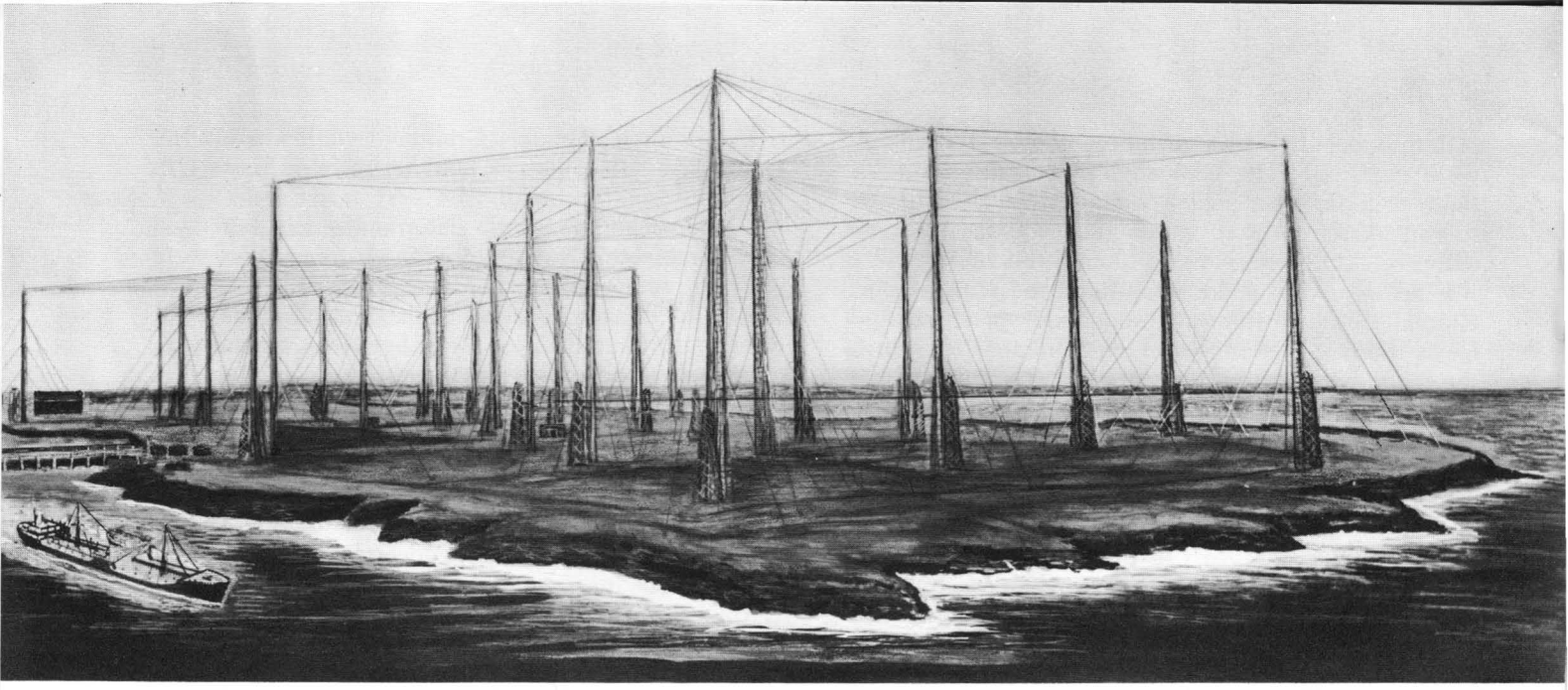


PLACE OF THE TALL TOWERS

By Jonas Crane

THE name of Cutler, Maine, a fishing hamlet little known to others than its 500 inhabitants, is about to resound in the history of communication.

On January 1, 1961, a switch will be thrown in the control center at Cutler, starting operational tests of the most powerful radio station in the world. Designed to service the atomic-powered submarines that carry the Polaris missiles, Cutler's U.S. Naval Radio Station NAA will complete a final link in our nation's underwater defense system. With Station NAA in action, U.S. atomic-powered submarines, which hitherto have had to raise antennas above the ocean surface to receive and send messages, will be able to maintain an unbroken chain of communication while remaining under water for many months.

