

BROADCAST NEWS



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EQUIPMENT

RCA Victor Company, Inc., Camden, N.J.

NUMBER 1

OCTOBER, 1931



RCA Victor Company, Inc.

A Radio Corporation of America Subsidiary

Camden, N. J.

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BROADCAST TRANSMITTERS

POWER RADIOTRONS

POLICE TRANSMITTERS

POLICE RECEIVERS

SPECIAL COMMUNICATION EQUIPMENT

BROADCAST NEWS

Edited by
E. JAY QUINBY

NUMBER 1

OCTOBER, 1931

OUR BIRTHDAY ANNOUNCEMENT

To those who are responsible for the present success of the Broadcasting Art,—to those who devote their time and attention to the advancement of this fascinating and highly useful triumph of radio service, we modestly present this publication in the hope that it will provide a pleasant and convenient medium for the exchange of ideas and information,—and that it will bring its readers into closer harmony for their own benefit and for the benefit of the American people whom we all serve in this enterprise.



L. W. YULE, Manager
Engineering Products Division
RCA Victor Company, Inc.

Published Occasionally by
RCA VICTOR COMPANY, INC.
CAMDEN, N. J.

Station KFI, Los Angeles

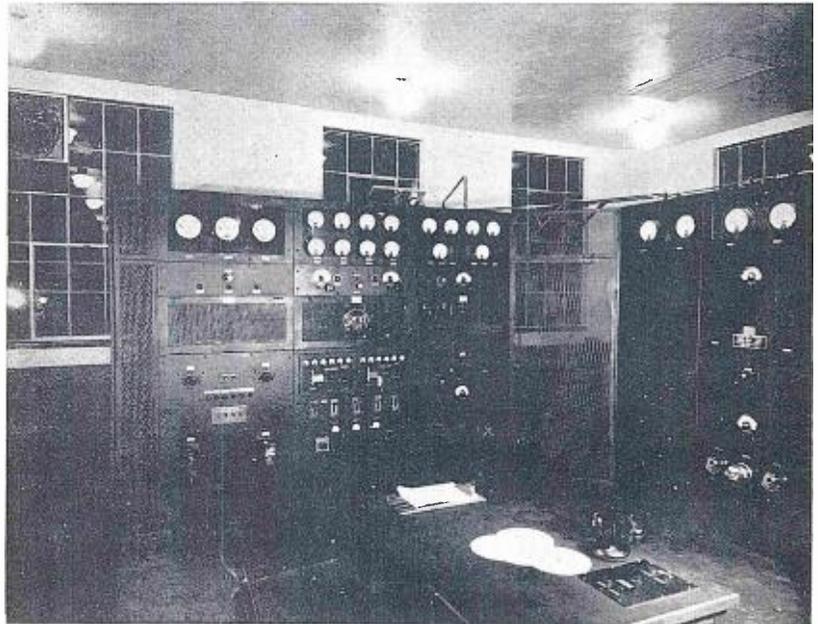
By I. R. BAKER

Manager Transmitter Sales, RCA Victor Co., Inc.

KFI, the first 50 Kilowatt Broadcast station West of Texas was recently completed near Los Angeles, and is owned and operated by Earl C. Anthony, Inc. Until recently, KFI had a power output of 5 KW and the greatly increased output of the new transmitter not only expands the range considerably, but also improves the local reception of the station.

The transmitter is located approximately 20 miles from the city of Los Angeles, on a 30 acre tract of land near Buena Park. After extensive field strength tests by engineers of the RCA Victor Company, this location was chosen to provide a "circular pattern" for the coverage, providing approximately equal radiation in all directions from the point where the signals are generated.

A handsome two story building of brick, steel and concrete has been erected to accommodate the transmitter and associated equipment. The auxiliary devices are located on the



RADIO FREQUENCY UNITS OF KFI.

first floor, and the transmitter proper and control panels are located on the

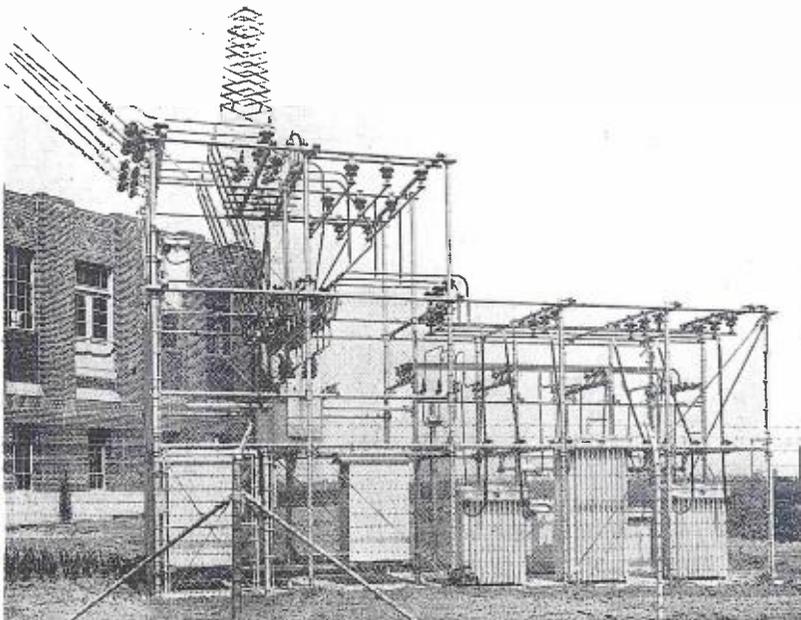
second floor. A semi-circular arrangement of the control panels and instrument boards makes for a maximum of convenience and efficiency so that the operator who sits at the centrally located desk can observe the performance of the entire installation from this one position.

A pair of steel frame towers have been constructed, 700 feet apart, and the station building is located 475 feet from the midpoint of a line joining the two towers, so that the building and the two towers form an approximately equilateral triangle.

The transmitter is of the very latest design, known as the RCA 50-B standard unit, and represents the best that engineering skill and expense can provide.

From left to right, the control panels shown in the illustration of the operating room are:

- a. Low Power Rectifier and Automatic Control Unit.
- b. Exciter Modulator Unit (with crystal oscillator units).



THE POWER DISTRIBUTION FRAMES AT KFI WITH A SECTION OF ONE OF THE 400 FT. TOWERS IN THE REAR.

