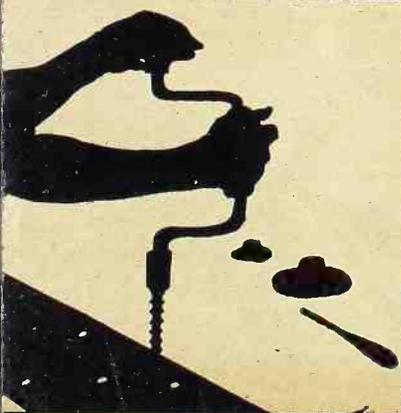
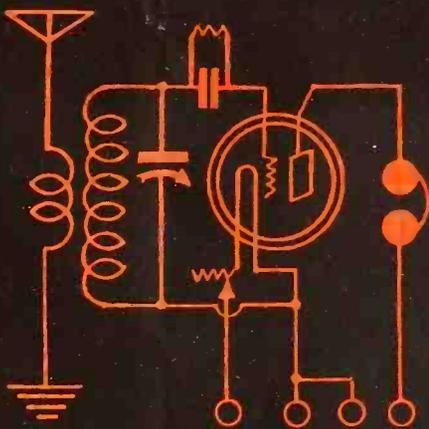
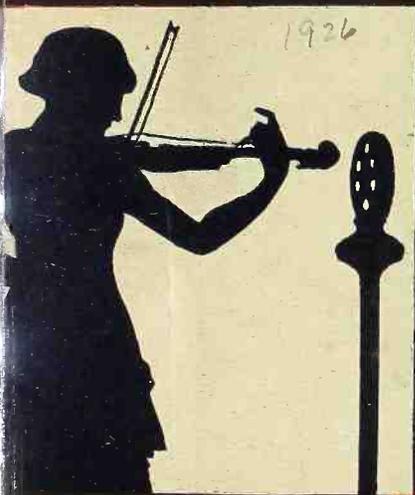


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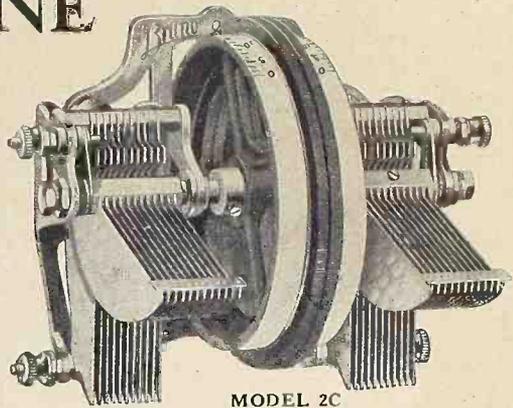


Announces New Tuning Unit that Simplifies and Beautifies Any Set

UNITUNE

Model 2C

This basic instrument consists of two BRUNO .0005 mfd. straight-line frequency condensers mounted on an aluminum frame, a bronze panel plate and two drums, with scale. The condensers are electrically insulated from each other. This unit is a handsome addition to any set. Price, complete, assembled, \$11.00.

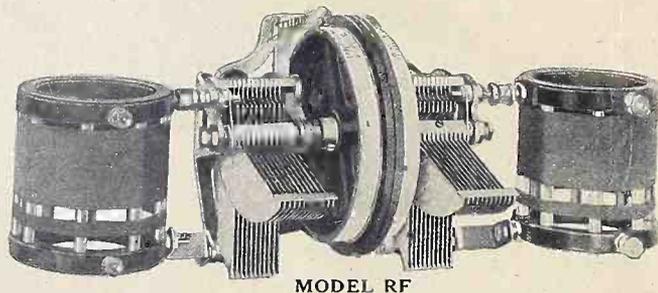


MODEL 2C

The exquisite drum type of tuning is made available to home constructors of radio receivers by the brilliant ingenuity of William A. Bruno, who has designed the most beautiful drum tuning control on the market.

This is the Unitune, so-called because it enables the tuning controls to be adjusted, so tuning can be accomplished with one up or down motion. The drums themselves are independently available.

\$3.50 per pair with plate.



MODEL RF

UNITUNE

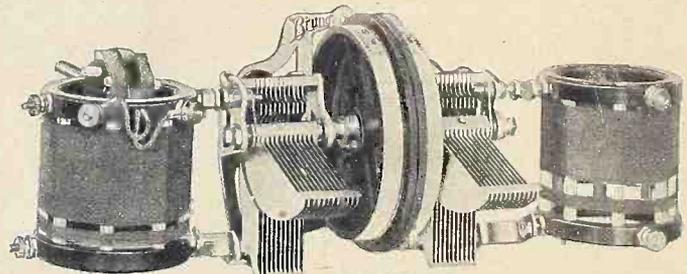
MODEL RF

Consists of the basic condenser frame, Model 2C, and two Bruno LOW LOSS RF transformers. This combination provides two radio frequency stages and covers a wavelength of 200 to 550 meters. Price, complete, assembled, \$17.00.

UNITUNE

MODEL TK

This model is similar to Model RF except that the right hand condenser holds a standard BRUNO THREE-CIRCUIT TUNER. It is adaptable to a variety of circuits. Price, complete, assembled, \$20.00.



MODEL TK

Booth S-5, Radio World's Fair

Write for Booklet of Complete Bruno Line

For better reception use instruments manufactured by

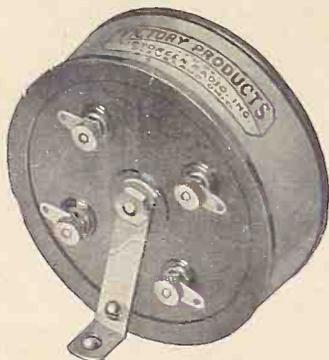
BRUNO RADIO CORPORATION

40 Paynter Avenue
LONG ISLAND CITY, N. Y.



The Heart of the Circuit

VICTOREEN Transformers and VICTOREEN Master Control Unit



Victoreen No. 170 R. F. Transformer—neat and compact—3" in diameter, 1" thick.

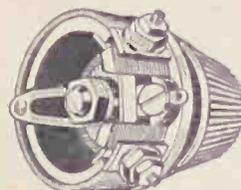
Victoreen R. F. Transformers

are made with air core construction. They are not merely "matched" but are actually tuned to a guaranteed precision of 1/3 of 1%.

Victoreen Super sets are free from oscillations, howls or squeals—no matching of tubes is necessary.

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For range, clarity, volume, selectivity and ease of operation, a Victoreen Super can not be excelled.



Victoreen Manganin Rheostats

The only Rheostat with zero temperature coefficient—no matter how warm the unit becomes the resistance remains absolutely constant.

Victoreen Rheostats have double the number of turns of wire used on ordinary Rheostats—that means twice as fine adjustment.

Genuine Manganin wire used in all Victoreen Rheostats.

This three terminal Rheostat simplifies wiring. Made with 5 resistances—2, 6, 10, 20, 30 ohms—\$1.20 each.

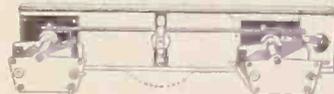
Victoreen Potentiometers

200 and 400 ohm resistances \$1.50 each.

The Heart of the Circuit

4 Victoreen No. 170 R. F. Transformers, each.....	\$7.00
(No. 171 Transformers when dry cells are used)	
1 Victoreen No. 150 Coupling Unit, each.....	5.50
Should the use of aerial be preferred to loop, Victoreen No. 160 antenna coupler is required, each.....	3.50
1 400-ohm Victoreen Potentiometer.....	1.50
2 6-ohm Victoreen Rheostats, each.....	1.20
2 30-ohm Victoreen Rheostats, each.....	1.20
1 type V. S. Master Control Unit.....	19.50

Get a complete list of necessary parts from your dealer or write us direct. Your dealer will be able to supply all parts. The free Victoreen folder and hook-up answers all questions about the Victoreen circuit.



Victoreen Master Control Unit

A completely assembled convenient single control unit for use in any circuit employing two, three or four condensers.

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Extra condenser ready to mount..... 4.50

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The Beacon—3 Tubes; Panel Lights Featured

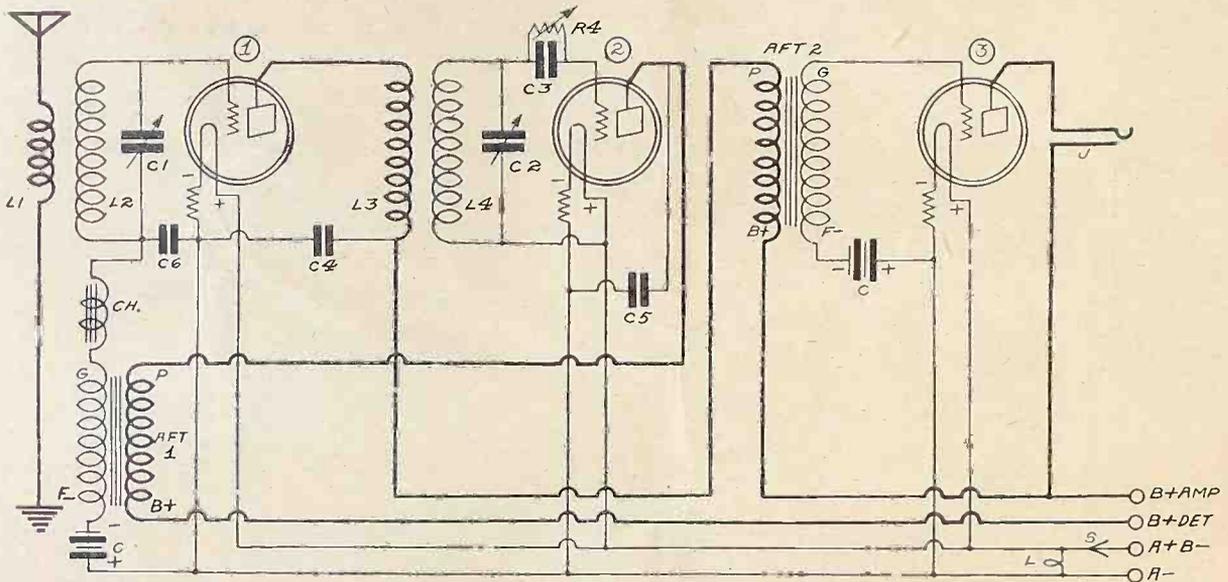


FIG. 1

An efficient 3-tube receiver. The detector plate voltage is normally 45, while the B plus amplifier voltage is 135. The first tube is kept from over-oscillation by a slight negative bias. Usually $1\frac{1}{2}$ volts are enough.

Excellent Parts Used to Produce a Receiver That Answers Demand for Selectivity, Sensitivity and Volume, Though 3-Volt Tubes Are Used—Reflex Principle Invoked.

By James H. Carroll

WHAT can be done on three tubes? Quite a lot. And if parts of excellent manufacture are chosen, not only will electrical efficiency rule, but the receiver will have a professional appearance of the highest order. Such a set is the Beacon, so-called because of the fine panel illumination afforded. The tuning adjusters are the new Mar-co illuminated controls, among the handsomest offerings in radio today. Suitable mounting and wiring directions will be found in the Mar-co boxes. The only other member of the front panel family is the new Bruno ruby light switch, LS, which shines with a fascinating red to tell you that the set is on, and to eliminate danger of leaving the radio tubes lighted when you go to bed, even though the switches on the Mar-co controls are "off."

The circuit diagram, Fig. 1, shows that the receiver is a reflex. The principle is successfully employed because the set is

balanced, thus preventing self-oscillation at audio or radio frequencies, and sufficient selectivity is obtained, although there are only two tuned stages, due to the low-loss design of the coils and variable condensers.

Double Function Choke

The choke coil CH, serves a double function. It helps prevent the flow of radio frequency current through the secondary of the first audio frequency transformer, an imperative precaution, and it helps to balance out any existing tendencies toward self-oscillation. The variable leak R4 aids this stabilization which is rendered complete through the utilization of a small negative bias on the grid of tube 1, the reflexed bulb. Negative bias has a damping effect on the radio frequencies, hence must be indulged in sparingly in this branch of the circuit. Considering the B plus amplifier voltage as 135, the bias on the first tube, where the C battery is shown at lower left in Fig. 1, should be about 1.1-2 volts, and

this bias may be well supplied from a small flashlight cell. (No. 950 Eveready unit cell for flashlights.)

A factor never to be ignored in the neutralization safeguards is the variable grid leak, R4, which is the Verileak, the newest variable grid leak on the market and one of the most efficient of them all. While it is true that a set is more likely to burst into over-oscillation due to the behavior of the exclusively radio frequency channel, sometimes the detector is the offender, or at least a contributing agency, and in that event the leakage path of the excess negative electrons is facilitated by lowering the value of the resistance of the Verileak. This is done simply by turning the small knob of the Verileak, and once the proper setting is achieved there will be no need for changing it, as the resistance value of the Verileak, at any setting from its zero point to its maximum, .10 megohms, will not vary more than 2 per cent. over a period of months.

The DX Method

There is one time, however, most opportune for determining the most effective setting, and that is when some far-distant station is tuned in, and the signal is weak. By adjusting the Verileak knob the signal can be brought up to maximum strength, for it is well-known that correct leak setting will add about 25 per cent. to the volume, and when you

Why It Is Better to Have Long Plate Than Grid Bus

Pointers on How to Locate Sockets for Best Effectiveness in Reflex Sets—RF Choke Coil Aids Fixed Condenser to Keep RF Out of the Secondary of the AF Transformer.

multiply that by the voltage gain in the audio channel the total improvement is enormous. With the distant-station system of setting the leak you have solved the problem of highest detecting efficiency obtainable with your receiver.

A novelty incorporated in this receiver is the use of a choke coil outside the RF stage. As the set is made up particularly for the benefit of those who desire to operate from dry cells, the 3-volt .06 ampere tube is used here, and of course the 3-volt .12 ampere tube is used in the last audio stage, tube 3 in Fig. 1. In the circuit as tested in RADIO WORLD's laboratories the 3-volt Ce-co power amplifying tube was used in socket 3, with the 3-volt .06 ampere Ce-co as the RF and detector tubes.

Rebirth of Reflex

As a circuit the reflex lately has not been holding its own with the others, largely because of the drop in tube prices since the reflex was at the height of its career. However, when demands for simplicity, economy and beauty are combined, and one desires a set that lives up to selectivity and sensitivity needs, not a squeal from the set no matter how low a broadcast wavelength is tuned in, the answer is the reflex, for with the number of tubes limited to three, which was taken as an economical requisite, the specified end scarcely could be gained in any other way. And the final result was most gratifying. Good parts were used and these took the distortion curse off the reflex as we knew it a couple of years ago—with high-ratio transformers then of poor design adding to other troubles, heightened by attempts to over-reflex.

The Beacon design utilizes only one reflexed stage, and the usual trouble



(RADIO WORLD Staff Photo)

FIG. 3

The three tubes are arranged in a row. At left are the choke coil and the first audio transformer. The Amperites are placed in front of the respective tubes.

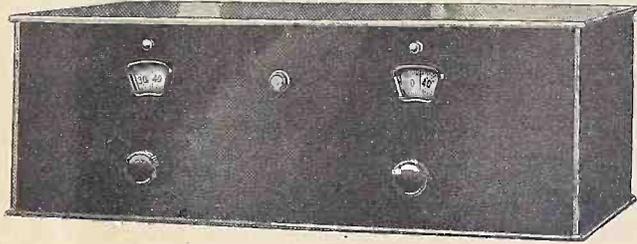


FIG. 2

The front panel view, showing up the new Mar-Co illuminated controls. The flash-light type bulb behind the scale lights it up, so that the dial may be read. At top of each dial is a switch, so that the lights may be turned off, independent of the A battery switch.

sources are absent, any novice being able to make a success of this receiver, providing, however, that the audio transformer in the first stage is properly chosen as to its primary impedance. This is AFT1, lower left in Fig. 1, and it is a Samson 2-to-1 ratio transformer, a very efficiently made instrument. The second stage transformer, AFT2, is of the Samson 3-to-1 ratio model, of the same design as the other. With these transformers excellent quality of audio amplification is assured.

Theory of the Set

The circuit design is clearly drawn, so that even a novice can follow it.

As a guide it may be said that the radio signals circulate almost impartially in the primary L1, and only the desired wavelength is picked up by the first tube, through tuning the secondary L2 by the variable condenser C1. The amplified radio signal emerging from the plate of tube 1, is built up around the primary L3 of the interstage coupler, and induced in the secondary L4, whereby the signal, further selected against interference by the tuning of C2L4, is delivered to the grid of the detector tube, 2. In that tube the radio current, which is alternating, is changed or rectified to a form of direct current known as pulsating because the wave undulation does not go below the zero line. This is audio frequency current and it is fed into the primary of the first audio transformer, AFT1. It is passed on to the secondary thereof and delivered to the grid of tube 1 through the choke coil CH—a new model of low distributed capacity—to the radio transformer secondary L2, passed through the first tube and, by means of the primary L3 of the other radio transformer, delivered to the primary of the final audio transformer. It is then deposited (but not for long) in the secondary of AFT2 and the grid of the last tube, 3, from which tube the output is taken in familiar fashion.

