

Telling The Story

Lowell A. Benson, Unisys Senior Staff Engineer – Retired 1994

INTRODUCTION

At the Legacy Committee's [first meeting](#) in January of 2006, we resolved to tell the then-to-fore untold story of Engineering Research Associates (ERA). This 200th IT Legacy Paper updates our legacy initiative status; "77-yrs since ERA pushed the power button to ignite MN's computer age¹."

- ✓ We've posted 200+ career summaries listed in <http://vipclubmn.org/People.html#bios>. People sub-chapters 11 thru 22 have those career summaries and article contributors' names. Our MN corporate name history is at <http://vipclubmn.org/lmcolegacy.html#Names> while our local defense industry General Managers are listed in <http://vipclubmn.org/lmcolegacy.html#Mgrs>.
- ✓ The <http://vipclubmn.org/OurStories.html> chapter's authors and article contributors are listed in <http://vipclubmn.org/PeopleIndx.html#Writers>. This 200th paper for January 2023 has an alphabetized Our Stories' author's tabulation and an alphabetized by title-topic table.
- ✓ Our Club Contacts & Links page leads to 100+ [computer research](#) and [STEM](#) websites.
- ✓ The Dakota County Historical Society's (DCHS) S St. Paul [Lawshe Memorial Museum](#) has 'more defense-industry computer artifacts than any other museum in the world!'
- ✓ The Twin Cities Public Television (TPT) in partnership with the MN High Tech Association produced a '[Solid State: Minnesota's High-tech History](#)' documentary. It was filmed at the TPT studios, the museum, a VIP Club picnic, and a few other MN sites. Narrated by Dr. Tom Misa, it includes eight Legacy Committee member interviews.
- ✓ A Legacy initiative byproduct is the VIP Club's history, <http://vipclubmn.org/history.html> and our [social activity history](#) about the many outside-of-work camaraderie gatherings.

Are we done telling the story? Almost!

Contents²

INTRODUCTION.....	1
WHAT IS MISSING?.....	2
OUR STORIES.....	2
By Author (primary person).....	2
By Title – Topic.....	8
LEGACY ANTHOLOGY Table of Contents	13
LEGACY STATUS – December 2022	18
Current Legacy Committee	19
Deceased Committee Members	19
Museum Volunteerism Team	19
SPECIAL THANKS TO:	19

Edited with Microsoft Word, December 26, 2022



¹ Paraphrased from a Curt Brown email about a January 2021 Minneapolis Star Tribune article.

² Click on a section for a quick scroll thereto.

WHAT IS MISSING?

A sign outside a chapel, 'What's missing, CH __ CH?' - **UR!** Occasionally a little levity gives one pause to think of a retort or another story. For our *Legacy Anthology* chapters we need stories about the Clearwater, FL and the Pueblo, CO facilities. Both were started to support St. Paul operations with lower employment wages and lower state business taxes. Pueblo was specifically developed for Air Force computers' manufacturing. Clearwater was an expansion of an old Sperry facility to produce Navy shipboard products. Do you have any stories about those two facilities or their people? And we could use more from our Roseville, MN retirees about their careers and products. Please send them to us, we do have web site spaces ready for your information. Thanks, *LABenson*.

OUR STORIES

Many of these are intertwined and some overlap. Our Legacy has seven decades of air traffic control, six decades of Naval Tactical Data Systems, six decades of Airborne Surveillance, and thousands upon thousands of satisfied users and customers in Minnesota, the US, and throughout the world.

By Author (primary person)

Primary Writer(s)	Title or Topic of Story	Posted
Abbott , Dennis	Canadian Patrol Frigate (CPF)	2008-05
Alcon, Chuck LCDR US Navy (ret.)	Navy Standards Program – Don Ream tribute	2020-12
Allen, Clyde	Engineering Organization , Sperry 1980	2015-10
Andersen, David	Invention of Voice Mail	2007-06
Anderson, Larry and Earl Vraa	VHSIC Hardware Design Methodology	2009-08
Anderson, Sally via Bernie Jansen	Artifact Accessioning at DCHS museum	2014-11
Anderson, Steve	Apollo 11 Memories – a TPT video interview	2019-07
Andrews , Jim	Autogram Display and How It Reduced the Logic Design Cycle	2022-05
Angvall, R. and Ron Q. Smith	ERA formation and 1100/2200 evolution	2017-11
Anonymous – at the donor's request	Arbitration , Project 6977 Israel contract	2018-05
Benson , Lowell A.	It's A Wrap – Minnesota's Sesquicentennial	2009-02
Benson, Lowell A.	Legacy at the University of Minnesota	2010-03
Benson, Lowell A.	Display Report for university #2, summer '10	2010-07
Benson, Lowell A.	Display Posters Text on 4'x4' tabletop board	2011-12
Benson, Lowell A.	Computer History Review – 1 st 25 years	2012-01
Benson, Lowell A.	Slides for a 2012 Ft. Snelling presentation and Script for the Ft. Snelling presentation.	2012-03
Benson, Lowell A.	ATLAS Evolution with shadow box photos	2012-08
Benson, Lowell A.	Sperry UNIVAC History Boxes – technologies	2012-11
Benson, Lowell A.	Brief History of Sperry Corp, circa 1985	2013-01
Benson, Lowell A.	Repertoire Cards – 24 bits	2013-03
Benson, Lowell A.	Letter to the Smithsonian Museum Curator	2013-05
Benson, Lowell A.	Ocean Surveillance Chronology – 5 decades!	2013-08
Benson, Lowell A.	Book Review – Digital State by Dr. Tom Misa	2014-08

<u>Primary Writer(s)</u>	<u>Title or Topic of Story</u>	<u>Posted</u>
Benson, Lowell A.	Legacy Preservation Partnerships	2015-05
Benson, Lowell A.	Letter to 'Ole' , i. e. Richard Olson Legacy Committee Accomplishments	2015-12
Benson, Lowell A.	Artifact Collecting – donating to the museum	2016-04
Benson, Lowell A.	Through the Ages! An Eagan Open House	2017-08
Benson, Lowell A.	Information Technology Anthology – site map	2017-12
Benson, Lowell A.	Ocean Surveillance Chronology – Univac to LMCO, 50-years of excellence	2019-05
Benson, Lowell A.	Security clearance process memo, 1973	2019-06
Benson, Lowell A.	Anthologies Tell the Story , ERA - 75 yrs ago	2021-01
Benson, Lowell A.	Technologies' Experiences for MHS interview	2022-06
Benson, Lowell A.	LEGACY COMMITTEE ANNIVERSARY!	2022-10
Benson, Lowell A.	Status of Our Stories , etc. 200th Our Story	2023-01
Benson, Lowell A., et al'	Achievement Award for the 200-nanosecond memory - 1966	2010-06
Benson, Lowell A., et al'	Realization of a Dream, exhibit at the Lawshe	2013-10
Benson, Lowell A., et al'	Program and Product Management , 1974	2017-03
Benson, Lowell A., et al'	Donations to CBI from Curt Christensen, Pat Corbett, Bob Jablonski, Jim Larson, and M. Adelman	2018-06
Benson, Lowell A., et al'	International sites of note, http://vipclubmn.org/Articles/World_Wide.pdf	2020-11
Benson, Lowell A., et al'	UNISYS WEB and TIMELINES , what and when.	2021-11
Benson, Lowell A., et al'	Compendium, No. 2 of newsletter articles	2022-01
Blixt , R. P. 'Bob'	A-NEW Data-Processing System, CP-754A	2010-11
Blumenthal, Mike	Letter to Weinberger	2009-05
Bolton , Larry D.	Vendor Surveillance Notebook	2007-10
Bolton , Larry D.	Magnetic Drum Artifacts, three	2009-04
Bolton , Larry D.	Parts Control , Minuteman computers	2009-07
Bolton , Larry D.	Hardware Artifact Log as of November '09	2011-09
Bolton , Larry D.	Semiconductor Technology Progression at UNIVAC/Sperry/Unisys/LMCO in Minnesota	2014-09
Bolton , Larry D.	Plant 8, circa 1966 – scan of a news article	2019-04
Bolton , Larry D.	Component Quality and Reliability	2021-08
Bolton , Larry D. and Clinton Crosby	Addendum to Minuteman Plated Wire Usage	2011-02
Bolton , Larry D. and Ralph Kerler	UNIVAC 7901000-series Integrated Circuits	2008-11
Bolton , Larry D., et al'	Nike-X System Hybrid Integrated Circuits Nike-X electrical circuit/component diagrams	2019-01
Bolton , Larry D.; Clinton Crosby; and James 'Jim' Howe.	Plated Wire Memory Usage on the UNIVAC Minuteman Weapon System Computer	2008-04
Bower , Ed	Sperry Utah , Sergeant Missile Program	2020-01
Brown, Curt, et al'	At 99, Don Weidenbach looks back	2021-03
Burrell , Warren	Recollections , Pre-Athena, i. e. Transtec, etc.	2011-03

