

VOLUME 1, BOOK 1

EARNING AND SERVING

As my 'ship' sailed into the sunset; it seemed apropos for this 'bird' to record life activities.



A Mediterranean Sunset; 9/25/2010 at Civitavecchia, Italy

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Life is Our Time, Space Continuum of Human Interactions!

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INTRODUCTION

This Volume 1 Book 1 is a part my life's story; a record of my volunteer activities and work experiences through 2018. The contents herein started in the 60s as my UNIVAC Professional Staff Data Sheet. It became a resume in 1994 when Unisys laid me off as 'Glasnost and Perestroika' made so many defense industry engineers expendable – the University of Minnesota hired me to develop an intelligent transportation research laboratory, an academic staff position at the Center for Transportation Studies. There it was my Curricula Vitae for research grant applications. As I retired from the U of MN 2001, this booklet became a resume again as I sought consulting jobs. Then, in 2007 it became my career summary when I volunteered to co-chair the VIP Club's Legacy Committee.



I am very proud and appreciative of Gloria, my wife of 57+ years, our three children, and our grandchildren. Without their continual support and considerations; career experiences would likely have been somewhat different. These booklets are dedicated to our family! I'm also proud of the University of Minnesota where I received the educational basis for a successful engineering career.

I value the respect and trust shown me by previous directors, supervisors, teammates, co-workers, colleagues, committee members, teachers, and customers. This trust includes 36-years of government security clearances during military service and defense industry positions plus serving as treasurer for several volunteer organizations. All part of life's time, space continuum of human interactions!

Volunteering to give of one's own time and talents is more than psychologically rewarding – it is and always has been a method of maintaining communications skills as well as keeping in touch with those people about whom I care. In alphabetical order, I've volunteered for or participated in a plethora of organizations: [*Be wary, there is a bit of egotism herein!*]

- AARP 55-Alive Driver Safety Program: Instructor – February 2000 thru Dec. 2002. I taught almost a dozen classes per year for three years at the White Bear Lake and Mahtomedi senior centers. Initially, this was in conjunction with a University of MN part-time study project looking to infuse new technologies into older driver education curricula. Then because I liked doing it.
- AHS '56 reunion committees for 2016, 2011, 2006, and 1986. I have been maintaining our classmate address file since the 2001 45th reunion. John Loken is now the alternate. I created the classmate reunion booklets for our 50th in 2006, a 52nd, the 55th, and the 60th; *Reconnecting, Remembering, Reflecting*.
- American Association of Retired Persons (AARP): member since 1993 – an occasional travel discount benefit!
- Boy Scout Troop 401 committee, 1973 => 1982: treasurer two years and chairman two years. A great joy in 2010 was seeing our Eagle Scout son volunteering as a Scoutmaster for his son's local troop. The bonus was seeing his son earn the prestigious Eagle Scout rank in 2015. As 2nd Class Scout in 1952, I was a Cub Scout Den Chief – Troop 201 in Alexandria, MN.
- Growth Stock Investor's Club: 1987 through 2002; secretary one year, occasional substitute treasurer, and led the audit team thrice. Chaired the 2002 bylaw re-write committee.
- Institute for Transportation Engineers: member 1994 – 2005; now 'Retired' status.
- Intelligent Transportation Society in Minnesota: Board meeting host at CTS, U of MN 3/95 to 5/01; Newsletter editor 1996-99; Communications Committee Chair 1997-98; and Membership Committee Chair 1995-96.



- Lake Miltona Association (LMA): Board member & area director - 5/95 thru 6/10. Prepared a 'Bog Removal' position paper in 2002. Prepared a position paper relative to the deterioration of the outlet control dam in 2005 – updated in '06 & '07. Met with DNR engineers to lobby for dam site repairs in 2008. Webmaster for <http://lake-miltona.org>, 2009=>2016.

- Minnesota Street Rod Association: (MSRA) member since 1996. Keeps me in touch with second son's and grandson's Cops-n-Rodders hobby cars.
- Owasso Pointe Homeowners Association (OPHA): We moved into the OPHA area on April 27, 2012. I volunteered to join the management board, was elected to a two-year term on 11/17/12. Assignment was to take oversight responsibility for the maintenance of the common grounds [snow plow and mowing contract, etc.] as well as structure exteriors. Back on the board again for the 2016/17 & 18/19 biennia; President for 2017 & 18, Vice President for 2019. .
- Prince of Peace Lutheran Church: Member since 1968. I've been an occasional usher, greeter, or lector since we joined. I also spent one year in the 80s as offering deposit coordinator. In 2006 I began maintaining our church's web site, <http://princeofpeacerosseville.org>. Phase out of being webmaster in 2018. In 2014, I started substituting as a Meals-on-Wheels driver/deliverer.



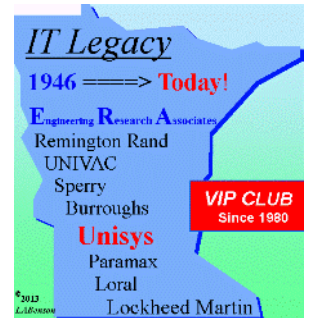
- UNISYS Golf Leagues: Just a team player at Highland Park Golf Course 1986 – 1990. Also, was the 1989 Treasurer & tournament coordinator.
- University of Minnesota (U of MN), Center for Transportation Studies (CTS): Appointed to the Transportation Safety and Traffic Flow Council for 2009/15. I was a committee ‘friend’, 1994 thru 2008 – again for 2016. I participated in the annual research conference planning for the CTS Safety and Traffic Flow Council including session moderating from 2002 through 2013. Also, volunteered as a CTS Outreach and Education Council Friend, 2000-05.
- University of Minnesota Alumni Association: member 1995 through 2002.



