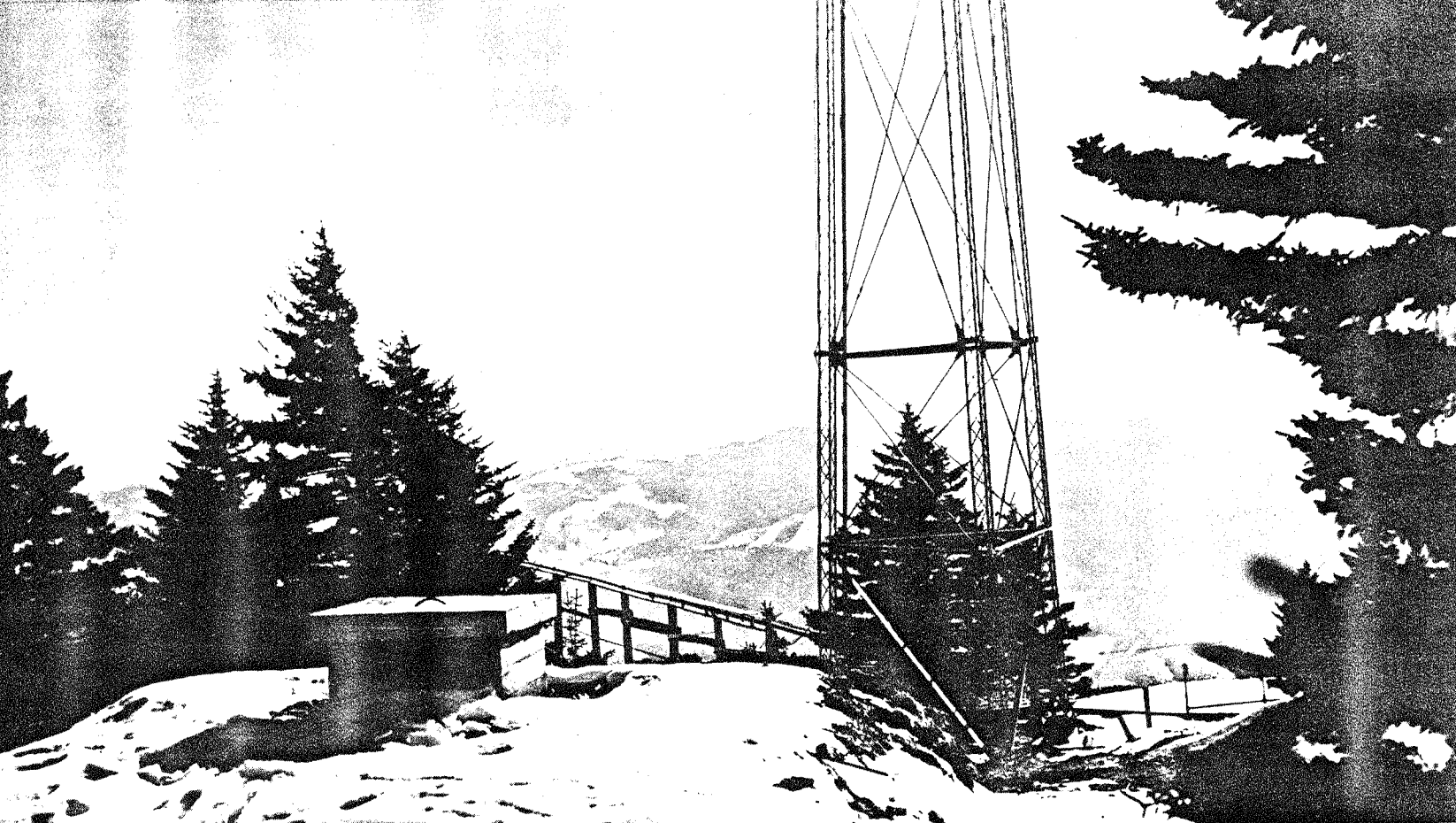


WOPI-FM HISTORY

If you've listened to our AM Network lately, you've heard us say that WOPI is on FM AGAIN! While WOPI's programming is now heard in the immediate Bristol area at 97.9 on the FM dial, the original WOPI-FM signed on from White Top Mountain on Christmas day, 1946, as the Tri-City region's very first FM station. Its frequency was 96.9 "megacycles." While it was subsequently sold by a later owner of WOPI (and is now known as WXBQ), the original WOPI-FM represented a true pioneering effort on the part of original WOPI owner, W.A. Wilson. (Listen to the FM discussion in one of the historic Wilson interviews on this website.)