<u>Primary Writer(s)</u>	<u>Title or Topic of Story</u>	<u>Posted</u>
Burrell, Warren and George Champine	ERA 1102 Computer at Arnold Engineering Development Center, 1952 - 1966	2010-05
Carlson, Dan; Bob Engel, Kristen Maloney, Tom Montgomery, and John Westergren	Plant 8 Closure , end of an IT epoch	2013-04
Carter, James – via Keith Myhre	Starring the Computer – a website dedicated to computers in film and TV, some are ours.	2020-02
Champine , George – Ph. D	UNIVAC Computers I Have Known	2012-10
Charlton, Art, et al'	Photo Club History , donated to the museum	2017-05
Christensen, Curt	Another Computer Was Born	2008-07
Christensen, Curt	ENIAC Beginning Summary	2011-06
Coombs, J.R	Drum Prototype Design , scan of a 1947 National Electronics Conference reprint.	2010-04
Cray, S. R. and Kisch, R. N.	Report, Progress of CAD circa 1954	2009-10
Crowe, Forest W. via Andy Simon	Apollo 11 Mission Congratulations Letter	2018-02
Devlaminck, Ghislain A.	VIPS Adventure – fixing a problem in the field	2020-04
Devlaminck, Ghislain A.	Black Briefcase delivered classified items	2022-02
Devlaminck, Ghislain A., et al'	Plant 2, Glider History	2014-03
Dexter, Patty re' Tom Weyrick	Apollo 11 mission work interview	2019-08
Dickson, Paul – et al'	Plated Wire Dialogues	2020-03
Dragseth, Kevin – TPT Producer	About Solid State : Minnesota's High-tech History – documentary summary and links	2019-10
Durand, David – et al'	USAF mobile system developed at RADC	2016-11
Erickson, Robert A. 'Bob'	Engineering Organization , UNIVAC Feb. 1977	2015-08
Ernst, Steve	Precision Agriculture Business Initiative	2020-05
Fadden, C. via Les Nelson	NEXRAD , more than meets the eye	2018-01
Fox, Andrew	ERA to Lockheed Martin : MN computer Industry	2014-11
Ganz, Bill via Ron Irwin	MATCALS – Technical Description re-print	2011-05
Goldbacher, Harry	Frank Lapinski was my mentor	2015-04
Goldbacher, Harry	UNIVAC Plated Wire Memories – Blue Bell.	2015-04
Graber, Ken; Larry Bolton; and Jeff Parker	SNERT Chip Development	2008-09
Gray, George	Sperry Military Computers	2007-05
Gray, George	NSA Used UNIVAC Computers	2015-03
Gray, George and Ron Q. Smith	Sperry Rand's Third Generation Computers 1964–1980	2022-11
Greenia, Mark	Burroughs , Legacy Corporation on YouTube	2018-04
Greenia, Mark	Computer History Archives Projects (CHAP) – 20 YouTube video links w/summaries	2019-09
Greenia, Mark, et al'	Sperry UNIVAC Fastrand Drums on YouTube	2018-03
Greenia, Mark, et al'	Early Computer Parts, notes and YouTube link	2018-09
Hambleton , Glen	World-Wide Career	2008-01
Heckert, Quint	Booklet , VIP Club's 30-Year Anniversary	2010-12

Primary Writer(s)	Title or Topic of Story	Posted
Heryla, Robbin – Unisys HR Dept.	Membership Recruiting – VIP Club, 1988	2015-07
Hoffman , Kevin	Assignment in Mississippi	2020-09
Hunter, Ned; Tom Knops - et al'	First Flying Programmer , Oscar Lundbeck	2013-09
Inda, Jim and Mike Wold	B-2 STEALTH BOMBER STORY	2015-01
Irwin , Ron	MATCALs – A 30-Year Life	2015-06
Jansen , Bernie	Legacy Preservation Sites – a 2012 Unihogs luncheon presentation	2012-12
Johnson, Carl	Carl Johnson Collection at CBI	2017-10
Johnson, Carl	Micro-1100 Story – Chip Set Development	2019-11
Johnson, Don via Larry Bolton	Semiconductor Testing at UNIVAC Semiconductor Test Record , 1957-1962 P/N 4908000 and P/N 4907828 specifications	2020-07
Johnson, Glenn and Dave Saxerud	Our Winnipeg Story	2010-01
Keremedjiev, George; Anders Carlsson, and Duane Craps	Eighteen Bit Computers – from three non-Minnesotan Legacy Anthology browsers	2015-09
Ketchum, James via Warren Burrell	When Computers came to Minnesota	2011-07
Klobuchar, Jim via Larry Bolton	Creation of the 1824 , scan of Minneapolis Star article from Nov. 5, 1965.	2018-11
Knight, Michael	Reservation System , BEA Design Ahead of its Time?	2009-01
Koltes , Steve	Employed 60-Years, James Bacon	2015-11
Koltes, Steve, et al'	ARTS II Display Emails	2020-08
Lantto , Ernie, et al'	When Did it Happen? Computer type dates .	2021-10
Larson, LeRoy	Quicksilver , a Shadowbox Story	2017-06
LaViola, Joe – UBBRG President	Letter to Unisys Blue Bell Retirees Group	2016-10
Leichtweis, Capt. Donald USN ret.	Nomination, Name a Ship the Donald Ream	2014-12
Lenfestey, James P.	Gaggle of Geeks – a news article	2008-03
Lins, Ray vis son Mike Lins	Open House at Sperry Univac - 1974	2018-07
Lundgren , Richard 'Dick'	European Defense Business	2007-12
Lundgren, Richard 'Dick'	Charles Babbage Institute – Our 1st Visit	2014-10
Lundgren, Richard 'Dick', et al'	Compendium, IT Legacy Newsletter Articles	2016-03
Mager , Don	UNIVAC Digital Trainer – UDT-6	2019-03
Mager, Don - #101, <i>The first of Our Stories</i>	Apollo Computers – the early deliveries	2007-04
McCarthy , Gene; Mike Bukovich, and Bob Elfering	Contract Wins ; CPF, UYK-43, and UYK-44	2007-07
Metzger, Jack, et al'	Circuit Card(s) History – germanium to silicon	2016-12
Miller , John	Turtle Mountain Corporation spinoff NDSU newsletter article scan re' Miller	2021-12
Misa, Dr. Thomas	Minnesota's Hidden History in Computers	2010-12
Mitchel, Herbert – auto-biography excerpts from George Gray via Ron Q. Smith	UNIVAC in Philadelphia, Volume I UNIVAC Marketing, Volume II	2014-01
Monson, Bengt 'Ben'	Plant 2, A New Tenant	2014-02

