Author: Lowell A. Benson – BEE, U of MN, 1966
Univac/Unisys 1960-94

VIP CLUB
Established in 1980

Display Report for University, #2

Introduction

This is the second in a series of reports for the VIP Club Legacy Committee's history displays setup at the University of Minnesota under a one year agreement. This summer session display focuses on the ERA spinoff history and the rich legacy of our involvement with computers and systems of the space age.

The site is in the Walter Library located on the University's mall (photo right.) The location within the library space is on the second floor in front of the reference and information desk (photo below.) The Summer Semester display setup was installed on May 12th, it will be there until fall semester, about mid-September.

The initial display during spring semester, 2010 was previously documented as the VIP Club's web site March 'Article for the Month'. The display uses the University's display cases and double-sided board. Standing at the right, looking at the display, is VIP Club President Tom Turba when the initial display was setup in January, 2010.

Display case dimensions are:

- Each display case is 10 1/4" tall x 24" wide by 48" long. Total stand and case is 35 1/2" tall x 24" wide by 48" long.
- The display panel is 79.5" tall x 50" wide (this includes the bracket to allow the panel to stand upright). The actual display panel space is 64" tall x 47" wide; there is a 1 1/2" metal frame around the display space.

The rest of this document describes the posters used and the artifacts and books in the cases.

Display Side A

The primary side of the display continues use of the two large posters generated by a VIP Club sponsor, Lockheed Martin. The top 'ERA Minnesota's Technology Wellspring' poster and center time-line chart were originally created for the VIP Club's 2008 Minnesota sesquicentennial display venues. We credit the design of these two charts to retired UNISYS Fellow Quint Heckert, also a Club Director and our membership database guru.

The other posters on this display side are replicated hereunder.

Poster A1 Wording

POSTER EXPLAINATIONS ⇒

*This poster was created for the Minnesota Sesquicentennial to illustrate the 60$^+$ year **I**nformation **T**echnology 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 **UN**ited **I**nformation **SYS**tems. 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 are some of the significant milestones, i.e. the **1958** delivery of the University's first computer and a listing of many of the spinoff companies.

The chart's lower half illustrates just a few of the computer systems developed in St. Paul.

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Poster A2 Wording

U of MN and the ERA IT Legacy (1)

- **Since 1946**: Thousands of University graduates have worked for ERA, Remington Rand UNIVAC, Sperry UNIVAC, Sperry, Burroughs, **UNISYS**, Loral, and **Lockheed Martin**.
- **1958:** Remington Rand Univac donated an 1103 computer to the University, the beginning of the Computer Science Program in Electrical Engineering under Dr. Marvin Stein.
- **1977:** Former ERA engineer/manager Erwin Tomash and wife Adelle founded the International Charles Babbage Society, renamed the Charles Babbage Institute (CBI) in **1979,** and then moved to the University of Minnesota in **1980**.
- **1989**: With support from industry and individuals, the University established the *'Engineering Research Associates Land-Grant Chair in the History of Technology'*, initially held by CBI Director Arthur Norberg. Under Dr. Norberg's leadership, CBI developed into the world's leading research center for the history of information technology.
- **~2005**: A University '*Wall of Discovery'* display item is the Remington-Rand UNIVAC Nike-Zeus missile launch computer block diagram credited to Mr. Rolland Arndt, a 1948 U of MN BEE graduate hired by ERA in 1952.
- **2006**: CBI Director Norberg retired, Dr. Tom Misa was hired as his replacement, now holds the ERA Land-Grant Chair. Dr. Misa is also an advisor to our VIP Club Legacy Committee.
- **September 2008** through **May 2009:** A lecture series "*Minnesota's Hidden History of Computing"* presented by Dr. Misa of the Charles Babbage Institute, started with ERA.
- **January 2009**: VIP Club representatives put documents reflecting the University relationship to the ERA Legacy into Minnesota's bicentennial time capsule for a 2058 event!
- **January 2010:** Univ. & VIP Club signed a display contract.
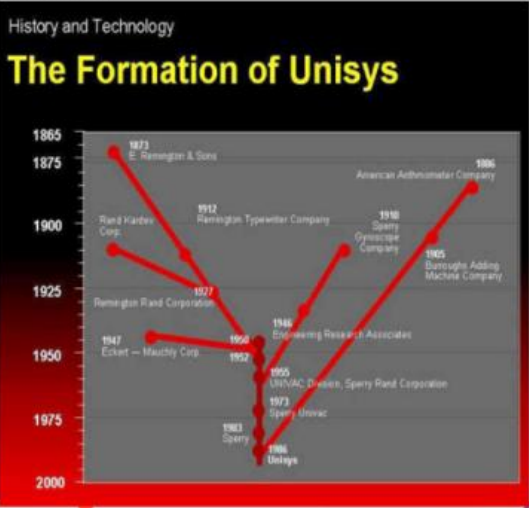
Poster A3

