



Observation Foyer.

**R**ADIO Station WIRE, Indianapolis, Indiana can proudly say that it has one of the finest and most modern studio and transmitting plants in the mid-west. A firm believer in the statement that "Good Engineering is Good Business," WIRE like many other leading stations has gone RCA — ALL THE WAY.

A little more than a year ago WIRE selected a new transmitter site seven miles northwest of the center of Indianapolis. On this site a spacious modernistic transmitter building was erected. The main transmitter room is very spacious, being 26 by 32 feet with a ceiling height of 18 feet. This room houses the RCA 5-D transmitter. Exhaust fans in the rear of the room are used to remove the heat given out from the transmitter.

After almost 14,000 hours of service the RCA 891-R and 892-R

## NEW STUDIOS FOR WIRE

*Indianapolis Station Installs New Equipment in Studios*

air-cooled tubes are still going strong, the filament voltage still being operated at 2 volts under normal.

To the front and center of this room is located the master control desk. From this point the operator has full control of the transmitter and directional antenna system. Four cabinets are located to the left of the master desk. These racks contain such equipment as RCA's new 311-A frequency monitor, 96-A limiting amplifier, 94-D monitor amplifier, 66-A modulation monitor, 303-A frequency-limit monitor and other auxiliary speech equipment.

### Transmitter Building

Upon entering the transmitter building one finds himself in an observation foyer. From this point visitors may view all of the equipment in the main transmitter room. At the south end of the foyer is the office of the chief engineer and at the north end is a well equipped laboratory. Equipment in the lab includes RF and AF measuring units, signal gen-

erator, field intensity set and other measuring and test devices.

On the south side of the main transmitter room will be found two doors, one leads to the auxiliary transmitter room where a complete 1 KW composite transmitter is installed. It is ready for immediate use at all times. The other door leads to the power distributions and spare parts room.

The antenna system at WIRE consists of two 330 foot vertical radiators spaced one-half wave apart. Directional operation during the nighttime hours shields in the east and west directions. The ground system consists of 14 miles of number 8 copper wire bonded to 40 foot ground screens under each radiator.

### Transmission Line

The transmission line feeding the south tower is 160 feet long and the line feeding the north tower is 230 feet long. To do away with any possibility of transmission trouble a 2½ inch concentric line was installed 18 inches above the ground. To give some degree of protection to the concentric line a 2½ inch steel conduit was installed directly above the feeders. In this conduit are the wires for lighting the tower lights and flashing beacons atop each tower, remote antenna meter wires, monitoring wires and relay switching wires for directional operation.

The main AC feeder lines for power service are brought in under ground from two separate sub-stations. During a storm should service from the north be interrupted, instantaneous switching to service from the south can be made.

### Mobile Stations

Just outside the building leading from a large semi-circle drive there is a spacious parking area and garage. The garage houses WIRE's mobile truck and equip-

Master Control Desk at WIRE.



ment. The mobile stations are licensed under the calls WATB, WEII and WEIH.

Shortly after completing the transmitting plant the engineering department of WIRE turned its thoughts to the design and construction of new studios and offices.

The new studios and offices are located atop the Claypool hotel in the heart of downtown Indianapolis.

Neither words or pictures can do justice to the beautiful studios and offices of Radio Station WIRE. In all there are 23 offices, 3 studios, master control room, entrance lobby, clients audition room, observation foyer and recording laboratory. The main studio is equipped with two grand pianos, a Hammond organ, Nova-Chord and a complete set of Deagan chimes. Each noonday a chime concert is played for downtown Indianapolis over a powerful speaker system atop the Claypool hotel.

#### Air Conditioning

Ideal weather, which makes working a pleasure, is manufactured by a giant air-conditioning plant on the roof above the studios.

All rooms are completely air-conditioned with modern machinery developed by the Chrysler-Airtemp company. The air is washed, humidified and cooler heated so that even temperature is maintained at all times, regardless of whether the studio is occupied by one performer or by a large audience. The condensers and compressors for summer cooling are located on the roof, with feed and control lines terminating in the machinery room. In order to eliminate any sound of moving air, and to eliminate the possibility of having sound carry from one studio to another through air ducts, silencers have been installed at both the feed and exhaust outlets.

In designing the station a modified form of modern architecture was used, which makes the place very attractive and the atmosphere very cheerful. Visitor accommodations include a beautiful reception lobby and a spacious

observation foyer. A lounge is also provided for announcers and artists. The executive and business offices total 23 in all, each very spacious and well lighted.

Expansive sheets of vision windows which are of slanting double structure are provided between each studio and the public space adjoining. The master control room has glass on three sides which gives maximum vision for the control technician.

All sound communication between any of the studios, control and audition rooms, has been eliminated by sound isolation treatment. The studio doors are over three inches thick and have rubber gaskets, special locks and automatic closures at the bottom to protect all door openings from outside noise.

