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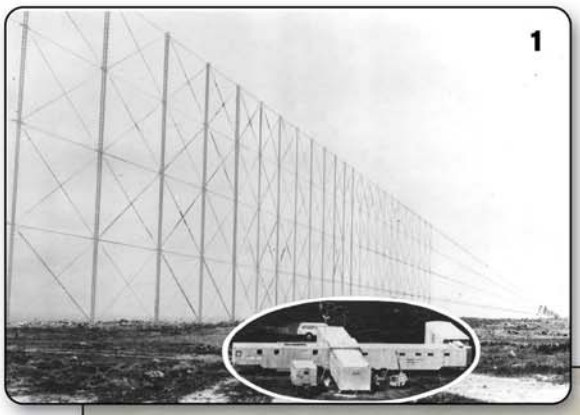
A LOOK BACK IN TIME... THE BIRTH OF CODAR AT NOAA

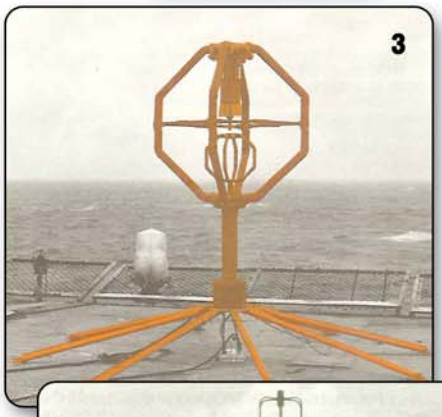
The first HF radar to demonstrate and validate current and wave measurement capability was built between 1969-1973 in a program led by DARPA and NOAA, in cooperation with Scripps Institution of Oceanography and Stanford University. Designed by Donald Barrick at NOAA Environmental Research Laboratories (ERL), the radar with its conventional 500-meter long phased-array antenna was bulky and inconvenient for deployment, but proved the point that HF radar is a viable tool for measurement of ocean current and wave parameters.

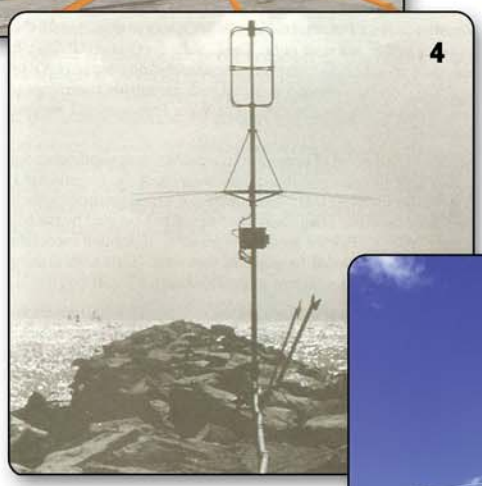


After the initial success, NOAA's ERL commissioned Dr. Barrick in 1972 to develop a practical replacement for the large and expensive phased array antenna design. The technology resulting from this NOAA program was called CODAR, an acronym standing for -
Coastal **O**cean **D**ynamics **A**pplications **R**adar.

In 1977 the prestigious journal Science published an article on the demonstrated CODAR success. Shortly after, in 1978 the NOAA team that developed CODAR was awarded the U.S. Department of Commerce Gold Medal Award. Various patents relating to the technology were granted within the NOAA group starting in 1979.

In the early 1980s, the core team that invented the original CODAR was encouraged by NOAA to move into private industry, to continue the technology evolution and provide a commercial source for institutions to acquire HF radar equipment. That company became CODAR Ocean Sensors, Ltd. The technology has evolved from original CODAR radar and is now the SeaSonde®. It remains the only commercially available HF radar system that is based on the groundbreaking compact HF radar concept developed and patented inside NOAA, while all other HF radars still utilize the phased array approach that was abandoned back in the 1970s. As of 2010, the SeaSonde represents over 85% of all HF radars ever built and used for ocean current and wave measurements, with systems used in 22 countries.





Photos illustrate the current mapping HF radar antenna evolution. Starting with image #1: 500-m long phased array radar at San Clemente Island, circa 1972. Smaller inset image shows the trailers used to house the radar electronics and computer system. Image #2: the first NOAA-built CODAR antenna system consisting of a square monopole receive array with direction-finding closed-form solutions for bearing. Smaller inset image shows the electronics and DEC PDP-11/23 computer and tape drives used for near-real-time processing and archival. Image #3: The first crossed-loop CODAR antenna, built of copper. Image #4: a later version of crossed-loop CODAR antenna, built of PVC. Image #5: Successor to CODAR, the SeaSonde. Image #6: Latest SeaSonde antenna system with all transmit and receive elements colocated atop a single mast. The unit shown is located on Scripps Pier in La Jolla, California. Image #7 shows latest SeaSonde electronics system, consisting of a small but powerful mini-processor and two 19" electronics chassis.

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