<u>Primary Writer(s)</u>	<u>Title or Topic of Story</u>	<u>Posted</u>
Monson, Robert via Keith Myhre	Valiant & Intrepid Workstation History	2022-03
Montgomery, Tom, et al'	Legacy Epoch , Air Traffic Control	2012-07
Mullaney, Frank C.	December 12, 1950 – distribution letter and Technical Memorandum No. 15 reprint	2011-01
Mullaney, Frank C.	ERA 1101 Computer Design Features - scan	2017-02
Myhre , Keith	Cataloging Legacy Artifacts at the Lawshe Memorial Museum.	2020-10
Myhre, Keith	Artifacts on Display, 16 Legacy Story Boards	2021-05
Myhre, Keith	Valiant Workstation Resurrection	2022-04
Myhre, Keith	Oral Interview of Keith Myhre by MHS	2023-02
Myhre, Keith, et al'	40-year ERA Plaque – Where did it go?	2022-08
Nelson , Ed, et al'	Fred Hargesheimer Story	2007-09
Nelson, Les	Programmable Signal Processor (PSP) Development	2022-09
Nelson, Les and Lowell Benson	ASW History , 50+ years	2012-09
Nelson, W. 'Curt'	ERA 1103 Announcement – a 1953 news scan	2017-07
Nelson, W. 'Curt'	BOMARC , the ERA 1104 development	2017-09
Nelson , W. 'Curt' and Lowell Benson	ASW-mod 1 Avionics System, 1963 Aviation Week reprint plus our background info.	2010-10
Nemanich, John	Networking History at Unisys	2007-08
Neukom, Hans, et al'	UNIVAC 418s , triple use application	2017-04
Neuman , Don	Air Force Satellite Control Network - reprint	2013-12
Norris, William C.	World War II Experiences – a paper scan	2016-01
Palzer, Norm	Drum Memory archived at MHS	2009-06
Petschauer , Richard J. 'Dick'	Carbon Heat Trapping : Merely a Bit Player in Global Warming	2008-02
Petschauer, Richard J. 'Dick'	History and Evolution of 1100/2200 Mainframe Technology	2014-07
Pickering, Gerry	Creativity-Success-Obscurity , what happened?	2012-04
Pogorzelec, Ed	Winnipeg Operations , Tribute 1977-2000	2021-06
Pogorzelec, Ed	Winnipeg Operations People and plants	2021-07
Pogorzelec, Ed, et al'	Canadian Patrol Frigates upgraded	2017-01
Rapinac , James 'Rapp'	Army Experiences before Sperry Univac	2016-05
Rego, CWQ4 John P.	Deployment to Somalia – MAATCALs in 1993	2011-04
Reiter , Allan	UNIVAC I Computer System , Technical UNIVAC I System Experiences , People	2012-06
Rubin, Richard via Gish Devlaminck	Little Instrument in Your Pocket	2021-02
Sandusky , Vern	Johnston Island Hurricane damage report Johnston Island repairs report	2009-12
Sater , Jack	Air Traffic Control – From NTDS to ARTS	2008-06
Schlueter, Lou	MAPPER Systems History Presentation	2013-06
Shelander, David	AN/UYK-43 Computer , a synopsis	2012-05
Shoquist , Marc C.	Serial Input/Output papers, two	2008-12
Shoquist, Marc C.	Interview transcription via John Westergren	2016-05

<u>Primary Writer(s)</u>	<u>Title or Topic of Story</u>	<u>Posted</u>
Sloan, Judy	Joint Strike Fighter Electronics	2018-08
Smith, Ron Q.	Unisys history sequence – slide set	2014-04
Smith, Ron Q.	Unisys and the Growth of Computing	2016-02
Smith, Ron Q.	Growth of Computing at Unisys	2020-06
Snyder, Samuel S. – release June '09	NSA History , General-Purpose Electronic Digital Computers – reprint of 1964 paper	2010-08
Society, IT History via LABenson	IT History Reference (www.ithistory.org) Honor Roll . ERA to Unisys people therein	2019-12
Solberg, Arlyn	TRANSIT , The Navy's 1 st GPS development	2012-02
Solberg, Arlyn and Jacques Lignieres	London Development Center , history	2013-11
Solomonson, Craig	UNIVAC 8008 Micro – 1972 8-bit computer	2015-02
Stockman, Chuck	S-3A aircraft computer history	2018-10
Stone, Noel	Engineering Organization , UNIVAC July 1961	2015-10
Svendsen , B. N. 'Mike'	Semiconductors at UNIVAC for CBI	2013-07
Svendsen, B. N. 'Mike'	ERA to Unisys Technologies – shadow boxes	2014-05
Svendsen, B. N. 'Mike'	UNIVAC to Unisys Technologies – shadow boxes	2014-06
Taipale , Harvey	What is all this LEGACY stuff about anyway?	2007-11
Taipale, Harvey	Winning of CNCE – Air Force comm system	2021-09
Taipale, Harvey, et al'	Snapshots of Times – President's Messages	2022-07
Thomas, Todd J.	CP-823/U Communications Log	2010-09
U of MN, CSE	Digital Age , a reprint of an Inventing Tomorrow publication, 75 th IT anniversary.	2011-10
Unknown from Ron Irwin	MATCALs – Controlling the Skies in 1993	2011-04
Von Neumann, John	First Draft of a Report on the EDVAC , 6/30/45	2022-12
Vraa, Earl M.	Computer Aided Design - automation	2009-09
Vraa, Earl M., et al'	Evolution of CAD , 1957 => 1980s	2009-11
Webb, Tom	The almost Silicon Valley , Pioneer Press	2010-02
Weidenbach , Don	Career summary , 1946 to 2021	2013-02
Welshinger, Paul and Bob Keenan	Environmental Test Laboratory Evolution	2008-08
Wendell, Douglas C. Jr.	Magnetic Tape Plating Facility, Unisys History	2008-10
Westergren , John	Video Library List , 3/11/2009	2011-08
Westergren, John	Focus on the Future , presentation to the Annual Unihogs/Unturkey's luncheon	2011-11
White, Robyn – Chief Editor	U of MN, 40 Years of Excellence	2009-03
Williams , Gerald 'Jerry'	Three Satisfying Inventions – book excerpt	2021-04
Willis, Ken via Ron Q. Smith	ENIAC is 75-yrs Old! Philadelphia Inquirer scanned article	2021-02
Wilson, Jack – via Larry Bolton	Astronauts to the Moon , scan of Minneapolis Star article from Oct. 20, 1968.	2018-12
Yost, Dr. Jeffrey	Minnesota's Computing History – a web site	2019-02

