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SUMMARY

Experienced mechanical engineer with over 20 years experience in mechanical design and theoretical and experimental analysis. Special strengths in project management, team leadership, product design, design for assembly and manufacturability, concurrent engineering and numerical analysis. Additional strengths in tool design, the application of the finite element method, PC-based software and website design. An effective team leader with excellent engineering and mathematical skills who sets and meets aggressive project schedules.

PROFESSIONAL EXPERIENCE

Rochester Area Consulting Engineers (Rochester, MN)

1994-Present

Founder. Created a small business to respond to projects too small for larger companies like PEMSTAR (now Benchmark Electronics).

- Provided an EMI & ESD expert to HTI in 1995 to educate them in the subtleties of flex cable/suspension electromagnetic performance.
- Directed a project in 1999 to refine a design and estimate costs for an automated horizontal door (e.g. for barns and large sheds) opener/closer system.
- Directed a project in 2002 for the Mayo Clinic to design and prototype a miniaturized epinephrine delivery system (similar to the Epi-Pen™) so that everyone who needs protection against anaphylactic shock would be able to have this personal injector available to use at all times.
- Directed a project in 2003 for Mendota Healthcare to develop a mechanical prototype concept for a new prescription package buffering system, as well as to provide industrial designs of that system for use in marketing.
- Directed a project for the Mayo Clinic in 2004-2007 to design and build a very special custom cart to be used in internal Mayo Clinic technical innovation meetings (see the main page of my [website](#) for an article on this project).
- In 2006, redesigned an innovative toy for a Winona small business to make the product manufacturable, reliable and low cost.
- Provided design support to Innovative Animal Products on various implantable devices from 2004 to present.
- In 2006-2007 consulted with Rochester Medical Products on an automated manufacturing system to remove male external

catheters from high density dipping fixtures and package them for distribution.

- Provided ongoing system design support to Stellar Products for investigations of possible products including a data logging personal scale for monitoring patient fluid retention to control heart failure, high speed moving walkways and a theft prevention cigarette distribution system for convenience stores.
- Consulted with PRT International on their personal rapid transit system.

PEMSTAR Inc. (Rochester, MN)

1994-2003

2002-2003 Manufacturing Engineer. Responsible for hermetic sealing and testing of fiber optic components as well as supporting other manual assembly processes. (This position change was made necessary by a prolonged economic downturn in contract manufacturing and particularly at PEMSTAR).

2000-2002

Research Engineer. Responsible for monitoring developments in Micro-Electrical/Mechanical Systems (MEMS) and advising PEMSTAR management on future applications and technology needs. Also, worked at obtaining and preparing software tools to be used in the mechanical design of fiber-optic systems, as well as preparing and delivering internal classes in mechanical design for these applications. Also acted as internal consultant on challenging engineering tasks.

1994-2000

Program Manager. Directed a very large development effort aimed at commercializing a needle-proof fabric for medical applications. Directed another very large effort aimed at developing a secure and consumer-friendly vending system for dispensing medical prescriptions. Directed a variety of other projects developing medical, automotive and consumer electro-mechanical devices.

Project Engineer. Designed an insert-molded flexure assembly and oversaw the manufacturing of the assembly for a Tandberg Data tape drive. Consultant on disk drive automation tooling and processes, experimental modal analysis and finite element analysis. Designed a carrier clip for handling/transfer/alignment of disk drive actuator assemblies for IBM. Designed the last generation of IBM molded head/suspension assembly for their high capacity MR slider-based hard drives.

Rochester Community College (Rochester, MN)

1994-1997

Instructor in Engineering Technology teaching Strength of Materials, Fluid Mechanics and Statics.

IBM Corporation (Rochester, MN)

1979-1994

1993-1994

Advisory Engineer. Member of the Advanced Magnetics Research Laboratory in Rochester working on future hard disk drive storage

technology, particularly actuators and head/suspension assemblies (HSAs).

1991-1994 Member of Storage Systems Invention Review Board.

1981-1993 Hard disk drive HSA product development.
Advisory Engineer. HSA development team leader on **STARFIRE** file (1993-1994), **SPITFIRE** file (1992-1993), **CORSAIR** file (1989-1992), **LIGHTNING & REDWING** files (1987-1989).
Staff Engineer. HSA development team leader on **LEE** file (1984-1987), **GRANT PRIME** file (1983-1984). **Staff Engineer.** Various HSA development activities including finite element analysis & design (1981-1983).

