

WTAG

RADIO
STATION

OWNED AND OPERATED BY THE
WORCESTER TELEGRAM AND GAZETTE
WORCESTER, MASS.



WELCOME



WTAG

JOHN J. STOREY
Managing Director

Visitors are always welcome at the new WTAG transmitter station at Holden and at the WTAG studios in Worcester. Here you may see for yourselves just how a radio program is put on the air.

Through its association with the National Broadcasting Company's Red Network and with the Yankee Network, WTAG is privileged to present the finest radio programs in the world. Through the new RCA "High-Fidelity" transmitter at Holden these programs are brought to WTAG's listeners with all the realism modern radio science affords.

This booklet will answer some of your questions on "how it's done". If you have other questions, the operator or announcer on duty will be glad to answer them.

Better Reception

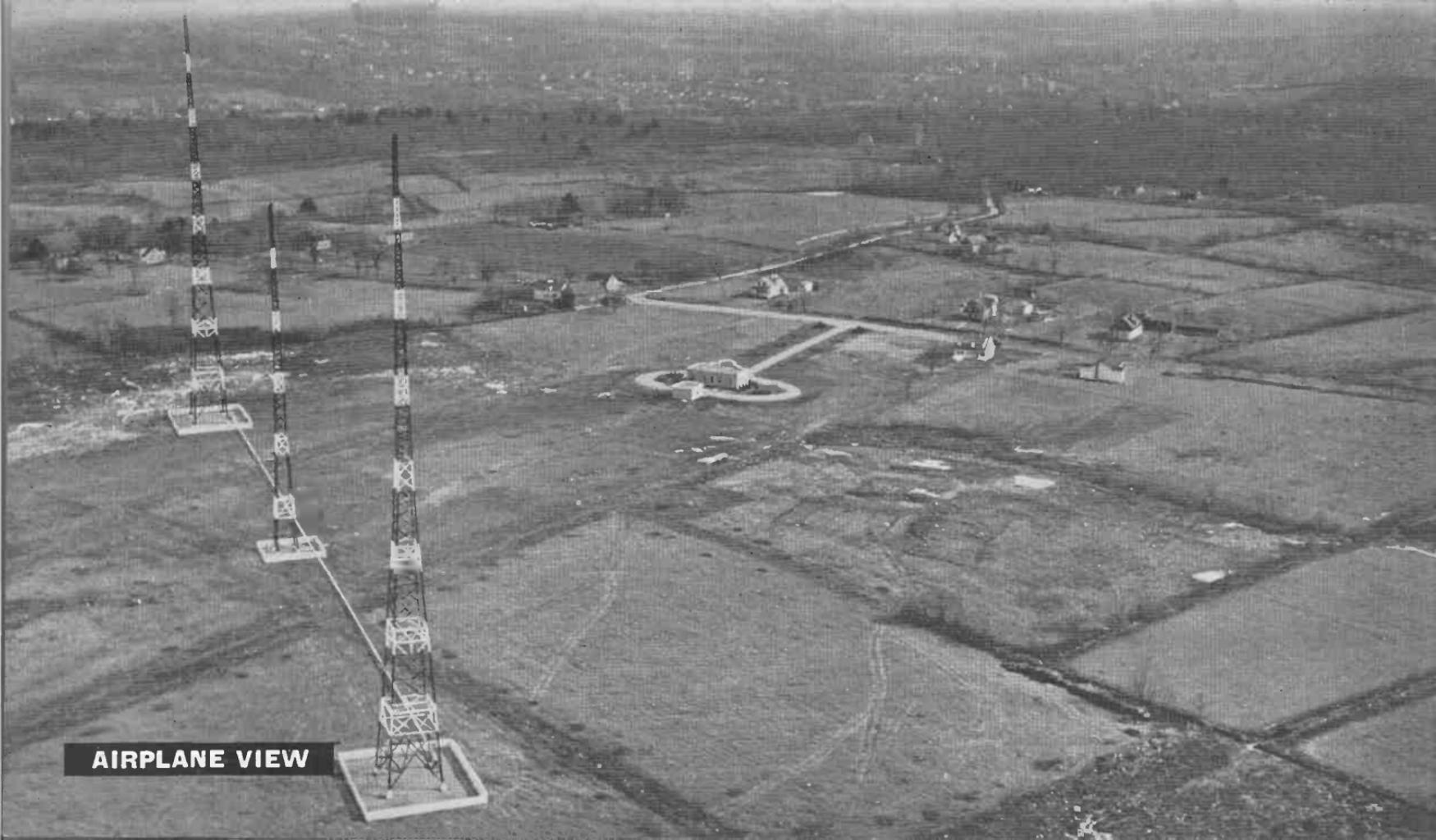
From its new \$100,000 transmitter station WTAG speaks with a clearer, louder voice. The highest notes of the flute, the deepest tones of the bass horn, are reproduced with startling realism by the new RCA transmitter that incorporates every new feature of "high fidelity" performance.

