

HOOSIERS LISTEN

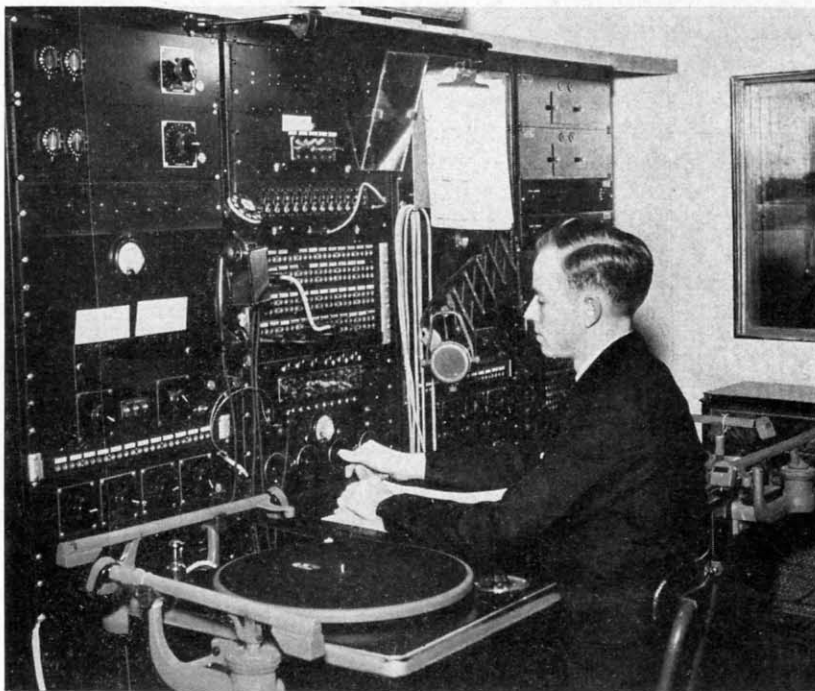
South Bend Station Goes All

WITH the installation of new RCA High-Fidelity transmitter and speech equipment and new acoustically treated studios, WSBT-WFAM launches a new era of service for the discriminating radio listener.

Growth of Station

WSBT, owned and operated by the South Bend Tribune, first went on the air in June, 1922, and was authorized to broadcast under the call letters WGAZ. Since that day the station has always endeavored to serve the public with the best entertainment. In order to provide more adequate service WFAM was purchased in 1931. The schedule of these two stations has been arranged so that when one station signs off, the other one signs on. Local popularity of these stations is attestable by the fact that in November a telephone survey showed 78.3 of the listening audience in South Bend was tuned in on WSBT-WFAM.

To better serve this audience, a year ago the Tribune decided to buy the most modern equipment. First, new studios were construct-



New racks of Speech Input Equipment.

ed utilizing the latest in design and accepted acoustical knowledge. The finished result is, studios modernistic in design air conditioned and attractively furnished. RCA velocity microphones are used in all studios and High-

Fidelity RCA monitor speakers are used for talk back circuits, cueing and guest entertainment purposes and indirect flush lighting systems are employed in all studios and all doors, windows and ventilator ducts are sound proofed against outside noises.

Special Press Problem

The greatest problem was presented by the presses which transmit vibration through the columns of the building. The new presses which were installed in the Tribune this summer were mounted on springs. Tests show that these springs have eliminated 90% of vibration. The Tribune is the third newspaper in the United States to mount its presses on springs. Another problem though less serious was presented by the Intertype type-setting machines. Vibration from these machines can be eliminated by mounting them on rubber pads. Experiments are still being made to determine the best type of pad for this purpose.

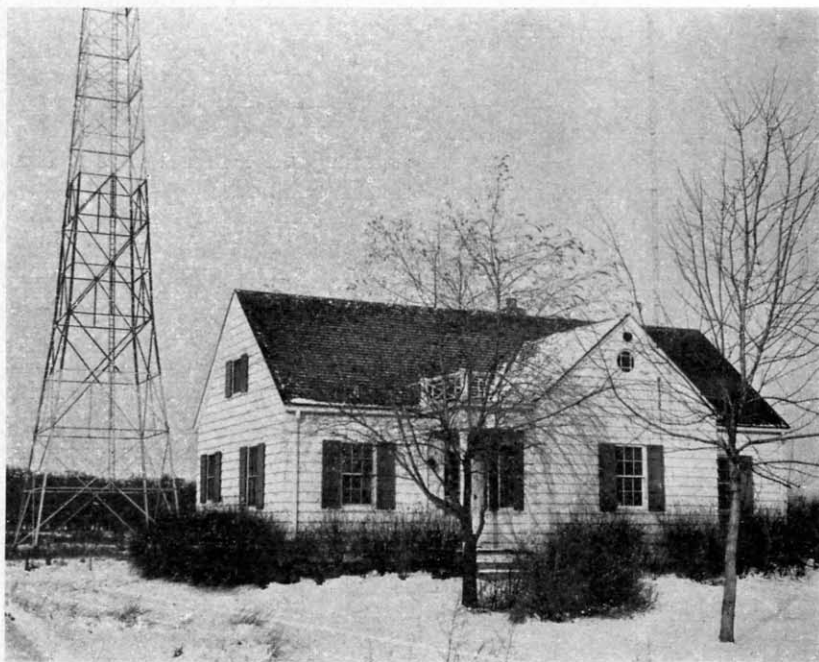
Complete new speech input equipment in the form of twin