1979-1981 Floppy disk drive head/suspension analysis & testing. **Staff Engineer.** Experimental work & numerical analysis and simulation using NASTRAN for modal analysis and APL for system simulation.

Exxon Corporation (Florham Park, NJ) **1971-1979**

1976-1979 Solar Thermal Systems Division of Exxon Enterprises Inc.
Staff Engineer. Active solar thermal system numerical analysis.
Systems Analysis Group Leader (first line management position).

1975-1976 Math, Computers & Systems Division of Exxon Corp.
Senior Analyst. Developed numerical analysis system for the optimization of gas centrifuge-based uranium refinement for Exxon Nuclear.

1971-1975 **Analyst.** Engineering analysis software development for refineries including piping network stress and deflection analysis, pressure vessel stress and deflection analysis, safety valve network pressure and flow rate analysis, marine loading arm stress analysis (geometry processing, pre and post processing for the ICES STRUDL FEM package).

MTS Systems (Eden Prairie, MN) **Summer, 1969**

1969 Worked on a Ford Motor Company random fatigue experimental research project and consulted on other short test jobs.

University of Minnesota (Minneapolis, MN) **1963-1971**

1963-1971 Taught a variety of classes (as teaching assistant, then as instructor) as well as did some contract experimentation.

EDUCATION

Continuing Education through participation in company-sponsored courses while at PEMSTAR, IBM and Exxon.

PhD Work. Major - Engineering Mechanics, Minors - Fluid Mechanics & Mathematics. Preliminary written and oral exams passed in 1967 and 1968 respectively. All required credit work completed in 1969.

Master of Science. University of Minnesota, June, 1967. Major - Engineering Mechanics, Minors - Fluid Mechanics and Mathematics.

Bachelor of Science. University of Minnesota, June, 1965, with distinction. Major - Engineering Mechanic, Minors - Fluid Mechanics and Mathematics.

PAPERS/PRESENTATION

Paper on the "**Impact Of Shading On The Performance Of Domestic Hot Water Solar Systems**" presented at the San Diego SERI (federal Solar Energy Research Institute) Convention in 1978.

Paper on "**Contract Manufacturing And MEMS Product Commercialization**" presented at the SMTA Conference in September, 2000.

HONORS

IBM Corporate Technical Achievement Award in 1993 for CORSAIR HSA development.

IBM Outstanding Innovation Awards in 1991 and 1992 for CORSAIR HSA development.

IBM Outstanding Innovation Awards in 1987 for LEE HSA development.

Tau Beta Pi (honorary engineering society) 1964, treasurer 1965.

Four **IBM Invention Achievement Plateau Awards** in 1990, 1991, 1993 and 1995.

REFERENCES

Available on request.

COMPUTER LITERACY

- Very familiar with the finite element method, having used ICES STRUDL, NASTRAN, ALGOR and CosmosExpress. I use the latter two programs currently.
- Very familiar with various 2D design systems including CADAM, ProCADAM and CADRA. I now use the 3D design system, SolidWorks, for all mechanical design work.
- Very experienced with BASIC, FORTRAN and APL, and some experience with SAS. I also use True Basic which is a quite powerful and convenient PC-based analysis system.
- Very experienced with Lotus Smartsuite applications including Lotus 1-2-3, Word Pro and Freelance Graphics as well as with the similar Microsoft applications: Excel, Word and PowerPoint. Have used Lotus 1-2-3 and MS Excel to do quick analysis and system models. Also experienced with various email systems including Lotus Notes, Outlook and Outlook Express, and project scheduling programs MS Project, Scitor's Project Scheduler and TurboProject which is what I currently use.
- Very experienced with MS FrontPage in creating websites.
- Very experienced with MS Publisher. I use this to do a monthly newsletter for SME which is delivered via email as a PDF file.

COMMUNITY INVOLVEMENT

- Scribe and webmaster for the Knights of Columbus (4th Degree) Assembly 548 of SE Minnesota. 2004-present. Member of KCs since 1991. Newsletter publisher for KC (3rd Degree) Chapter 1013 1995-2003.
- Secretary and webmaster for the Society of Manufacturing Engineers Chapter 162 of SE Minnesota. Member of SME since 1993.
- Member of Dollars and Sense Investment Club since 2000. Treasurer since 2004.

- Member of St. Francis Catholic Church since 1988. Member of church choir since 2005.

INVENTION HISTORY

See separate document.