WTAG's doubled power (1000 watts instead of 500) has greatly improved the quality of reception and widened the range of the station. Interference—whether from atmospheric disturbances or from faulty electrical appliances in the listener's neighborhood—is greatly reduced by this added power.

From WTAG's new triple-tower antennae, voice and music are sent out with all the clearness and fidelity of which modern radio science is capable. The size and position of these triple towers govern the distance and direction of WTAG's broadcasts.

This site was chosen as ideal for radio transmitting because of the flatness of the ground and the excellent transmitting qualities of the soil.

AIRPLANE VIEW



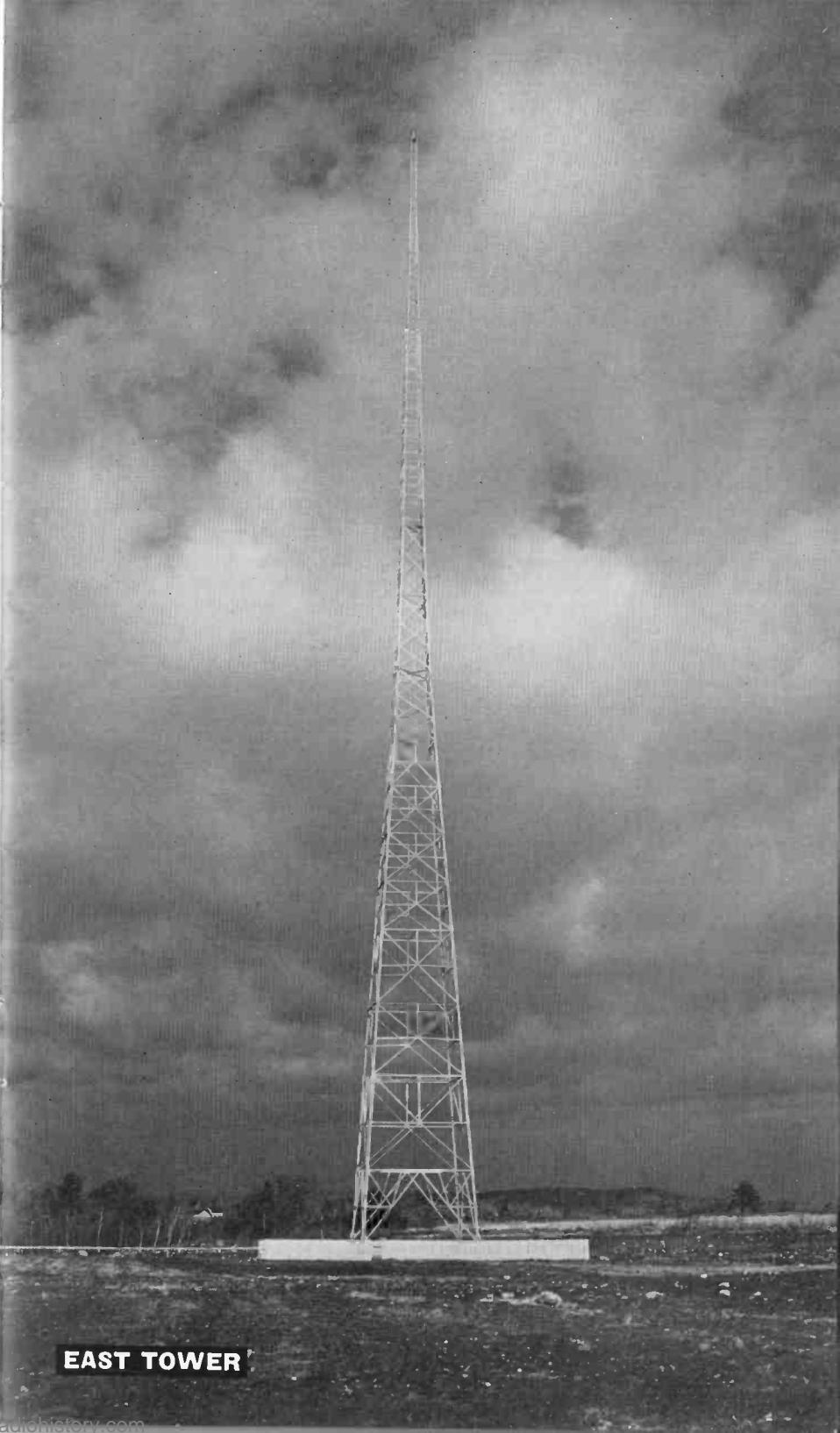
The Towers

The three great towers of the WTAG antennae system dominate the Holden skyline by day and by night. They are visible for many miles from surrounding highways and from the highways of the sky.