By Title – Topic

Primary Writer(s)	Title or Topic of Story	Posted
Myhre, Keith, et al'	40-year ERA Plaque – Where did it go?	2022-08
Dragseth, Kevin – TPT Producer	About Solid State : Minnesota's High-tech History – documentary summary and links.	2019-10
Benson, Lowell A., et al'	Achievement Award for the 200-nanosecond memory - 1966	2010-06
Bolton, Larry D. and Clinton Crosby	Addendum to Minuteman Plated Wire Usage	2011-02
Neuman , Don	Air Force Satellite Control Network - reprint	2013-12
Sater , Jack	Air Traffic Control – From NTDS to ARTS	2008-06
Shelander, David	AN/UYK-43 Computer , a synopsis	2012-05
Blixt , R. P. 'Bob'	A-NEW Data-Processing System, CP-754A	2010-11
Christensen, Curt	Another Computer Was Born	2008-07
Benson, Lowell A.	Anthologies Tell the Story , ERA - 75 yrs ago	2021-01
Anderson, Steve	Apollo 11 Memories – a TPT video interview	2019-07
Crowe, Forest W. via Andy Simon	Apollo 11 Mission Congratulations Letter	2018-02
Dexter, Patty re' Tom Weyrick	Apollo 11 mission work interview	2019-08
Mager, Don - #101, <i>The first of Our Stories</i>	Apollo Computers – the early deliveries	2007-04
Anonymous – at the donor's request	Arbitration , Project 6977 Israel contract	2018-05
Rapinac , James 'Rapp'	Army Experiences before Sperry Univac	2016-05
Anderson, Sally via Bernie Jansen	Artifact Accessioning at DCHS museum	2014-11
Benson, Lowell A.	Artifact Collecting – donating to the museum	2016-04
Myhre, Keith	Artifacts on Display, 16 Legacy Story Boards	2021-05
Koltes, Steve, et al'	ARTS II Display Emails	2020-08
Hoffman , Kevin	Assignment in Mississippi	2020-09
Wilson, Jack – via Larry Bolton	Astronauts to the Moon , scan of Minneapolis Star article from Oct. 20, 1968.	2018-12
Nelson, Les and Lowell Benson	ASW History , 50+ years	2012-09
Nelson , W. 'Curt' and Lowell Benson	ASW-mod 1 Avionics System, 1963 Aviation Week reprint plus our background info.	2010-10
Brown, Curt, et al'	At 99, Don Weidenbach looks back	2021-03
Benson, Lowell A.	ATLAS Evolution with shadow box photos	2012-08
Andrews , Jim	Autogram Display and How It Reduced the Logic Design Cycle	2022-05
Inda, Jim and Mike Wold	B-2 STEALTH BOMBER STORY	2015-01
Devlaminck, Ghislain A.	Black Briefcase delivered classified items	2022-02
Nelson, W. 'Curt'	BOMARC , the ERA 1104 development	2017-09
Benson, Lowell A.	Book Review – Digital State by Dr. Tom Misa	2014-08
Heckert, Quint	Booklet , VIP Club's 30-Year Anniversary	2010-12
Benson, Lowell A.	Brief History of Sperry Corp, circa 1985	2013-01
Greenia, Mark	Burroughs , Legacy Corporation on YouTube	2018-04
Abbott , Dennis	Canadian Patrol Frigate (CPF)	2008-05

<u>Primary Writer(s)</u>	<u>Title or Topic of Story</u>	<u>Posted</u>
Pogorzelec, Ed, et al'	Canadian Patrol Frigates upgraded	2017-01
Petschauer , Richard J. 'Dick'	Carbon Heat Trapping : Merely a Bit Player in Global Warming	2008-02
Weidenbach , Don	Career summary , 1946 to 2021	2013-02
Johnson, Carl	Carl Johnson Collection at CBI	2017-10
Myhre , Keith	Cataloging Legacy Artifacts at the Lawshe Memorial Museum.	2020-10
Lundgren, Richard 'Dick'	Charles Babbage Institute – Our 1st Visit	2014-10
Metzger, Jack, et al'	Circuit Card(s) History – germanium to silicon	2016-12
Lundgren, Richard 'Dick', et al'	Compendium, IT Legacy Newsletter Articles	2016-03
Benson, Lowell A., et al'	Compendium, No. 2 of Newsletter Articles	2022-01
Bolton, Larry D.	Component Quality and Reliability	2021-08
Vraa, Earl M.	Computer Aided Design - automation	2009-09
Greenia, Mark	Computer History Archives Projects (CHAP) – 20 YouTube video links w/summaries	2019-09
Benson, Lowell A.	Computer History Review – 1 st 25 years	2012-01
McCarthy , Gene; Mike Bukovich and Bob Elfering	Contract Wins ; CPF, UYK-43, and UYK-44	2007-07
Thomas, Todd J.	CP-823/U Communications Log	2010-09
Klobuchar, Jim via Larry Bolton	Creation of the 1824 , scan of Minneapolis Star article from Nov. 5, 1965.	2018-11
Pickering, Gerry	Creativity-Success-Obscurity , what happened?	2012-04
Mullaney, Frank C.	December 12, 1950 – distribution letter and Technical Memorandum No. 15 reprint	2011-01
Rego, CWQ4 John P.	Deployment to Somalia – MAATCALS in 1993	2011-04
U of MN, CSE	Digital Age , a reprint of an Inventing Tomorrow publication, 75 th IT anniversary.	2011-10
Benson, Lowell A.	Display Posters Text on 4'x4' tabletop board	2011-12
Benson, Lowell A.	Display Report for university #2, summer '10	2010-07
Benson, Lowell A., et al'	Donations to CBI from Curt Christensen, Pat Corbett, Bob Jablonski, Jim Larson, and M. Adelman	2018-06
Palzer, Norm	Drum Memory archived at MHS	2009-06
Coombs, J.R	Drum Prototype Design , scan of a 1947 National Electronics Conference reprint.	2010-04
Greenia, Mark, et al'	Early Computer Parts, notes and YouTube link	2018-09
Keremedjiev, George; Anders Carlsson, and Duane Craps	Eighteen Bit Computers – from three non-Minnesotan Legacy Anthology browsers	2015-09
Koltes , Steve	Employed 60-Years, James Bacon	2015-11
Allen, Clyde	Engineering Organization , Sperry 1980	2015-10
Erickson, Robert A. 'Bob'	Engineering Organization , UNIVAC Feb. 1977	2015-08
Stone, Noel	Engineering Organization , UNIVAC July 1961	2015-10
Christensen, Curt	ENIAC Beginning Summary	2011-06