One Reflex Stage

Therefore the first tube is the reflex stage, because this is the one, and the only one, that handles both radio and audio frequencies, the audio ones being slow (100 to 5,000 cycles), the others almost incredibly fast, from say 1,500,000 to 500,000 cycles per second.

The sequence of tubes is merely numerical in Fig. 1, and does not represent the recommended order in actual construction. It is preferable to have the reflexed

tube first, that is, at left, supposing you are facing the front panel, and to have the detector tube 2 at extreme right, instead of between the two others. The main reason is the reduced length of the rotor of the tuning condenser C2 to the grid condenser C3, which is at the grid post of the detector tube socket. If you had to bring the grid lead all the way from a mid-located detector tube socket to the condenser C2 at the right-hand panel side, efficiency would hardly be so high. It is preferable to have a long plate lead, rather than a long grid wire, and this preference is carried into practice when one locates the detector tube socket at right and the final audio socket in center. Also it will be found the most convenient location for audio purposes, as well, since the tube at extreme left is the first audio one, and what is more acceptable than to have the next audio tube right beside it?

Small, Pretty Sockets

The sockets used in the original receiver are suitable for the X base tubes particularly, and of course the 3-volt tubes may be used, or the 5-volt ones in sockets that have X bases. But for 5-volt tubes use two 1A and one 112 Amperites. The sockets, like so many other items in the excellent list of parts, are brand-new, being Louis Gerard Pacent's contribution to beauty and efficiency in socket design. Mr. Pacent long has enjoyed an enviable reputation as the designer of some of the most bewitching-looking radio parts, excellent for their efficiency as well, and in his new moulded Bakelite socket he has hit upon another fetching attraction.

The construction of the receiver is very simple. Any one not familiar with reflex wiring should adopt the practice of wiring the antenna coupler and its condenser component to the first tube just as would be done in any other receiver, leaving the grid return wire not connected from the stator of the condenser C1. Likewise the interstage coupler L3L4 should be wired conventionally as indeed it is, even diagrammatically but the B battery lead is not connected. Then when you reach the plate of the detector tube, connect this to a pair of points (a) to one side of the fixed condenser C5, and (b) to the P post of the audio frequency transformer. Next take the choke coil CH, which is the neat little unit made by the Precision Coil Co., and connect

(Continued on page 6)

How to Act Decently With Regeneration

Operator of Receiver Must Avoid Sending Out Squeals, for They Annoy Neighbors—Rules for Best Efficiency

By Leon L. Adelman

The Chas. Freshman Co.

The principle of regeneration as used in radio receiving sets, according to a popular definition, is that a part of the output of the detector tube feeds back into its own input and thus greatly increases the volume of the signal. We know that regeneration can be accomplished in several ways, by tickler feedback, by the tuned plate method or by other capacitive feedback. Of these various methods, the tickler feedback circuit is no doubt the more common.

It has been found that increasing regeneration up to a certain point will greatly increase the volume, sensitivity and selectivity of the receiver. This so-called point of maximum amplification borders very closely upon what is known as the oscillation point. Our next question is then, what is oscillation? It is the creation of radio frequency currents caused by allowing the set to over-regenerate.

Bad Effects

When a radio receiving set in a state of oscillation is tuned to a broadcast station, the following deleterious effects ensue:

It causes whistles in neighbors' radio receiving sets tuned to the same or even some other station. This interference may be heard up to a distance of several miles. Secondly, it distorts the quality of your own music. Thirdly, it may even cause howling and squealing sufficient to frighten every timid folk in the house.

Many of you may have had the experience of tuning in a station by means of hair-breadth adjustment so as to cut out the squeals just either side of the proper setting. In fact, you may have had to keep your hand on the dial for fear that the noise would recur. This condition is described as that of zero beat adjustment. When a radio receiving set in a

state of oscillation is exactly tuned to a broadcast station it is said to be in the state of zero beat. This, however, distorts the broadcast reception and also interferes with neighboring receiving sets which are tuned to the same station. In a word, regeneration carried to over-oscillation causes great annoyance to your neighbors; poor reception, in distorted quality of reproduction and has no advantages whatever. A radio receiver in an over-oscillatory condition is a miniature but powerful transmitter, and since the law requires that a license is necessary to own and operate a transmitter, it is virtually an infraction of the law to allow one's set to continue in a state of over-oscillation.

How to Trace Origin

The interfering and annoying whistle which you hear in your receiving set may originate in your own set or it may be interference caused by your neighbor. To determine this point you can make the following test: Leave the regeneration control in a fixed condition, slowly rotate the tuning dial and note particularly the change in sound of the whistle. If the whistle rises and lowers in pitch, simultaneously with the movement of your tuning dial, it indicates that your receiving set is in a state of oscillation and probably is causing interference to other sets. On the other hand, if the whistle does not change in pitch corresponding to each movement of your tuning dial, but simply varies in volume, the whistle is not caused by your receiving set but is interference produced by some other over-oscillating receiving set in the neighborhood.

Many so-called non-radiating receivers under certain conditions will radiate and so cause interference. Make it your business to see that your set is not causing trouble. If you are in doubt as to whether your set can cause interference, you may check up by making the following test, but be careful to do so at a time when

only a few are listening in so as not to cause annoyance.

Call a neighbor on the telephone, and ask him to listen in on a particular station at a prearranged time and then tune your own set to the same station. Turn up your detector tube filament to normal and put the regeneration control to its maximum. Slowly move your tuning dial five times across the point corresponding to the tuning of that station. Then telephone your neighbor and ask him if he heard the interference corresponding to these five movements of the dial on your receiving set. If he heard your interference, the probability is that hundreds of others also have been annoyed. You should therefore learn how to operate without causing this interference.

If you will take the trouble to observe the rules which follow, you will obtain greater satisfaction and enjoyment from your radio receiving set and at the same time cause minimum annoyance to your neighbors:

1 Practice on tuning in powerful local stations and do not try to pick up weak distant stations until you become expert.

2 Use both hands, one hand for the regeneration control, the other hand for tuning.

3 Keep the regeneration control always below the point of over-oscillation or saturation. Your set is then in the most sensitive condition. This is the reason for using your two hands for tuning. You will find that as you tune in the stations on the lower waves, it will become necessary to turn back the regeneration control.

4 If your set then accidentally breaks into oscillation, turn back the regeneration control at once.

5 Do not try to find the station by the whistle. If your set is tuned just below the whistling point, the signals will come in clearly and the regeneration control can then be turned a little further to increase the volume.

6 Do not force regeneration in an attempt to hear stations beyond the range of your set, be content with those that you can really hear.

7 Do not force regeneration in an attempt to obtain speaker volume from a set not designed for the purpose. The fact that you once heard a distant station on your receiving set is no indication that you can hear this station regularly, for occasionally, a radio broadcast from a distant station is received due to some freak atmospheric condition. Repeatedly to turn one's dials will result in preventing some other broadcast listener in tuning in that station on a more powerful receiving set.

THE BEACON

(Continued from page 5)

either end of it to the G post on the secondary of the first audio transformer, the AFT, which will be to the left in the assembly.

Wiring Hints

The other terminal of the Precision choke is joined to the stator plate of C1.

Now connect the end of L3 that ordinarily would go direct to B plus, instead to the P post of the second audio transformer, the B post of which goes to B plus amplifier voltage. You will observe that two battery leads have not been completed, and these are the grid return of the first tube and the B battery supply to the detector tube. These two leads are soldered when you are ready to bring your set wiring to an end, with receiver leads soldered to lugs on the bracketed battery terminal strip.

The final audio stage is familiar to

LIST OF PARTS FOR THE BEACON 3-TUBE REFLEX

Two Mar-co illuminated tuning controls.
One Verileak variable grid leak, R4.
Two Bruno .0005 mfd. straight line frequency condensers, C1, C2.
Two Bruno 99 RF transformers, L1 L2, L3 L4
One Precision Coil Co. radio frequency chock, CH.
Three Patent X sockets.
One Samson 2-to-1 audio frequency transformer, AFT1.
One Samson 3-to-1 audio frequency transformer, AFT2.
One 120 Amperite.
Two 4-v 199 Amperites.
Three .00025 mfd. Tobe bypass condensers, C4, C5, C6.
One 7x20" baseboard.

nearly all who know anything about radio, as is the filament wiring.

As the circuit is not critical on filament heating, that is, does not depend on underheated filaments to prevent self-oscillation, Amperites are used through-

One .00025 mfd. Micamold fixed condenser, C3.

One 7x21" Diamond State Fibre Co. Celeron panel.

One Bruno light switch, LS.

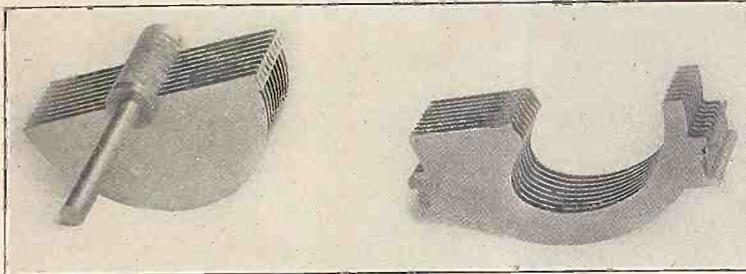
One bracketed battery and antenna-ground terminal strip (H. & F. Laboratories), consisting of four Eby binding posts and one Carter short jack.

Accessories: Electrad antenna kit, Electrad lightning arrester; five parallel-connected 4½-volt Eveready No. 771 C batteries for use as A battery; one midget 22½-volt B battery, for use as C battery, one 1½-volt flashlight cell, one cabinet, one speaker, three 45-volt Eveready heavy duty B batteries, one phone plug.

out, these being of suitable carrying capacity and resistance for the particular tubes. (Tube 3 equals 120 Amperite, 1 and 2 equal 4v199 for the small tubes).

[More about the Beacon set will be published next week]

A New Effect In Condensers



(Courtesy General Instrument Corp.)

FIG. 1

HOW semi-circular plates are used for the rotor, while the stator plates are cut away, to afford straight line tuning, on the basis of dial divisions, rather than straight line capacity, wavelength or frequency.

Manufacturers Turning to Models That Introduce the Straight Line in the Dial Variation, Rather Than Exclusively in the Capacity, Wavelength or Frequency Scale—Virtues of All Three Combined in Composite

By Wm. M. Henderson

THE tuning problem has brought the tuning condenser very much into the limelight during the past two years. The prevalent use of this instrument to tune the circuits in a radio receiving set has placed upon this device the problem of solving the tuning difficulties.

With the great number of broadcasting stations crowded within too small a frequency band it is only natural that apparatus designed in the days before broadcasting should cause inconvenience in tuning. Two years ago, when the straight line capacity condenser was in general use, stations below 400 meters were jammed together on the dial.

That this should occur was only natural, considering the laws governing tuning circuit operation. This jamming of short wave stations gave rise to two difficulties: first, poor dial visibility; second, poor access to selectivity.

Visibility Defined

Dial visibility means actually the number of dial divisions between station settings. The greater the separation between stations on a dial the greater the dial visibility and consequently the greater the ease of tuning.

Poor access to selectivity, with the SLC condenser, was due to the almost impossibility of hitting a station on the dot, because of the slight dial variation necessary to bring in another station or cut out the one desired. In other words, the stations were so close to one another that physical difficulty attended separating one from another, even though the selectivity factor was electrically present just the same.

The first step taken toward a remedy was the design of a straight line wavelength condenser. This instrument was made with the rotor plates cut away at one end so that the capacity variation, with the respect to the SLC condenser, was slower at the lower end of the broadcast band. The result was to lessen slightly the tuning difficulty on the short waves, give excellent separation of stations operating in the middle band and crowd the upper wavelength stations.

As the SLW instrument did not fill the bill entirely, another design was brought out—the straight line frequency condens-

er. This was given quite a reception, because it afforded an even frequency variation for equal dial separation.

The instrument afforded perfect dial visibility on the lower waves but brought the high wave stations closer together on the dial.

This year has brought forth straight line tuning instruments.

These new condensers have a tuning characteristic that is a combination of the best qualities of the three former types. The stator plate section of the new models is specially shaped instead of the rotor plate, and SLF tuning is obtained from 0 to 50, on a 100 decimal dial, SLW tuning from 50 to 80 and SLC tuning from 80 to 100.

This tuning characteristic gives the straight line frequency condenser's station separation on the short waves, the middle wave separation of the straight line wavelength condenser and the high wave station separation of the straight line capacity instrument. At no point on the dial are stations crowded.

A good idea of the tuning character can be obtained from the table. This was compiled from laboratory data obtained with condensers having the same capacity values and using the same coil.

What Table Shows

In this table are given wavelength and frequency points of resonance with the wavelength and frequency separation between these points. Then in the first column is the separation afforded by the

Poor Dial Visibility and Awkward Access to Selectivity Avoided in Unit That Is SL Frequency, Wavelength and Capacity By Turn.

straight line capacity condenser over this band.

In the second column is a list giving the dial division separation afforded by the straight line wavelength condenser and then in the third the separation of the straight line frequency instrument. A comparison shows where each familiar type excels in one portion of the broadcast band (in bold type). The last column shows how the features of each of the other types are incorporated in the new straight line tuning condensers. At no portion of the band are the new models more than one division of a dial poorer than that afforded in that section by the type it emulates.

The rotor plates are supported in three places and the stator plates in four places. This gives rigidity to the combination tuning instrument, known as Metralign.

WGY Schedules Test Of Two Transmitters

Propagation tests on two of its three transmitters will be continued by WGY, of Schenectady, on successive Saturday nights, September 11 and September 18, on 379.5 meters. Engineers of the General Electric Company are endeavoring to give radio listeners the very best possible transmission service and to do this the cooperation of listeners in all parts of the country is necessary.

The transmitters used will be known as No. 2 and No. 3. No. 2 will be used until 9:30 p. m. E. S. T., at which time No. 3 transmitter will be operated for a half hour period. At 10:00, No. 2 will be put in commission until 10:30, when No. 3 will go on the air for a period of a half hour.

Observers will be placed in about forty special locations and it is expected that with these reports and the large number expected from other listeners the engineers will have valuable data from which to draw their conclusions. The listeners are asked to compare the signal strength of the two receivers and to give their opinion of the relative reliability of the output. Listeners are also asked to indicate their preference.

DIFFERENCES IN DIAL DEGREES Between Stations Using Various Type Condensers

STATIONS Call Letters	Wave Length Meters	Frequency Kilocycles	Differences Between Stations					
			In		S.L.C.	S.L.W.	S.L.F.	S.L.T.
			Meters	kc				
WNYC	526	570	11	5½	6	9½		
WEAF	492	610	37	50	11½	6½	5	9½
WJZ	455	660	50	80	10½	6½	8	10½
WOR	405	740	45	93	8½	11	8	12
WHN	360	833	44	117	11	12	10	11½
WGBS	316	950	43	150	7	10	12	11
WFBH	273	1100	21	90	4	6	7½	7½
WGCB	252	1190	12	60	2	3½	4	3½
WHAP	240	1250	7	40	1½	2½	3½	3½
WNJ	233	1290	15	85	1½	2	4	3½
WIBI	218	1375						

The 1927 Model Victoreen Designed With Power Unit

Arthur H. Lynch Creates New Plane of Efficiency In Set and Shows How It May Be Operated With Lynch Power Amplifier and B Supply and Eliminating All Batteries—Three Stage Resistance Audio Employed, But Any AF Channel May Be Used.

By Herman Bernard

Associate, Institute of Radio Engineers

THROUGH the combined efforts of some of radio's leading engineering brains RADIO WORLD is enabled to offer its readers a series of articles such as has never been surpassed in interest or importance in any radio periodical. There are to be five such articles, including this, the first one, which is merely a summary of what is to follow each week for the next four weeks.

A brief summary of these revolutionary articles includes the following important new developments:

1. A newly designed 6-tube Super-Heterodyne which may be operated either from batteries or direct from the 60-cycle line current, without any batteries.
2. A complete article describing the theory, building and operating of the new power amplifier and B supply unit designed by Arthur H. Lynch. This article will include complete information for using this wonderful improvement in radio reproducing devices with the new Super-Heterodyne as well as with other types of receivers.
3. The third article will be a well-illustrated description of the first two articles combined with novel means of using apparatus now on the market for operating direct from the light socket.
4. The concluding article of this series will deal with effective means of operating directly from the lamp socket without any batteries whatever and will also include many suggestions for console and high-boy assemblies so that this receiver de luxe may have a suitable housing which will blend well with the most exquisite living-room setting. This article also will include complete instructions for building an A battery current supply which will function directly from the AC house line. And what is of even more importance to the home builder and more notable as a real advance in the radio art—there will be a complete description of the technical details and construction helps for the building of an A current supply which will operate directly from the light socket.