The two taller towers rise to a height of 360 feet — almost three times as high as the State Mutual building. The middle tower is 260 feet in height.

The towers are built of fabricated steel, with a total weight of 40 tons, and are supported on porcelain insulators which for all their seeming frailty are capable of holding up a weight of 50 tons. Beneath these insulators are heavy concrete bases sunk eight feet into the ground.

The towers are built to withstand a wind velocity of 115 miles per hour — which is vastly greater than has ever been recorded hereabouts. On a hot Summer's day they will rise about three and a half inches higher than they were last Winter. The steel will expand that much with the heat.



EAST TOWER

Guide for Aviators

The WTAG towers are painted in alternate stripes of aviation orange and white, as designated by the Airways division of the U. S. Chamber of Commerce.

At night the towers are gleaming red beacons visible for many miles in all directions. Many people have commented on the beauty of the three red towers against the dark hills. The real purpose of the illumination of course is not beauty — but safety for aviators. From the skyways the triple towers make a striking landmark.

The sides of each tower are lighted by six 100-watt beacons. The East tower is topped by a 400-watt aviation beacon and the other towers are topped by beacons of 100-watt power.

All these lights are automatically turned on at dusk and off at dawn, by clocks adjusted for the change in light at different times of the year.

The towers stand on a line due East and West.

24 Miles of Wire

High electrical efficiency requires ease of current conduction through the soil surrounding the base of towers. This has been accomplished by plowing into the ground 127,000 feet — more than 24 miles — of copper wire arranged in a symmetrical pattern over 20 acres of ground. To do this it was necessary to tear down a mile and a half of stone walls and to remove hundreds of tons of rocks.

This 24-mile network of buried wires forms an efficient "ground" for the powerful new transmitter.

The center tower stands 620 feet, the East tower 440 feet, and the West tower 900 feet, beyond the Transmitter House. The outside towers are 846 feet apart. The radio programs are carried to them on specially-constructed concentric tubing lines running six feet underground to the center tower and above ground between the towers.

These lines measure 2700 feet and are believed to form the longest transmission lines of any broadcasting station in the United States. The lines are kept dry by nitrogen gas under a constant pressure of 15 pounds.

Transmitter House

The new WTAG 1000-watt transmitter is housed in this beautiful modern structure specially designed for its purpose. The materials used are buff face brick with iron spots, and Indiana limestone. The building is approached by a 300 foot drive leading off Shrewsbury street, Holden.

Facing the main entrance is a reception and observation room for visitors. Beyond this is the transmitter room itself. To the right of the transmitter room is a lounging room for operators, and to the left, a workshop.

In the basement are an emergency electric plant, a modern heater and a variety of electrical and other apparatus necessary for a station of this type.

Power for the WTAG transmitter is purchased from the Town of Holden. In case outside power lines should fail, in a few seconds the station would be on the air under its own power. The failure of outside power automatically starts the emergency generator.