<u>Primary Writer(s)</u>	<u>Title or Topic of Story</u>	<u>Posted</u>
Willis, Ken via Ron Q. Smith	ENIAC is 75-yrs Old! Philadelphia Inquirer scanned article	2021-02
Welshinger, Paul and Bob Keenan	Environmental Test Laboratory Evolution	2008-08
Mullaney, Frank C.	ERA 1101 Computer Design Features - scan	2017-02
Burrell, Warren and George Champine	ERA 1102 Computer at Arnold Engineering Development Center, 1952 - 1966	2010-05
Nelson, W. 'Curt'	ERA 1103 Announcement – a 1953 news scan	2017-07
Angvall, R. and Ron Q. Smith	ERA formation and 1100/2200 evolution	2017-11
Fox, Andrew	ERA to Lockheed Martin : MN computer Industry	2014-11
Svendsen, B. N. 'Mike'	ERA to Unisys Technologies – shadow boxes	2014-05
Lundgren , Richard 'Dick'	European Defense Business	2007-12
Vraa, Earl M., et al'	Evolution of CAD , 1957 => 1980s	2009-11
Von Neumann, John	First Draft of a Report on the EDVAC , 6/30/45	2022-12
Hunter, Ned; Knops and Tom; et al'	First Flying Programmer , Oscar Lundbeck	2013-09
Westergren, John	Focus on the Future , presentation to the Annual Unihogs/Unturkey's luncheon	2011-11
Goldbacher, Harry	Frank Lapinski was my mentor	2015-04
Nelson , Ed, et al'	Fred Hargesheimer Story	2007-09
Lenfestey, James P.	Gaggle of Geeks – a news article	2008-03
Smith, Ron Q.	Growth of Computing at Unisys	2020-06
Bolton, Larry D.	Hardware Artifact Log as of November '09	2011-09
Petschauer, Richard J. 'Dick'	History and Evolution of 1100/2200 Mainframe Technology	2014-07
Benson, Lowell A.	Information Technology Anthology – site map	2017-12
Benson, Lowell A., et al'	International sites of note, http://vipclubmn.org/Articles/World_Wide.pdf	2020-11
Shoquist, Marc C.	Interview transcription via John Westergren	2016-05
Andersen, David	Invention of Voice Mail	2007-06
Society, IT History via LABenson	IT History Reference (www.ithistory.org) Honor Roll . ERA to Unisys people therein	2019-12
Benson , Lowell A.	It's A Wrap – Minnesota's Sesquicentennial	2009-02
Sandusky , Vern	Johnston Island Hurricane damage report Johnston Island repairs report	2009-12
Sloan, Judy	Joint Strike Fighter Electronics	2018-08
Benson, Lowell A.	Legacy at the University of Minnesota	2010-03
Benson, Lowell A.	LEGACY COMMITTEE ANNIVERSARY!	2022-10
Montgomery, Tom, et al'	Legacy Epoch , Air Traffic Control	2012-07
Benson, Lowell A.	Legacy Preservation Partnerships	2015-05
Jansen , Bernie	Legacy Preservation Sites – a 2012 Unihogs luncheon presentation	2012-12
Benson, Lowell A.	Letter to 'Ole' , i. e. Richard Olson Legacy Committee Accomplishments	2015-12
Benson, Lowell A.	Letter to the Smithsonian Museum Curator	2013-05

Primary Writer(s)	Title or Topic of Story	Posted
LaViola, Joe – UBBRG President	Letter to Unisys Blue Bell Retirees Group	2016-10
Blumenthal, Mike	Letter to Weinberger	2009-05
Rubin, Richard via Gish Devlaminck	Little Instrument in Your Pocket	2021-02
Solberg, Arlyn and Jacques Lignieres	London Development Center , history	2013-11
Bolton, Larry D.	Magnetic Drum Artifacts, three	2009-04
Wendell, Douglas C. Jr.	Magnetic Tape Plating Facility, Unisys History	2008-10
Schlueter, Lou	MAPPER Systems History Presentation	2013-06
Irwin , Ron	MATCALs – A 30-Year Life	2015-06
Unknown from Ron Irwin	MATCALs – Controlling the Skies in 1993	2011-04
Ganz, Bill via Ron Irwin	MATCALs – Technical Description re-print	2011-05
Heryla, Robbin – Unisys HR Dept.	Membership Recruiting – VIP Club, 1988	2015-07
Johnson, Carl	Micro-1100 Story – Chip Set Development	2019-11
Yost, Dr. Jeffrey	Minnesota's Computing History – a web site	2019-02
Misa, Dr. Thomas	Minnesota's Hidden History in Computers	2010-12
Alcon, Chuck LCDR US Navy (ret.)	Navy Standards Program – Don Ream tribute	2020-12
Nemanich, John	Networking History at Unisys	2007-08
Fadden, C. via Les Nelson	NEXRAD , more than meets the eye	2018-01
Bolton, Larry D., et al'	Nike-X System Hybrid Integrated Circuits Nike-X electrical circuit/component diagrams	2019-01
Leichtweis, Capt. Donald USN ret.	Nomination, Name a Ship the Donald Ream	2014-12
Snyder, Samuel S. – release June '09	NSA History , General-Purpose Electronic Digital Computers – reprint of 1964 paper	2010-08
Gray, George	NSA Used UNIVAC Computers	2015-03
Benson, Lowell A.	Ocean Surveillance Chronology – 5 decades!	2013-08
Benson, Lowell A.	Ocean Surveillance Chronology – Univac to LMCO, 50-years of excellence	2019-05
Lins, Ray vis son Mike Lins	Open House at Sperry Univac - 1974	2018-07
Myhre, Keith	Oral Interview of Keith Myhre by MHS	2023-02
Bolton, Larry D.	Parts Control , Minuteman computers	2009-07
Charlton, Art, et al'	Photo Club History , donated to the museum	2017-05
Monson, Bengt 'Ben'	Plant 2, A New Tenant	2014-02
Devlaminck, Ghislain A., et al'	Plant 2, Glider History	2014-03
Carlson, Dan; Bob Engel, Kristen Maloney, Tom Montgomery, and John Westergren	Plant 8 Closure , end of an IT epoch	2013-04
Bolton, Larry D.	Plant 8, circa 1966 – scan of a news article	2019-04
Dickson, Paul – et al'	Plated Wire Dialogues	2020-03
Bolton, Larry D.; Clinton Crosby; and James 'Jim' Howe.	Plated Wire Memory Usage on the UNIVAC Minuteman Weapon System Computer	2008-04
Ernst, Steve	Precision Agriculture Business Initiative	2020-05
Benson, Lowell A., et al'	Program and Product Management , 1974	2017-03
Nelson, Les	Programmable Signal Processor (PSP) Development	2022-09

Primary Writer(s)	Title or Topic of Story	Posted
Larson, LeRoy	Quicksilver , a Shadowbox Story	2017-06
Benson, Lowell A., et al'	Realization of a Dream, exhibit at the Lawshe	2013-10
Burrell , Warren	Recollections , Pre-Athena, i. e. Transtec, etc.	2011-03
Benson, Lowell A.	Repertoire Cards – 24 bits	2013-03
Cray, S. R. and Kisch, R. N.	Report, Progress of CAD circa 1954	2009-10
Knight, Michael	Reservation System , BEA Design Ahead of its Time?	2009-01
Stockman, Chuck	S-3A aircraft computer history	2018-10
Benson, Lowell A.	Security clearance process memo, 1973	2019-06
Bolton, Larry D.	Semiconductor Technology Progression at UNIVAV/Sperry/Unisys/LMCO in Minnesota	2014-09
Johnson, Don via Larry Bolton	Semiconductor Testing at UNIVAC Semiconductor Test Record , 1957-1962 P/N 4908000 and P/N 4907828 specifications	2020-07
Svendsen , B. N. 'Mike'	Semiconductors at UNIVAC for CBI	2013-07
Shoquist , Marc C.	Serial Input/Output papers, two	2008-12
Benson, Lowell A.	Slides for a 2012 Ft. Snelling presentation and Script for the Ft. Snelling presentation.	2012-03
Taipale, Harvey, et al'	Snapshots of Times – President's Messages	2022-07
Graber, Ken; Larry Bolton, and Jeff Parker	SNERT Chip Development	2008-09
Gray, George	Sperry Military Computers	2007-05
Gray, George and Ron Q. Smith	Sperry Rand's Third Generation Computers 1964–1980	2022-11
Greenia, Mark, et al'	Sperry UNIVAC Fastrand Drums on YouTube	2018-03
Benson, Lowell A.	Sperry UNIVAC History Boxes – technologies	2012-11
Bower , Ed	Sperry Utah , Sergeant Missile Program	2020-01
Carter, James – via Keith Myhre	Starring the Computer – a website dedicated to computers in film and TV, some are ours.	2020-02
Benson, Lowell A.	Status of Our Stories , etc. 200th Our Story	2023-01
Benson, Lowell A.	Technologies' Experiences for MHS interview	2022-06
Webb, Tom	The almost Silicon Valley , Pioneer Press	2010-02
Williams , Gerald 'Jerry'	Three Satisfying Inventions – book excerpt	2021-04
Benson, Lowell A.	Through the Ages! An Eagan Open House	2017-08
Solberg, Arlyn	TRANSIT , The Navy's 1 st GPS development	2012-02
Miller , John	Turtle Mountain Corporation spinoff NDSU newsletter article scan re' Miller	2021-12
White, Robyn – Chief Editor	U of MN, 40 Years of Excellence	2009-03
Smith, Ron Q.	Unisys and the Growth of Computing	2016-02
Smith, Ron Q.	Unisys history sequence – slide set	2014-04
Benson, Lowell A.	UNISYS WEB and TIMELINES , what and when.	2021-11
Neukom, Hans, et al'	UNIVAC 418s , triple use application	2017-04
Bolton, Larry D. and Ralph Kerler	UNIVAC 7901000-series Integrated Circuits	2008-11
Solomonson, Craig	UNIVAC 8008 Micro – 1972 8-bit computer	2015-02