The New Super-Heterodyne

All four succeeding features will come from the pen of that veteran designer whose sensible application of theory to

practice and lucid descriptive powers have won him an international reputation—Arthur H. Lynch.

In casting about for the receiver which would satisfy the most capricious and discriminating experimenter Mr. Lynch has chosen the well-established and fully proven variety of Super-Heterodyne. His reasons for doing so are many. It is simple to build, simple to operate, can be used with either loop or small antenna—and of all the circuits now known to radio it is the one least understood. It is possible, by following Mr. Lynch's clear-cut directions, to build a receiver which is extremely satisfactory, and one in which the real experimenter will find plenty of opportunity for research.

The author has made a number of very significant improvements in the design of the receiver and suggests many logical ways for improving on his own work. Radio authorities, who have heard the receiver in operation in the author's home, proclaim it to be a very wonderful job. Though it naturally pleases him to have his design so favorably commented upon, it has not gone to his head and he merely says that it is but the beginning of what may well be some serious work on the part of those engineers and experimenters who will never be satisfied until radio reproduction as a whole is truly perfect. It is good, now—very good, in fact—but not perfect.

The author has taken the fundamental Super-Heterodyne circuit first brought to light here by Armstrong and later adopted as the foundation of many magazine and newspaper articles, to say nothing of papers read by notable engineers before some of the greatest scientific societies in this country and abroad. He has selected, for use in his models—and there have been quite a number, as his work has been going on for a protracted period—a group of equipment which any experimenter can duplicate in nearly any section of this country and in many foreign countries.

Chose the Victoreen

The foundation for Mr. Lynch's Super is found in the popular and satisfactory line of Victoreen units which were so popular last year. The other units are all standard, also, except the tubes—but the author has taken the precaution to include the necessary technical data for standard tubes as well.

In order to have the receiver function at its best, a special arrangement of tubes is suggested and these include vacuum tubes having a high amplification constant for use in the intermediate frequency amplifier, two special detector tubes which tests have proven to be highly sensitive, and a conventional tube for use in the oscillator.

The overall amplification is therefore very high and the receiver is both sensitive and very selective.

The plate voltage for each of the tubes in the receiver is passed through a fixed resistor shunted by a condenser after the fashion described by Mr. Lynch in connection with his now-famous Improved Browning Drake. By this method the author provides any desired plate voltage for any one tube from a single plate voltage source and accomplishes two very desirable results, namely: greatly improved performance and the reduction to

Options Are Presented, So That Batteries May Be Used, If Preferred, or B Battery and Trickle Charger, or B Eliminator With Any A Source—An Efficient A Eliminator for Filament Heating Is Developed.

a minimum of parasitic stray fields, to say nothing of greatly simplified wiring.

The receiver itself is made with but six tubes—ending at the second detector. It may be operated on batteries or with current supply devices now on the market. It may be used with any type of audio amplifier and the author has provided for both straight and sloping panel assembly so that the home constructor may have his choice. In either case the receiver itself may be placed in a standard 8x22" cabinet, while the amplifier and batteries or other source of current supply may be placed in a suitable console and, such is now available on the market in almost any desired style. There are but five leads from the console to the receiver and they include the two output leads which go to the input of the audio amplifier.

Surpasses Expectations

This receiver has been made with many important elements in mind and the result is all and more than most of us have expected. Mr. Lynch has remembered that all radio experimenters are not millionaires and has chosen the elements which go into his receiver with this important fact constantly in mind. He has also given consideration to the fact that some otherwise perfectly satisfactory units do not enjoy very wide distribution and has chosen a group which may be picked up in a hurry at Cross Roads, Kalamazoo and Oshkosh, as well as in San Francisco, Chicago, New York or any of our other large cities.

In designing the resistance-coupled power amplifier which bears his name Mr. Lynch had made another very important contribution to the radio art. It is capable of passing and amplifying speech and music with remarkable fidelity. It is designed for use with any of the units now on the market for the Raytheon tube and addition to being an amplifier itself it provides the necessary B voltage for the receiver with which it is used. It is thus an audio amplifier and an eliminator.

Generally Useful

Many radio experts and even some radio companies gave up the problem of using a resistance coupled amplifier with the Super-Heterodyne. Many others claimed that resistance coupling with a B supply unit was out of the question. Mr. Lynch solved both problems and his power amplifier and B supply is just about as neat a piece of electrical and mechanical design as we have ever seen. It embodies so many features that space does not permit us to tell about them all here. It will

(Concluded on page 28)

Arthur H. Lynch's Set In a Console In His Home

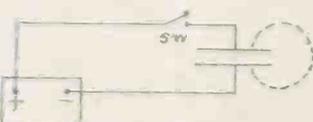
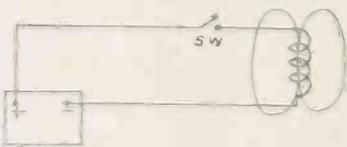
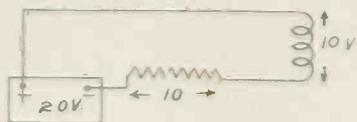


FIG. 1

The 6-tube Victoreen Super-Heterodyne in a console that houses also the A and B eliminators.

For the Novice—

The Opposing Effect of Resistance, Inductance and Capacity



FIGS. 1, 2, 3 AND 4.
These illustrate, top to bottom,
effects of resistance, inductance and
capacity.

By K. B. Humphrey

RESISTANCE is a function of the material used as a conductor of electricity and of the cross section and length of the wire. Then, for any given material the resistance may be obtained by a simple formula involving these factors. Resistance is equal to the specific resistance of the material times the length divided by the cross sectional area. The specific resistance is the resistance of a wire one foot long and one circular mil in section. However, do not get alarmed with the use of the different terms. The formula is very seldom used, as there are wire tables available which give the resistance of any given size wire per foot. The term circular mil is used only in the very large sizes of wire and need not concern the radio fan.

It may be seen from the formula that the resistance varies directly as the length of the wire. In other words, the longer the wire the greater the resistance. It will also be noticed that the larger the wire is in diameter the less resistance it will have to the passage of a current of electricity. The wire might be compared to a pipe in which some liquid were flowing and the same laws would apply.

The Counter EMF

There is another type of resistance with which we are concerned with in the electrical circuit and that is the counter electromotive force or opposing voltage. Fig. 1 gives an illustration of a 20-volt source of voltage, such as a battery with a resistance placed in series with a coil. This resistance is so adjusted that the voltage across the coil is only 10 volts. Now, we may obtain the same effect by inserting a battery giving 10 volts in place of the resistance, so that it opposes the first battery. That is, the two negative poles are connected together, as shown in Fig. 2. It may be seen that the voltage across the coil is still 10. Resistance then can

actually be considered as an opposing voltage as well as a physical property of the material being used. This factor must be kept in mind to understand the action of the electric current under different operating conditions.

Inductance

Supposing we have a battery as a source of electricity, a coil and a switch in the line as shown in Fig. 3. When the switch is closed an electrical circuit will be formed and a current of electricity will flow through the wire in the coil. However, while most persons look upon the action of an electrical current as being instantaneous, this is not actually a fact. The current does not come to the value, say one ampere, immediately, but gradually comes up to the maximum and remains there.

The time consumed in bringing the current up to the steady value is very very short, but there is a time factor.

In the same way when the switch is opened the current does not stop flowing instantaneously but has a tendency to keep on going. This fact can be illustrated by taking a coil of wire on a transformer, say, and putting a voltage across it from a B battery. When contact is made there is no appreciable spark, but when the contact is broken there is a tendency for the current to keep on flowing and a good sized spark is the result.

The Flux or Field

Whenever a current flows through a wire an electromagnetic field is formed in the immediate vicinity of the wire (Fig. 3) and might be considered as an elastic line under tension which is held out from the wire according to the amount of current flowing through the wire. These lines, which are purely imaginary, are used in most illustrations for want of something better to express the idea. Supposing the lines formed by the current in the wire cut across another wire which happens to be close to the first wire. An electric current is thus formed in the second wire.

It can be seen that these lines can only cut through another wire if there is motion of the line, as for instance when the circuit is first closed. This is just what happens in a coil of wire.

The lines gradually expand and in so doing cut through the other turns of the coil, thus having a tendency to start another electrical current. This current of motion of the line, as for instance when electricity bucks the incoming current because the voltage is opposite of the incoming voltage.

This is why the current does not rise to its normal value immediately the switch is closed.

Action In Coil

There is an opposing voltage generated in the coil. In a like manner, when the circuit is opened the lines collapse and tend to make a current flow in the same direction as the incoming current, due to the outside voltage impressed on the coil. The flow of current is thus prolonged and we have the phenomenon known as inductance.

If the current were to be reversed periodically, as is the case with alternating current, there would be a regular opposing voltage generated in the coil which at all times would act against the impressed voltage and the effect would be that of an increased resistance in the circuit.

The resistance of a wire when it is

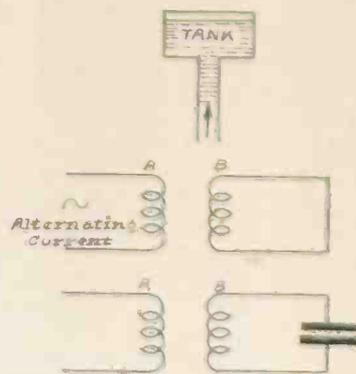


FIG. 5, 6 AND 7.
Read from top to bottom.

wound in the form of a coil can not be figured only on the physical properties of the wire such as area, length, and specific resistance, when alternating current is allowed to flow in it.

The reactance of a coil depends upon other factors, such as the spacing of the wires, the shape of the coil, and the number of turns of wire. You naturally wonder how Ohm's law can be applied to such a condition. It holds good, however, when we consider the opposing voltage as being in the nature of a resistance, as explained in the preceding paragraphs.

It might be well to note at this point that an alternating current is usually produced by means of a generator and is obtained by moving a wire through an electric field rather than the field cutting across the wire.

A condenser consists of two plates which are connected across an electric battery, as shown in Fig. 4. We will not go into details of just what happens. The medium between the plates is in reality the place where the electricity is stored and hot in the plates.

In other words, it would make no difference in the capacity of the condenser no matter what the plates were made of so long as they were a conductor. We are interested mostly in the medium used in between the plates. This may be air, mica or any other non-conductor of electricity.

The Pail Parallel

The thickness of this layer of non-conductor, the material, and the area of the plates are the determining factors. Larger plates necessarily mean that a larger portion of the insulating medium will be in the circuit and consequently the greater the capacity. Also the thinner the medium or distance between the two plates, the greater the capacity.

Let us see what happens when the switch is closed in the circuit, as in Fig. 4.

There is a flow of current for an instant only, as there is in reality no electric circuit, as previously defined.

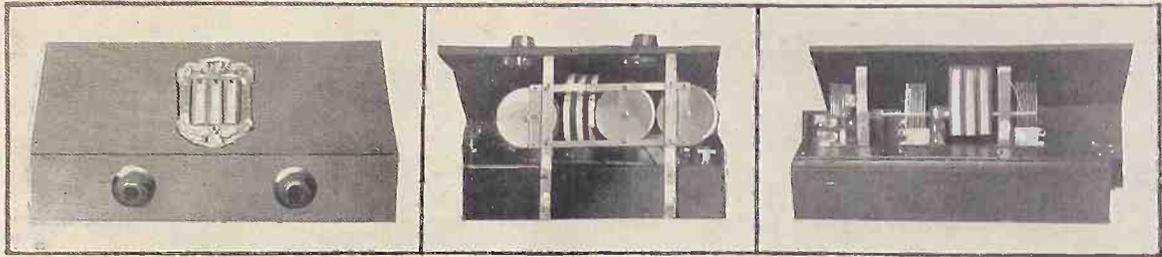
The condenser acts almost like a pail. The minute it is filled up the flow of current stops and there is no further action.

In fact the electricity seems to be sucked into the pail as if there were a vacuum there. If the switch is opened there will be no connection to the condenser, but the condenser will remain charged with electricity (the pail being full).

If a wire is connected across the terminals of the condenser as shown in

(Continued on page 28)

The Na-ald Truphonic Set



(Radio World Staff Photos)

FIGS. 1, 2 AND 3.

The front panel view is at left. The other photos show the bottom and the rear views.

Extreme Compactness Achieved in Receiver That Utilizes Localized Control Unit, Double Impedance Audio Amplifier, Gang Socket Strip and Shielded Coils.

By Humbolt Brill

A SKILLFULLY designed 6-tube receiver possessing the ideal radio fan qualifications, such as simplicity of control, great volume, but with exact tonal truthness; selectivity, distance, yet no unruly squeals due to interaction of the fields of the coils, is shown photographically in Figs. 1, 2 and 3 and schematically in Fig. 4. The first two tubes act as radio frequency amplifiers, the next one as a non-regenerative detector and the concluding three as AF amplifiers.

A newly developed system of audio frequency amplification is employed, known as the double impedance system. The complete theoretical and practical discussion of this system will be given in the next issue of RADIO WORLD by A. N. Clifton.

Set Is Alden Design

The receiver shown on this page was designed by engineers of the Alden Manufacturing Company. The Na-ald Localized Control is the means of manipulating the .000375 variable condensers, while the Na-ald Truphonic amplifier-unit, including choke, constitutes the audio channel. Another Alden product is the gang socket strip.

The RF and detector part of the circuit is the familiar efficient one. A point of interest is the use of the Sickles shielded

coil, a new product. The diamond weave variety of coil affords shielding without loss of compactness, for obviously the set is very compact.

The filaments of the two RF tubes are controlled by a 10-ohm Carter rheostat, while the filaments of the detector and the three AF tubes are controlled by a 3-ohm Carter rheostat. C11 and C8 are both bypass condensers and have a capacity of about .1. C4 is the grid condenser .00025 mfd. The grid leak R10 is of the 2 or 3-megohm type. It will be noted that there are two possible ways to connect this leak, either in shunt to the grid condenser or in shunt to the grid filament plus. This depends upon the type of tube used. The -01A requires a positive grid return for detection, while the -00A requires a minus grid return.

May Use Power Tube

Provision is made in the last stage for the use of a power tube with the proper C bias. A choke coil and condenser to keep the DC off the speaker windings are in the audio unit.

The complete set can be constructed in a 14" long sloping model cabinet, 6½" high. The localized control is mounted in the center, with the condensers in their respective places. Underneath the condensers the coils are mounted.

The special unit containing the Truphonic AF Amplifier and the sockets is placed in the rear and supported by a bracket.

The rheostats are mounted on a vertical auxiliary panel.

The antenna and ground posts are mounted on a strip and bolted to the end of the unit casing. The phone tip jacks are also mounted here. The battery leads are made through a tagged cable.

The wiring of this set is very simple, most of it having already been made in the unit. Flexible wire is used. The sockets in the unit will hold any UX type tube, also the old style base 01A tubes.

Ease of tuning is assured. The tone

6-Tube Creation Affords Simplicity in Tuning and Assures Excellent Tone Quality, As the Audio Grids Do Not Overload on Strong Signals.

quality is wonderful, due to the freedom from grid blocking on strong signals on the audio amplifier. Selectivity is good. The set is a marvel in compact construction.

Two Naval Vessels to Send Weather Maps

WASHINGTON.

Testing of radio transmission of weather maps is being undertaken by the Naval Experimental station at Bellevue under the Jenkins picture transmission system. Receivers have been furnished two naval vessels and it is expected that the installation will be ready for service tests early in September.

Officials are reluctant to comment on the possible outcome of the tests, but it is admitted that if they are successful it may revolutionize the dissemination of weather information. Quicker and more accurate weather reports to the general public is said to be one of the possibilities if success is attained.

NAVY TO BROADCAST

WASHINGTON.

Arrangements are being made by the Navy Department for the broadcasting of programs through two chain stations and a number of local stations throughout the country, according to an announcement. Commandants of all Naval Districts have been notified to assist.