Note that the History and Technology slide shown on this PowerPoint page is part of a presentation created by Ron Q. Smith, a UNISYS member of our Legacy Committee. That entire slide show is available on the Club's web site.

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Posters A4 and A5

VIP CLUB

40 Years of the Legacy

Retirees of Unisys and Lockheed Martin
http://vipclubmn.org

In 1986 Sperry employees and management erected a plaque commemorating the founding of ERA at 1902 Minnehaha Ave. in St. Paul.

Unveiling the plaque were Rollie Anderson, Bill Geiger, Jack Nichols, and Robert 'Bob' MacDonald.

40- year document copies available from the VIP Club – paper or electronic.

UNISYS   *LOCKHEED MARTIN*

VIP CLUB

Retirees of Unisys and Lockheed Martin
http://vipclubmn.org

Information Technology Legacy

- Display courtesy of the VIP Club's Legacy Committee.
- Display coordinated with the University's Department of Electrical and Computer Engineering and the Engineering Librarian.
- Poster artwork courtesy of the Lockheed Martin Corporation.

Contact Us?

- Use the contact page on our website, http://vipclubmn.org.   The VIP Club is a non-profit, social and services organization of retirees from UNISYS, Lockheed Martin, and their Twin Cities predecessors.
- Lockheed Martin MS2 located in Eagan, Minnesota can be called at 651-456-2810.

UNISYS   *LOCKHEED MARTIN*

VIP CLUB
Established in 1980

Poster A6 Wording

ERA & CDC Progeny

ERA Spinoff Organizations	YEAR	CDC spinoffs
Ramsey Engineering	1953	n/a
General Kinetics	1955	n/a
Northport Engineering	1956	n/a
Midwest Circuits Inc. (later became Fabri-tek), Transistor Electronics Corp, and **Control Data Corporation**	1957	CONTROL DATA
Data Display (later acquired by CDC)	1958	
General Magnetics Inc.	1959	Flame Industries
National Connector Corporation (with people from Magnetic Controls), Flortronics Inc, Nuclear Data, Whitehall Electronics (later acquired by Electro-Science Investors), Electro-Med Inc. (also acquired by Elector-Science Investors)	1960	
Data Management Inc., Theradyne Corporation, Minneapolis Scientific Controls Corporation	1961	
Aries Corporation, Tron-chemics Research Inc.	1962	
Wiesmantel and Associates	1965	
Analysts International- grew out of Aries Corporation (see1962).	1966	Computer Systems Inc. Computer Communications
	1967	Data Action (NCS)
Atron (acquired by Mohawk Data Services), Comcet (became NCR-Comten), Comserv	1968	Astrocom, Data100 (became Northern Telecom in 1979)
United Software, Dicomed	1969	The Analyst, Data Central, Techanalysis, Data Card
Community Electronics	1970	

ERA Spinoff Organizations	YEAR	CDC spinoffs
	1971	Midwest Data Systems
	1972	Datagraph, Cray Research, CRAY
	1974	Network Systems
	1979	Shugart – became Seagate
	1983	ETA, Edge Computer
Printware, Inc.	1985	
Info Pet	1991	
Product Development Association	1994	

Display Case, Side A

The display case on this side continues the use of the Pioneer Press issue which features the January 3rd article "The almost Silicon Valley." The left, top booklet also continues from the spring semester display. It is the ERA 40 year recognition book mentioned in poster A4 above.