- UNISYS and predecessor company retirees’ non-profit: Director in 2006; Treasurer 2007/08; Vice President 2009, 10 & 13; President 2011, 14 & 15; Past President 2012, 16 & 17; and now a Director for 2018/19.

I feel good about leading several Board accomplishments: a) Established an independent PO Box, b) Got the IRS to change our name from Sperry Retirees Club to the VIP Club, c) initiated CDs to earn interest on pre-paid future dues, d) converted membership database from MAPPER to Excel, e) filled in for President Turba for 3 months in 2010 as he recovered from a stroke, f) initiated the *Member Emeritus* and *Volunteer Extraordinaire* recognition awards, and g) developed our electronic newsletter deliveries - now at 60%.

Volunteered as Co-chair of the Legacy Committee since October 2005. In 2006, I started a Legacy web site anthology of our history, merged with a new VIP Club site in 2007, <http://vipclubmn.org>. Also helped develop the 2008 Sesquicentennial displays at the Capitol Mall and State Fair venues. Aided in the setup of workstations at the Lawshe Memorial Museum for legacy photo ID work. I coordinated the Annual Univac Old Timers Reunion gathering from 2006 to 2017 and served on the Unihogs/Uniturkeys planning committee since 2000.



- West View Bay Association, 1973 => 1986: 6 years as treasurer, 4 years as secretary, VP & President one year each. At our first summer cabin, I turned on water in the spring and drained the lines in the fall most of the years during our 13 years of ownership. Resigned from that management board when we sold the Aitkin County, Island Lake cabin.

PROFESSIONAL CONSULTING ACTIVITIES

Reverse chronological order; some would say a bit of everything – others, not much of anything .

Minnesota Department of Transportation (MnDOT) Consultant 3/09 to 7/09

The MnDOT Transportation Research Assistance Program contracted with me to evaluate their aging Central Library printed resources. Then, in conjunction with the library staff, we procured over 500 new books or revised book editions. The new book orders focused on innovation and risk management texts. Some were advanced training journals for Microsoft software products. This was my life’s last 1099 Misc. form for income tax purposes.



Crystal Welding, Inc. Technical Writer 9/06 to 3/07

I upgraded their Quality Control Manual to meet MnDOT bridge metal-working requirements. In conjunction with their production shop manager [our 2nd son,] we developed a dozen topical shop procedures. MnDOT certified their shop 3/07. Although listed as a professional activity, this was pro-bono to help son and his company at that time.

Center for Transportation Studies**Research Project Analyst 4/04 to 8/04**

CTS needed someone with a broad spectrum of experiences so called me. This project required evaluation of nine completed U of MN, CTS research projects then selective generation of implementation plans or project closure memos. The technologies involved were video traffic sensors, vehicle safety devices, human factors studies, and traffic flow modeling simulation scenarios.

Center for Transportation Studies**Technology Outreach Coordinator 1/02 to 6/03**

As I retired from the University, the CTS Director asked me to keep in touch about a day a week. As an outreach specialist, I supported the CTS Intelligent Transportation Society of Minnesota activities focusing on the Intelligent Transportation Society of America's 2003 annual meeting technical tours. Specifics included publication drafts, scheduling, and contract coordination for a vehicle technologies' demonstration at the Minnesota State Fairgrounds. Two additional 2002 CTS support activities were:

1) Coordinated creation of a new Local Technical Assistance Program class "Planning and Designing Roads for Older Driver Safety." This required creation of an advertising flyer, Federal Highway instructor scheduling, and facility arrangements via the U of MN's Continuing Education department. A post class report included a participant survey analysis.



2) Coordinate a few tours of the Intelligent Transportation Systems (ITS) Laboratory, the Smart Bus, and the Human FIRST Laboratory at the University. These tours included giving a CTS functions overview slide presentation – updates to previous salaried work tasks.

ITS Minnesota**Web Site Editor****5/99 to 5/2001**

My primary function was to gather information from the ITS Minnesota monthly director's meetings and local functions, then create monthly updates in hypertext marked language [* .html] format for the <http://itsmn.org> web site. I did this web site work from my home office to keep it separate from my CTS daily job. A MnDOT volunteer took over the site in 2001 as I phased into retirement from the University.

Institute of Transportation Engineers**Tour Guide****1996 & 1998**

I was asked to take on these two 'gigs' by my then director, Dennis Foderberg. I used vacation time from CTS while traveling during the trips to avoid receiving project pay from the University for my time while getting paid by the ITE.

In 1996 I did the tour site planning then led a week long ITS Technology Site Tour for 33 local, national, and international transportation industry professionals. This tour included two sites in Toronto, two sites in Boston, one site near Baltimore, three sites around the Washington D.C. area, then two sites in Atlanta - ending in Orlando at the ITS World Congress. Dennis coordinated the post tour report to the IEEE Washington Office.

In 1998 I did the tour site planning then led the week long ITS Technology Site Tour [chartered bus] for 24 Industry professionals. This tour visited two venues in Minneapolis, two sites near Chicago, one in Ann Arbor MI, two sites in Detroit then ended with three sites in Toronto. While at the ensuing Institute of Electrical and Electronic Engineers Toronto conference, I presented the U of MN Transit Way Safety Project paper for an ailing co-author. My boss again coordinated the post tour report.

Minnesota Datametrics Corp.**CFO and VP****2/86 to 3/95**

Minnesota Datametrics Corp. (MDC) was/is a friend's home-based business. My primary activity, from 1986 to 1994, was to build and test MD2 microscope digitizers in my basement workshop. I also built a couple of MD2s in my apartment while working for UNISYS in the DC area. My second MDC responsibility was the state and federal tax reporting. My third responsibility was to support hardware and software demonstrations at several national Neuroscience Conferences during the late 80s and early 90s. Gloria and Charlie's wife, Margo, also supported these conferences with the sewing of table skirts, logistics, and visual effect feedback.



