Unisys History

TwinSPIN Program Manager: Jim Plasek, **Unisys** Employee

A TwinSPIN PRESENTATION

FEBRUARY 1, 2024

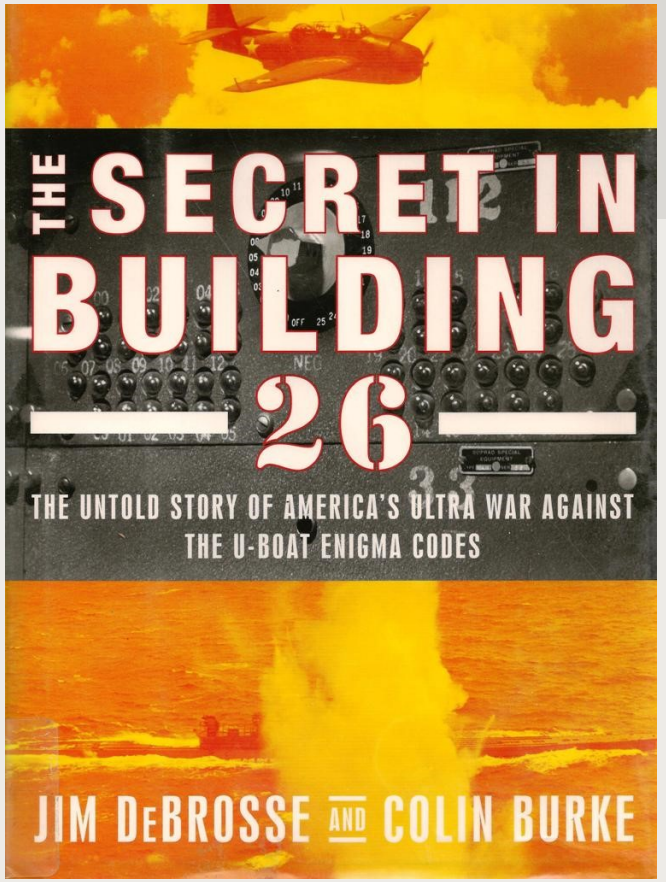
LOWELL A. BENSON

UNIVAC 1960 => **UNISYS** 1994

BEE, U OF MN, 1966

Presentation Topics:
From ERA in 1946 to today's Unisys

- U of MN, Computer Science interactions.
- Corporate Merging & Diverging since 1873.
- Systems Evolution; HCI, 1100 series, MAPPER.
- Defense Industry Systems; Navy, FAA, NWS, …
- Museums, history tidbits
- ERA Recognition Plaque in 2023
- ERA, The First Computer Company - Unisys' Grandfather!
- Telling the ERA Story



WWII activities of ERA founders William 'Bill' Norris, Ralph Meader, and Howard Engstrom – 2008.

U of MN Interaction

https://vipclubmn.org/Articles/40Years_of_Excellence.pdf

Hundreds or thousands of U of MN graduates went to work for ERA/UNIVAC/Sperry/Unisys and spinoff orgs.

- In 1955 RRU gifted the University 400 usage hours on an ERA 1103, the beginning of Computer Science experiments.
- In 1958 UNIVAC delivered 1103 S/N 4 to the Numerical Analysis Center; Dr. Marvin Stein was the 1st director, former UNIVAC employee, Dr. Pete Paton was the 2nd.
- About 1962 the Center acquired a CDC 1604. Dr. Stein's Fortran classes (and book w/Dr. Munro) used it.
- In 1980 the Charles Babbage Institute (CBI) moved to MN; founder Erwin Tomash had been an ERA engineer.
- Founding CBI Director Dr. A. Norberg held the ERA Land Grant Chair for the History of Technology.
- Professorial consulting and donations to CBI!

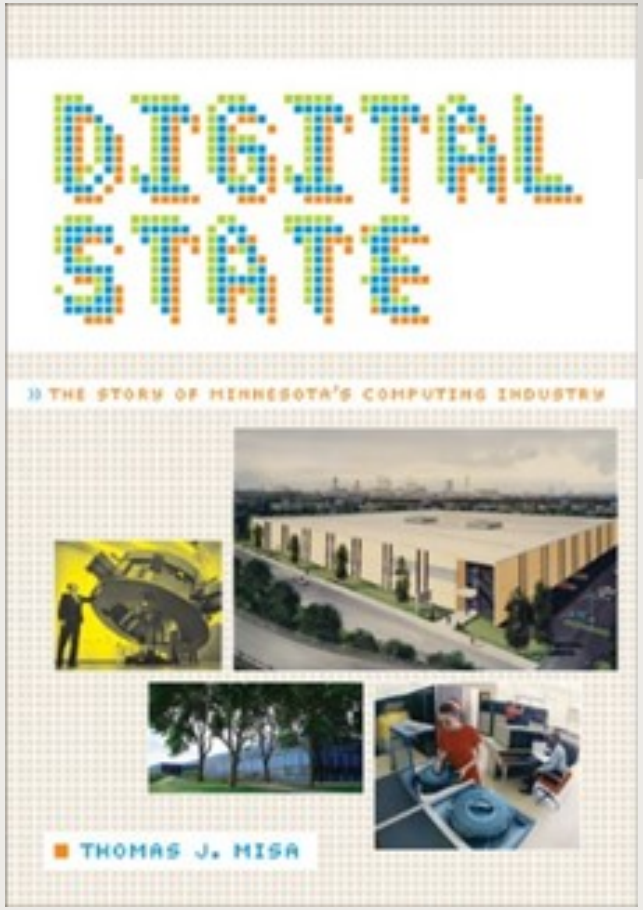
When Mr. Norris left UNIVAC with others to found Control Data Corporation; plant maintenance cleaned out his office - giving his Drum collage to Don Weidenbach, the young engineer shown kneeling in the picture. Donated to CBI in 2011.

Photo by LABenson

U of MN, Telling the Story

https://vipclubmn.org/Articles/FirstVisitToCBI.pdf

- January 2006, the VIP Club met with Dr. Norberg at the U. His advice was to gather 200 career summaries and we would have the ERA/Unisys story. We started our Legacy Anthology web site.
- July 2006 Dr. Thomas Misa became the 2nd Director of Charles Babbage Institute and an advisor to the Club's Legacy committee.
- In 2008 Dr. Misa conducted a lecture series "*Minnesota's Hidden History of Computing*" using some of our gathered legacy data, https://vipclubmn.org/Articles/HiddenHistory_02_2010-Oct4.pdf
- In 2013 he finished the book at the right using some of our data.
- In 2019 Tom was the narrator of TPT's "Solid State – Minnesota's High-tech History", (https://www.tpt.org/solid-state/). Eight VIP Club members are among the 20+ interviewees therein.
- As of December 2023, over 600 people have contributed items to our 60-chapter Legacy Anthology, https://vipclubmn.org/Legacy.html.



MERGING

- 150 years ago, Remington business machines started.
- 1946 **E**ngineering **R**esearch **A**ssociates (ERA) incorporated.
- 1947 **E**ckert **M**auchly **C**omputer **C**orporation (EMCC) incorporated.
- 1950 Remington Rand bought EMCC.
  1952 Remington Rand bought ERA.
- 1955 Sperry combined EMCC & ERA into the UNIVAC Division.
- 1973 renamed Sperry Univac.
- 1983 became Sperry.
- 1986 Burroughs bought Sperry to form **Unisys**