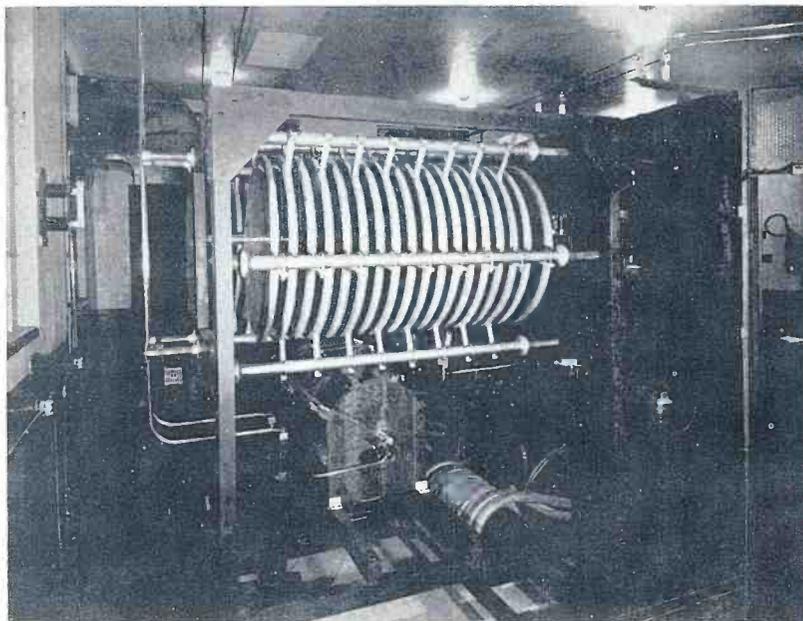
- c. 5 KW Amplifier Unit.
- d. 50 KW Amplifier Unit.
- e. Main Control Panel Unit.
- f. Main Rectifier Unit.

There are many outstanding features in the design of this type of transmitter.

Screen grid Radiotrons are employed throughout wherever practical, to preclude the necessity of neutralization.

The Crystal oscillator stage employs one UX 210 Radiotron in the circuit with a quartz crystal accurately ground to a frequency of 640 KC at specified temperature. The crystal is mounted in a specially designed compartment in which the temperature is maintained constant by means of an automatic heater and a sensitive thermostat regulator, which confines the temperature variations within extremely narrow limits. Two complete crystal oscillator units are provided and so arranged that immediate transfer may be effected from one to the other.

The new 100 KW Radiotrons, UV 862 employed in the final power amplifier unit were developed especially for use in these 50 KW transmitters, as it is desirable to avoid paralleling of tubes in class "B"



A "CLOSE-UP" OF ONE OF THE HUGE TUNING CONDENSERS USED IN THE FINAL 50 KW. AMPLIFIER STAGE OF KFI. THE CONDENSER IS BALANCED, AND THE OTHER HALF CAN BE SEEN IN THE REAR. SINCE THE DIELECTRIC IS AIR, THE CONDENSER IS SELF-HEALING IN CASE OF SURGES.

operation. Unless great care is exercised in the design of such amplifiers, the result will be instability, which manifests itself in poor quality and short tube life, to say nothing of "flashovers" and service interruptions. However, the class "B" or

linear amplifier which was designed for this type of transmitter overcomes these shortcomings, and provides efficient performance coupled with reliability.

Mercury vapor rectifier tubes are employed in this transmitter, and the rectifier is so designed that when the voltage is first thrown on the tubes, it will be only 10,000,—after which the regulator automatically brings the voltage up to the normal 18,000,—which process protects the tubes. The rectifier is of the three phase full wave type, employing a newly developed low-loss mercury vapor rectifier tube, and effects a great saving over the former water-cooled type of power rectifiers.

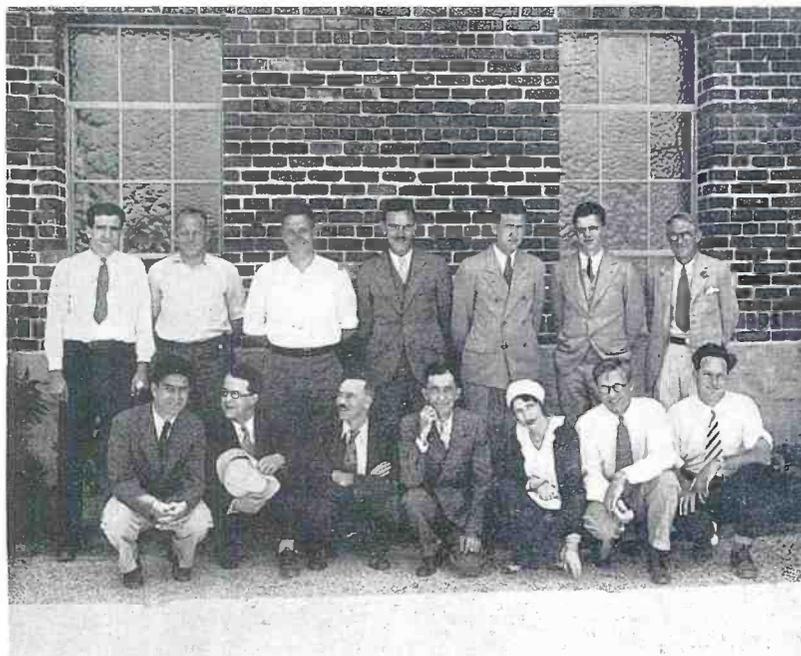
A two wire radio frequency transmission line connects the 50 KW transmitter with the antenna coupling and tuning apparatus, which is located in a separate building directly under the antenna itself. The transmission line has an efficiency of nearly 100%, the only loss being that of I²R loss in the conductors which is negligible.

Every modern safety feature for the protection of operating personnel and equipment has been included in the design of this station. Some of these features are:

Water flow relays that prevent injury due to water failure.

Water temperature indicating thermometers.

(Continued on Page 12)



THE PERSONNEL RESPONSIBLE FOR THE CONSTRUCTION OF THE KFI STATION.

Microphone Placing

By T. A. SMITH

Engineering Products Division, RCA Victor Co., Inc.

SINCE the early days of broadcasting, engineers have been striving to obtain the utmost naturalness of reproduction. With the great improvement in receiving sets which has occurred during the last few years, listeners have become more discriminating and poor quality which was tolerated in the early days is no longer considered satisfactory.

Great improvements have been made in the frequency characteristics of studio equipment. For example, all RCA speech input equipment has been designed to pass frequencies in the range of 30 to 10,000 cycles. Transmitters have been constructed to handle the higher tones which were formerly suppressed. The use of condenser microphones has been responsible for improved fidelity as well as easier pickup of musical programs. These factors have made for better broadcasting, but there is another factor which has an important bearing on the naturalness of reproduction. This factor is the proper placing of the condenser microphone.

When carbon microphones were in general use for studio pickup, it was necessary to crowd the artists about the microphone to obtain a level high enough to overcome the microphone hiss. Since the advent of the condenser microphone, a more natural arrangement is possible, but nevertheless proper microphone placing is necessary for best results.

Formerly, for a large orchestra pickup, several microphones were used to obtain a high level at each unit. The various microphones were balanced electrically to obtain the desired result. However, this arrangement was subject to distortion caused by the fact that the output from the various microphones was not in phase. Such distortion was not always apparent, but was often attributed to studio acoustics. It sometimes resulted in a hollow effect,

or other unnaturalness, similar to that caused by acoustic resonance.

