

PICK-UPS

FEBRUARY 1938



Giant copper tubes carry radio currents. See pages 20-21.

Pioneer WHAS Pioneers Again

Doherty Circuit Doubles Efficiency of New 50 KW Transmitter

Novel Local Programs Do Real Job for Broadcasters

Introducing a New 5 KW Transmitter

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PICK-UPS

BEING A PERIODICAL DEVOTED TO DEVELOPMENT
IN SOUND TRANSMISSION. PUBLISHED BY THE

Western Electric Company

195 Broadway, New York, N. Y.

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FEBRUARY, 1938

Indigenous Programs

In this issue M. M. Beard describes many of the fine, novel programs which stations are originating today. Most of them are indigenous to the territories covered by the stations. These programs are popular with listeners, and do a fine job for the stations. They are concrete evidence of how well broadcasting serves the public.

Keeping up with Science

The pace of radio engineering is swift, yet broadcasters keep up with it. *Pick-Ups* in this issue presents pictures and stories of stations that are keeping abreast of developments.

Fortunate Industry

The broadcasting industry is fortunate in having probably the highest type of personnel enjoyed by any industry in the country. In editing this magazine, hundreds of pictures of engineers, announcers, managers, program directors, secretaries, pass over the desk. They represent a fine-looking, intelligent group of people.

Broadcast engineers, particularly, are noted for their capability, their devotion to their jobs. Most of them are recruited from the ranks of amateurs. They have grown up with an unquenchable desire to learn why and how

things work. This desire dominates their work, makes them honest, reliable, efficient engineers.

Program personnel is of the highest calibre, and is steadily growing better. Moreover, many stations today are broadcasting programs conceived and staged completely by grammar, high school and college students. Some of these young people will be fascinated by the lure of broadcasting, and will continue in radio once their educations are completed. Thus broadcasting, consciously or unconsciously, is attracting to itself the very highest type of future personnel.

Mecca

For a good many months to come, Louisville, Kentucky, will be the mecca for many broadcasters. Station WHAS, in the Derby City, has just installed the last word in broadcasting facilities—a new Western Electric 50 KW transmitter. *Pick-Ups*, in this issue, presents the new WHAS in pictures and story.

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NAB

1938

**THE WASHINGTON CONVENTION
FEBRUARY 14-16, 1938**

Through the long formative years, when the American system of broadcasting was evolving, the National Association of Broadcasters gave direction and leadership to the industry. Today broadcasting stands on the threshold of far greater achievements some of which seem even beyond the horizon of imagination and prophecy.





Minneapolis high school students in a dramatic offering "Safety on the Highways" which has won such overwhelming response that merchandisers want to buy it but it is not for sale—WCCO sustains it as an educational service.

Novel Local Programs Do Real Job for Broadcasters

By M. M. BEARD

Among the many successful programs on the air today is a wide selection of unique programs which numerous stations have originated or adapted to meet the needs or to tickle the fancies of their particular listeners. In variety of ideas they are as heterogeneous as Lewis Carroll's "Shoes and Ships and Sealing Wax—Cabbages and Kings." For this very reason they are invaluable to the broadcaster who must serve a mixed fare to his audience, catering as he does to all types and all ages. These novelty numbers range from *Curious Careers* to *Sandman Sandy*—from *Hymnology* to *Fathers of the Funnies*—from *Florida Facts* to *Stump Us Boys*. They evoke laughter and tears—bring comfort and relaxation. They stimulate friendly relations in community life. They broaden cramped horizons and narrow world boundaries to the dimensions of a living room. They are educational, inspirational, fanciful, funny.

Typical of such programs is *On to Nicollet* presented by WCCO (Minneapolis). Three years ago the Civic and Commerce Association originated the broadcast for the purpose of stimulating closer, more friendly relations between Minneapolis and outlying sections of the Northwest. Communities are invited to send delegations to Minneapolis, see the baseball team in a home game at Nicollet Park and

make the expedition a community holiday. At the close of a day of parades and fun, each city or town has its time before the WCCO microphone to tell its story to the Northwest—dramatize its town theme.

Let's follow along with a typical *On to Nicollet* delegation.

It's "Brainerd Day"—Brainerd, the key city of one of Minnesota's famed lake districts. You assemble at Pioneer Square, are greeted by a committee of Minneapolis business men and at noon you swing into a parade down Nicollet Avenue led by an escort of motorcycle police. It's a jubilant cavalcade—bands playing, uniformed bodies marching, floats and banners telling the people of Minneapolis that Brainerd is a great town and an ideal vacation spot.

Just before game time, Brainerd has its first opportunity for radio publicity. WCCO's baseball announcer has the air and thousands of listeners hear him describe the stunts which Brainerd stages before the grand stand. The big hour comes after the game, when the visiting town puts on its special show. Communities which build these programs put in hours of earnest preparation to make their radio presentation of utmost value. The time is theirs without cost as a WCCO community service. "*On to Nicollet* has succeeded," says WCCO, "because it is composed of



College girls dramatize the Hows and Whys of good social usage in "Half Hour in Good Taste" which has become one of the top numbers on the list for KOAC, Corvallis, Ore.

fundamentals: people, their gregariousness and love of carnival; baseball, the most popular national sport; community enterprise and the thrill and profit of expressing it; and radio, the all-inclusive stage."

A program similar in its state-wide appeal is the *Florida Industrial and Agricultural Series* presented by WRUF (Gainesville, Florida). "The idea came to me," explains Garland Powell, Director, "after traveling around Florida and finding to my surprise that Florida people know very little about the diversified industries and agricultural advantages of their state." The series started with the Wilson Cypress Company, largest tide-water cypress company in the world. By remote control the station gave an eye description of lumber floating down the river, being picked up at the mill, passing through the mill and loaded on cars. Another broadcast came from the Hav-A-Tampa Cigar Company and followed the manufacturing process from bales to boxes. "Response has been tremendous," Powell says. "Public schools and libraries in the State want WRUF to transcribe the programs into a sort of textbook for the use of students and the general public."

Florida Farm Hour and *Florida Facts* are other WRUF outstanding hits. The former, composed of daily talks, music and dramatic sketches, is broadcast in cooperation with the College of Agriculture and the Agricultural Extension Division. On the air for the past eight years, the program, Powell claims, has saved millions of dollars for Florida farmers and growers. *Florida Facts* is a daily broadcast to inform natives as well as tourists of what is going on in the State.

Utilizing a wealth of little known stories concerning forest service adventures in the Pacific Northwest, KOAC (Corvallis, Oregon) in 1936 inaugurated a weekly series known as *Foresters in Action*. The first few programs consisted of straight talks describing the Fernhoppers. Members of the

Busy Dick Osgood gathering material for "The Factfinder," a popular novelty number broadcast daily over WXYZ, Detroit.

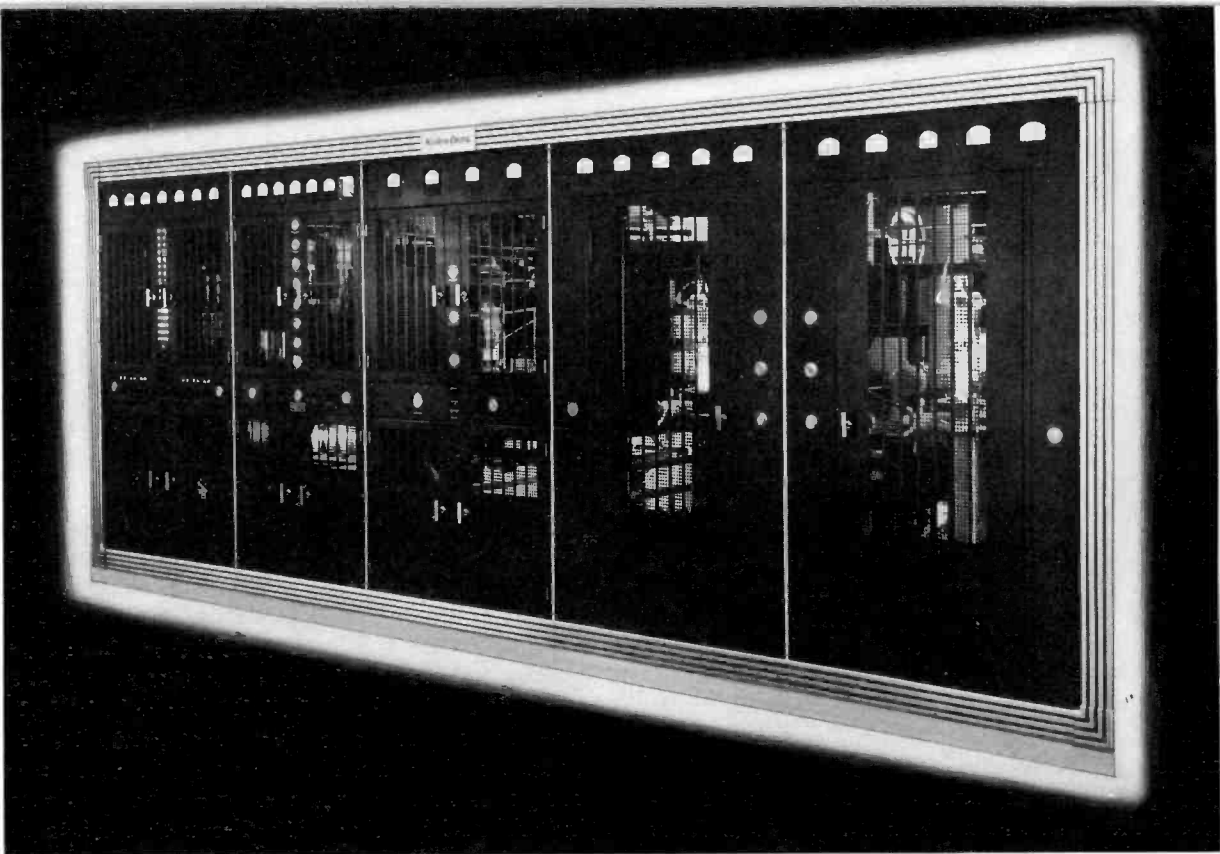
Oregon State College forestry club, who were furnishing story material for the features, soon became interested in active participation in the program. Style of presentation was changed to include a cast of characters to relate true stories through dialogue and dramatized flashbacks. While most of the tales have definitely constructive themes, they are occasionally interspersed with amusing "whoppers" of the Paul Bunyan type. KOAC finds that this method of presenting educational material on forest conservation has a distinct advantage over the conventional radio lecture.

A daily commercial, but one with a strong educational angle, is *The Factfinder* broadcast over WXYZ (Detroit), the six stations of the Michigan Network and WSPD (Toledo). In the year and a half the program has been on the air over 400 stories have been presented. "Subject matter covers everything under the sun," writes Felix C. Holt, Editorial Director—"industry, science, manufacturing, great pioneers, presidents, financiers; events dating back 25, 50 and 100 years. For example, a recent week's broadcasts included stories on smuggling, pine, teeth, correspondence schools, display windows." Richard E. Osgood prepares a six-minute script which is supplemented by musical numbers. Osgood gathers most of his material in the public library. Policy is to keep everything popular—to avoid becoming boring at all costs.

Letters commending the programs have come from the American Red Cross, the president of a salt company, officials of Grand Rapids furniture companies, business executives and from many high school students requesting copies of some particular talk.

(Continued on Page 34)





Doherty Circuit Doubles Efficiency of New 50 KW Transmitter

By H. VADERSEN

Commercial Products Development,
Bell Telephone Laboratories

Those who are familiar with older radio transmitting equipment will recognize, no doubt, that considerable engineering effort and thought has been spent on the design of the new line of Western Electric radio transmitters. This is evident at first glance, and with some astonishment too, as the new 50 KW (407A) transmitter occupies no more space than many 5 KW sets and the 5 KW (405A) transmitter is very little larger than many 1 KW transmitters of days gone by.

However surprising this reduction in size may seem at first, there is really no mystery to it and in fact it is only the natural result of the great advances in circuit design. When one considers that the power usually dissipated in wasted heat has been reduced by a factor of nearly three through the use of the Doherty high-efficiency circuit, it becomes immediately evident that the component pieces of apparatus can be reduced greatly in size also, and the assembly of these components is accomplished quite naturally in less space without in any way sacrificing accessibility or ease of maintenance. Floor plan layouts and photographs accompanying this article illustrate the point.

The new line of equipment includes

transmitters of power ratings of 100 watts through 500 kilowatts. The present descriptive material will be confined to two of these transmitters, the 5 KW and the 50 KW. The 5 KW, in fact, forms part of the 50 KW transmitter in arrangements described elsewhere in this issue dealing with circuits and performance.

Mechanically, the 405 Type Transmitter comprises three main units, together with a power distribution cabinet, primary power and water cooling auxiliaries. Of this equipment all but the water cooling apparatus, which is best located outside of any high voltage enclosure, can be installed in a floor area of 10 by 10 feet without crowding. Other arrangements can be followed with but minor modifications of interconnecting details.

The three main units are constructed of steel cabinets with access in the front through doors. The standard power amplifier and rectifier units are supplied less side and back and top panels. These panels in readily removable form are available, however, and can be furnished if specified. The first unit (to the left facing the transmitter) contains the power control apparatus. Next comes the driving unit, and the third cabinet houses the complete 5 KW amplifier,

tubes, and circuits.

The three cabinets form a panel when set side by side which can be surrounded by the walls of a room housing the power equipment behind the cabinets or set out in a larger room with some other form of enclosure, such as a steel-glass partition. However, no enclosure is furnished as part of the transmitter although a specially designed enclosure is available as an extra item. Spaces may be left between the cabinets if desired, but this is not a necessity as the middle unit is not as deep as the two outer ones, giving excellent approach to the sides of the deeper units.

The control and rectifier unit is built in two parts, as the rectifier is not necessarily employed when the 5 KW transmitter becomes part of the 50 KW transmitter. Control is obtained by means of seven toggle switches. These switches, in addition to simplifying the control circuit* through omission of a large number of relays and contactors formerly employed in the "master control" technique, also provide separate control over sections of the power supply auxiliaries making servicing or tracing faults convenient.

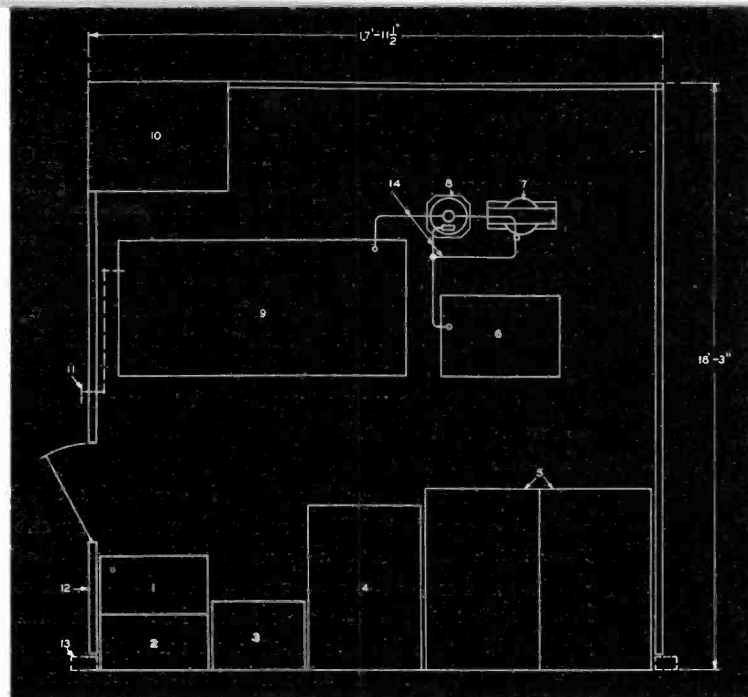
The control unit is built for use with 5, 50, and 500 KW transmitters. In the 50 and 500 KW equipments additional relays, lamps, and other devices are mounted in places already provided. By this means a 5 KW control unit could be modified in the field easily if the transmitter was increased in power to 50 KW later on.

The high-voltage rectifier contains, in addition to the tube mountings and filament transformers, a multi-blade grounding switch for personnel protection before access can be had to high voltage parts. This switch operates electric door latches on the doors of the 5 KW amplifier unit in such a manner that the doors to the amplifier unit are locked until the high voltage is cut off and the circuit is grounded. The mechanism of the grounding switch is such that it can be adapted to any type of enclosure.

Four doors on the front of the driver unit encourage frequent inspection. The unit is enclosed and, like the others, may be adapted to air conditioning as mentioned below.

The third and last unit is the power amplifier. Two vacuum tubes are mounted close to the front doors and the components of the circuits, condensers, coils, resistors, are located behind the tubes facing the rear, some of the apparatus being in shielding boxes. In the 405A1 Transmitter the vacuum tubes are water cooled, two of the 220 type comprising the complete final stage complement. The filament voltage of each tube is separately adjustable. Straight porcelain pipe glazed inside and outside is

* For a description of the control circuit, please see p. 18 of December, 1937, *Pick-Ups*.



Typical apparatus layout of the Western Electric 50 KW transmitter: 1. Bias Rectifier, 2. Control Unit, 3. Oscillator Amplifier, 4. Modulator Amplifier, 5. Power Amplifier, 6. High Voltage Condensers, 7. High Voltage Choke Coils, 8. Surge Protector, 9. High Voltage Rectifier, 10. Power Distribution Panel, 11. Grounding Switch, 12. Metal and Glass Partitions (optional), 13. Building Partitions, 14. High Voltage Busses.

mounted in the unit through which the cooling water is conducted to and away from the tube jackets. Porcelain pipe is preferred to rubber hose and other forms of insulating arrangements electrically because of the exceptionally low radio frequency loss it effects in the output of the amplifier and mechanically because of its compact and accessible configuration.

Associated with the transmitter are the auxiliaries which consist of a low voltage distribution cubicle, three single phase transformers, a retard coil and condenser comprising the high-voltage filter, an automatic voltage regulator and the water cooling equipment. The three single phase transformers are all mounted in the same tank containing Asbestol (pyranol). Asbestol is also used in the filter retard as the cooling medium. The automatic voltage regulator is of the step-by-step commutator type and is air cooled; it regulates the entire transmitter supply, high-voltage plate power as well as all auxiliaries against variations in the supply voltage. All of this power apparatus is for indoor installation close to the transmitter units connected by short runs of wire, bus or cable.

Two types of cooling equipment are available. The standard form consists of separate items, the pump, air blast radiator, and a copper tank, ready for connecting together and to the transmitter. The optional form which is slightly more expensive is a single unit containing the pump, radiator, and tank already connected together and requiring only two water pipes to be installed between it and the power amplifier unit. This cooling unit can be worked easily into any building heating

(Continued on Page 31)

WDAF

Kansas City, Mo.

With a 16-year background crammed full of colorful events WDAF, owned and operated by the Kansas City Star, obligingly turns back the pages of its diary and traces the station's progress from the first broadcast in 1922 to the most recent installation of a modern Western Electric 5,000 watt transmitter.

From a makeshift, burlap-covered studio in the basement of the Star Building WDAF sent forth its initial program over a borrowed 50 watt transmitter owned by the Western Radio Company. Appearing on the nightly broadcasts which usually lasted one hour were Leo R. Davis and his orchestra, Eddie Kuhn's orchestra, Madeline Farley, soprano, Wilbur Pfeiffer, pianist, and other entertainers of the day.

Shortly after this cooperative arrangement between the Star and the Western Radio Company had been established WDAF staged one of the first remote control broadcasts in the history of broadcasting from Convention Hall, Kansas City.

Within six months WDAF's studio had graduated from the cellar to the third floor of the Star Building where a 500 watt Western Electric transmitter, together with speech input and other associated equipment, had been set up. This was the second Western Electric transmitter, manufactured for broadcasting purposes, to be installed in the United States; the first going to WWJ, Detroit.

The inaugural program over WDAF's own transmitter proved a gala affair, starting at eight o'clock on the night of June 5, 1922, and lasting for two hours. Telegrams and telephone calls came pouring in from 43 states. The schedule, which at that time seemed rather extensive, called for 22 hours of broadcasting each week. Today the station is on the air with a weekly total of 125 hours.