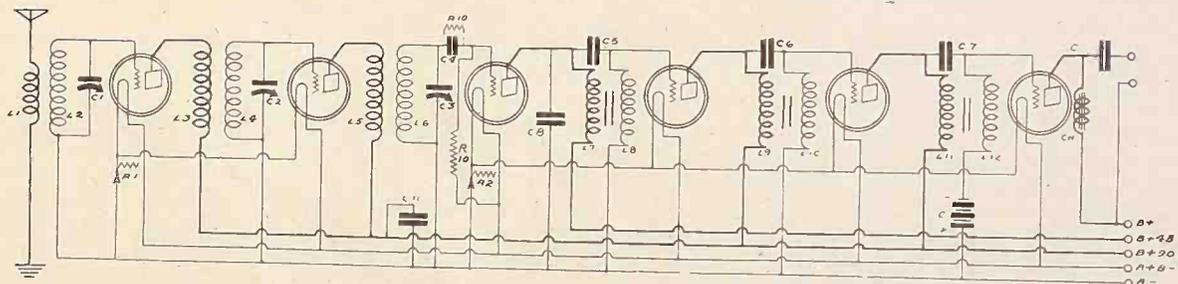


FIG. 4.

The circuit diagram of the compact 6-tube receiver, using a localized tuning control, shielded coils and three stages of double impedance coupled audio.

Radio University

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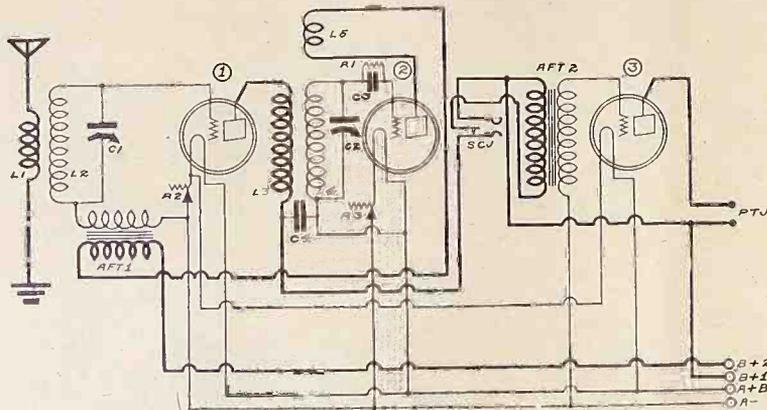


FIG. 423

The circuit diagram of the 3-tube reflex, desired by James Klein.

PLEASE PUBLISH the circuit diagram of a 3-tube receiver, using a non-regenerative RF amplifier, a regenerative detector and a stage of transformer coupled AF amplification. The RF amplifier should be connected up so that it will act as a AF amplifier also. (2)—I have a single circuit, closed type jack, a tuned RF coupler and a 3-circuit tuner. The primaries of both the tuner and the RFT consist of 10 turns, while the secondaries consist of 45 turns. Each primary and secondary is wound on a tubing $3\frac{1}{4}$ " in diameter, with No. 22 double cotton covered wire. The tickler is wound on a tubing $1\frac{1}{4}$ " in diameter and consists of 36 turns, using No. 36 single silk covered wire. Can these be used? (3)—What other parts will be necessary?—James Klein, Ferndale, N. Y.

(1)—The diagram of such a receiver is shown in Fig. 423. (2)—Yes. (3)—You will need two .0005 mfd. variable condensers, a high (6 to 1) and a low ratio (3 to 1) audio frequency transformer, a 10 ohm and a 20 ohm rheostat, a .00025 mfd. grid condenser, a 2 megohm grid leak, a .001 mfd. fixed condenser C4, tubes, etc. The variable condensers shunt the secondaries of the RFT and the tuner. The high ratio AFT (AFT 2) is used in the amplifier stage, while the low ratio AFT (AFT 1) is used in the reflex stage. The 10 ohm rheostat controls the filaments of the RF-AF and the AF tubes, while the 20 ohm rheostat controls the filament of the detector tube. The single circuit, closed jack is used at the RF-AF output. Phone tip jacks PTJ, are used in the output of the last tube. C4 is a by pass condenser. Use the 01A type tubes throughout, with a 6 volt A battery for filament supply. The plates of the amplifier tubes receive about $67\frac{1}{2}$ to 90 volts, while the plate of the detector tube should receive about 45 volts. These voltages are purely experimental, they depending wholly upon the individual characteristics of the tubes. Care should be exercised, when connecting up the grid returns. The returns of the amplifier tubes are made to the F minus, while the detector return is brought to the F plus.

I WOULD like to build a 4-tube receiver, employing two stages of tuned radio frequency amplification, a non-regenerative detector and one stage of transformer coupled audio frequency amplification. The first RF tube should act as an AF tube. The circuit diagram of such a receiver, employing any special

coils, condenser, etc., but with no tube additions, so as to obtain loud signals, will be appreciated. Give circuit data.—William Buckley, East Wyndham, N. Y.

Fig. 424 shows the electrical diagram of this receiver. You will note that a tuned antenna and a single winding antenna inductance is used. These additions will give you tremendous volume. This continuous winding consists of 50 turns, tapped at the 8th turn from the beginning and wound on a tubing $3\frac{1}{4}$ " in diameter, using No. 22 double cotton covered wire. The primaries of the RFT, L2 and L4, consist of 8 turns. The secondaries, L3 and L5, consist of 45 turns. Each primary and secondary is wound on a tubing $3\frac{1}{4}$ " in diameter. No. 22 dcc wire is used. The 42 turn portion of the continuous winding and the secondaries of the RFT are each tuned by .0005 mfd. variable condensers, C1, C2, C3. The filaments of the RF-AF and the detector tubes are each controlled by 20 ohm rheostats, while the filaments of the RF and the AF tubes are controlled by ballast resistors. These should be of the $\frac{1}{4}$ ampere type. The coil in the antenna tuned system consists of 31 turns of No. 24 dcc wire, wound on a tubing 3" in diameter. A .001 mfd. variable condenser shunts this winding. The first audio frequency transformer is of the low ratio type (3 to 1), while the transformer in the AF stage is of the high ratio type (6 to 1). The plates of the amplifier tubes receive 90 volts, while the plate of the detector tube re-

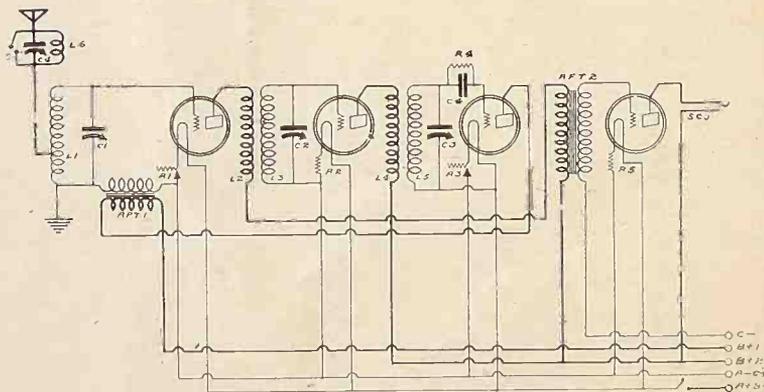


FIG. 424

The circuit diagram of the 4-tube receiver, requested by William Buckley.

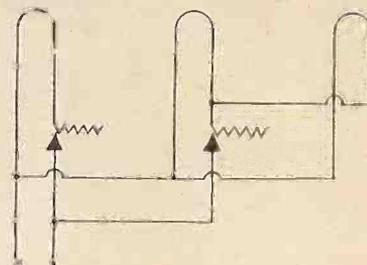


FIG. 423a

The filament wiring of a 3-tube set.

ceives 45 volts. Provision is made for the insertion of a C battery. A separate B voltage may be applied to the plate of the last AF tube, by breaking the lead from the bottom of the jack and running it to another binding post. A filament switch, inserted in the A plus lead, is required, there being no other means of cutting in or out the filament power to the RF and the AF tubes.

PLEASE show the wiring of the filament of a 3-tube set rising —01A tubes and two rheostats.—A. J. Willow, Spokane, Wash.

Fig. 423a shows this. The rheostat at left is 20 ohms and the other is 10 or 15 ohms.

PLEASE GIVE the circuit diagram of the receiver, described in the Radio University columns of the August 21 issue of Radio World, wherein a triple condenser was employed. Include the resistance AF stages in the diagram. Give the constants of all the parts.—Carl Stinton, Mt. Vernon, N. Y.

Fig. 425 shows the electrical diagram of this receiver. L1, L3, L5 and L7 represent the primary windings, while L2, L4, L6 and L8 represent the secondary windings of the radio frequency transformers.

C1 is the single .0005 mfd. variable condenser, used to tune the secondary of the antenna RFT. C2 is the triple condenser, with its common rotor and three stationary sections. R1 is a 20 ohm rheostat. R2 is the 10 ohm rheostat. R3 is another 20 ohm rheostat. R11 is a $\frac{1}{2}$ ampere ballast resistor, used to control the filament temperature of the first two audio tubes. The filament of the last AF tube is controlled by a single ballast resistor. This provides flexibility in case you wish to use a power tube. A special C battery connection is also provided for. R5, R7 and R9 are all .1 megohm fixed resistors. R6 is a 1 megohm grid resistor. R8 is a .5 megohm grid resistor, while R10 is a 25 megohm grid resistor. C5, C6 and C7 are all .25 mfd. fixed stopping condensers. C4 is the .00025 mfd. grid condenser. R4 is

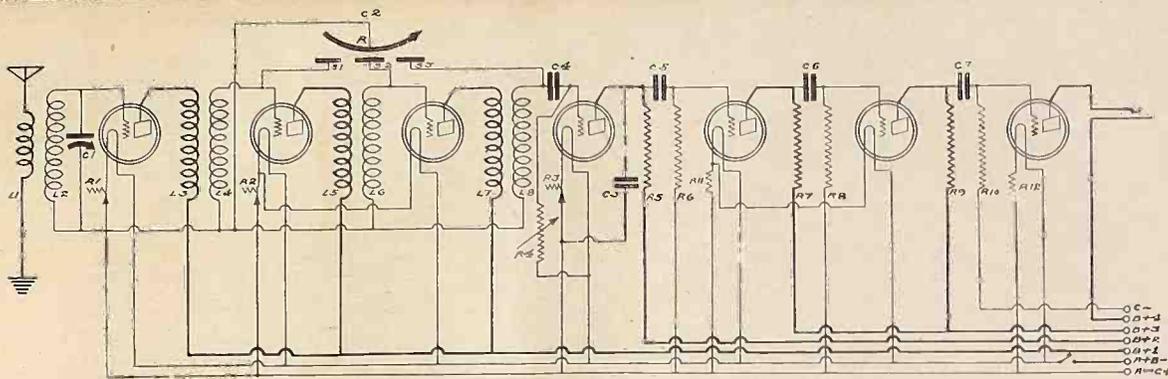


FIG. 425
The circuit diagram of the 7-tube, 2-control receiver.

the variable grid leak. C3 is the .001 mfd. fixed condenser used for bypassing. B plus 1 equals about 67½ volts. B plus 2 equals about 45 volts. B plus 3 equals about 90 volts. B plus 4 equals about 135 volts. These voltages are for the -01A tubes. Hi-mu tubes may be used in the first two AF stages and a lo-mu tube in the last AF stage. In this case higher voltages will have to be employed. The correct voltages should be obtained from the cartons or the circulars placed with these tubes. This applies to the C voltage of the last AF tube.

I HAVE a variocoupler, having a 20 turn rotor (2 inch diameter) and a 50 turn stator (4 inch diameter). No. 22 dcc wire is used. A circuit diagram of a 2-tube receiver, using a tuned RF amplifier, and a regenerative detector, with this coupler in the detector stage, will be appreciated.—Carl Mertens, West New York, N. J.

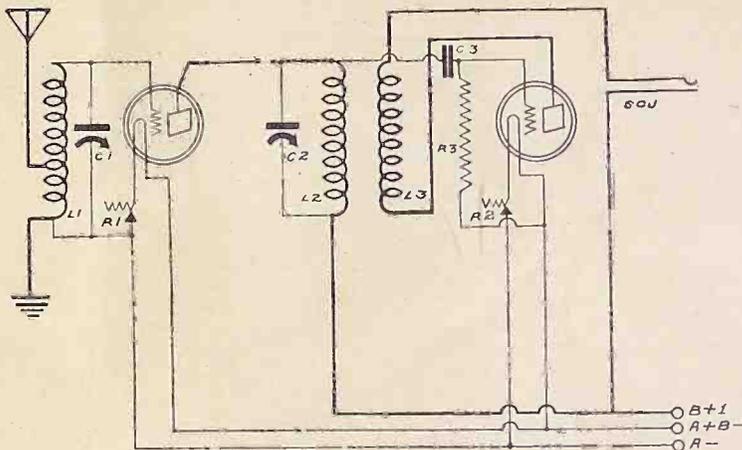


FIG. 426
A 2-tube regenerative receiver requested by Carl Mertens.

Fig. 426 shows the electrical diagram of this set. A single winding antenna inductance is used, shunted by a .0005 mfd. variable condenser. This coil consists of 50 turns wound on a tubing 3¼ inches in diameter, using No. 22 double cotton covered wire. A tap is made at the eighth turn from the beginning. This tap is connected to the antenna, while the beginning of the coil is brought to the ground. The ending of this coil is brought to the grid post on the RF socket. Use the stationary coil for the plate winding of the RF tube and the rotary winding for the plate winding of the detector tube. That is, use this latter winding as a tickler. Rheostats of the 20 ohm type should be used to control the filaments of both tubes. A .00025 mfd. grid condenser and a 3 megohm grid leak is used. A single circuit jack is used at the output. Although the plates of both tubes are connected to one B plus terminal in the diagram, better results will be obtained, if a separate voltage is applied to each of the plates, e.g., 45 to the detector and 90 to the amplifier. This set is difficult to control. All adjustments should therefore be made with care. For loudest signals use the -01A.

I HAVE two 50 turn honeycomb coils. Could I have the circuit diagram of a 4-tube receiver, in which these two coils can be used?—Melvin Kratzner, Jersey City, N. J.

Fig. 427 shows the circuit diagram of this set. The impedance method of coupling is used. A .0005 mfd. variable condenser is used to tune the antenna and one is used to tune the plate coil. The antenna coil may be tapped as per diagram, at every second turn, or it may be a single winding without any taps. Each rheostat is of the 10 ohm type. The rheostats in the filament circuits of the AF tubes are not necessary. Ballast resistors

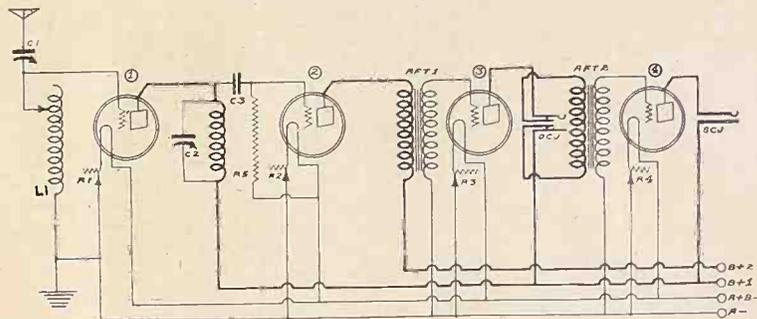


FIG. 427
The circuit diagram of a 4-tube impedance coupled receiver.

may be substituted. A .00025 mfd. grid condenser and a 3 megohm grid leak is used. The leak is not shunted to the grid condenser, but connected from the grid to the F plus terminal on the detector socket. The first AFT should be of the low ratio type (3 to 1), while the second AFT should be of the high ratio type (6 to 1). These positions may be reversed. A double circuit jack is placed at the first AF output and either a single circuit jack, open, or a pair of phone tip jacks may be placed at the last AF output. The plates of the amplifier tubes receive one voltage, e.g., 67½, while the plate of the detector tube receives about 45 volts. The -01A tubes should be used for best results, with a 6-volt A battery source. If no rheostat is used in the filament circuits of the AF tubes, either a filament switch or a filament control jack will be necessary.

COULD YOU favor me with the circuit diagram of a 1-tube receiver, employing a regenerative RF tube reflexed and acting also as an AF tube and a crystal detector? The coil data would be appreciated.—Martin Humboldt, Waco, Texas.

Fig. 428 shows the circuit diagram of this receiver. A 3-circuit tuner is used in the RF stage. A standard RFT is used for coupling. The primaries of both the tuner and RFT consist of 10 turns. The secondaries of these units consist of 45 turns. Each primary and secondary is wound on tubings 3¼" in diameter, using No. 22 double cotton covered wire. The spacing between the two windings is experimental. The secondaries of the tuner and the RFT are shunted by .0005 mfd. variable con-

(Concluded on page 14)

Realism in Studio Is Tax on Ingenuity

Godfrey Ludlow Tries 57 Varieties of Bells to Simulate Locomotive's But Has to Get Real One from Train

"While it is possible to fool the human ear, it is folly to attempt to trick the microphone," is the expert opinion of Godfrey Ludlow, who has charge of all acoustical effects in the studio of WJZ. When asked to give his reasons for this opinion, Ludlow cited the case of the blind.