In 1994, Dr. Knox with a bit of my help developed the MD3, a microprocessor-based digitizer unit. Charlie took on the build of this MD-3 unit as I focused on my [then] new position with the University's Center for Transportation Studies.

Hyde Translations, Inc.**Translator - Editor****3/94 to 6/94**

This required creation of a lexicon in Russian for a technical manual. The technical manual was for a mineshaft ventilation system, being exported to the Urals. It also required conversion of English to Metric nomenclature for dimensioned items in translations done by others. This contract came to me via a retired UNIVAC/UNISYS technical editor.

Amex Systems, Inc.**Engineering Specialist****5/83 to 9/83**

This consulting job consisted of teaching the engineering staff of a minority owned California business how to re-design shipboard equipment for a military aircraft environment. This involved thermal conduction and vibration mitigation methodologies plus proposal writing techniques. The re-packaging also required electrical isolation of encrypted messages from the non-encrypted original text, i.e. black/red signal separation. The result was a proposal presentation to the US Navy at Lockheed, Burbank. The proposed AMEX re-designed equipment was subsequently installed aboard the Navy's EP-3 aircraft. My AMEX contact was Dan Brophy, a former UNIVACer.

PROFESSIONAL EMPLOYMENT**Center for Transportation Studies (CTS) at the Univ. of Minnesota****Technical Staff, Intelligent Transportation Systems (ITS) – March 1999 to December 2001**

As a semi-retired, half time employee, I was responsible for CTS support of the ITS Minnesota board including communications committee participation. I performed the Webmaster functions for ITS Minnesota from 11/99 to 5/01 as part of CTS sponsored committee obligations. For the CTS Local Technical Assistance Program director's visit to the former Soviet Union, I created Russian language overheads outlining our transportation technology education classes. As a safety outreach initiative, I conducted an evaluation of Minnesota older driver education programs in conjunction with AARP 55-Alive volunteer teaching. In conjunction with ITS Institute's laboratories' managers we coordinated and/or conducted dozens of visitor technology tours at the Human Factors Research Laboratory. In response to a Dr. Donath request, I created variations for technical demonstrations then presented them to the ITSA 2003 technical tour committee. Their consensus was to merge Intelligent Vehicle demonstrations into the general conference tour plans – see fifth consulting entry on page 4. Dr. Max Donath was my director at that time. The position was significant as it was my life's final W2 form for tax reporting of the 2001 year!

Manager, ITS LABORATORY –**April 1994 through February 1999**

This Academic Staff Coordinator position was responsible for development and operation of the Intelligent Transportation Systems Laboratory for CTS. This started as a temporary position in the Civil Engineering building then became permanent as we moved into a new building in October of 1994. The key performance measure for the position was to keep development and operations projects within budget: Laboratory Design [\$265k], Laboratory Equipment [\$1M], and 4-year Laboratory Operations [\$190k].

I was also responsible for supporting CTS display booths at many local and national conferences. Especially rewarding for me was as a Guest Lecturer for the University's Elder Hostel program, the SESEM gifted high school student program, and a few Institute of Technology, Civil Engineering introductory engineering career classes. Dennis Foderberg was my director.

The position also required 'outreach' committee work: MnDOT Guidestar R&D Committee, ITS Minnesota Communications Committee, CTS/ORS team, University-MnDOT-MTEC Arterial Technology Advisory Panel, Adaptive Urban Traffic Signal Control and Integration board, Orion team, and a MnDOT Bicycle Sensor evaluation committee. I served as technology advisor to the University's Parking and Transportation Services department for their Transportation Integration Program. I managed the Transit-way' Safety Program evaluation project, including several conference presentations. I created an evaluation plan for the Midtown Greenway project for MnDOT, the City of Minneapolis, and CTS. During this period, I conducted dozens of technology demonstrations for hundreds of ITS Laboratory visitors.

A key factor in getting hired by the Center after UNISYS laid me off was that I'd met Mr. Foderberg and some MnDOT management people in 1993 when I led the UNISYS investigation of the ITS market place for defense conversion possibilities.

UNISYS and Its Defense Industry Predecessors: July 1960, Feb. '94

After the Army Security Agency [MOS 982.1663] released me from active duty in 1960, UNIVAC hired me to be a drawing control clerk in the Antenna Coupler department - working in Plant 1. [I paid an employment agency \$150 to find me a job.] A rather simple beginning to a multi-decade career - over 20 position descriptions and two dozen supervisors, managers, and directors during my 33.6 years of service to the company.

Thanks to the following for raises or promotions during my tenure at UNIVAC to UNISYS: Jim Chaffee, *Al Mueller*¹, Cliff Cunningham, *Tut Runyon*, *Finley McLeod*, Ken Oehlers, John Miller, *Dave Zemke*, Ernie Lantto, Jack Smith, *Bob Oulicky*, *Mel DeBlauw*, Tom Petschauer, Ken Pearson, Paul Kruelle, *Marv Mirsch*, Neil Hahn, Don Marth, Bob Thelen, and Karen Maddock.

Senior Staff Systems Engineer - Eagan, MN

12/92=>2/94

I transferred back to Minnesota from Rockville, MD in November of 1992.

Air Traffic Control (ATC) Departmental support tasks;

Tony Beck was my director at this time - he had the onerous job of giving me lay-off papers on Tuesday, 2/15/1994.

