By Paul Courson, WA3VJB

Hams Redeem Old Transmitter at Fountain of Youth

Historic radio station relocates and leaves behind a vintage Collins rig.

WFOY-AM, St Augustine, Florida, bills itself as "the oldest radio station in the nation's oldest city." Its call sign relates to the station's being built at the Fountain of Youth National Archaeological Park, where artifacts traced to Spanish explorer Ponce de Leon helped date the discovery of the New World.

A group of Amateur Radio operators discovered that the station would soon discontinue operations at this location, 490 years after the explorer made landfall there, and that the station's owner would leave behind an artifact now housed at a radio museum where town curators plan to showcase it as part of a fascinating claim to some technical history in the earliest days of wireless.

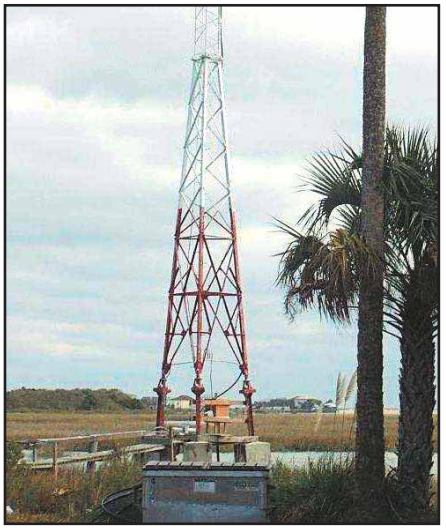
The "artifact" happens to be a beautiful, art-deco style Collins AM transmitter, the model 300-G, which features a picture window to admire a quad of tall, glowing, type 810 triode vacuum tubes. The rig will take a new spot on the dial on 160 meters where it will be operated as a demonstration of vintage radio for museum visitors and the amateur community. Its first formal appearance on the bands is expected to be during the "Heavy Metal Rally" when retired broadcast transmitters like this one are fired up for the prime winter no-static season.

WFOY, 1240 kHz, is thought to be the first station in America where planners deliberately located a transmitting tower in marshland to test whether such an installation would boost the range of a signal. The concept of *ground conductivity* as it relates to signal patterns has long been proven, but in the early days of broadcasting "we got on the air and then all of a sudden we started getting DX reports from as far away as New Zealand and England," said John R. Fraser, ex-WD4KQX, son of the station's founder, Walter Fraser, who put WFOY on the air in the 1930s.

Fraser said his father quickly faced many questions from others in the broadcast industry, curious as to whether WFOY was within its licensed power limit to be received at locations so far away. Fraser recalled stories of engineering crews coming to Florida from CBS, the station's network, as well as from WLW, the legendary Ohio powerhouse. The technicians had the same question, Fraser said, "It was just, with 135 watts, 'how do you do that?'"

"The only thing they could reckon was

WFOY transmitted from this building for 63 years; those are oyster shells in poured concrete!



This tower, erected in 1936, was among the first in broadcasting to prove the link between ground conductivity and enhanced signal.

One of the last known pictures of WFOY on the air at its original 1936 location. The Collins 20V-2 is on the left, while the 300-G is to the right.

that it was in the marsh," Fraser continued. "What we didn't know was that by putting the ground rods out in the marsh it drew the top of the lobe down closer to the water, so therefore we could get some transmission to stay closer to the surface" and follow the curvature of the earth.

But until WFOY came on the air, the effect "was sort of a blackboard theory—it had never been tried, and this was the first place they tried it," according to stories surrounding the station passed along by Parky Boone, W4YVX, a retired aircraft communications technician who first met the Fraser family as a teenager growing up in St Augustine.

Boone, the station's engineer the past 15 years, affirmed that the station's strong signal has been attributed to its location. "It's ground conductivity. The salt water is far superior to any conductivity you could get on ground." He noted the tower is about a hundred feet out in the marsh of the Matanzas River, just south of St Augustine Inlet to the Atlantic Ocean. Boone said, "The tide comes in and out. It's mud flats at low tide and about three feet deep at high tide."

The station's claim to history seems to be solid. Broadcast engineers and historians contacted for this article knew of no research suggesting any station had gone on the air earlier than WFOY at such a site specifically with a possible signal advantage in mind. Many stations have, however, located their transmitting towers in wetlands over the years as a function of cheap land value, and as validation later came in that such locations can indeed enhance a signal.

Retired Transmitter Rescued

The station's current owner, Doug Shull, had no future plans for the Collins 300-G, but wanted to keep as a backup a newer Collins 20V2, which was now on the air as the primary transmitter at the old site. He told the author that he would give away the 1951 300-G in exchange for moving the 1961 20V2 to the new location. Calls went out to other hams who own examples of the 300-G, Jim Young W8MAQ, and Tom Mackie, W2ILA, and the three of us enthusiastically decided to stage a rescue.

