerospace, ASOC, Commercial, Government, and International – which has a 'legacy within our legacy' i.e. the 50 years of operations in Bad Godesberg, Germany.

## Locations – seven chapters

Location chapters are detailed as Twin Cities, United States, International, Blue Bell, Winnipeg. Yes, we have a Blue Bell chapter even though it is not directly an ERA progeny. Since the 50s, some St. Paul operations have reported to UNIVAC, Sperry, and Unisys management in Pennsylvania. Minnesota commercial operations were/are part of the EMCC to Unisys chapter, <http://vipclubmn.org/UNISYS.html>. Defense legacy parallels the commercial operations chapter, <http://vipclubmn.org/lmcolegacy.html>.

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**Our stories - 175 and counting**

In April 2007, we posted the first monthly story, [Apollo Computers](#) from Don Mager. This January 2021 'Telling the Story' paper is the 175<sup>th</sup> monthly article. Of these 175 stories and 300+ product/project entries, my top five are:

- 4<sup>th</sup> runner up: from before the legacy committee started; a reprint of a Minnesota Monthly, July 2005 newspaper article. It was first published as "The Original Geek Squad" by James P. Lenfestey, <http://vipclubmn.org/Articles/AGaggleOfGeeks.pdf>.
- 3<sup>rd</sup> runner up: moving the shadowbox collection from Unisys, Roseville to Unisys, Eagan thus preserving the technology history of the commercial 1100 series of computers, <http://vipclubmn.org/Articles/ThroughTheAges.pdf>.
- 2<sup>nd</sup> runner up: establishment of a permanent artifact display at the Lawshe Memorial Museum, <http://vipclubmn.org/Articles/DreamRealization.pdf>.
- 1<sup>st</sup> Runner up: a summary list of YouTube links to videos from Mark Greenia, Director of the Computer History Archives Project (CHAP). The most recent is about the beginnings of ERA, [http://vipclubmn.org/Articles/CHAP\\_Summary.pdf](http://vipclubmn.org/Articles/CHAP_Summary.pdf). The other two dozen are videos and stories about specific UNIVAC/Unisys computer systems.
- The best of all that we have done or supported is a public television documentary. <http://vipclubmn.org/Articles/TPTclips.pdf> has a link to the primary hour-long video as well as several out-takes. Seven VIP Club members, former employees, were interviewed by producer Kevin Dragseth for inclusion in the video. Dr. Tom Misa is the featured narrator. Some of the scenes are from the Lawshe Memorial Museum and from the Club's 2019 picnic. Special thanks to Dale Weeks who spearhead the fundraising to do the documentary. Thanks to Keith Myhre who provided documentary theme outlining and to Unisys' Chuck Lefebvre for co-hosting the October 2019 premiere event. This is a wonderful documentary of Minnesota's computer history as it covers technologies and people at ERA, Honeywell, IBM, CDC, the University of MN, and public education via computer networks.

**Artifact Exhibits**

When the Legacy Committee began in 2005, one of our long-term objectives was to find a permanent place to display our artifact collection. There were already two small 'artifact' display sites in Minnesota: at the UNISYS, Roseville facility in Eagan and at the Minnesota Historical Society's St. Paul Museum. Neither was positioned to become a permanent exhibit location.

We found a permanent place in 2011 when the Dakota County Historical Society (DCHS) agreed to accept donation of our artifacts and to establish a permanent exhibit at the Lawshe Memorial Museum in S St. Paul. Thanks to VIP Club member emeriti Bernie Jansen and Millie Gignac who worked with then DCHS Director, Chad Roberts to get the 'ball rolling'. Bernie and Millie were also DCHS trustees thus knew the people who could make the decisions. The VIP Board and Legacy Committee are forever grateful for the hundreds of hours which John Westergren put in to arrange for the transfer of the artifacts collected over 7-years from retirees and stored at the Eagan, LMCO facility between 2007 and 2012.