General practice now demands the use of a single condenser microphone or at most two, nearly adjacent. For a combination of a soloist and orchestra, two spaced microphones are frequently employed, but the solo

balance between instruments, it is well to consider this type of pickup.

It is obvious that the amplitude of the drums should be proportionately lower than the remainder of an orchestra. Neither would a stringed quartet with the bass predominant be musically correct. Proper placing

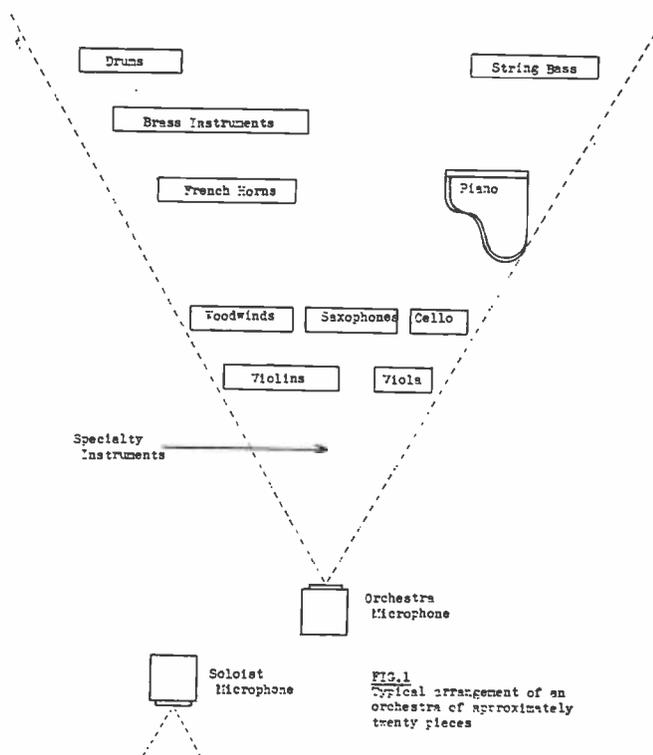


FIG. 1
Typical arrangement of an orchestra of approximately twenty pieces

microphone is so placed that relatively little instrumental pickup is obtained.

The primary purpose for careful placing of the microphone is to obtain a definite balance between the volumes produced by each of the artists or instruments. Proper placing also assures the most natural reproduction of each artist or instrument and prevents blurring when a large group is being broadcast. Since the broadcasting of an orchestra demands careful

of the microphone will prevent such errors. Every instrument in an orchestra should be heard at the loud speaker, in the same relative proportion that an observer would hear it, were he listening in a concert hall, with the musicians in their normal positions.

Theoretically each arrangement of an orchestra or ensemble should be checked by a trained musician in order to obtain proper relation between individuals. However, experience

has shown certain arrangements to be satisfactory under most conditions. Naturally the acoustics of a particular studio will influence the results, but in general the principles stated herein hold true.

Any diaphragm type of microphone will have certain directive characteristics which must be taken into consideration when placing the microphone. For example high frequency sources will produce less output when placed at the side of a microphone than when placed directly in front. It is therefore necessary to put musical instruments which are rich in overtones in front of the microphone, or nearly so. If this is not done the distinguishing characteristics of the instrument will be lost. The harmonics which lend individuality to the violin, for example, will be lost and the tone will resemble that of a flute. The brassy sound of the trumpets will not reproduce unless the instruments are in front and not to the side of the microphone. This does not mean that these instruments need to be near to the microphone, but that they be placed so that they are within a cone whose vertex is at the microphone and whose angle "A" (Figure 2) does not exceed about 30°.

Among the instruments which should be located in this manner are the treble stringed instruments, woodwinds, trumpets, cornets, etc.

The drums are generally placed at a greater distance from the microphone than any other instrument. Cornets, trombones, and tubas are usually located some distance from the microphone on account of the large sound output. Flutes, violins, piccolos, oboes, are placed closer to the microphone with banjos, cellos, and specialty instruments somewhat nearer. Figure 1 shows a typical arrangement.

For a piano solo, the microphone may be located approximately five feet from the instrument and for a concert type is generally placed nearer the treble end.

For transmitting speech, such as talks or plays, it is well to have the participants stand from 6" to 24" away. Speech should be directed directly towards the microphone when the speaker is further than one foot from the diaphragm. The speaker should use a conversational tone of voice. If the voice is raised, the percentage of overtones in the

voice is increased, while due to technical limitations the volume cannot be increased proportionately, creating an unnatural condition.

Consequently loud speech sounds less clear and distinct than that of moderate intensity. If the speaker is too far from the microphone the overtones are apt to be reduced, and the distinguishing characteristics of the voice will be lost.

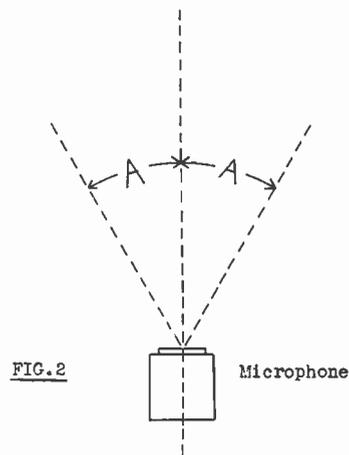


FIG. 2

For announcements, many prefer to have the announcer talk extremely close to the microphone, facing it at an angle of about 45°. When less than 12" from the microphone, the sibilant sounds will be somewhat exaggerated if the speaker faces directly toward the diaphragm. This effect can be used to advantage when

it is desired to give the impression that the speaker is very near, or is whispering.

When making announcements, many stations use an additional microphone so that it will not be necessary to change the volume control setting due to the difference in level between the announcer and the musical program. An announcer type microphone is a useful addition to the station equipment for this purpose.

It is perhaps desirable to keep the peak level of announcements slightly lower (about 4 db) than that of the regular program. This gives a suitable difference in level between the voice of the announcer and the orchestra or band which may have preceded him.

Many stations have devoted a great deal of time to determine the proper placing of their microphones for best results. It is not intended that this article recommend any other arrangement than the one which produces the most natural sounding reproduction. However, it may be of some use in explaining the properties which require proper placing and may suggest some changes which will be of value.

Thanks are due for suggestions on this subject made by Mr. R. M. Morris of the Plant, Operating and Engineering Department of the National Broadcasting Company, Inc.

Willing to Cooperate

WJZ lapsed into temporary silence, owing to the fact that an S.O.S. message held the ether in its ominous grip. The station staff sat back and awaited developments. Presently, as always happens at such times, the telephones tinkled—the public began calling up to find out what was wrong with the program.

In their usual courteous manner, the boys patiently answered each call, explaining the cause for the sudden shut-down. Came the voice of one dear, old lady—"I'd like to know what is the trouble—here I am listening to a very entertaining program, and right in the middle of it, my loudspeaker quit speaking—is anything wrong over there at the station?"

