

## INTRODUCTION

Although retired, I do have time and energy available for short-term, part-time ‘paying’ projects. My problem solving skills and technologies’ application knowledge are based on formal/continuing education and over sixty years of quite varied work experiences. I value the respect and trust shown me by previous directors, supervisors, teammates, co-workers, colleagues, committee members, and customers. This trust included 36-years of government security clearances during military service and defense industry positions plus serving as treasurer for several volunteer organizations. I’m very proud and appreciative of Gloria, my wife of 49+ years, our three children and seven grandchildren.



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### PROFESSIONAL CONSULTING ACTIVITIES

**Minnesota Department of Transportation (Mn/DOT)      Consultant      3/09 to 7/09**

The Mn/DOT Transportation Research Assistance Program contracted with me to evaluate their Central Library printed resources. Then, in conjunction with the library staff, we procured over 500 replacement or new books - the new focused on innovation and risk management texts.

**DCF Manufacturing, Inc.      Web Site Design      4/07 to 7/07**

I developed a web site for a friend’s airport GSE manufacturing business.

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

I upgraded their Quality Control Manual to meet Mn/DOT bridge metal-working requirements. In conjunction with their production shop manager, we developed a dozen topical shop procedures. Mn/DOT certified their shop 3/07.

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

This project required evaluation of nine completed University of Minnesota (U of MN) Center for Transportation Studies (CTS) research projects then selective generation of closure memos or implementation plans. 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 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 Minnesota State Fairgrounds demonstration site. Two early 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 participant survey analysis.

2) Coordinate a *planner’s emeriti* tour of the Intelligent Transportation Systems (ITS) Laboratory and the HumanFIRST Laboratory at the University. This tour included giving a CTS functions overview slide presentation.

***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. A Mn/DOT volunteer took over as I phased into retirement.

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

In 1998 I did the tour site planning then led the ITS Technology Site Tour 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. A co-worker, Dennis Foderberg, coordinated the post tour report. While at the ensuing IEEE Toronto conference, I presented the U of Mn Transit-way Safety Project paper for an ailing co-author.

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 Washington D.C., then two sites in Atlanta - ending in Orlando at the ITS World Congress. Dennis again coordinated the post tour report.

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

A primary activity, from 1986 to 1994, was to build and test MD2 microscope digitizers in my basement workshop for a neighbor’s home-based business. My second responsibility was the state and federal tax reporting. My third responsibility was to support hardware and software demonstrations at several national Neuro-Science Conferences during the late 80’s and early 90’s. In 1994, Dr. Knox with a bit of my help developed the MD3, a microprocessor-based digitizer unit. Charlie took over 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.

***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 required electrical isolation of encrypted messages from the non-encrypted original text. 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.

## PROFESSIONAL EMPLOYMENT

### *Center for Transportation Studies @ the University of Minnesota – 7 ¾ years*

Technical Staff, Intelligent Transportation Systems (ITS) – March 1999 to December 2001

As a semi-retired, part time employee, I was responsible for CTS support of the ITS Minnesota board including communications committee participation. I performed the WEB Master functions for ITS Minnesota from 11/99 to 5/01 as part of CTS sponsored committee obligations. For the CTS LTAP director's visit to the former Soviet Union, I created Russian language overheads outlining our transportation training classes. As a safety outreach initiative, I conducted an evaluation of Minnesota older driver education programs in conjunction with my AARP 55-Alive volunteer teaching. In conjunction with ITS Institute's laboratories' managers we coordinated and/or conducted dozens of technology tours at the ITS and HFRL laboratories. 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 1.

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. 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]. The position required committee work: Mn/DOT Guidestar R&D Committee, ITS Minnesota Communications Committee, CTS/ORS team, University-Mn/DOT-MTEC Arterial Technology Advisory Panel, Adaptive Urban traffic Signal Control and Integration (AUSCI) board, Orion team, and a Mn/DOT 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 Transitway' Safety Program evaluation project, including several conference presentations. I created an evaluation plan for the Midtown Greenway project for Mn/DOT, the City of Minneapolis, and CTS. During this period, I conducted dozens of technology demonstrations for hundreds of ITS Laboratory visitors. 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.

### *UNISYS and Its Defense Industry Predecessors – 33 1/2 years, reverse chronological order*

Senior Staff Systems Engineer - Eagan, MN; 12/92=>3/94

#### **Intelligent Vehicle-Highway Systems (IVHS) Project;**

I led an evaluation project investigating the Intelligent Vehicle Highway Systems marketplace as a defense conversion venture for Unisys Defense System Division. This focused on an Advanced Traveler Information System demonstration for the Minnesota Guidestar's Genesis project. The demo result was a PC-to-Pagers radio communications system, showcased at the 1993 IVHS America 3<sup>rd</sup> Annual Conference. We drafted the Unisys marketplace business plan and initiated a Metro-Mobility proposal team. These IVHS projects ended when management decided to focus investments on defense associated projects.