United **i**nformation **sys**tems,

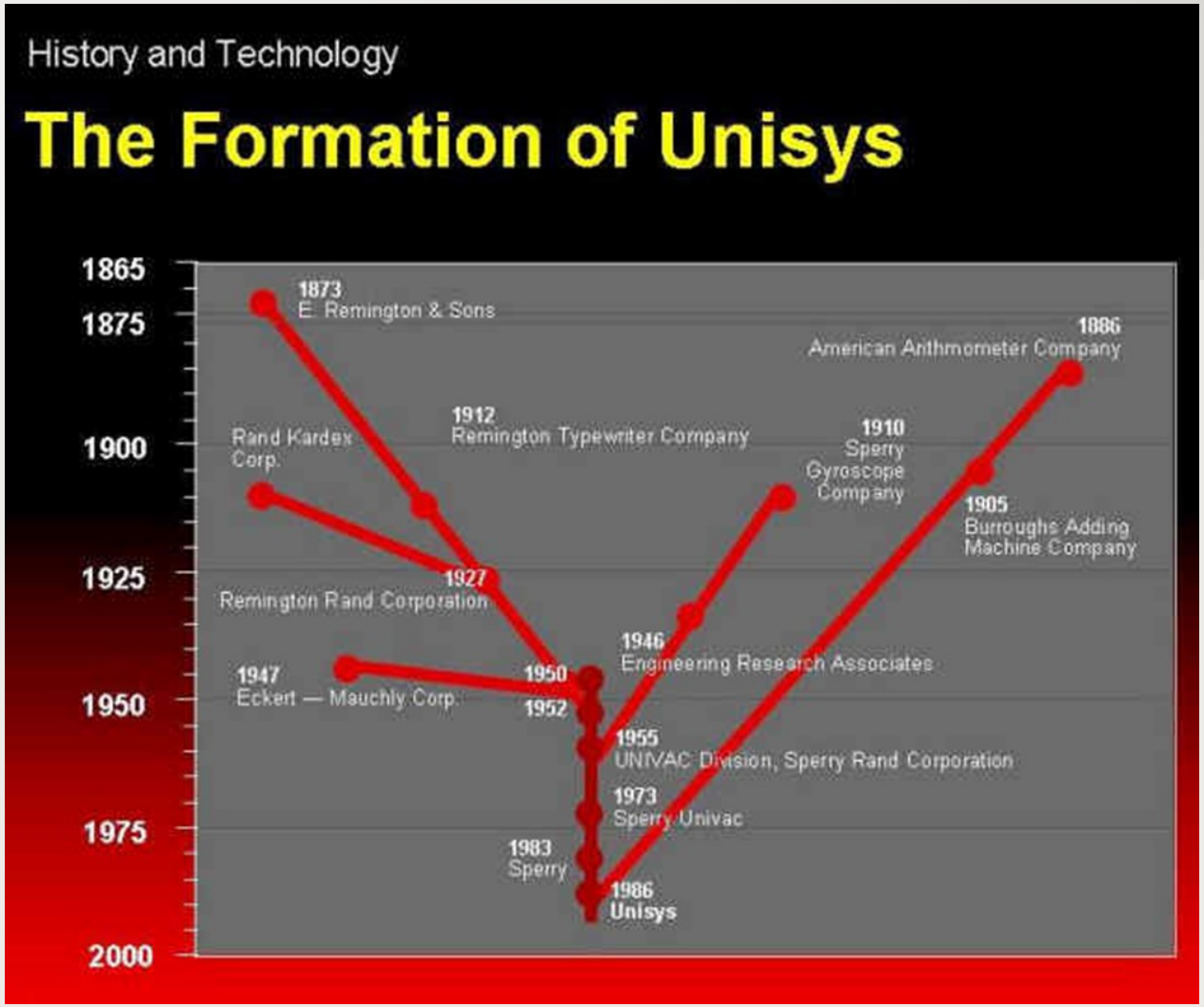


Figure from Ron Q. Smith, Unisys Fellow

DIVERGING

In 1962, for business accounting reasons Remington Rand UNIVAC (RRU) separated into Defense Systems Division (DSD) in St. Paul and Information Systems in Blue Bell, Roseville, ...

In 1986, when Burroughs bought Sperry to form Unisys, they kept the separation. DSD was renamed Paramax, intending to do an IPO. Unisys commercial operations continued in Roseville, still reporting to Unisys in Blue Bell, PA.

In 1995, DSD was sold to Loral who in turn sold to Lockheed Martin Corporation in 1996.

In 2012, Lockheed Martin closed in Eagan.

In 2017, **Unisys** (St. Paul) re-sized to just Eagan.

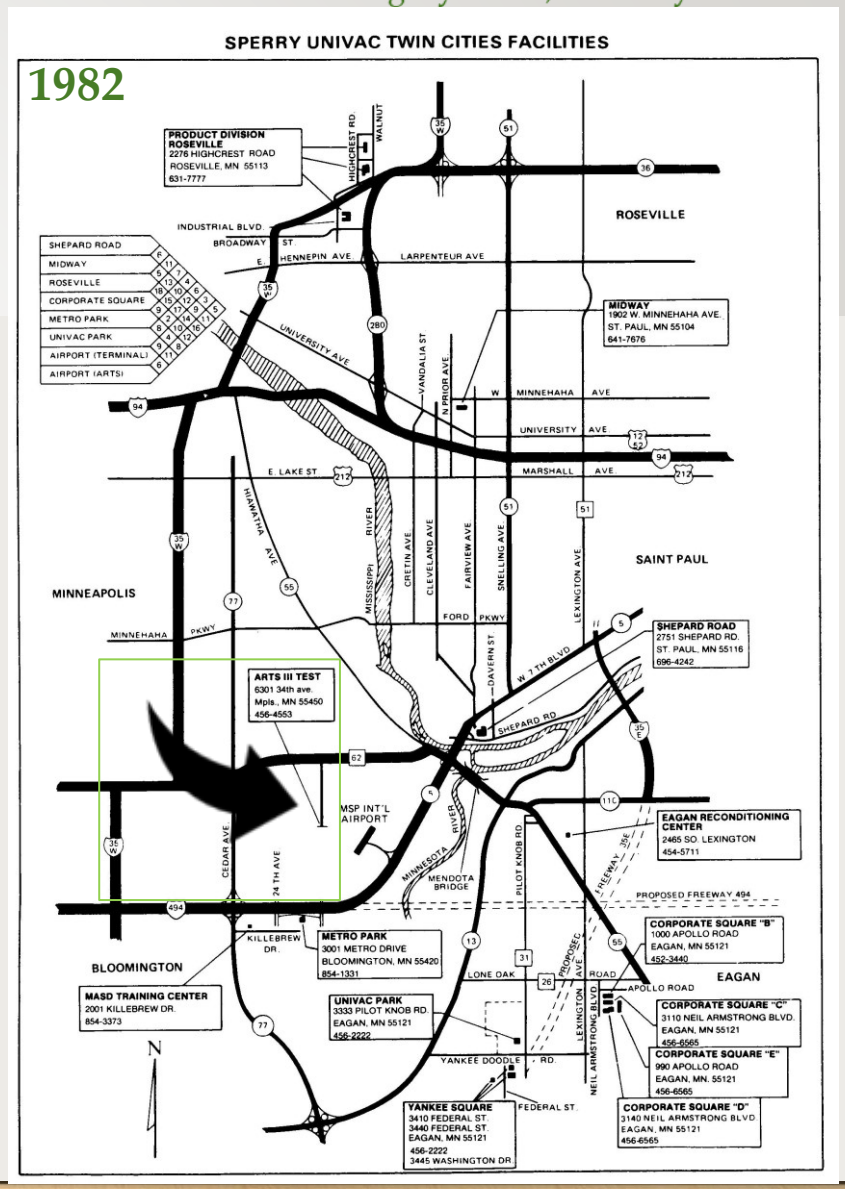
In 2024, **Unisys** is moving to Woodbury!

https://vipclubmn.org/lmcolegacy.html#Names.

LOCAL FACILITIES

- **Original ERA buildings illustrated below were in St. Paul's midway area**. Designated as UNIVAC/Unisys Plant 2.
- Built in 1952, Univac Plant 1 was on Shepard Road in St. Paul.
- In 1961, Commercial operations started a move from Plant 1 to Roseville Plant 4.
- In 1967, Sperry built Defense Systems Division headquarters in Eagan, identified as Plant 8.
- In 1982, Sperry had 16 facilities; in 1986 when Burroughs bought Sperry; combination had 28 Twin Cities locations.

Minnehaha Ave. from Fairview to Prior in St. Paul.



Systems/Computer Lineage

Artist's drawing depicts the new "ERA 1103" general purpose computing system, the first of which will be completed in mid-1954. The giant machine features electrostatic, magnetic tape, and magnetic drum memory systems, part of a complete data processing system. Application possibilities include: automatic process control, air traffic control and air defen aircraft simulation, automatic data duction, general industrial and econor planning, and mathematical computatior

the Orbit

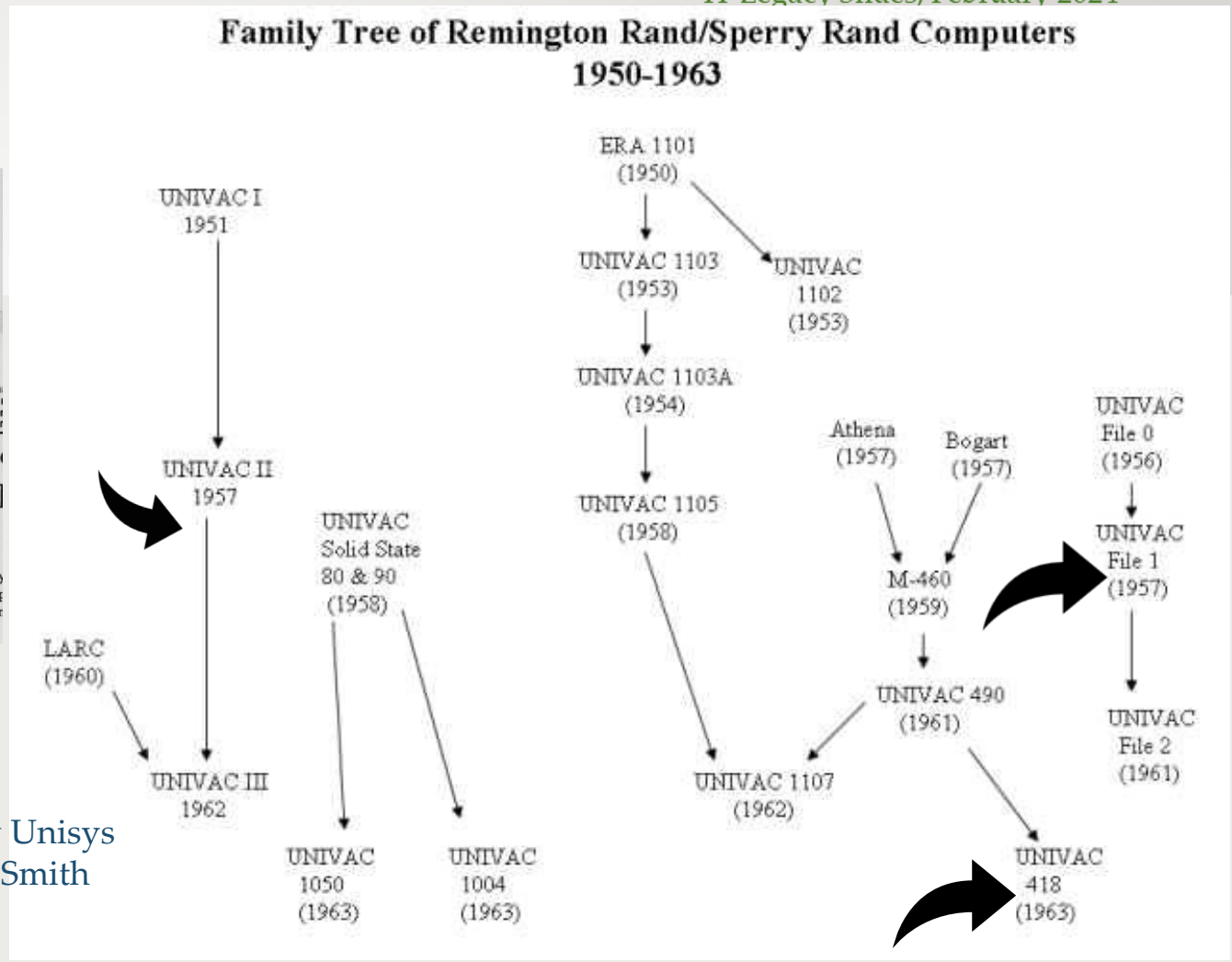
Vol. II St. Paul, Friday, February 20, 1953 No. 2

"ERA 1103" Opens Way t

Automatic Process Control

Plans for construction of two new ultra-high speed eral purpose electronic digital computing systems just been announced by ERA and Remington Rand Inc.