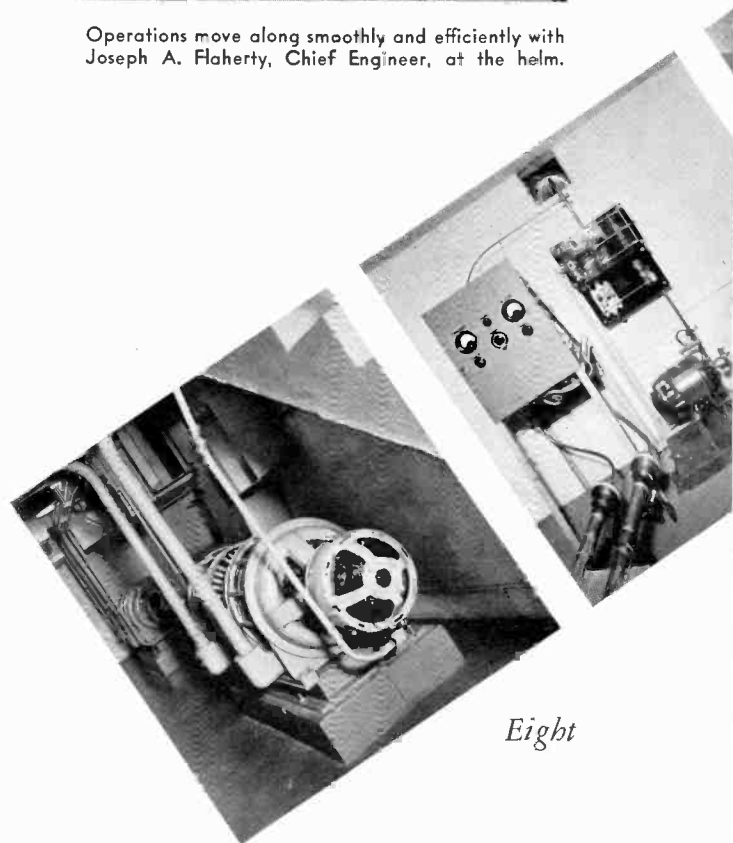
Among WDAF's 1922 hit numbers were "Marketgrams"; "School of the Air," presented by faculty members of the Kansas City School system and the University of Kansas; the Star's string trio and "Round the Town with WDAF." The latter consisted of entertainment by remote control from various Kansas City theatres, hotels and night clubs. In the grill of the Hotel Muehlebach was born the first midnight show known as "Night Hawk Frolic." It was presided over by Leo Fitzpatrick, at that time the

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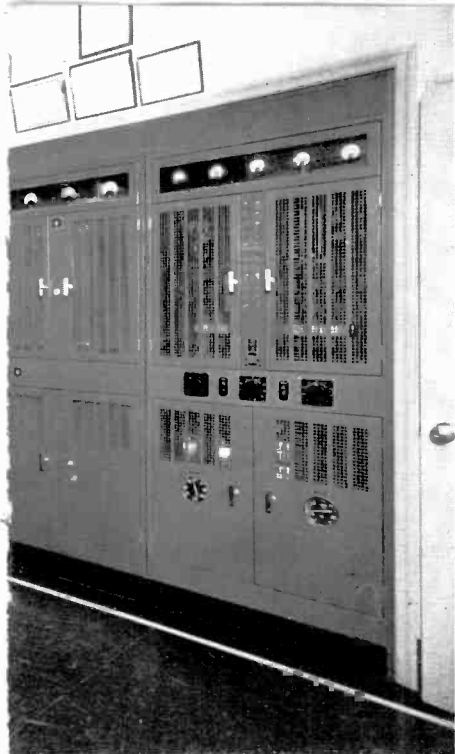


Operations move along smoothly and efficiently with Joseph A. Flaherty, Chief Engineer, at the helm.



Eight

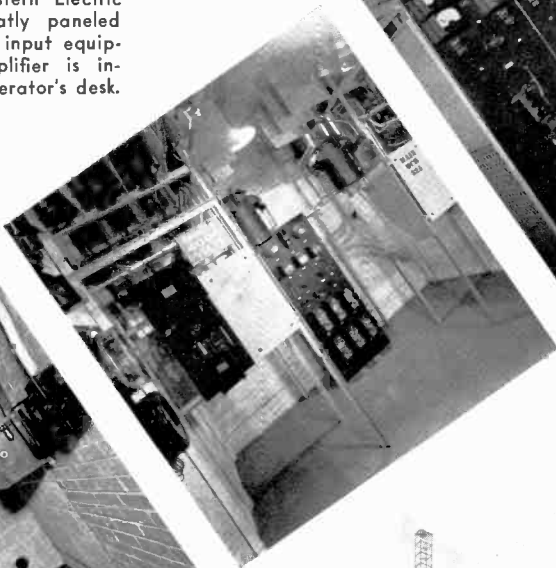
This layout of modern broadcasting equipment, installed early in 1937, marks the latest step on the long road which WDAF has travelled since that day in 1922 when the station sent forth its first program from a basement studio via the medium of a borrowed 50 watt transmitter.



Control room showing Western Electric 5,000 watt transmitter neatly paneled along the wall. The speech input equipment with the 110A Amplifier is installed at the left of the operator's desk.



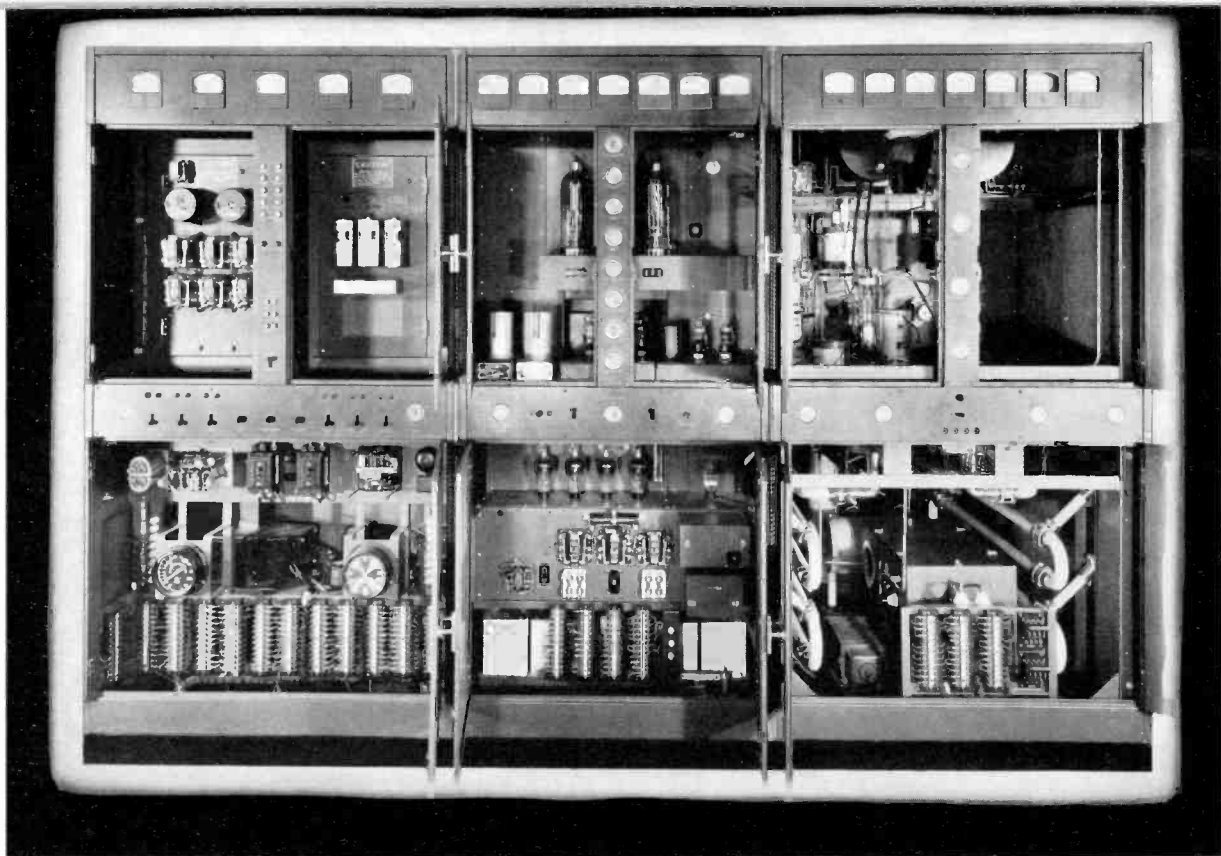
Transmitter building and 420 foot Blaw-Knox tower located on a 52 acre tract of land at the intersection of Somerset Drive and Mission Road, Johnson County, Kansas.



Above panel shows associated equipment for 5,000 watt transmitter. Left to right: Duplicate motor generators used as prime power for transmitting equipment—Concentric transmission lines, coupling unit, tower lighting generator—Entrance room for transmission lines and conduits—Automatic sub-station—Duplicate power control panel and voltage regulators—12,000 volt plate supply for 5 KW amplifier.

Nine





Introducing a New 5 KW Transmitter

By R. E. CORAM

Commercial Products Development,
Bell Telephone Laboratories

The three years of careful research covering every single item going to make up this new transmitter will result in performance never before obtained in any class or power range of broadcasting equipment. The important features which make such performance possible are:

1. Doherty High-Efficiency System
2. Overall Loop Feedback
3. Overmodulation Capability
4. Complete AC Operation
5. High Fidelity Characteristics

As it might be expected, the first 5 kilowatt broadcasting transmitter to employ the high-efficiency circuit has been put through a long period of testing. After completing in the Fall of 1936 the preliminary experimental work on a laboratory set-up, the operation of which was viewed by many engineers in the industry as far back as November, 1935, a mechanical design was prepared and the first model of the new Western Electric 405 Type Transmitter was built in the Specialty Products Shop at Kearny, N. J. This transmitter was installed at the Whippany Laboratory in the Summer of 1937 where it has gone through exhaustive tests. These tests have yielded performance data upon which information appearing below is based.

The circuit employed in this 5 kilowatt transmitter is extremely simple and its simplicity is reflected in its ease of adjustment, maintenance, and excellent performance. There are no balanced circuits employed, nothing requiring a dexterity of adjustment or matching of tube characteristics. From RF oscillator on one hand and AF input on the other, through to the coaxial transmission line connection, all circuits are grounded on one side. This feature presents the optimum in circuit design for today's requirements of high quality and high-efficiency operation.

Flexibility of arrangement is also a feature of the new circuits. The basic unit design is used as a 5 kilowatt transmitter rated particularly for that power, or as a 5 kilowatt transmitter which can be built up to 10 kilowatts or 50 kilowatts under a variety of conditions at some later time in the field, being supplied initially with power equipment and auxiliaries as dictated by the economics of any particular situation.

The circuit starts, of course, with the crystal oscillator. One 702A Oscillator containing a low temperature coefficient quartz plate is furnished. Provision is made for a spare oscillator and a selector switch permits either one to be used at a moment's

notice as the idle one is kept up to temperature, although not oscillating, the starting drift in frequency being extremely small. With all possible variables changing in the same direction at once over a very wide degree of change, the stability of the 702 is such that much less than a 10 cycle deviation is experienced. The oscillator is provided with a fine adjustment so that the frequency can be set to agree exactly with the frequency monitor. Space is provided adjacent to the oscillators for the purpose of mounting additional apparatus if the transmitter is to be made part of a synchronized system.

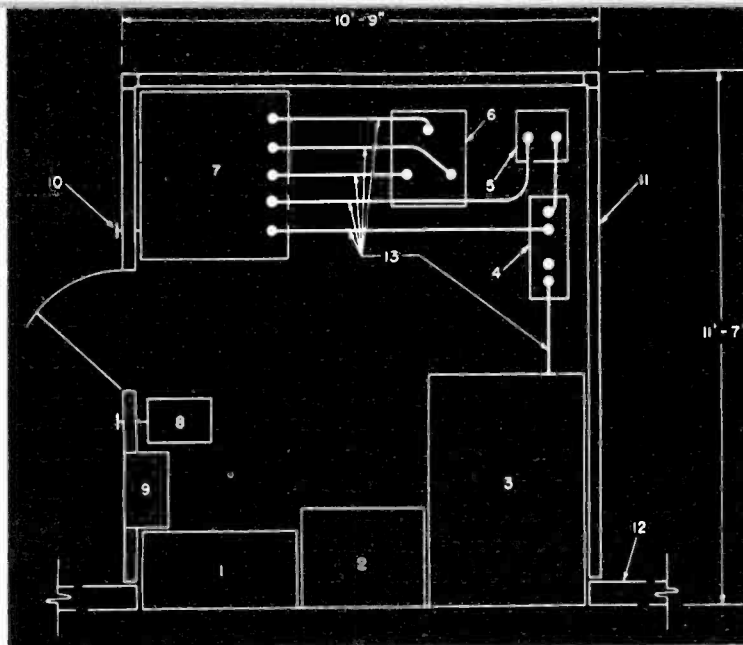
Two stages of amplification provide the RF drive for the modulating amplifier which consists of two 241 Type Tubes in parallel. The program voltage is obtained from a two-stage audio amplifier that requires only 6 milliwatts (zero level) input energy for full modulation. Modulation is affected by the practically distortionless grid-bias method on the two 241 Type Tubes.

Stabilized feedback obtained from the output of the transmitter through a full-wave rectifier is connected into the first audio stage. There are no transformers employed inside the feedback loop which is important not only on account of the best quality characteristics, but because of the excellent flexibility of circuit arrangement it provides if enlargement of the station is carried out later. Another RF rectifier identical with the feedback rectifier is used for audio monitoring and as a standby feedback tube.

The modulating amplifier drives the final stage directly. The 5 kilowatt amplifier employs the circuits of the Doherty high-efficiency system* giving linear amplification with a plate efficiency of over 60 per cent.

In the 405 Type Transmitter, two 220 Type Vacuum Tubes operating at 12 kilovolts provide, with ample margin, the full output to a coaxial transmission line through the harmonic filter. Tuning by means of tapped coils and variable condensers is exceptionally simple as the circuit is provided with taps for connecting in a cathode ray oscillograph. By use of the oscillograph, the circuit action appears graphically and no doubt can exist as to the correctness of adjustment. Meters are used for amplitude readings. In the tests at Whippany no change in the original adjustment was found necessary over a period of six months of operation. Only a non-critical circuit requiring no balances of circuit elements or tubes would hold adjustment over so long a period. Considerable departures from the proper adjustment have been made for the purpose of proving the non-critical feature and these tests show that the quality of transmission remains uniformly excellent over a wide range.

* For a description of this system, please see one of the following: I.R.E. Proceedings for Sept., 1936, p. 1163, or *Pick-Ups* for July, 1936.



Apparatus layout of new Western Electric 5 KW Transmitter: 1. Control Unit, 2. Oscillator Amplifier Unit, 3. Power Amplifier Unit, 4. High Voltage Condensers, 5. High Voltage Choke, 6. High Voltage transformers, 7. High Voltage Rectifier, 8. Induction Regulator, 9. Power Distribution Panel, 10. Grounding Switch, 11. Metal and Glass Partition (optional), 12. Building Partition, 13. High Voltage Busses.

The amplifier is equipped with a device which indicates continuously by meter reading the exact state of circuit adjustment. This ability is secondary, however, as the main duty of the device is to protect all apparatus connected between the final amplifier and the antenna from breakdown due to transient disturbances, such as charges induced in the antenna by lightning. A complete description of this feature, until now built only into 50 kilowatt transmitters, will be found in the December, 1937, issue of *Pick-Ups*.*

Several methods of connection to the antenna or antenna array are available, the arrangement depending on the requirements.

The 405 Type Transmitter with program modulation and with two 220 Type Vacuum Tubes in the power amplifier requires a power input 16 to 16.5 kilowatts on an all-day basis from a 220/240 volt three phase supply. This power input corresponds to an overall efficiency of 31 per cent from power line to antenna. The increase in efficiency from the best previous figure of 18 per cent is one of the principal features of the new transmitter.

The 220 Type Vacuum Tube takes a normal filament current of 40 amperes. The use of two of these tubes in the power amplifier will greatly increase the tube-hour life and correspondingly decrease the tube-hour cost. The filament transformers used in the transmitter are capable of furnishing the higher current.

The fidelity characteristics are excellent as in most recent transmitters employing modern
(Continued on Page 28)

* See Fig. 1 of F. C. Ong's "New Controls Curb Lightning" on p. 29 of December, 1937, *Pick-Ups*.

WOL, Voice of the Nation's Capital

Already one of the nation's biggest little stations, WOL, Washington, D. C., soon is to attain even greater stature. Equipment will be installed to increase its power from 100 to 1000 watts on the 1230-kilocycle regional channel, instead of the present 1310. A new transmitter building and a two-element directional antenna system, located at a strategic point in nearby Maryland, is to replace the present transmitting plant in downtown Washington. This move is the latest in a 15-year record of progressive growth by the station.



Henry H. Lyon
Chief Engineer

Originally assigned the call letters WRHF in 1923, these were later abandoned when listeners confused them with those of another station. The first transmitter was a donation to the Washington Radio Hospital Fund, an organization devoted to raising funds for equipping veterans' hospitals with radio receiving sets. Upon the successful conclusion of this charitable enterprise the station was purchased by one of the group, LeRoy Mark, who operated it as a hobby until November, 1925. At this time it was taken over by the American Broadcasting Company, of which Mr. Mark became president.

Since that time WOL has become an increasingly important factor in the entertainment and cultural life of the nation's Capital. Today, 26 employees are required to carry on its broadcasting activities, including eight technicians and operators, and a program staff of 10. The organization is headed by William B. Dolph, General Manager; Henry H. Lyon, Chief Engineer; and Madeline C. Ensign, Program Director.

Having outgrown its former quarters in the Annapolis Hotel, the station's studios and offices were moved, in May, 1937, to the newly completed Heurich Building, at 1627 K Street, N. W., where they occupy the entire fifth floor.

Two studios, each accommodating some 40 persons, are reached from a central corridor as far as possible from street noises. A master control room is situated between and adjoining these studios. A small speaker's studio opposite the control room is in turn flanked by temporary offices and an audience room from which productions in studios A and C may be watched as they are broadcast. This arrange-

ment also permits the observation of all studio activities from the master control room through triple plate glass windows. At present technical operations of all studios are carried out from the master control room. Provision has been made for the addition of individual studio control booths as may be required by future expansion.

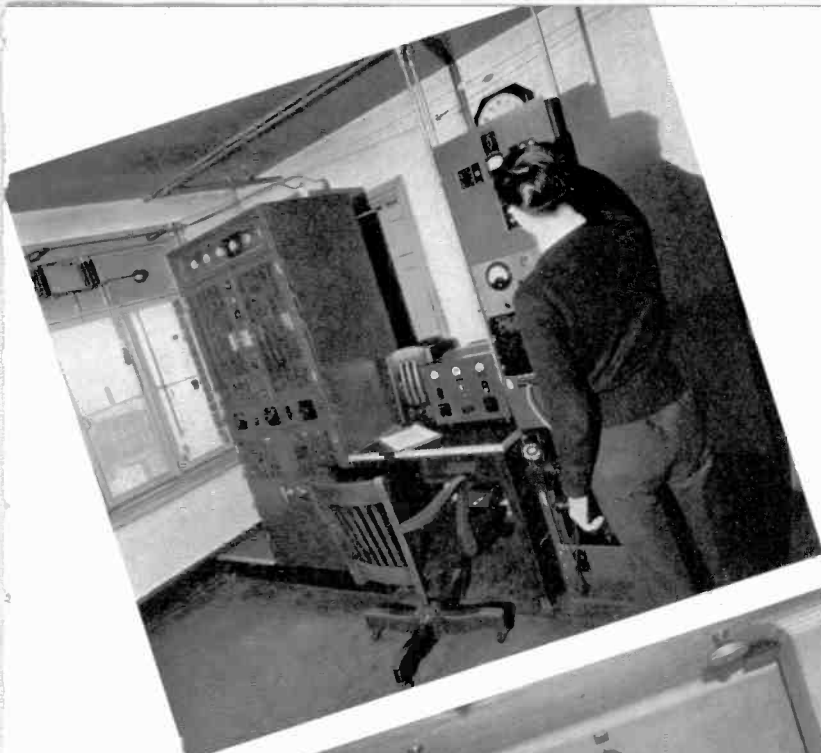
Speech input equipment includes two Western Electric 701A bays, each consisting of a five channel mixer, interchangeable line and monitoring amplifiers, volume indicator, amplifier power supply, and the control and signalling circuits necessary for the operation of each bay as a complete studio amplifier channel. These bays are supplemented by a miscellaneous equipment panel in which are mounted the equalizers, attenuators, program and order wire jacks, repeating coils, and similar accessories necessary to its function as a receiving and dispatching terminal.

Western Electric microphones, including the 618, "Eight-ball," and "Salt-shaker" types, are used exclusively. For remote broadcasts 22A portable speech input equipments are employed. Remote points include the White House, Capitol and War College, from which both the Mutual and Intercity networks are frequently fed through the facilities of WOL.

The Heurich Building was designed and constructed to accommodate not only the station's offices and studios but also a 179-foot Blaw-Knox vertical radiator and the Western Electric 12B radio transmitter. However, pending completion of the new transmitting plant near Chillum, Maryland, concurrently authorized by the FCC, the transmitter will remain at the Annapolis Hotel. Meanwhile, its effectiveness has been markedly increased by the installation of a Western Electric 110A Program Amplifier. In agreement with the results reported by other stations using this device, an average 4 db increase in signal effectiveness has been realized. That this increased signal has been appreciated not only by the station's engineers but also by the listening audience is testified to by the many letters received congratulating the station upon the "installation of its new transmitter."

Also installed in the transmitter control room are the Western Electric 1A frequency monitor, 94A monitoring amplifier, and other equipment for controlling and testing transmitter operation. When the new building is ready, early next Summer, the power may easily be increased to 1000 watts by the addition of a 6071B (radio frequency)

(Continued on Page 26)



LeRoy Mark, President of the American Broadcasting Company and of WOL.



WOL
Washington, D. C.

James N. Chaconas, Engineer (top) adjusts the Western Electric 110A Amplifier. Below him is shown Studio B with Helen Slye before the mike and Lou Moy, program department. Studio C, next in line, with George I. Jones, Graybar Sales Engineer (foreground) and F. L. Ankers, Announcer. In the master control room (bottom) Henry H. Lyon, Chief Engineer (left) and Ted G. Belote, Engineer, are at the speech input equipment controls.



William B. Dolph, General Manager, who heads WOL's efficient staff of 26 employees.



KFRC



San Francisco
Station of the
Don Lee
Broadcasting
System

Neat and compact is KFRC's line-up of speech input equipment panels topped by the station's licenses.