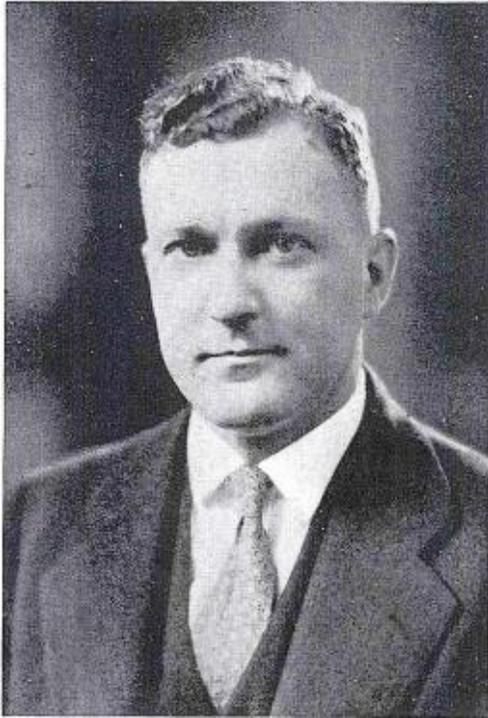
To which one of the staff courteously replied, "No, ma'am, we just had to shut down for an S.O.S., that's all."

"What an excuse!", continued the voice at the other end—"What an excuse! What is an S.O.S. anyway?"

"Well," explained the operator, taking a deep breath, "an S.O.S. is the signal of distress from some ship at sea, which may be on fire or sinking, endangering the lives of passengers and crew, and we always shut down immediately in a case like that."

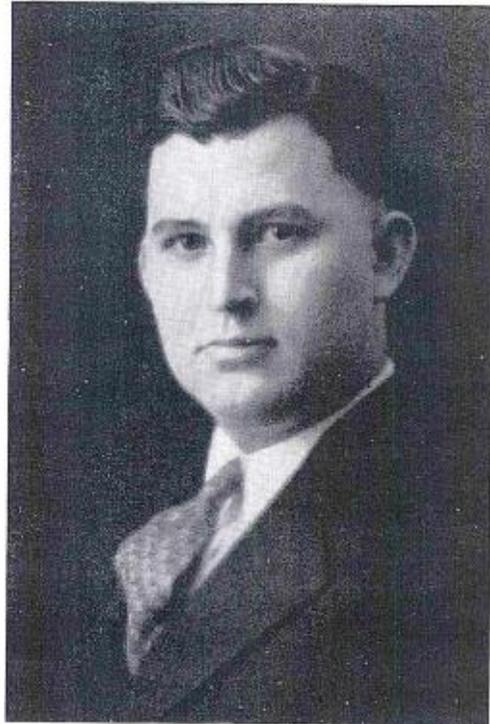
"Oh dear," came the voice of the nice, old lady—"Oh dear, I'm so sorry, I didn't understand at all—it's perfectly all right to do as you say—and if there is anything I can do to help, you'll let me know, won't you?"

LET'S GET ACQUAINTED



L. S. YULE, Manager Engineering Products Division RCA Victor Company, Inc.

THE ENGINEERING PRODUCTS DIVISION, OVER WHICH MR. YULE HAS CHARGE, INCLUDES NOT ONLY THE TRANSMITTER SALES SECTION, BUT ALSO SUCH OTHER ACTIVITIES AS CENTRALIZED RADIO, SPECIAL (CUSTOM-BUILT) PRODUCTS, FARADON CONDENSERS, DIRECTION FINDERS, AND COMPONENT PARTS



I. R. BAKER, Manager Transmitter Sales Section RCA Victor Company, Inc.

HIS ACTIVITIES INCLUDE BROADCAST TRANSMITTERS, POWER RADIOTRONS, POLICE TRANSMITTERS, POLICE RECEIVERS, AND SPECIAL COMMUNICATION EQUIPMENT

Broadcasting Personalities

J. C. Randall, Plant Manager of WTIC, down in Hartford, Conn. is Police Commissioner of East Hartford. Since "Clayte" bought that new Auburn convertible roadster which can do eighty-five, he wears his badge more conspicuously.

E. J. Gluck, manager of WBT, Inc., down in Charlotte, N. C. was televised on his last visit to New York. Paul Rosekrans, the engineer of WBT, says there is no living with him now.

"Phil" Weiss of WSYB, in Rutland, Vt. says the station will move to a new location in the city sometime in October.

In a recent broadcast from W2-XAB, Columbia's Television Station in New York, a number of valuable jewels were transmitted. It's easy to give a million dollars worth of entertainment this way.

"Ray" Gaul, who is busy installing a new RCA 1 KW transmitter at WEEU in Reading, Pa. has been broadcasting the county fair for WRAW.

"Bill" Foss of WCSH in Portland, Me. is reported to have a new plane which pushes the wind aside at a speed well over 200 mph. Bill won't be happy until he can beat the signals from WCSH into Boston.

The manager of WFI, Philadelphia, Mr. E. Lewis has returned from a trip abroad. He planned to include a stop at the Welch Music Festival (the real name of which is practically unpronounceable on this side of the Atlantic).

Frank Marx of WMCA, Broadway's own station, spent his vacation on a trip south. He managed to get as far as Texas by jumping from station to station.

Hunter Copeland of Newport News, Va. showed real ingenuity when WGH had a studio fire by transferring the studio to his home where broadcasting was carried on.

RCA Victor Personalities

"C. F. Coombs, Pacific Coast Representative of RCA Victor Visits Camden." (Says Police Warning.)

Just a breathing spell after supervising the installation of the new RCA 50 kilowatt transmitter—on his trip East he learned how to stop a fan and how not to stop a fan—ask him about it, but don't shake hands with him with too much enthusiasm.

It's the ambition of several of us to get George Chase and "Joe" Cummings together discussing climate—not to mention the respective merits of their 50-KW transmitters. (Just between us, they're identical sets.)

Sidelights on Baker's Dallas & San Antonio trip:—He had a good time—at least everyone told him so.

He occupied the same suite of rooms as Clara Bow did—formerly.

He cannot understand why everyone who came back from Dallas raved so much—He knows now, it's the climate.

J. P. Taylor one of the men who does a lot of work at the National Office, recently entered the holy state of matrimony. We offer our heartiest congratulations and besides we admire an optimist. Just in passing:—he gets in at the office even earlier than before. We can't figure out whether this is because of or in spite of the fact that he is now in double harness.

Freddy "What A Man" Weber... you know—the NBC chap from Chicago who agrees with you about the programs you should take—was in the East recently. Nuf sed.

R(adio) F(requency) Guy(—Any way the radio frequency engineer of NBC) has just returned from a vacation. What surprises us, he didn't go to Canada—He says that New Jersey is all right.