One Cutler citizen, searching for ways to describe his town's new place in history, recalled that the Passamaquoddy braves who once hunted in the lush swales of the Cutler peninsula spoke of it with reverence as the Place of the Fat Moose. "If those warriors could come back from their happy hunting grounds today," he speculated, "they'd stare at the new landmarks and name it the Place of the Tall Towers."

Such a description would be appropriate, for the 26 radio towers—some of them nearly twice as high as the Washington Monument—are the most striking feature of the Cutler project when viewed from across Little Machias Bay. But no less awesome to the men of the Cutler area who helped to build it are such staggering components of Station NAA as 15,000 tons of steel, 35,000 cubic yards of concrete, 750,000 pounds of bronze conductor wire and 1,000,000 pounds—measuring about 2000 miles—of copper wire.

Among the uncanny features of the finished project are the 220-ton counterweights that act as safety valves for the 100,000-pound pull of the antennas. To the casual eye these huge chunks of concrete are earth-bound. But if a heavy wind or an accumulation of ice should increase the pull of the antennas to the danger point, one would see what happens when "an immovable object meets an irresistible force." Then the concrete leviathans would come to life. They would start moving upward. Slowly and meticulously they would inch their way up well-oiled pulleys, relieving the strain on the spiderweb of antennas, while the wind continued to blow in all its fury. Should the strain be due to an accumulation of ice, an electronic mechanism called an ice indicator located in another section of the project would go into action to aid the counterweights.

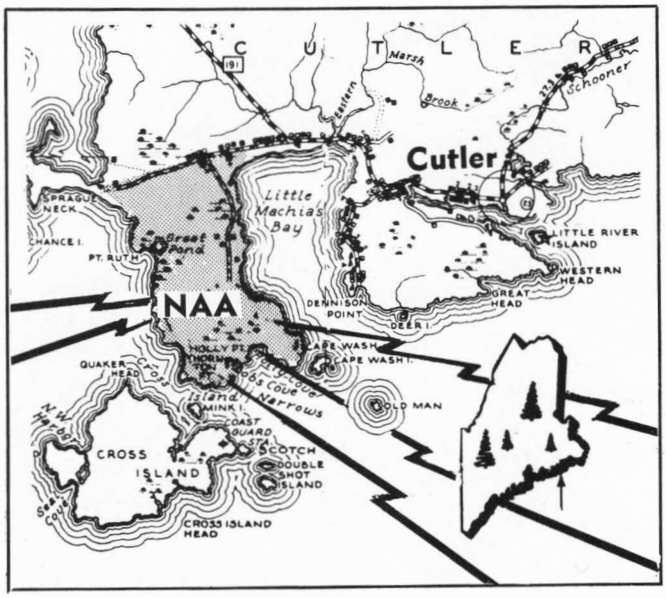
The Navy's new radio station NAA in Cutler, Maine—the most powerful ever built —will achieve the "impossible," transmitting signals under water to U. S. submarines anywhere in the world.

Boosted by 11,000,000 watts of power, the antennas would be heated and the ice quickly melted, allowing the enormous counterweights to settle back on the earth again.

Cutler was selected as the site of Radio Station NAA for two important reasons. First, the 3000-acre tract is large enough for the many complex installations required for the world's most powerful broadcasting station, and since it is mainly woodland, it can be used without disrupting the family and economic life of the area. Second, the Cutler peninsula is surrounded on three sides by salt water, an excellent conductor of electricity, which makes it ideally suited to generate the volumes of power needed for sending underwater messages.

Historically, the Cutler radio station is a lineal descendant of the Navy's first high-powered radio transmitting station, located at Arlington, Virginia, across the Potomac from Washington. This station, whose call letters NAA were known to naval and merchant radio operators the world over, furnished continuous service to the U.S. Fleet from its commissioning in 1912 until it was supplanted in 1940 by the Annapolis station, which used the call signal NSS. That the historic signal of NAA was revived and given to Cutler indicates the importance of its place in the National Defense System.