"Everyone knows," said Ludlow, "that the hearing of a blind person is more acute than that of a person with clear vision. Nature attempts to equalize the senses and if one sense is lacking, the others are made more acute. The human brain, bereft of one of its sources of sense, depends more upon the remaining, with

the result that with more use, these senses become more delicate and less likely to be fooled.

Depends on Ear Only

"This explains why the microphone is more sensitive than the human ear. As far as the action in the studio is concerned, the entire radio audience is blind. They rely upon the sense of hearing alone to convey the action which takes place in the studio to their mind. Therefore, if that sound is not absolutely accurate, the mind catches the deception and the effect is lost.

"Here is an example. Suppose you went

THE RADIO UNIVERSITY

(Concluded from page 13)

densers. The tickler consists of 36 turns, wound on a tubing $1\frac{3}{4}$ " in diameter. A low ratio AFT should be used. C3, C4, C5 and C6 may all be .001 mfd. fixed condensers. A rheostat controls the filament temperature of the RF

amplifier. CD is the crystal detector. At the X point, a radio frequency choke coil may be inserted. This will tend to prevent the RF current from entering into the AF circuit. The -01A tube should be used. The crystal detector should be of the fixed type.

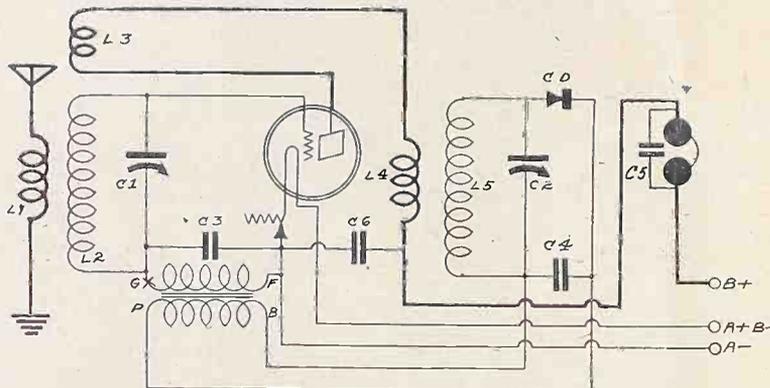


FIG. 428

The electrical diagram of the 1-tube reflex using a crystal as a detector.

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[In sending in your queries to the University Department please paragraph them so that the reply can be written under or alongside of each query. Write on one side of sheet only. Always give your university number.]

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to a movie and a picture of a moving locomotive were thrown on the screen. A man in the orchestra rang a bell, blew a whistle and rubbed two pieces of sandpaper together. The illusion is complete. You have the picture of the train and the sound which accompanies it is realistic. But if you were blind and could not see the picture of the locomotive, when you heard the ringing of the bell, the blowing of the whistle and the scrape of the sandpaper, you would probably ask your neighbor what all the noise was about.

A Hard Problem

"When you were told that it was a railroad locomotive your mental comment would be, 'that bell sounds like a dinner bell and that whistle sounds like a ferryboat and that other noise sounds like pieces of sandpaper being rubbed together. That's no locomotive.' Now, do you see what the radio producer who tries to imitate sounds is up against? He cannot as yet put a picture of the action before the listener. He cannot gracefully come before the microphone and baldly state, 'The sound which you will next hear will be that of a locomotive pulling out of a station.' That would give the listeners a hearty laugh. His continuity might hint that a locomotive was supposed to be nearby and then his imitation must be so realistic that there will be no doubt of it.

"I remember recently when the Pennsylvania railroad first broadcast from WJZ they wanted to create the illusion that the radio audience was joining with their entertainers on a railroad trip. It was up to me to make a noise like a railroad train. The job seemed simple. I got a bell and a whistle and had some one sound them before the microphone while I listened at a loudspeaker in another room. The bell sounded so much like a dinner gong that my mouth watered. The whistle sounded like one of New York's finest calling his mate.

Bells and Bells and Bells

"I tried more bells and more whistles. At one time I had fifty-seven bells and twenty-nine whistles in the studio, but I was no nearer to a railroad train in sound than I was when I started.

"Finally I had to have the railroad take a bell off one of their spare locomotives, mount it on wheels and send it up here. It is in the studio now, if you care to see it. We had a locomotive whistle fitted to a compressed air blower and used that. I thought the effect was right. The sound was genuinely made by the real things. Yet after the first broadcast we received several letters from the radio audience complaining that our bell and whistle didn't seem realistic!"

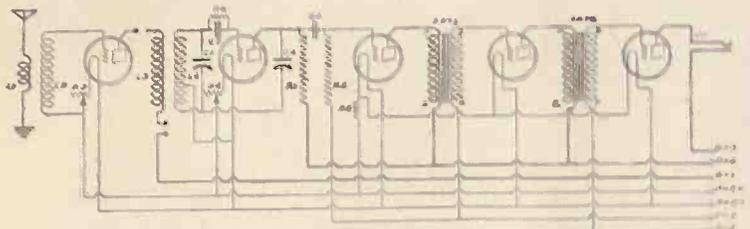
High Frequencies Favored By Navy

WASHINGTON.

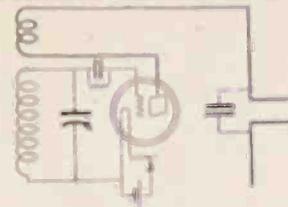
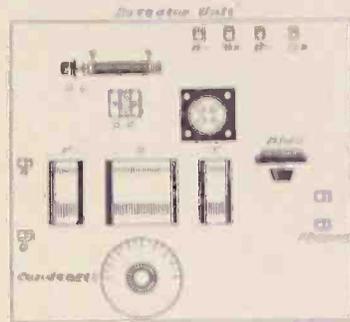
Use of high frequencies has been brought to a routine in the Navy Department for the transmission of messages. During the month of July the shore radio traffic stations showed an increase of 65 per cent. in volume of traffic handled by high frequency as compared to June, according to figures prepared by the Communications Division of the Department. This is by far the best month to date in high frequency work.

The extent high frequency is effecting communications is shown in some degree in the commercial tolls paid by the Navy Department in June, 1925, and June, 1926. In the first instance there were \$1,000 and in the latter \$400. The difference is due largely to traffic sent on high frequency which was formerly routed by commercial wires on account of delays due to atmospheric.

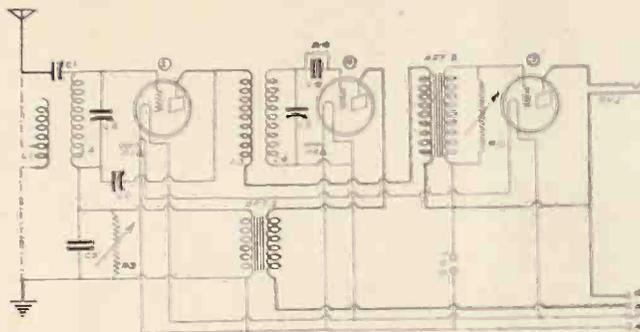
Tubes—One to Nine—What'll You Have?



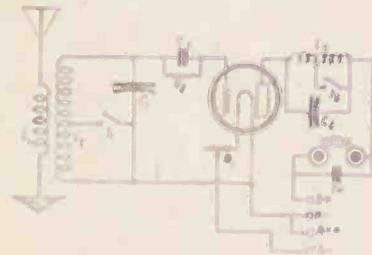
A 5-TUBE receiver employing a stage of untuned radio frequency amplification, a regenerative detector, capacitively coupled, a stage of resistance and two stages of transformer coupled AF. With the aid of phone tip jacks or binding posts in the RF output it is possible to connect the antenna and the ground to the detector input, or use the RF tube and obtain comparative results.



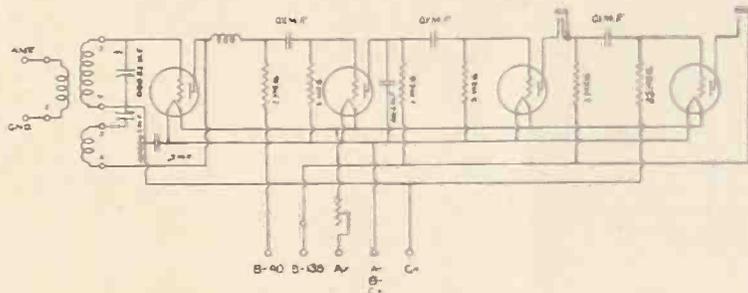
A SUGGESTED test layout for a 3-circuit tuner detector unit, for finding the different types of coupling which will give the utmost satisfaction.



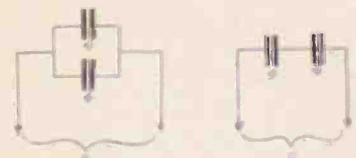
A 3-TUBE reflex, wherein the RF-AF tube is neutralized. The grid is connected via a .00005 mfd. variable condenser to the antenna. This accounts for the great volume that is possible to obtain with this set. A standard RFT can be used to couple the RF-AF output to the detector input. A single winding is used in the antenna. This may be the secondary winding of an RFT. A 10-ohm rheostat controls the filament temperature of the RF-AF and the AF tubes, while the temperature of the detector tube is controlled by a 20-ohm rheostat.



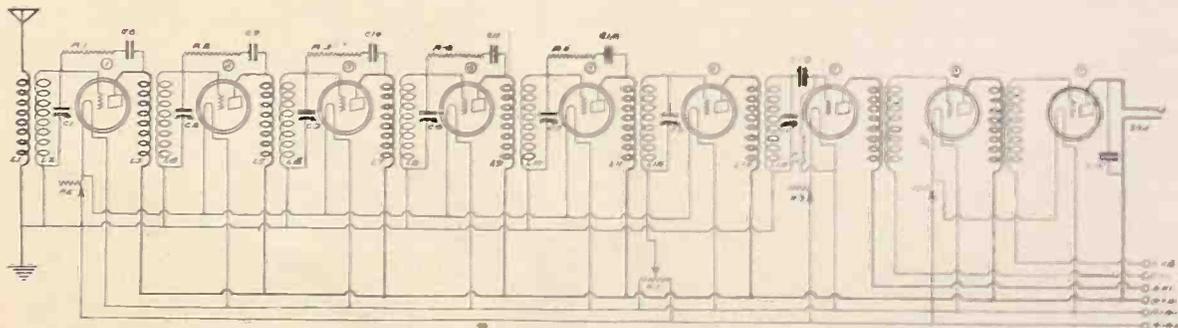
A POPULAR 2-tube regenerative receiver, employing switches, so that either the higher or the lower wavelengths can be heard.



A 4-TUBE receiver employing a regenerative detector and three stages of resistance AF coupling. Single circuit jacks are inserted in the second AF output as well as the last AF output. The detector tube should be of the 0-1A type, the next two AF tubes of the hi-mu and the last tube of the lo-mu type.



IF YOU connect condensers as to the left, you add the capacities. If, as to the right, you divide by the number in the group, if equal capacities.



A WELL-BALANCED 9-tube receiver. Six stages of tuned radio frequency amplification, a non-regenerative detector and two stages of transformer coupled AF amplification are used. The first five stages of RF amplification are neutralized. The variable condenser may be ganged on one shaft, making it one-control.

OFFICIAL LIST OF STATIONS

(Corrected and Revised Up to August 31)