Owned and operated by the Don Lee Broadcasting System, KFRC, San Francisco, has been Western Electric equipped since the early part of 1927, when Don Lee purchased the station. In 1935 the old 6B transmitter was replaced with the present 5 kilowatt which was one of the first two transmitters of this type to be installed on the Pacific Coast. The other went to KHJ, Los Angeles, also of the Don Lee System.

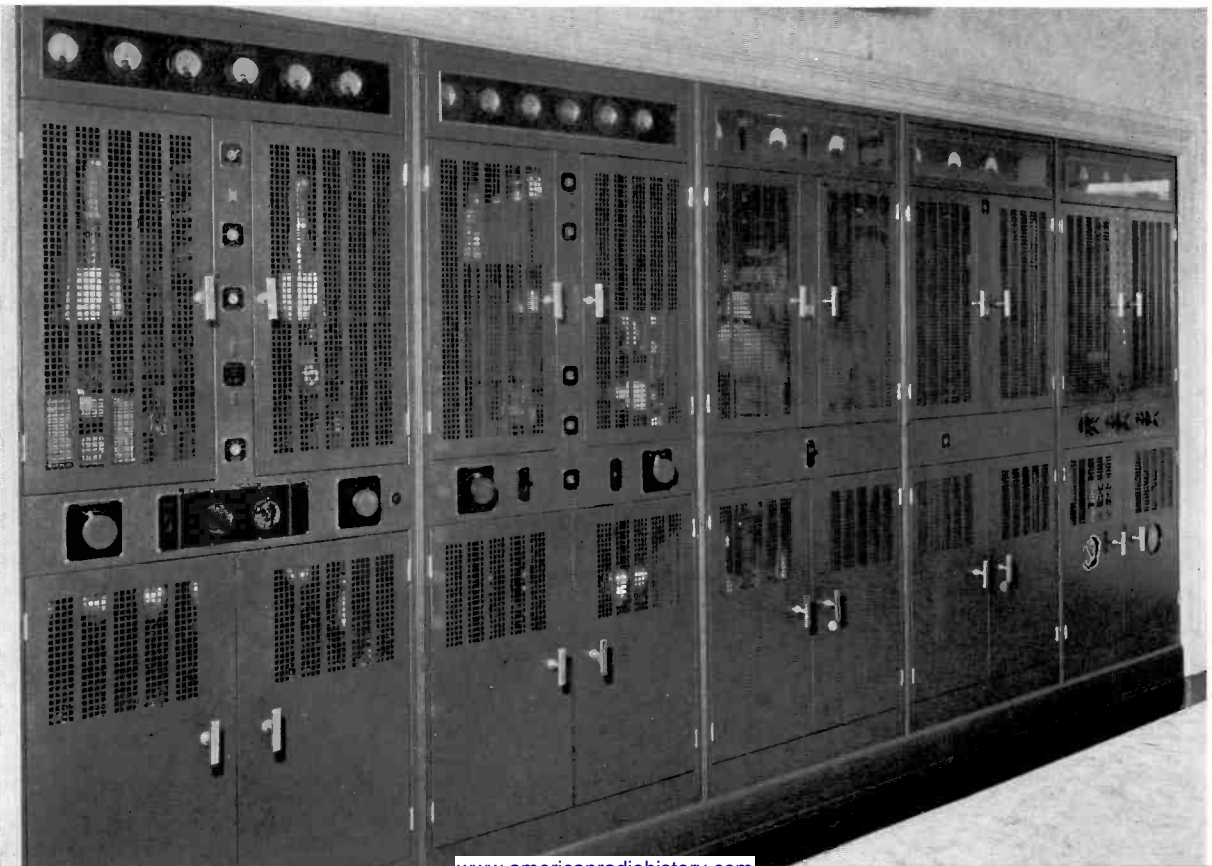
The speech input equipments of these "identical twins" have likewise always been of Western Electric manufacture. The earlier battery operated equipments employing 8 type amplifiers will be replaced by the modern AC operated 700 series speech

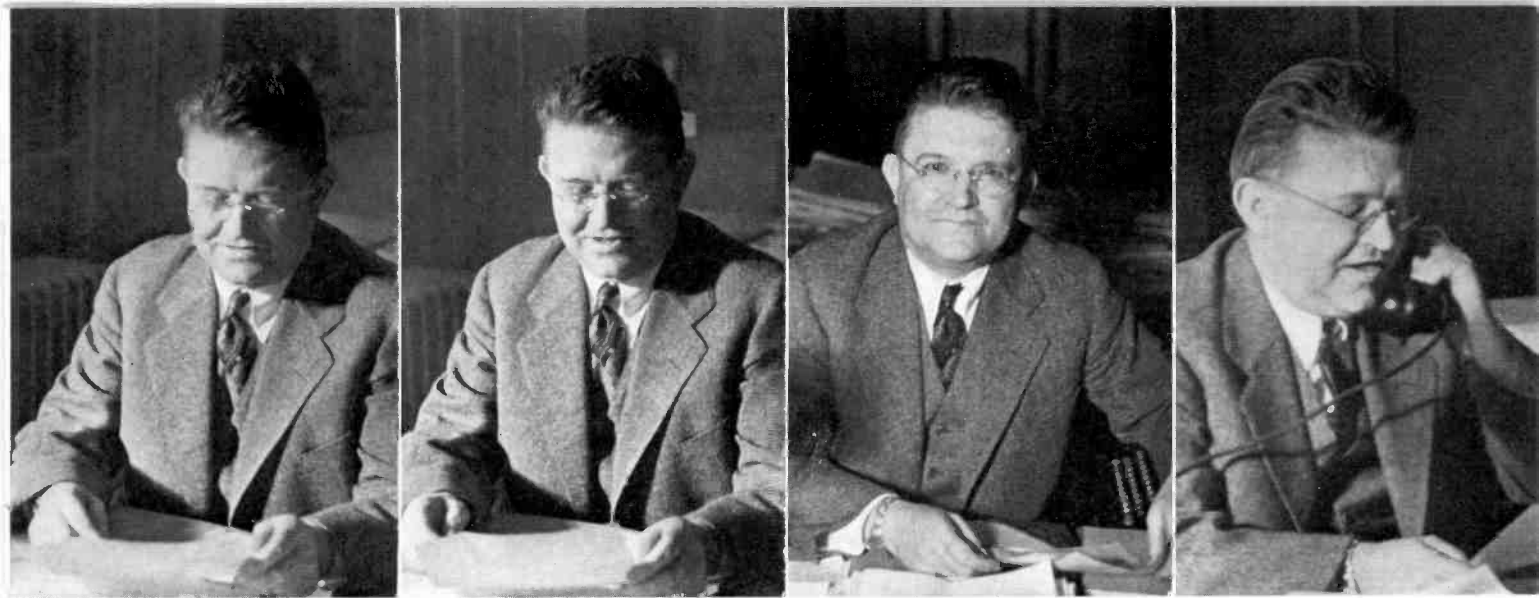
input equipments employing 81 and 82 type amplifiers when they become available.

Continuing this progressive policy of utilizing the latest Western Electric developments, orders were placed for two 110A program amplifiers early in 1937. These modern amplifiers have already proved their worth in many ways. The effective signal delivered to the primary areas of the two stations has been markedly increased and at the same time the effectiveness of the secondary area signal has been added to greatly.

The Don Lee Broadcasting System is under the management of Lewis Allen Weiss; Ernest G. Underwood is chief engineer of station KFRC.

Western Electric five kilowatt transmitter which has been operating at the San Francisco station of the Don Lee Broadcasting System since 1935. A similar transmitter was installed at station KHJ, Los Angeles—first of its type on the Pacific Coast.





Pick-Ups presents a rare camera study of a broadcaster receiving news of a station license grant. Harold Hough, WBAP, Fort Worth, receives telegram from Washington announcing KGKO license. The news brings a smile to his face, then a look of complete satisfaction and then to share the good news, he phones his many friends and associates.

Stations Need More Individuality, Says Harold Hough, WBAP

Had there been such a thing as a radio poll in the early days of radio, the Southwest would have voted to a man for "The Hired Hand" as the most popular announcer. And if anyone had asked the same audience what was the most familiar and welcome sound on the air, the vote would have been cast for a cow bell.

The cow bell was the Hired Hand's signature. The Hired Hand was Harold Hough, and the station was WBAP, Fort Worth, Texas. Then, as now, Harold Hough was circulation manager of the Fort Worth Star-Telegram and general manager of WBAP, the Telegram's station.

In those early days of radio, however, few people knew the identity of the Hired Hand. To listeners, he was more myth than man. His wit had something of the Will Rogers in it, and a dash of Mark Twain. His philosophy was keen, shrewd and kindly, like that of an old-time cattleman. His slapstick, slap-dash programs had some of the fun of Bert Lahr, The Four Marx Brothers, and Charlie Chaplin in them. Mix all that together and you've got something, and that's what the Southwest got every time it listened to the Hired Hand. Because he was on the air mostly late at night and early in the morning, he kept the whole state of Texas from getting enough sleep.

To Harold Hough goes much of the credit for the rise of WBAP from a five watt station in 1922 to a 50,000 watter today. The Hired Hand stayed on the air for eight years, and then yielded the microphone to others because "it was discovered

that broadcasters could sell things over the air, and this brought in the era of good spieling—where the boys with the lace on their tonsils commenced to peddle cold cream syrup and things like that," says Hough.

Quitting the microphone was a painful process, "just like taking a nipple from a baby or a mike from a preacher." He is proud of the distinction of being "the only announcer who ever fired himself because he was no good." That's what *he* claims, but it is still an event when, once in a while, the Hired Hand takes to the microphone again to broadcast a rodeo, the stock show, or the annual New Year's Negro Holy Roller show.

It was the individuality of his style and his programs which made Harold Hough a by-word in the Southwest, and if there is anything wrong with radio today, according to him, it is the lack of individuality in programs and stations.

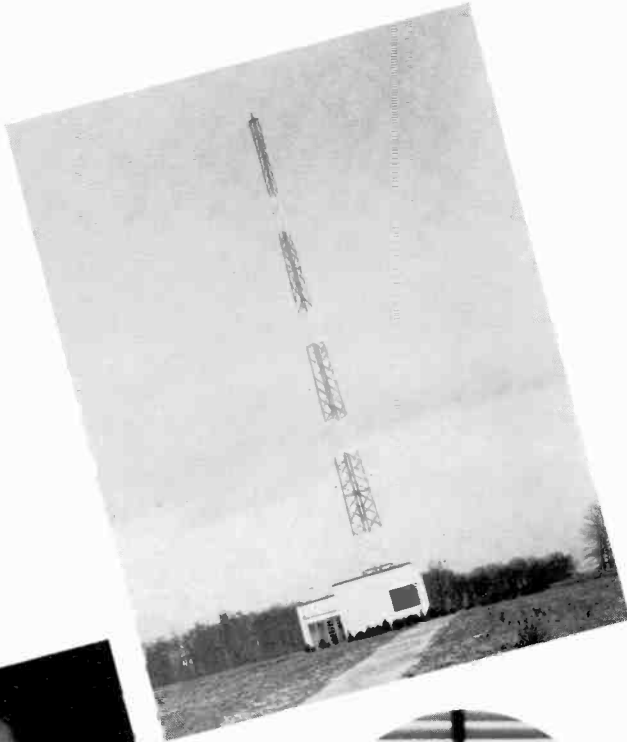
"We are too imitative today," he says. "The people we like best are those who have distinct individual personalities. Radio stations should have personalities, too, and be different from other stations. No two areas are the same. People in any one area have a distinct group personality. They have their own customs and traditions. The radio stations that serve them should reflect this personality.

"Instead of this, stations are too apt to copy others. We have vogues which sweep broadcasting. Once it was sopranos, and we had sopranos until listeners were sick of them. Then we had hill

(Continued on Page 26)



B. Bryan Musselman, General Manager, Lehigh Valley Broadcasting Service. Below: WCBA-WSAN transmitting plant. The shunt excited radiator behind the building rises 190 feet into the air.



J. C. Shumberger (square) and David Miller (oval), Vice-Presidents, WSAN, Inc. WCBA-WSAN operating staff. Standing (left to right): Sheldon Walker, Harold Lampel, Austin Dreisbach, John Van Sant, Walter Frank, E. H. Wetzel, Albert Mann. Seated: W. A. McCutcheon, Dr. Carl W. Boyer, Olivia Musselman, Mrs. Bessie Miller Male, Ellen Boyer, George Snyder, Charles Petrie.

WCBA-

Allentown,

Back in 1923, when the radio industry was still in its infancy, the Lehigh Valley became the birthplace of two broadcasting stations, WCBA and WSAN. Although these were by no means super-power stations, they served to launch radio in the "Valley." WCBA, operating on a frequency of 1070 kilocycles, boasted of five watts of power, while WSAN, operating on 1310 kilocycles, sent out a mighty 10 watt signal. In June, 1927, both stations increased their power to 100 watts, changed their frequencies to 1350 kilocycles, and commenced operations on a time-sharing basis. Their present frequency of 1440 kilocycles was assigned in December, 1928, and their power increased to 250 watts. During this period of growth both stations were operating independently of each other.

B. Bryan Musselman, owner of WCBA, was engaged in 1934 by the operators of WSAN to take over its commercial work, thus placing both stations under the direction of the "Lehigh Valley Broadcasting Service" with Musselman as General Manager. New studios and business offices were constructed to take care of the increased activities and personnel. Separate transmitters, of the well known "composite" type, were maintained for each station.

When permission was given for an additional increase in power in 1935 both stations be-



-WSAN

Pennsylvania

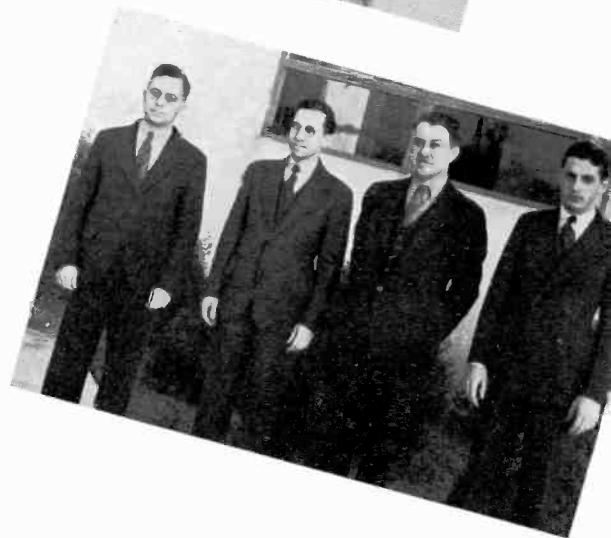
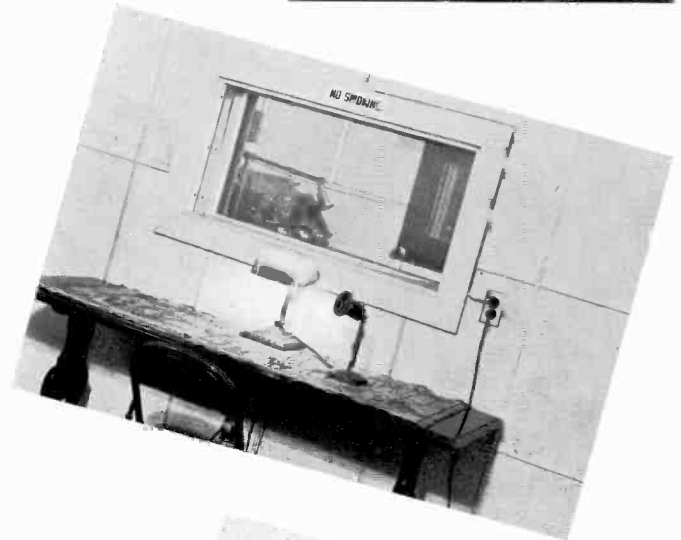
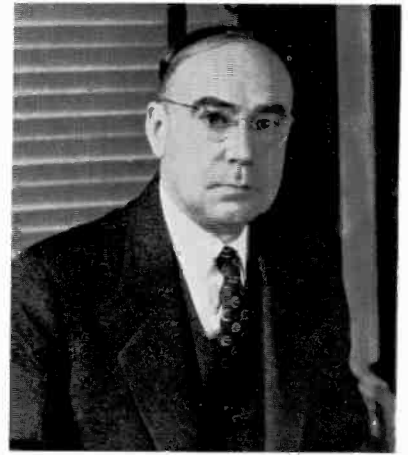
gan operating on 500 watts. New business and new methods necessitated new equipment, as well as a change in transmitter location to permit erection of a more efficient radiating system. Having obtained permission from the Federal Communications Commission, the usual experiments and tests were made and, in the late summer of 1936, a favorable site was decided upon. Ground was broken, radials were plowed under, vertical radiator erected and transmitter house constructed during early winter. A record for speed was established when the construction of the complete transmitting plant, from bare ground to operation with regular programs was accomplished in 25 days.

The new Western Electric 353E-1 transmitter went on the air in January, 1937. Listener response was most gratifying, not only from the immediate vicinity of Allentown, but also from listening areas which previously had little or no reception from WCBA and WSAN.

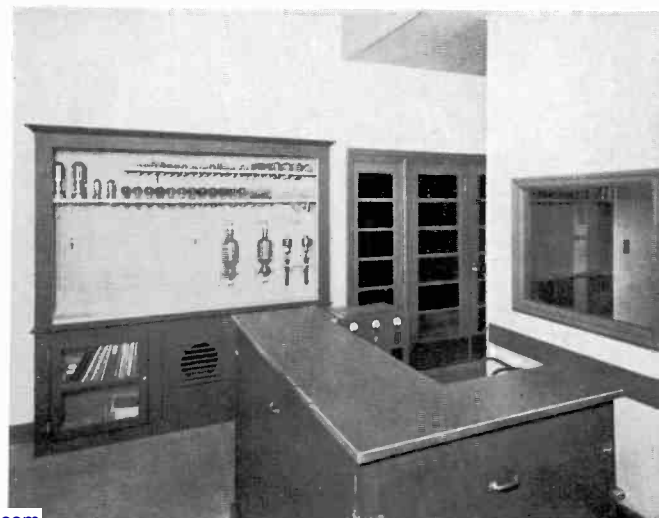
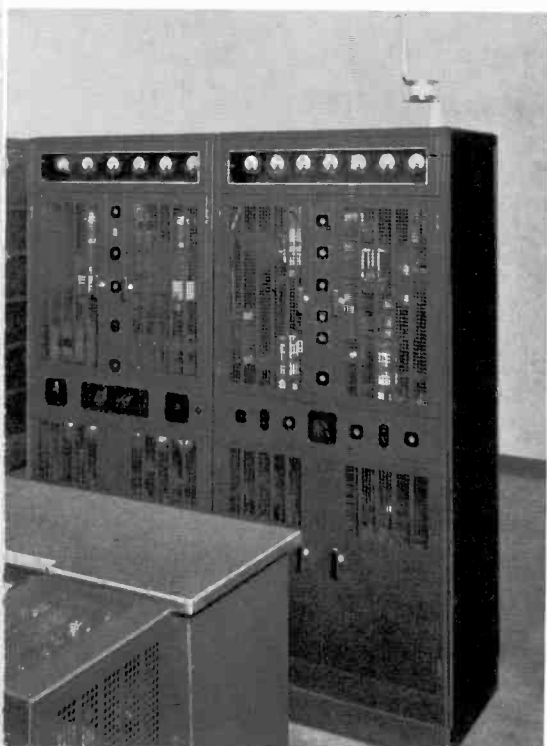
Allentown, the sixth largest city in Pennsylvania, has within its limits a population of over 90,000. Its trading area, with a population of over 300,000, is the fourth largest metropolitan area in Pennsylvania and the thirty-eighth largest in the United States. Inasmuch as the topographic and geologic formations of Eastern Pennsylvania definitely

(Continued on Page 37)

Royal W. Weiler, President of WSAN, Inc. Below: View from News Studio, looking into Transcription Studio. In keeping with its usage the walls of the News Studio are panelled with used newspaper mats.



Above, right: Transmitter Engineers, WCBA-WSAN. Left to right: Charles R. Sauerwine, Russell R. Taylor, Floyd J. Rice and Joseph D. Sofsky. In oval: Dr. Levering Tyson, Educational Advisor, WCBA-WSAN transmitting room showing (left) control desk and transmitter with shunt feed to antenna and (right) tube cabinet and a built-in monitor speaker.



