



View of the main operating console, auxiliary turntable and other equipment at WSJS-FM. The bottom of the antenna may be seen through the window.



Modern building which houses the transmitter of WSJS-FM.

The Installation of WSJS-FM

WHEN THE PIEDMONT Publishing Company decided to make its venture into FM broadcasting, it was faced with that all-important problem of selecting the best place for its transmitter for maximum coverage.

The company, publisher of the *Winston-Salem Journal*, morning daily newspaper, and the *Twin City Sentinel*, an afternoon daily newspaper, first had entered broadcasting in 1930 when it established WSJS. And Piedmont Publishing Company president Gordon Gray had quite a bit of personal FM experience, with his famous experimental FM transmitter WMIT atop Mount Mitchell in western North Carolina.

In considering the commercial FM project, it was found that it would be

10-Kw FM Transmitter, With a 6-Bay Circular Antenna, Ideally Located in Hills of North Carolina, Providing Coverage of Approximately 65 Miles in 50-Microvolt Contour.

by WILLIAM E. EAST

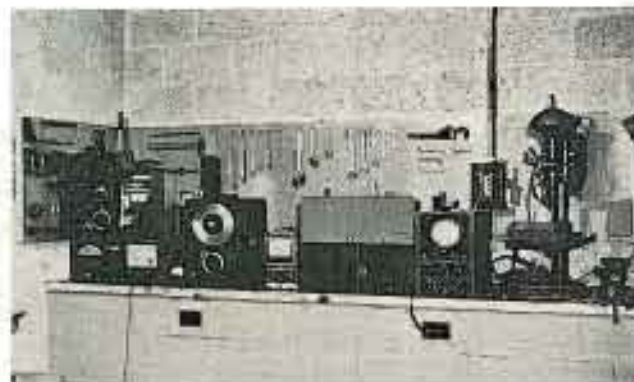
The Twin-City Sentinel
Winston-Salem, N. C.

best to locate on a site which would serve the tri-cities of Greensboro, High Point and Winston-Salem, which form a triangle in the northern part

of Piedmont, North Carolina. In addition, it was also felt that the site should be favorable for TV, which it

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Test equipment and the tool room.

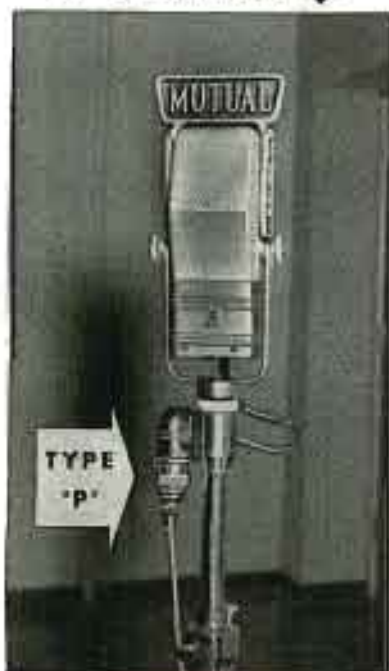


Station wagon which houses a portion of WSJS-FM equipment in its rear.



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TV Monitor

(Continued from page 33)

script, and to G. E. Hamilton and P. F. Brown, who reviewed the manuscript and whose help was invaluable. He is also grateful to those members of the receiver division, without whose help the project could not have been completed, particularly Cleo Marsh, Bernard Amos and Fred Schmidt.

References

¹John Rustin, *Control Console for a Television Transmitter*, *COMMUNICATIONS*, October, 1948.

²Ho Shou Loh, *On Single and Couple Tuned Circuits Having Constant Response-band Characteristics*, *Proc. IRE*, April, 1938.

³Cleo Marsh, *Recent Advances in the Design of Intermediate Frequency Amplifiers for Television Receivers*, a paper presented before the 1947 Winter meeting of the IRE.

WSJS-FM

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is hoped will come to the Tar Heel state.

The site finally selected has proved just about as perfect as it could be under the many existing circumstances which arose. Phil Hedrick, chief of the engineering staff, believes after the first year of operation; WSJS-FM first went on the air full time December 1, 1947.

The transmitter was located directly on U. S. Highway 421 seven miles east of Winston-Salem. This highway links Winston-Salem and Greensboro 29 miles away.

The ground level at the transmitter site, 956' above mean sea level, is the second highest area in Forsyth County, the highest being 1,026', a short distance further east towards the community of Kernersville, which lies approximately three miles away.

The airways and airports came in for some special figuring when the transmitter site was chosen. There is only one existing airport within 10 miles of the transmitter site, the Smith Reynolds Airport on the northern city limits of Winston-Salem, approximately five miles west of the transmitter. Another airport at Greensboro-High Point, located to the east of the transmitter site, is farther away, but had to be considered in the location selection. In addition, there are two existing airways, the center lines of which are within 10 miles of the transmitter location of the FM station.

They are Green Airway No. 6, the center line of which is approximately eight miles southeast of the location, and Red Airway No. 34, the center

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line of which is approximately 8.5 miles northeast of the location.

After both of these airways had been cleared according to current regulations, it was found that only a small area remained for the projected transmitter site.

In addition, it was found necessary to consider a location which would provide the best accessibility to existing power and telephone lines. This was important since the programs for WSJS-FM were to originate in the WSJS Radio Center on North Spruce Street in Winston-Salem.

A 10-kw transmitter and auxiliary equipment was housed in a modern-design building which was also equipped with one small studio for use in the event of an emergency, and shop, garage, furnace and auxiliary power plant rooms. In the transmitting room is an operating console with the cabinets housing the transmitter immediately in front of the operator. An auxiliary turntable is at the operator's right, with a loudspeaker above to his rear. To his left rear are two cabinets containing the frequency and modulation monitors and line and monitor amplifiers, also a patch panel to facilitate switching equipment.

The shop is in the rear of the build-

G. E.

ing and is fully equipped with tools and equipment needed for spot repairs. An assortment of standard checking instruments also are on hand, one being an external standard for measuring the frequency of the AM and FM transmitters. This equipment is standardized on the Bureau of Standards' standard WWV.

Approximately seven miles of telephone miles from the studio to the transmitter building have been equalized by Southern Bell from 30 to 15,000 cycles within 1 db, with noise level being 68 db down from program level which meets FCC requirements.

The base of the antenna, a 6-bay circular type, is approximately 50 feet west of the transmitter building. The antenna is supported on a structural steel tower, so that the center of the radiating portion of the antenna system is supported approximately 321' above ground level, or 1,277' above mean sea level. The height of the supporting structural steel tower is approximately 268'. The overall height of the antenna system above ground level is 348', and the overall height above mean sea level is 1,304'.

Power is fed to the antenna system through a 400' length of coaxial transmission line, having an outside diameter of 3 1/2" and an estimated efficiency of 87 per cent.

The power delivered to the antenna system is 8.7 kw, the effective radiated power being approximately 48 kw.

To insure continued operation in the event of a power failure, a 40 kw 4-wire power plant with automatic change has been installed. A gasoline-driven motor cranks up and delivers power within approximately 45 seconds in the event of a commercial power failure.

WSJS-FM now operates on a 17-hour day, from 8 A.M. to 1 A.M. In addition to local programs which originate in Winston-Salem, the station also carries NBC network programs.

Incidentally this area has become quite FM conscious, one out of every five families in the county owning an FM receiver.

Tract of land (outlined) along United States Highway 421 east of Winston-Salem selected as the site of WSJS-FM.



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