Station	Owner and Location	Meters	Station	Owner and Location	Meters
KFVS	Cape Girardeau Battery Station, Cape Girardeau, Mo.	224	KZRO	Far Eastern Radio, Inc., Manila, P. I.	222
KFWY	Radio Supply Co., Albuquerque, N. M.	230	NAA-U. S. Navy, Arlington, Va.	435	
KFWA	Browning Bros., Holyoke, Utah	261	WAAD	Ohio Mink Institute, Cincinnati, O.	255
KFWB	Warner Bros., Hollywood, Cal.	282	WAAP	Drivers Journal, Chicago, Ill.	275
KFWC	L. E. Wall, San Bernardino, Cal.	211	WAAM	R. Nelson Co., Newark, N. J.	268
KFWF	St. Louis Trust Center, St. Louis	214	WAAW	Oman Loan Ex. Co., Omaha, Neb.	278
KFWH	F. W. Morse, Jr., Eureka, Cal.	254	WABB	Harrisburg Radio Co., Harrisburg, Pa.	204
KFWI	Radio Entertainers, Inc., South San Francisco, Cal.	220	WABC	Ashtabula Battery Co., Ashtabula, N. C.	254
KFWO	Oakland Educat. Soc., Oakland, Cal.	207	WABI	First Universalists Church, Bangor, Me.	204
KFWU	Lawrence Mott, Avallon, Cal.	218	WABO	Lake Ave. Bapt. Ch., Rochester, N.Y.	278
KFWV	Louisiana College, Pineville, La.	218	WABQ	Haverford College Radio Club, Haverford, Pa.	263
KFWW	Willbur Sherman, Portland, Ore.	233	WABR	Scott High School, Toledo, O.	263
KFXB	B. O. Heller, Big Bear Lake, Cal.	305	WABW	College of Wooster, Wooster, O.	247
KFXD	Service Radio Co., Logan, Utah	305	WABX	H. E. Joy, Mt. Clemens, Mich.	247
KFXF	Pikes Peak Broadcasting Station Co., Colo. Springs, Colo.	250	WABY	John Magaldi, Philadelphia, Pa.	242
KFXH	Bledsoe Radio Co., El Paso, Texas	242	WABZ	Coliseum Place Baptist Church, New Orleans, La.	275
KFXJ	Mt. States Radio District, Inc. (Portable), Col.	216	WADC	Allen T. Simmons, Akron, O.	258
KFXR	Classen Film Finishing Co., Okla. City, Okla.	214	WADF	A. B. Parfet Co., Port Huron, Mich.	275
KFYJ	Mary M. Costigan, Flagstaff, Ariz.	205	WAHG	Grebe Co., Richmond Hill, N. Y.	316
KFYF	Carls Radio Den, Oxnard, Cal.	205	WAGM	R. L. Miller, Royal Oak, Mich.	225
KFYJ	Houston Chausicle, Houston, Tex.	205	WAII	A. H. Waite & Co., Taunton, Mass.	254
KFYJ	(Portable)	238	WAIU	American Ins. Union, Columbus, O.	254
KFYO	Buchanan Vaughn Co., Texarkana, Tex.	210	WAMD	Radisson Co., Minneapolis, Minn.	254
KFYR	Hoskins Meyers, Inc., Bismarck, N. D.	248	WAPI	Alabama Polytechnic, Auburn, Ala.	249
KGAR	Citizen Pub. Co., Tucson, Ariz.	244	WARC	American Radio Res. Corp., Medford Hillside, Mass.	261
KGBS	A. C. Dailey, Seattle, Wash.	243	WATT	Edison Co. (Portable), Mass.	244
KGAW	M. Brotherson, Joplin, Mo.	280	WBAA	Purdue University, West Lafayette, Ind.	373
KGXB	Illus B. Abernomb, St. Joseph, Mo.	349	WBAA	State Police, Harrisburg, Pa.	276
KGBY	A. C. Dunning, Shelby, N. C.	303	WBAL	Gas and Elec. Co., Baltimore, Md.	246
KGZ	Federal Live Stock Remedy Co., York, Neb.	533	WBAP	James Millikin University, Decatur, Ill.	270
KGCA	C. W. Greenley, Deiorah, Ia.	280	WBAP	Star Telegram, Fort Worth, Tex.	476
KGCB	Wallace Radio Institute, Oklahoma, Okla.	331	WBAY	1st Baptist Church, Asheville, Tenn.	236
KGO	General Electric Company, Oakland, Ca.	361	WBAY	H. Stanger, J. Wilkes, Raleigh, N. C.	259
KGTT	Glad Tidings Tabernacle, San Francisco, Cal.	207	WBBL	Grace Covenant Presbyterian Church, Richmond, Va.	289
KGUM	A. Mucioy, Honolulu, Hawaii	278	WBBS	Atlas Investment Co., Chicago, Ill.	238
KGW	The Oregonian, Portland, Ore.	492	WBBS	High School, Petoskey, Mich.	226
KGY	St. Martin's College, Lacey, Wash.	270	WBBS	Peoples Pulpit Ass. S. Is., N. Y.	413
KHJ	The Times, Los Angeles, Cal.	405	WBBS	1st Baptist Church, New Orleans, La.	256
KHQ	Louis Wasmer, Spokane, Wash.	273	WBBS	Ruffner City, Norfolk, Va.	228
KJBS	J. Brunton Co., San Francisco	230	WBBS	Washington Light Infantry, Charleston, S. C.	222
KJR	Northwest Radio Co., Seattle, Wash.	384	WBBS	C. L. Carroll, (Portable), Chicago, Ill.	216
KLDS	Reorganized Church of Jesus Christ of Latter Day Saints, Independence, Mo.	441	WBBS	Foster McConnell, Chicago, Ill.	266
KLS	Warner Radio Co., Oakland, Cal.	250	WBBS	Baxter Co., Grand Rapids, Mich.	256
KLX	Tribune, Oakland, Cal.	508	WBBS	Bliss Electrical School, Takoma Park, Mich.	232
KLZ	Reynolds Radio Co., Denver, Colo.	266	WBOO	Grebe & Co., Richmond Hill, N. Y.	232
KMA	May Seed and Nursery Co., Shenandoah, Ia.	461	WBNY	Miss S. Katz, N. Y. C.	322
KMJ	Fresno Bee, Fresno, Cal.	234	WBRC	Bell Radio Corp., Birmingham, Ala.	246
KMMJ	Johnson Co., Clay Center, Neb.	239	WBRE	Baltimore Radio Ex., Wilkes-Barre, Pa.	231
KMO	Love Elec. Co., Tacoma, Wash.	250	WBRS	Universal Radio Mig. Co., Brooklyn, N. Y.	394
KMOX	Globe Democrat, St. Louis, Mo.	250	WBT	Commerce Chamber, Charlotte, N. C.	275
KMTR	Echophone Mig. Co., Hollywood, Cal.	238	WBZ	Westinghouse Co., Springfield, Mass.	333
KNRC	C. B. Juneau, Hollywood, Cal.	208	WBZA	Westinghouse Electric and Mig. Co., Boston, Mass.	275
KNX	Express, Los Angeles, Cal.	337	WCAC	Agricultural College, Mansfield, Conn.	263
KOA	General Electric, Denver, Colo.	322	WCAD	St. Lawrence University, Canton, N. Y.	263
KOAC	Oregon Agricultural College, Corvallis, Ore.	280	WCAE	Kaufman & Baer, Pittsburgh, Pa.	463
KOB	College of Agri., State College, N. M.	349	WCAJ	Nebraska Wesleyan University, University Place, Neb.	254
KOCH	Omaha Central High School, Omaha, Neb.	258	WCAL	St. Olaf College, Northfield, Minn.	337
KOCW	Okla. College for Women, Chickasha, Okla.	252	WCAM	Galvin Radio Supply Co., Camden, N. J.	236
KOIL	Monarch Mig. Co., Council Bluffs, Ia.	278	WCAP	Frager of Baltimore, Baltimore, Md.	275
KOWW	Frank A. Moore, Walla Walla, Wash.	285	WCAR	Southern Radio Corp., San Antonio, Texas	263
KPO	Hale Brothers, San Francisco, Cal.	229	WCAT	School of Mines, Rapid City, S. D.	240
KPPC	Presbyterian Church, Pasadena, Cal.	256	WCAU	Universal Broadcasting Co., Philadelphia, Pa.	278
KPRC	Houston Print Co., Houston, Tex.	297	WCAV	University of Vermont, Burlington, Vt.	254
KPSN	Pasadena Star-News, Pasadena, Cal.	316	WCB	C. W. Reinbach, Allentown, Pa.	250
KQP	H. B. Read, Portland, Ore.	213	WCB	G. W. Voliva, Zion, Ill.	345
KQV	Doubleday Hill Elec. Co., Pittsburgh	275	WCBE	Uhalt Radio Co., New Orleans, La.	263
KQW	First Baptist Church, San Jose, Cal.	331	WCBH	University of Mississippi, Oxford, Miss.	242
KRCA	RCA, portable, San Francisco and Los Angeles, Cal.	305	WCBR	C. H. Messter (Portable), R. I.	210
KRE	Gazette, Berkeley, Cal.	256	WCBS	H. L. Downing (portable), Providence, R. I.	240
KSCA	Kansas State Agricultural College, Manhattan, Kans.	341	WCOO	Gold Medal Station, Minneapolis, St. Paul, Minn.	416
KSD	Post Dispatch, St. Louis, Mo.	545	WCK	Stix Baer & Fuller Co., St. Louis, Mo.	273
KSL	Radio Service Corp., Salt Lake City, Utah	300	WCL	E. Whitmore, Camp Lake, Wis.	281
KSMR	S. M. Valley R. R. Co., Santa Maria, Cal.	210	WCLM	H. M. Church, Joliet, Ill.	214
KSO	A. A. Berry Seed Co., Clarinda, Ia.	242	WCMA	Culver Military Academy, Culver, Ind.	259
KTAB	Ass. B'd'casters, Oakland, Cal.	303	WCMB	Hotel Chapeau, Baltimore, Md.	229
KTBI	Bible Inst., Los Angeles, Cal.	294	WCDA	Municipal Station, Pensacola, Fla.	222
KTBR	Brown's Radio Shop, Portland, Ore.	263	WCER	C. R. White, Chicago, Ill.	345
KTCL	Bert F. Fisher, Seattle, Wash.	306	WCET	Henry F. Rines, Portland, Me.	256
KTHS	New Arlington Hotel, Hot Springs, Ark.	375	WCFS	C. W. Selan, Proviencs, R. I.	210
KTNT	N. Baker, Muscatine, Ia.	331	WCX	Detroit Free Press & Jewett Radio and WDJ-J. L. Bush, Tuscola, Ill.	278
KTWA	1st Presbyterian Church, Seattle, Wash.	454	WDAD	Dod's Auto Accessories, Inc., Nashville, Tenn.	276
KUOA	University of Ark., Fayetteville, Ark.	300	WDAE	Tampa Daily News, Tampa, Fla.	233
KUOM	State University of Montana, Missoula, Mont.	245	WDAF	Kansas City Star, Kansas City, Mo.	363
KUSD	University of S. D. Vermillion, S. D.	278	WDAJ	J. I. Martin, Amarillo, Tex.	266
KUT	University of Texas, Austin, Tex.	231	WDAH	Trinity Metr. Church, El Paso, Tex.	261
KVOO	Voice of Oklahoma, Bristow, Okla.	325	WDAY	Radio Equipment Corp., Fargo, N. D.	268
KWCR	H. F. Paar, Cedar Rapids, Ia.	278	WDBE	Gilham-Schoen Elec. Atlanta, Ga.	271
KWG	Portable Wireless Tel. Co., Stockton, Cal.	248	WBDI	Richardson Wesleyan, Ronoke, Va.	229
KWKW	Duncan Studios, Kansas City, Mo.	236	WDBK	M. F. Bray, Weyland, Cleveland, O.	227
KWKH	W. K. Henderson I. W. and S. Co., Shreveport, La.	313	WDBR	Rollins College, Winter Park, Fla.	243
KWSC	State College, Pullman, Wash.	313	WDBY	Boy Scouts of Amer., Kingston, N.Y.	230
KWUC	Western Union College, Le Mars, Ia.	252	WDCH	Dartmouth College, Hanover, N. H.	250
KYW	Westinghouse Co., Chicago	535	WDGY	Dr. G. W. Young, Minneapolis, Minn.	263
KZKZ	Electric Supply Co., Manila, P. I.	270	WDND	Dod's Auto Accessories, Inc., 160-164 8th Ave., N. Nashville, Tenn.	226
KZM	P. D. Allen, Oakland, Cal.	240	WDD	1st Radio Co., Chattanooga, Tenn.	255

