OTHER STUFF

Newsletter article by Harvey Taipale in September 2023:

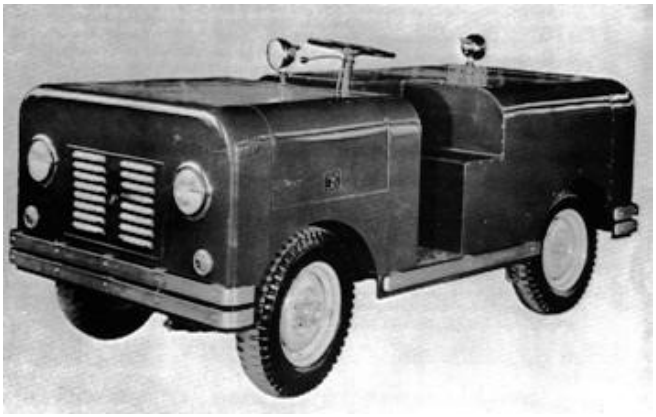
The other side of our legacy

Many people have heard of the early computers built by our founding company, Engineering Research Associates (ERA), but some of ERA's side activities are also a bit interesting and perhaps entertaining. As a start-up in the late 40s, ERA was cash strapped and tried many things to raise money.

Pages 4-5 of https://vipclubmn.org/Newsletters/Enews2309.pdf provided Harvey's initial article on this topic. Lowell has merged other info and links herein to supplement the topics.

AIRPORT SERVICE VEHICLES

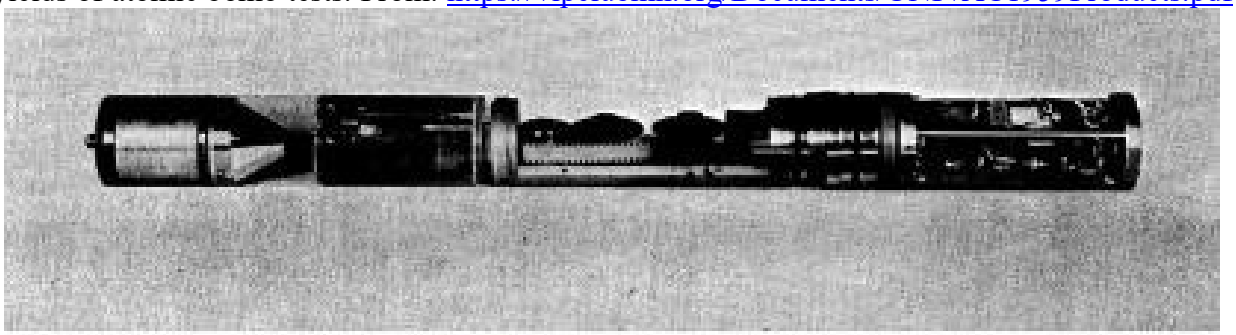
The Airport Service Vehicle ERA's founder, John Parker, was involved with the early aviation industry, and ERA developed a low profile (to fit under an aircraft wing) vehicle built on a Crosley car chassis. One version delivered fuel to airplanes, shown at the right. Another (sometimes casually referred to as "honey wagons") was used to drain the lavatory holding tanks. ERA also developed skis for moving aircraft over ice and snow, and oddly, folding skis for humans.



This was part of the work that Parker brought to the plant because of his previous affiliation with Northwest Airlines. [lab]

BORE-SITE CAMERAS

ERA was involved with instrumenting atomic tests, thus developed a bore-site camera for inspecting drill holes and a number of sensors to measure explosion effects. Charles Babbage Institute has a 1950's era film where hundreds of tons of high explosives were ignited, with ERA measuring blast effects remotely. This was a massive experiment to find ways to calibrate the yields of atomic bomb tests. From: https://vipclubmn.org/Documents/UNIVAC1959Products.pdf