Tom first saw a 300-G at the author's house and has been hooked ever since. "The size and look caught me. This was the essence of the art of radio. I believe I mumbled something like 'if you find another one of these, let me know.' That was probably 12 years ago," said Mackie, an engineer with Trimble Navigation who has brought several 300-Gs to safe haven after stations abandoned them or otherwise decided to get rid of the well-built old machines. He operates on 160 meters with a totally restored 300-G that he retrieved in Oklahoma. A second 300-G from Texas awaits his curative powers.

"These little transmitters kinda grow on you, they're pretty, very stylish, even endearing." said Young, also a longtime fan of the 300-G who works as Chief Engineer at a radio station in Ohio. Jim has done the research and design work to allow the Collins to operate at full power on 160, 75 and 40 meters, the most popular bands where AMers gather to share vintage radio stories and technical tips at building, repairing, restoring and enjoying this nostalgic specialty in ham radio (see the sidebar "New Life for an Old Transmitter").

WFOY's old site presented some challenging logistics for the removal of not one but two huge transmitters. When word first came, the station was still in

New Life for an Old Transmitter—Converting the Collins 300-G to HF

Jim Young, W8MAQ, sums up best why it is sometimes justified to permanently modify a classic transmitter like this. At more than half a ton but only a quarter kilowatt, "the 300-G had little inherent value as it sat. It could serve an entire second life as a tribanded ham AM transmitter." And so the broadcast engineer took on a design challenge increasing functionality to cover 160, 75 and 40 meters, while somehow preserving many original components.

The original inductively tuned RF tank was a "T" section followed by a "Pi," and used tuning motors that pushed slugs within differential coils. Collins, in a service memo accompanying late serial number transmitters like WFOY's No. 147, realized friction would cause chronic failure of these motors, "which led to the Pi-L solution with dc motors replicating the original tuning method," Young explained. "After that process I never felt guilt about reworking the network," especially when measured RF efficiency jumped from 70% to around 76%.

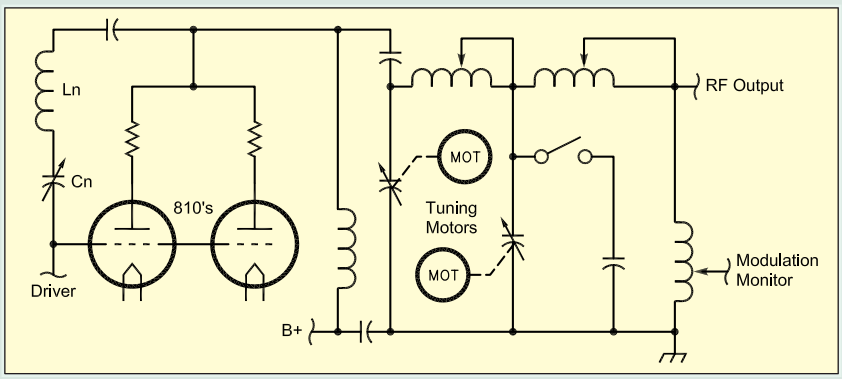
With an eye on how WØCXX, Art Collins himself might have envisioned it, Jim said "I re-used the glazed ceramic coil forms, rewound them to suit and used motor-driven variable capacitors for Tune and Load. This works great. I employed dynamic braking of the dc motors so there's no over travel when power is removed."

Jim continued, "I switch in a fixed capacitance for loading on 160 meters and move adjustable taps on the coils for band changing, and the original motor control circuits in the rig still function as intended." They are tuned from the original momentary contact, spring-loaded switches capped by the pre-war style, anodized aluminum knobs on front door.

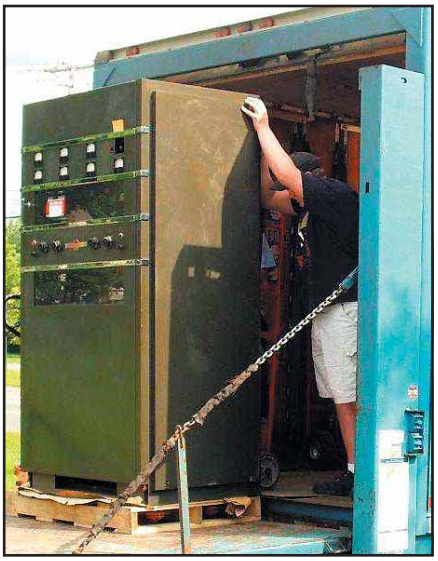
The RF drive comes from a pair of parallel-connected 807s and is tuned by a conventional tank. Jim said, "I only had to rewind the coil and determine appropriate taps. The variable capacitor is also motor driven from the front panel, as original, and a fixed cap is added for 160."