He has just observed and "deddied" the installation of the new RCA 50 kilowatt transmitter at WJZ, a sister station at WEAf.

Stanley Lucas, KFyR's Chief Engineer, visited Chicago recently. As usual, upon departing, he was

accompanied to the train by Harold Vance and "Freddy" Weber.

P. J. Meyer, owner of the above station, tells us he is making a trip to Camden shortly. We always

from the world famous research laboratories of the General Electric, Westinghouse & RCA Victor."

It would be amusing—very amusing to us—to see Harold Vance



GEORGE GRAY, ENGINEER AT WEAf, AND RAYMOND GUY, ENGINEER OF NBC, DISPLAY THE MUTT AND JEFF OF RADIOTRONS.

look forward to these trips. Well do we remember the last one.

When Harold Vance was congratulated on being "daddy" he remarked modestly, "Oh! that's nothing." The boy has been named "Radio."

In discussing the offspring Vance said—"Yes, 100% modulation, precision control, low loss rectifier tubes, all the result of knowledge obtained

walking the floor at 3 A. M., trying to turn off the "loudspeaker." What's a few squeals or heterodynes more or less these days?

WGH is owned by a chap who also runs an amusement park and bathing beach. We're tempted to accept his invitation to come down and try them, but we're rather doubtful about being able to wade through the corn.

What Is Your "Coverage"?

By J. P. TAYLOR

Sales Engineer, RCA Victor Co., Inc.

WHAT is your coverage? That is what Mr. Advertiser is asking you, Mr. Broadcaster. Can you tell him? Can you give him figures—or must you guess? Can you lay before him a map showing accurately your area of influence? Unless you have an up-to-the-minute field survey, Mr. Broadcaster, we doubt if you can.

Your daytime service area—your nighttime service area—these should not be a matter of conjecture. Don't make the mistake of thinking field intensities mean nothing to your advertisers. The chains and big stations have educated them. You



FIG. 3. CUMBERSOME OLD-STYLE FIELD INTENSITY MEASURING EQUIPMENT BEING USED BY MR. ADLER, RCA VICTOR SALES ENGINEER, OCTOBER 1930.

can't fool them anymore—why keep on fooling yourself. Be prepared, Mr. Broadcaster, to back your claims of "coverage" with facts on field strength as well as figures on population.

Broadcasting is no longer a game of blind man's bluff. Those prized DX records hold no interest for advertisers. Your audience of today, Mr. Broadcaster, is right in your own backyard. Your once despised ground-wave has replaced in importance that erratic sky-wave. But the advantage is yours for this ground-wave is a more dependable thing. You can count on it. You can meas-

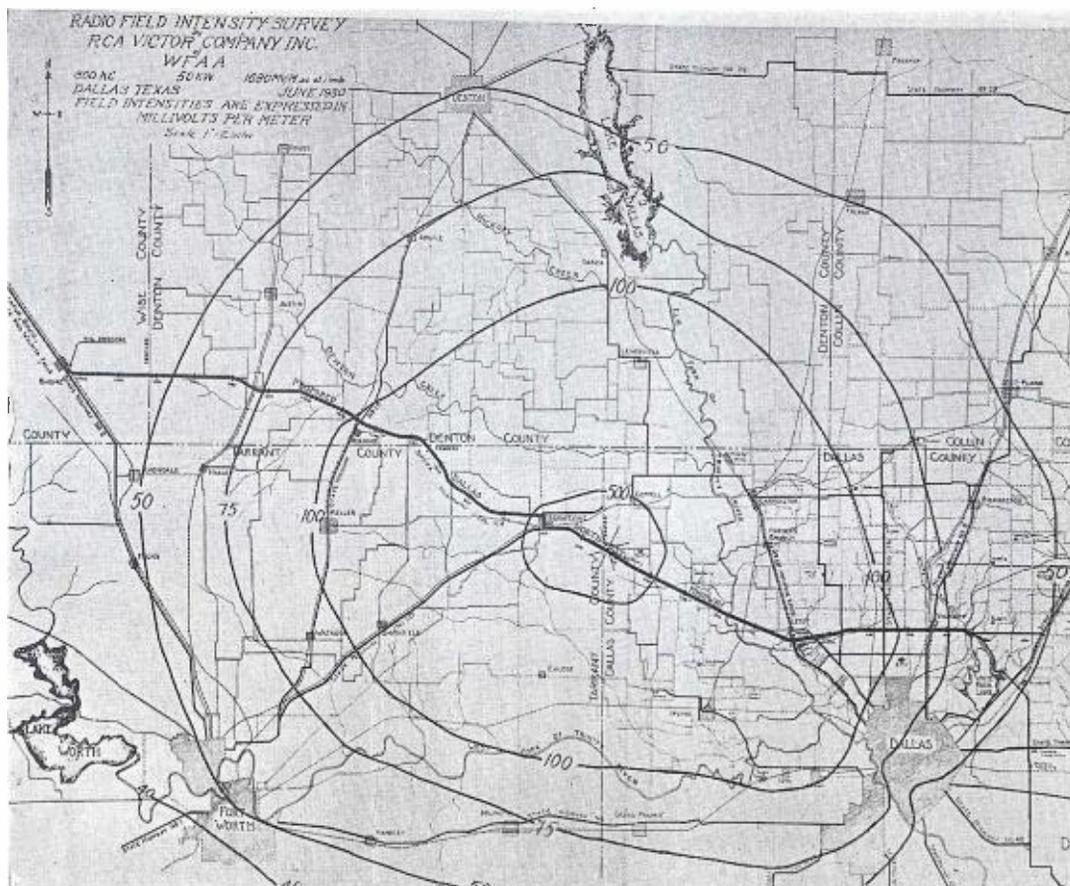


FIG. 1. A FIELD SURVEY INDICATING ACCURATELY THE INTENSITY OF WFAA'S CARRIER IN THE TWIN CITIES OF DALLAS AND FT. WORTH.

ure it—in absolute units which can be compared to the transmissions of other stations. From such measurements you can draw contours of field intensity about your transmitter, as in Fig. 1, which will accurately indicate the area in which you furnish an adequate signal. Or you can make a planograph, such as Fig. 2, showing the progressive attenuation of your signal in a given direction. A diagram such as the latter may be exceedingly useful in determining interference and cross-talk limits. The one shown here was submitted as evidence before the Federal Radio Commission.

Are you equipped to measure your field intensity, Mr. Broadcaster? Recent developments have eliminated the former disadvantages of the equipment for this use. The cumbersome outlay shown in Fig. 3 has been replaced by a single unit mounted in a case whose maximum dimension is eighteen inches. Old-style equipments were portable only in the sense that they could be carried around in a car. New equipments can without difficulty be carried off into a field—away from interfering wire lines—and conveniently set up on a tripod mounting, see Fig. 4. The new three volt battery tubes have made possible operation from self-contained batteries and obviated the

(Continued on Page 12)



FIG. 4. NEW TYPE TMU-21 FIELD INTENSITY METER BEING USED IN THE FIELD BY MR. GIHRING, RCA VICTOR ENGINEER. NOTE COMPACTNESS AND CONVENIENT TRIPOD MOUNTING.