Bore-Hole Camera

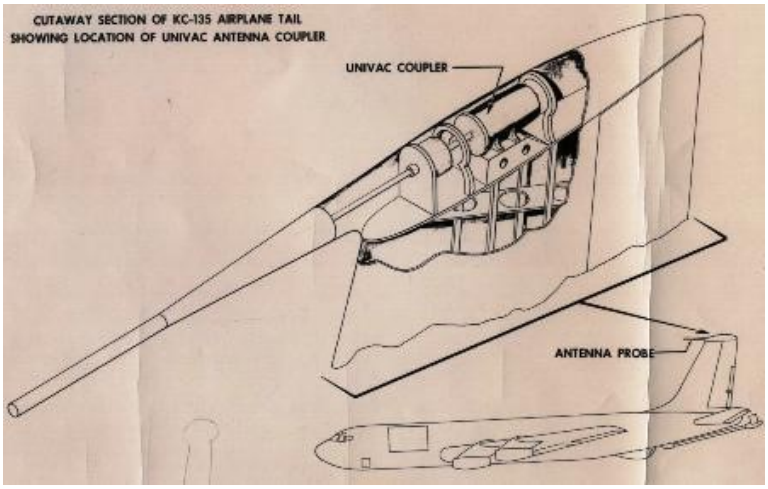
The camera provides an improved exploration technique for appraisal of characteristics of bedrock, interior concrete, and well or drained casings. It makes possible detailed inspections of interior surfaces. Lowered into a three-inch borehole, the camera provides a photographic record of the entire bore-hole sidewall surface.

Developed under the supervision of the U.S. Corps of Engineers by the Engineering Research Associates, Inc., the Borehole camera produces a continuous 360-degree photograph of the side wall of a three-inch diameter bore hole, on either black and white or colored 16-millimeter moving picture films. The camera unit is encased in a tubular, stainless steel housing 2 3/4 inches in diameter and 31 3/8 inches long.

The Bore-Hole Camera equipment consists of five major elements:

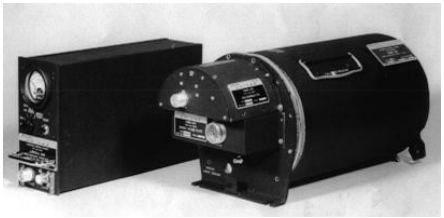
1. Photographic unit - A 16-millimeter camera with a film drive, conical mirror, flash tube, and compass.
2. Dummy camera - A casing, similar to that which houses the photographic unit and which is used for preliminary exploration of the borehole.
3. Cable unit - A manually operated table reel used to lower and raise the photographic unit into the borehole.
4. Power Supply - An electronic chassis used to supply necessary direct current operating voltages for the photographic unit.
5. The electrical power required to operate the camera is the conventional 115 volts a-c. For remote location operation, power may be derived from a standard, gasoline driven motor generator set.

ANTENNA COUPLER



One of the most successful side products was the Automatic Antenna Coupler (AAC). AAC production provided cash flow to keep the ERA/UNIVAC plants open in the '50s and early '60s. Early aircraft radios had to be electrically re-tuned to match the antenna impedance whenever the frequency was changed, a manual job for the radio operator. Couplers were needed for long range over the ocean communications.

The Antenna Coupler system did it automatically, reliably, and in the rugged aircraft environment. As illustrated above for the KC-135, tail tops or wing tip installations were common. Pictured at the right is the 707 control/discriminator box and coupler.



The Antenna Coupler was a standard in the aircraft industry for years (virtually every early Boeing jet used them), and ERA sold thousands of them, providing a critical revenue stream for a fledgling company. The product line and engineering support was transferred to Sperry Marine in the late 60s. Hank Bruns was the last St. Paul support engineer.

The Antenna Coupler Program

Contributed by Marc Shoquist, Project Engineer on Antenna Coupler Development - 1951 U of MN graduate, Electrical Engineering. Joined ERA in 1953 [34 years with ERA/Sperry].

Please link to https://vipclubmn.org/couplers.html#Program

Business Aspects

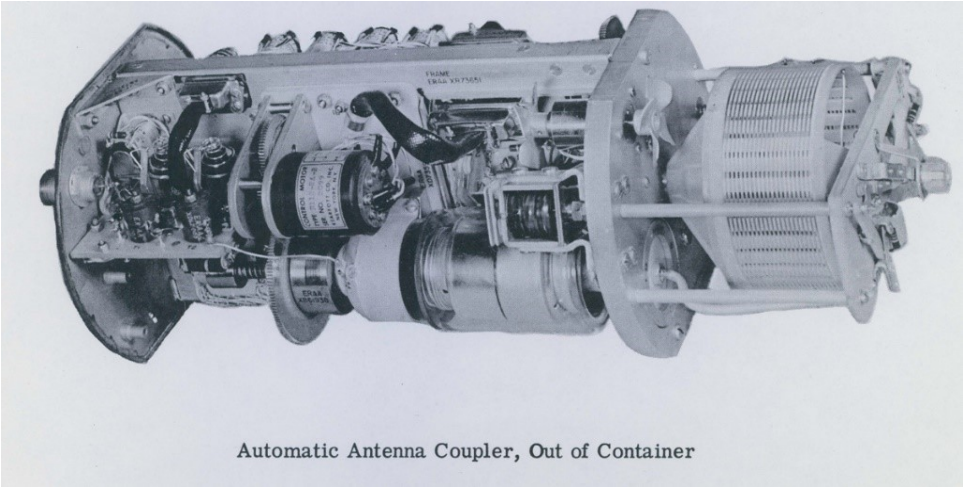
Fiscal year 1957 [April 1, 56 - March 31, 1957] was one of UNIVAC's most profitable years. This was the year that the new plant was opened on West 7th Street, and Wm. Norris would say it wouldn't have been built but for the antenna coupler's profits. Details from Marc Shoquist are part of our Coupler Engineering chapter, https://vipclubmn.org/couplers.html#Business.

