

## **IN MEMORIAM HARRY PETERS**

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Many people in this community knew Harry Peters or have been associated with the hydrogen masers he designed and created in one way or another. Harry passed away this past May.

Harry grew up in Minnesota and graduated from high school in 1941. He then joined the Navy, and received an Honorable Discharge in 1953 with last rating as a Chief Petty Officer. He graduated *magna cum laude* from the University of Washington with a B.S. in Engineering Physics. After working 3 years at the Applied Physics Lab of Johns Hopkins, he accepted a position with Bomack, later Varian, in Beverly, Massachusetts. While there, he participated in the design, construction, and operation of the first field-operable hydrogen masers with Bob Vessot and with the consultation of Norman Ramsey and Dan Kleppner. From 1965 to 1975, he was responsible for the hydrogen maser research and development at NASA/Goddard Space Flight Center for the VLBI network. The first masers Harry developed at Goddard were the NR-1 and the NR-2 (NASA Research) masers.

In 1977, with wife Aileen Peters, he incorporated Sigma Tau Standards Corporation, where he undertook research to develop a small hydrogen maser for the Air Force. This research led to the development of the cavity-frequency switching method of cavity tuning that did not require an external frequency reference: an auto-tuning maser. Also developed at Sigma Tau was an improved focusing magnet and beam trajectory design that reduced hydrogen consumption by more than an order of magnitude. In 1985, the first three Sigma Tau prototype masers that implemented these new designs were delivered. These designs evolved into the first field operational devices commercially available to government organizations and research laboratories. He had successfully transformed a complex laboratory instrument that needed care and feeding from highly trained experts into a commercially available production item. In 1997, he sold Sigma Tau to Datum, which is now Symmetricom, and then retired. At that time, Sigma Tau had delivered about 40 masers worldwide and almost all the masers built to date are still operating.

Harry was recognized by the timing community for his outstanding work.

- 1971 John C. Lindsey Memorial Award from NASA for individual contribution to the advancement of hydrogen maser frequency standards
- 1984 Instrumentation and Measurement Society Award for contributions in the advanced design and development of hydrogen maser frequency standards for precise earth physical measurements
- 1997 IEEE International Frequency Control Symposium Rabi Award for development and manufacture of the hydrogen maser for precise timekeeping applications
- 2002 Distinguished PTTI Service Award for the contribution that his work on hydrogen masers made to the precise timing field.

His enthusiasm would show when giving tours of the maser manufacturing facility. It didn't matter if you were a Nobel-Prize-winning scientist or someone visiting to bid on garbage collection, you got the same

tour and explanations on how cavity tuning works in an atomic frequency standard. Many visitors left the facility with a blank expression on their face from information overload.

Harry was extremely passionate about his work with hydrogen masers. Even though he primarily concentrated his efforts on one device, he had a remarkable expertise in the many disciplines that were necessary to design and construct a highly complex atomic frequency standard. These included, but were not limited to, engineering, physics, mathematics, chemistry, welding, materials, machining, electronics, and drafting.

Our timing community has lost a great colleague, innovator, and designer.