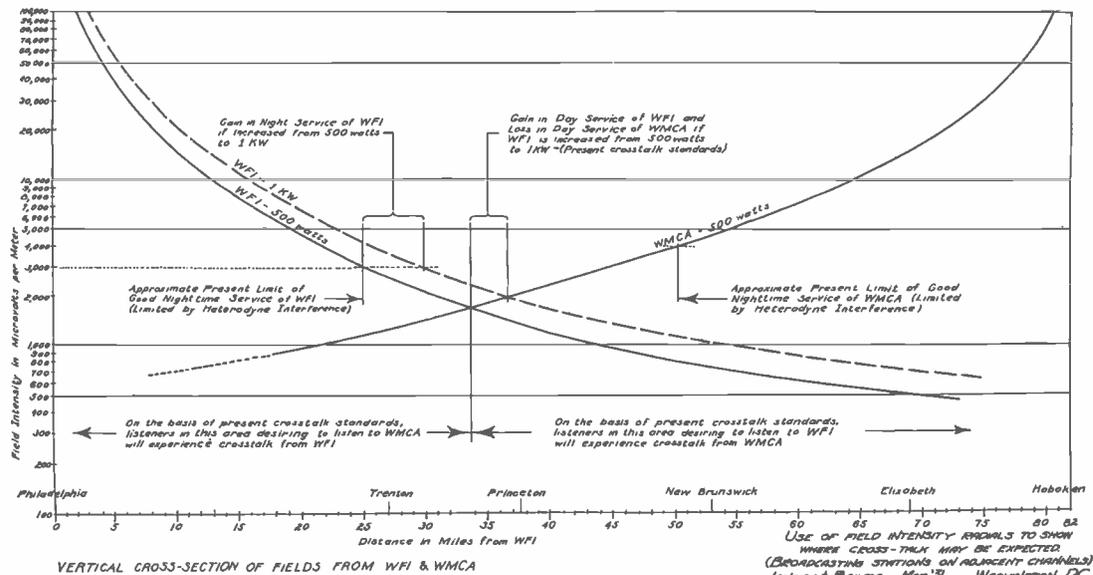


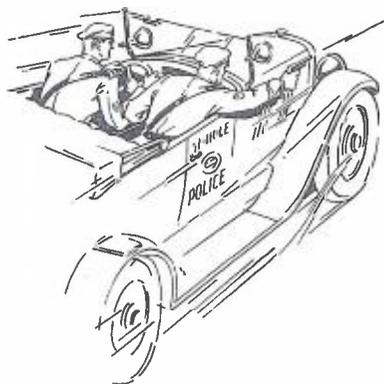
Fig. 2 Planograph showing attenuation of WFI's carrier along a line between Philadelphia and New York. This is reproduced through the courtesy of station WFI, Strawbridge & Clothier Company of Philadelphia, and of Jansky & Bailey, consulting engineers who made the survey.

Police Alarm Broadcast Apparatus

The Transmitter

WHEN properly installed and operated in conjunction with suitable receiving equipment the Model ET-3670 Police Alarm Broadcast Transmitter provides a reliable and efficient means of communicating police alarms and other valuable information to police officers operating bandit chasers, squad cars, etc. The value of such service has already been demonstrated, and the cost of installing and operating such a radio system is considerably less than the amount that would be required to provide enough patrolmen to protect the same area without the use of radio.

Unlike the telephone, the telegraph, or the usual alarm systems which may be interrupted by wire cutting, the radio communication facilities can not be cut off by criminals or by accidents to lines which might interfere with ordinary communication systems.



Construction

The Model ET-3670 Police Alarm Broadcast Transmitter is ruggedly constructed of the best materials obtainable. It is designed to eliminate so far as possible the necessity for frequent adjustments in service, but it is so constructed that, should such adjustments become necessary, all parts are rapidly accessible for adjustment, repair or replacement. As designed, the unit may be placed in any convenient location, and may be readily moved, as the wiring external to the transmitter is very

simple. Adequate protection to the operating personnel is provided by interlocks on the removable side screens. All dangerous voltages are disconnected from the transmitter when these screens are removed. All tuning controls may be locked in position after being adjusted to proper values.

Operation

This Police Alarm Broadcast Transmitter has been designed to operate for long periods of time without expert technical supervision. It is designed to operate on a very rapid service schedule involving

its own temperature controlled heater box, provided with thermometer and thermostatic control. The thermostatic controls are of the mercury column type, and control GS-10 grid glow relay tubes, which in turn control the current in the heaters of the crystal boxes. This system

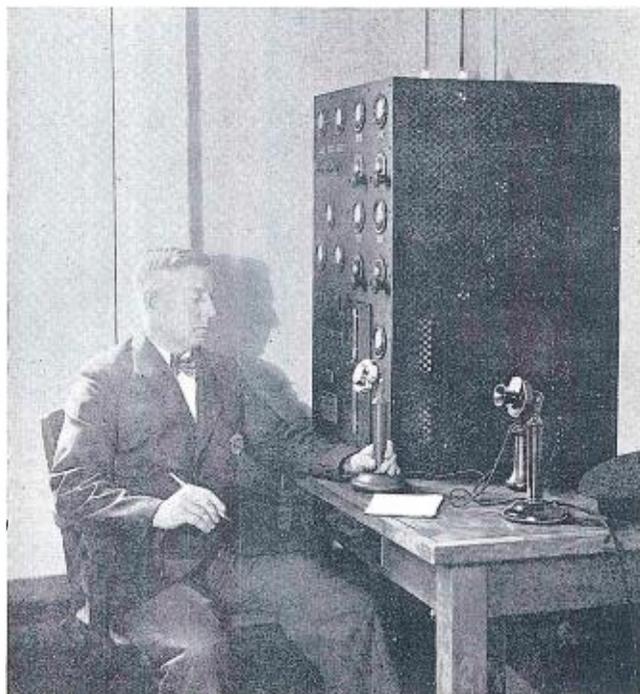
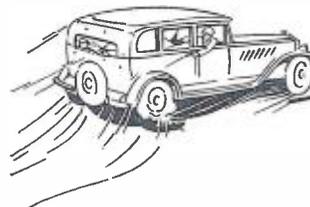


FIG. 1 POLICE ALARM BROADCAST TRANSMITTER

numerous starts and stops. It may be operated in standby position with a very low current drain on the power line, and is instantaneously available when required.

Radio Frequency Circuit

The circuit employed consists of a crystal controlled master oscillator, using a type UX-210 Radiotron. Two crystals are provided, each with

eliminates all mechanical relays and prevents the possibility of poor regulation due to sticking or dirty contacts. Either crystal may be instantaneously switched into the circuit using the crystal selector switch on the front of the panel.