- Evaluated system performance requirements, then wrote the System Engineering Management Plan for the Unisys Hong Kong new airport proposal. I investigated and wrote the technical proposal sections for electronic flight strips, system printers, and a voice processing system. Unfortunately, we didn't get the contract. [I was thru this airport twice in 2013.]
- I led a team preparing an Air Traffic Control history course for the training of new systems engineers as part of the companies emerging ISO (International Standards Organization) 9000 processes.
- As a proposal team member, I wrote two subcontractor Statements of Work for a Brazilian Amazon surveillance/Air Traffic Control proposal. These were for automated weather stations & Global Positioning Systems base stations. Merle Cole was the business coordinator. Management decided to no-bid after the technical proposal was completed.

Intelligent Vehicle-Highway Systems (IVHS) Project;

This project was a follow on to the investigation that started while on site in Rockville, MD. I led an evaluation project investigating the IVHS marketplace as a defense conversion venture for Unisys Defense System Division. We focused on an Advanced Traveler Information System (ATIS) demonstration for the Minnesota Guide Star's Genesis project. The demonstration result was a PC-to-Pagers radio communications system, showcased at the 1993 IVHS America 3rd Annual Conference. We drafted a Unisys marketplace business plan and initiated a Metro-Mobility proposal team.

¹ Italicized names indicate that as of 2016, I know that the person is deceased.

These projects ended when management decided to focus investments on defense projects. I worked with Roger ‘Dean’ Nelson in the Marketing department on this project. The best part of this project was that it gave me some technical knowledge that led to a laboratory manager position at the University of MN’s Center for Transportation Studies – Intelligent Transportation Systems.

Aluminum Circuit Technology Project;

After translating several patent documents from the Russian to English in 1993, I led a business and engineering team on a three-week technology investigation trip to Moscow and Minsk. These technologies had been used in their MIG-29 aircraft. We hosted a subsequent Russian delegation to St. Paul for additional technology transfer discussions. Management decided that the use of this technology would not significantly enhance our defense industry marketplace share. *Tom Watson*, Program Management was the ‘Executive of Interest’.

Entrepreneurial Project;

I was assigned to investigate the technical and business aspects of a process control system to improve electrical power generation by injecting helium into the steam working fluid. An interesting part of this project was a ‘back room’ tour of the Monticello, MN nuclear plant. I created a system design, prepared the development cost analysis, wrote a sales plan, and then presented these to the General Manager's Staff. The Staff declined to continue as it was too far from our then core businesses. They decided instead to put research funds into GPS for farm tractor control of seeding and fertilizing.

Software Product Manager - Rockville, MD

7/91=>11/92

As one of the first three on-site sub-contract systems engineers, the leadership team grew the contract support staff to a 55-person team. I directed systems engineers who were writing computer software requirement specifications for tower control operations of the FAA's Advanced Automation System. Responsibilities included coordination of ADA [software language] programming work for system integration between Unisys, IBM, and SDC programmers. Karen Maddock was the on-site program manager - Lee DuBois was the lead systems engineer.

At the request of transportation systems management, I began IVHS marketplace investigation for new business penetration while wrapping up a portion of the FAA systems design. This initiative facilitated my move back to Eagan, Minnesota. Plus, these investigations gave me a few more skills which in turn led to the position at the University of Minnesota. Thanks for this opportunity!

Senior Staff Engineer - Eagan, MN;

4/90=>6/91

Don Marth was my director for these three initiatives:

- Represented Unisys on the Air Force's (AF) Modular Avionics System Architecture (MASA) Systems Engineering Committee. These meetings were in Dayton, St. Louis, Los Angeles, Owego, Indianapolis, and Santa Barbara.
- Led a proposal team, planned, won, and then managed the \$900k Time Stress Measurement Module (TSMM) development for the Air Forces' Wright Laboratories in Dayton, OH. This TSMM module plugged into the Navy’s standard AN/AYK-14 airborne computer built by CDC – and it functioned in a spare card slot, thanks to the design team.
- Led the proposal teams, negotiated, and then managed the software simulation contracts with ZYCAD for the AF's \$138k JAID and \$277k IOBIDS programs. We achieved a 35% gross margin on both programs.

Technical Director - Avionics Business Unit in Eagan;

9/87=>3/90

Don Marth was my director for these three initiatives.

- As the Unisys technical lead for government/industry avionics standards, I represented our Northrop prime, meeting with 14 of the 28 Joint Integrated Avionics Working Group (JIAWG) committees for the F-23 stealth fighter-plane systems development. I also represented UNISYS on the Navy's Standard Hardware and Reliability Program (SHARP) Industry Advisory Board. The Air Force awarded me a couple of 'leadership' wooden plaques for conference planning.
- I was responsible for implementation of airborne module standard specifications. Defined product enhancements to the airborne computer electronic processing and interface modules. Modules were built for the Northrop Advanced Tactical Fighter [YF-23]. Lockheed-Martin subsequently won the fly-off with their YF-22 stealth fighter plane.
- Led a proposal team, negotiated, and then managed the \$487k DAMES simulation program for the AF's Advanced Tactical Fighter System Program Office via ZYCAD Corporation located in New Jersey. I was both Program Manager and Project Engineer – 30% gross margin! ZYCAD asked me to come to work for them to be director of their defense industry program management group. I didn't schedule an interview as wasn't interested in moving to NJ.