Officially designated the ERA 1103, the computer sy contains the latest general purpose electronic comp designed, developed, and built by ERA since its orgar tion in late 1946.

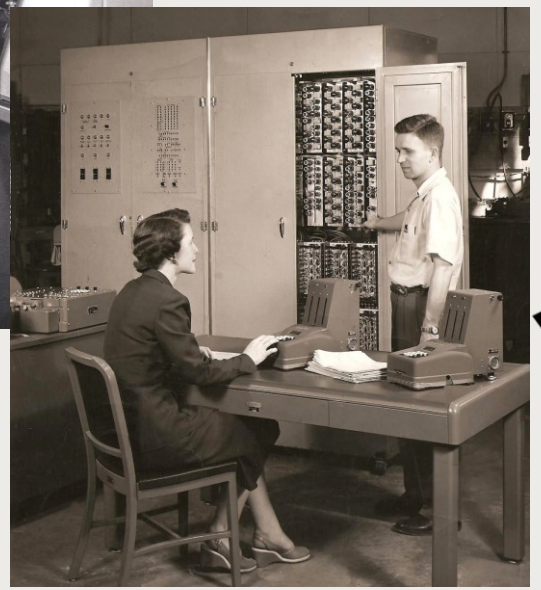


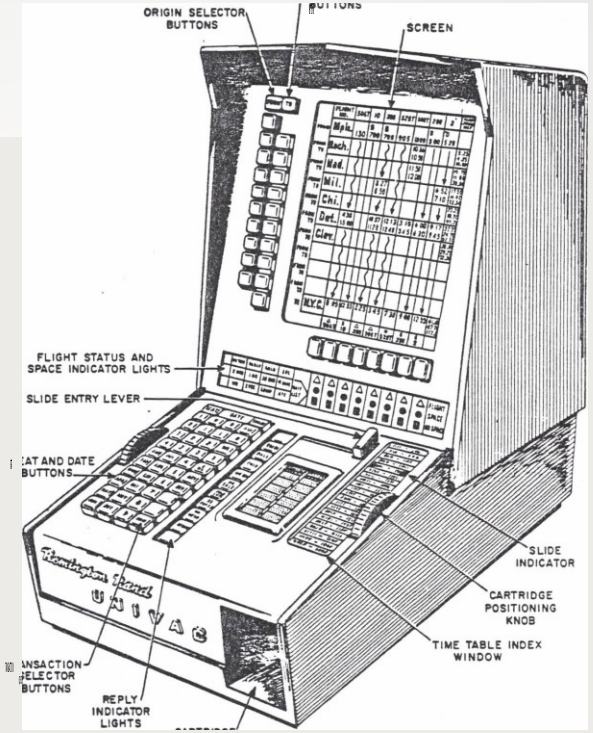
Lineage chart by Unisys Fellow Ron Q. Smith

https://vipclubmn.org/EngDocImg/CommlCustomers.pdf

Human Computer Interfacing

1101, 1950





ERA Speed Talley, ERA/UNIVAC File Computers in the 50s.

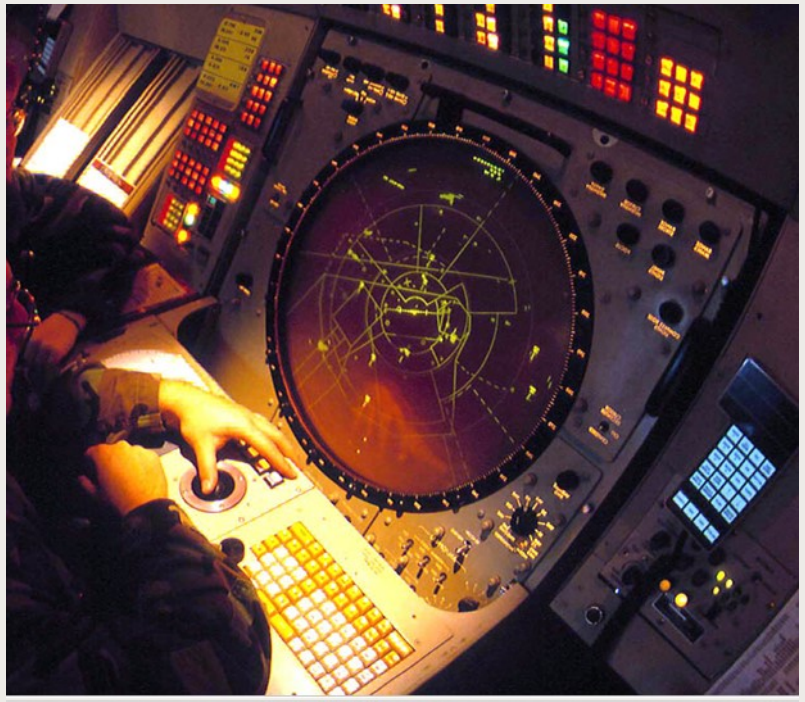
1107 console, 1962

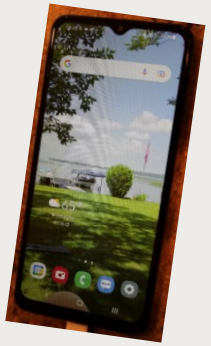
https://vipclubmn.org/Articles/HCI-paperR1.pdf

HCI – patents, CRTs adapted

https://vipclubmn.org/Articles/InventionofVoiceMail.pdf

Voice Response Unit & Voice Information Processing System





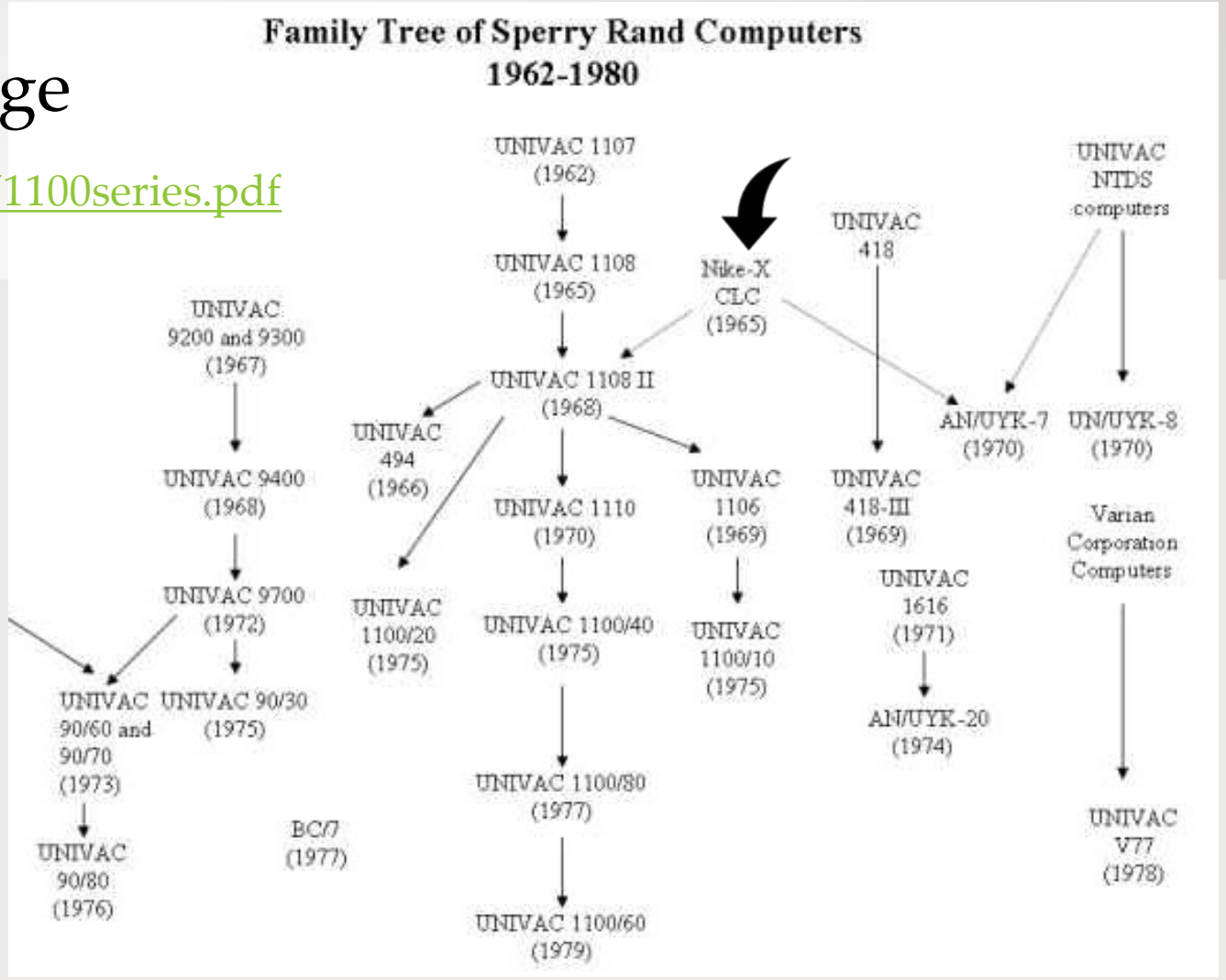
https://vipclubmn.org/Patents.html

https://vipclubmn.org/People3.html#Granberg

Systems/Computer Lineage

https://vipclubmn.org/Articles/HISTORY1100series.pdf

System	1st unit	Last unit	Qty
1107	1962	1965	38
1108	1965	1975	303
1106	1969	1976	338
1110/10-30	1972	1980	359
1100/40	1975	1979	455
1100/80	1976	1985	1121
1100/60	1979	1988	2863