Poster A7

The words on the poster just above the newspaper are:

> ## "The almost Silicon Valley"
>
> VIP Club Legacy Committee co-chair, John Westergren, read an Armour Company 'history article' in the Pioneer Press the summer of 2009. Mr. Westergren called the author, Tom Webb, to suggest that Engineering Research Associates (ERA) could be a good topic for an article.
>
> In December 2009, Mr. Webb researched the ERA topic at the Charles Babbage Institute then interviewed several VIP Club members to develop this January 3, 2010 article.

Poster A8

In 2008 the University of Minnesota recorded 100 years of their electrical and computer engineering history (photo right.) In the book are several pages documenting the early years of ERA.

One of the photos in the book shows the ERA drum memory family and associated personnel, listed with their U of MN degrees (photo below.)
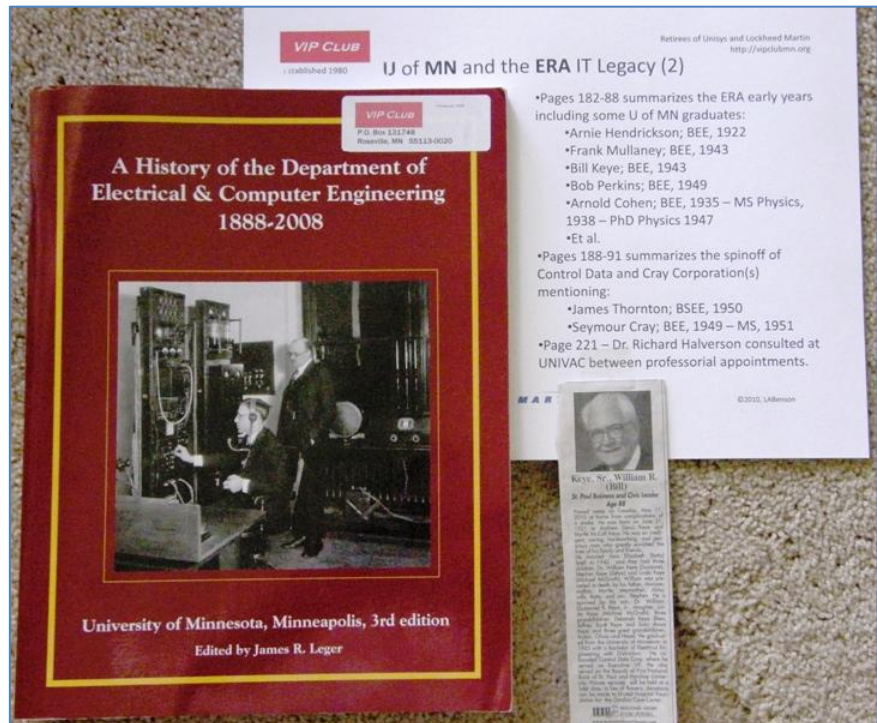
Ironically, as this summer session display was being prepared, William Keye [the last of this group photographed in the early 50's] passed away on May 12 – he was also one of the CDC founders along with Bill Norris.

This University book also records the CDC 'spinoff', and subsequent Cray spinoff companies.

Poster A9

A witness to many, many of the spin off companies was David Lundstrom. His story was first published in 1987 after retiring from Control Data Corporation – then republished in 1997.

Mr. Lundstrom describes his young engineering career working with a multitude of companies as the UNIVAC engineer responsible for computer to peripheral interfaces of the Naval Tactical Data System (NTDS) [focus of the upcoming fall display.] Then he worked in a variety of peripheral engineering and management assignments for CDC while noting the experiences of others spinning off companies.