Primary Writer(s)	Title or Topic of Story	Posted
Champine , George – Ph. D	UNIVAC Computers I Have Known	2012-10
Mager , Don	UNIVAC Digital Trainer – UDT-6	2019-03
Reiter , Allan	UNIVAC I Computer System , Technical UNIVAC I System Experiences , People	2012-06
Mitchel, Herbert – auto-bio excerpts from George Gray via R.Q. Smith	UNIVAC in Philadelphia, Volume I UNIVAC Marketing, Volume II	2014-01
Goldbacher, Harry	UNIVAC Plated Wire Memories – Blue Bell.	2015-04
Svendsen, B. N. ‘Mike’	UNIVAC to Unisys Technologies – shadow boxes	2014-06
Durand, David – et al’	USAF mobile system developed at RADC	2016-11
Monson, Robert via Keith Myhre	Valiant & Intrepid Workstation History	2022-03
Myhre, Keith	Valiant Workstation Resurrection	2022-04
Bolton , Larry D.	Vendor Surveillance Notebook	2007-10
Anderson, Larry and Earl Vraa	VHSIC Hardware Design Methodology	2009-08
Westergren , John	Video Library List , 3/11/2009	2011-08
Devlaminck, Ghislain A.	VIPS Adventure – fixing a problem in the field	2020-04
Taipale , Harvey	What is all this LEGACY stuff about anyway?	2007-11
Ketchum, James via Warren Burrell	When Computers came to Minnesota	2011-07
Lantto , Ernie, et al’	When Did it Happen? Computer type dates .	2021-10
Taipale, Harvey	Winning of CNCE – Air Force comm system	2021-09
Pogorzelec, Ed	Winnipeg Operations People and plants	2021-07
Pogorzelec, Ed	Winnipeg Operations , Tribute 1977-2000	2021-06
Norris, William C.	World War II Experiences – a paper scan	2016-01
Hambleton , Glen	World-Wide Career	2008-01

LEGACY ANTHOLOGY Table of Contents

- [Chapter 1](#) - **IT Anthology**: Introduction, Search Box, Committee, Project Successes, Thank You, Acronyms
 - [Chapter 2](#) - ERA to LMCO; 75-year Introduction, Corporate Name History, General Managers,
 - [Chapter 3](#) - EMCC to UNISYS; Philadelphia Introduction, UNISYS Corporate Genealogy, UNISYS Milestones, UNISYS Computers, Networking History, and UNIVAC III pictures.
 - [Chapter 4](#) - Burroughs, etc.: Introduction, Burroughs bought Sperry, RCA, {place holders for other predecessors}
 - [Chapter 5](#) - Minnesota's Technology Wellspring Milestones, 1946 to 2017
 - [Chapter 6](#) - Spinoffs of ERA and CDC 1953-1994; Northport Engineering; and Printware Inc.
 - [Chapter 7](#) - Artifacts: Models, Printed Circuit Cards, Memory Modules, and Power Supply.
 - [Chapter 8](#) - Mementos: Service Awards, Plaques, and Trinkets.
 - Chapter 9 - Place holder for future topic

- [Chapter 10](#) - **People**: Introduction; Listing of Career Summary submittals; 9/11 experiences by Doll, Taipale, Halls, Roselle, and Reischel; plus, Diversity tidbits by Shoquist, Benson, Chin, and Unke.
 - [Chapter 11](#) - People A-B: Article contributors; Career Summaries by Abbott, Alton, Andrews, Arnold, and Allen; and Summaries by Becker, Behnke, Benjamin, Benson, Blackmer, Blattie, Block, Bolton, Bougie, Bro, Bukovich, Burns, Burrell, Butler, and Bower.
 - [Chapter 12](#) - People C-F: Article contributors; Career Summaries by Casey, Chappelle, Christ, Covington, and Cross; Summaries by Davis, Doll, Donaldson, Dotzler, Duncan, and Debelak; Summaries by Edwards, Enstad, and Esch; and Summaries by Fedor and Lyle Franklin.
 - [Chapter 13](#) - People G-H: Article contributors; Career Summaries by Geiger, Gignac, Gildemeister, Giles, Goulding, Granberg, Gregory, Grendzinski, Grewenow, Gunderson, and Gunther; and summaries by Halverson, Hambleton, Hanson, Hartmann, Heiden, Hileman, Hoffman, Hove, and Hyslop.
 - [Chapter 14](#) - People I-L: Article contributors; Career Summaries by Irwin and Iskos; Summary by Jurgens; Summaries by Kenny, Kistler, Kloner, Klugherz, Kolling, Kratz, Kuhns and Koltes; and Summaries by Lahti, Langer, Lantto, Lovely, and Lundgren.
 - [Chapter 15](#) - People M-O: Article contributors; Career Summaries by Mager, Manning, McCarthy, McKenna, Michaud, Miller, Moe, Mortison, Mozak, K. Myhre, P. Myhre, and Bob Myller; Summaries by Nellis, Curt Nelson, Ed Nelson, Ken Nelson, Les Nelson, and Neumann; and Summaries by 'Ole', Jim Overocker, and Jim Olijinek.
 - [Chapter 16](#) - People P-R: Article contributors; Career Summaries by Pagac, Parkins, Petschauer, Patton, Pejasa, Phipps, Pickering, Plait, and Prokop; Summary by Quiggle; and Summaries by Rapinac, Raveling, Reiter, Roberts, Roessler, and Rougier.
 - [Chapter 17](#) - People S: Article contributors; Career Summaries by Sandstrom, Sandusky, Santoski, Sater, Scholz, Schwitters, Sinkula, Soller, Spearing, Spitzmueller, Stephenson, Svendsen, Sloan, Schmidt and Suckstorff.
 - [Chapter 18](#) - People T-Z: Article contributors; Career Summaries by Tilford, Tofteland, and Taipale; Summary by Valentini; Summaries by Walzer, Weidenbach, Weinhold, Westergren, Widenkopf, Widdoss, and Wold; and Summary by Yahr.
 - [Chapter 19](#) - Deceased: Introduction; Obituary Logs; and Testimonials for Arndt, Bergum, Blixt, Casey, Champine, Cohen, Frank, Hargesheimer, Higgenbotham, Hill, Homan, Huberty, Joseph, Keye, Kiesling, Kucera, Markfelder, McDonald, Ream, Reid, Rubens, Tomash, Wesslund, and Zimmer.
 - [Chapter 20](#) - They Flew: Oscar Lundbeck; Ensuing ASW flyers Tomisch, Barness, Kratz, Nickell, and Ronneberg; Noyes; Jack Anderson and Lowell Benson; Quent Fabro; Ron Handy; Tricia Myhre; John Enstad;