Every effort was made to secure the finest available facilities for the WIRE audition room. A spacious sound insulated chamber has been constructed, with every comfort for the client, with the modern motif carried out in the furnishings and decorations. A high-fidelity RCA speaker has been provided and, from this room, any of 11 program and audition channels may be monitored. The audition room is equipped with microphones and signal lights and may be used as a studio should the need arise.



Organ Studio at WIRE.

Each studio is equipped with the latest type RCA microphones. The type of microphone used depends on the nature of the program.

Each executive office is supplied with a special finished RCA high-fidelity speaker and amplifier. A turn of a switch selects one of 11 program and audition channels.

Special precautions were taken in all the wiring throughout the station. Heavy conduit and special bonding reduce all strays to a minimum. Over 65,000 feet of shielded wire was used for interconnections between equipment.

Three factors were kept in mind when designing the equipment for the master control room, (1) reliability, (2) flexibility and (3) simplicity. The very latest type of RCA equipment has been used throughout.

(Continued on Page 24)

Stand-by Studio and Transcription Room.







Cabinet racks in WIRE control room.

## WIRE

(Continued from Page 3)

Five cabinet type racks have been installed for equipment mounting and termination facilities. All racks have jack strips to provide input and output jacking for every piece of equipment used either in the rack or at the control desk. Normal operation requires no patch cords. Stress has been placed on the location of all equipment for convenience of operation as well as accessibility for servicing.

Each studio panel on the master desk has four microphone inputs, four mixer controls, master gain control, four microphone switches, audition and on air switch, monitor and talk-back switch, monitor selector switch and VU meter.

The complete set-up includes three program channels and three audition channels. When needed, one or more of the audition channels may be used for a program channel. Separate amplifiers and mixers are used for NBC and Mutual programs.

All studio and channel switching is done by push-button operation. The equipment at WIRE has been designed with such flexibility that the technicians have yet to find an operating problem which they cannot handle.

Indianapolis can proudly point to WIRE as one of the show places of the city.

## THE DECIBEL SCALE

(Continued from Page 7)

Obviously all these conditions cannot be met by a single definition of resistance change in decibels unless it be encumbered with a complicated ruling such as for instance: "The change in current in db will equal the change in resistance in db, but the change in power in db will be only one half that number, etc., etc." Such a definition would hardly be a mathematical convenience. Furthermore, since we normally do not work with either constant voltage or constant current circuits, but rather with circuits in which the voltage, current, and power will all change whenever the resistance is change, such a definition would find little, if any practical application. For these reasons resistance and impedance changes are not defined in decibels.

A few facts about decibels which are of interest follow:

(1) The decibel is the natural psychological unit of change in stimulus level.

(2) Curves plotted in decibels present to the eye a more accurate picture of what the ear (and brain) hears.

(3) A curve whose ordinate scale is linear in decibels has the same percentage accuracy all over the ordinate range, even at the bottom of the page. This is particularly important with automatic or semi-automatic curve tracing equipments, in which case, the accuracy from a linear ordinate scale is so poor as to render the curve useless at or below 5% to 10% of full scale deflection.

(4) Curves plotted in db (to the same scale) may be directly compared by superimposing them over a light source (if on semi-transparent paper). This saves a tremendous amount of replotting and calculating, particularly when comparing curves of considerable irregularity, as for instance, sound pressure curves.

(5) Curves employing a decibel ordinate scale are not necessarily smoother than the same data plotted to a linear scale. It is purely a matter of scale selection. If the curves occupy the same ordinate space, the decibel curve will exhibit lower peaks but deeper dips.

(6) The decibel being a unit of power *ratio*, it is necessary to specify the reference level when giving performance indices in decibels. To state that the power output of an amplifier is 40 decibels is meaningless unless a reference level is also stated, as for instance, 40 db above one milliwatt. In this respect, the industry is guilty of loose usage of the decibel as an index of performance, and one repeatedly sees microphone sensitivities, amplifier hum and noise, amplifier output, phonograph pick-up outputs and line power levels specified in db without mentioning a reference level. In all cases, a reference level is implied, but since many of them are not yet standardized, the figures given are, to say the least, ambiguous. Sound levels, intensity levels, loudness levels and noise levels may be correctly stated in db without mentioning the reference, since for acoustic work, zero level of intensity has been standardized (at  $10^{-16}$  acoustic watts per square centimeter).

(7) Transposition from linear units to decibels can be most easily accomplished on an ordinary polyphase slide rule or log slide rule if the C, CI and D scales are used for voltage and current values and ratios, and if the A, B and BI scales are used for power values and ratios. The result of a calculation then can be read directly in decibels on the L scale, remembering to multiply by 2 (since the L scale is 10 units long whereas the slide rule is 20 decibels in length). Care must be taken to locate or define zero db correctly.