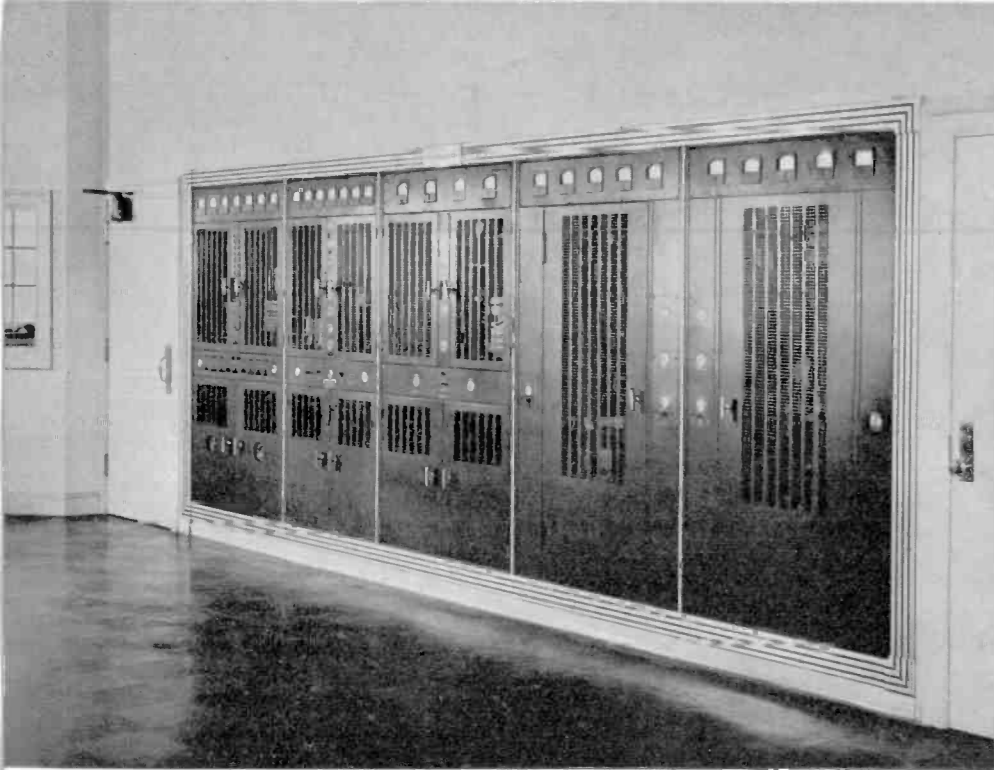


1922

WHAS

1938

LOUISVILLE ★ KENTUCKY

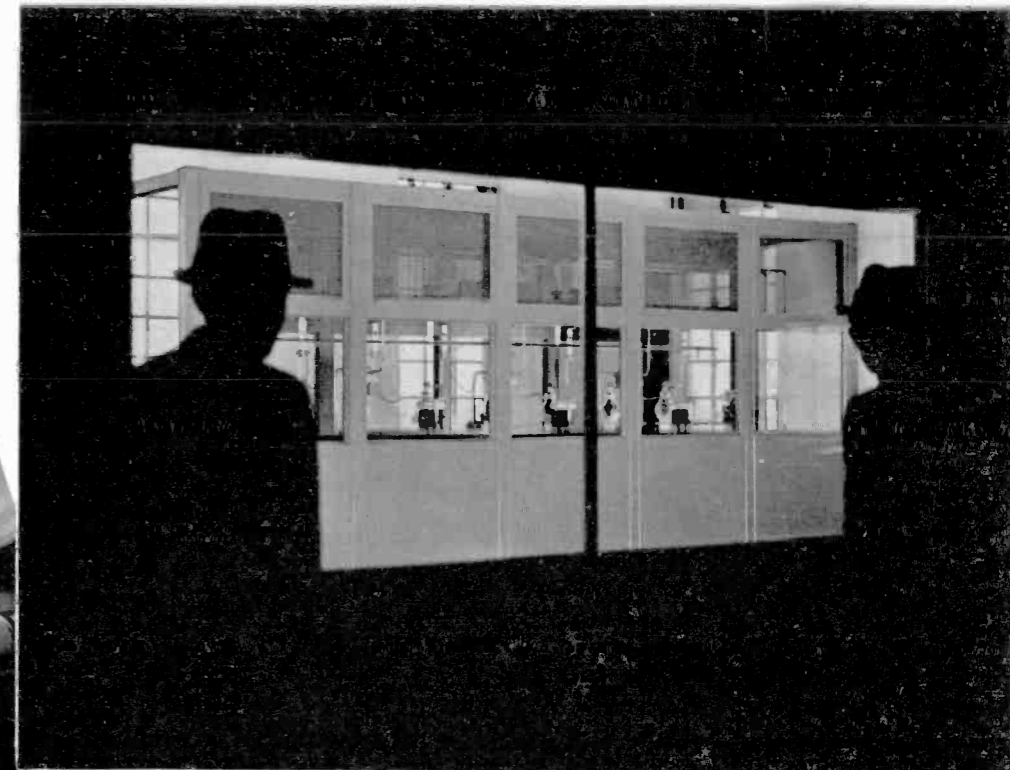


50 KW

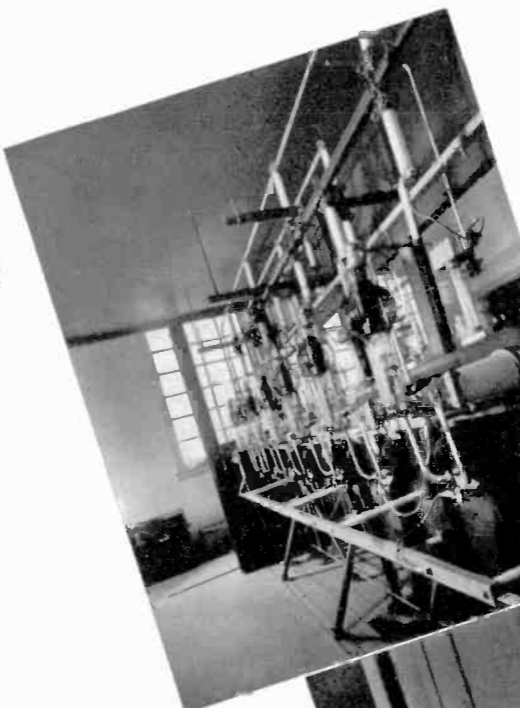
WHAS

820 KC

Presenting first pictures of the new WHAS, Louisville, Ky., as it goes on the air with the world's most efficient high-power transmitting facilities—Western Electric's new 50 KW Transmitter, employing the famous Doherty Circuit. Provision has been made for future operation at 500 KW.

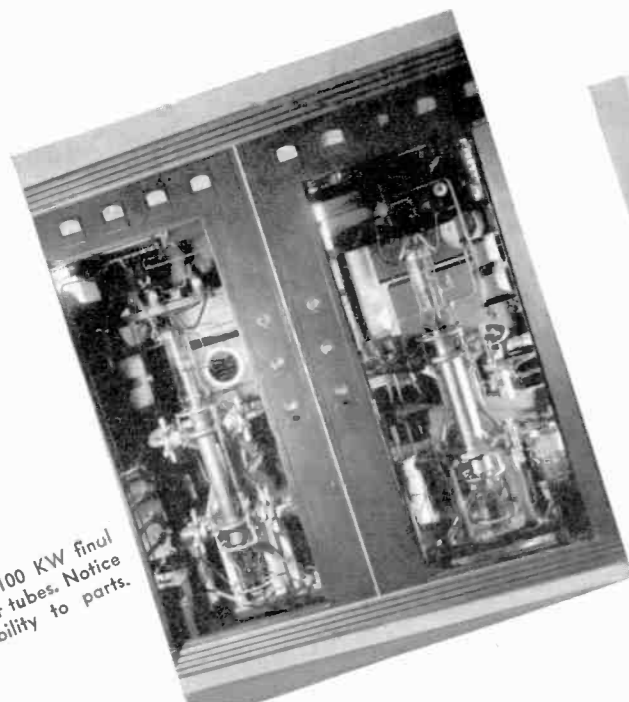


High-voltage rectifier tube unit showing 10 ampere rectifier tubes.



Rear of rectifier unit. 500 KW operation will use 75 ampere tubes.

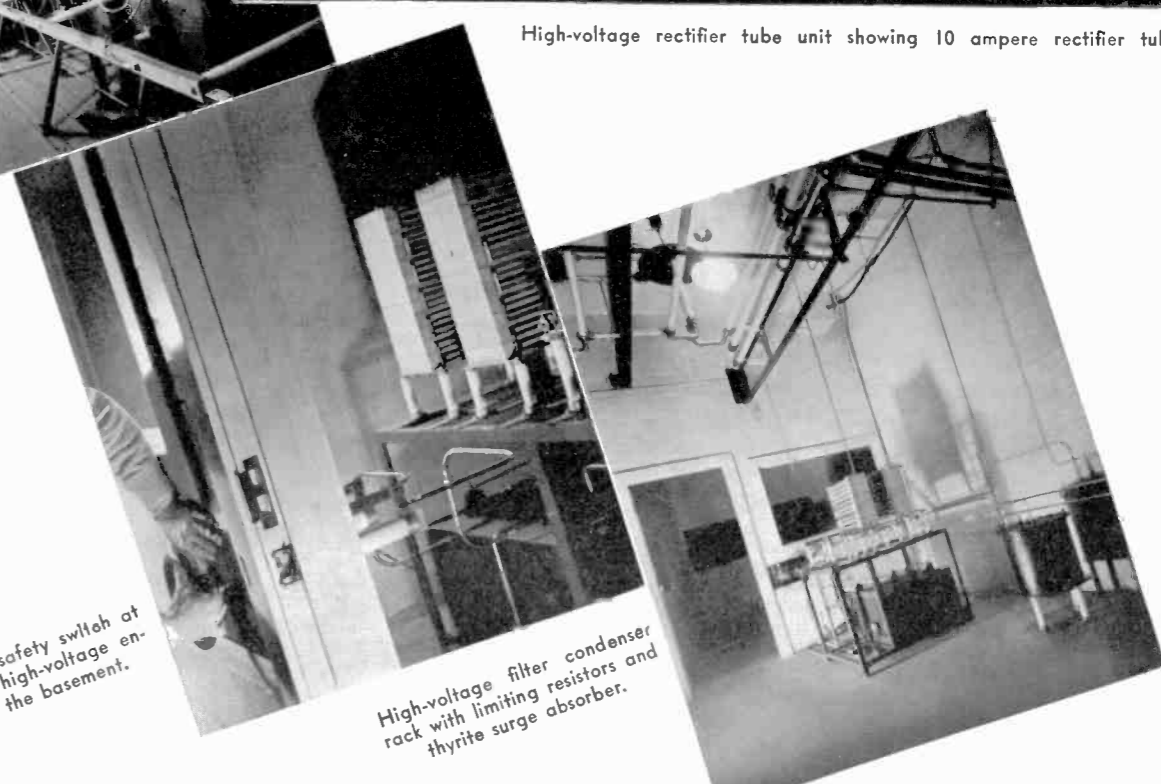
Occupying no more space than formerly required for a 5 KW, the 50 KW transmitter is framed like a picture on the wall.



The two 100 KW final amplifier tubes. Notice accessibility to parts.

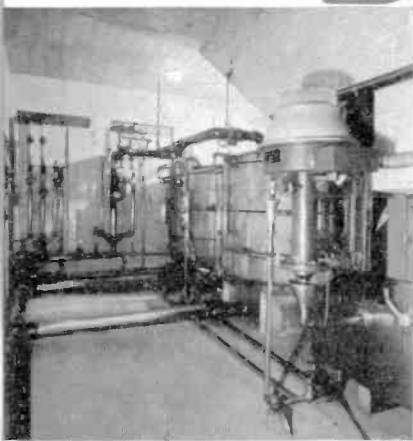


Transmitter speech input bay, featuring the Western Electric 110A Program Amplifier.



High-voltage filter condenser rack with limiting resistors and thyrite surge absorber.

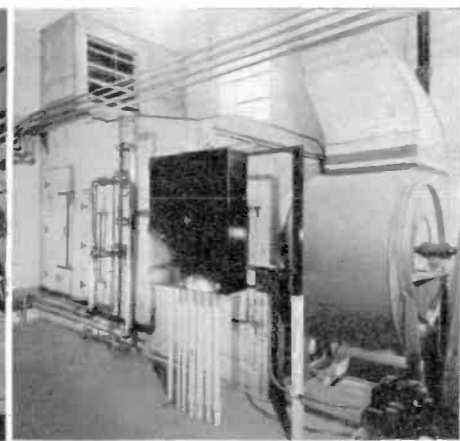
Hand wheel safety switch at entrance of high-voltage enclosure in the basement.



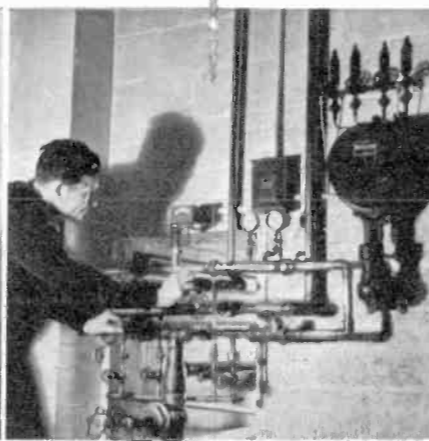
Water circulating system in basement for cooling tubes can handle 500 KW.



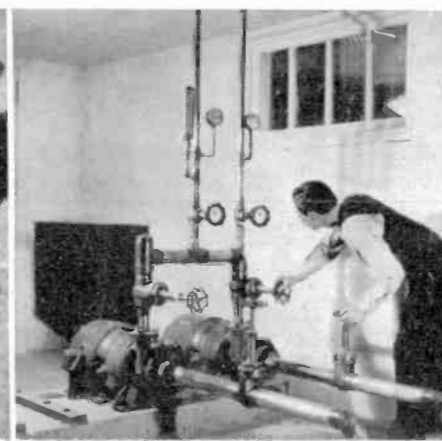
Porcelain tubes mounted on basement ceiling in which cooling water flows.



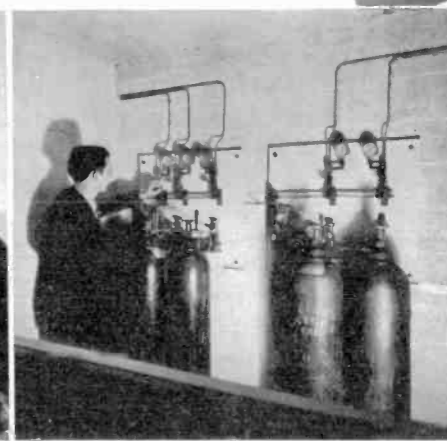
Air conditioning plant for the transmitting building installed in basement.



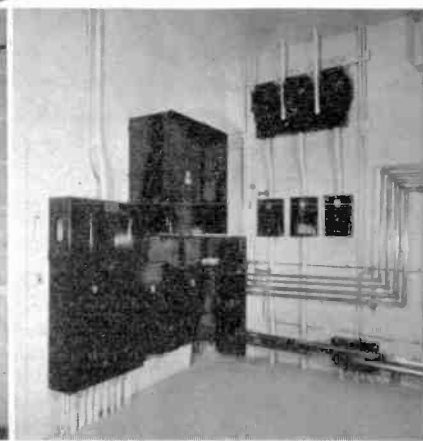
Water pressure and protective controls for the water circulating system.



Centrifugal type water circulating pumps. One used as a standby spare.



Nitrogen gas tanks and manifolds for transmission lines and condensers.



Distribution boards for the building service—installed in the basement.



From left to right: Barry Bingham, owner of WHAS; W. Lee Coulson, executive manager; Joe Eaton, program director; Credo Fitch Harris, station director.

(Continued from Page 19)

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Today WHAS has lines into five colleges in the state, and educational programs go out regularly from these institutions. Harris believes just as firmly as ever in the educational power of radio, but after 16 years he is still trying to develop the right sort of educational program. His optimism has not lessened, but his experience and wisdom have grown. "Professor Quizz does more to educate his listeners than the average college professor," he says.

"Too many educators still try to broadcast in the same way they conduct a class in a university. They forget, that while their students may be forced to sit still and listen to them in the classroom, their radio listeners can whisk them into oblivion with the turn of the dial. They forget that to hold their listeners with programs for their own benefit and self-improvement, the programs must possess the same drama, romance and humor that listeners can find in the best commercial programs."

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"No program," says Harris, "has the right to go on the air unless it can command the attention of a large share of the station's listeners, no matter how laudable its purpose may be. Listeners are just like a covey of quail. They are ready to fly away to another station the moment they hear any-

thing that disturbs or fails to interest them. And an audience once lost is hard to recapture. Such a program is unfair to the one which follows it."

There is one word at WHAS which dominates the policy of the station. It is "respectability." No program which fails to meet the acid test of that word goes on the air. "Radio has become the country's greatest influence for good or evil," Harris avers. "More than 600 stations of the country have become the very warp and woof that is constantly knitting the fabric of American culture. To maintain and build upon this culture, every station must hit the taste and standards of the highest type of citizen."

Broadcasting has developed a service to its commercial clients that is almost unique. As a general rule a news organization feels it has fulfilled the obligation when it prints a client's ad in his paper.

How different it is in radio advertising! Often the stations prepare the programs, make the surveys, provide merchandising cooperation and exploitation, and are always on the alert to learn listener reaction. Often the entire campaign on the air is handled by the station for the client. Perhaps this is one reason why radio advertising is so successful.

Much of this work comes under the duties of the program director of the station whose job is somewhat similar to that of the managing editor of a newspaper. One way to judge the worth of a newspaper is by the ratio of local news to syndicated material and boiler plate. Likewise, one check for evaluating a radio station is the ratio of station-originated programs to network programs.

"We try to keep a fifty-fifty balance between local and network programs at WHAS," says Joe Eaton, program director. "Our week-days hit this average, but our weekly ratio runs about 57-43 due to the many fine network programs which we broadcast each Sunday.

"There is far too much New York and Hollywood in network programs today," he says.

(Continued on Page 38)

Transmitter building entrance, WHAS.



Behind these doors, the new Western Electric 50 KW.

Pioneer WHAS Pioneers Again

By WILL WHITMORE

In memory my ears ache as though my head were in a vise and my fingers tremble as I adjust a small german silver wire. Yes, in memory, I say, because I have just laid down a book which took me back almost 16 years. Sixteen years ago, when radio was aborning, I listened nightly for a voice coming from afar. The ache came from earphones, and the wire was the catwhisker which one adjusted feverishly to avoid missing a single note of ethereal, magical music, or a word from the announcer.

Nightly, then, I listened for the opening announcement which preceded several hours of enthralling entertainment: "This is WHAS, the radio telephone broadcasting station of the Courier-Journal and the Louisville Times, in Louisville, Kentucky!" The book, "Microphone Memoirs," was written by the man who spoke those words then (and often speaks them now)—Credo Fitch Harris, director of WHAS.

WHAS began its broadcasting career July 18, 1922, with Harris as manager. When it opened that hot, sultry July evening, WHAS was pioneering a new and untrod trail. Radio stations which one could hear could be counted on the fingers of one hand, and none knew where this new marvel was headed. Today, after 16 years, WHAS is still pioneering, still standing out in front helping to show the way.

I have recently returned from Louisville to see WHAS switch over to a new transmitting plant, a plant which represents the industry's latest

and finest in technical achievement. It is new from microphone to antenna, and no station has a greater right than WHAS to pioneer again with science's latest contribution to the art of broadcasting.

Soon after WHAS went on the air Credo Harris penned a "code" for the station and those who appeared before its carbon microphone. After 16 years of continuous broadcasting, neither Harris nor the station has seen fit to change one word of that code. It reads:

"A station's value is in proportion to the esteem of its listeners. One objectionable word will ruin the most beautiful program ever built. If the Lord had written an eleventh commandment, it might have been: 'Thou Shalt Not Be Common.'

"Entertainment, if not in good taste, belies its name. Mispronunciation is worse than no pronunciation. Failing in these, Silence becomes a virtue!"

To that code he has added a word of instruction and caution to all those who would use the radio. To such, he says, "It's better to say little to many than much to none at all."