Attached is an article from a late 1940's edition of RCA's BROADCAST NEWS, a then popular broadcast industry trade magazine, which details some of the early trials and tribulations of Tri-Cities first FM station!

George DeVault, President / Holston Valley Broadcasting Corporation / September 2007



View from WOPI-FM's transmitter building atop Whitetop Mountain near Bristol, Tennessee-Virginia.

WOPI's MILE HIGH FM INSTALLATION

3 KW Transmitter Using 3-Bay Super-Turnstile Antenna Installed During Sub-Zero Weather

EDITOR'S NOTE: This story of WOPI-FM is a saga of pioneering and persevering which should be "must" reading for all FM applicants with mountain-top aspirations. In it you will find two things of great helpfulness. These are: first, a preview of problems to be met in mountain-top installations and second, some ideas on how these problems can be licked.

WOPI-FM did it the hard way—in a hurry, in the midst of shortages, and with winter coming on. Those who follow may find it somewhat easier. But, many of the same problems will always be encountered wherever buildings, antenna structures, power, water, heat, and living accommodations must be provided and maintained at remote and difficult spots.

WOPI-FM, located on Whitetop Mountain, 5,643 feet above sea level and 33 air-line miles east of Bristol, Tennessee-Virginia, was one of the first postwar FM stations to go on the air. Their construction permit was granted August 15, 1946. Five days later, ground was broken on Whitetop Mountain—and just a little over three months later, Christmas Day 1946, to be exact, WOPI-FM was on the air.

Three months doesn't sound like much of a record, and it wouldn't be for a station erected on the flat (or "under the mountain," as we mountain men say); but, just try it on top of a five-thousand-foot mountain with winter coming on. WOPI's construction problems were practically numberless. The closest

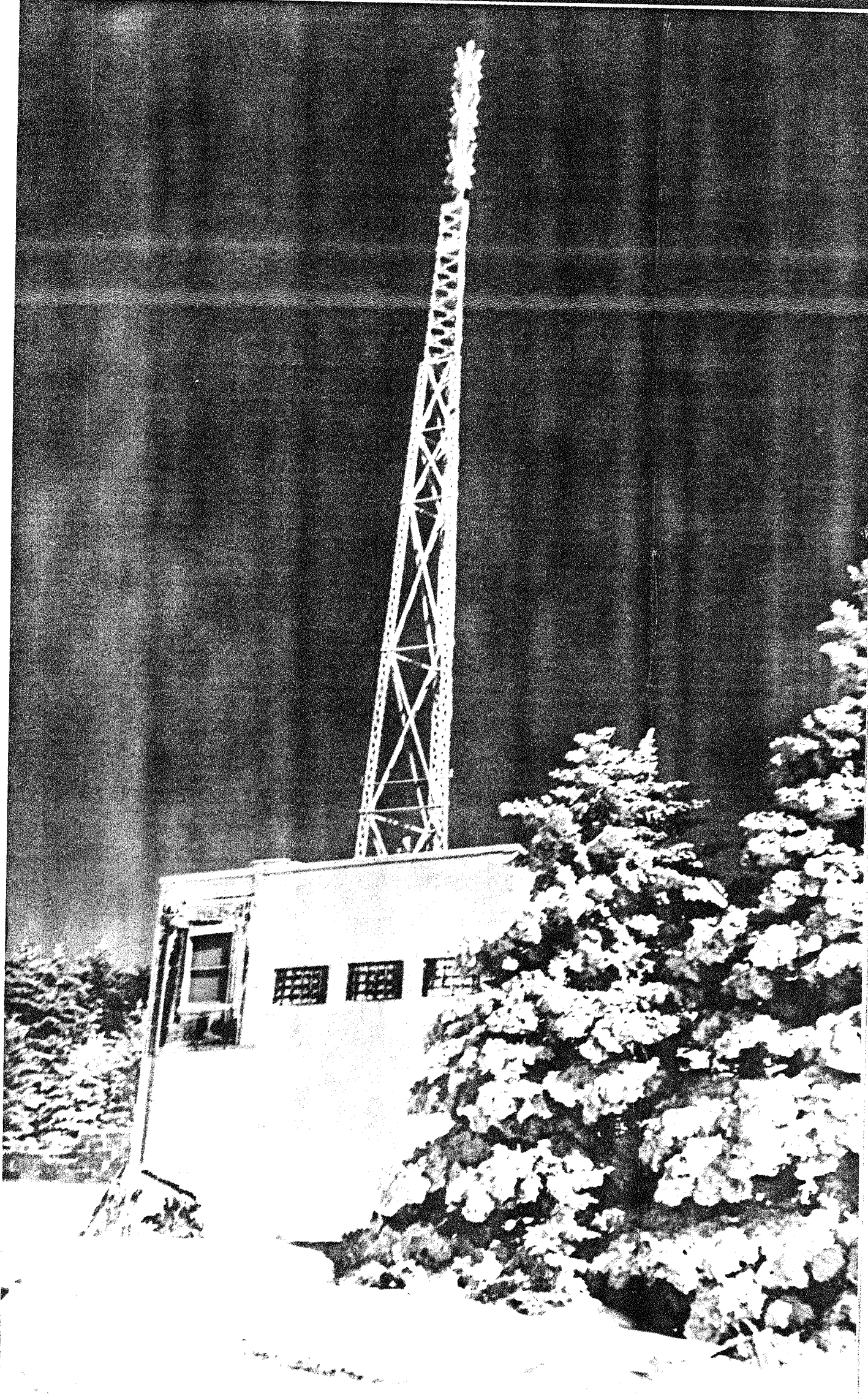
power lines were 6 miles from the transmitter site and only single-phase, at that, while 3-phase was necessary for operation of the FM transmitter. All material and equipment had to be trucked from 20 to 150 miles over roads that were often impassable. Winds of 50 to 90 miles an hour were encountered during the erection of the transmitter tower with temperatures of 5 degrees below zero and snow accumulations of 10 to 15 feet. Since the nearest living quarters were 8 miles away, the transmitter building had to be designed to house the engineers as well as equipment.