Established in 1980

A part of the artifact transfer was the establishment of several workstations for the cataloging of artifacts, papers, and photographs. Many of the photographs curated by Keith Myhre are on Minnesota's computer history website, <https://mncomputinghistory.com/>. Keith Myhre also wrote the most recent museum archiving status [October 2020], <http://vipclubmn.org/Articles/CatalogingStatus.pdf>. Volunteers continue to meet there weekly to work on cataloging and provide support to researchers.

The second Minnesota exhibit is not open to the public, i.e. a set of two dozen shadow boxes exhibiting the technology evolution of the 1103 to 2200 commercial series of computers. These were moved from Unisys Roseville to Unisys Eagan in 2017, <http://vipclubmn.org/Articles/ERA2unisysWeb.pdf>.

BTW, our Exhibits Chapter has descriptions of and links to half-a-dozen other US museums with 'UNIVAC' artifacts, <http://vipclubmn.org/Exhibits.html#Others>.

## LAST YEAR - 2020

The club had planned a September gala event to celebrate our 40 years, honored invitee was club founder Mildred Gignac. Unfortunately, the COVID-19 pandemic influenced the Club to cancel all 2020 events except for board meetings which were/are conducted electronically.



We were able to facilitate 100+ birthday greeting note deliveries to Millie who turned 100 on October 22, 2020. (snapshot from January 2018 Holiday party.)

The board decided to extend all club memberships by a year and to offer free 2021 memberships to former/inactive members plus offer a free 2021 membership to qualified people who submit a registration form.

## EPILOGUE

### Legacy Initiative Future

We have another year or so of volunteer work at the Lawshe Memorial Museum to finish scanning and cataloging images. Plus, we would like to get all images and documents on-line for researchers. We appreciate the continuing Dakota County Historical Society support of our legacy.

Our initial goal was to have 200 career summaries – almost there. And we need of a few more manufacturing location and operations stories to complete our history. Send your program, project, or career recollections to [webmaster@vipclubmn.org](mailto:webmaster@vipclubmn.org), we'll find a place for it.

### Club Future

Our membership database has a few people paid through 2025, we have money in the bank to sustain a free 2021 membership year and to celebrate a 4<sup>th</sup> one gala event next year. Newsletters continue, archived since 2004, <http://vipclubmn.org/Newsletters.html#Archives>. The Club Board assumes that the pandemic will subside in 2021 and a vaccine will be available for seniors, thus we are reserving some venue dates to resume our social activities. Check the home page announcements.

***Sorry that we cannot have a January 8<sup>th</sup> jubilee gathering to celebrate the start of ERA!***

Thank you and KEEP SAFE!

## POSTER EXPLANATIONS $\Rightarrow$

*This poster was created for the Minnesota Sesquicentennial to illustrate the 60+ year Information Technology Legacy which began with Engineering Research Associates (ERA) in 1946.*

- The time line across the chart's middle shows the corporate names beginning with ERA. Of note is 1986 when Burroughs bought Sperry to form UNited Information SYStems. UNISYS then sold their Eagan based defense operations to Loral in 1995 who in turn sold to Lockheed Martin in 1996. UNISYS in Roseville continues to provide commercial industry systems and services.
- On the poster's left are the four Engineering Research Associates 'founding officers' – the 1946 early employees are listed across the top left.
- At the top right is a listing of spinoff companies, the most significant of which was in 1957 when one of the founding officers, William 'Bill' Norris formed Control Data Corporation.
- Above the time line of companies are some of the significant milestones, i.e. the 1958 delivery of the University's first computer and a listing of many of the spinoffs.
- The chart's lower half illustrates just a few of the computer systems developed in St. Paul.

The 4' x 8' board is available for viewing at the Lawshe Memorial Museum in S. St. Paul.  
Thanks to Quint Heckert, et al' for the poster design and thanks to LMCO for the publishing.

{pdf reader hint: use the magnify function to read small print on the poster}