Lineage chart by Unisys Fellow Ron Q. Smith

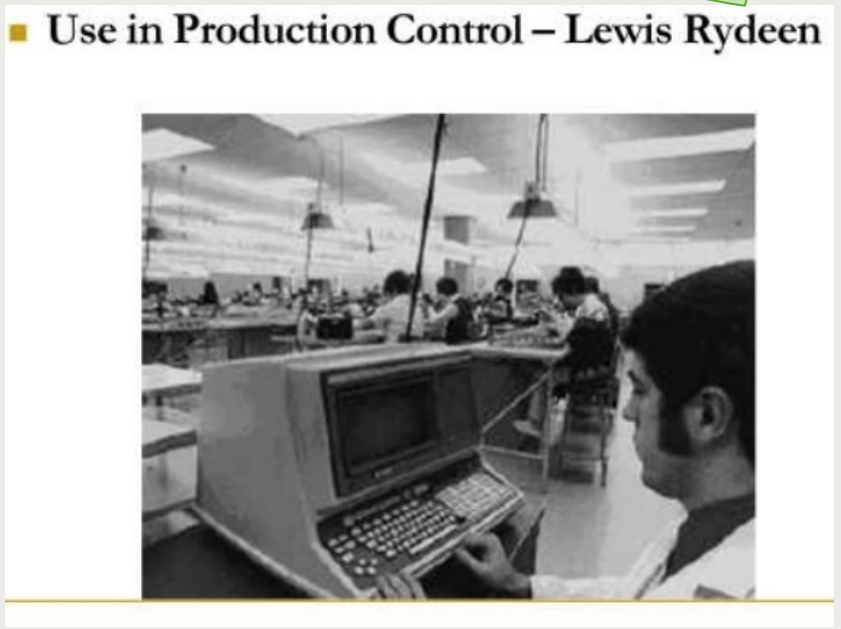
MAPPER – since 1968

https://vipclubmn.org/Articles/MAPPERHistoryPresentation.pdf

Maintaining, **P**reparing, and **P**roducing **E**xecutive **R**eports;
a 45⁺-year MAPPER History Presentation by Lou Schlueter.

The 418-computer system was chosen because of its' communications capabilities.

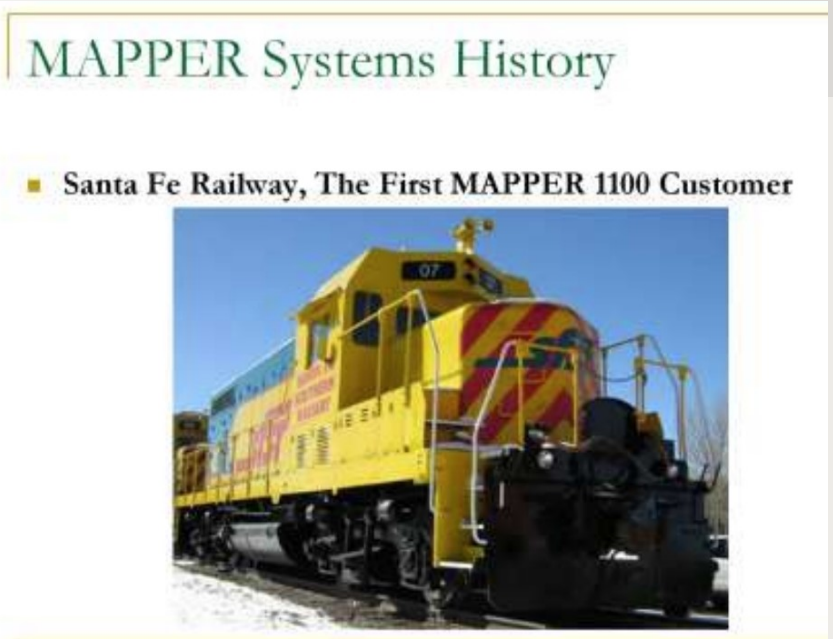
- In 1968, once an adequate hardware input device was available in form of the UNISCOPE 300 CRT display It became possible to do transactional real time information processing
- Used in St. Paul for Production Control, Scheduling and Dispatching, Quality and Reliability Control, Final Test, Purchasing, Material Support, Cost Accounting, Receiving, Final Assembly, Shipping, Site Administration, Development Center Engineering Drafting, etc.
- Expanded to Sperry factory operations at: Eagan MN, Jackson MN, Montreal Canada, Utica NY, Salt Lake City UT, Bristol TN, Chicago IL, Elk Grove IL, Philadelphia PA, Cupertino CA, and Blue Bell Headquarters.



MAPPER – 'Business Information Systems' since 1986

- Ported from the 418 OS to: the 1100 system series, MAPPER C, MAPPER Unix, Sperry & IBM PCs, Linux, OS 2200 ClearPath, Sun Solaris, Microsoft Windows, …
- Circa 1990 there were a plethora of Mapper systems:
  - 1,500 in the USA under 1100 series Exec 8 OS
  - 1,000 internationally under Exec 8
  - 500 in Japan under Exec 8
  - 6,500 Personal MAPPER Systems
  - 4,300 UNIX Mapper Systems
- MAPPER translated to 15 native languages including Chinese, French, German, Japanese, Spanish, …
- Industry Interfaces to DB2, INFORMIX, Microsoft SQL Server, Object Database Connectivity (ODBC), ORACLE, and SYBASE

  Unisys Roseville became the major corporation information services site with a real-time database!

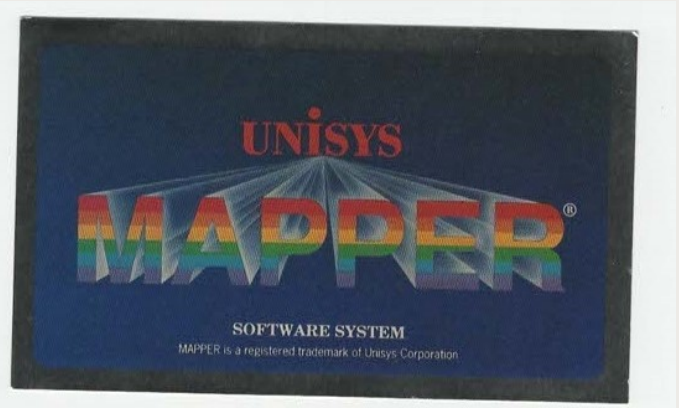


By 1982, over 2,500 terminals were on-line tracking over 68,000 cars in about 175 rail yards, using two Sperry 1100/84 central multi-processors.

MAPPER – in the 90s

- **Representative MAPPER Customers At That Time**
  - Manufacturing
    - Unisys, General Telephone & Electronics, McDonnell Douglas, Nike
  - Transportation
    - Santa Fe RR., Northwest Airlines, America West Airlines
  - Distribution
    - Subaru of America, King Bearing, Kesko
  - Retailing
    - Circle K, Floral Network
  - Federal, State and City Governments
    - DOD, State of Minnesota, Westchester County NY, Hillsborough County FL, California and NYC welfare systems

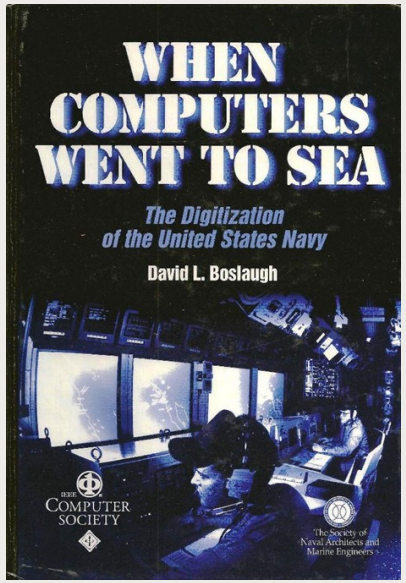
- Aircraft Mfg. – **Lockheed Martin**
- Banking – TS Bank, Union Bank of Switzerland
- Insurance – National Life, Kansas City Life, Employees Mutual
- Construction – Bechtel Corp., Sargent & Lundy
- Energy – Northern States Power, Kansas City Power & Light
- Recreation – Walt Disney Enterprises, Carnival Cruise Lines, **Royal Caribbean Cruises**
- Military Branches – US Army, Navy, Air Force