The output of the crystal controlled master oscillator is amplified through two buffer stages, the first employing a UX-210 Radiotron and

the second a UV-211 type Radiotron. The output of the second buffer stage excites the final modulated radio frequency amplifier, which employs a UV-211 type Radiotron. The output of the final radio frequency amplifier is coupled to an antenna tuning unit which is built into the transmitter as an integral part. No auxiliary tuning units are required, and this transmitter may be directly connected to an antenna and ground system.

Power Supply

Filament supply for all tubes is obtained from filament heating transformers. Plate and grid bias supply for all tubes, with the exception of the grid bias of the speech amplifier UY-227, is obtained from a suitable single phase rectifier employing two UX-866 hot cathode mercury vapor rectifier tubes. The grid bias for the speech amplifier consists of a small bias battery which has a very long life, as it is not called upon to supply any power. As customarily furnished, the ET-3670 transmitter is designed to operate from 220 volts, single phase, 60 cycle alternating current. It required by the customer, this unit may be furnished for operation on 110 volt single phase 60 cycle alternating current. Suitable rheostats are provided for adjusting filament, plate, and bias voltages, and all circuits are suitably metered to permit of correct adjustment.

Audio System

A double primary input transformer is provided, permitting the attachment to either a 500 ohm line or a local single button type of carbon microphone. Using the line connection, a local microphone amplifier, such as may be required with double button carbon or condenser type microphones, can be employed without changes in the transmitter proper. A volume control is provided which permits the operator to adjust the incoming signal to the proper level. Incoming signals are amplified through a single stage of audio amplification, employing a UY-227 Radiotron. The output of this speech amplifier excites the grids of the two UV-845

modulator tubes connected in a push-pull circuit. The output of this modulator stage is capable of modulating 100% the final radio frequency amplifier.

The Receiver

Only through the use of high speed communication facilities is it possible to outwit and overtake the modern gangster.

The ability to place police officers on the scene while criminals are still at work is the aim of every municipal and state police department. The

The dimensions of the automobiles in which the receivers are to be installed impose limitations on the antenna which can be used while weather conditions and the disposition of the occupants of the cars introduce variables which ordinarily would tend to reduce the sensitivity of the receivers. To offset this, a special antenna coupling circuit has been devised to avoid the detuning effects of these variables. The loss in sensitivity which otherwise would result under these conditions has

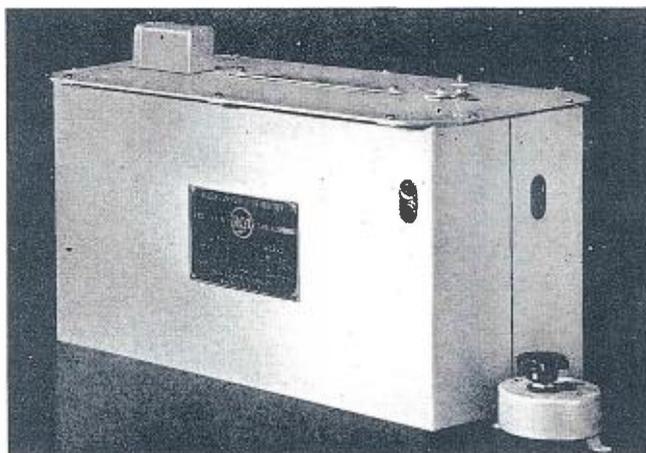


FIG. 2. POLICE COMMUNICATION RECEIVER

widespread use by criminals of automobiles and rapid transit facilities has necessitated the employment by police departments of automotive equipment. A radio communication system with receivers in squad cars and cruisers provides the necessary contact to bring such a mobile force to its highest state of efficiency.

The Type AR-1182 has been developed by the RCA Victor Company, Inc., as a rugged and efficient receiver unit suitable for installations in these police cars.

Radio Circuit

The Type AR-1182 Police Communication Receiver employs four tuned circuits with three Type UX-222 Radiotrons as radio frequency amplifiers. A UX-201A Radiotron is used as a detector and another as a first stage audio amplifier. A UX-112A Radiotron is utilized as a power amplifier.

thus been fully overcome. Because the sensitivity of this receiver is sufficient to reach the average noise level in any locality, the cruising range of police cars equipped with it is considerably increased and—with sufficient power in the transmitter—suburban and highway communication service now becomes practical.

Audio frequency transformers are employed as interstage coupling devices while the output system employs a choke and condenser. The use of transformer coupling slightly emphasizes the voice frequencies, thus reducing the effects of electrical disturbances which cause either very high or very low frequency responses. Another advantage of this type of coupling is that it avoids the blocking of the amplifier by heavy stray impulses, which is a common difficulty with other types of amplifiers.

(Continued on Page 12)

POLICE ALARM BROADCAST APPARATUS

(Continued from Page 11)

Construction

The unit construction of the Type AR-1182 Receiver is indicated in the view shown herewith. The welded construction of the container adds materially to the strength of the unit as a whole. Tuning and trimming adjustments are made through holes in the container, which are normally closed by swivel plates.

Operation

It is intended that the Type AR-1182 Receiver fit into an outer container, permanently mounted in police cars. Shock absorbing material is placed between the receiver and this container. If desired, the outer container may be locked to prevent tampering with the receiver adjustment. The volume control is intended to be mounted on the dash or in any convenient location. The cable connecting this volume control and the batteries, terminates in a substantial polarized plug which fits into the receiver. This arrangement greatly facilitates removal of the receiver unit for servicing.

Since the range of the Type AR-1182 Receiver, 1590 to 3200 kilocycles, includes all of the frequencies at present assigned for police alarm broadcasting as well as the emergency fire alarm frequency of 1596 kilocycles, the city may utilize it for both police and fire department activities. Such a system has many advantages from a maintenance and service standpoint.

STATION KFI, L. A.

(Continued from Page 3)

- Filament no-voltage protection on both d-c and a-c tube filaments.
- Bias no-voltage relays.
- Timed filament voltage build-up.
- Step starting for the Power Rectifier.
- Overload release on-circuit breakers for both branches of power circuit.
- Power rectifier surge overload relay with automatic reset.
- Power rectifier sustained overload trip.
- Intermediate rectifier overload trip.
- Sequence interlocks that protect each successive operation in either starting or stopping.
- Thermal overload relays in each motor starter circuit.
- Fuses in all branch circuits.
- Disconnect switches in high voltage circuits.
- Filament burnout relay on the 5

kilowatt amplifier that removes plate power when circuit unbalance is caused by tube failure; and removes filament voltage where both tubes take their filament current through a resistance.

Switches on all doors that remove bias and plate voltages, thus protecting the personnel from accidental contact with high voltages.

Timed water flow after removal of power tubes to assure complete cooling.

Automatic drain of cooling water to prevent freezing in cold weather.