#### **Aluminum Circuit Technology Project;**

After translating several patent documents from the Russian to English, I led a business and engineering team on a three-week technology investigation trip to Minsk and Moscow. We hosted

a subsequent Russian delegation to St. Paul for additional technology transfer discussions. Management decided that the use of this technology wouldn't significantly enhance our defense industry marketplace share.

**Air Traffic Control (ATC) Departmental support tasks;**

1. 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.
2. I led a team preparing an ATC history course for the training of new systems engineers as part of the emerging ISO 9000 processes.
3. 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.

**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. I created a system design, prepared the development cost analysis, wrote a sales plan, then presented these to the General Manager's Staff. The Staff declined to continue as it was too far from core business.

**Embedded Computer Applications;**

As a proposal team member, I created the RISC processor section of a proposal to the U.S. Navy for a display/processing unit with an open-system architecture. Company won the competition – units went into AN/UYQ-70 production for the US Navy.

**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 support staff to a 45-person team. I directed systems engineers writing computer software requirements specifications for tower control operations of the FAA's Advanced Automation System. Responsibilities included coordination of ADA programming work for system integration between Unisys, IBM, and SDC programmers. At the request of transportation systems management, I began Intelligent Vehicle-Highway Systems marketplace investigation for new business penetration while wrapping up a portion of the FAA systems design.

**Staff Consultant - Eagan, MN;**4/90=>6/91

- Represented Unisys on the Air Force's (AF) Modular Avionics System Architecture (MASA) Systems Engineering Committee.
- Led a proposal team, planned, won, then managed the \$900k Time Stress Measurement Module (TSMM) development for the Air Forces' Wright Laboratories in Dayton, OH.
- Led the proposal teams, negotiated, 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

- 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, then managed the \$487k DAMES simulation program for the AF's Advanced Tactical Fighter System Program Office via ZYCAD Corporation located in New Jersey.

- As the Unisys technical lead for government/industry avionics standards, I represented our Northrop prime, meeting with 12 of the 28 Joint Integrated Avionics Working Group (JIAWG) committees for the F-23 stealth fighter-plane systems development. Represented Unisys on the Navy's Standard Hardware and Reliability Program (SHARP) Industry Advisory Board.

Career Path Positions at UNIVAC and Sperry before the 1986 merger with Burroughs

Program Manager	03/86 to 09/87	Special Products Department – highlight was the development of a radiation hardened microprocessor chip set 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.
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 new technology problems with component manufacturing at Motorola in Phoenix suburbs.
Engineering Manager	02/80 to 06/84	Hardware Engineering Department – I managed a 25- person department for Navy standard computer continuation engineering. We conducted cache memory enhancement studies for the UYK-7 computer via a contract with the U of MN. I led the proposal and development of an AN/AYK10 design update for Harpoon missile launching from the S3A airplane. We created a semi-conductor memory system for the Canadian CP-140 aircraft’s central computer, subsequently integrated into the Lockheed S3A to S3B updates. We also transitioned the production of the AN/UYK-502 mini-computer from St. Paul to Winnipeg.
Project Engineer	06/77 to 02/80	Hardware Eng. Dept. - Avionics Department. Created an airborne version of the Navy’s standard UYK-44 shipboard computer (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 Voice Lab with Russian language support.
Engineering Supervisor	06/74 to 06/77	Hardware Eng. Dept. - Ship Systems - Highlights were development of the NATO serial interface for 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, and Memory Processor computer hardware.
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 and dozens of proposed applications in military systems. Also led the environmentally testing of the AN/UYK-23 airborne version of the AN/UYK-20 computer for a classified ASA application.

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. I was called on to do marketing support technology presentations in Italy, France, Sweden, England, Germany, Holland, Denmark, and Yugoslavia.
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 P3C central computer. Proposed, then led the design of a shipboard version for a German Navy FPB application.
Computer Operator & Programmer	09/63 to 06/66	Military Computer Center at Plant 1 in St. Paul – Operated and programmed six computer types at night while attending the University during the day - 1206, 1218, 1219, CP-667, 1004, and SS-80.
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.