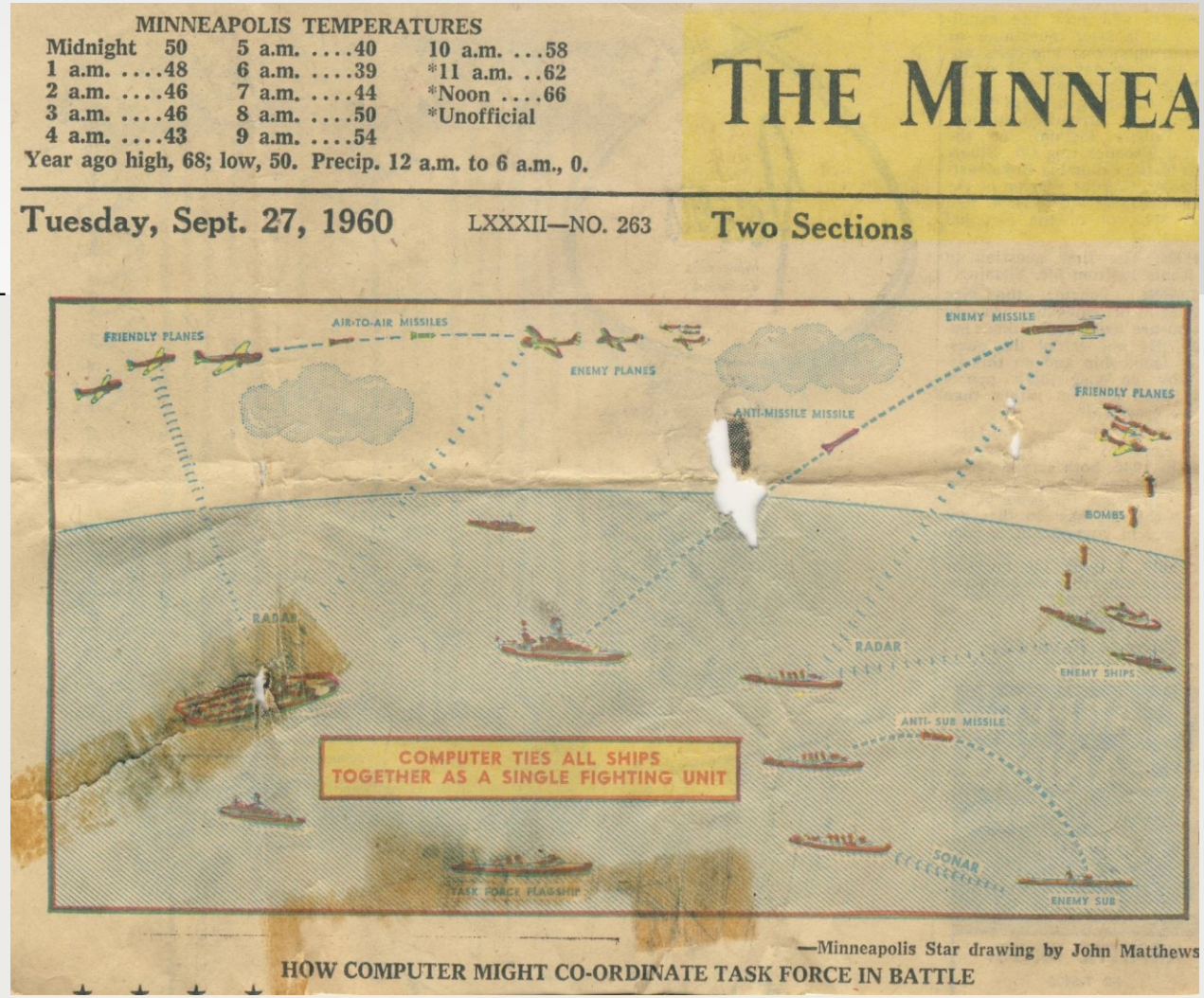
In 2008 the MAPPER Users group celebrated 40 years in Orlando, FL

Naval Tactical Data Systems (NTDS)

NTDS used multiple identical computers working together, real time, with a very advanced Input/Output (I/O) system – development started in '55.



- Ships were connected via radio links. This was an electronic communications system of unprecedented size in operation 25 years before the internet!
- The NTDS interfaced via LINK communications with the Marine Tactical Data Systems and the Airborne Anti-Submarine Warfare systems.
- This led to DoD laboratories connecting via ARPAnet; UNIVAC in St. Paul was the 1st non-government organization to be on this network! Before 'Gopher' at the U of MN?



MINNEAPOLIS TEMPERATURES

Midnight 50	5 a.m. 40	10 a.m. ...58
1 a.m. 48	6 a.m. 39	*11 a.m. ..62
2 a.m. 46	7 a.m. 44	*Noon 66
3 a.m. 46	8 a.m. 50	*Unofficial
4 a.m. 43	9 a.m. 54	

Year ago high, 68; low, 50. Precip. 12 a.m. to 6 a.m., 0.

THE MINNEA

Tuesday, Sept. 27, 1960 LXXXII—NO. 263 Two Sections

—Minneapolis Star drawing by John Matthews

HOW COMPUTER MIGHT CO-ORDINATE TASK FORCE IN BATTLE

https://ethw.org/First-Hand:The_Navy_Codebreakers_and_Their_Digital_Computers_-_Chapter_2_of_the_Story_of_the_Naval_Tactical_Data_System

NTDS Systems Technology Evolution

- Computer models at Lawshe Memorial Museum – Geranium transistors ('54) to silicon transistors ('58) to Medium Scale Integrated Circuits ('69)
- Left, Application Specific Integrated Circuit (ASIC) UYK-44s & an AN/UYK-43 at the museum, built in the early 90s.
- In 2008 a frigate's AN/UYK-43 system launched a missile to intercept an errant missile over the Pacific and destroyed it.

- In 1994 **Unisys** in Eagan won the competitive bidding to embed commercial processors into multi-screen display units for NTDS functions [apps], AN/USQ-70.
- In 2013 the USS Minnesota, SSN 783 (submarine) was launched. In the Combat Information Center was S/N 8,000 AN/USQ-70! Manufactured by LMCO in Clearwater FL!

- Today, some NTDS systems support is in the hands (minds) of Eagan's Production Development Associates (PDA), a spinoff from Unisys plus some former Lockheed Martin employees.

Air Traffic Control (ATC)

Automated Radar Terminal System (ARTS)

- Aircraft Code includes flight #, plane type, plane altitude, ….
- ARTS I, initial test systems at Atlanta, New York, …
- ARTS II, at ~80 small airports
- ARTS III at 64 larger airports