Collins used a 6L6 as an untuned Class-A buffer before the 807s. "I added a band switched plate tank here and made the 6L6 screen voltage adjustable to set the 807 drive at 3 or 4 mA," he explained. "For an exciter I am currently using a Boonton Labs signal generator; input requirements are about 4 volts across 10K. I also built a couple of protective bias supplies, one for the finals and another for the 807s."

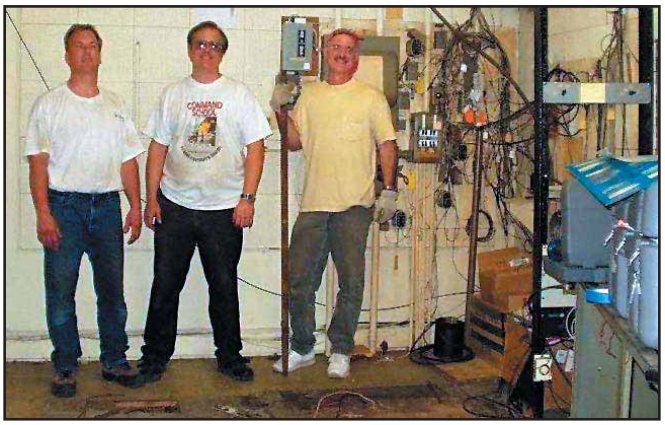
This protects the impressive and hard-to-replace Weston meters, which originally would pin and (hopefully) trip breakers. Jim notes the RF input is muted while receiving, but can be turned on locally for driver tuning and frequency spotting. Remote controls for plate ON and OFF, and receiver muting complete the conveniences.



The Pi-L output network for 160, 75 and 40 meters.



Professional movers gently bring No. 147 to its new home.



Success! Tom, W2ILA, engineer Alan Alsobrook, and Paul, WA3VJB, view the now-spacious studio.

Sixty-seven years worth of weathering at the base of the WFOY tower.

operation at the property next to the Fountain of Youth. The units were located in the same room as the on-air personalities. The Collins operating console in the small studio was directly in front of the transmitters, and nothing could happen until that mixing board was disconnected and removed from the path out the door.

Meantime, Parky and his assistant, Alan Alsobrook, were busy solving some antenna problems at the new site a few miles across town that delayed the switchover and the move. This temporarily sidetracked plans by the hams to gather at St Augustine from their homes in Annapolis, Rhode Island and Cleveland, respectively.

This provided some additional time to establish what the trio would do with the transmitter. All three men already have working examples of the 300-G on the air. All three men also already have spare, dismantled examples for parts support. And all three men had some trouble seeing where at their homes they could fit another big rig like this. Alert readers will notice this sort of discussion happened after the decision had already been made to retrieve Serial No. 147 at St Augustine.

Radio History Society Becomes Safe Port

Near Washington, DC, is an old farmhouse renovated as a municipal museum sponsored by the town of Bowie, Maryland. The Radio History Society is dedicated to nurturing the appreciation of radio's heritage through displays of broadcast and communications receivers and memorabilia from the "golden age" of radio, including a set of NBC network chimes.

Everyone has heard of or experienced the days when a family's home entertainment center was a big wooden floor console playing the rich, mellow sounds of shows picked up on what was known as the Standard Broadcast Band. The author, who lives near the museum, contacted officials at the Radio History Society with an idea to give people a vintage look at a source of those old signals. They reacted well and responded quickly with an invitation for the men to place the vacuum-tube transmitter on long-term loan for display at the museum.

"I suspect very few of our visitors (other than those who actually worked in radio) have ever been inside a station," said Brian Belanger, the museum's curator who also is an executive with the national Antique Wireless Association. "Being able to showcase even some of that atmosphere is something to strive for." The Maryland museum includes many local radio station artifacts, and by chance, the 300-G was the same model originally installed at local WYRE-Annapolis, and WUST-Washington, DC, when these stations first went on the air just after World War II.

Jim, one of the hams on this mission, owns the WYRE transmitter, Serial No. 22, and the author owns the WUST rig, Serial No. 33. (We've taken to referring to these rigs by serial number since we've now tracked down more than a dozen examples, each with its own history, that are now owned by hams.)

The museum has eventual plans to put together a replica radio station featuring vacuum-tube studio equipment, open-reel tape machines and other gear of the 1940s and 1950s, but for now it is constrained by space. Meantime, hopes are high for a functional ham radio station, combining the Collins 300-G with some classic Hallicrafters and other receivers that have been donated to the facility. Officials say the Radio History Society will be the first museum in the country to have an antique broadcast transmitter on the air and in direct contact with other nostalgic stations, thanks to AM activity on the ham bands.

Related Web sites:

- **www.amfone.net**
- **www.amwindow.org**
- **www.radiohistory.org**

All photos by the author.

You can contact the author at PO Box 73, West Friendship, MD 21794-0073; **wa3vjb@arrl.net**.