From the very beginning of the station, WHAS began ringing up one "first" after another. So long as it met the test of the code and came under the trilogy of "interest, convenience, necessity," nothing was too difficult for WHAS to

(Continued on Page 22)

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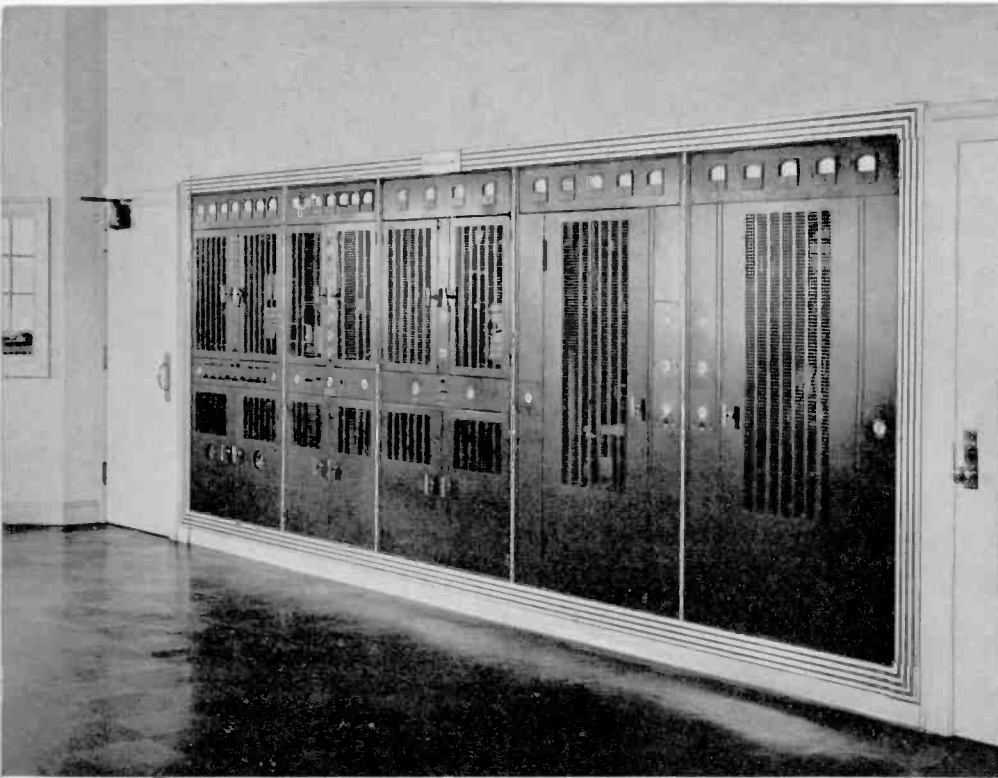
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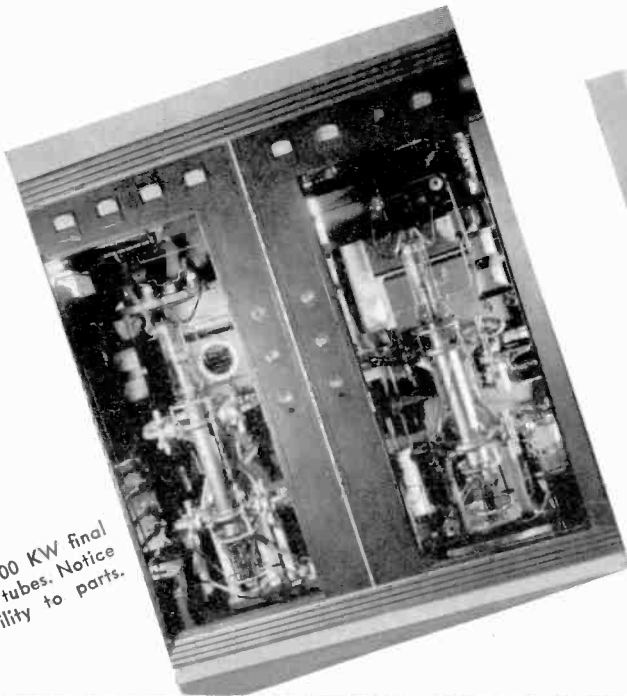
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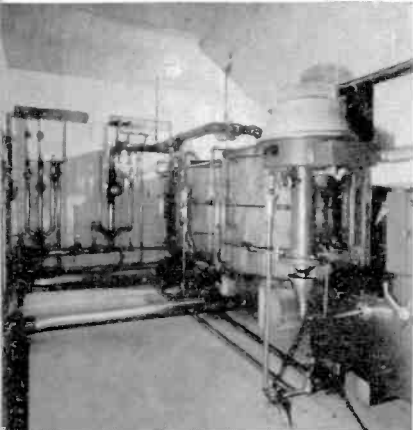
Occupying no more space than formerly required for a 5 KW, the 50 KW transmitter is framed like a picture on the wall.



The two 100 KW final amplifier tubes. Notice accessibility to parts.



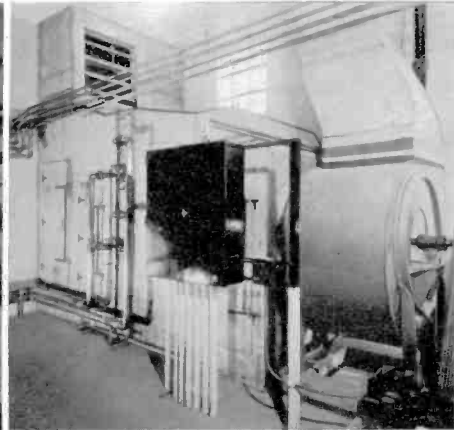
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Porcelain tubes mounted on basement ceiling in which cooling water flows.



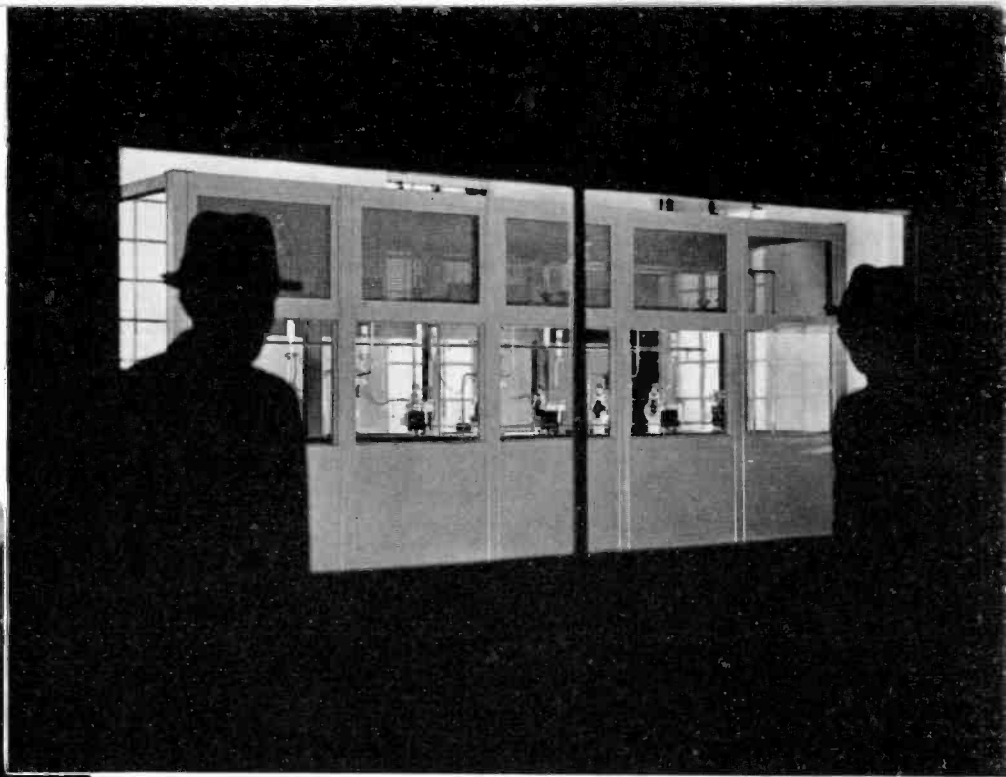
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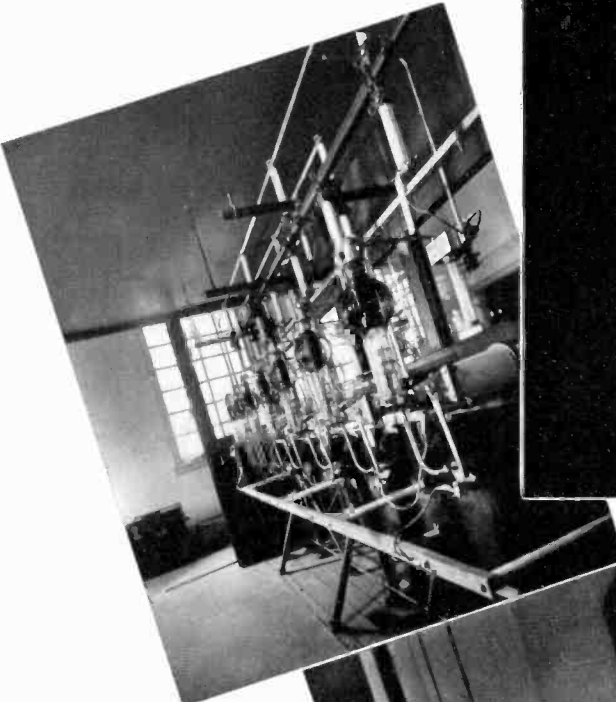
Water pressure controls for the water

AS

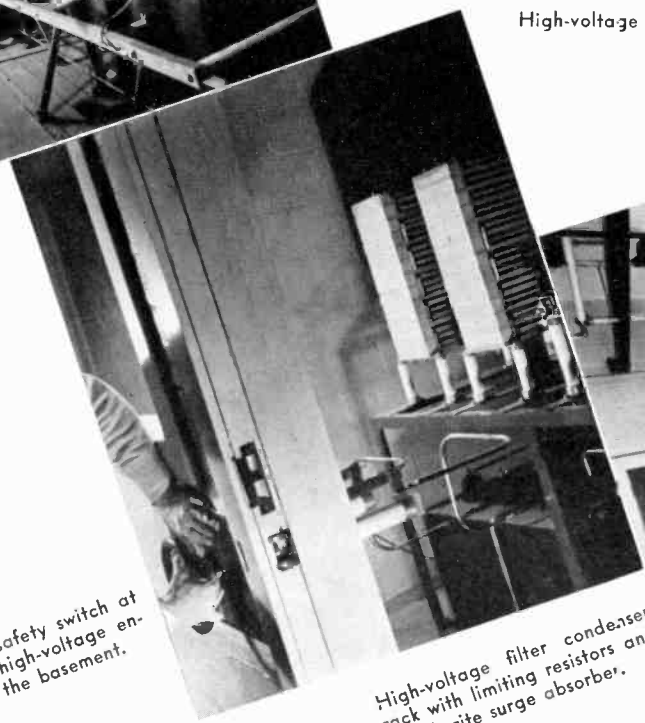
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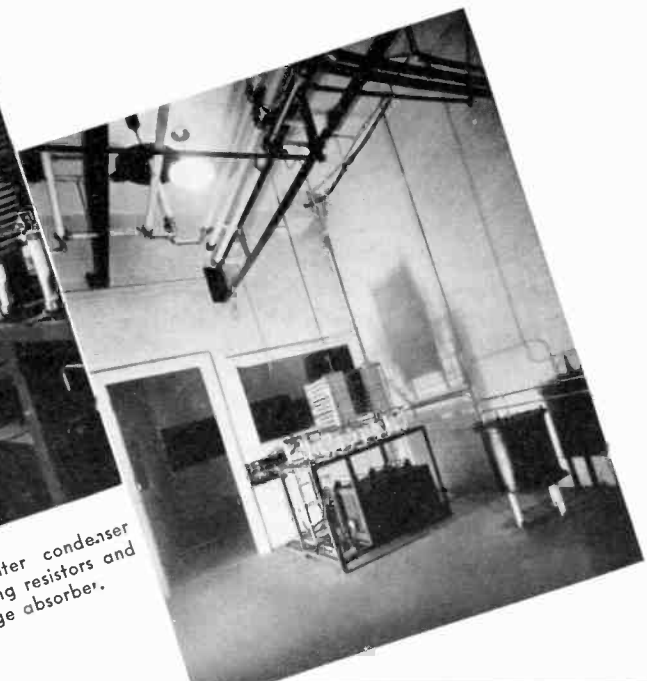
High-voltage rectifier tube unit showing 10 ampere rectifier tubes.



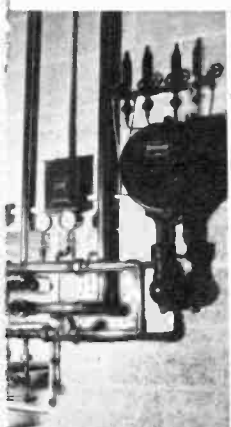
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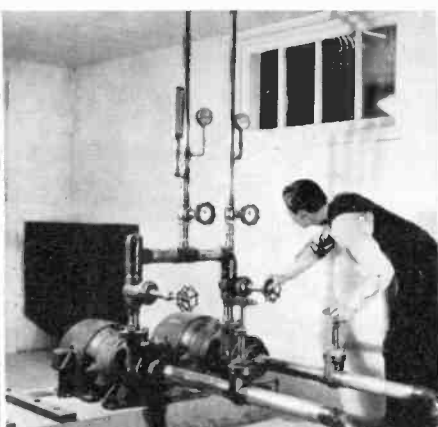
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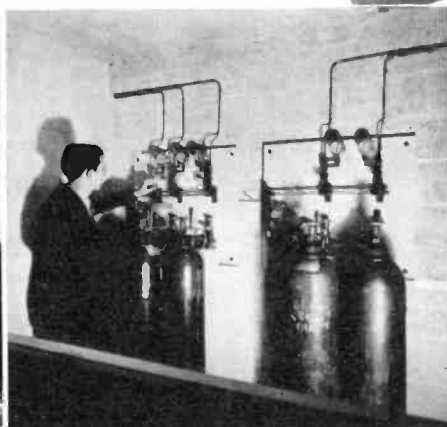
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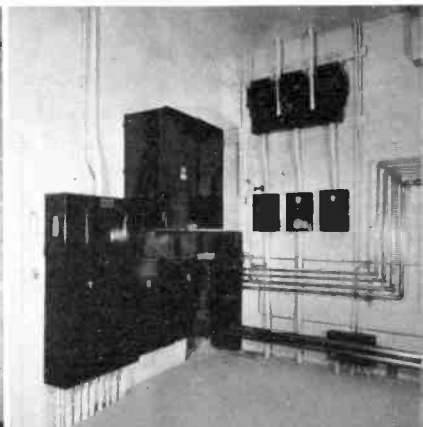
Protective non-circulating system.



Centrifugal type water circulating pumps. One used as a standby spare.



Nitrogen gas tanks and manifolds for transmission lines and condensers.



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There is one word at WHAS which dominates the policy of the station. It is "respectability." No program which fails to meet the acid test of that word goes on the air. "Radio has become the country's greatest influence for good or evil," Harris avers. "More than 600 stations of the country have become the very warp and woof that is constantly knitting the fabric of American culture. To maintain and build upon this culture, every station must hit the taste and standards of the highest type of citizen."

Broadcasting has developed a service to its commercial clients that is almost unique. As a general rule a news organization feels it has fulfilled the obligation when it prints a client's ad in his paper.

How different it is in radio advertising! Often the stations prepare the programs, make the surveys, provide merchandising cooperation and exploitation, and are always on the alert to learn listener reaction. Often the entire campaign on the air is handled by the station for the client. Perhaps this is one reason why radio advertising is so successful.

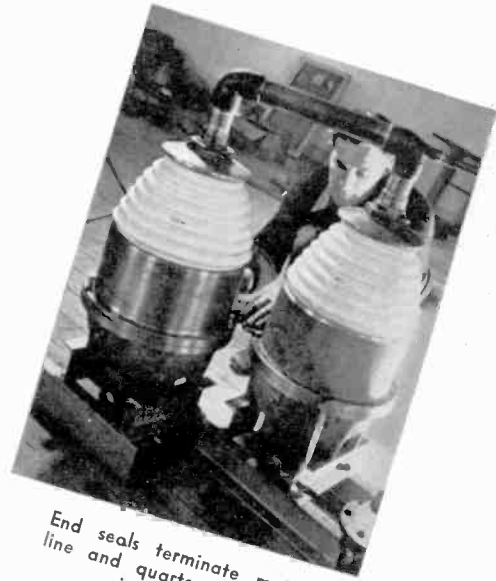
Much of this work comes under the duties of the program director of the station whose job is somewhat similar to that of the managing editor of a newspaper. One way to judge the worth of a newspaper is by the ratio of local news to syndicated material and boiler plate. Likewise, one check for evaluating a radio station is the ratio of station-originated programs to network programs.

"We try to keep a fifty-fifty balance between local and network programs at WHAS," says Joe Eaton, program director. "Our week-days hit this average, but our weekly ratio runs about 57-43 due to the many fine network programs which we broadcast each Sunday.

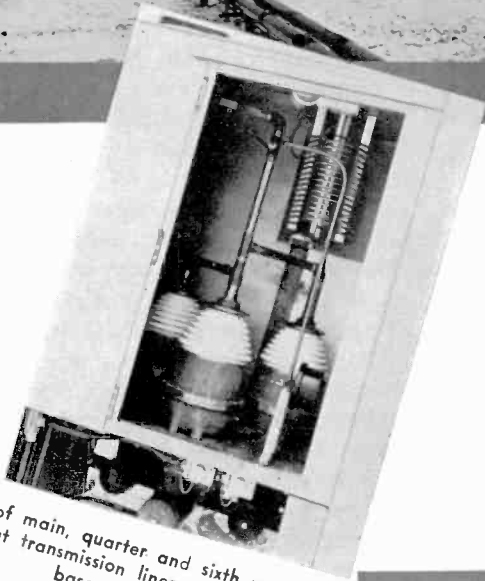
"There is far too much New York and Hollywood in network programs today," he says.

(Continued on Page 38)

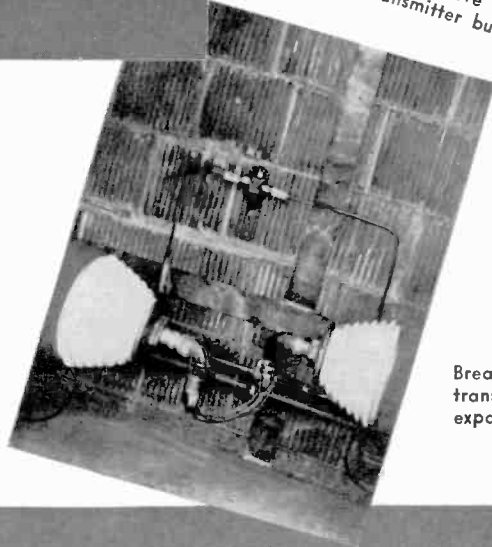
WHAS shunt excited antenna, 654 feet high, and transmission line which is capable of 500 KW operation.



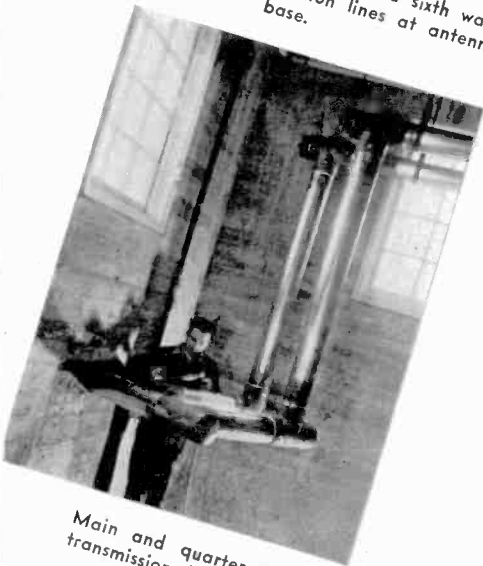
End seals terminate main transmission line and quarter wave harmonic shunt in transmitter building.



Termination of main, quarter and sixth wave harmonic shunt transmission lines at antenna base.



Break at half-way point in transmission line allows for expansion and contraction.



Main and quarter wave harmonic shunt transmission lines in transmitter building basement.



WHAS transmitter building, large enough to house a 500 KW transmitter. Extension at right is four car garage.

WRNL, New Station for Richmond, Va.

Richmond's newest broadcasting station is now on the air. Old WPHR, Petersburg, has been moved to Richmond, entirely revamped and given a new set of call letters, WRNL, the initials of the Richmond News Leader, with which the station is associated.

The transmitter site was selected early last year, a promising location on the Scott Road two miles north of Richmond and just off U. S. Route Number Two to Washington. It consists of 22 acres of flat meadowland directly adjoining a swamp whose water level is only 18 inches below the surface of the meadow. Across the upper end of the plot runs a fairly large springfed brook which has been permitted to spread out over the bottom. The land is so flat and the grade so slight that practically the entire ground system location is under water most of the time.

A 280 foot Blaw-Knox quarter-wave radiator was erected and the ground system plowed in. This ground system consists of 120 radials, each of which is 375 feet long—some nine miles of wire—and 240 ground rods. These were driven at the outer end of each radial and around the base of the tower, and penetrate fully four feet into the damp, marshy clay. All connections were spot welded, this method being selected because it provided a better and more permanent joint than solder.

The new transmitter building, modernistic in design, of concrete and brick construction, is completely fireproof. An exterior finish of smooth white stucco has been laid over the brick. The front of the building is rounded and presents a striking appearance. Extensive use has been made of glass brick to provide natural lighting in the transmitter room. The building consists of the main transmitter room, announcer's booth, engineer's office, shop storage room, sleeping room for operators, kitchenette and shower. In the basement is a garage and an automatic oil-burning heating plant.

The radio equipment at WRNL is completely Western Electric. Its transmitter room houses a five kilowatt 352E1 transmitter and a cabinet into which will be built the old WPHR transmitter for use as an auxiliary. The speech input equipment is mounted in a standard relay cabinet located in the announcer's room. Here 104A pre-amplifiers are used to drive the 110A program amplifier. In the special mixing cabinet Western Electric components are used.

The studios now under construction are located on the second floor of the News Leader Arcade in the heart of Richmond's retail shopping district. Here the modern treatment has again been carried out with a wide use of color bands and aluminum strip-

ping. The reception room, 17 by 27 feet, will have leather and chrome decorated furniture. At opposite ends of this room are two corridors, one leading to the two larger studios and the ladies' powder room and washroom, and the other to the men's washroom, a small studio and an audience viewing room.

The three studios, to be known as the Gold, Blue and Green Rooms, are grouped around the elevated control and operating rooms. These are interlocked so that any studio can be operated from either one.

Two Western Electric transcription tables equipped for vertical and lateral recordings, and a 23A control console are used in the operating room, and in the control room is located a second 23A console and another Western Electric turntable. These are intended primarily for auditions while a program is being aired.