Station	Owner and Location	Meters	Station	Owner and Location	Meters	Station	Owner and Location	Meters
WEAL	Cornell University, Ithaca, N. Y.	254	WIBM	Billy Maine, Chicago, Ill.	216	WOCL	Hotel Jamestown, Jamestown, N. Y.	275
WEAM	Borough of North Plainfield, N. J.	261	WIBR	Thurman A. Owings, Weirton, W. Va.	246	WODA	O'Dea Temple of Music, Paterson, N. J.	391
WEAN	The Shepard Co., Providence, R. I.	267	WIBS	Lt. T. F. Hunt, Elizabeth, N. J.	233	WOI	Iowa State College, Ames, Iowa	270
WEAO	Ohio State University, Columbus, O.	294	WIBU	The Electric Barre, Fayette, Wis.	220	WOK	Neutrowound Radio Mfg. Co., Homewood, Ill.	217
WEAR	Willard Storage Battery Co., Cleveland, O.	390	WIBX	Dr. L. Dill, Lordsburg, Ind.	220	WOKO	Earl B. Smith, Patterson, N. J.	233
WEAU	Davidson Bros. Co., Sioux City, Ia.	275	WIBZ	A. B. Trum, Montgomery, Ala.	231	WOO	John Wanamaker, Philadelphia, Pa.	508
WEBC	W. C. Bridges, Superior, Wis.	242	WIL	Benson Radio Co., St. Louis, Mo.	273	WOOD	Grand Rapids Radio Co., Grand Rapids, Mich.	242
WEBD	Elec. Equipment & Service Co., Anderson, Ind.	246	WIOD	Carl S. Fisher Co., Miami, Fla.	248	WOQ	Unity School of Christianity, Kansas City, Mo.	278
WEBH	Edgewater Beach Hotel, Chicago, Ill.	370	WIP	Gimbel Brothers, Philadelphia, Pa.	353	WOR	L. Bamberger & Co., Newark, N. J.	405
WEBJ	Third Avenue R. R. Co., New York, N. Y.	273	WJAC	Jackson's Radio Etc. Co., Ferndale, Mich.	400	WORD	Peoples Pulpit Assn., Batavia, Ill.	275
WEBL	Radio Corp. of Ama. (Portable)	226	WJAK	Norfolk Daily News, Norfolk, Nebr.	270	WORS	State Market Bar. Jefferson City, Mo.	271
WEBQ	Tate Radio Co., Harrisburg, Ill.	226	WJAL	Kokomo Tribune Station, Kokomo, Ind.	254	WOVO	Wain Main Auto, Ft. Wayne, Ind.	227
WEBR	H. H. Howell, Buffalo, N. Y.	244	WJAM	D. M. Perham, Cedar Rapids, Ia.	268	WPAK	N. D. Agricultural College, Agricultural College, N. D.	275
WEBW	Beloit College, Beloit, Wis.	244	WJAR	The Outlet Co., Providence, R. I.	306	WPAP	Palisades Amusement Park, Clifford, N. J.	360
WFBZ	Savannah News & Journal, Savannah, Ga.	268	WJAS	Pittsburgh Radio Supply House, Pittsburgh, Pa.	275	WPCC	N. Shore Congre. Church, Chicago	258
WEEI	Edison Co., Boston, Mass.	349	WJAX	Voice of Jacksonville, Fla.	337	WPDO	H. L. Turner, Buffalo, N. Y.	205
WEHS	Robert E. Hughes, Evanston, Ill.	203	WJAZ	Zenith Radio Corp., Mt. Prospect, Ill.	322	WPG	Municipality, Atlantic City, N. J.	300
WEMC	Emm. Missionary College, Merrien Springs, Mich.	286	WJBA	D. H. Lentz, Jr., Boise, Id.	207	WPRC	Wilson Radio, Harrisburg, Pa.	216
WENR	All-Amer. Radio Corp., Chicago, Ill.	266	WJBB	W. J. McClure, St. Petersburg, Fla.	254	WPS	Penn State College, State College, Pa.	261
WEW	St. Louis University, St. Louis, Mo.	360	WJBC	Hummer Firm, Co. La Salle, Ill.	234	WQA	H. A. Beale, Jr., Parkersburg, Pa.	220
WFAD	Dallas News & Journal, Dallas, Tex.	476	WJBE	Financial Journal, St. Petersburg, Fla.	254	WQAC	Gish Radio Service, Amarillo, Tex.	234
WFAM	The Times, St. Cloud, Minn.	273	WJBI	R. S. Johnson, Red Bank, N. J.	219	WQAE	Moore Radio News Station, Springfield, Vermont	246
WFAV	University of Nebr., Lincoln, Nebr.	275	WJBK	Ernest F. Goodwin, Ypsilanti, Mich.	233	WQAM	Electric Equipment Co., Miami, Fla.	263
WFBC	1st Baptist Church, Knoxville, Tenn.	250	WJBL	Gushard Dry Goods, Detroit, Ill.	270	WQAN	Scranton Times, Scranton, Pa.	250
WFBE	J. V. De Waile, Seymour, Ind.	226	WJBO	V. Jensen, New Orleans, La.	268	WQAO	Calvary Baptist Church, New York, N. Y.	360
WFBG	W. F. Gable Co., Altoona, Pa.	276	WJBQ	Bucknell University, Lewisburgh, Pa.	212	WQJ	Calumet Rainbo Broadcasting Co., Chicago, Ill.	448
WFBJ	Walvin Radio Supply Co., Camden, N. J.	238	WJBR	Omro Drug Store, Omro, Wis.	228	WRAF	Laporte Radio Club, Wash. D. C.	224
WFBJ	St. Johns University, Collegeville, Minn.	236	WJBT	J. S. Boyd, Chicago, Ill.	238	WRAH	S. N. Read, Providence, R. I.	235
WFBM	Onondaga Hotel, Syracuse, N. Y.	252	WJBU	Bucknell University, Lewisburgh, Pa.	212	WRAC	Economy Light Co., Escanaba, Mich.	256
WFBM	Merchants Lighting Co., Indianapolis, Ind.	268	WJBV	Union Course Lab., Woodhaven, N. Y.	470	WRAM	Lombard College, Galesburg, Ill.	244
WFBW	Maryland National Guard, Baltimore, Md.	254	WJBW	C. Carlson, Jr., New Orleans, La.	341	WRAY	Antioch College, Yellow Springs, O.	263
WFCB	Knox College, Galesburg, Ill.	254	WJBY	Henderson & Ross, Oosteville, Mass.	280	WRAW	Avenue Radio Shop, Reading, Pa.	238
WFCI	Frank Crook, Inc., Pawtucket, R. I.	229	WJBY	Electric Construction Co., Gadsden, Ala.	270	WRAX	The Berachah Church of Philadelphia, Gloucester City, N. J.	280
WFCM	Chicago Fed. of Labor, Chicago, Ill.	492	WJDD	Order of Moose, Mooseheart, Ill.	370	WRBC	Immauel Lutheran Church, Valparaiso, Ind.	278
WFD	F. D. Fallain, Flint, Mich.	234	WJDR	Order of Moose, Mooseheart, Ill.	370	WRC	Radio Corp. of America, Washington, D. C.	469
WFD	F. D. Fallain, Flint, Mich.	234	WJDR	Phonograph Co., Pontiac, Mich.	517	WRCO	Wynna Radio Co., Raleigh, N. C.	252
WFI	Straubridge & Clothier, Philadelphia, Pa.	395	WJW	Radio Corp. of Amer., N. Y. C.	405	WREC	Wooten's Radio Shop, Cold Water, Miss.	254
WFKB	F. K. Brideman, Chicago, Ill.	217	WJZ	Radio Corp. of Amer., N. Y. C., Bound Brook, N. J.	455	WREO	Reo Motor Co., Lansing, Mich.	286
WFLR	R. M. Lacey, Brooklyn, N. Y.	205	WKA	WKA broadcasting Co., Milwaukee, Wis.	261	WRHF	Washington Radio Hospital Fund, Wash. D. C.	256
WGLA	Lancaster Elec. Supply Co., Lancaster, Pa.	248	WKAQ	Radio Corp. of Porto Rico, San Juan, P. R.	341	WRHM	Rosedale Hospital, Minneapolis, Minn.	252
WGBB	H. H. Carman, Freeport, N. Y.	244	WKB	Mich. Agric. College, Lansing, Mich.	286	WRK	Doron Bros., Elec. Co., Hamilton, O.	270
WGB	1st Baptist Church, Memphis, Tenn.	278	WKA	WKA, Milwaukee, Wis.	261	WRM	University of Illinois, Urbana, Ill.	273
WGBF	The Finke Furniture Co., Evansville, Ind.	236	WKA	Laconia Radio Club, Laconia, N. H.	224	WRMU	A. E. Grebe & Co., Inc., Motor Yacht M.-I. N. City	284
WGBH	Port Harrison Hotel, Clearwater, Fla.	266	WKB	Arrow Batt. Co., Chicago	288	WRNY	Experimenter, Pub., N. Y. C.	375
WGBI	Scranton Broadcasters, Inc., Scranton, Pa.	240	WKB	Sanders Bros., Joliet, Ill.	283	WRR	City of Dallas, Tex.	246
WGBR	Marshfield Broadcasting Association, Marshfield, Wis.	229	WKB	K & B Elec. Co., Webster, Mass.	270	WRST	Radiotol Mfg. Co., Inc., 5 First Ave. Bay Shore, N. Y.	216
WGBS	Gimbel Brothers, New York, N. Y.	316	WKB	Frank V. Brenner, Jersey City, N. J.	235	WRVA	Laurus & Bros. Co., Richmond, Va.	256
WGBU	Florida Cities Finance Co., Fulford By-the-Sea, Fla.	278	WKB	C. L. Watson, Indianapolis, Ind.	244	WRW	Tarrytown Research Laboratory, Tarrytown, N. Y.	273
WGBX	University of Maine, Orono, Maine	234	WKB	C. L. Watson, Indianapolis, Ind.	244	WSAI	S. J. Playing Card Co., Cincinnati, O.	328
WGES	Oak Leaves Broadcasting Station, Oak Park, Ill.	250	WKB	C. L. Watson, Indianapolis, Ind.	244	WSAJ	Grove City College, Grove City, Pa.	229
WGH	G. H. Boules, Developments, Clearwater, Fla.	266	WKB	C. L. Watson, Indianapolis, Ind.	244	WSAN	Allentown Call, Allentown, Pa.	229
WGN	The Tribune, Chicago, Ill.	303	WKB	H. L. Ansey, Birmingham, Ala.	225	WSAR	Doughty & Welch Elec. Co., Fall River, Mass.	254
WGMU	H. H. Grebe & Co., Inc., Richmond, N. Y.	236	WKB	H. L. Ansey, Birmingham, Ala.	225	WSAX	Zenith Radio Corp., Chicago, Ill.	268
WGCP	May Radio Broadcast Corp., Newark, N. J.	252	WKB	H. L. Ansey, Birmingham, Ala.	225	WSB	Chase Electric Shop, Pomeroy, Ohio	244
WGH	G. H. Boules, Clearwater, Fla.	266	WKB	H. L. Ansey, Birmingham, Ala.	225	WSB	Atlanta Journal, Atlanta, Ga.	428
WGHP	G. H. Phelps, Inc., Detroit, Mich.	270	WKB	H. L. Ansey, Birmingham, Ala.	225	WSB	World Battery Co., Chicago, Ill.	238
WGMU	Grebe & Co., Richmond, N. Y.	236	WKB	H. L. Ansey, Birmingham, Ala.	225	WSB	Stix Baer and Fuller, St. Louis, Mo.	275
WGR	Federal Co., Buffalo, N. Y.	319	WKB	H. L. Ansey, Birmingham, Ala.	225	WSB	South Bend Tribune, South Bend, Ind.	275
WGST	Ga. School of Tech., Atlanta, Ga.	270	WKB	H. L. Ansey, Birmingham, Ala.	225	WSCO	Wittenberg College, Springfield, Ohio	248
WGY	General Elec. Co., Schenectady, N. Y.	380	WKB	H. L. Ansey, Birmingham, Ala.	225	WSDA	7th Day Adventist Church, N. Y. C.	263
WHA	University of Wisconsin, Madison, Wis.	535	WKB	H. L. Ansey, Birmingham, Ala.	225	WSK	World's Star Knitting Co., Bay City, Mich.	261
WHAD	Marquette Univ., Milwaukee, Wis.	275	WKB	H. L. Ansey, Birmingham, Ala.	225	WSM	National Life and Accident Ins., Nashville, Tenn.	283
WHAM	Eastman Sch. Music, Rochester, N. Y.	478	WKB	H. L. Ansey, Birmingham, Ala.	225	WSBM	Saenger Amus. Co., New Orleans	219
WHAP	Taylor Finance Corp., N. Y. C.	271	WKB	H. L. Ansey, Birmingham, Ala.	225	WSHM	Shattuck Music House, Owosso, Mich.	240
WHAR	Cox's Sales, Atlantic City, N. J.	275	WKB	H. L. Ansey, Birmingham, Ala.	225	WSMK	S. M. K. Radio Corp., Dayton, O.	275
WHAS	The Courier Journal-Times, Louisville, Ky.	400	WKB	H. L. Ansey, Birmingham, Ala.	225	WSOE	School of Engineering, Milwaukee	246
WHAW	Wilmington Elec., Wilmington, Del.	266	WKB	H. L. Ansey, Birmingham, Ala.	225	WSRO	H. W. Fahlander, Hamilton, Ohio	251
WHAZ	Rensselaer Institute, Troy, N. Y.	280	WKB	H. L. Ansey, Birmingham, Ala.	225	WSSH	Tremont Temple Baptist Church, Wash. D. C.	484
WHB	Sweeney School Co., Kansas City, Mo.	366	WKB	H. L. Ansey, Birmingham, Ala.	225	WSUI	State University of Iowa, Iowa City, Iowa	219
WHBA	Shaffer Music House, Oil City, Pa.	250	WKB	H. L. Ansey, Birmingham, Ala.	225	WSVS	Seneca Vocational School, Buffalo, N. Y.	219
WHBC	Rev. E. F. Graham, Canton, Ohio	254	WKB	H. L. Ansey, Birmingham, Ala.	225	WSWS	S. W. Straus & Co., Woodale, Ill.	275
WHBD	C. W. Howard, Bellefontaine, Ohio	222	WKB	H. L. Ansey, Birmingham, Ala.	225	WTAB	Daily Herald, Fall River, Mass.	266
WHBF	Beardsley Co., Rock Island, Ill.	222	WKB	H. L. Ansey, Birmingham, Ala.	225	WTAD	R. E. Compton, Carthage, Ill.	236
WHBG	John S. Skane, Harrisburg, Pa.	231	WKB	H. L. Ansey, Birmingham, Ala.	225	WTAG	Telegram, Worcester, Mass.	545
WHCH	Hickson Elec. Co., Rochester, N. Y.	258	WKB	H. L. Ansey, Birmingham, Ala.	225	WTAL	Toledo Radio & Elec. Co., Toledo, O.	252
WHCL	Laver Auto Co., Ft. Wayne, Ind.	234	WKB	H. L. Ansey, Birmingham, Ala.	225	WTAM	Willard Storage Batt. Co., Cleveland	339
WHBL	C. L. Carroll (Portable), Ill.	216	WKB	H. L. Ansey, Birmingham, Ala.	225	WTAP	Cambridge Radio Elec. Co., Cambridge, Ill.	242
WHBM	C. L. Carroll (Portable), Chicago	233	WKB	H. L. Ansey, Birmingham, Ala.	225	WTAQ	S. Van Gordon & Son, Osseo, Wis.	254
WHBN	1st Ec. Methodist Church, St. Petersburg, Fla.	238	WKB	H. L. Ansey, Birmingham, Ala.	225	WTAR	Reliance Radio Co., Norfolk, Va.	261
WHBP	Johnstown Auto Co., Johnstown, Pa.	256	WKB	H. L. Ansey, Birmingham, Ala.	225	WTAW	Agricultural & Mech. College, College Station, Tex.	270
WHBR	Scientific E. & M. Co., Cincinnati, O.	216	WKB	H. L. Ansey, Birmingham, Ala.	225	WTAX	Williams Hardware, Streator, Ill.	231
WHBQ	St. Johns Meth. Church, Memphis, Tenn.	233	WKB	H. L. Ansey, Birmingham, Ala.	225	WTIC	Travelers Insur. Co., Hartford, Conn.	261
WHBU	B. L. Bing's Sons, Anderson, Ind.	219	WKB	H. L. Ansey, Birmingham, Ala.	225	WUBO	V. Jansen, New Orleans, La.	288
WHBY	St. Norbert's College, De Pere, Wis.	250	WKB	H. L. Ansey, Birmingham, Ala.	225	WUAE	Electric Park, Plainfield, Ill.	242
WHBW	D. Kiehl, Philadelphia, Pa.	216	WKB	H. L. Ansey, Birmingham, Ala.	225	WUAW	Michigan College of Mines, Houghton, Mich.	263
WHDI	Wm. Hood Dunwoody, Ind. Inst., Minneapolis, Minn.	278	WKB	H. L. Ansey, Birmingham, Ala.	225	WWGL	Radio Engineering Corp., Richmond Hill, N. Y.	213
WHCH	Hickson Elec. Co., Rochester, N. Y.	258	WKB	H. L. Ansey, Birmingham, Ala.	225	WWI	Ford Motor Co., Dearborn, Mich.	266
WHFC	Hotel Flanders, Chicago, Ill.	259	WKB	H. L. Ansey, Birmingham, Ala.	225	WWJ	Detroit News, Detroit, Mich.	353
WHN	George Schubel, New York, N. Y.	361	WKB	H. L. Ansey, Birmingham, Ala.	225	WWL	Lowia University, New Orleans, La.	275
WHK	Radio Air Service Corp., Cleveland, Ohio	273	WKB	H. L. Ansey, Birmingham, Ala.	225	WWRL	Woodside Radio Lab., Woodside, N. Y.	259
WHO	Bankers Life Co., Des Moines, Ia.	526	WKB	H. L. Ansey, Birmingham, Ala.	225			
WHT	Radiophone Broadcasting Corp., Derrfield, Ill.	400	WKB	H. L. Ansey, Birmingham, Ala.	225			
WIAD	H. R. Miller, Philadelphia, Pa.	250	WKB	H. L. Ansey, Birmingham, Ala.	225			
WIAS	Home Electric Co., Burlington, Ia.	254	WKB	H. L. Ansey, Birmingham, Ala.	225			
WIBA	Capital Times, Madison, Wis.	236	WKB	H. L. Ansey, Birmingham, Ala.	225			
WIBG	St. Paul's E. P. Church, Elkins Park, Pa.	222	WKB	H. L. Ansey, Birmingham, Ala.	225			
WIBH	Elite Radio, New Bedford, Mass.	210	WKB	H. L. Ansey, Birmingham, Ala.	225			
WIBJ	Frederick B. Gittell, Flushing, N. Y.	219	WKB	H. L. Ansey, Birmingham, Ala.	225			
WIBK	L. Carroll, Chicago, (Portable)	216	WKB	H. L. Ansey, Birmingham, Ala.	225			
WIBO	Nelson Bros., Chicago, Ill.	226	WKB	H. L. Ansey, Birmingham, Ala.	225			

TABLE FOR CONVERSION OF FREQUENCIES AND METERS appeared in RADIO WORLD dated May 1, 1926. See on receipt of 15c. or start your sub. with that number. RADIO WORLD, 145 W. 45th St., N. Y. C.

Impromptu Uncle Saved By Religion

Suddenly Called on to Entertain With Bedtime Story,
He Takes a Remark of Dr. Cadman's as Cue
And Makes a Success

Do you know how it feels to be suddenly called upon, thousands of miles from home, to face the mike and tell bedtime stories to the children of the radio audience?

Only those who at some time have been asked to say a few impromptu words in broadcasting studio or elsewhere before the microphone can possibly picture such a situation.

While visiting station 5CL at Adelaide, South Australia, Phil A. La Brie faced this test. He visited J. L. Smallcombe at the station in connection with some Fada radio matters. Mr. Smallcombe is known to the kids of his land as Uncle Radio. It was around 6 p. m. and the bedtime stories were on the air. Uncle Radio, King Electron and Auntie Peggy were having a great time and their listeners a better one. While La Brie rested the bedtime stories went on apace.

"I sat there in front of a little table and smoked my pipe," said Mr. La Brie. "As I watched their antics I could not help thinking that if the listeners-in were enjoying it as much as I, then this particular period was undoubtedly a genuine success. Comedy seemed to be at its height when, presently, Uncle Radio exclaimed: 'Oh look! See who is with us, a great big Uncle from the United States.' And then he proceeded to give a description of me.

"The next thing I knew Uncle Radio was saying: 'Now, listeners-in, you will hear a few stories from Uncle Sam,' and the microphone was placed on the table in front of me. Both Uncle Radio and King Electron left the studio. There I was, alone with the mike and Auntie Peggy, who remained at the piano.

"To make matters worse I had not been introduced to her. You will understand the situation and my sense of loneliness much better when I tell you that one does not get very far in South Australia socially unless he is properly introduced. Formality is one of the necessities to promote social contact in this part of the world. Glancing over in Auntie Peggy's direction got me no look of encourage-

ment from her. She kept her eyes right on the music in front of her.

"If ever there was a time when I needed a friend it was this particular moment. There I had let my thoughts wander away on the rapid comedy of the entertainers of the studio. I had swelled out at the description given of me and thought the idea of giving my dimensions a very jolly one, to say the least. The introduction came so rapidly I had not got out of my contemplative mood. I might as well confess at this point that not only had I never before listened-in in my native country when the bedtime stories came over the air but actually could not recall having heard any when a kid myself. I actually suffered mike fright.

"And what do you think crashed through my brain all of a sudden? A remark that I heard Rev. Dr. S. Parkes Cadman make at the Young Men's Conference in Brooklyn, N. Y., over the air one night a long time ago! Yes, sir, religion came to my rescue. I don't know how I did it, but starting out with the remark of Dr. Cadman I managed to put over a talk that was distinctly religious in its nature.

"I talked and talked and when I had been going along some time an announcer handed me a slip of paper on which was written: 'You have four minutes to go.'

"I learned afterward that I had carried on for thirty minutes altogether. Although I made a pretense at jumping on the studio management for putting over such a stunt on me when I was unprepared, my wrath had subsided by the next day when the mail brought fifteen letters asking for Uncle Sam to come on the air again. The following day brought the total number of letters to 300."

As a result of the first talk and because of the increasing number of letters that came in, the station asked Mr. La Brie to continue his talks. He prepared a series, going on the air four evenings in succession, and entertained the children and grownups.

The enjoyment was mutual.

Nibbling by Mouse Costly to Financier

Trouble with growingly poor reception, Bertram Reinitz, of 127-A Clarkson Ave., Brooklyn, N. Y., financier, bought set of six new tubes, total price \$15. No improvement, so he put in two new variable condensers, at \$10 a pair.

His A battery was 4-volts, to feed type 99 tubes, and the leads ran through the floor from the cellar. One night when he went into the cellar to make sure the family casks of vinegar still were intact

his wife called to him that the set suddenly had started to be scratchy again. He glanced at the battery leads in the cellar and there he saw a mouse nibbling the insulated wire. The mouse evidently had enjoyed almost nightly contacts with the small current, like a child playing with a shock machine. The wire was weak from being nibbled. Reinitz fixed this, totally shielded the leads, and radio serenity ensued.

A POPULAR QUARTET



THE EVEREADY HOUR MIXED QUARTET, a chain of stations, and who appear in New York City. Left to right, Charles Rose Bryant, contralto, a

Casting Radio Is Baffling

Players Must Not Exceed
Be Given Audition to
Problems in Radio

The radio presentation of moving picture scenarios, one of the features of WJZ's Thursday evening programs for the past six months, is more difficult than would appear on the surface, according to Colonel C. T. Davis, who makes the adaptations.

The movie scenarios, when received, cover a story requiring from one to three hours, four to ten reels, to relate pictorially. The cast of the movie is always larger than that possible to use in the radio presentation.

The first task is to "boil down" the story to a few scenes which will carry the full thread of the plot and not exceed twenty-five minutes. The number of characters must then be cut to not more than four or five, because with more than that number in a radio play the audience, using the sense of hearing only, are not able to distinguish the characters by their voices, and become confused. When these two things have been accomplished, the real work starts.

The dialogue is written with the idea of not wasting a word. With the radio adaptation completed, the casting is started. This is often the most difficult task of all. Often fifty or more persons are tried for a single part.

Although at most only four or five per-

NET ON THE AIR



ET, featured regularly from WEAF ally at the Radio Industries Banquet, prison, tenor; Betsy Ayres, soprano; Wilfred Glenn, basso.

Radio Play ling Work

ve, and Often 250 Must
get This Number—
ted Movie Plots

ons are needed, each one must possess voice typical of the part he or she is to play and at the same time the voice must not be close enough in tone quality to another voice in the same cast or confusion of the listeners will result.

When the cast has been completed, the "speakee" goes into rehearsal, at first only dialogue, and on the last four or five, the musical setting is rehearsed with the play.

Brokenshire Honored At Seaside Pageant

Norman Brokenshire, one of radio's most popular announcers, was selected to serve as master of ceremonies and official announcer at the Atlantic City Pageant, held in Atlantic City on September 8, 9, and 10. This was the first time in the history of the pageant that a radio announcer had been chosen for this important work. Last year De Wolf Hopper served in a similar capacity.

In selecting Mr. Brokenshire, of station WJZ, to fill this key position in the pageant ceremonies, the committee was influenced by the widespread popularity of the radio fans' idol, as he is referred to in broadcasting circles.

Officials Alarmed Over Interference

Commerce Department Fears Trouble Unless Industry, Broadcasters and Public Unite to Obtain Legislation—Hoover Declines to Head Union

WASHINGTON.

Chairmanship of a permanent organization of the radio industry, including manufacturers, broadcasters and the public, has been declined by Secretary of Commerce Herbert Hoover.