The first problem was to build a road to the transmitter site. This was done with a bulldozer, hauled up by truck. The bulldozer cleared a road for 500 feet from the main mountain road, then cleared the transmitter site. While this was going on, an 8-man crew dug a 48-inch ditch 700 feet down the mountain and tapped a spring for the water supply. The spring was then cemented into a 24-foot square basin and a 300-gallon concrete tank was erected 20 feet below in order for the water to flow by gravity. The final phases of the operation included laying pipe to the transmitter site and the erection of an 11,000-gallon steel and concrete reservoir.

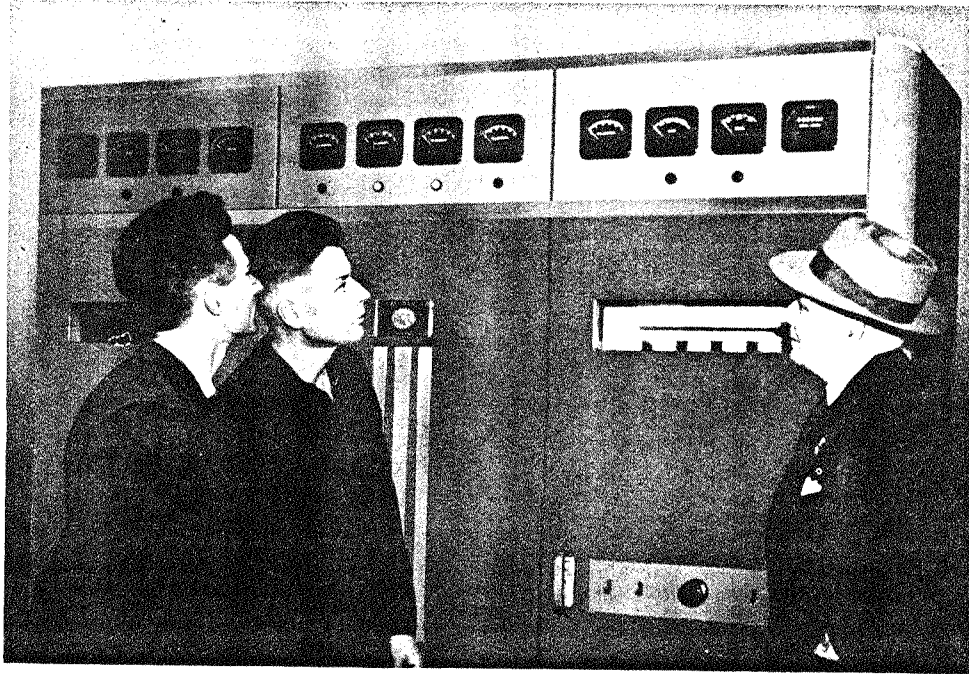
Additional workmen built a steel and concrete septic tank and laid a 200-foot sewage line from it to the transmitter building. All material for these operations, as stated previously, had to be hauled a minimum of 20 to 40 miles, with some material