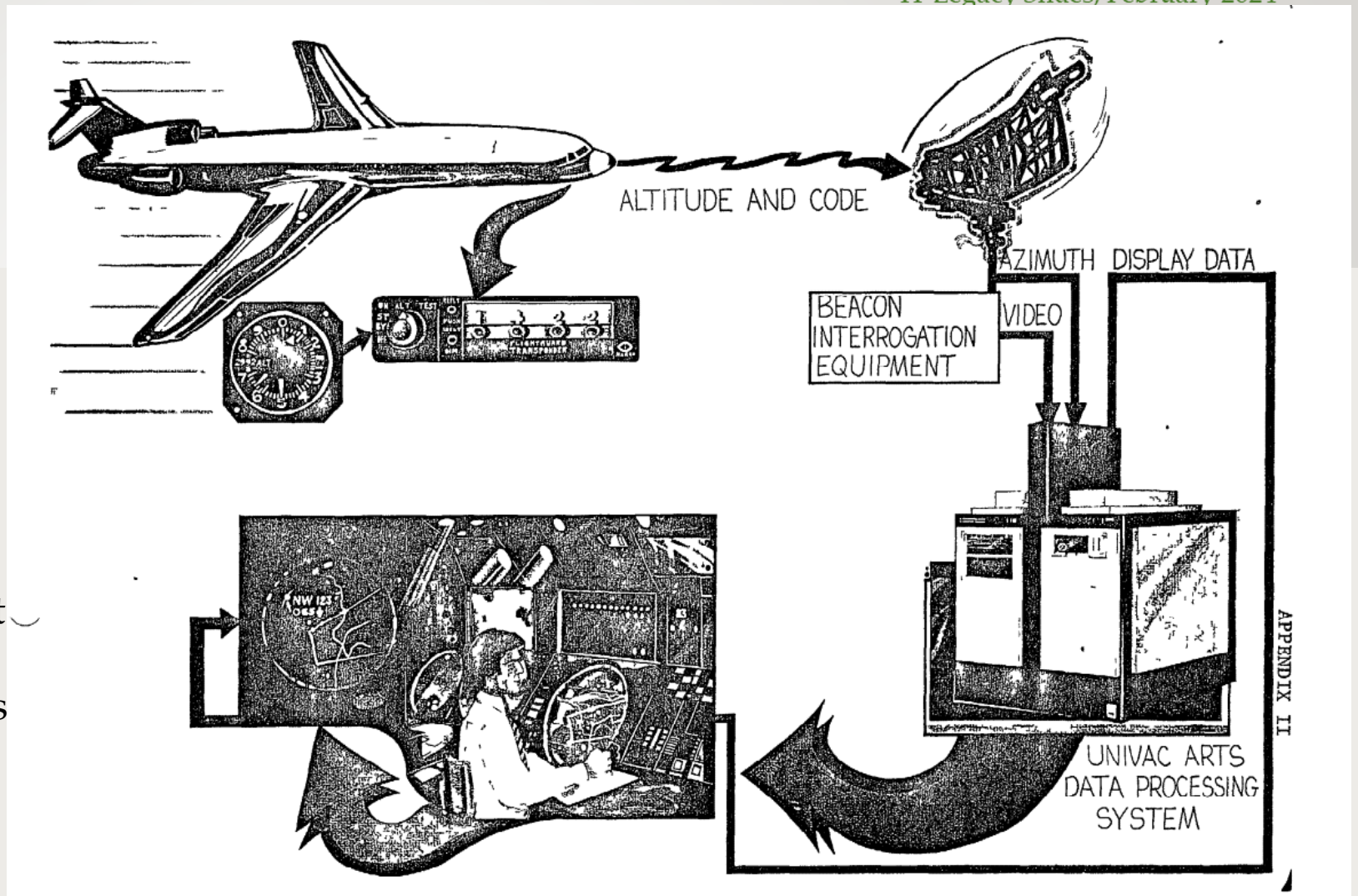


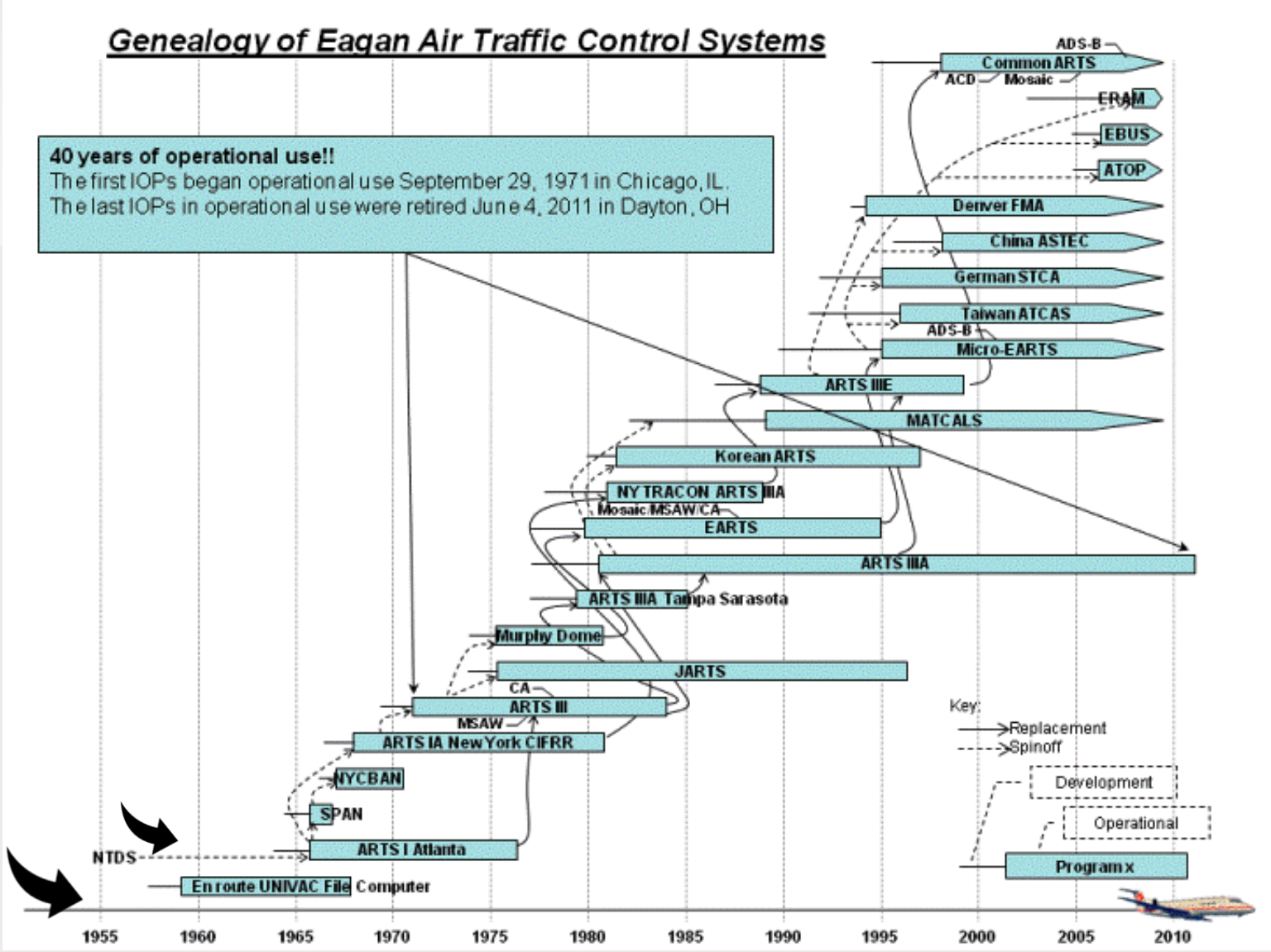
Diagram from DOT-FAA Staff Study Paper #092650, 2/1973

Air Traffic Control

https://vipclubmn.org/aircontrol.html

1957 - Enroute systems used the UNIVAC file computer for flight info.
1966 – Automated Radar Tracking Systems (ARTS I) used the UNIVAC 1218 and a variation of the Navy's **I**dentified **F**riend or **F**oe.
1981 – system went to Korea.
1989 – Marine Air Traffic Control and Landing System.
1988 – Common ARTS used commercial integrated hardware versus the IOPs.

https://vipclubmn.org/aircontrol.html#Soft
Info Diagram from Tom Montgomery



Air Traffic Control

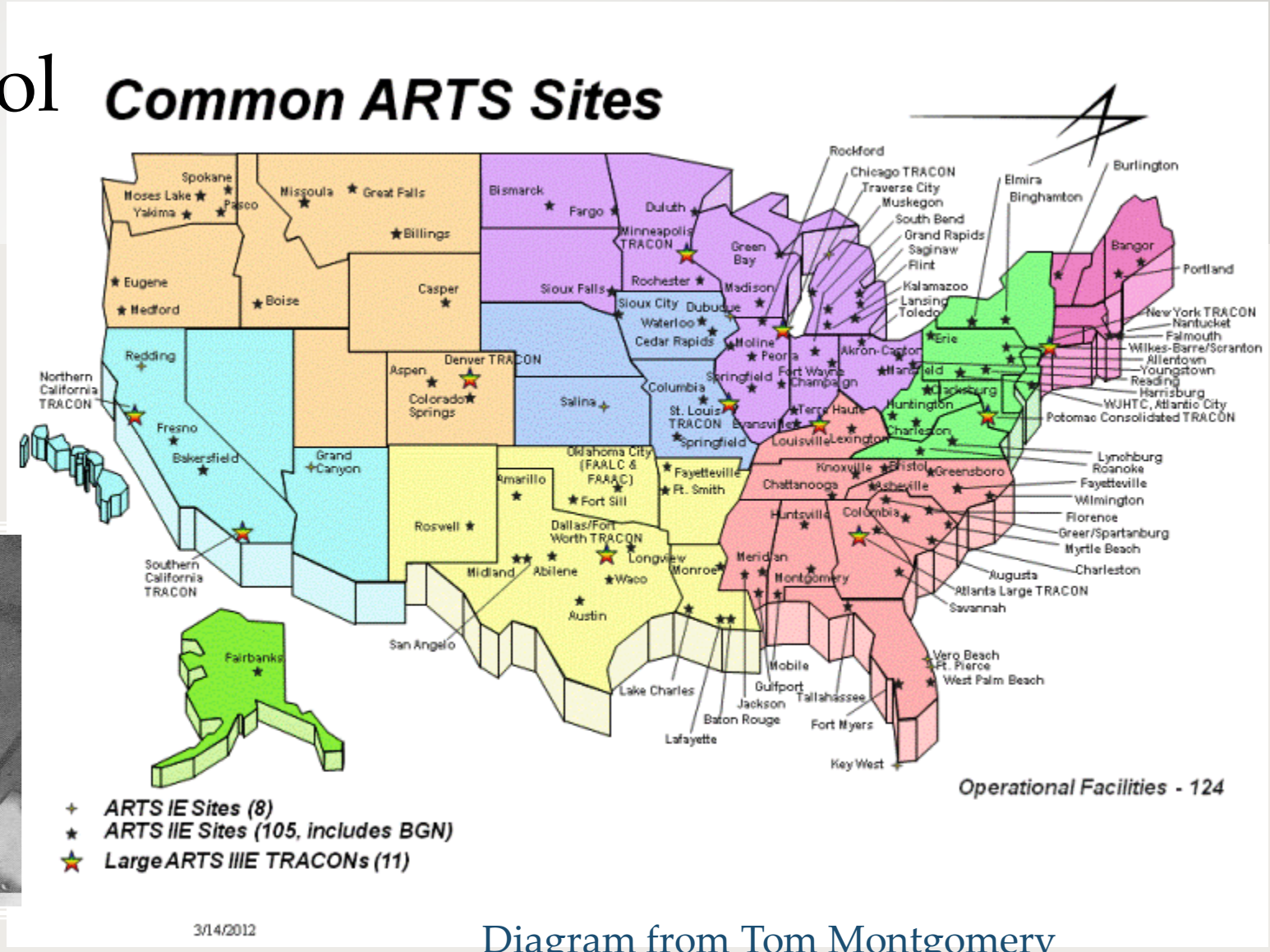
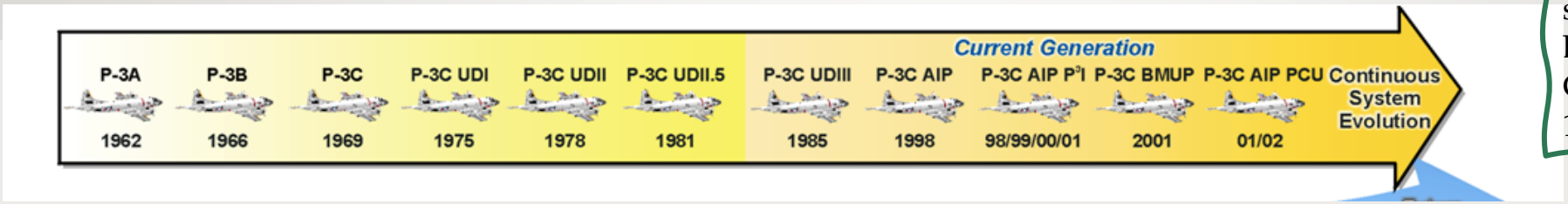


Diagram from Tom Montgomery

Anti-Submarine Warfare (ASW)

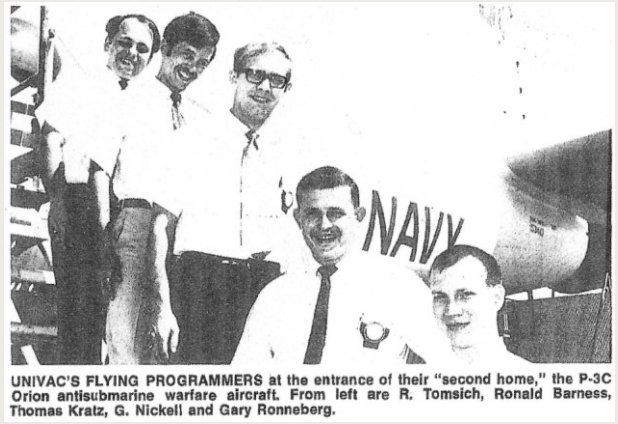
https://vipclubmn.org/sysairborne.html



In 2012 there were yet 40 CP-901s computers flying in the Japanese ocean surveillance P-3C aircraft, Bob Pagac. First of 499 CP-901s was delivered in 1967, 45+-year service life!

https://vipclubmn.org/CP30bit.html#CP901, St. Paul airborne computer design.