David also refers to the informal 'Uni-hog' group that meets annually. Initially this was a social gathering of those who had left UNIVAC. Continuing yet today, it has expanded to retirees of various spin off organizations.
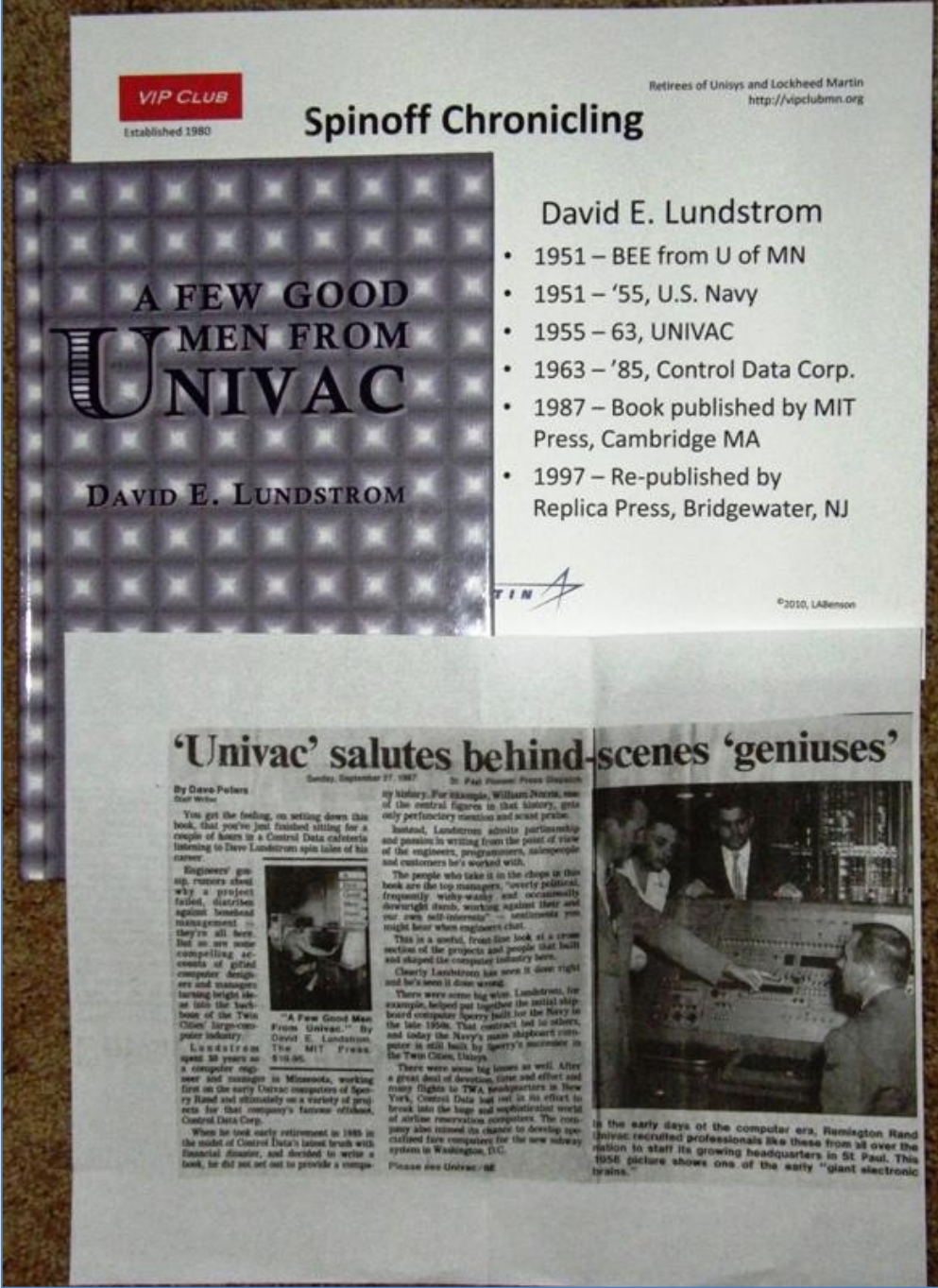
Thanks to Bernie Jansen for the loan of the book and newspaper article for the display.

Display Side B

This side of the legacy display was designed to provide information about our early participation in the space age. We've continued use of the defense systems computer genealogy chart as the centerpiece. Thanks to the Lockheed Martin artwork department for printing this genealogy chart.

Thanks to Bernie Jansen, Warren Burrell, Ken Pearson, Don Mager, and Curt Hoganson who provided technical and time sequence experiences for creation of the various posters.

A special thanks to Quint Heckert who discovered the 200 nanosecond plaque photo among our artifacts, after which he pursued several avenues to identify the participants of this technology development.