Description from PX1947

The Antenna Coupler is essentially an automatic tuning network with variable capacitance and variable inductance. The tuning elements are driven by servomotors which are controlled by phase and resistance discriminators. Several models of the AAC have been produced to match automatically the impedances of aircraft radio antennas and their transmission lines. Basically, each coupler consists of two functional units, a control unit and a tuning unit. When there is an impedance mismatch between an antenna and its connecting radio frequence (r-f) line, the standing voltage standing wave ratio (VSWR) on the r-f line is increased; a loss of power results, and the increased voltage stress may break down the line. The problem of continually matching hanging impedances is solved automatically by an AAC inserted in the line between antenna and transmitter.

In some models both units are contained in a single case while other models consist of two separate cases. Later models include a self-testing unit for preflight checking of the equipment as an integral part of the Antenna Coupler package.

In January 2026 a hobbyist contacted the club with the color photos (next page) of his coupler, seeking design drawings. The top center of his photo has the same part number as our 1959 'Out of Container' picture in the PX-1947 document. The bottom center has the glass enclosed copper variable capacitor of both – the ERA part numbers thereon are different. His has a hand marking of 10-350 picofarads. Lowell's recollection from the early 60s is that the other is likely 10-750 picofarads.



Automatic Antenna Coupler, Out of Container

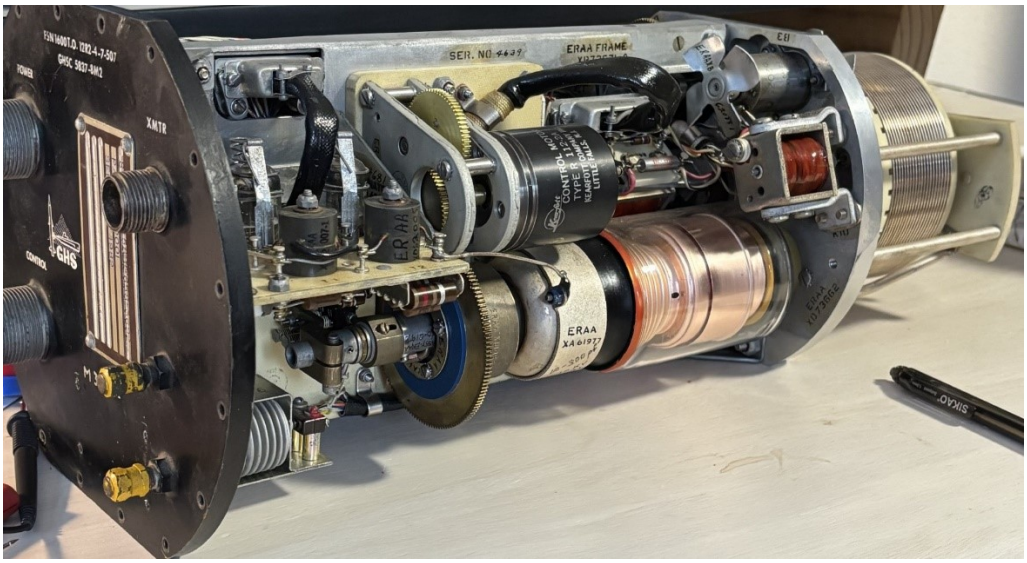


Figure 1. Coupler photo from hobbyist, January 2026. Note the glass sealed variable capacitor, ERA P/N XA.