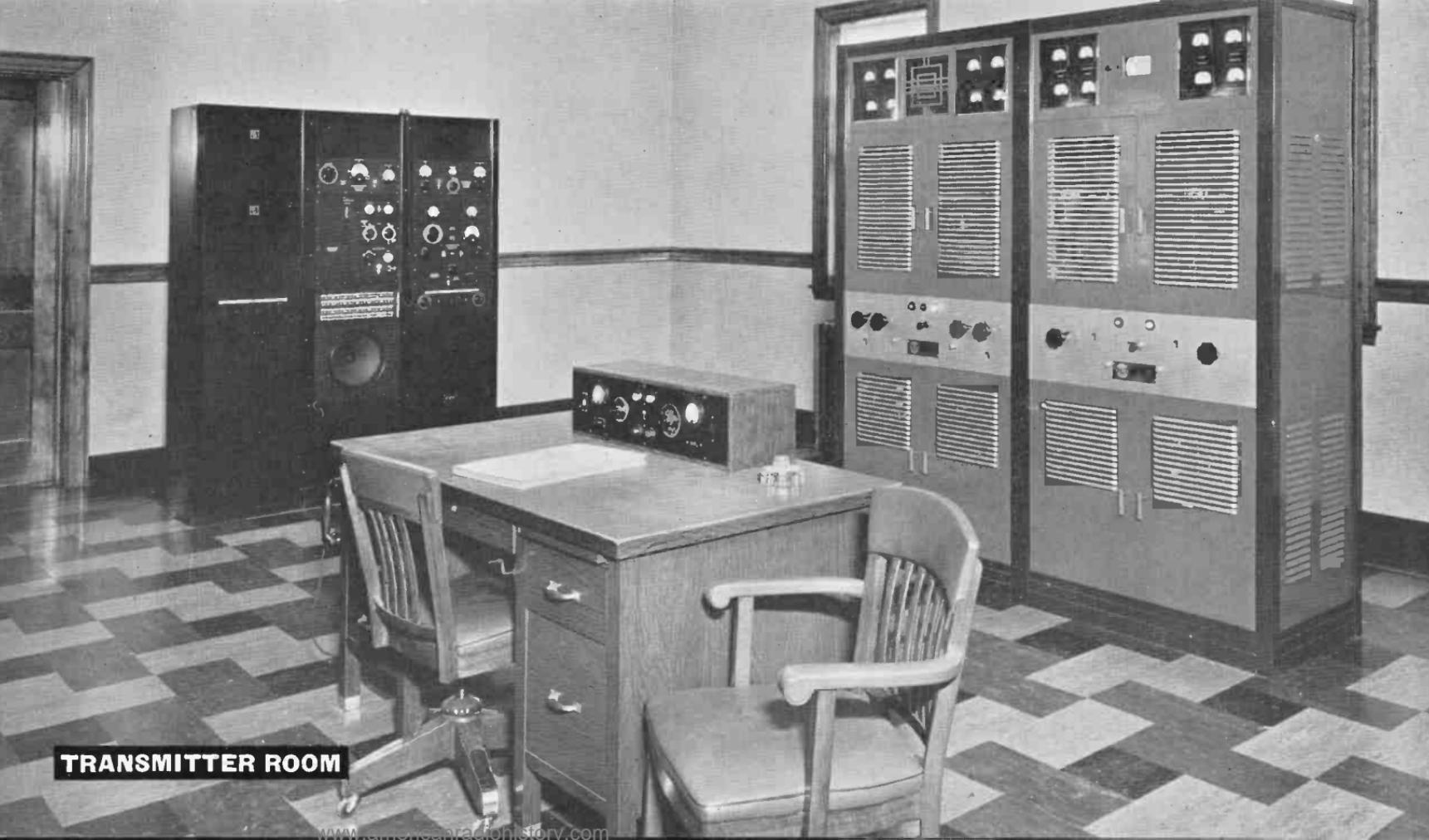
TRANSMITTER HOUSE

Transmitter Room

Programs of the National Broadcasting Company's Red Network and of the Yankee Network of which WTAG is an associated station, are received over special telephone cables at the WTAG studios on Franklin street, Worcester. Here these programs, with any local programs originating within the studios, are sent via telephone cables to the transmitter in Holden.

The transmitter changes these "audio waves" of the telephone lines into "radio waves" sent hurtling through the atmosphere from the triple towers. The tubes in your radio set change the radio waves back into audio waves again.

At the left in the transmitter room are racks and panels containing apparatus that amplifies voices and music brought in by the telephone-cables. The loudspeaker just below center of the unit allows the operator to monitor the programs as he sits at his desk. In the two panels at right are generated the actual radio waves or signals heard by WTAG's listeners. Master controls are on operator's desk — center.



TRANSMITTER ROOM



PROF. HOBART
H. NEWELL,
CONSULTING
ENGINEER



CLARENCE B.
KELLEY,
TRANSMITTER
OPERATOR



PAUL E.
ANDERSON,
OPERATOR



CHESTER W. GAYLORD, ANNOUNCER



HOWARD J. PERRY
COMMERCIAL MANAGER



CLARENCE F. DAVIS,
OPERATOR



JAMES S. GODFREY,
OPERATOR



DOROTHY B. ROBINSON,
COMMERCIAL DEPT. & DRAMATICS



LILLIAN MURPHY MOYNIHAN,
PROGRAM DIRECTOR



MARGUERITE MCCORMACK,
MANAGER'S SECRETARY



DOROTHY B. MATTISON,
RADIO EDITOR

WHO'S WHO on **WTAG** STAFF

How It Works

The radio engineer explains that the transmitter is like a big pump. Consider the electrical radio impulse as water, he suggests. From New York or Boston or the Worcester Auditorium it flows over telephone cables to the WTAG studios in Worcester, then through more telephone cables from studios to the transmitter.

