

alumni profile

Dr. James Barger

Dr. James Barger (M.S. Mechanical Engineering '60) is a scientist and engineer whose illustrious career path has been, from the beginning, both multifarious and on the technological cutting edge.

As a child growing up in Ames, Iowa, Dr. Barger recalls, he had a young friend whose father was famed computer innovator John Atanasoff. The friendship proved fruitful: at the ripe age of seven, Dr. Barger was privileged to begin his computer education by programming the Atanasoff-Benson Computer (ABC) which was the first electronic digital computer. He went on to earn a B.S. in mechanical engineering at the University of Michigan. During a three-year tour of duty in the Navy, while working on sonar systems at the Naval Research Center in New London, Dr. Barger earned his master's degree from the University of Connecticut. Dr. Barger found the experience very useful, he recalls, and particularly relevant to the engineering challenges he faced while working in the Navy Underwater Sound Laboratory. After graduating from UConn, he proceeded to Harvard, where he earned his M.A. and Ph.D. degrees in applied physics.

After seven years of advanced-level education, Dr. Barger was convinced that he wanted to avoid compartmentalization in his career, so he went to work at BBN Technologies, then a 50 (now 5,000) employee multidisciplinary R&D consulting firm and famed "think tank" located in Cambridge, MA. Founded in 1948 by faculty from MIT, BBN is now owned by Verizon but continues to operate semi-autonomously. Initially starting as a senior scientist, Dr. Barger later directed the Physical Science Division and today is a semi-retired chief scientist at BBN specializing in acoustical science. His areas of expertise include sonar, underwater noise detection and reduction, broadband medical ultrasound, sensors for geophysical seismic exploration, and noise and vibration cancellation.

During his career with BBN, Dr. Barger contributed to making BBN renowned for pioneering some of the world's most sophisticated acoustical and telecommunications technologies. The company's customer list comprises the top federal and corporate customers in the nation, including the Defense Advanced Research Projects Agency, Defense Logistics Agency, Joint Chiefs of Staff, all branches of the military, and the top defense contractors. Among the company's milestones while performing contract problem resolution for their varied clients are: having laid the foundation (packet-switching technology) for the ARPANET, the forerunner of today's Internet; development of the first natural language database, LUNAR; creation of the communications infrastructure for major commercial customer networks, including MasterCard and MCI; and development of the first network e-mail, thereby positioning the @ icon as an integral element in the digital age.

Dr. Barger himself has been instrumental in developing some of the company's key innovations. For example, he designed prototypes of the explosive line arrays used by the Navy's new Distant Thunder Sonar System; designed and tested the patented, BBN-made system used by all tension leg platforms (e.g., offshore oil rigs) in the Gulf of Mexico to maintain continuous monitoring of tension and bending movement in each mooring tendon; and analyzed and designed sound sources for geophysical seismic exploration. As a research collaborator, he designed the company's patented counter sniper system, a reconfigurable network of robust field microphones that can be quickly installed (on infantry helmets, for example) to locate a sniper and determine the weapon caliber and vector. Currently, he leads a study of cueing satellites with information from ground sensor networks.

Dr. Barger's distinguished career as an acoustics expert has included several highly controversial episodes in which he was called upon to serve as an expert witness in high profile criminal cases. He delivered expert testimony to Congress, for example,

on the John F. Kennedy assassination, the infamous Kent State University shootings, and the Nixon-Watergate tapes. The most rewarding times during his 37-year career, says Dr. Barger, were his assignments at sea testing various sonar apparatus, including damping systems to reduce submarine noise. The affinity he developed at an early age for undersea ventures has remained with him throughout his life.

What advice does this alumnus offer engineers embarking on their careers today? "First, remember to ask your colleagues how they would solve the problems you are thinking about," he comments. "They usually know things that you do not, and their answers will accelerate your education. Second, look for innovative solutions to important problems and promote them with confidence when you find them... the better solutions to most problems remain undiscovered because of orthodoxy in the relevant technical communities. These are dedicated communities that don't respond well to the timid." Dr. Barger is living proof that those who cast their own shadows in the engineering world can flourish while breaking down conventions.