Visual indicators as a guide to all important circuit conditions.

The new KFI Transmitter went on the air officially in July, 1931, and the results obtained were immediately gratifying to the designers, builders, and the owners alike.

A complete detailed description of the transmitter equipment installed at the new KFI station will appear in the November issue of "Radio News" magazine.

"BROADCAST NEWS"

is not on sale. If you wish to be placed on our mailing list, please notify the editor, at the RCA Victor Co., Inc., Camden, N. J.

WHAT IS YOUR "COVERAGE"?

(Continued from Page 9)

necessity of lugging around a heavy storage battery. Use of a comparison method of measurement makes the apparatus self-calibrating, and frequent return to the laboratory unnecessary. Compact assembly and rugged construction insure that equipment will stand up under hard usage. Under ordinary conditions an accuracy of 5% can be obtained.

The equipment now combined in a single unit consists essentially of loop antenna, loop attenuator, calibrating oscillator, oscillator attenuator, superheterodyne receiver, and output meter. Its operation is simple. The loop and receiver are tuned for maximum response to the signal to be measured. The loop attenuator and receiver volume control are adjusted to give a reading on

the upper part of the output meter scale. Next, the receiver is switched to the calibrating oscillator, and the oscillator attenuator adjusted to obtain a similar reading on the output meter. When this has been done the intensity of the signal being measured is equal to the intensity of the signal furnished by the local oscillator. A field survey such as that indicated by Fig. 1 can be made by measuring—in the manner indicated above—the field intensities at equidistant points along several radials from the transmitter. The results of such a survey are most indicative when prepared as a contour map similar to that shown. A planograph similar to that of Fig. 2 is obtained by making measurements on two stations at intervals along a line between them.

Surveys such as the above allow the area in which your transmitter furnishes an adequate signal to be accurately determined. Knowing this area, and the number of receiving sets it contains (from U. S. Census figures), your prospective audience can be counted to the satisfaction of your most exacting customer.

ANNOUNCER "SHOOTS THE WORKS" But It's A Dummy Mike

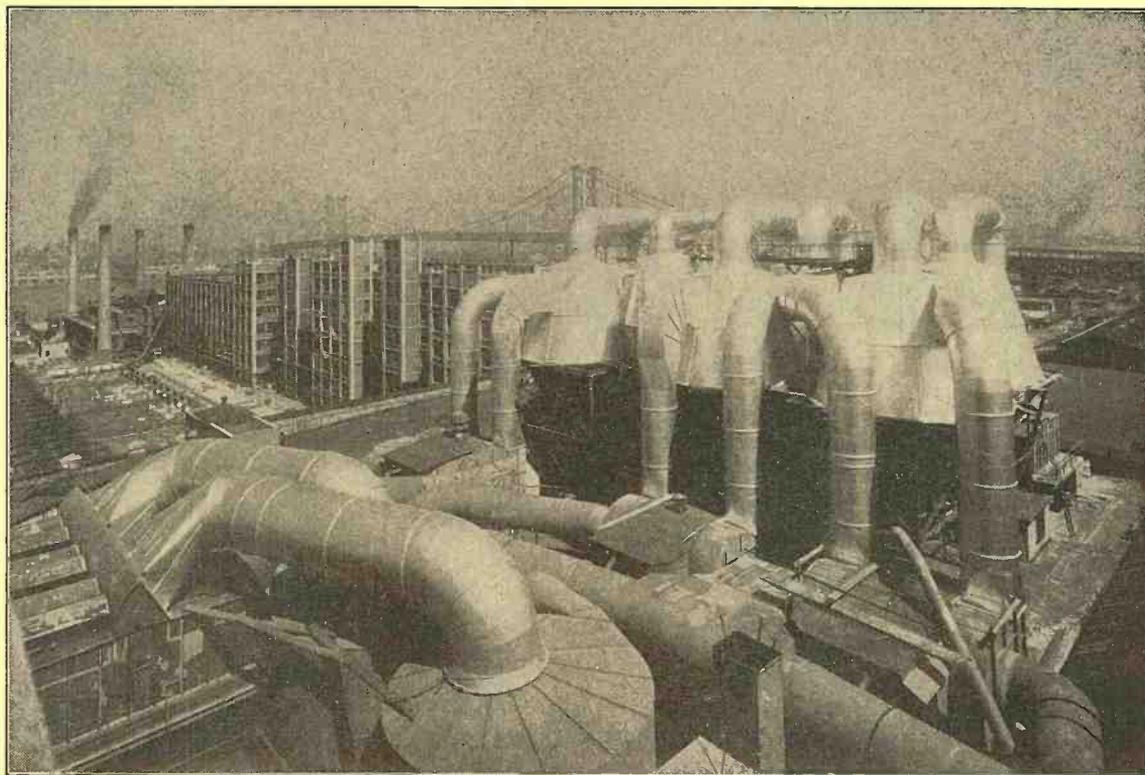
Everyone connected with the Broadcasting Art, especially station announcers and regular feature artists, will get a great kick out of Heywood Broun's new show, "Shoot The Works", in which a radio artist gets a chance to address his audience just as he would *like* to, not as he is compelled to by propriety and the censors.

It was all we could do to keep the radio announcer who accompanied us from dashing up on to the stage to shoot a few remarks into the "prop" microphone himself. You will probably recall that Heywood Broun recently completed quite a stretch before the mike.

SEND US YOUR NEWS

Tell us what is going on out there at your station—send us the latest personal news about your station staff—and don't forget to enclose a couple of snapshots. Please be sure to write names legibly.

You like to read news items about the others—they like to read about you. We must depend on you to keep us furnished with material of this sort. Photos of station personnel and of station interiors and exteriors are always interesting.



A CORNER OF "RADIO HEADQUARTERS"—CAMDEN, N. J.

The Meaning of "RADIO HEADQUARTERS"



THE activities of the RCA Victor organization are not confined to the manufacture and sale of radio receivers, but are diversified in every branch of the radio broadcasting and radio entertainment field. Aside from the fact that more millions of listeners are today enjoying their radio programs and their phonograph selections through the medium of equipment bearing the famous RCA seal and the familiar Victor trademark than through any other medium, the RCA Victor organization has developed and has furnished the nation with the finest in Broadcast Transmitters, Power Radiotrons, and associated equipment to originate the programs which create and sustain "listener interest".

Add to this the fact that the world's greatest library of recorded selections has been compiled and is being maintained by this same organization, both for broadcasting and for home entertainment purposes,—that this same organization has produced recording equipment for the home, is equipping the nation's schools, hotels, apartments, hospitals, and other institutions with Centralized Radio Systems, and is cautiously leading the way to practical Television minus ballyhoo in the best equipped radio research laboratory and with the best engineering talent available,—and you will begin to grasp an idea of the magnitude of the industry which is concentrated at

"RADIO HEADQUARTERS"