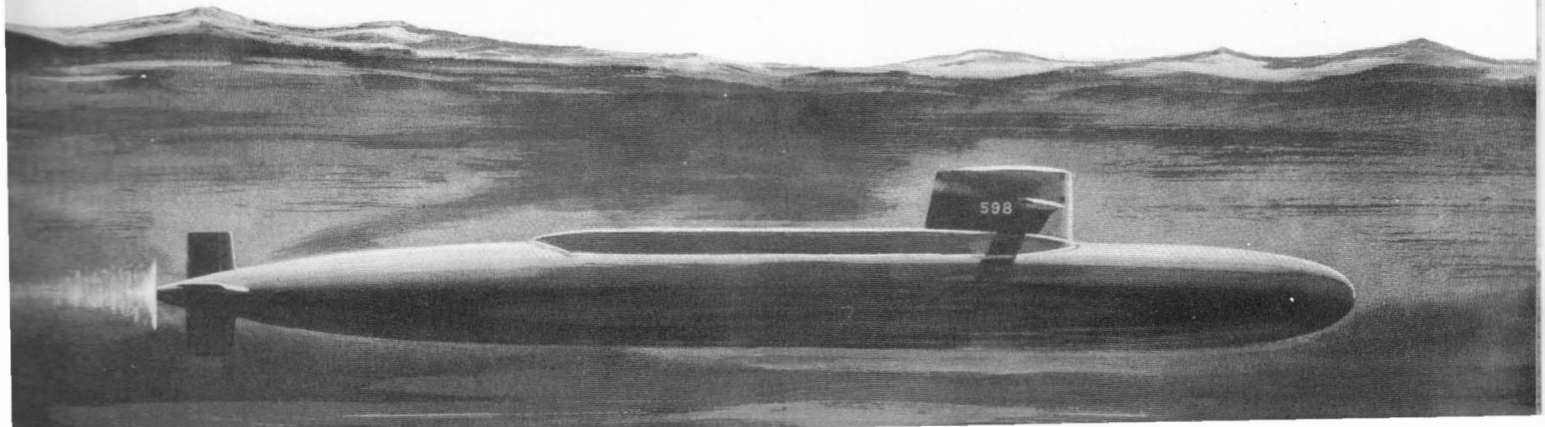
Planned and built by the Continental Electronics Company of Dallas, Texas, in accordance with Navy specifications, the Cutler communications center has 40 times the power of any present commercial broadcasting station. Since the ocean absorbs radio waves much the same as colored glass absorbs light rays, Cutler had to be geared to 2,000,000 watts of electrical energy. The coaxial cables that carry signals to the antennas are as big as sewer pipes. The four 500,000-watt final amplifiers have tubes two feet high. Although the ordinary TV or radio transformers can be carried in the hand, those at Cutler are as tall as a man. A mammoth network of cables forms the "top hat" part of the antennas, which jack up a 900-foot element giving it the sending power of a tower five miles high.



Electricity flowing through the top hats at Cutler returns to the ground and enters a screen made up of 2000 miles of No. 6 copper wire. This screen, buried under a foot of earth, is grounded in the ocean to form a perfect conductor. It was an enormous task to lay these 2000 miles of wire without a short circuit. Some of the wires, both large and small, run through six-feet-deep tunnels underground.

To landscape the project, the engineers moved 10,000 cubic feet of rock, 2,500,000 yards of earth and cut thousands of cords of wood. They turned a trout brook into a reservoir to provide plenty of pure water for the station personnel and their families. The modern sewage disposal plant will transform all

Below—*The Polaris missile-firing submarine* George Washington *will carry an explosive punch equal to all the bombs expended by both sides in World War II, including the A-bombs dropped on Hiroshima and Nagasaki. Serving as mobile and hidden missile-firing bases, the nuclear subs are considered America's most powerful retaliatory weapon. Of 45 U.S. nuclear submarines now included in the defense program, 20 are afloat—14 in commission, 6 undergoing sea trials.*