### FORMAL EDUCATION

- AARP 55 ALIVE Older Driver Safety Instructor – May 2000;
- *Firststaff* Computer Learning Center – Microsoft Office products and NT Server Administration classes (1995 through 1998);
- Anoka/Hennepin Technical College – Novell NetWare Spring 1994;
- Lakewood Community College – Business Law 1991;
- Over 35 in plant technical and managerial classes (1967 through 1993);
- **University of Minnesota - Bachelor of Electrical Engineering June 1966;**
- Defense Language Institute @ Monterrey CA – Russian Certificate 1958;
- 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 CDC's AN/AJK-14; May '91
- Cited by the Air Force for outstanding performance on the MASA systems engineering committee - Oct '90. I 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 cost despite having a 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**

Many of these papers are published in the conference proceedings:

- Display Enhanced Signal Lights, 16th Annual Transportation Research Conference, April 2005 at the St. Paul, MN River Centre.
- ITS IMPROVES TRANSITWAY SAFETY, 10th Annual ITS America Conference; May 2000 in Boston. Operational results after two years ITS equipment operation.
- UNIVERSITY TRANSITWAY SAFETY PROGRAM, 68th Annual ITE Meeting; August 1998 in Toronto Canada: Also 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 3rd 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.
- Minnesota Intelligent Transportation Systems' Laboratory - ASCE AATT Conference @ Capri Italy; June 1995: Also at ITS AMERICA 5th Annual Meeting; March, 1995
- 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; October 1987

**VOLUNTEER SERVICES**

- Citizen's League for Environmental and Economic Responsibility (CLEER). Created a position paper then conducted a lakes water quality analysis, both published on web sites.
- VIP Club President 2011, Vice President 2009/10, Treasurer 2007/08, Director 2005/06. Co-chair of the Legacy Project committee since Nov. 2005. Developed a Legacy web site anthology of history items, merged with a new VIP Club site in 3/08. Have served on the Unihogs/Uniturkeys planning committee since 2001. I've coordinated the annual 'Old Timer's O'Club gathering since 2006. Helped other volunteers developing the VIP/UNISYS/LMCO 2008 Sesquicentennial displays for the Capitol Mall and State Fair venues. Also led a By-laws update committee in 2006.
- Center for Transportation Studies – I've participated in the annual research conference planning for the CTS Safety and Traffic Flow Council including chairing a session each year from 2002 through 2010.
- Lake Milona Association (lake property): Board member & area director - 5/95 thru 2010. Webmaster since 2009. Prepared a position paper relative to the deterioration of the outlet control dam in 2005 – updated in '06 & '07. Created a 'Bog Policy' for the '05 board, it was enacted and published on LMA web site 'til the IRS 501C3 status approval.

- Prince of Peace Lutheran Church member since 1968: Maintaining our church's web site since 2006, occasional usher, greeter, or lector, one year as offering deposit coordinator.
- Shoreview Community Center: Created bridge program flyer and forms, May 2002.
- AARP 55-Alive Driver Safety Program: Instructor – March 2000 thru Dec. 2002. I taught half a dozen classes per year for three years supporting both the White Bear Lake and Mahtomedi senior centers.
- Selective Service Board (standby): member 20 years, local chairperson 8 years – 1981 => 2001.
- West View Bay Association (lake property): 6 years as treasurer, 4 years as secretary, VP & President one year each – 1973 => 1986.
- Boy Scout Troop 401 committee: treasurer two years, chairman two years, and member – 1973 => 1982.

### **ORGANIZATION MEMBERSHIP PARTICIPATION**

- Center for Transportation Studies: Transportation Safety and Traffic Flow Council Friend, 1994 thru 2008 – member for 2009-12. Outreach and Education Council Friend, 2000-05.
- Minnesota Street Rod Association: member since 1996.
- American Association of Retired Persons: member since 1993.
- Institute for Transportation Engineers: member 1994 – 2005, now 'Retired.'
- University of Minnesota Alumni Association: member 1995 through 2002.
- ITS Minnesota: Board meeting host at CTS 3/95 to 5/02, Newsletter editor 1996-99, Communications Committee Chair 1997-98, Membership Committee Chair 1995-96.
- Growth Stock Investor's Club: member 1987 through 2002; secretary one year and audit team thrice. Chairman of bylaw review and re-write committee in 2002.

### **MILITARY SERVICE**

- 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 plus two summer camps at Ft. Sheridan, IL.
- U.S. Army: Linguist/Analyst @ Army Security Agency - 7/57 => 6/60. Military Occupation Specialty 982.1663 – rank SP5. All work classified. Service sites were Fort Carson, CO; Fort Devens, MA; Presidio of Monterrey, CA; Heilbronn, Germany; and Rothwesten, Germany. I earned expert rifleman and good conduct medals.
- Minnesota National Guard: 47th Division in Minneapolis – 9/56 => 6/57. Was trained for 155mm howitzer fire direction artillery control and truck driving. Service sites were at the Minneapolis Armory; Camp Ripley, MN; and Camp McCoy, WI.

### **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 Tribune and Minneapolis Star: newspaper delivery & sales 3/50=>4/55
- Uncle's MN farm: child care, livestock feeding, and some field work – summer '52 and '53
- Neighbor's ND farm: field weeding and harvest grain handling – summers of '47 and '48