Aerial view of South Bend.

N ON NEW WSBT

Way With RCA in Modernizing



The Colonial bungalow which houses the transmitter.

racks controlled by a central master control has been installed. It is now possible for the operator to preset any or all of the four input channels by rack for audition or program purposes. The flip of a single key places either rack in operation on the broadcasting line to the transmitter. All apparatus by this method is duplicated in its entirety and insures against partial or complete failure. Uninterrupted service is thus insured to the listeners of WSBT-WFAM.

Monitoring Speakers

Visitors to the studios are entertained by the many monitor speakers which are located in the executive offices and in the reception rooms. Executives have speakers equipped with selectors making it possible to listen either to auditions or programs. Talk backs are so arranged as to permit direction of skits and programs from remote points in the offices on direction from the master control. RCA transcription equipment is used throughout and can handle both vertical and lateral transcriptions.

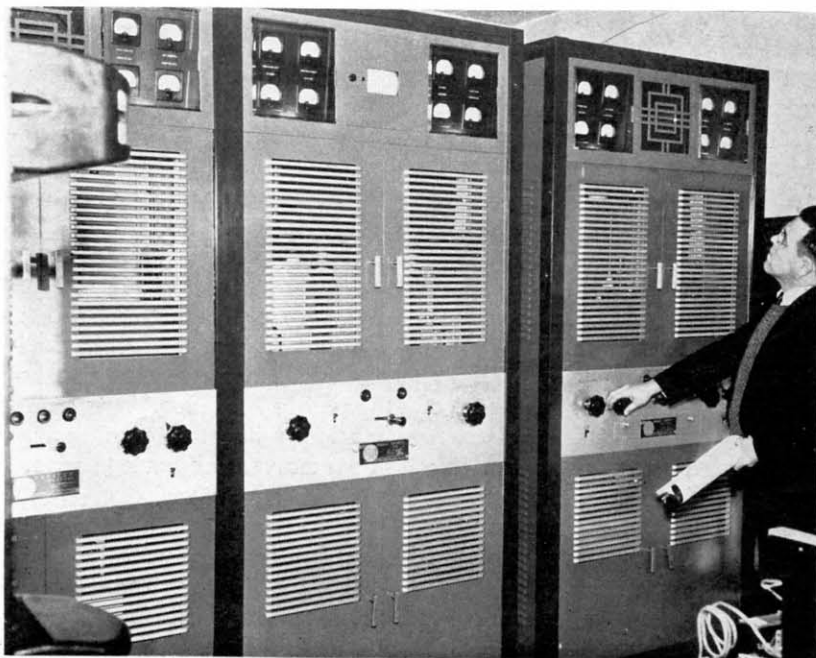
Notre Dame University lies just outside the city limits of South Bend and from the WSBT-WFAM studios on the campus come many interesting programs. The officials of the University have graciously constructed a studio in the engineering building and the

Tribune has installed complete RCA High-Fidelity speech input equipment.

Bungalow Type Transmitter House

The distance from Notre Dame to the transmitters is about six miles by air and visitors to this site, see as they approach two steel towers 200 feet in height located some 100 yards apart with a heavy steel cable suspended between them bearing the weight of a vertical cage antenna. The lower end of the antenna is terminated in a white, colonial type bungalow which serves to house the new High-Fidelity RCA transmitters. WSBT, the higher powered of the two, is rated at 500 watts and is of the 1-D type. WFAM, a 100 watt job, is a No. ET4240 type. Both transmitters utilize the same antenna for a radiating system and since neither is operated simultaneously a switch is used for connecting from one transmitter to the other. This change can be made in a matter of seconds and both transmitters are utilized twice during the 17 hours daily sched-

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The new 5-C 5 KW Transmitter at WSBT.

PROBABLE PERCENTAGE MODULATION

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ator) in such a way as to obtain 100% modulation constantly, at every instant during operation. In the first case the gain control should naturally be set so as to obtain exactly 100% modulation with the loudest sound ever to be broadcast, and in the second case, there should naturally be sufficient gain available in the microphone amplifiers to give 100% modulation with the weakest sounds encountered.

