



**Human  
Factors  
and  
Ergonomics  
Society**

## FELLOW PROFILE

**Name:** Harry L. Wolbers

**Degrees,  
certifications, etc.:** BS Electrical  
Engineering 1946,  
Calif. Institute of  
Technology

MA Industrial  
Psychology 1949,  
University of Southern  
California

PhD Psychology 1955,  
University of Southern  
California

**Current status:** Retired

### **Biography (How I got involved in the field, major career activities and milestones):**

During and post World War II, I served on active duty in the U.S. Navy (1943-1947). I had enlisted as an apprentice seaman in 1943 and left active duty in 1947 as a Navy Lieutenant (j.g). During this time I served aboard three different Navy minesweepers (USS Seer AM 112, USS Crag AM 214, and YMS 325) and one Light Cruiser (USS Columbia CL56). On the Cruiser my duty station was in "Main Plot" which was the Combat Information Center (CIC) for the ship. The CIC contained surface and air radar displays, plotting boards, and computers all manned by enlisted and officer personnel. All personnel wore sound-powered phone headsets connected by telephone lines. During critical operations, as you might imagine, the area could give the appearance of "controlled chaos". It was at this time that personnel from the Navy's Bureau of Ships, together with support from contractor personnel, were examining ship borne CIC installations with the goal of improving their operational efficiency. I became interested in these study efforts and began to see how the optimal physical relationship between men and machines could play a critical role in the performance effectiveness of complex man/machine systems. I began to realize that the human element was the key ingredient in system design. Everything is done by, for, or against other humans.

When my tour of active duty in the Navy was over I wanted to return to a University to learn more about the sensory, perceptual, cognitive, and psychomotor capabilities of people. I believed that as a prospective design engineer I needed to know more about the capabilities and limitations of the human element in any system design. At that time there

were no formal academic programs in human factors engineering and it seemed to me that my best bet would be to find a psychology department with faculty that had been involved in real world operational problems. I found such an academic setting at the University of Southern California. Five of the faculty members of the post war Psychology Department had served in the U.S. Army Air Force's Aviation Psychology Program during World War II. (J.P. Guilford, Milton Metfessel, William Grings, Wayne Zimmerman, and Neil Warren, the Department Head). In addition there was a strong Industrial Psychology program under Floyd Ruch and Clark Wilson (a former wartime Navy Lt. Cmdr. in the Submarine Force).

I applied to, and was accepted by, the Psychology Department at USC. In Graduate School my major was Industrial Psychology with a minor in the School of Architecture's Department of Industrial Design. During my years as a graduate student at USC I had the opportunity to work on many research projects for the U.S. Air Force and the Navy's Office of Naval Research under the direction of professors Floyd Ruch, J.P. Guilford, Neil Warren, William Grings, and Clark Wilson.

### **Employment History and Contributions to the field**

In 1954 I was asked by the Department of Industrial Engineering in USC's School of Engineering to develop and teach a graduate course dealing with the human factors in system design. Over time that first course expanded into several courses dealing with principles of human factors engineering, research methodology, and the design and conduct of human factors studies. The Department name also was changed to the "Department of Industrial and Systems Engineering". For the next 31 years I continued to teach part time in this Department as an Adjunct Professor.

Also in 1954, the Douglas Aircraft Company became the Prime Contractor for the Navy's Office of Naval Research "Integrated Instrument Development Program" which had the objective of developing a true all weather flight instrument capability for Navy Aircraft. When the Army joined in the financial support of the program it became known as the Army Navy Instrumentation Program (ANIP). I was recruited by Douglas in 1954 as an "Engineering Psychologist" to work on this program. I ended staying with Douglas, and then McDonnell Douglas, for the next 37 years, until I retired in 1991.

As a side note, in the post World War II period the human factors community nationally was quite small with people concentrated on the East Coast and around the aircraft community in Southern California. The number of people in the field was small enough that we pretty much knew everyone whether East Coast or West Coast. In the Los Angeles area we had a small group which got together frequently to talk shop. It was called the Aero-medical Engineering Association. A similar group formed in the San Diego area centered around the Naval Electronics Laboratory and the aircraft companies in that area. On the East Coast other small groups of people with similar interests were forming. On a national level, one of the main symposia for these various groups to get together was the annual Human Engineering Conference which was sponsored by the Navy's Office of Naval Research. Max Lund was the key player at ONR in organizing these meetings and was also personally involved in discussions with various individuals about the potential value of establishing a formal organization to bring people together from various disciplines involved in the design of man/machine systems and to provide a forum for information exchange. At ONR Max Lund was also a key player in the ONR sponsored ANIP effort. The Douglas Aircraft Company agreed to host the annual ONR Human Engineering Conference, scheduled for

September 1957, because it was to include discussions of the Army Navy Instrumentation Program (ANIP). The company's Tulsa Division was assigned the task to organize the meeting because the location would provide a central and more convenient location meeting point for East Coast, West Coast, and mid-country participants. Arrangements were made to hold the meeting at the Mayo Hotel in Tulsa, Oklahoma, on Thursday and Friday, September 26 and 27, 1957.