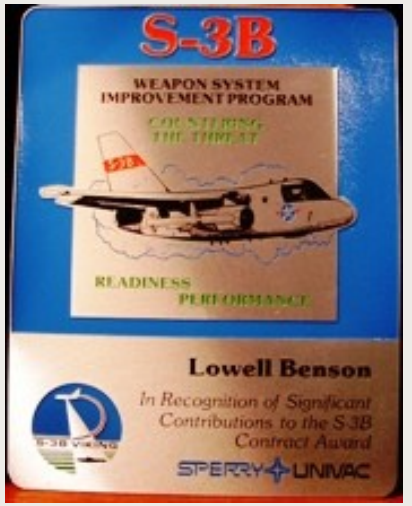
P-3C over Maui.
LABenson snapshot.



UNIVAC'S FLYING PROGRAMMERS at the entrance of their "second home," the P-3C Orion antisubmarine warfare aircraft. From left are R. Tomsich, Ronald Barness, Thomas Kratz, G. Nickell and Gary Ronneberg.

Tricia Myhre onboard US Navy P-3C Orion AIP (Anti-Surface Warfare Improvement Program) Aircraft - 1997

Carrier based ASW.



https://vipclubmn.org/flyingps.html

The Canadian services used the Lockheed P-3C aircraft and the S-3A's AN/AYK-10 for their CP-140 Aurora ASW system.

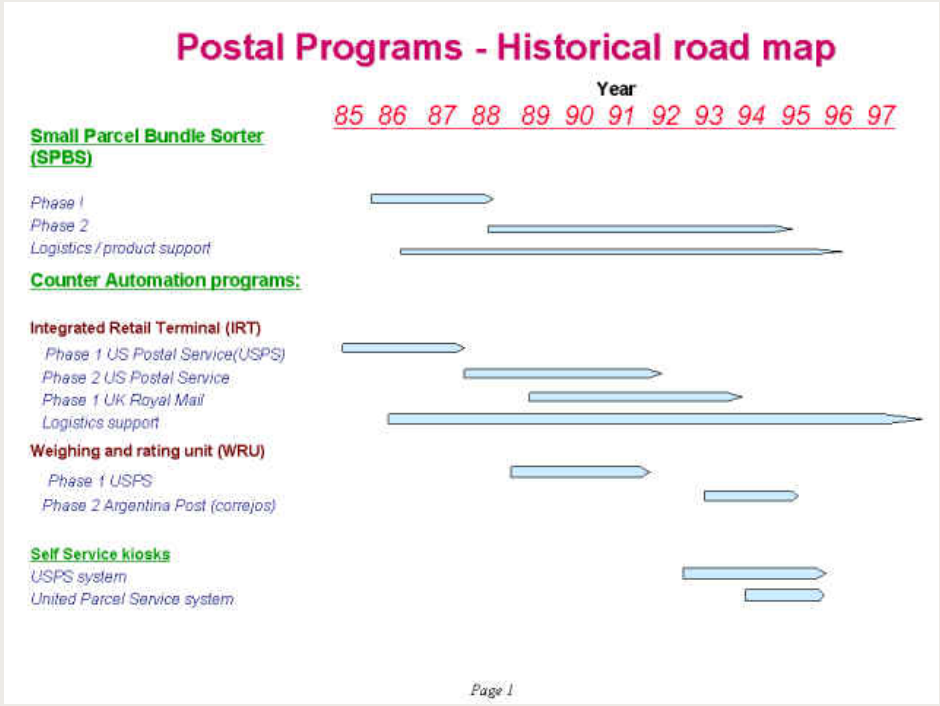
National Weather Service, etc.

Most people don't realize it as they watch NEXRAD in action every day on the evening weather report!

- https://vipclubmn.org/Articles/NEXRADarticle.pdf
- https://vipclubmn.org/Articles/PSP_Development.pdf, **P**rogrammable **S**ignal **P**rocessor (PSP), Eagan's part of the NWS Next Generation Radar (NEXRAD) systems – from Les Nelson, BEE '69 UofMN.

Almost 100 US systems, one in Eden Prairie MN since 1994.

Postal systems started at **Unisys** defense in Eagan. After LMCO bought Loral in '96 the support was transferred to New York!



https://vipclubmn.org/sysgovernment.html#Postal

Lawshe Memorial Museum

Museums away from MN with UNIVAC/Unisys artifacts are linked from our Exhibits chapter.

S. St. Paul, MN

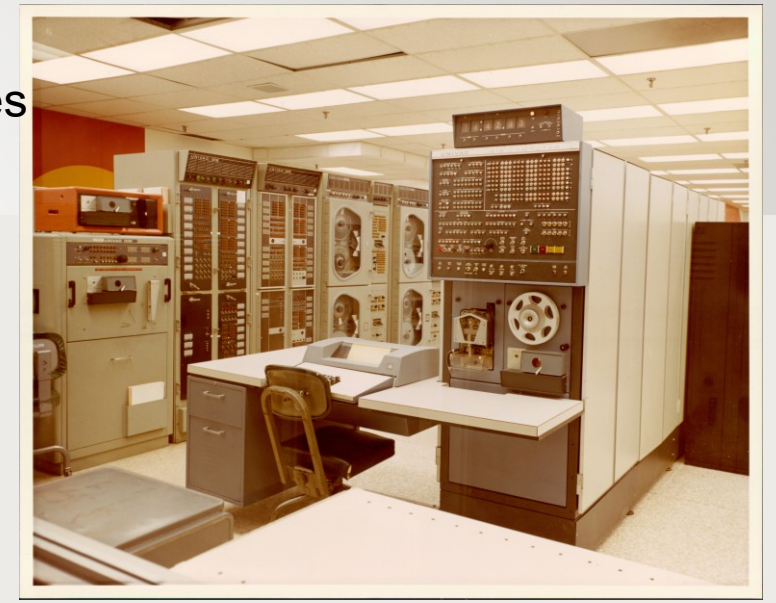
Posters and hardware are located on the North wall of the Great Room. Our Realization of a Dream article relates the history of the beginning of the exhibit(s) at this museum. With over 1,000 artifacts that range from individual Printed Cards to operator workstations to full sized computers, we proclaim this to be *the world's largest collection of defense industry computer systems' hardware items.*
https://vipclubmn.org/Exhibits.html#Lawshe

- American Computer Robotics Museum
- Compuseum at Philadelphia
- Computer History Museum
- Computer Museum of America
- Hagley Museum in Delaware
- Southwest Museum of Engineering, Communications and Computation
- System Source Computer Museum
- USS Midway Museum
- Vintage Computer Federation
- Vintage Technology Association

Tidbits and Factoids!

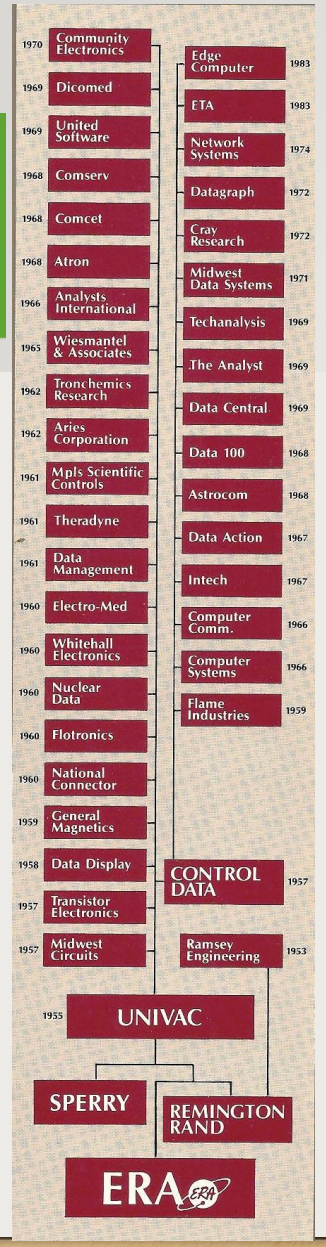
The UNIVAC Athena computer systems had over 400 ‘Space’ launches without an abort due to the computer or software. From Cape Canaveral, Vandenberg AFB, and Johnston Island in the Pacific.

Univac had both 494’s at Mission Control Center (Bldg. 30) and 1230’s which installed at Apollo tracking sites around the world. The 1230’s were replacing the Gemini program 1218’s which were connected to U494’s at Goddard space Center in Greenbelt, MD which in turn was connected to Houston’s 494’s. https://vipclubmn.org/sysmissles.html also discusses other NASA systems.