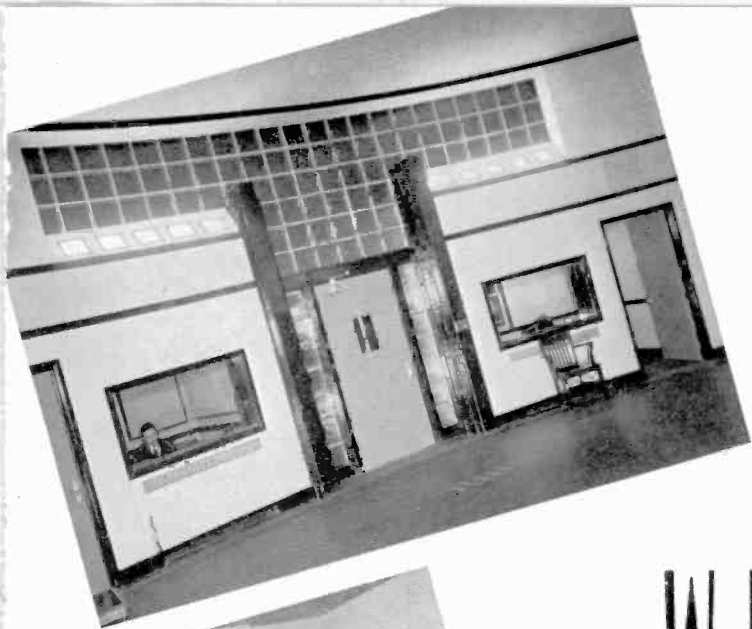
Two speech input cabinets are also located in the control room. The first houses incoming remote equipment, including equalizers, repeating coils and jack panels. In the second cabinet is the output speech equipment consisting of a mixing panel, five bridging amplifiers, attenuators and volume indicator. The bridging amplifiers feed the transmitter, loud-speaker system and lines to other stations in the state.

The station has been broadcasting since November from temporary studios in the News Leader Library. The transmitting equipment has operated perfectly and many comments have come from listeners on the clarity and strength of its signal. Radio experts regard the transmitter location as being almost ideal, and the results obtained seem to substantiate their belief. Operating daytime only (the examiner's report on night-time and increased power was favorable) the station is giving good coverage up to 100 miles. Many reports of reception give it a range of 150 miles, carrying into the nation's capital and far into North Carolina and West Virginia.

Stockholders of the station are John Stewart Bryan, president of the College of William and Mary, Williamsburg, and publisher of the Richmond News Leader; Dr. Douglas S. Freeman, president of the Board of Trustees of the University of Richmond, and editor of the News Leader; and Tenant Bryan, vice-president of the newspaper.

The station personnel includes Earl Sowers, promotion director and former managing editor of the News Leader, as managing director; Walter R. Selden, chief engineer; and C. Alden Baker, commercial manager.

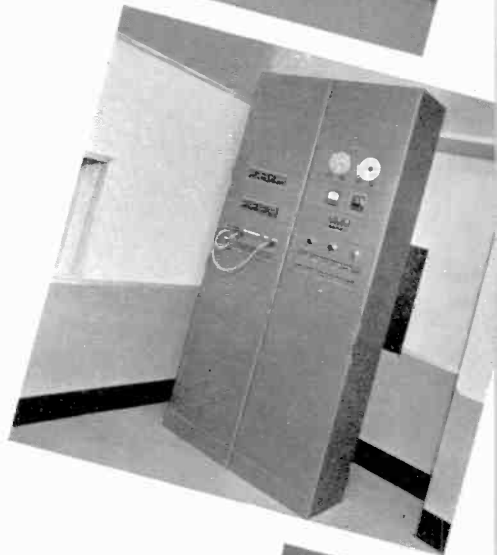
Virginia is proud of its new station.



WRNL

Richmond, Va.

From transmitter building to studios and Western Electric equipment WRNL presents beauty in architectural design—quality in art of transmission.



Top view shows the main studio. Second: Control desk and at right, main entrance with long distance view of transmitter. Walter R. Selden, chief engineer (left).



From top to bottom: Transmitter building — speech input equipment — Manager Earl Sowers and the spacious quarters which the 500 watt transmitter occupies.





One of the WBAP-City High School broadcasts in which students from Fort Worth public schools plan and present the complete programs.

Stations Need Individuality Says Harold Hough, WBAP

(Continued from Page 15)

billies, next amateurs, and now we have Hollywood!

"Hollywood is the current vogue, and the current 'what's wrong with radio.' Seems like every time you turn on the switch, there's a Hollywood program on the air. Some of the programs are good, but too many of them are not, and people are growing tired of so much glamor. We need to originate more programs in our own stations."

There is much material and talent right at home if stations would just go to the trouble to develop it, Hough thinks. "Why, we have kids right here in our Fort Worth High Schools and colleges who can do more than many of the people in Hollywood. You should hear the talent on our school program every Saturday morning."

WBAP is particularly proud of this WBAP-City High School half-hour feature and so are its listeners. The series has been on the air every Saturday morning at 9:30 for about 20 weeks now and is fast becoming one of the station's most popular programs. The show is broadcast from the auditorium of the William P. McLean Junior High School, and a different school puts on the program each week. The students handle everything, selecting their own personnel and performers. A Collegiate program, similar in nature, and composed of college students, is likewise broadcast each Saturday, just prior to the high school series. It, too, is proving extremely popular.

Carrying on WBAP's policy of originating programs indigenous to its area, the station, under the technical supervision of R. C. Stinson and station direction of George Cranston, completed more than 3,000 remotes in 1937. It claims something of a record by averaging more than 55 weekly remotes for a total mileage of 55,000.

To handle a number of its remote pickups the station has recently equipped a truck with a 100 watt, short-wave transmitter with call letters of KNED. The truck has complete equipment capable

of furnishing enough power for the average small community. Should any town in the WBAP area meet with disaster and be left without power, it is planned to rush the truck to the scene. Fortunately, no such emergency has arisen, but WBAP is ready to serve when it does.

Service to its area is WBAP's motto. On the last day of 1937 Harold Hough received a wire from his Washington attorney which read: "Congratulations on your KGKO grant and happy New Year." That meant the Fort Worth Star-Telegram had received a license to operate another station, 5,000 watts night, and 1,000 watts daytime. It goes on the air early this year.

Harold Hough, the Old Hired Hand, may not go on the air a great deal any more, but he's in radio up to his ears. Last April he put his own station KTOK, Oklahoma City, on the air. And it's doing mighty well, thank you.

Voice of Nation's Capital

(Continued from Page 12)

Amplifier.

Despite a continuous daily operating schedule from 7 A.M. to 2 A.M., the time lost due to apparatus failures is reported to have been negligible since the present installation was completed. This fact is largely due to the quality and dependability of the equipment used, as well as to the excellent installation and the thorough maintenance job done under Mr. Lyon's supervision.

That equipment dependability is of unusual importance may be realized from consideration of the fact that WOL serves not only its own community but also the many outlets of both the Mutual and Intercity Broadcasting Systems, for which it is the Washington key station. Because of the great public interest in the day-to-day events in Washington, the station's staff and facilities often must function to produce locally radiated programs simultaneously with others consigned to its associated networks, or to individual stations in other parts of the country. Such programs may be, for example, talks by members of Congress directed to the radio audience in some particular locality. Too, the nation's best known voice—that of the President—is transmitted to vast audiences through the facilities of WOL.

WOL originates several well known sustaining features. The U. S. Army Band, Elder Lightfoot Solomon Mischaux (who "chases the devil from Coast to Coast over the Mutual network"), and the WOR Forum, are among those most widely heard.

Serving a city in which news is made, it has become WOL's constant aim to be "first with the news in Washington."

Right: The beautiful home of the Larchmont Police Department, with graceful antenna pole lined against the sky.

William J. Keresy,
Chief of Police

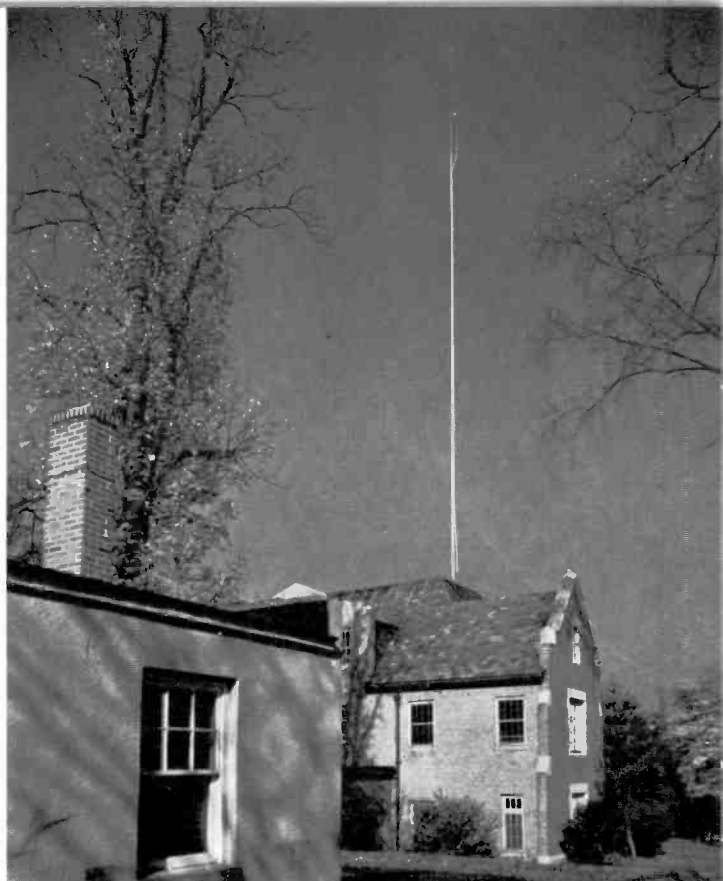


Larchmont Police Radio Is Reality After 14 Years

Back in 1924 the police department of Larchmont, New York, was presented with a Western Electric radio transmitter and receiver. This equipment, bought at a government sale by a good friend of Larchmont, had seen plenty of service, but was still capable of delivering a strong signal and receiving programs from even distant stations. Larchmont thus may be considered as one of the pioneers in police radio work. The only trouble with this pioneering was that there was no one with whom to talk. Besides which they had no transmitting license. Nevertheless, the members of the department hooked up the equipment and even had a licensed amateur make a few test broadcasts, after which they used only the receiver, listening to amateur and commercial programs. The man who did most of the work of installing the equipment was a motorcycle patrolman named William J. Keresy.

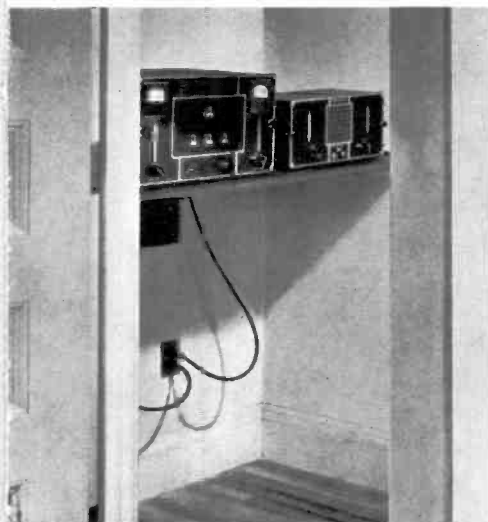
Today the Larchmont police department, headed by Chief of Police William J. Keresy, is using the latest in two-way police radio equipment. Their system consists of a five watt Western Electric transmitter and a station house receiver. Three roving patrol cars are equipped with receivers and ultra-high-frequency car transmitters.

Visitors to the police station look in



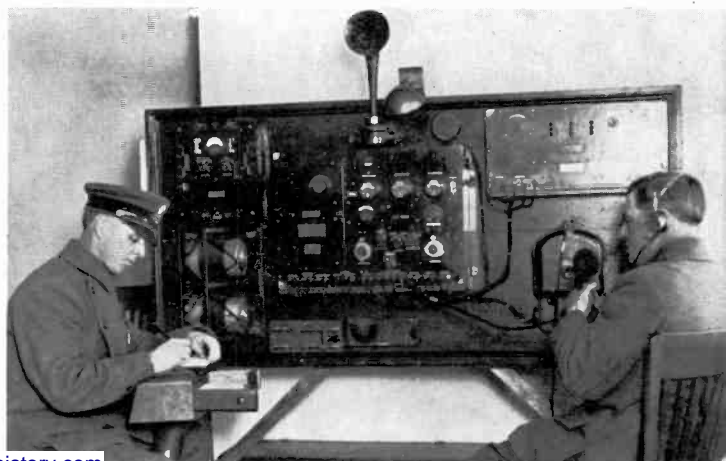
vain for an elaborate layout of equipment. To casual onlookers there is no evidence of any radio apparatus and not until the loud speaker bursts into speech are they given any clue. This speaker is hidden behind the top of the high desk in the "receiving" room and on the desk are two identical telephone handsets, one of which is used to converse with the roving cars. The actual transmitting and receiving equipment is located in a closet on the top floor of the building.

The new system has been in continuous operation since August 21, 1937, and, as might be expected, has given excellent service. Chief Keresy and the members of his department are full of praise for its performance. The task of policing and patrolling their busy town has been facilitated and when trouble arises radio sends a policeman to the spot at once. The town is divided into three districts with a car assigned to each. In actual tests it was found that to go from the farthest point in any one district to the opposite end of another takes only three minutes. The average time in answering calls is less than half



Requiring little attention the headquarters equipment is in an out-of-the-way spot.

A "pioneer" police radio equipment. The patrolman seated at the left is now Larchmont's Chief of Police.



of that, which means fast work.

According to Chief Keresy there have been many arrests which could not have been made without the aid of the police radio system. A typical case from his files illustrates how valuable it has proved to be.

About three o'clock one morning a passer-by was startled to see a hold-up in progress in an all-night drug store. He rushed immediately to a nearby telephone and called headquarters. The alarm was put on the air and Car Number One ordered to the scene. Exactly 57 seconds later the car pulled up at the drug store, arriving just as the thief started to leave. Seeing the police car, he dashed back into the store evidently headed for another exit. The drug store was on the ground floor of a building that occupied an entire block, with five exits into four different streets. The quick-witted policeman, realizing that he could not make the capture alone under these circumstances, immediately put on speed and began circling the block to prevent his escape from any of the exits. At the same time he lifted his phone and asked headquarters for help. The other two cars were ordered to his aid and, less than three minutes later, the thief, risking a dash from the building, was caught by the patrolman from Car Number Three.

Another and more humorous incident occurred soon after the system was installed when a woman called up to say that some one was trying to get in her back door. The car in her district was cruising less than two blocks away at the time and was at her door in a matter of seconds. Seeing nothing wrong, the policeman rang the bell. In answer, a woman's voice rang out, "Get away from there! Don't you dare to try to get in! There will be a policeman here in a few minutes." And it took some time and argument before she would believe that her visitor was a policeman and that he had come in answer to her call. She would not admit it was possible until he had shown her his telephone handset, made his report to headquarters, and both had heard the clearly audible reply, "Okay, Number One, return to your post." The "burglar" turned out to be a couple of mischievous youngsters playing a tic-tac on the glass of her door.

One day last month something went wrong with the electric current supply at the police station and as a result the headquarters equipment was, for a number of hours, without the power to operate. However, what might have been a serious problem was solved in an astonishingly simple manner. One of the patrol cars was brought back to the station house and used as a temporary "radio room." Calls came and went as usual, with the other two cars taking care of the district usually patrolled by the one at headquarters. The Western Electric ultra-high-frequency car transmitter and receiver served perfectly as temporary headquarters equipment and

maintained the system's record of continuous operation.

Chief Keresy is willing to back his police radio system against any other low-powered equipment made. He knows whereof he speaks, for, with an engineer assigned by the Town Board, he inspected practically every make and model being used by various police departments before a final selection was made and the equipment purchased. He has never regretted his choice.

A New 5 KW Transmitter

(Continued from Page 11)

techniques for quality control. At the high percentages of modulation resulting from the use of a Western Electric 110A Program Amplifier, the distortion contribution as measured on an actual shop production model is always less than 2.0 per cent, and it does not exceed 5 per cent at somewhat over 100 per cent tone modulation in the entire band of 50 to 7500 cycles.

The ability to take high program levels is another new feature engineered into this transmitter. The amplifiers are designed to carry over 100 per cent modulation peaks without a sharp increase in distortion and with absolutely no damaging effect to circuit components or tubes. This ability is a direct result of the continued development and research on low-level modulation systems and the associated overall stabilized feedback circuits.

The level of carrier noise, as in earlier transmitters using DC filament supply or AC filaments with feedback, is further down from the program signal than necessary. In this transmitter it is well over 60 decibels down, unweighted.

The audio frequency characteristic is as usual—flat over the entire audio range.



The University of Kentucky and WHAS, Louisville, have established more than 40 listening posts like the above in the mountainous country of the state. People come from miles around to listen to the radio.

WDAF, Kansas City, Mo.

(Continued from Page 8)

"Merry Old Chief" of WDAF and now vice president and general manager of WJR, Detroit. Coon Sanders' orchestra supplied musical numbers while the "Night Hawks" issued charters and membership cards to over 300,000 listeners located in 48 states, Canada, Cuba, Mexico and Alaska.

As the years rolled by WDAF stepped steadily forward. In 1925 a 1,000 watt Western Electric transmitter was installed and additional studio space secured. A year later the station joined the NBC network. By 1935 the 1,000 watter had been supplemented by a Western Electric amplifier which increased daytime power to 5,000 watts. In the fall of 1936 the Star officials decided to build a complete new rural transmitting plant and selected a 52-acre site in Johnson County, Kansas.

On June 30, 1937, WDAF went on the air with its new Western Electric high fidelity 5,000 watt transmitter. The transmitter building houses a complete automatic sub-station, fed from two separate power plants. The 3-phase, 4,000-volt lines from these power plants follow entirely different routes, minimizing chances of an interruption due to line failures during stormy seasons. The 4,000-volt loops are normally tied in parallel at the sub-station. However, if any one phase on either circuit gets in trouble, it is automatically lifted until such time as the trouble is cleared—after which it restores itself.

The building lighting is supplied by a 75 KW bank of transformers tied directly on the 4,000-volt service. Power for the transmitter and its associated equipment, however, is supplied from either of two 75 KW, 230-volt, 3-phase General Electric motor generator sets. The generators are driven by 150-h.p. synchronous motors. It was found advisable to employ such a set-up due to excessive voltage fluctuation as well as slight frequency variations, inasmuch as WDAF's location is on the end of the power lines and regulation is poor. The additional cost of this type of installation is rapidly paying for itself in overall noise reduction on the carrier, better tube life, increased stability of entire transmitter and ease of operation.

The power control board for these machines employs the latest type voltage regulators so that generator sets may be paralleled or switched at any time without difficulty. The load when operating on 5 KW is 24.4 KW. This load represents entire transmitter speech equipment, 110A program amplifier, as well as numerous testing equipments, water pumps and fans.

All equipment associated with the transmitter such as water pumps, water cooling equipment, transmission lines and program circuits from the studios is carried in duplicate. The program cir-

uits are equalized to plus or minus one-half db, from 30 to 10,000 cycles, and are used alternate days, as is all duplicate equipment.

The two Isolantite two and one-half inch concentric transmission lines are 700 feet long and run side by side, laid in and covered with half tile buried 3 feet deep. Nitrogen gas at a pressure of 35 pounds is carried on lines at all times. To date, but one pound of gas has escaped since the lines were installed last June. The only bends in the entire line are inside the transmitter building, where oversize junction boxes were used in order to make repairs simple in the event of trouble from lightning.

The ground system consists of 120 radials, each 450 feet long. They are made of tinned copper strips, one inch by one thirty-second. The radials are buried three inches underground for the first 50 feet from antenna base and 8 inches thereafter. The ground ribbons running adjacent to the concentric lines are tied to lines every 10 feet. All splices in the system are brazed and no solder joints are employed in the entire set-up.

The antenna tuning house, located at the base of the 420-foot Blaw-Knox uniform, cross section, vertical radiator, is half above and half below ground. It houses antenna coupling equipment, motor generator set for tower lights and flasher equipment for the beacon light. This room, seven feet square, is completely shielded and tied into the ground system. The transmitter control room and rectifier room are completely enclosed in copper screen, every reinforcing rod, window lintel or, in fact, every metallic object used in the construction of the building is spot welded to a one and one-eighth inch by one-eighth inch copper strip, which is tied into the ground system, as well as numerous copper ground rods 10 feet long driven below the basement floor. There are well over 2,500 feet of one and one-eighth inch by one-eighth inch copper used in grounding in the building alone.



Set up in a bowling alley instead of the tube rack of WOR's 50,000 watt transmitter in Carteret, N. J., a strike by an accurate bowler would cause \$20,000 worth of damage—that is the value of these assorted bits of glass and wire. They are kept in reserve against any possible emergencies.

WMAS

Springfield, Mass.

Matching strides with the steady improvement in the technique of broadcasting and the general development of the industry throughout the country, WMAS, Springfield, Mass., in five short years, has taken a leading position in the western area of the state. The latest step forward in the station's march of progress is the installation of a Western Electric 310B high fidelity transmitter.