Career Path Positions at UNIVAC and Sperry before the 1986 corporate buyout by Burroughs

Title	Dates	Department – responsibilities and accomplishments
Program Manager	03/86 to 09/87	Special Products Department – highlight was the development of a radiation hardened microprocessor and floating-point processor for the CIA's Strategic Defense Initiative space program. Disciplined simulation led to first pass operational tests of the RISC 32-bit architecture chip set. Our primary challenge was to investigate, select, then contract with a subcontractor for chip manufacturing after the Burroughs/Sperry merger closed the Eagan semi-conductor facility. Neil Hahn was my director.
Program Manager	06/84 to 03/86	Airborne Products Department – highlight was the development and production of shipboard 'bubble' memory storage device units for the US Coast Guard ships and for a US Navy Airborne system. Business and technical challenge was resolving problems with component manufacturing at Motorola in the Phoenix suburbs. <i>Marv Mirsch</i> was my director.
Engineering Manager	02/80 to 06/84	Hardware Engineering Department – I managed a 27-person department for Navy standard computer continuation engineering. We conducted cache memory enhancement studies for the AN/UYK-7 computer via a contract with the U of MN – Dr. Peter Patton was the U of MN contact. Concepts developed during this study were subsequently used in the AN/UYK-43 computer and reviewed for use in the commercial 2200 series machines. I led the proposal and development of an AN/AYK-10 design update for Harpoon missile launching from the S-3A airplane. We created a semi-conductor memory system for the Canadian CP-140 aircraft's central computer, subsequently integrated into the Lockheed S-3A to S-3B updates. We also transitioned the production of the AN/UYK-502 mini-computer from St. Paul to Winnipeg. Paul Kruelle was my director.

Title	Dates	Department – responsibilities and accomplishments
Project Engineer	06/77 to 02/80	Hardware Eng. Dept., Avionics Department. Created an airborne version of the Navy's standard AN/UYK-44 shipboard computer [type 1834]. The cache memory techniques and I/O processor architecture were subsequently adopted by the Navy for an AN/AYK-14 airborne computer upgrade. Supported the AN/AYK-14 second source proposal with documentation and process analysis. Supervised completion of the IR&D High Speed Search Function. Provided the Voice Laboratory ² with Russian and German language recognition support. Tom Petschauer was my Group Manager.
Engineering Supervisor	06/74 to 06/77	Hardware Eng. Dept., Ship Systems - Highlights were development of the NATO serial interface for AN/UYK-7 and UYK-20 computers and two peripheral devices. We also conducted Internal Research and Development of a handheld device for the automation of diagnostics. This maintenance processor technology was subsequently incorporated into the UYK-43, UYK-44, B-2 processor, CP-2044, and Memory Processor computer hardware. <i>Mel DeBlauw</i> was my Manager at this time.
Product Engineer	08/72 to 06/74	Hardware Engineering Department, Mini-computers section – Highlights were the environmental qualification of the AN/UYK-15 shipboard computer. Supported marketing with dozens of military systems application proposals. Also led the environmentally testing of the AN/UYK-23 airborne version of the AN/UYK-20 computer for a classified ASA application. <i>Bob Oulicky</i> was my Manager at this time.
Senior Electrical Engineer	09/70 to 08/72	Ship Systems Dept: Installed and maintained software development centers in Hengelo, Holland and Wilhelmshaven, Germany for their Fast Patrol Boat (FPB) systems. Co-taught computer and peripheral systems maintenance in Wilhelmshaven with Dick Lundgren. I was called on to do marketing support technology presentations in Italy, France, Sweden, England, Germany, Holland, Denmark, and Yugoslavia. I also traveled to Paris to repair a French Navy AN/USQ-20B. Ernie Lantto was my director.
Electrical Engineer	06/66 to 08/70	Hardware Eng. Dept. - Avionic computers at Plant 8 in Eagan – Performed logic design for 30-bit processors, memory interfaces, and Input-Output communications. Conducted environmental testing for the 30-bit CP-901 P-3C central computer. Proposed, and then led the design of a shipboard version for the German Navy FPB application. I worked for Ken Oehlers, <i>Dave Zemke</i> , Jim Miller, and <i>Larry Woznicka</i> during these years.
Computer Operator & Programmer	09/63 to 06/66	Military Computer Center at Plant 1 in St. Paul – Operated and programmed seven computer types at night while attending the University during the day: 1206, 1218, Trans-tech, 1219, CP-667, 1004, and SS-80. Reported to <i>Tut Runyon</i> and Cliff Cunningham.
Documentation Control Clerk	07/60 to 08/63	Antenna Coupler Department at Plants 1 & 5 in St. Paul – Processed engineering changes to mechanical and electrical designs including record keeping, some drafting work, and Smith Chart impedance analysis. Supervisors were Jim Chaffee and <i>Al Mueller</i> .

² See invention of voice mail in David P. Andersen's book: *The Cello Maker and other Stories of Working Man*.

MILITARY SERVICE, 6.5 years [I am a 'cold war' veteran]

- Selective Service Board [standby] 1981 => 2001: local board chairperson for 8 of these 20 years.
- U.S. Army Reserve: Linguist @ 328th Military Intelligence Detachment – 8/60 => 3/63. I did organizational training for 'captured' document language recognition. Service sites were monthly meetings at Ft. Snelling, MN; two summer camps at Ft. Sheridan, IL; and a weapons training exercise at Camp McCoy, WI. Commander was *Col. Al Poch* – First Sgt. was Fred Vihovde, both UNIVAC employees at that time. Received honorable discharge, March 1963 .
- U.S. Army: Linguist/Analyst @ Army Security Agency - 7/57 => 6/60. Service sites were Fort Carson, CO; Fort Devens, MA; Presidio of Monterrey, CA; Heilbronn, Germany; and Rothwesten, Germany. I earned expert rifleman with the top score out of 220 recruits in the basic training company. I was awarded a good conduct medal too. Military Occupation Specialty of record was 982.1663; intercepted communications traffic analyst specializing in Russian – rank SP-5. I learned some cryptology methods during three months supporting a de-crypt department. All work specifics were classified [in 2013 a few things began to appear on Wikipedia.] I learned to operate teletypes, radios, radio direction finders, IBM card sorters, and printers for cards and paper tapes.
- Minnesota National Guard: 47th Division in Minneapolis – 9/56 => 6/57. Was trained for 155mm howitzer fire direction artillery control and truck driving [5-ton, deuce & a half, and ¾ ton.] Service sites were monthly at the Minneapolis Armory and two weeks at Camp Ripley, MN.