Midwinter view of WOPI-FM's transmitter building and ice-coated three-bay Superturnstile antenna.

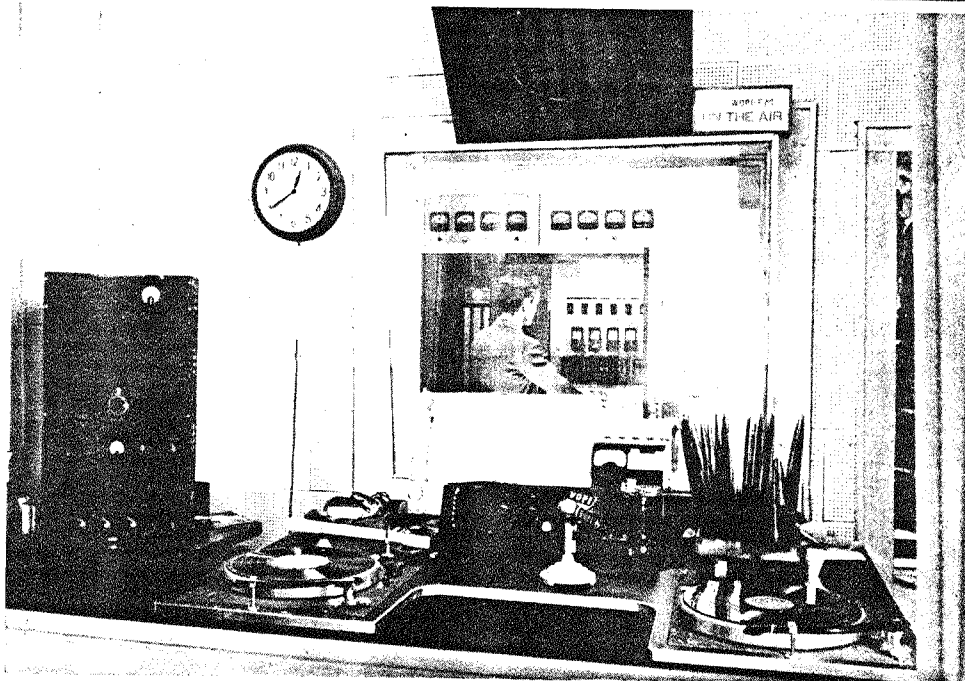
◆
*View from WOPI-
FM's transmitter
building atop
Whitetop Mountain
near Bristol,
Tennessee-Virginia.*



◆
*Midwinter view of
WOPI-FM's trans-
mitter building and
ice-coated three-bay
Superturnstile
antenna.*



Inspecting WOPI-FM's newly installed BTF-3B Transmitter. Left to right: P. G. Walters, RCA Southeastern Regional Office; W. E. Tucker, RCA Engineer; W. A. Wilson, President and General Manager, WOPI and WOPI-FM.



View of the studio control room of WOPI-FM. Through the control room observation window can be seen the power panel of the transmitter.

coming from 900 miles away. The per-load cost averaged \$18.75 to \$200.00, with total hauling cost estimated at \$5,000.

Plans for the transmitter building had meanwhile been drawn up. It was to be a two-story, three-car garage apartment, constructed of concrete, steel and cinder blocks. It would have two bedrooms, dinette, studio control room, transmitter room and bath on the second floor, with heating unit, power unit and room for two cars on the first floor. A foundation, 35 by 36 feet, of concrete, floor of 4-inch concrete, with 6 inch steel and concrete slabs was used for the second floor. As completed, the second story has inlaid asphalt and cork block flooring, black square linoleum wainscoting in the hall, bathroom and dinette, and fluorescent lighting throughout.