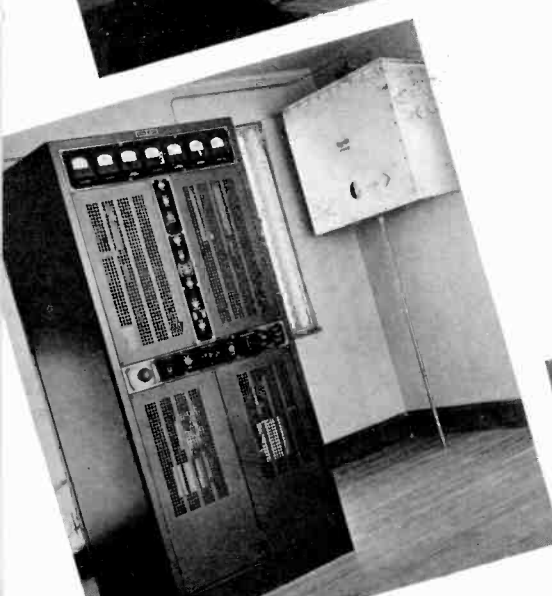
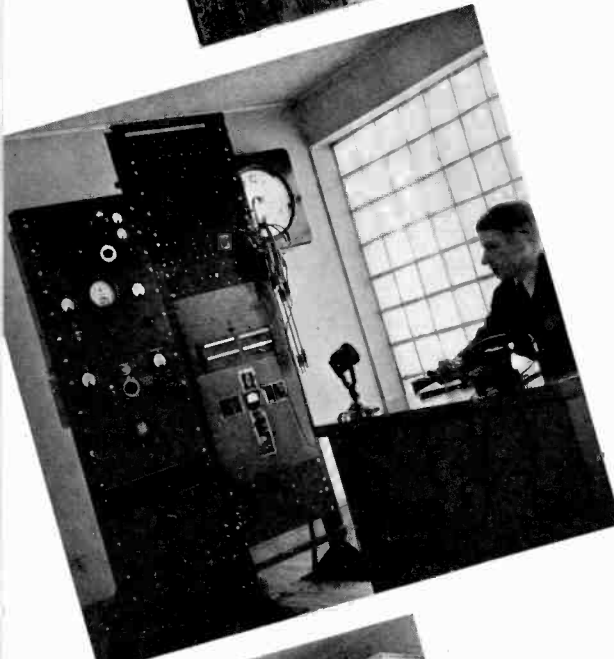
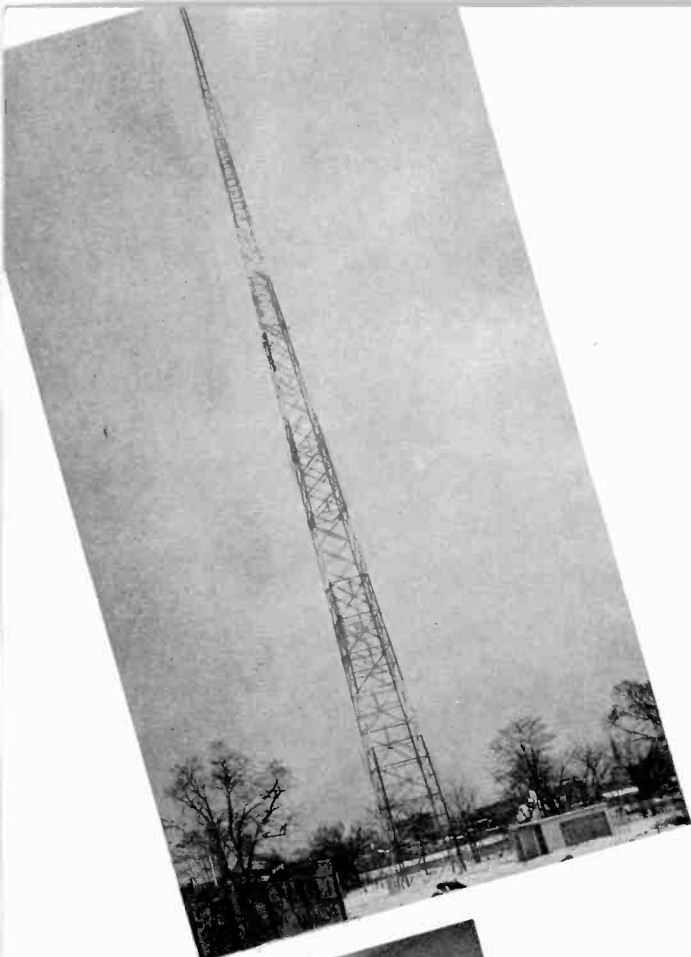
When WMAS made its debut in September, 1932, studios and transmitter were located in the Hotel Stonehaven. Because of the excellent schedule the station has carried, including programs devoted to civic, religious and educational features as well as Columbia network broadcasts, the station has rapidly gained an important place in the community.

Early in 1937 plans were set in motion for expanding broadcasting facilities and, on September 1, WMAS moved into new and spacious quarters with studios and offices in the Hotel Charles. Completely new Western Electric speech input equipment was installed. A 23B Console is used to control the air shows of the three studios which are all equipped with Western Electric microphones. A. W. Marlin, Manager, says, "In flexibility, ease of operation and high fidelity reproduction the new equipment far surpasses anything previously used by the station."

The 310B Transmitter in conjunction with the 110A Amplifier and associated equipment was installed in a modernistic transmitter building at Pynchon Park on the east bank of the Connecticut River. A novel feature of building construction was used in making one entire side of the structure of vacuum glass blocks. These provide fine lighting.

According to Mr. Marlin the 110A Amplifier easily permits an average audio level increase of 3 db which in turn noticeably improves service to the listener. The new station facilities place WMAS in the forefront as one of the most up-to-date smaller stations in the country.

From the graceful tower topping the page to the Western Electric 310B Transmitter at the bottom WMAS is ultra-modern in its broadcasting facilities. The 110A Amplifier (center) has been a worthy addition according to Albert W. Marlin, Manager, who is seen checking a report presented by James L. Spates, the station's chief engineer.



New 50 KW Transmitter

(Continued from Page 7)

plant for use of the ordinarily wasted heat.

The low voltage distribution cubicle comes completely assembled and wired ready for connection on one side to the incoming power supply cable and on the other side to all separate parts of the transmitter requiring power. In the cubicle are protecting no-fuse circuit breakers and electrically operated remotely controlled switches (controlled from the front panel) for each circuit. The main power switch is a motor operated circuit breaker of great stamina. Square duct or conduit can be used for the external connecting wires to the other parts of the transmitter, making the installation problem exceptionally simple.

Several optional arrangements are possible with respect to power apparatus and plan of installation; however, the radio units remain much the same under any of these arrangements.

The 407A1 code number applies to the transmitter that would be offered to stations not contemplating any increase in the power rating of the station beyond 50 KW within short enough space of time to build for the increase. It is the most efficient and least expensive arrangement for an output of 50 kilowatts (or 25 kilowatts) as only one set of power apparatus for high-voltage plate supply is employed for the whole transmitter. The 407A2 code number refers to the transmitter having its auxiliaries and other parts rated in power capacity as part of a complete 500 KW transmitter. The new transmitter at WHAS, Louisville, is of this type. The 407A3 code number applies to the 50 KW transmitter for operation on 50 cycle AC power supply.

The 407A1 Transmitter consists of the same three main units of the 5 KW transmitter described above, with some minor changes in circuit, and a 50 KW amplifier. The radio part of the amplifier is housed in one frame twice as wide as that of the 5 KW part and has two full length doors in front. Behind each door is a 100 KW vacuum tube and behind the tubes facing the rear are the circuit components. Three relatively small coils, very small when compared to those in older transmitters, on ceramic forms and two gas-filled variable plate condensers form the complete output circuit of the amplifier. A harmonic shunt is also part of the unit.

Connection from this unit through a coaxial transmission line is made to whatever type of antenna coupling device is necessary.

The 100 kilowatt tube is double ended, the grid connection being on the bottom end, filament at the top and anode in the center part. The mountings for these two tubes are designed so that five short motions release a tube from the mounting and

a similar number in the reverse direction secures a tube in place.

Each tube has a manually operated induction regulator in the filament supply in addition to a common automatic regulator. The individual regulators permit adjustment of filament voltages separately and the automatic regulator keeps the voltages constant at the set values.

Circuit adjustments are made initially by tapped coils and finally by the tuning of the adjustable condensers. Jacks are located adjacent to the condenser controls on the panel for plugging in an oscillograph which makes the circuit action graphic.

The five main cabinets form a front of approximately 18 feet long. Steel-glass partitions form the other three sides of an enclosure 17 feet deep in which all the apparatus not located outdoors or associated with the water circulating system can be installed. The front panel may be made part of one of the walls of the operating room as the particular styling, color and finish employed work well into many decorative treatments. A four-inch molding of extruded aluminum containing alternate strips of satin-aluminum and grooves of dark gray is employed to give continuity to the cabinet assembly forming, out of individual units, a blended continuous panel.

Within the steel-glass partition are located the high-voltage and grid-bias rectifier units, the low-voltage distribution cubicle, filter retard and filter condenser. A multi-blade grounding switch is mounted on the high-voltage rectifier unit and is associated with the door to the enclosure in such a manner as to require stopping the transmitter and grounding the high-voltage circuits before any access to front or rear can be had.

The low-voltage distribution cabinet, like that of the 5 KW transmitter, comes assembled and wired ready for connection between the incoming power cables and the parts of the transmitter requiring power. The unit contains no-fuse circuit breakers for protection of each separate branch and remotely controlled (from the control unit in the front panel) switches. The incoming power switch is a motor-operated circuit breaker of great stamina used well within its ultimate rating. All switches are immediately accessible for inspection and servicing. With duct or conduit connection from this unit to the other units of the transmitter, each provided with marked terminal strips, installation effort is reduced tremendously over that required with older transmitters.

Straight pieces of porcelain pipe glazed inside and outside are employed in the water circulating system. These may be mounted in several arrangements to fit the building design. Duplicate pumps and coolers are furnished for the forced-draft radiator cooling system or two sets of pumps with intercoolers for the spray pond system, whichever is used. The forced-

draft radiator is of the dry type, as this kind of radiator requires no scale servicing and its efficiency remains constant.

The power supply apparatus is of simple and rugged design and consists of three single phase transformers and an automatic voltage regulator, for mounting outdoors, or indoors where indoor mounting of oil cooled transformers is permitted. No motor-generators are employed, in fact the only rotating machinery is found in the pumps and the fans of the radiators. The regulator is of the induction type arranged to return to minimum position when idle, thus allowing starting at one-half plate potential. After full plate voltage is reached automatically, the regulator then maintains the voltage constant. A second and smaller automatic regulator maintains constant filament and bias voltages.

The transformers for plate supply are rated so that two of them in open delta carry full load. A third transformer is furnished, however, and with the purpose of keeping all transformers in good condition, the third may be connected into the circuit to close the delta or a plan of periodic rotation of transformers may be employed so that one is always idle but tested.

The following general features will be found in both 5 and 50 KW transmitters and may be of interest:

In the routine maintenance of radio equipment, considerable time is spent in cleaning the interior of the units. This cleaning, in some cases, can not be done satisfactorily on account of the short time during which the transmitter is off the air. There is also the danger of damage beyond immediate repair to parts while cleaning. The recent tendency toward air conditioning of the building in which the transmitters are installed minimizes the dust accumulation but this, however, is not always sufficient to eliminate frequent cleaning, as dust gets into the building through other openings than the dust filter. In order to minimize maintenance of transmitters in locations where the dust problem is severe, the 405 and 407 types of equipment are designed to permit the addition of parts for completely enclosing the units and with facilities for attaching an inlet and an outlet duct for conducting filtered air. These parts are designed and available and consist of easily removable panels on sides and rear and transparent windows attached behind the perforations in the doors. These can be added without difficulty and do not change the installation layout except for the addition of the inlet and outlet ducts and providing a source of clean air.

The steel cabinet type of construction is essentially a strong steel angle framework which supports the apparatus components on the inside and the doors and covers on the outside. In the process of manufacture the facility of mounting apparatus in such a frame later becomes of advantage to those respon-

sible for maintenance and operation in that each component piece is quickly accessible.

The cabinets are finished in aluminum gray made up of a deep shade of gray lacquer with flecks of aluminum distributed throughout. This finish was developed some years ago and is continued in use due to its ability to stand up under years of wear and because it blends well with varying decorative treatments of transmitting rooms without losing character as the years roll by and styles change. The doors are built of light but exceptionally strong sections and contain perforations of small squares. Both the aluminum gray finish and the perforated doors have characterized Western Electric apparatus for years.

In previous designs of radio equipments, a problem that always existed was the selection of meters having uniform cases and scale markings readable at a reasonable distance from the meter. On account of the wide variety of exacting requirements imposed upon the supplier and the necessity of accepting meter cases that were in existence at that time, it was not unusual to have assembled on a transmitting equipment a variety of meters ranging from three to six inches in round cases and also in several other shapes. The four inch square illuminated flush-type meter furnished with this new design of equipment has overcome these problems and is the result of close cooperation between the supplier and the Laboratories and involved examination of numerous full-size models for detailed study of styling, scale marking, and dial illumination. This preliminary study also brought out the utility of having the functional title of the meter printed on the dial instead of the conventional separate nameplate.

This feature has been considered of sufficient importance to warrant its inclusion on the meters. The conventional black finish of the meter case has been replaced by aluminum gray, blending with the background. This color scheme, together with the illuminating features, results in an improved dial predominance. All meters are assembled in a single row across the topmost part of the units. This position was established principally from consideration of the operator's convenience and also the appearance of the equipment. In isolating the meters from the panel controls and placing them as close to the eye level as practicable, the operation of meter reading is accomplished without the searching and distraction caused by proximity of other parts.

The equipment described in this article is standard, and numerous deviations are possible to meet particular conditions.

NOTE: For additional pictures of this transmitter see pages 16 and 17 of the December, 1937, issue of PICK-UPS.



KWNO

Winona, Minn.

One of the youngest and best equipped of the smaller stations in the country is KWNO, Winona, Minnesota, which broadcast its inaugural program on January 16. In contrast to many older stations whose chronicles tell of the early struggles and heartaches experienced with makeshift, inadequate equipment, this newcomer emerges into the limelight with every modern improvement in broadcasting facilities at its command.

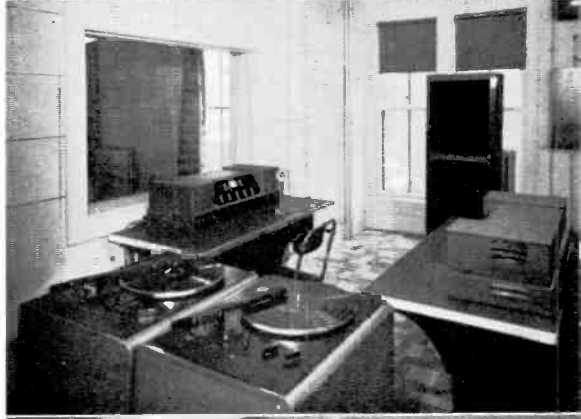
The site selected for KWNO's transmitting plant is ideal since it is located on marshy ground. The transmitter house contains one large room and three smaller ones. Exterior walls are built of solid brick, eight inches thick. Partitions inside are of concrete blocks and the floor is of reinforced concrete. More than eight miles of copper wire, buried six inches deep and surrounding the 199 foot Blaw-Knox tower, form the ground system.

All equipment used by KWNO was built by Western Electric. It includes the 310 type transmitter, 110A Amplifier, two speech input consoles, two transcription tables, microphones and associated equipment.

A staff of nine competent members headed by A. E. Mickel, Manager, comprises the personnel. Mr. Mickel comes to the new Winona station from KFJB at Marshalltown, Iowa. Before taking over the managerial duties of that organization he had been an announcer, continuity writer and salesman. At Marshalltown he took an active part in the Chamber of Commerce, Red Cross, Salvation Army and other civic organizations.

The extent of KWNO's broadcasting range has been repeatedly demonstrated by letters, long distance calls, and telegrams which have flooded the station since its opening and have originated in 17 states. Such comments as "Your volume was surprisingly strong," "I must say you have fine equipment, for reception here was splendid," "Loud and Clear," indicate that this newcomer is starting off with flying colors.

Station personnel down left panel — A. E. Mickel, Manager; Maurice Reutter, Chief Engineer; L. L. McCurnin, Sales Manager and Announcer; Arnold Johnson, Sales and Continuity; C. C. Crewe, Announcer and Continuity; Leo Dahm, Announcer; Kenneth Heddens, Engineer; Isabelle Hartung, Secretary; Margaret Johnson, Staff Pianist and Receptionist. Right panel: Studios, equipment and transmitter station.





It's "On to Nicollet" day in Minneapolis and a jubilant parade swings into action as do WCCO microphones. These community service programs have won a host of listeners.

Novel Programs Do Real Job for Broadcasters

(Continued from Page 5)

Since the series started the sponsor has greatly enlarged his headquarters office in Toledo, has cancelled a program on another station and is now broadcasting *The Factfinder* over five additional Ohio stations.

According to Walter B. Pitkin "Life Begins at Forty." According to WSAR (Fall River, Mass.) *Life Begins at Sixteen* and they are giving the 16-year-olds, or thereabouts, a big break in their program of that title. The station has long felt that students of the B.M.C. Durfee High School who participate in extra-curricular activities deserve special recognition. These activities help mold character, develop poise and should be publicized, WSAR contends. Therefore, they have turned over their microphones to the students each Wednesday afternoon at four o'clock. Broadcasts feature various extra-curricular groups. The initial presentation, under the Students Activities Association, gave a general resume of various club and association happenings followed by the forum, debating society, dramatic club, football rally and journalism classes. Programs are presented in dramatic or sketch form composed of facts germane to the subject with which the group deals.

"Listener response is excellent," writes Francis J. McLaughlin, Jr., Production Manager. Student enrollment of the Durfee High School numbers 3,300. This means that a potential listening audience of at least 3,000 is interested. The station feels that the presentation is one of real public service and as such makes for intense program interest. A popular late afternoon spot is particularly valuable as it accustoms students and parents to tuning in on afternoon broadcasts. "Many people," says McLaughlin, "dislike afternoon script shows which run indefinitely in serialized form and for this reason do not listen in at this time. *Life Begins at Sixteen* has renewed their interest."

Appealing to the still younger genera-

tion WCHS (Charleston, W. Virginia) stages a Saturday morning *Children's Recess* which concerns a group of eight contestants, ranging from eight to fifteen years of age. The curtain rises with the ringing of a school bell, the noise of children entering the studio classroom and the singing of School Days. After commercial credit is given the teacher quizzes the class members on questions which they might receive in their own particular grades and also those pertaining to current events; what they should observe in their homes, on the streets and places of amusement. The skit has gained such wide popularity that registration of contestants is made five to eight months in advance. Each week three small cash prizes are awarded pupils who head the class. WCHS considers *Children's Recess* not only a program of educational value but also one that teaches juveniles qualities of fair play. At the same time it provides a choice entertaining medium for the sponsor.

Studio Schoolroom introduced by KYOS (Merced, Cal.) embodies somewhat the same idea. During the first 15 minutes of the broadcast 10 lessons are read to the class. Towards the close of the program 10 questions are asked concerning these lessons.

Hi-School Hi-Lights carried by KRMC (Jamestown, N. D.) and *School Musicale* by WSBT (South Bend, Ind.) as their titles imply, bring high school students to the microphone in dramatic and musical presentations. WIBX (Utica, N. Y.) also is encouraging musical instruction in schools by a broadcast which demonstrates the progress of music education from the first through the eighth grades. *College Views and News*, a KVQ (Pittsburgh) weekly, provides the school paper editors of Pittsburgh's three universities with an opportunity to broadcast school news. Programs open with a fanfare and snappy introduction by the announcer. News is presented in the form of interviews between the announcer and the editor. "Listener interest runs high," writes KVQ, "and the program is a natural for publicity as the three college papers are tied up with the broadcasts and thus acquaint all students with the program."

"What is good social usage" was the germ of an idea that has become a gem of a program for KOAC. Three years ago the station considered a series of broadcasts on points of etiquette. Several organizations were interested in developing the subject but the Associated Women Students of Oregon State College actually initiated the series, later making it one of their major activities. They appointed a student program chairman who worked with the station staff in planning an extensive series directed to high school girls.

Known as the *Half Hour in Good Taste*, the program is offered weekly with each broadcast developed around a single field of etiquette. Methods of presentation include dramatization, inter-

views, short talks and question boxes. Campus dance orchestras and artists lend variety to the productions. Topics of discussion have included Fashion Parade, Visits to the Beauty Parlor, May I Present, Let's Give a Party, Hows of Eating, Hints on Letter Writing, See Others as Others See You. A survey indicates that high school girls tune in from all parts of the state. Some meet in groups, others take notes for future discussions.

Highlights of the first three years of the series were recently prepared in booklet form for distribution to Girls' Leagues and other organizations in Oregon high schools. Entitled "Charming," the first edition contains eight programs rewritten to provide groups with monthly skits for the entire school year. Chief aim of the programs and publication is to help girls to develop and make the most of their individualities. *Half Hour in Good Taste* has so aroused interest in good social usage that a co-ed committee is formulating an etiquette code especially adapted to campus life.

Taking the Fear Out of Inferiority Feelings, a second KOAC offering, is the general theme of a psychology series introduced by Dr. Howard R. Taylor, chairman of the department of psychology at the University of Oregon. His discussions cover such topics as: Common Causes of Inferiority Feelings, Protecting Children from Failure, Blaming Others for our Troubles, Daydreaming as an Easy Way Out of Trouble and Combatting Nervousness.

Still another KOAC novelty is *What Shall We Do at Our Next Meeting?* This series is devoted to women listeners and aims to assist organizations and individuals in planning and presenting programs and entertainment. The broadcasts are offered in cooperation with the Oregon unit of the Works Progress Administration program.

"To emphasize again and again the story of Safety in a colorful, dramatic and convincing manner is one that can never be told too often," says WCCO, and the thought reverberates throughout the realm of broadcasting. There is hardly a station in the country which is not rendering signal service along this line of endeavor. The story rings out over the air in any number of novel presentations.