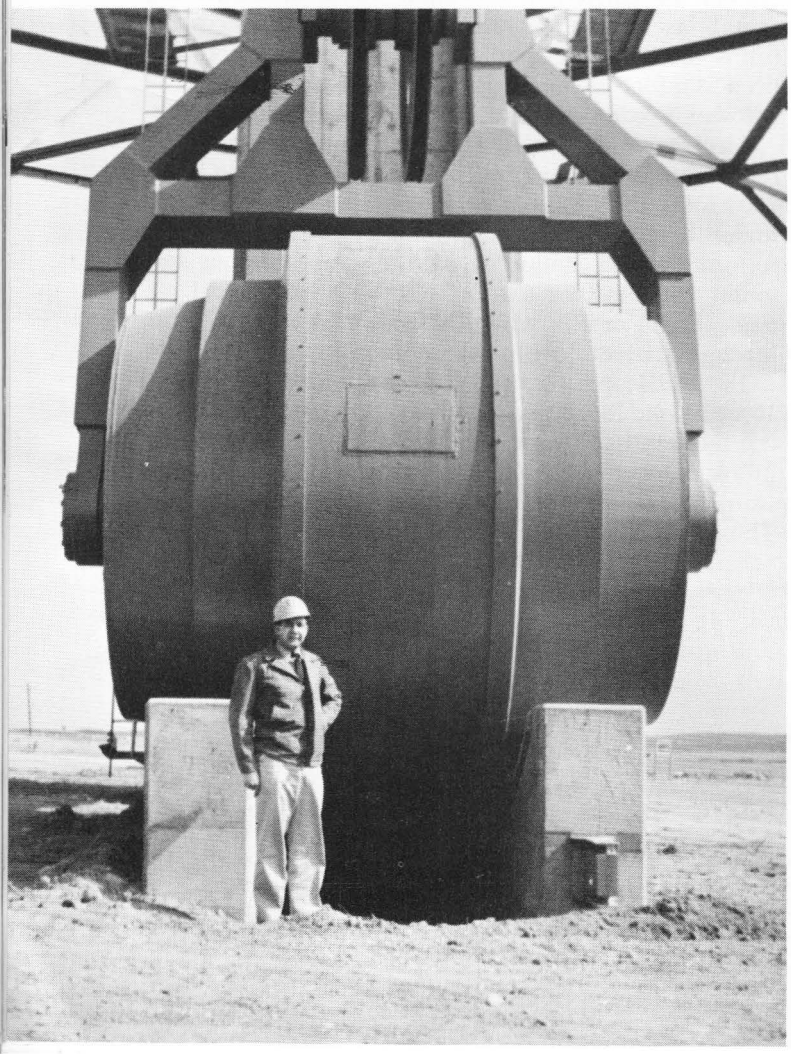
Each of Cutler's 26 sky-piercing towers pivots on a pointed base. Towers are supported by guy wires and adjoining rigid structures rigged with counterweights. Left–Counterweight track, main tower above.

waste into harmless material that will not contaminate a single Cutler clam. Even the grass at the Cutler project has its own individuality. Since long grass cuts down transmission power, a special seed mixture has been used that will not grow over six inches high.

There will be many special problems of maintenance. For instance, it takes a trained climber about four hours to go up one of the towers. An inexperienced man probably would need the better part of a day to reach his lofty destination.

Maintenance men also must use a special technique in getting out of their trucks. If they climbed out in the usual manner, under certain ground conditions their bodies might act as conductors to the steel in the trucks and they would be knocked flat. The trick is to jump so that both feet land at the same time.

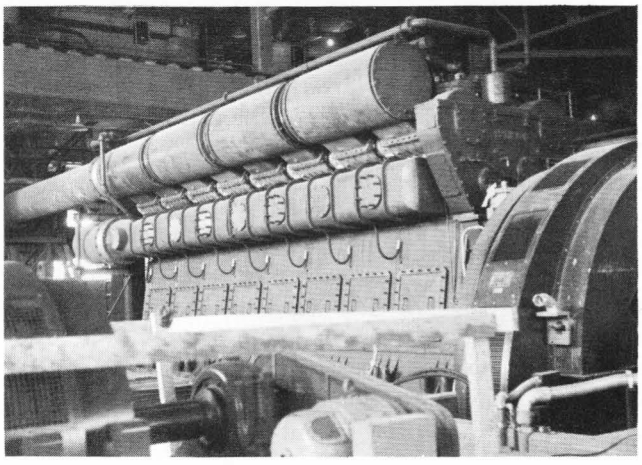
The townspeople of Cutler admit that the construction of the station has brought them the most prosperous period they can remember. Contractors, badly in need of men to operate their huge machines, soon found that local lobstermen, who had tinkered with engines and boat gear since childhood, took to the work as instinctively as they took to the sea. Most of the available men in Cutler soon were drawing $3.50 an hour as expert machine operators, an enormous steady wage to fishermen dependent upon the whimsies of their profession for a livelihood. Local workmen gladly put in as much overtime as possible