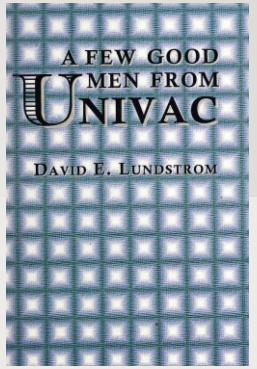
NASA communications system photo scanned by Keith Myhre at the Lawshe Memorial Museum.

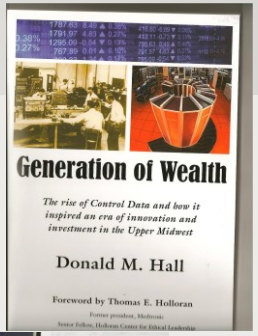
You 18-bit guys would be happy to know that the last Navy 1219Bs were just turned off in 2015! They were at a shore site AN/SPN-42 Automatic Carrier Landing System, Duane C. First of 367 1219B computers was delivered in 1965, 50-year service life!



SPINOFFS: In 1986 Sperry published an ERA 40th anniversary booklet https://vipclubmn.org/Articles/ERA40thAnniversary.pdf

In 1987 Dave Lundstrom published *A few good men from UNIVAC*. Dave was a Univac engineer, a CDC engineer, and a VIP Club member.





In 2014, Don Hall, published: *Generation of Wealth - the Rise of CDC*. Don is a retired stockbroker and former CDC employee.
In 2021, Mr. Hall contacted the Ramsey County Historical Society (RCHS) to suggest recognizing ERA with a permanent plaque.

June 15th, 2023, Chad Roberts, President of the Ramsey County Historical Society (RCHS) and Don Hall unveiled a commemorative plaque at the original Engineering Research Associates St. Paul Minnehaha Ave. site recognizing the importance of ERA and over 100 spinoff companies to the local economy and the world.

https://vipclubmn.org/Articles/ERA-History_Talk.pdf

Photo by Keith Myhre, U of MN BEE 1972

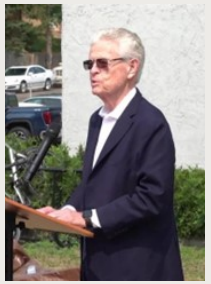
ERA Recognition Ceremony

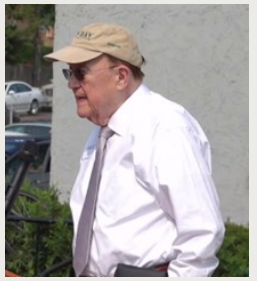
https://www.vipclubmn.org/Documents/ERA%20RCHS%20Article.pdf

Unisys, Eagan VP Chuck Lefebvre and Director Ron Voight.

After Chad read the plaque speakers were Lowell Benson, Unisys; Dean Laurance, ERA & CDC; James McGuire, CDC; John Rollwagen, CRAY; and Manny Villafana, Medical Industry.







Leichtweis, Capt. Donald, ret. USN – Led the Navy's personnel and contract projects in the 70s at the leased Sperry facility on Minnehaha Ave., photo by his wife.

Bonnie Hill, daughter of Jack Hill who was on the 1950 ATLAS installation team.

About 150 attendees – photos by Keith Myhre.

ERA, First Computer Company* – Irony!

- ERA's first public deliverable was a 1947-48 report, reprinted by CBI at the U of MN. This book does not mention the then classified ERA machines. https://vipclubmn.org/BitsBakUp/ERA%20High%20Speed%20Computing%20Devices%20Book%20(1950).pdf

- Being a contract engineering company, ERA sold paper designs of a 'drum' computer to IBM in the early 50s. These paper designs went to several IBM labs and engineering groups. IBM presumably used these design concepts to detail its IBM 650 computer, announced in 1953. They went on to capture the low-end computer market; some 2,000 IBM 650 computers were sold, catapulting IBM into a near monopoly position in the low end of the fledgling industry. {George Champine, PhD – 1979 paper}


World's first computer **Hard Drives** invented in St. Paul

IBM 650 drum memory, image from IBM history website.

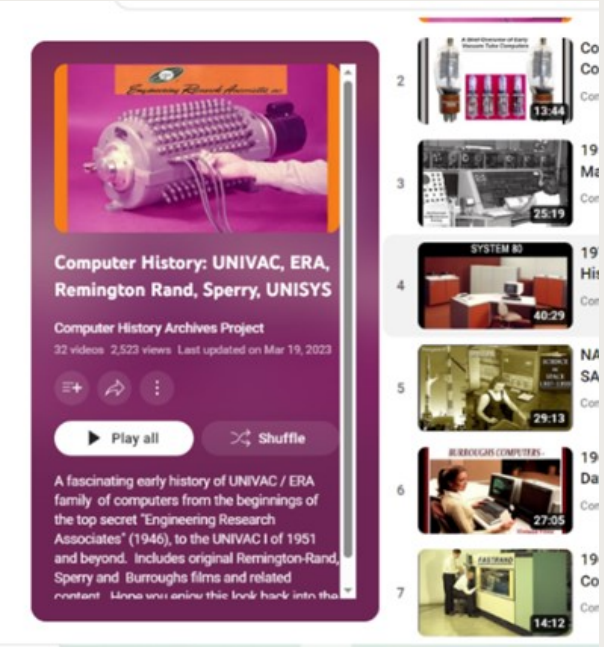
* IBM, Remington Rand, and Burroughs were office machine companies, that bought their way into the computer industry. EMCC was not incorporated until 1947. Ergo, ERA delivered the first stored program computer, thus was the father of UNIVAC and grandfather of Unisys!

Anthologies Tell the Story – a January 2021 posting.

https://vipclubmn.org/Articles/Anthologies2Go.pdf

An IT legacy spawned by Engineering Research Associates in 1946, continuing yet today at Unisys. Our anthology theme is "*People engineering computers and systems at locations in Minnesota*". Wikipedia-like with detail links and ~ 600 contributors.

IT Legacy Anthology – eight chapters.
- People – thirteen chapters
- Engineering – ten chapters
- Computers – ten chapters
- Systems – ten chapters
- Locations – seven chapters
- Our Stories – (210 and counting), and
- Artifact Exhibits.



Special Site Links

- Computer History Archives Project (CHAP) – 32 ERA/UNIVAC/ Sperry/Unisys topical YouTube videos, https://www.youtube.com/playlist?list=PLsMFdolQPga49bN2aZlOu6SbZj57uZpZl
- THE MINNESOTA COMPUTING HISTORY PROJECT, https://mncomputinghistory.com/ - designed at CBI by Liz Semmler.

ERA to UNISYS

Thanks to TwinSPIN for this opportunity to tell some of our history!

Lowell W. Benson

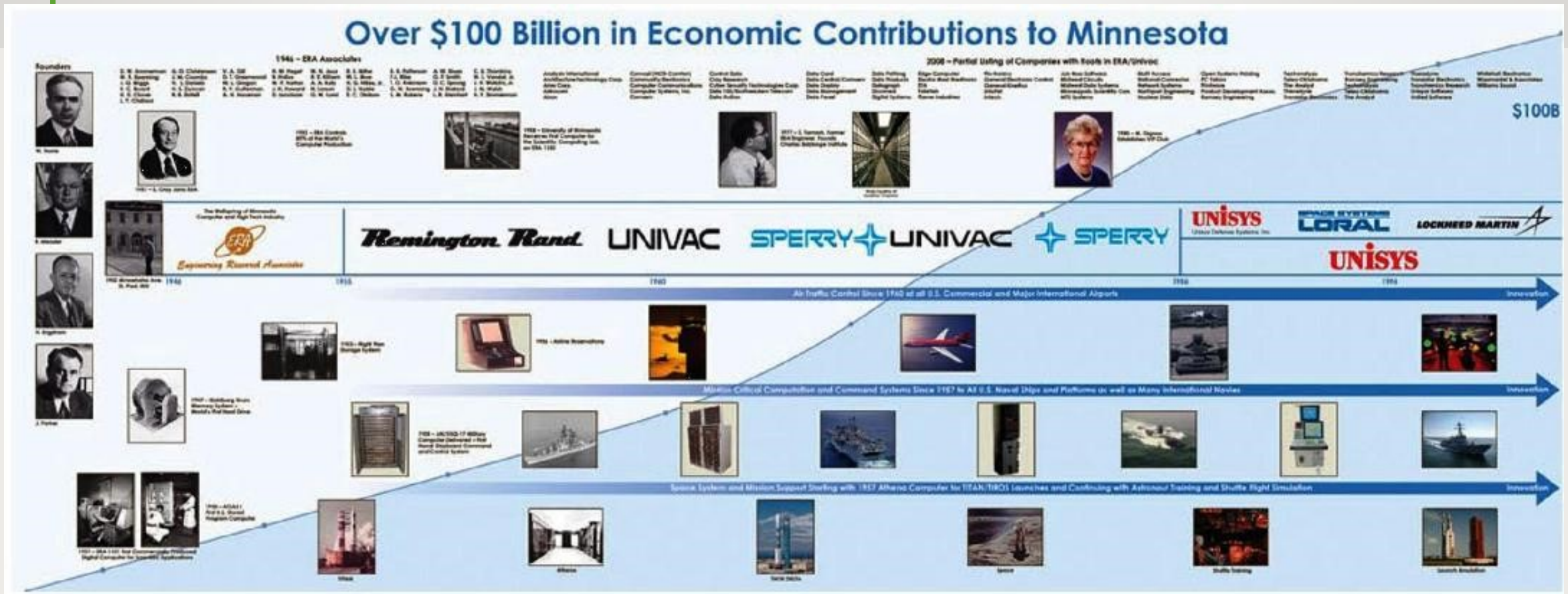


Chart prepared for the 2008 Minnesota Sesquicentennial Exhibits, Author Quint Heckert.