DEFENSE INDUSTRY CAREER HIGHLIGHTS

I worked on or with many, many computer types during these years: 1206, SS-80, 1218, CP-667, 1219, 1004, Transtec, 1830 Phoenix, CP-901, 1830B, U9200, AN/USQ-20B, 1616, AN/UYK-15, AN/UYK-23, U3760, AN/UYK-502, AN/UYK-20, AN/UYK-7, 6802 microprocessor, U1834, AN/AYK-14 second-source proposal, AN/AYK-10 enhancement designs [Navy's S-3B], B-2 unit memory upgrade study, RISC chip set development [CIA's Satellite processor], Common Module Family development [AF's YF-23], B-2 processor enhancement studies, and the initial Navy AN/USQ-70 proposal.

I have listed my career top-ten highlights hereunder - the most important to me was #1!

- **10.** About 1984, while boarding a flight from MSP to DCA, I noticed a grey-haired female Navy Commodore sitting in the back-left corner of first class. I stopped and asked: "Ma'am, are you *Grace Hopper*?" She was! I told her that I was a UNIVAC computer engineer and that it was an honor to meet one of the industry pioneers. We chatted for about five minutes before the plane took off.
- **9.** January 1972, I was assigned to Wilhelmshaven Germany for the 1830B installation into the German Navy's computer center reporting to Ernie Lantto in Bad Godesberg. For three months, I served as the site manager, co-maintenance engineer with Pierre Iskos, and co-instructor with Dick Lundgren. Dick and I conducted computer and peripheral maintenance training lectures in English with hands-on lab work in German.

Programmers on site were: Bill Rogers, Dennis Christ, Tom Kratz, John Rachac, and Jim Gannon. Ernie had me write 'raise' recommendations for two of the on-site programmers. The site commandant at the time was Kapitan Willie Kraus - later Admiral Kraus. I felt honored during the exit interview when he spoke with me entirely in German.

- 8. September 1987, I was promoted to Technical Director - Avionics Business Unit in Eagan reporting to Don Marth. I was responsible for implementation of airborne module standard specifications. Modules were being designed and built for the Northrop Advanced Tactical Fighter [YF-23.] As the Unisys technical lead for government/industry avionics standards, I met numerous times with 14 of the 28 Joint Integrated Avionics Working Group (JIAWG) committees, representing of our Northrop prime. Later, I was recognized by the Air Force as playing a key role in resolving a wide variety of systems integration issues critical to the success of their Common Avionics Baseline. As part of a JIAWG follow-on contract, Demonstration of Module Exchangeability via Simulation, Air Force Brigadier General Fain commended me and our team of Paul Leavitt, Paul Swart, and Larry Reiners for “exceptional professionalism and a true cooperative spirit.”
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- 7. In 1993, UNISYS was offered Aluminum Circuit Technology used aboard MIG-29 fighter planes by the former Soviet Union. I translated several patent documents from the Russian to English and then was the lead engineer on a three-week technology investigation trip to Moscow and Minsk, Belarus. We later hosted a Russian delegation to St. Paul for additional technology transfer discussions. My ability to speak and read Russian was a major contributor to our understanding this technology even though management decided that this technology wouldn't significantly enhance our defense products. *Tom Watson* was the managing director, Paul Roselle was a process specialist, and I don't recall the other team names.
 - 6. In the fall of 1975, the U.S. Navy was testing a small ships' system aboard the USS Pegasus PHM-1. Each time they fired their anti-aircraft gun at a towed drone, the system went dead with a red light lit on the 1830B computer. I flew to Port Hueneme, CA to ride the Pegasus with our local field engineer, Bob Herbster. On the Pacific firing range, they shot, the system went dead; the computer's program fault and power fault red lights were both lit! I asked for a copy of their power fault program; there was none! After half an hour, I had ginned up an elementary power fault program using machine code, plugged it in from the maintenance console, and then asked them to repeat the firing. They fired; the system blinked and kept tracking the target. The power fault indicator was lit but not the program fault light. Bob and I determined that the power generator mounted on the fantail was not bolted down; so, the shock/vibration of the deck from the gun firing caused the generator to slam sideways interrupting output power. After bolting it down, they fired again and the entire system operated as expected. I converted the power fault program from machine code to mnemonics for their programmers. Bob and I received the honorary title of *Hydrofoil Mariner* for our efforts plus overtime pay for our 17-hour day on the Pacific.
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- 5. In 1992, I was a 'product manager' working on the FAA Advanced Automation System (AAS) in the Rockville, MD IBM plant - our engineering manager was Lee DuBois, Program Manager was Karen Maddock. We submitted the first Tower Control Systems specification to the IBM validation process. Their automated document evaluation process detected no errors that sent the IBM quality group scrambling to find the problem with their 'documentation' test software. They had never received a new specification without errors! Our systems team subsequently submitted several 'error-free' specifications. What we never told them was that one of our programmers had written a simple check-it program to catch omission errors. My personal reward was an Achievement Award for Excellence and a \$5k bonus check – I took my team to lunch.

- 4. In 1967, I was working checkout and test of the first CP-901 computers at the Shepard Road facility. The Navy flew a P-3C into Wold-Chamberlin Field - Jack Anderson [Field Service Engineer] and I got on board with the CP-901 S/N 1 then flew to the Naval Air Development Center (NADC) at Johnsville, PA for the first customer delivery. Jack and I installed the CP-901 into their computer center for ASW software development. 20 years later, I smiled while watching the P-3C in the *'Hunt for Red October'* movie. We had flown in a sub-hunter plane. In 2012, a retiring Lockheed Martin program manager [Bob Pagac] told me that there were still 40 CP-901 computers operational in the Japanese ocean search and surveillance fleet. Very few design teams have created a computer that would have a system life still operating 45 years after the first delivery.