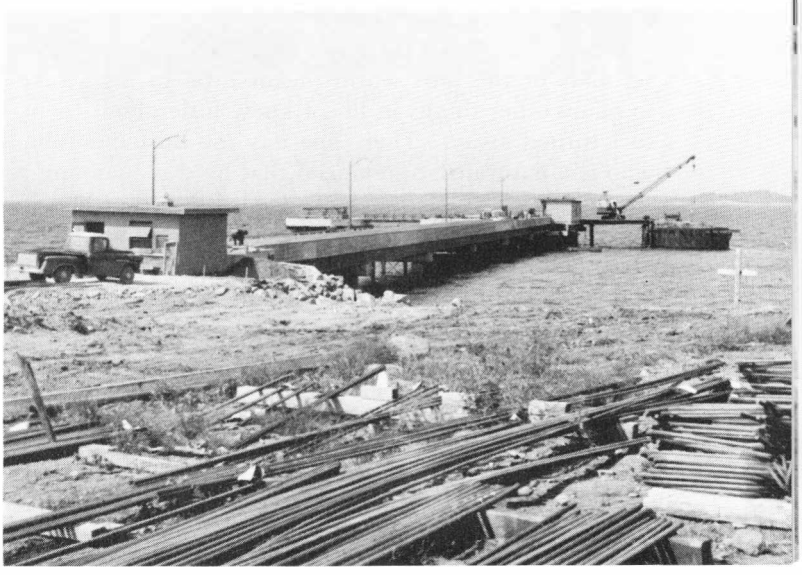


Below and left–*Gigantic counterweight, 220 tons, rides on a "roller-coaster" track to compensate for pressure of wind. Weight lifts on pulleys, connected to antenna above and to winch at base of tower.*


ADMINISTRATION BUILDING

Right—*The power plant, which houses generators driven by diesels (see below), produces 11,000 KW, enough for the City of Bangor. Electric de-icing circuits fed from this plant can melt two inches of ice from antenna wires in half an hour.* Lower photo—*Pier where tankers land fuel oil for 20,000-barrel storage tanks.*





and invested their surplus earnings in long-needed home improvements, giving Cutler the bright look befitting her new role in the world.

However, the station will need only about 200 specially-trained men to keep it in operation. With their families, these workers may double the population of the town. They will have money to spend, but in all likelihood they will spend it, as most of the people of Cutler do, in near-by places with large stores.

Cutler people already are worrying about the $80,000 school which the town will have to build to accommodate the children of the station personnel. Although the government will put up $60,000 of this, the remaining $20,000 is a frightening sum to a small Maine community where most of the income is derived from the sale of fish, lobsters and pulpwood. Added to that is the extra cost of hiring more teachers to conduct a larger school. One lobsterman commented: "Machias will get the trade, and Cutler will get the scholars to educate."

Another fisherman took a lighter view. "I don't know how it will come out financially," he said, "but it sure has ruined the dispositions of our lobsters. Before they started scraping their tails on those underwater wires, our lobsters were real friendly. Some of 'em would even put out a claw to shake hands with you when you opened a trap. But now they act like Florida alligators and charge straight at you the minute you open that lath door."

A third Cutler citizen summed up what probably is the opinion of the majority. "The cost of the Cutler station will amount to about $75,000,000," he said, "but it may be the best safety investment that the country has ever made. When that switch is thrown on January 1st, it will turn on the greatest power of communication the world has ever known."