WCCO has chosen high school students to deliver its safety message in *Safety on the Highways*. Why choose students to tell so important a story? "Because," WCCO explains, "when the home town high school goes on the air for a state-wide broadcast it's a community on parade. You'll find nearly every dial tuned to the station featuring the youngsters of its town. You have the impelling element of children telling adults how to behave on the highways. When youth gives a 'mind your manners' message the shock is sobering, the surprise delightful. Adults reflect, accept—and we feel—act. And Youth, more spirited in action than maturity, can help greatly to reduce acci-



"Fathers of the Funnies," a winner for WINS, New York City. These famous cartoonists are, left to right: Otto Soglow, Lee Falk, Carl Anderson, Walter Berndt and Russ Westover.

dents by taking to heart the lesson it tells itself."

Raw realism forms the framework of these radio dramas. Drawing on actual case histories of motor car accidents, students from various high schools write and act the sketches. "Audience response has been so overwhelming," affirms WCCO, "that more than a few enterprising merchandisers have asked for the series." But it is not for sale. The station created and sustained it purely as an educational project and intends to keep it as such.

WMC (Memphis, Tenn.) presents the following safety schedules in addition to various special pick-ups and spot announcements: *The Old Observer*—script supplied by the National Safety Council; *It Could Have Been Avoided* based on actual fatal accidents that occur in Memphis; a safety cruise utilizing WMC's portable transmitter car from which John H. Cleghorn, Program Director, and Sergeant Forrest Mortwieler cite traffic errors picked at random.

"We have tangible results," claims Cleghorn, "that for several months Memphis has led all cities in its class in comparative traffic reports issued by the National Safety Council and stands a good chance of winning the National Safety Award." Cleghorn also proudly points to the fact that WMC's dramatizations based on local incidents and presented in the interest of Fire Prevention Week have been largely instrumental in Memphis receiving first prize in safety for cities of its class and tying with Los Angeles for the grand prize in the best promotion of Fire Prevention Week throughout the nation.

It Might Have Been You, a sponsored program originating at WIOD (Miami), features dramatizations of traffic accidents occurring in the greater Miami area. With the assistance of the Accident Prevention Bureau the production staff works out the sketches with sound effects. "Listeners' response has been most gratifying," says WIOD.

The Safety Hour, a 15-minute weekly broadcast over WFAM (South Bend, Ind.) features discussions, interviews and playlets dealing with every aspect of safety. Speakers are drawn from police departments, industrial concerns, civic organizations,

From the same studios comes *Four Fire Alarm*, presented by the Fire Department. Dramatizations of outstanding fire tragedies, talks on fire fighting and fire prevention make up the programs.

KYOS inspires safer and saner driving with its dramatic offering *Death at the Wheel* during which accidents are re-enacted—the voices of Life and Death are heard. This is followed by a rapid fire presentation of crash headlines from a local paper concerning accidents. Common Sense, another imaginary voice, inserts safety slogans.

Traffic School of the Air carries KOMA's message in an effective manner by a series of interviews between Waymond Ramsey, Program Director, and motorists of Oklahoma City. Local police officials clear a half block on Main Street and as cars drive through the lane they are stopped and the drivers quizzed regarding traffic regulations.

WIBX has produced 66 Kiwanis Safety Programs in which they acquaint Mohawk Valley listeners with the causes of traffic accidents. Warnings against home accidents are also stressed.

Uncle Bill and Snowball's Safety Club, a popular early morning novelty, has gained a wide listening audience for WCAO (Baltimore). More than 30,000 children have enrolled as members since the club started 10 years ago. Names of new members and birthdays are announced and safety rules given. "We are informed by our local Safety Council," says WCAO, "that this feature has helped considerably in preventing accidents to children on their way to school. The many letters received daily are an indication that the program is welcomed by our listeners. It is probably one of the best known programs heard over any station locally. We consider it a real value to the station because it holds the attention of children and grown-ups alike."

An eye opener for the early morning riser is *The Minute Man*, a popular old timer, carried by WSFA (Montgomery, Alabama). For over 1,700 consecutive week day mornings the voice of Old Faithful, an alarm clock, has dragged many a reluctant South Alabamian out of bed. Time signals given every five minutes form the backbone of the program but the half hour is built around the music of the Minute Man at the piano and his canaries. The program also features a birthday and anniversary party, weather prediction, thermometer reading, bulletin board announcements for such organizations as the Parent-Teacher Associations, Boy and Girl Scouts and various civic groups. WSFA credits the unparalleled success of *The Minute Man* to the underlying purpose of the feature—service to the entire listening area.

A second early morning spot which WSFA treasures is *Around the Town* conducted by Camille Brown. Recently the program celebrated its fifth year on the air. This is not a household program. Mrs. Brown stays away from the recipe type of wo-

men's broadcasts—instead she draws most of her material from various social activities in Montgomery, together with experiences gained from her wide travels. *Around the Town* has had only two sponsors during its existence.

Two winners originating in the studios of WINS (New York) are *Fathers of the Funnies* and *Curious Careers*. The former consists of a round table discussion of cartoonists chatting informally as to how they concocted their funny men. The program aims to be light in character although a certain amount of sound advice and information for aspiring artists is sprinkled throughout the talks. Artists who have already appeared are: Carl Anderson (Henry), Otto Soglow (Little King), Ham Fisher (Joe Palooka), Gus Edson (The Gumps), Denys Wortman (Metropolitan Movies).

Curious Careers, as the name implies, brings to the microphone people who make a living at strange jobs. Among those who have told their stories are a legal forger, a sky writer, a planetarium technician, a night club photographer.

What Do You Do is KFAC's way of presenting a similar idea in Los Angeles. The broadcast is conducted by Dale Armstrong, Radio Editor of the Los Angeles Times, who interviews people engaged in unusual occupations. One of his recent guests was the vice president of the Braille Institute. From the same station come *Edward Schallert's Conversations*—informal talks with motion picture stars, *Thumbnail Biographies*—dramatic incidents in the lives of historical luminaries, *Book Parade* and *Looks at Books*, *Portraits from the Bible*—a Federal Theatre project presenting incidents taken from the Scriptures—and *Uncle Whoa Bill Club*. The title character Uncle Whoa Bill greets his young members on their birthdays—admonishes them regarding their weaknesses (which usually have been confided by writing parents). He sets forth the idea of saying "Whoa Bill" in response to pain or disappointment, rather than resorting to tears. Parents have a stunt of hiding birthday gifts in the homes and having Uncle Bill tell the youngsters where and how they may find them. The program has entered its sixth year of continuous sponsorship.

Do You Want to Be an Announcer? If so, tune in on WIOD's novelty of that title. The master of ceremonies concentrates chiefly on humor and human interest in his interviews with applicants. Sponsors are Miami merchants using spots handled by the would-be announcers. WIOD also schedules *News Distorter*, stressing the comic side of news items and *Cheerology*, a conversational piece of kindly philosophy.

KGB (San Diego, Cal.) strikes a note of optimism in *The Week's Best Good News* which is designed and conducted by a member of the clergy but delivered from the layman's standpoint, with little religious context. It is constituted mainly of good news

items from the press or elsewhere in contrast to the predominance of pessimistic news flashes throughout country. *Pulpit Highlights*, as the title indicates, presents sermons pared and redrafted by ministers who delivered them the preceding Sunday.

So You're Going Places is going places for WCLO (Janesville, Wis.) as well as its sponsor. The station sends a young woman to the bus depot several times daily where she chats with passengers. Her interviews give the public a clear picture of how completely bus lines serve the traveling public throughout the country. While the program has been on the air only since November 1st the bus depot reports a day-to-day increase of from 26 to 48 per cent.

A convincing crime-doesn't-pay playlet reaches KQV listeners who tune in on *Your Police Reporter* under the direction of the superintendent of police. The program uses a dramatic staff and members of Pittsburgh's official police family. It tells the crime news around the city during the past week.

KYOS is originating an oddity called *Market Basket* during which a basket full of food-stuffs is given each morning to the persons who can guess whose voice is heard reading an advertisement. The voice is that of an employee of the sponsor. The public, therefore, must frequent the various stores owned by the sponsor in order to become familiar with employees' voices.

WHK (Cleveland) provides a path to radio professionalism for aspiring artists in a new broadcast *New Names*. Talent for performances is recruited from Clevelanders who meet the requirements for an appearance. It is not an amateur show, says WHK—one of the prerequisites for engagements being a previous baptism of fire on the radio or stage. If the public or studio audiences demand repeat performances the artists are invited to return to the air.

The Stump-Us-Boys are playing their way into the spotlight of popularity among WCAO listeners with their seemingly limitless repertoire of musical numbers. During the program the announcer goes among the studio guests asking them to suggest a selection which will stump the boys in the orchestra. If the musicians are unable to play any portion of the selection, the person suggesting the number receives a case of the soft drink being advertised.

And so the curtain falls on *Pick-Ups'* presentation of some of radio's novelty shows. For a thousand and one reasons audiences throughout the nation are applauding them and broadcasters echo that applause. These men behind the microphones have cause for hand-clapping since such programs are, in many instances, doing an excellent job. They are creating good-will towards stations. They are bringing in money. They are helping to solve that stupendous problem of keeping a station on the air from 12 to 24 hours a day. And they are rendering a real service to the listening public.

PICK-UPS

WCBA - WSAN

(Continued from Page 17)

limit satisfactory reception from outside stations, WCBA and WSAN have a trust to keep with listeners in this area.

Progress was rapid after the completion of the new transmitting plant and shortly after the first of the year several new features were added which further enhanced the stations' value to the community.

On May 1, 1937, WCBA-WSAN initiated consistent transmission of National Broadcasting Company programs for their loyal listeners in the valley.

Elaborate broadcast and public address facilities were installed during the summer of 1937 in the Hartner Memorial Chapel at Muhlenburg College, from which point regular weekly educational broadcasts now emanate. Inasmuch as Allentown is the center of a territory which is studded with educational institutions, collegiate activities form an important part of the twin stations' broadcasts.

Remote programs indigenous to this area and particularly with its inhabitants are a feature of these stations' activities. It is well known that the Pennsylvania Germans are famous for their culinary prowess. Capitalizing upon this the "Kitchen Klub of the Air" was inaugurated several years ago. Under the direction of Mrs. Bessie Miller Male, this program has gained such tremendous popularity throughout the territory that it has become necessary to reserve seats in advance for the public cooking demonstration. In keeping with the progressiveness of the Lehigh Valley a modern and complete electric kitchen was recently installed in one of the studios. Here famous old Pennsylvania dishes and modern recipes are prepared before weekly audiences of over a hundred guests in the studio in addition to the countless radio listeners.

Plans are now under way to broadcast for the first time, as far as is known, the world famous Moravian Sunrise Easter service, held annually upon the plains of Bethlehem. Thousands of people from all parts of the country attend this most impressive service and this year's broadcast will add millions to those who will hear it on the spot.

Worthy local and national organizations are always afforded opportunity to use these stations' facilities.

Stations WCBA and WSAN have always stressed service to the listener as their paramount consideration, and, in keeping with modern broadcast practice, have spared no effort or expense to keep technical facilities at least on a par with metropolitan broadcasters. Allentown and its listeners are justly proud of the radio stations which serve them so well. A modern broadcasting organization, alert to bring the world to its listeners, and its listeners to the world—that's WCBA-WSAN.

Thirty-seven

WHAS Pioneers Again

(Continued from Page 22)

"The people responsible for the big radio shows should get out in the country, travel from coast to coast, talk with local station program directors and really learn what their audiences want, and what they think about. Perhaps then their programs would be even more successful. I'm sure there wouldn't be quite so much sophistication and subtlety on the air."

Recently Louisville staged a "Flood Gratitude Day" and WHAS broadcast a three-and-a-half-hour program. Radio acts from many stations participated and an audience of 15,000 people who had come from many miles in every direction was present to see its favorite radio stars. "I wish every program director in the country could have been present," says Eaton. "The sophisticated, subtle type of acts got courtesy applause, but the acts which smacked a bit of the soil were cheered to the rafters. If radio is to continue its tremendous success, program directors and particularly those responsible for programs which go out over the entire nation, must do an even better job of gauging the listener's temper, his likes and dislikes, his customs, habits, and his ever-changing ideas and ideals."

W. Lee Coulson, executive manager of WHAS, sees still another increasingly important job for radio to do. "The industry must present its side of the picture to the public," he says. "We must do a better public relations job in the future. Most of the critics of radio are critics simply because they are not informed of the industry's problems and responsibilities. There are those who say that stations make too much money, but they do not stop to think about the tremendous investments in broadcasting. Perhaps there is no other industry in which progress is so fast, and plant equipment becomes obsolete so rapidly. WHAS began broadcasting in 1922 with 500 watts power. Since then the station has grown in successive jumps to 5,000 watts, to 10,000, to 25,000, to 50,000 watts. During that time no piece of equipment was retired because it was worn out. It was discarded because it had become obsolete due to the scientific development of broadcasting.

"In 1932 WHAS installed a new plant with 50,000 watts power. It was the last word in broadcasting, yet today it is necessary for us to retire this entire plant and install a new one, not because the old one has worn out but simply in order to take full advantage of technical development and to fulfill our obligation to the public and to the broadcasting franchise which we hold.

"What does it mean to keep abreast of the rapid developments in broadcasting to fulfill the obligations incumbent upon a station which holds a license granted by the Federal Communications Commission? Perhaps a few figures will help to show!

"The new plant at WHAS called for an expenditure of almost \$600,000, and remember, the old plant, of the same power, was doing a fine job right up to the day the new plant swung into action. Let's break down the lump sum and see what some of that \$600,000 went for. Here it is:

Caretaker's cottage	\$ 4,000
Engineer's home	11,000
Dam for water supply	12,000
Tower and revolving beacon.....	30,000
Ground System	2,500
Transmitter site	7,116
Western Electric station Transmitter and Speech Input Equipment	250,000
Western Electric Studio Speech Input Equipment	15,000
Power Transmission Line	10,000
Reconstruction of Studios	20,000

"Such items as lounge, reception room and studio furnishings, office furniture and equipment, organ and concert pianos run the cost well into the \$600,000 for the most modern broadcasting station in the world, but how long will it remain that? Will it have to be replaced in another five years? More than likely it will.

"The listener who complains of a two minute commercial announcement in a 30 minute program should remember that those two minutes make the 30 minute program possible and they pay for the broadcasting station which puts it on the air," Coulson points out.

"The sophisticated listener who lives in the city and has all its creature and cultural comforts should remember there are people in this world who do not have such comforts and opportunities to enjoy the finer things in life. The under-privileged and semi-privileged people have as much right to receive the kind of program which will be helpful and enjoyable to them. It is the broadcaster's duty to serve each class. For his own welfare, it is the broadcaster's job to educate each class to an acceptance of this fact. It will require a better public relations job than has been done in the past. When it is accomplished, however, most of the criticisms leveled at radio will be eliminated," says Coulson.

For 16 years a goodly slice of the country's population has been fortunate in having the best in radio brought to it by WHAS. Last year it was more than fortunate in having WHAS come to its rescue when flood waters inundated its homes. The station handled 115,000 bulletins which saved countless lives during those tragic days. And today it is fortunate in having the best radio facilities the art of broadcasting can provide. The nation as a whole is fortunate in having such a station as WHAS which has done so much to develop, promote and maintain the American System of Broadcasting.



Above: The transmitter and control room, showing the 23B transmitter and, on the table, Western Electric 23A speech input equipment.

WMIN

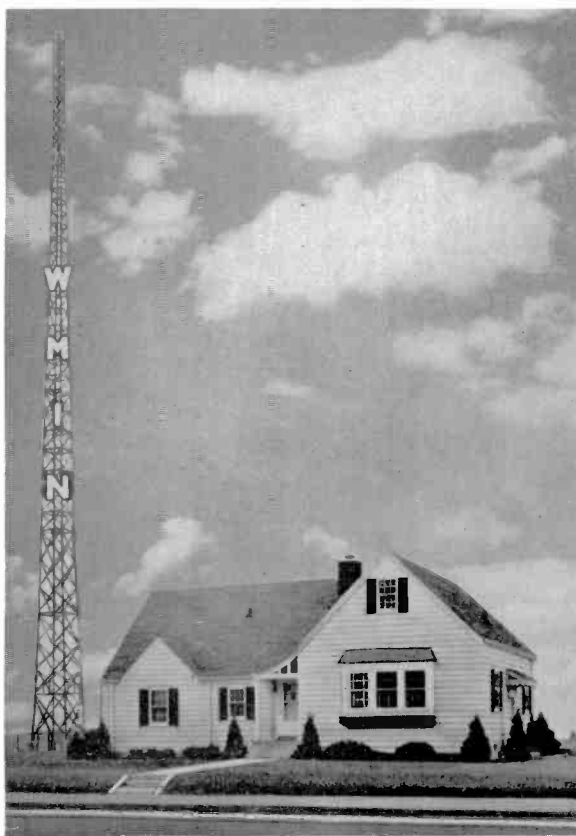
St. Paul, Minn.

This Twin City station is another of the many using the popular 23 type transmitter. Operating on 100 and 250 watts, its signal strength has been appreciably increased by the recent addition of a 110A program amplifier.



Mat Walz,
Chief Engineer

The main studio, with its acoustically treated walls and modern effects, is as efficient as it is beautiful.



Left: The 199-foot Blaw-Knox radiator is a giant sign post for the building that houses WMIN's studio and transmitting facilities.



Edward Hoffman,
Owner and Manager

This bird's-eye view of the home of WMIN was taken by Chief Engineer Walz from the top of the antenna.

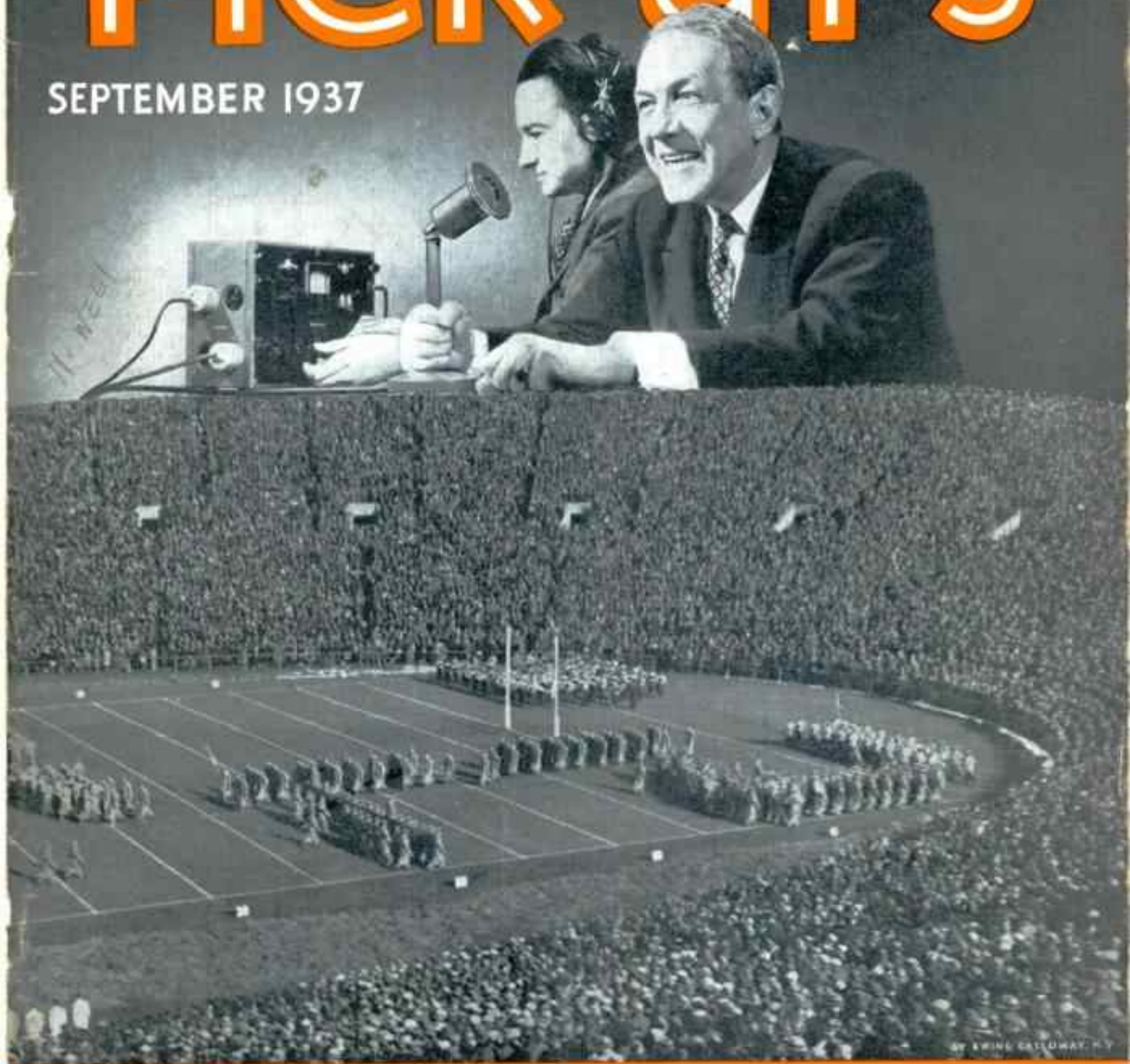




"Guess everybody but me likes this new Western Electric transmitter"

PICK-UPS

SEPTEMBER 1937



Is Radio Developing Public's Appetite for "Better Music"?

First Use of Stereophonic Sound in Giant
Pageant Creates New Thrills

Multi-Band Transmitter Smooths Many
Communication Kinks

Mixing Circuits for Speech Input Equipment

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