- 3. In 1975, I was an engineering supervisor responsible for an Internal Research and Development of a handheld device for the automation of computer diagnostics. Previous diagnostics had been volumes of sequential 'if - then' pages. We used a simple numeric keyboard and a 16-character LCD display, a 6802 microprocessor, and a ribbon cable to connect to the computer's back panel. This maintenance processor technology was subsequently incorporated into several computer lines [AN/UYK-43, UYK-44, Memory Processor, and CP-2044] as a replacement for the classic computer console rows of binary indicators and tomes of trouble shooting instructions. John Ringdahl and *Dean Free* were key engineers for the design, prototype build, and concept demonstrations.

Jim Runquist, a marketing planner, told me at an Old Timer's gathering in 2011 that he'd tried to get 1976 research money for me to integrate this technology into a soldier's portable GPS/radio unit. If only we had had the foresight of other applications, this device could/would be recognized today as the grandfather of today's PDA, GPS, Cell phones, and I-pad like devices!

- 2. In 1985, I had left engineering for a transfer to the Special Products Program Management Department – given responsibility for the development of a radiation hardened microprocessor chip set for the CIA's Strategic Defense Initiative space program. I received a Sperry Challenge Award for leading the proposal for the second phase RISC Implementation. During the second phase, the Burroughs/Sperry merger closed the Eagan semiconductor facility - we had to find a subcontractor for chip manufacturing. Jim Stewart and Dr. Vic Wells helped evaluate replacement facility candidates. Jim and I had visited 16 'sand factories' around the US. Disciplined simulations by Design Engineering's John Porter led team gave us first pass operational tests of the MIPS RISC 32-bit chip set manufactured at United Technologies in Colorado. This was the world's first radiation hardened CMOS 32-bit chip set. Our CIA sponsor sent me a commendation letter.



- 1. The summer of 1963, the Antenna Coupler department shrank to half-a-dozen people - I found a financial analysis position in Plant 1, with *Bob Fischer, Bob Price, Curt Christensen, Jack Mann, Rollie Arndt, Rufus Korting*, and Ruth Horan. In August, I took a night-class education reimbursement form to department director, *Leon Findley*. He asked how long until a degree to which I said "10 to 12 years." Then he asked why I did not work nights to enroll at the University during the day - my reply was: "I can't support my wife and son on the night jobs that I'd seen advertised." Leon said: "I'll see what I can do for you."

The next afternoon *Mr. Findley* asked me to meet with *Tut Runyon*, manager of the Plant 1 Military Computer Center. **Three days** later, I started working the second shift operating the 1206, 1218, 1219, SS-80, CP-667, & 1004 computers. **Three weeks** later, I started University day classes. **Three years** later in June '66, I received my U of MN Bachelor of Electrical Engineering degree. Good things do come in threes! Thanks Leon!!

FORMAL EDUCATION

Reverse chronological order.

- AARP 55 ALIVE – Older Driver Safety Instructor May 2000;
- Firststaff Computer Learning Center – Microsoft Office products and Server Administration 1995 thru 1998;
- Anoka/Hennepin Technical College - Novell NetWare & network connections Spring '94;
- Lakewood Community College - Business Law Spring '91;
- Over 35 in plant technical and managerial continuing education classes 1967 through 1993;
- University of Minnesota - Bachelor of Electrical Engineering June 1966;
- Defense Language Institute @ Monterrey CA – Russian Certificate December 1958; and
- Alexandria High School, Douglas County, Minnesota – Diploma May 1956.

PROFESSIONAL AWARDS

- Unisys "Achievement Award for Excellence" for leadership during the FAA Advanced Automation Systems assignment at the IBM plant in Rockville, MD. July '92
- Cited by TRW [Dayton, OH] for TSMM best subcontractor performance, team's new module design functioned correctly when plugged into the NAVAIR CDC built AN/AYK-14. May '91
- Cited by the Air Force for outstanding performance on the MASA systems engineering committee - Oct '90. I also received recognition plaques for MASA common electronic module conference planning and coordination activities - 1988 and 1989.
- Cited by Air Force General Fain for exceptional professionalism of the team which I was leading - DAMES contract, June '89.
- Cited by the CIA at the completion of the SDIO phase II CMOS project for outstanding program managerial performance in meeting both schedule and costs despite having the UNISYS, Eagan fabrication plant closure in 1988.
- Sperry "Challenge Award" from management for winning Phase II of the SDIO CMOS RISC processor development program in 1987.

FORMAL PRESENTATIONS/PUBLICATIONS

- "Building 26 Sequel or Another Untold Story" presented during the WW II History Round Table at Ft. Snelling on Feb. 9th, 2012. Colin Burke, author of "The Secret in Building 26 – The Untold Story of America's ULTRA War against the U-boat Enigma Codes" was the featured speaker for the evening's topic '*Code Breaking and the Beginning of Computers*'. My PowerPoint slides are available on line at http://vipclubmn.org/Articles/WWII_Roundtable.pdf.
- Display Enhanced Signal Lights, 16th Annual Transportation Research Conference, in April 2005 at the St. Paul, MN River Centre. This was a concept paper; I was not able to obtain prototype design/build funding.