- Special Program flyers Cady, Bezdicek, and Ken J. Nelson; Hydrofoil flying Cady, Herbster, and Benson; and ABCCC flyers - Svenson, Rossman, Vitale, and DuBrall.
- [Chapter 21](#) - Anecdotes: HSA Recollections by Ole and Benson, Musings by Rapinac, John Alton's Recollections, Legend of Jerry Green, John Markfelder, Marketing by Franklin, Environmental Laboratory, NTDS software, and SHINPADS by Ron Schroeder.
 - [Chapter 22](#) - People Interviewed: Introduction; Interviewee Snippets of Rapinac, Hargesheimer, Shoquist, Jack Hill, and Larry Debelak; Interview questions by Ole; ERA Old Timers - recordings of Bill Butler, Jim Wright, Jerry Williams, Ed Nelson, Jack Ross, Bernie Jansen, Bob Wesslund, Leo Bock, Alden Allen, Phil Phipps, Chuck Homan, Gale Jallen, and Warren Burrell. Additional videos of Myron Lecy, Roy Valentini, Manny Block, and a 2nd of Phil Phipps.
 - Chapters 23 thru 28 - These are place holders for new people stories or to resize some of the larger chapters of 11 thru 18.
 - [Chapter 29](#) - People Index: 1) Alphabetical index of people mentioned within Legacy chapters and 2) Chapter by chapter of names of people who have contributed to the chapter. *This chapter needs verification.*
 - [Chapter 30](#) – **Locations:** Introduction; Original ERA buildings summaries by Benson, Lundgren, and Wise plus NSTR by Michaud and Nilsson.
 - [Chapter 31](#) - Twin Cities': Introduction; 1987 facilities listing; Descriptions of Plant 1, Plant 3, Plant 4, Plant 5, Plant 6, Plant 6 the second, Plant 7, Plant 8, and the MACS building.
 - [Chapter 32](#) - United States sites: Introduction; Manufacturing Facilities in Salt Lake City UT, Clearwater FL, Pueblo CO, and Clear Lake IA; Customer sites in Rockville MD, Valencia CA, and San Diego CA; TSD offices; and Marketing Offices.
 - [Chapter 33](#) - International sites: Introduction; Canada; Europe's Bad Godesberg and Paris; Pacific Rim; and Australia, Africa, and Asia.
 - [Chapter 34](#) - Blue Bell history: Introduction; List of ENIAC firsts; UNIVAC I, II, and III; Technical Publications; Other design efforts; and Stories from Blue Bell Pioneers Chapline, Bartik, Gehring, Smoliar, Wilson, and Chintz; plus, the UNIVAC Magnetic Tape plating facility.
 - Chapter 35 - place holder for Clearwater, FL.
 - Chapter 36 - place holder for Pueblo, CO.
 - [Chapter 37](#) - St. Paul Operations: An Emmett Johnson organization chart -
 - [Chapter 38](#) - Winnipeg Operations,: Introduction, 2012 Reunion, People, Facilities, and Products
 - Chapter 39 - place holder for other location stories
 - [Chapter 40](#) – **Engineering:** Introduction; Frank Kline tidbits; PC Design by Bob Langer; Maintenance Panels by Larry Bolton; Embedded Processors by Harry Wise; and Computer Aided Design (CAD) by Earl Vraa, et al.
 - [Chapter 41](#) - Couplers & ERA Products: Introduction, Antenna Couplers, Crosley GSE, Doppler Wind Drift Indicator, and other ERA products.

- [Chapter 42](#) - Component Engineering: Introduction, Component Analysis, Pulse Transformers, Motley Crew, Procurement, Product Assurance, and Semiconductor Development.
- [Chapter 43](#) - Field Service: Introduction, History of Field Service by Dick Roessler, Johnston Island and Vandenberg AFB by Neumann and Sandusky.
- [Chapter 44](#) - Interface engineering: Introduction, Low Level Serial, Fiber Optics, 1773, SHINPADS, and communications systems.
- [Chapter 45](#) - Memory Engineering: Introduction, Drum Memories, Braided Wire Memory, Plated Wire Memory, Bubble Memory, Film Memory, Core Memory, and Semi-conductor Memory.
- [Chapter 46](#) - Patents: Introduction, Archi Lahti, Lee Granberg, Gary Grundy, Charles Kiesling, Gerald Williams, Cost Savings, and Dockets.
- [Chapter 47](#) - Peripherals: Introduction, DEAC by Kuhns, Commercial I/O consoles, Ruggedized I/O Consoles, Magnetic Tape Units, Display Units, Repertoire cards, and Technical Manuals.
- [Chapter 48](#) - Software: Introduction; Athena; MAPPER Stories by Del Fiacco, Schlueter, and Thalhuber with Code Cards; NTDS by Byrne; Simulation Development by Plumer, Navy Compilers by Clyde Allen; and 1103 Software by Ross.
- [Chapter 49](#) - Training: Introduction; Recollections by Lyle of TAC, File Computer, Technician Training, and UNIVAC Scientific; and People stories of Glen Kregness and Gary Holthusen.
- [Chapter 50](#) - **Computers**: Introduction; Level 2 Chapter summaries, NTDS Computer Models, Computer Genealogy, and Genealogy Comments by Harry Wise.
 - [Chapter 51](#) - 24-bit CPUs: Introduction; Genealogy Chart; CPUs Classified, ATLAS 1101, ATHENA, 1824, CP-818, CP-823, and Speed Tally; Repertoire Cards; and Technical Manuals.
 - [Chapter 52](#) - 30-bit CPUs: Introduction; Technologies; CPU summaries for the 1104, USQ-17, M-460, USQ-20, CP-642A, CP-642B, CP-808, CP-823, Phoenix, 1230, CP-890, CP-901, 1830B, UYK-8, 1530 MTC, FAA IOOP, and ARTS III IOP; Repertoire Cards; and Technical Manuals.
 - [Chapter 53](#) - 18-bit CPUs: Introduction; Computer Family; Unit descriptions of 1218, U1500, 1219B, 1219C!, 1818, 1819, UYK-11, and 418 computer series; Repertoire Cards; and Technical Manuals.
 - [Chapter 54](#) - 16-bit CPUs: Introduction; Genealogy; Unit descriptions of 1616, UYK-15, MPC16, 3760, UYK-20, AYK-14, UYK-5056, 1834, UYK-44, and UYK-507; Repertoire Cards; and Technical Manuals.
 - [Chapter 55](#) - 32-bit CPUs: Introduction; Computer Family; Unit descriptions of UYK-7, AYK-10, CP-140, S-3B, and UYK-43; Memory Processor; Repertoire Cards; and Technical Manuals.
 - [Chapter 56](#) - 36-bit CPUs: Introduction; Unit descriptions of 1103, 1105, and CP-667; Repertoire Cards; and Technical Manuals.