The completed first floor contains a 50-KW, 3-phase, Diesel engine, furnace, laundry tray, washer and storage room, with space left over for a jeep and passenger car. The jeep proved to be a happy thought, for it was the only thing that could get through the heavy snows. And even the jeep couldn't make it

for 10 days during the peak of the winter, food and other supplies having to be dropped by plane.

A fuel oil stoker furnishes hot-water heat for the building, with fuel supplied from five 550 gallon tanks buried 100 feet from the building. Two additional tanks, holding 5,000 gallons each, supply the Diesel, which furnishes the 3-phase power for the RCA BTF-3B transmitter.

The local power company erected poles and strung lines for 6 miles to furnish electricity for heating and cooking—the diesel being capable of taking over the job in an emergency. The diesel, by the way, had to be mounted on a separate concrete floor and mounted on 3½ inches of cork to surmount vibration difficulties.

The antenna, erected by a special crew brought in for the job, is a 150-foot Truscon self-supporting steel tower supporting an RCA 3-bay super-turnstile radiator, standing 2,210 feet above the average terrain (116 feet above the very top of the mountain). Hundreds of tons of steel, rock and cement, taking about

18 hours to pour, went into the foundation. At the time the antenna was erected, the reservoir was still under construction, so all water had to be hauled 2½ miles by truck. Weather conditions were so severe while the antenna was going up that on several occasions crew members had to climb to the aid of the one working on the tower and help him down.

Installation of the 3¼-inch transmission line from transmitter to the bottom of the turnstile, a distance of 250 feet, was another stickler. This line, larger than would ordinarily be needed with a radiated power of 10,400 KW, was used to allow further power increase without having to replace the co-ax line. Because of heavy winds and ice the horizontal run of 100 feet had to be anchored securely. This problem was solved by having it rest on specially-treated 2- x 8-inch planks bolted to 6 poles sunk about 4 feet in the ground, each with two heavy duty guy wires. The co-ax line is boxed to prevent damage from falling ice from the tower. While the line was being installed, the weather closed in again, bringing a coating of ice with it, and high winds that at one time worked the inside conductor of the transmission line loose at the juncture of the line and turnstile.

The audio equipment and operating console are located in the studio control room, with the transmitter room immediately adjacent. The high altitude made it necessary to have the blower fans, which cool the amplifier tubes, run at twice the ordinary speed, so as to give a sufficient volume of the rarified air.

On Christmas Day, 1946, WOPI-FM went on the air. First broadcasts were with a 26-inch temporary antenna and a reduced power of 3,000 watts of radiated power. The short antenna made r-f power show up everywhere in the building. Lights kept burning after they were turned off, metal strips around the console became warm and you could develop a high fever by merely standing near the antenna. However, this situation ceased on January 4, 1947, when WOPI-FM began using the turnstile antenna and full radiated power of 10,400 watts.

WOPI-FM now has a 25-watt, 214-mc ST link in the Bristol studios, which permits constant broadcast of commercial programs during the 12-hour broadcast period, from 10:00 A.M. to 10:00 P.M. Listener reports indicate excellent coverage up to 100 miles, with reception reported (very satisfactory) from as far as 200 air-line miles away.

TYPICAL LOG, AS REPORTED BY WARREN GILPIN, ENGINEER WOPI-FM

WEDNESDAY, DECEMBER 25, 1946: Checked diesel, tower lights, lines and flasher. Fuel line stopped up at 12:12 P.M., went off air same time, back on at 12:25 P.M. Time clock would not work, cleared trouble 1:30 P.M., on air 6 hours, 47 minutes. Lowest temperature 18 above. Had two visitors.

THURSDAY, DECEMBER 26, 1946: Electrician worked on house lights. Power company men fixed line to house from last pole and guyed all poles. Power off 10:21 to 11:30 A.M. Off air between 10:21 and 10:41 to change to local power. (This has since been corrected with necessary switching arrangements between outside power and diesel power). Grounded transmitter to outside ground. Checked water pump at spring, found O.K. On air 6 hours. Noise on arm of turntable feed back, therefore cueing on air. (All programs originating from FM control room at this time, as we were using temporary antenna, which caused radio frequency all through building.)