- ITS IMPROVES TRANSITWAY SAFETY, 10th Annual ITS America Conference; May 2000 in Boston. Operational results after two years of ITS equipment operation on the Minneapolis to St. Paul dedicated campus-campus route.
- UNIVERSITY TRANSITWAY SAFETY PROGRAM, 68th Annual ITE Meeting; August 1998 in Toronto Canada: Also presented at the Minneapolis CTS 1998 Annual Technology Forum, May 1998 and at the Partners for Roadway Safety Conference, October 1998.
- UNIVERSITY TRANSPORTATION INTEGRATION PROGRAM, Parking and Transportation Services – 4th ITS World Congress; October 1997 in Berlin Germany: Also presented the paper at the third TRB Integrated Transportation Management Symposium; June 1996 in Boston.
- GUEST LECTURER for ITS transportation research and technology topics. University of Minnesota Elder Hostel Program; August 1997, August 1998, and October 1998.
- ITS DEPLOYMENT PLANNING, User Satisfaction Focus - ITS America 6th Annual Meeting; April 1996 in Houston, Texas. Gloria was with me, we spent a few days on North Padre Island after the conference.
- Minnesota Intelligent Transportation Systems' Laboratory - ASCE AATT Conference at Capri Italy; June 1995: Also at ITS AMERICA 5th Annual Meeting; March 1995. Gloria was with me, we did a bit of post conference touring.
- Minnesota Intelligent Transportation System Studies - IVHS OHIO 1st Annual Meeting; September, 1994
- Common Module System Mass Memory - NAECON Conference; May, 1991
- Module Verification, Validation, and Certification - Government/ Industry Workshop, WPAFB; April, 1990
- Integrated Diagnostics for Intelligent SEM-E Modules - SHARP Conference; 5/89
- Common Modules, The Future Is Here - SHARP Conference; May, 1988
- RISC Architecture as A Multiprocessor Base - MILCOM Conference at Hilton Head; October 1987

YOUTH TIME JOBS

- University of Minnesota Centennial Hall cafeteria: food-service & cleanup 9/56=>6/57
- Lake Region Cooperative: automotive & truck service station 7/55=>9/56
- Alexandria A&W: inside food preparation & customer service 4/55=>6/55
- Alexandria High School: Audio/Visual Dept. shipping clerk 9/54=>5/56
- Bloom's Drive-In Theatre: clean windshields and trash cleanup summer of 1954
- Minneapolis Star and Tribune: newspaper delivery & sales in Alexandria 3/50=>4/55
- Uncle's MN farm: child care, livestock feeding, and field work summers of '52 and '53
- Lake Region Press: part time floor sweeping and trash removal summer of '51
- Neighbor's ND farm: field weeding and harvest grain handling summers of '47 & 48
- Not really a job but I do have some memories of helping my parents as they were migrant workers mostly up and down the West coast from 1942 to '46. I do clearly recall picking up walnuts from under trees in Oregon after Dad hit the trunk with a large rubber sledge thereby causing the ripe walnuts to fall. My oldest brother, John Morris Benson, and I toted one side

each of apple baskets as mom and dad filled them in the orchards of Washington. I also recall dragging a sack with my brother as we picked cotton bolls somewhere in the South.

EPILOGUE

In the Twin Cities, I have worked at UNIVAC/UNISYS plants 1, 2, 5, and 8. In the early '70s I worked in Hengelo, Holland and then Bad Godesberg & Wilhelmshaven, Germany. In the early '90s, I was assigned to an IBM facility in Rockville, MD as a senior system's engineer on the FAA Advanced Automation System project. Between 1981 and 1991, I averaged 21 business trips per year as a program manager and in support of marketing initiatives. Company travel took me to 81 airports in 22 states plus Belarus, Canada, Denmark, England, France, Germany, Holland, Italy, Japan, Russia, Sweden, and the former Yugoslavia. I worked on or with computer systems for many government agencies including the Army, the Navy, the Air Force, the Coast Guard, the CIA, FAA, NSA, ASA, USDOT, MnDOT, the Canadian Forces, and the German Navy.

There was just one career 'really-low' point - testifying to a grand jury for 2.5 days during the government's 'Ill Wind' investigation of Sperry-Univac. Even getting laid off by UNISYS in 1994 wasn't that stressful.

My work with Dr. Charles Knox building microscope digitizers and demonstrating at several national neuroscience conferences was quite mentally rewarding as it provided opportunity to learn about yet another technology area! CK has also been a 46+ year, neighbor and close friend.

My 7 years of direct employment with the University in the transportation research industry was quite interesting. At the U of MN [as a student and 1994-2001 employee], I worked on or with the CDC 1604; a Bi-Tran 6; and the SGI, HP, & Sun servers. At home, I've had Sperry, Compaq, and Dell PCs as well as my most recent HP laptop. Computers as a tool have indeed transformed business offices and home communications.

Working in all of these places, with all of these organizations, and with thousands of people led me to my definition of life: **Life is our time, space continuum of human interactions!**

In 1947, a North Dakota neighbor paid me [and my brothers and sisters as tabulated at right] for grain harvest help. In 2009, MN/DOT paid me to evaluate their library book inventory and to order newer editions of already on their shelves volumes and books of new topics for roadway innovation. The Mn/DoT 1099-Misc form was my life's final earned income. Social Security, pension and savings sustain us comfortably.

Seventy-one years earning money intermixed with 55+ years of volunteering has been quite a life – a few more yet to go serving my wife, our family, the VIP Club, my church, HS classmates, etc.

Benson Flax cutters			
vis			
John G. Olsen			
Lowell	2½ days	@ \$2.00	= \$ 5.00
David	2½ "	@ \$1.00	= 2.50
Connie	"	@ .25	= .75
Beth	"	@ .25	= .75
Arne	"	@ .25	= .75
Ronald - for speaking fluent Russian like I do			<u>\$666.75</u>
			10.50

Lowell A. Benson,
BEE - U of MN, 1966