Poster B1 Wording (right of genealogy chart)
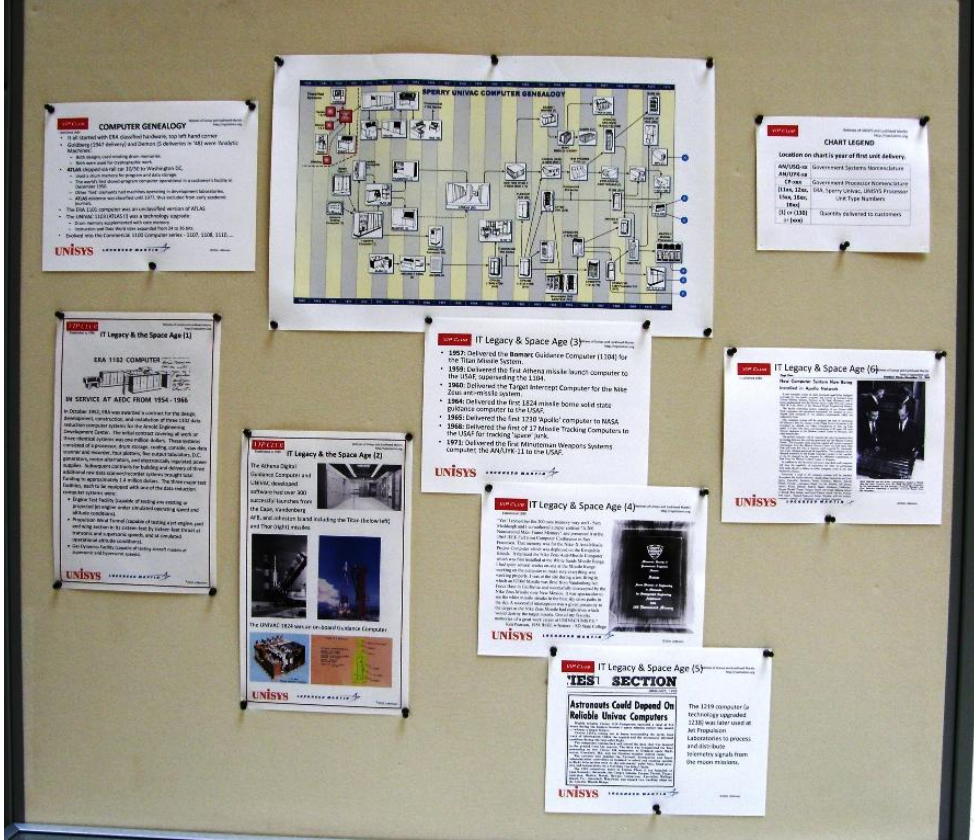
CHART LEGEND	
Location on chart is year of first delivery.	

AN/USQ-xx AN/UYK-xx	Government Systems Nomenclature
CP-xxx	Government Processor Nomenclature
(11xx, 12xx, 15xx, 16xx, 18xx)	ERA, Sperry Univac, UNISYS Processor Unit Type Numbers
(1) or **(130)** or **(xxx)**	Quantity delivered to customers
Titan, Moonbeam,	Project or Application Title

Poster B2

This poster is immediately to the left of the genealogy chart. This and poster B1 are slightly revised from the Spring Semester display.

COMPUTER GENEALOGY

Retirees of Unisys and Lockheed Martin
http://vipclubmn.org

- It all started with ERA classified hardware, top left hand corner
- Goldberg (1947 delivery) and Demon (5 deliveries in '48) were 'Analytic Machines'.
  - Both designs used rotating drum memories.
  - Both were used for cryptographic work.
- **ATLAS** shipped via rail car 10/50 to Washington DC,
  - Used a drum memory for program and data storage.
  - The world's first stored-program computer operational in a customer's facility in December 1950.
  - Other 'first' claimants had machines operating in development laboratories.
  - **ATLAS** existence was classified until 1977, thus excluded from early academic journals.
- The ERA 1101 computer was an unclassified version of ATLAS
- The UNIVAC 1103 (ATLAS II) was a technology upgrade:
  - Drum memory supplemented with core memory
  - Instruction and Data Word sizes expanded from 24 to 36 bits.
- Evolved into the Commercial 1100 Computer series - 1107, 1108, 1110, …
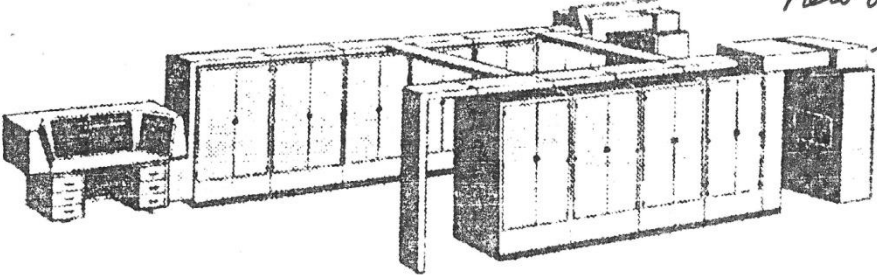
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Poster B3 Wording