From the transmitter it is piped through specially-designed "co-axial" transmission lines to the towers. As soon as a tower is filled up with this electrical radio impulse it will begin, like a fountain, to send out sprays of radio in every direction, striking radio sets throughout the broadcasting territory of the station.

Some of the sprays will shoot straight out, parallel with the ground. These form the "ground wave" which assures such splendid reception to listeners in the station's immediate neighborhood. Other sprays shoot diagonally upward, hit an ionic layer several miles up, bounce downward again to serve listeners far from the station.

HOW IT WORKS

As explained by

WTAG Consulting Engineer

Prof. H. H. NEWELL

Note that directly over the tower is a blank spot where the broadcast cannot be heard. Such blank spots are an infallible guide to aviators "flying blind". When an aviator cannot get the station's signals—he knows he is directly above the station's towers.

HEAVYSIDE LAYER

RADIO WAVE

GROUND LEVEL

RADIO TOWER

Operator's Home

One transmitter operator makes his home in the new Cape Cod cottage built for him a stone's throw from the transmitter. In case of another "Flood of '36" or "Blizzard of '88" or any other emergency the operator will be right on the spot, ready for instant action day or night.

Site Is Ideal

Visitors comment on the flatness of this level spot amidst the rolling hills. This flatness, and the fine transmitting qualities of the soil, were the reasons why this particular site was selected.

And — you have WTAG's word for it — to find a sweep of level land in hilly Worcester county was no quick or easy task!

The land was formerly a farm. To tear down farm buildings — clear acres of brush — remove stone walls apparently built to stand until the end of time — cart away hundreds of tons of rocks — this in itself was a major undertaking.



OPERATOR'S HOME

In the Studios

All local programs of WTAG originate in the studios at 18 Franklin street. Here the news announcer stands before the microphone to tell you about the accident or the fire. Here the singer sings and the orchestra plays.

Voice and music enter the studio microphone, pass on through the Control Board in the Control Room adjoining, and out through telephone cables to the transmitter at Holden.

Church services, football at Fitton Field, concerts at the Memorial Auditorium, are picked up by microphones on the spot, relayed by telephone to the Control Room, and so on out to the transmitter.

Studios A and B are large rooms within rooms, suspended on springs to avoid vibrations, and carefully soundproofed with acoustone. Studio A will accommodate a large chorus or orchestra.

In addition there is Studio C—the beautifully furnished audition room—which is used by public speakers. For a single voice—especially a speaking voice—its acoustics are ideal.

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2000 Transcriptions

At the WTAG studios is a library of more than 2000 electrical transcriptions, played on a turntable like that of a phonograph. The music is picked up by the needle, goes directly into the Control Board amplifiers and so out to the transmitter. No microphone is necessary.

What will you have? The golden voice of a famous soloist singing a popular song? The music of a great symphony orchestra? The operator can furnish whichever you prefer—and few listeners can detect the difference between the living voice itself and these modern recordings.

Sound Effects

The studios have special paraphernalia for creating sound effects such as wind, fire, the roar of a lion and the hoof-beats of a horse. In addition, there are many special sound effects recorded on electrical transcriptions.

Just as you blend hot water and cold from two faucets into one basin—so the operator can blend any desired sound effects into a radio program.



**AUDITION ROOM
and
STUDIO C**

Control Room

Through the studio windows you may view the Control Board of the WTAG Control Room. This long panel holds a maze of exceedingly delicate apparatus. No visitors are permitted in the Control Room.

One end of this panel is really like a telephone switchboard. Into this board come direct telephone cables from New York and Boston carrying the programs of the National Broadcasting Company's Red Network and the Yankee Network. The operator may connect the New York cable with the cable running out to the transmitter, or he may let the New York music "go to waste" while he sends out to Holden the sermon of a local pastor or the songs of a local soloist which are being received over other lines at the same time.

Received by telephone cables—from the studio next door or from New York or Boston—the sound waves pass through another panel where they are tremendously amplified before being sent on to Holden.

Here in the control room the quality of the program to be broadcast is constantly watched.

CONTROL ROOM



News Broadcasts

of The Worcester Telegram and
The Evening Gazette are given
daily at

8:00 A. M.

1:00 P. M.

6:30 P. M.

11:00 P. M.

In addition, Press-Radio news
bulletins are broadcast daily at

9:55 A. M.

**Over
Radio Station
W T A G**