FRIDAY, DECEMBER 27, 1946: Electrician installed box to switch from Appalachian Power to local diesel power. Carpenters changed lines on diesel and caused me to leave the air at 6:25 P.M.—returned to the air at 6:59 P.M. Installed lines would not feed diesel properly. Washing machine shorted out basement light, found trouble and cleared. Had eight visitors.

SATURDAY, JANUARY 4, 1947: (Co-ax line completed and in service on this date). On air 6 hours. Covered part of transmission line to prevent ice falling on cable . . . covered hole in roof, where lines enter. Electrician here and finished most of his work. Automatic voltage control on diesel causes voltage to vary from about 200 to 225 volts constantly. Am now using manual control, works fine, but have to watch it most of the time. Stopped one leak in transmission line, but there are others. Weather not permitting me to locate all of them.

FROM LOG KEPT BY GENERAL MANAGER IN BRISTOL

JANUARY 31, 1947: Furnace out. Engineer met plumbers at foot of mountain. Found stack-stat defective. Changed hot water tank intake from boiler to intake of cold water line. This corrected most of trouble as the hot water tank was pulling the hot water out of the boiler . . . Mailed stack-stat to Konnarock.

FEBRUARY 2ND: General Manager left for Whitetop 9:45 A.M., returned 9:30 P.M. Took plumbers to work on furnace. Installed new stack-stat, put furnace in operation . . . 106 miles.

FEBRUARY 4TH: Furnace out. One radiator frozen and busted . . . suggested they install stove in basement and build good fire so will thaw pipes. Cold water pipes not frozen, will check at 3:00 P.M. Unable to locate electrician. Plumbers at Chilhowie (34 miles from Bristol) will go up today on air check at 10:00 A.M. Two engineers from Bristol left at 7:20 P.M. for Whitetop. 10 degrees below zero . . . arrived at transmitter at 10:20 P.M. Announcer had left in jeep . . . did not want to chop wood and build fire. (This man was discharged on arrival in Bristol).

FEBRUARY 5TH: 8:45 A.M., Furnace out. Oil all over floor in basement. Engineer up since 3:00 A.M. mopping floor. Below freezing in building. 1:20-1:30 P.M. WOPI-AM and WOPI-FM used two-way communication pertaining to safety of personnel.

FEBRUARY 6TH: Furnace men repair furnace; now working okay. One radiator disconnected because of pipes busted. Weather bad—heavy snow and zero. Continue on air. Engineer Gilpin announcing. Two engineers from Bristol still on mountain.

(This goes on and on. On February 21, we find the following):

FEBRUARY 21ST: Temperature 6 degrees above zero . . . snow has hard crust about quarter-inch thick . . . drifts high, did not go down road today. Worked on turntables. Broke ice on

water, have only three thousand gallons (reservoir). Ice about a quarter-inch thick. Water pressure okay.

FEBRUARY 22ND: 6 degrees above zero. Two of the three guy wires on pole 2 (second pole from the building) pulled loose. Insulated wire swinging into top wire on pole. Will soon wear thru and short . . . only one guy wire left. Will probably break during night. Wind is blowing badly. Pole already leaning. Programs came thru okay . . . when signed off at 9:00 P.M. temperature three above zero. Snow drifts up to eight feet near building. Unable to get out with jeep. Have food enough for about a week. Water for two weeks.

FEBRUARY 24TH: Emergency power line arching to ground on pole at pump. Notified power company, and etc. and etc. 5:35 P.M. snow continues to drift ten to twelve feet . . . really snowed in.

Right here things get worse and worse, and on February 27th food had to be dropped by two planes . . . then fuel oil ran out . . . this right at the very worst of the bad weather.

ON MARCH 7TH we find that they "got as far as the lodge with the jeep, which stuck in a drift—drift 100 feet long—dug for an hour and had to leave it—would try it again tomorrow."

MARCH 12TH: Announcer and lodge keeper got jeep out and went to foot of mountain . . . for mail and supplies.

These reports continue throughout the winter months.

* * *

All of these difficulties should be eliminated in the future as the entire installations have been made more permanent. There should be very little if any of these troubles during future winter months. Transmission line has been installed on a permanent basis, have installed additional radiators, arranged for ample supply of fuel oil, rearranged water pipes and made many improvements necessary to operation at such an out-post and to combat the rigorous climate.