It is easy to show that these two cases provide actual limits to the modulating energy occurring at the various frequencies. The percentage of modulation existing under the first assumption represents a lower limit to that which is likely to be found. The transmitter is then adjusted to be modulated 100% by only one source of sound, i.e., the most intense one. This maximum intensity occurs at only one frequency, so that, at all other frequencies, the percentage of modulation is necessarily smaller. Under the second assumption, the modulating energy obtained represents an upper limit, since the transmitter, in this case, can be modulated 100% at many more than one frequency.

Computing Modulating Energy

For our purpose then, it is sufficient to compute the modulating

HOOSIERS LISTEN IN ON NEW WSBT

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ule. From 1360 kc., WSBT, to 1200 kc., WFAM, is quite a jump on the dial but experience has shown us at WSBT-WFAM, that good programming and the ability to give the people real radio service

energy obtained at various audio frequencies under these two assumptions. In the first case, the highest sound pressure observed in each one of the 13 bands is taken, without any consideration as to which instrument produces it. The greatest of these energy values is then chosen as giving 100% modulation in the transmitter, and the twelve other figures are converted accordingly to obtain the corresponding percentage of modulation in each band. This is shown graphically in Fig. 1. It is convenient to speak of the modulation percentages thus obtained as resulting from absolute sound pressures, since these pressures are arranged according to their absolute magnitude.

Under the second assumption, the highest sound pressure in each band is also taken, but in this case the relative value of this pressure is considered rather than its absolute magnitude. The modulation percentage obtained in any one of the thirteen bands is

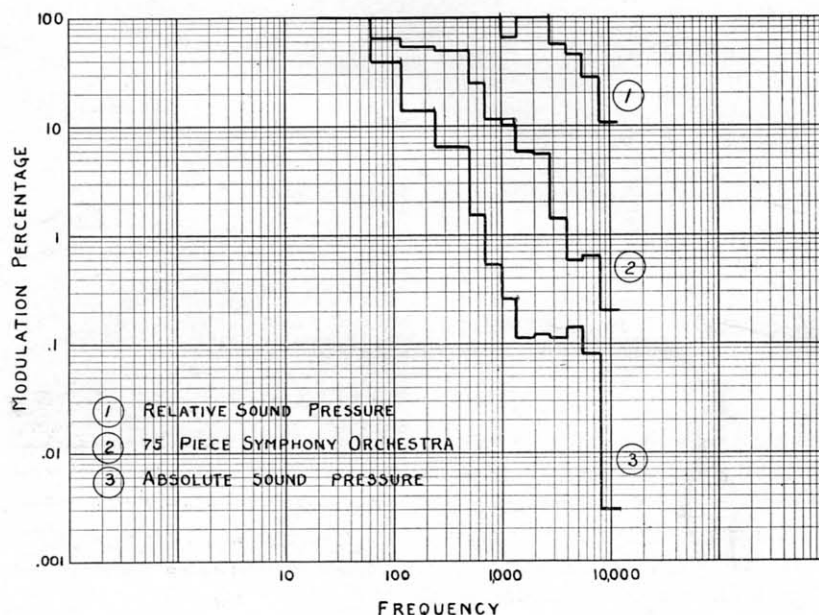
has taught them that it is wise to change when stations change.

The transmitter house is modern in every respect and the grounds around the bungalow have been landscaped and gardened.

WSBT-WFAM invite visitors to South Bend to call and inspect the station and equipment.

equal to 100% whenever an instrument (or combination of them) develops sound energy reaching a maximum within that band. When there is no maximum within a particular band, the modulation percentage corresponds to the sound pressure of that instrument (or group of them) which is closest to its maximum. The results can be represented as shown in Fig. 2. The dip of the curve to 63% modulation between 1000 and 1400 cycles simply means that no source of (musical) sound could be found which developed more than 63% of its maximum energy within that band. The curve shows, however, that instruments were found which developed their maximum energy at every other frequency up to 2800 cycles. Beyond this point, no instrument or orchestra has any maximum. Modulation percentages shown on Fig. 2 correspond to relative sound pressures, since these pressures are chosen according to their value with respect to an arbitrary maximum.

FIG. 5



Comparison

For purposes of comparison, the modulation percentages from a 75 piece orchestra, and for normal speech, are shown in Figs. 3 and 4. The values given also correspond to relative sound pressures. That is to say, 100% modulation corresponds in each case with the maximum sound pressure of the particular source considered.

Fig. 5 shows both the modulation from absolute and from relative sound pressures (Figs. 1 and 2,) together with the modulation from a symphony orchestra. It is interesting to note that the modulation percentages given for the orchestra fall in the limits assigned by the values of Figs. 1 and 2.