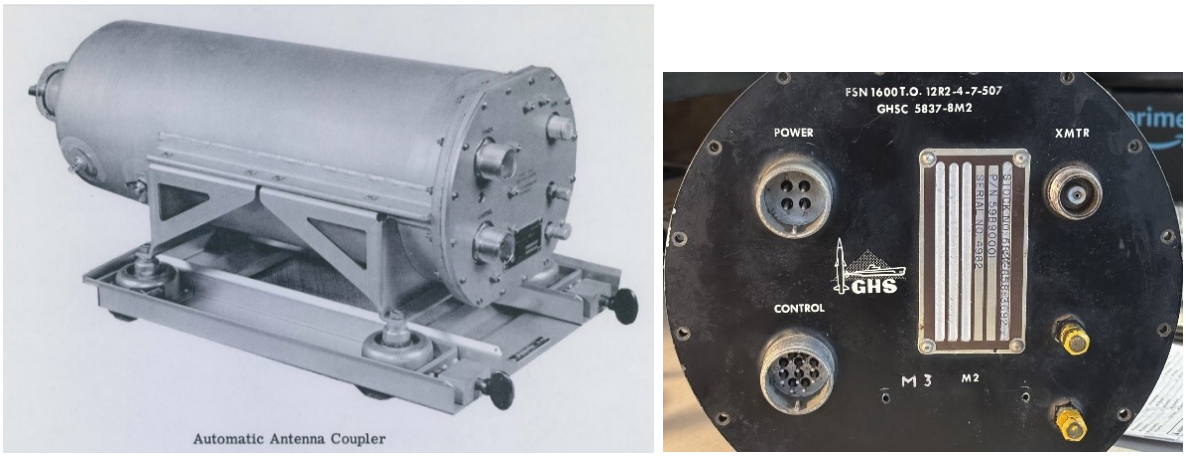


Figure 2. Left is control connector end from PX1947 product manual, right is hobbyists' snapshot.

The hobbyist's coupler seems to have had the ERA nameplate removed and a GHS corporation nameplate attached.

Features

The following are some of the performance features of later AAC models.

- Average tuning time: 3 seconds
- Continuous frequency range: 2-36 megacycles
- Power handling capacity: up to 1,350 watts
- Full power operation to 75,000 feet altitude
- VSWR tuning accuracy: less than 1.5:1
- Continuously variable and completely automatic coverage over the entire range.
- Protection by special safety devices against overheating and corona arc-over in the event of a loss of pressure in the tuner container.
- Shock proof up to 30 G.

CANDY MACHINE

A pass through of the listing of early ERA contracts also provides some other tidbits. In 1947, ERA had two contracts with the Trudeau candy company for a "candy machine" and a "double casting candy machine," Trudeau was famous for the 7-UP bar, a chocolate coated candy with seven separate fillings (the bars were delicious). Trudeau was eventually purchased by Pearson's Candies Company, and the 7-Up trademark was purchased by the well-known bottling company. See page 5 of Enews2309.pdf for personal recollections of Keith Myhre.

INTERNATIONAL BUSINESS MACHINES

One curious effort was in conjunction with IBM - In 1947 ERA had a modest (perhaps no cost) contract with IBM involving patent exchanges. There was an "IBM Room" in the original Plant 6 (near the Ford Plant) housing many documents which apparently were available to IBM, who displayed great interest in ERA's memory drum technology. IBM eventually hired John Coombs, the original ERA inventor credited with the first drum patent, and soon after came out with the IBM 650, a commercial drum-based computer that was a huge market success. Many have wondered if this effort amounted to ERA eating their own seed corn. See some details on pages 17-18 of https://vipclubmn.org/Articles/EnduringLegacy.pdf

EPILOGUE

These are just a few of the many diversified efforts undertaken by ERA to remain viable in the early days. The historical record for most of them is terse, so if any of our members can provide additional insight on these or others, now would be a good time to put some of your recollections in writing and get them posted on the VIP club website. *Harvey Taipale*

Three 'HAM' radio operators contacted us in 2008, inquiring about surplus store couplers to use with their home systems. Marc Shoquist's oral interview provides more personal insight into this product as does Warren Becker's mini biography. [lab]

We responded to the 2026 hobbyists' inquiry that we do not have any coupler drawings among our artifacts. Design and build documentation was transferred to Sperry Marine in 1969.

Editor Lowell Benson was a Drawing Control Clerk in the AAC engineering department, July 1960 to May 1963.

We do have an antenna coupler unit on display at the Lawshe Memorial Museum, and a descriptive poster - https://vipclubmn.org/EngDocImg/6.%20Univac%20Commercial%20Products.pdf.