IT Legacy & the Space Age (1)

In October 1952, ERA was awarded a contract for the design, development, construction, and installation of three 1102 data reduction computer systems for the Arnold Engineering Development Center. The initial contract covering all work on three identical systems was one million dollars. These systems consisted of a processor, drum storage, cooling, console, raw data scanner and recorder, four plotters, five output tabulators, D.C. generators, motor-alternators, and electronically regulated power supplies. Subsequent contracts for building and delivery of three additional raw data scanner/recorder systems brought total funding to approximately 1.4 million dollars. The three major test facilities, each to be equipped with one of the data reduction computer systems were:

- Engine Test Facility (capable of testing any existing or projected jet engine under simulated operating speed and altitude conditions).

- Propulsion Wind Tunnel (capable of testing a jet engine. pod and wing section in its sixteen feet by sixteen feet throat at transonic and supersonic speeds, and at simulated operational altitude conditions).
- Gas Dynamics Facility (capable of testing aircraft models at supersonic and hypersonic speeds).

Poster B4 Wording

IT Legacy & the Space Age (2)

The Athena Digital Guidance Computer and UNIVAC developed software had over 300 successful launches from the Cape, Vandenberg AFB, and Johnston Island including the Titan (below left) and Thor (right) missiles.
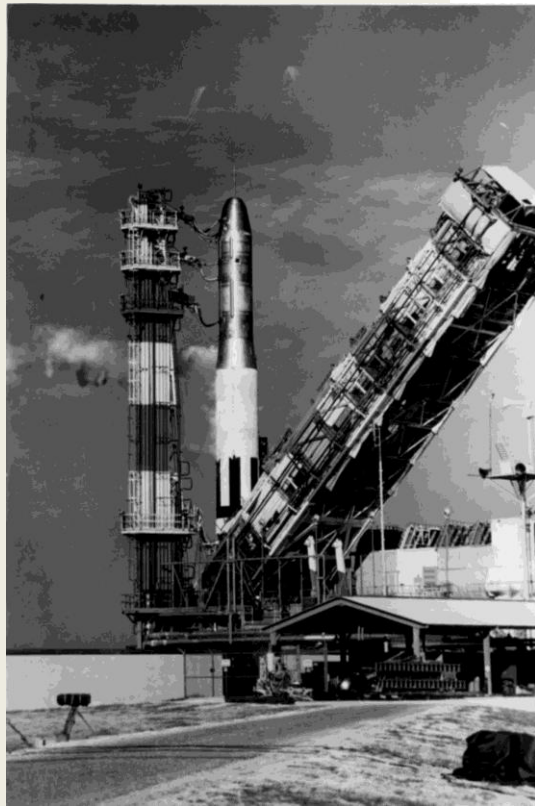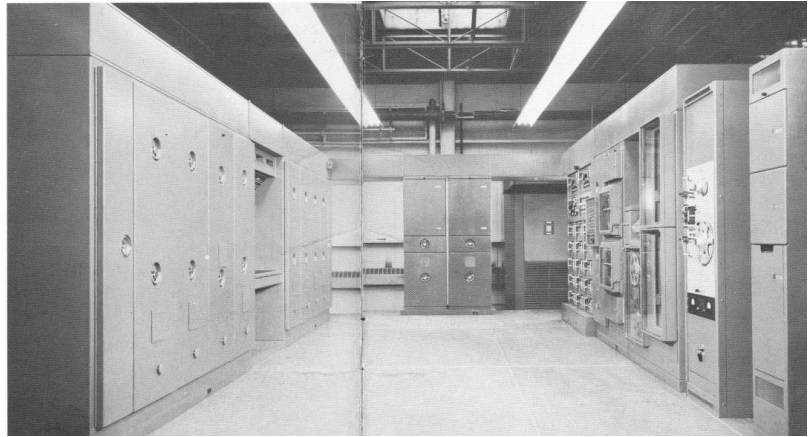
The UNIVAC 1824 was an on-board Guidance Computer