Established in 1980

- [Chapter 57](#) - AF Units: Introduction; Genealogy Chart; and Unit descriptions of 2052, RMF-400, WASP, B-2, YF-23, and JSF (Joint Strike Fighter).
- [Chapter 58](#) - Special Purpose: Introduction; 1624; Unit descriptions of UDT, NIKE, RISC, CP-2044, USQ-69 & UYQ-70, T3067 suitcase, and CLC; Special Purpose by John Alton and Wayne Olson; and MOD 0 by Lyle Franklin.
- [Chapter 59](#) - Commercial Computers: Introduction; Computer Tree 1950-63; Early Customer Lists; Early Computer References; Computer Tree 1962-80; Design Standardization; Beyond 1980; Repertoire Cards; and Technical Manuals.
- [Chapter 60](#) - **Systems**: Introduction; Systems Evolution; and Tactical Air Command. Many of these systems used our computers, software, and other products as described in the following level 2 tabs.
 - [Chapter 61](#) - Air Traffic Control: Introduction; Genealogy of systems; Locations; Hardware descriptions; Software descriptions; Systems descriptions; Documents; Associated sites; and ZKSD
 - [Chapter 62](#) - Airborne: Introduction; ASW stories by Blixt, Clement, Hunter and others; P-3 to S-3A by Rapinac; ABCCC by Debelak; Quicklook by CW4 Nesheim; and others such as LAMPS and Drone Systems.
 - [Chapter 63](#) - Government Systems: Introduction; NEXRAD by Pickering, Lang, and Nelson; Postal; Agricultural; and Intelligent Vehicle Highway Systems.
 - [Chapter 64](#) - International: Introduction: Canadian by McCarthy; Japanese by Lovely and Francis; Egyptian Navy by Booher; and European, Australia, Africa, Taiwan, and Thailand country summaries by Lundgren.
 - [Chapter 65](#) - Marines: Introduction, TPQ-27 demonstration, MTDS, MATCALs, and TERPES.
 - [Chapter 66](#) - Aerospace: Introduction, Vandenberg AFB, Johnston Island, AF Missile Tracking, Australia tracking station, Remote Tracking, NASA in Houston, and Others.
 - [Chapter 67](#) - Navy Systems: Introduction; Surveillance Systems; Systems' descriptions; Submarine systems; a Carrier Ride, TRANSIT GPS; and two NTDS Service Test stories from Pickering.
 - [Chapter 68](#) - ASOC: Introduction, System Chart, and Product Evolution - thanks to Lauren Cady.
 - [Chapter 69](#) - Commercial Systems: Introduction, Topical info, Precision Agriculture, and Flight Reservation Systems.
- [Chapter 90](#) - **Legacy Exhibits**: Lawshe Memorial Museum in S St Paul; Unisys in Eagan; Charles Babbage Institute in Minneapolis; Minnesota Historical Society Museum in St. Paul; and The Computer History Museum, the USS Midway Museum, American Computer and Robotics Museum, the Vintage Computer Federation, Vintage Technology Association, the Southwest Museum of Engineering, Communications and Computation, System Source Computer Museum (SSCM), and the Hagley Museum.

- [Chapter 100](#) - **Our Stories:** Introduction, Monthly Articles, Slide Shows, and a listing of Books - each of which tells parts of our story.

LEGACY STATUS – December 2022

In 2022 we posted the 200th career summary and this is now the 200th Our Stories posting. Since the Legacy Committee's first meeting the Club has issued about 150 newsletters. Each had Legacy tidbits, some were duplicates of the Our Stories and some are Legacy status summaries. For example, <http://vipclubmn.org/Newsletters/Enews2209.pdf> provided the status of our Lawshe Memorial Museum initiative. That news article by Keith Myhre projected about two more years of volunteerism needed to finish the cataloging.

Another Nov./Dec. 2022 newsletter article is, "**Anticipation** - We are anxiously awaiting the reopening of the Lawshe Memorial Museum after the Americans with Disabilities Act improvements are completed in early 2023. This picture by Keith Myhre shows ~1/3rd of the great room before the reconstruction.



The floor has a pictorial map of Dakota County; the periphery has our Legacy artifacts and informational posters. At the left, Les Nelson and Bob Pagac are looking at four of the 16 topical poster boards. From left to right are a Quality Control (QC) inspector's jacket behind an automatic antenna coupler, an Input/Output Processor (IOP) rack-mounted FAA computer, the micro-1100 wafer set with development project poster highlights, an AN/UYK-43 large scale Navy computer, an AN/USQ-69 display, the AN/UYK 44 minicomputer, the CP-2044 airborne computer, two variations of the Valiant displays, and more poster boards."

As soon as we receive an ADA compliant completion notice from the museum in 2023, we will need volunteers to reposition the displays from storage and reset the cataloging workstations. Then, if half-a-dozen people donate two Tuesday mornings per month during 2023 we may be able to declare victory and rest on our laurels!

Yes, we are 'Almost Done!'

Established in 1980

Current Legacy Committee

Committee chairman and Program Manager John Westergren; Senior Staff Engineer Lowell Benson; Systems Engineer Bill Bergen; Component Engineer Larry Bolton; Staff Engineer Carl Johnson; Instructor/Writer Dick Lundgren; Systems Engineer Tom Montgomery; Systems Engineer and Marketing Manager Keith Myhre; Systems Engineer Les Nelson; former DCHS trustee Greg Oxley, Program Manager Bob Pagac; Systems Engineer Jon Simon; UNISYS Fellow Ron Q. Smith; VP of Procurement and Semiconductor Development Mike Svendsen; and Engineering Manager Harvey Taipale.

Deceased Committee Members

Club Founder and Human Resources Director Millie Gignac, Warren Becker, Warren Burrell, Quint Heckert, Bernie Jansen, Bill Klingner, Tricia Myhre, Edwin Nelson, Richard 'Ole' Olson, Jim 'Rapp' Rapinac, Jack Sater, Marc Shoquist, Tom Turba, Don Weidenbach, Harry Weis, and Paul Welshinger.

Museum Volunteerism Team

Volunteer teams meet on Tuesday mornings from 9 'til noon, when Lawshe Memorial Museum is not open to the public. However, their staff gives access to us for the use of workstations as we continue cataloguing photos, artifacts, and documents. Contact leaders there to help:

- Exhibits; Keith Myhre, kmyhre@lightblast.net
- Photo ID work; Bob Pagac, rpagac@hotmail.com, and Jon Simon, jcsimon1st@aol.com
- Legacy Committee chairman; John Westergren, jwestergren48@gmail.com
- Museum/Club coordinator; Harvey Taipale, hjtaipale@comcast.net

SPECIAL THANKS TO:

- Dr. Tom Misa, former CBI Director, who gave our committee a decade of 'archiving' guidance, who included parts of our legacy in his U of MN lecture series, who included parts of our legacy in his Digital State book, who was the principal narrator for the 2019 TPT documentary, and who wrote *Gender Codes: Why Women are Leaving Computing* including interviews with several of our IT pioneers.
- Chad Roberts, the 2012 Dakota County Historical Society Executive Director, who got the ball rolling to begin the artifact exhibit at the Lawshe Memorial Museum in S. St. Paul.
- Matthew Carter, current Executive Director of the Dakota County Historical Society who has facilitated Minnesota Legacy grant applications for materials and supplies to help document and display the artifacts donated to the museum.
- Dale Weeks, current DCHS President, who connected with the Minnesota High-Tech Association then led the fund raising for a [computer history](#) web site and the documentary.
- Mark Greenia, director of the Computer History Archives Project, who has produced over a dozen [You Tube videos](#) featuring UNIVAC/Unisys history topics.

Life is our time, space continuum of human interactions.

LABenson, BEE UofMN 1966
[UNIVAC 1960 => Unisys 1994](#),
 VIP Club board, 2005-2019.