The serendipity provided by the attendees coming to the ONR Human Engineering Conference in a geographically central location, combined with the emerging movement toward forming a Human Factors Society of America, provided an ideal opportunity to call for, and schedule, a Constitutional Convention in conjunction with the ONR Human Engineering Conference. Accordingly, the First National Meeting and Constitutional Convention of the Human Factors Society of America was scheduled for the 25th of September, the day before the ONR Human Engineering Conference was to convene at the Mayo Hotel in Tulsa. I am proud that I was one of the attendees at this historic meeting. The rest is history.

My career at Douglas and later at McDonnell Douglas has been a fascinating journey. I was privileged over the years to always work on interesting studies, projects, and programs.

By 1963 I had become the Chief of Systems Research at the Douglas Aircraft Company's El Segundo Division. In this position I directed research in aircraft cockpit display design and advanced man-machine systems. Personnel under my immediate supervision included specialists in human factors, basic sciences, materials, micro circuitry and flight safety. The early 1960's were also a time of growing interest in manned space missions. Mercury, Gemini, Apollo, the Lunar Excursion Module (LEM), and the Douglas Skylab (the country's first space station) were all real hardware programs. In 1963 the Douglas Aircraft Company's Missiles and Space Systems division formed a new Manned Systems Directorate to focus specifically on future manned space missions. Selected personnel from the aircraft and missiles areas were assigned to this new Directorate. As a part of this new organization I was appointed Chief of Biotechnology and Experiment Integration focusing specifically on the Manned Orbital Research Laboratory (MORL), a NASA program to design the next generation Space Station beyond the Skylab. My team was responsible for determining crew activities, evaluating and integrating engineering and scientific experiments, optimizing man-machine interfaces, and defining research programs to be conducted on the MORL.

From 1963 until I retired from McDonnell Douglas in 1991 my activities centered on space programs and missions. From 1965 to 1974 I was the Chief Program Engineer for Space Systems. In 1974 I became the Chief Systems Engineer for Advanced Space Systems. From 1985 until I retired in 1991 I was the McDonnell Douglas Deputy Director for Flight Crew Systems on the Phase A and Phase B studies for today's International Space Station (ISS). It is amazing to see how closely the completed ISS now in orbit resembles those early designs we worked on in 1985.

During my last 28 years with Douglas and McDonnell Douglas I was involved in many different areas of research and development related to future space missions including such areas as biotechnology, orbital astronomy, oceanography, meteorology, materials research, communication systems and developing guidelines for the human role in future space missions. It has been a fascinating journey and the many interesting and dedicated people I have been associated with has made it a wonderful experience.

**Did you receive any notable awards or recognition during your career?**

During my working years I was honored to serve as a consultant to various government agencies and on advisory panels for the National Aeronautics and Space Administration. I was a member of the Aerospace Research and Technology Subcommittee of the NASA Advisory Council (NAC), and I served on the National Research Council's Commission on Behavioral and Social Sciences.

After I retired from McDonnell Douglas in 1991 I was appointed to serve a four year term with the U.S. Air Force's Scientific Advisory Board. This involved the semi annual review of Air Force Research and Development Programs and the participation in various special studies as requested by the Secretary of the Air Force. At the conclusion of my term of service I was awarded the Meritorious Civilian Service Medal by the U.S. Air Force.

**What advice would you give someone considering HF/E as a profession?**

For those people who may be considering the HF/E as a profession, I say to them that I can't imagine any more interesting, challenging, and rewarding career. Every aspect of our lives involves human/system interfaces in one form or another. Whether dealing with medical surgical procedures, highway traffic management, transportation systems, information handling and processing, law enforcement, military operations, fast food preparation, manufacturing and servicing, affordable housing, etc., the human is involved. Key to success in this field is to have a good basic knowledge regarding the capabilities and limitations of the human. Secondly, it is necessary to have an operational understanding of the requirements and technological state of the art in the specific area of application which is of interest to you. In many cases this may require a formal or continuing education on your part in related technical, engineering, or scientific areas. In the end you will have had an exciting career and many worthwhile opportunities to make your piece of our world a better place.