T-III MGC
Missile Guidance Computer

TITAN III C VEHICLE

PHYSICAL CHARACTERISTICS:
WEIGHT ~ 700 TONS
(SOLIDS 250 T EACH)
THRUST ~ 3 MILLION POUNDS
(SOLIDS 1.2 M EACH)
HEIGHT ~ 125 FEET
(SOLIDS 90 FEET)
DIAMETER – EACH STAGE
10 FEET

SATELLITE PAYLOAD
STAGE 3
STAGE 2
STAGE I
TVC TANK
STAGE O
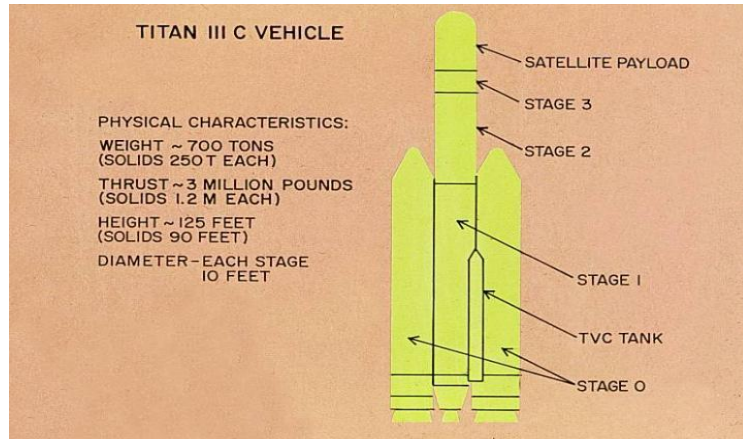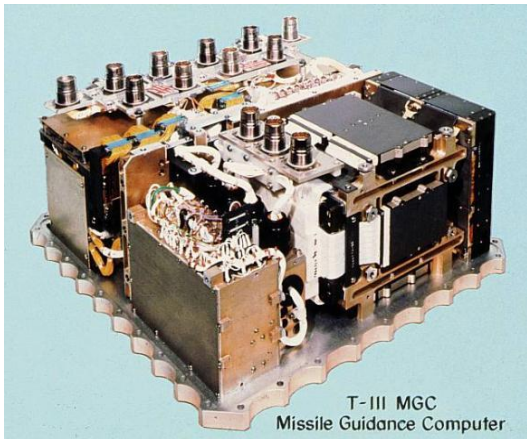
Poster B5

VIP CLUB IT Legacy & Space Age (3) Retirees of Unisys and Lockheed Martin
http://vipclubmn.org

- **1957:** Delivered the **Bomarc** Guidance Computer (1104) for the Titan Missile System.
- **1959:** Delivered the first Athena missile launch computer to the USAF, superseding the 1104.
- **1960:** Delivered the **Target Intercept Computer** for the Nike Zeus anti-missile system.
- **1964:** Delivered the first 1824 missile borne solid state guidance computer to the USAF.
- **1965:** Delivered the first 1230 'Apollo' computer to NASA
- **1968:** Delivered the first of 17 Missile Tracking Computers to the USAF for tracking 'space' junk.
- **1971:** Delivered the first Minuteman Weapons Systems computer, the AN/UYK-11 to the USAF.

UNISYS   *LOCKHEED MARTIN*

Poster B6

Poster B7

Poster B8

Display Case B

Most of the items in this case are memory artifacts carried over from the Spring Semester display. We have added the Athena module which was presented to Don Weidenbach upon his retirement. Note that this also has the Nike-X sticker on it, another project on which Don worked.

<p style="color:red; text-align:center">End of display report #2, LABenson primary author</p>