Expressing the desire to see the creation of such an organization which would help to relieve the threat of confusion this Winter before the enactment of legislation, Secretary Hoover nevertheless asserted that it would be impossible for him to accept the post.

The offer of chairmanship of the organization was made to Mr. Hoover by the Radio Section of the Associated Manufacturers of Electrical Apparatus.

In the absence of Secretary Hoover from Washington, Acting Secretary Stephen Davis said he believed conditions might be very bad at the beginning of the radio season this Fall unless some such an organization begins to function.

Officials of the Department of Commerce, while refusing to interfere in any way, are daily becoming more concerned over the broadcasting situation. With new applications for licenses pouring into the office of the Chief Radio Supervisor, prospects are that nearly 100 new stations will take advantage of the Department of Justice ruling that under the existing law there is no authority for the limitation of stations or allocation of wavelengths.

Many complaints reached the Department of Commerce last Winter due to many stations interfering with one another. At that time there was some semblance of order and most of the powerful stations enjoyed a 10-kilocycle separation from others.

With stations taking matters into their own hands, the old 10-kilocycle separation scheme has been abandoned and, for that matter, so has every other rule devised for the elimination of interference.

Chief Radio Supervisor Terrell is already preparing for the downpour of protests or complaints of interference which is expected when the season opens up. Mr. Terrell is contemplating having printed several thousand copies of a letter explaining that the Department of Commerce is powerless to do anything to help. It is expected to use this letter to answer complaints of interference.

If reception this Winter proves as good as normal, the former class B band will probably be as congested as was the former class A band. In such an event, fans may be able to obtain satisfactory reception only from their local station.

Sets Were Popular With Vacationists

LOS ANGELES.

Letters from radio followers on vacations have been heavy, according to a check made by KNX. Many more motor tourists, it seems, took radio equipment along with them this year than ever before.

Although Summer reception isn't considered equal to that of Fall and Winter, some good distance reports have come in. In checking over the letters people in the Owens River Valley have no difficulty in listening to KNX and other Los Angeles stations, it would seem from the glowing accounts that are given.

Kingdom for a Word To Describe-er-ahem

- Is a saxophone player an artist?
- Is a ukulele player a musician?
- Is a tenor a performer?

These and similar questions are troubling KFI, which is in search of a term that will satisfactorily describe all who perform nightly before the nation's microphones.

A term generally applied is "artist," but KFI hesitates to apply this term indiscriminately. The word "musician" does not include all who have to deal with the microphone, even when qualified as "radio musician," and, strictly speaking, "performer" cannot be used as a general term, since it suggests visual action, while "entertainer" lacks dignity.

Over a year ago KFI coined the word "receptionist," which has come into common usage with the general betterment

of programs, it being undoubtedly undignified to refer to "fans" in the same breath with a Brahms concerto, while "listener" does not fully connote the very important part that is being played in radio by the audiences of today. KFI believes that it will be necessary to coin a word that will as aptly describe the people behind the microphone as "receptionist" does those before their loud speakers.

"Microphonist," "microphoner," "microtician," and even, facetiously, "radiator" have been suggested. In this day of pungent and powerful additions to our mother tongue it should be a simple matter to find the word it is looking for so KFI issues a cordial invitation to all two-fisted word coiners to join in the search for a term that will properly enrich the American language.

OFFICIAL LIST OF STATIONS

(Corrected and Revised Up to
August 31)

Station	Owner and Location	Meters	Station	Owner and Location	Meters
KDCA	Westinghouse Co., Pittsburgh	309	KZRC	Far Eastern Radio, Inc., Manila, P. I.	222
KDLR	Radio Elec. Co., Devils Lake, N. D.	231	NAA	U. S. Navy, Arlington, Va.	435
KDYL	Newhouse Hotel, Salt Lake City, Utah	246	WAAD	Ohio Mech. Institute, Cincinnati, O.	258
KFAB	Nebraska Buick Auto Co., Lincoln	246	WAAP	Drovers Journal, Chicago, Ill.	278
KFAB	Nebraska Auto Co., Lincoln, Neb.	340	WAAM	R. Nelson Co., Newark, N. J.	263
KFAD	Electrical Equip. Co., Phoenix, Ariz.	273	WAAW	Omaha Grain Ex., Omaha, Neb.	278-384
KFAF	A. E. Fowler, San Jose, Calif.	217	WABB	Harrisburg Radio Co., Harrisburg, Pa.	204
KFAU	Ind. School Dist., Boise, Idaho	280	WABC	Asheville Battery Co., Asheville, N. C.	254
KFBB	F. A. Buttry Co., Havre, Mont.	275	WABI	First Universalists Church, Bangor, Me.	240
KFBC	W. K. Azbill, San Diego, Cal.	216	WABO	Lake Ave. Bapt. Ch., Rochester, N.Y.	278
KFBB	Kimball Upon Co., Sacramento, Cal.	248	WABQ	Haverford College Radio Club, Haverford, Pa.	261
KFBL	Leese Bros., Everett, Wash.	224	WABR	Scott High School, Toledo, O.	263
KFB5	School District No. 1, Trinidad, Col.	238	WABW	College of Wooster, Wooster, O.	207
KFBU	St. Matthews Cathedral, Laramie, Wyo.	375	WABX	H. B. Joy, Mt. Clemens, Mich.	246
KFCB	Nielsen Radio Co., Phoenix, Ariz.	238	WABY	John Magaldi, Philadelphia, Pa.	242
KFDD	St. Michael's Episcopal Church, Boise, Idaho	275	WABZ	Coliseum Place Baptist Church, New Orleans, La.	275
KFDM	Magnolia Petroleum Co., Beaumont, Texas	316	WADC	Allen T. Simmons, Akron, O.	258
KFDX	1st Baptist Church, Shreveport, La.	250	WAFD	A. B. Parfitt Co., Fort Huron, Mich.	275
KFDY	S. D. State College, Brookings, S. D.	306	WAHG	Grebe Co., Richmond Hill, N. Y.	316
KFDZ	H. O. Ibersen, Minneapolis, Minn.	231	WAGM	R. L. Miller, Royal Oak, Mich.	225
KFE	Meier & Frank Co., Portland, Ore.	248	WAIT	A. H. Waite & Co., Taunton, Mass.	229
KFEL	Eugene P. O'Fannon, Inc., Denver, Colo.	254	WAIU	American Ins. Union, Columbus, O.	294
KFEQ	J. L. Scroggin, Oak, Neb.	268	WAMP	Radisson Co., Minneapolis, Minn.	297
KFEY	Bunker Hill & Sullivan, Kellogg, Idaho	233	WAPI	Alabama Polytechnic, Auburn, Ala.	248
KFFP	1st Baptist Church, Moberly, Mo.	242	WARC	American Radio Res. Corp., Medford Hillside, Mass.	261
KFGQ	Crary Co., Boone, Iowa	226	WATT	Edison Co. (Portable), Mass.	274
KFH	Hotel Lassen, Wichita, Kans.	268	WBAA	Purdue University, West Lafayette, Ind.	243
KFHA	Western State College, Gunnison, Colo.	252	WBAC	State Police, Harrisburg, Pa.	276
KFHL	Penn College, Oskaloosa, Iowa	240	WBAL	Gas and Elec. Co., Baltimore, Md.	246
KFI	E. C. Anthony Inc., Los Angeles, Cal.	469	WBAP	James Millikia University, Decatur, Ill.	270
KFIF	Benson Institute, Portland, Ore.	248	WBAP	Star Telegram, Fort Worth, Tex.	476
KFIO	North Central H. S., Spokane, Wash.	266	WBAW	1st Baptist Church, Nashville, Tenn.	256
KFIQ	1st Methodist Church, Yakima, Wash.	236	WBAX	J. H. Stenger, Jr., Wilkes-Barre, Pa.	229
KFIU	Alaska Elec. Co., Juneau, Alaska	226	WBBL	Grace Covenant Presbyterian Church, Richmond, Va.	256
KFIZ	Daily Commonwealth, Fond du Lac, Wis.	273	WBBS	Atlas Investment Co., Chicago, Ill.	226
KFJB	Marshall Elec. Co., Marshalltown, Ia.	248	WBBS	High School, Petoskey, Mich.	238
KFJC	R. B. Fegan, Junction City, Kan.	219	WBBS	Peoples Pulpit Ass., S. Is., N. Y.	416
KFJF	National Radio Co., Oklahoma City, Okla.	261	WBBS	1st Baptist Church, New Orleans, La.	252
KFJJ	E. E. Marsh, Astoria, Ore.	246	WBBS	Ruffner City, Norfolk, Va.	228
KFJM	University of N. D., Grand Forks	278	WBBS	Washington Light Infantry, Charles City, Ia.	262
KFJR	Ashley C. Dixon & Son, Portland, Ore.	263	WBBS	C. L. Carrell, (Portable), Chicago, Ill.	216
KFJY	Tunwall Radio Co., Ft. Dodge, Iowa	246	WBBS	Foster McConnell, Chicago, Ill.	266
KFJZ	W. E. Branch, Fort Worth, Tex.	254	WBBS	Baxter Co., Grand Rapids, Mich.	256
KFKA	State Teachers College, Greeley, Colo.	273	WBBS	Bliss Electrical School, Takoma Park, Mich.	222
KFKU	University of Kansas, Lawrence, Kans.	275	WBOQ	Grebe & Co., Richmond Hill, N. Y.	236
KFKX	Westinghouse Co., Hastings, Neb.	288	WBNY	Miss S. Katz, N. Y. C.	328
KFKZ	Chamber of Commerce, Kirksville, Mo.	226	WBRC	Bell Radio Corp., Birmingham, Ala.	242
KFLR	University of N. M., Albuquerque, N. M.	254	WBRE	Baltimore Radio Ex., Wilkes-Barre, Pa.	231
KFLU	San Benito Radio Club, San Benito, Tex.	236	WBRS	Universal Radio Mfg. Co., Brooklyn, N. Y.	394
KFLV	Swedish Evangelist Church, Rockford, Ill.	220	WBT	Commerce Chamber, Charlotte, N. C.	275
KFLX	George R. Clough, Galveston, Texas	240	WBZ	Westinghouse Co., Springfield, Mass.	333
KFLZ	Atlantic Auto Co., Annetta, Iowa	273	WBZA	Westinghouse Electric and Mfg. Co., Boston, Mass.	242
KFMR	Morningside College, Sioux City, Iowa	261	WCAC	Agricultural College, Mansfield, Conn.	275
KFMW	M. G. Satarn, Houghton, Mich.	263	WCAD	St. Lawrence University, Canton, N. Y.	263
KFMX	Carleton College, Northfield, Minn.	337	WCAE	Kaufman & Baer, Pittsburgh, Pa.	461
KFNF	H. Field Seed Co., Shenandoah, Iowa	461	WCAJ	Nebraska Wesleyan University, University Place, Neb.	254
KFOA	Rhodes Company, Seattle, Wash.	454	WCAL	St. Olaf College, Northfield, Minn.	337
KFOB	KFOB Inc., Burlingame, Cal.	226	WCAM	Galvin Radio Supply Co., Camden, N. J.	276
KFON	Echophone Shop, Long Beach, Cal.	233	WCAO	Brager of Baltimore, Baltimore, Md.	235
KFOO	Latter Day Saints University, Salt Lake City, Utah	236	WCAR	Southern Radio Corp., San Antonio, Texas	263
KFOR	David City Co., David City, Neb.	236	WCAU	School of Mines, Rapids City, S. D.	240
KFOU	College Hill Radio Club, Wichita, Kan.	231	WCAU	Universal Broadcasting Co., Philadelphia, Pa.	278
KFOX	Technical High School, Omaha, Neb.	248	WCAX	University of Vermont, Burlington, Vt.	250
KFOY	Beacon Radio Service, St. Paul, Minn.	252	WCBA	C. W. Heimbach, Allentown, Pa.	254
KFPL	C. C. Baxter, Dublin, Texas	252	WCBB	W. Voliva, Zion, Ill.	345
KFPM	New Furniture Co., Greenville, Texas	242	WCBC	Uhalt Radio Co., Orleans, La.	263
KFPR	Forestry Department, Los Angeles, Cal.	231	WCBS	University of Mississippi, Oxford, Miss.	242
KFPW	St. John's Church, Cartersville, Mo.	258	WCBS	C. H. Messter (Portable), R. I.	210
KFPY	Symons Investment Co., Spokane, Wash.	275	WCBS	H. L. Downing (portable), Providence, R. I.	242
KFOA	The Principia, St. Louis, Mo.	261	WCCO	Gold Medal Station, Minneapolis, St. Paul, Minn.	416
KFOB	Searchlight Pub. Co., Ft. Worth, Tex.	263	WCK	Stix Baer & Fuller Co., St. Louis, Mo.	276
KFOD	Chorin Co., Anchorage, Alaska	227	WCLO	E. Whitmore, Camp Lake, Wis.	231
KFOP	G. S. Carson, Jr., Iowa City, Ia.	224	WCMA	H. M. Church, Joliet, Ill.	214
KFOU	W. Riker, Holy City, Cal.	273	WCMA	Culver Military Academy, Culver, Ind.	259
KFQW	F. C. Knierim, North Bend, Wash.	216	WCMB	Hotel Chapeau, Baltimore, Md.	229
KFQZ	Taft Products Co., Hollywood, Cal.	226	WCMA	Municipal Station, Pensacola, Fla.	222
KFRB	Hall Bros., Beaville, Texas	248	WCRC	C. R. White, Chicago, Ill.	240
KFRD	City of Paris, San Francisco, Cal.	268	WCBS	Henry P. Rines, Portland, Me.	256
KFRU	Stephens College, Columbia, Mo.	500	WCSC	C. W. Selen, Providence, R. I.	210
KFRW	Western Broadcasting Co., Olympia, Wash.	219	WCSC	Detroit Free Press & Jewett Radio and WJZ, L. Bush, Tuscola, Ill.	278
KFSD	African Radio Corporation, San Diego, Cal.	246	WDAD	Dod's Auto Accessories, Inc., Nashville, Tenn.	226
KFSG	Echo Park Evang. Assn., Los Angeles	275	WDAE	Tampa Daily News, Tampa, Fla.	273
KFUL	T. Googan & Bro., Galveston, Texas	258	WDAF	Kansas City Star, Kansas City, Mo.	366
KFUM	W. D. Corley, Colorado Springs, Colo.	240	WDAG	J. L. Martin, Amarillo, Tex.	263
KFUO	Concordia Theo. Seminary, St. Louis, Mo.	545	WDAH	Trinity Metr. Church, El Paso, Tex.	268
KFUP	Fitzsimmons Gen. Hospital, Denver	234	WDAY	Radio Equipment Corp., Fargo, N. D.	261
KFUR	Petry Building Co., Orden, Utah	224	WDBE	Gilham-Schoen Elec., Atlanta, Ga.	278
KFUS	Louis L. Sherman, Oakland, Cal.	256	WBDJ	Richardson Wayland, Roanoke, Va.	229
KFUT	Unity of Utah, Salt Lake City, Utah	261	WBDK	M. F. Broz, Furn, Cleveland, O.	227
KFVU	Colburn & Mathewson, Oakland, Cal.	220	WDBO	Rollins College, Winter Park, Fla.	240
KFVD	C. & W. J. McWhinnie, San Pedro, Cal.	205	WDBZ	Boy Scouts of Amer., Kingston, N.Y.	233
KFVE	Film Corp., St. Louis, Mo.	240	WDCH	Dartmouth College, Hanover, N. H.	250
KFVG	1st Meth-Episc. Church, Independence, Kan.	236	WDGY	Dr. G. W. Young, Minneapolis, Minn.	263
KFVI	56th Cav. Brigade, Houston, Texas	240	WDND	Dod's Auto Accessories, Inc., 160-164 8th Ave. N., Nashville, Tenn.	226
KFVN	C. E. Bagley, Welcome, Minn.	227	WDOD	Chatt. Radio Co., Chattanooga, Tenn.	258
KFVS	Cape Girardeau Battery Station, Cape Girardeau, Mo.	224	WDJ	J. L. Bush, Tuscola, Ill.	268
KFVY	Radio Supply Co., Albuquerque, N. M.	250	WDRG	Doolittle Radio, New Haven, Conn.	268
KFWA	Browning Bros. Co., Ogden, Utah	261	WDWF	Dutec Wilcox Flint, Cranston, R. I.	441
KFWB	Warner Bros. Hollywood, Cal.	252	WEAF	Broadcasting Company of America, N. Y. City, N. Y.	492
KFWC	L. E. Wall, San Bernardino, Cal.	211			
KFWF	St. Louis Truth Center, St. Louis	214			
KFWH	F. W. Morse, Jr., Eureka, Cal.	254			
KFWI	Radio Entertainers, Inc., South San Francisco, Cal.	220			
KFWM	Oakland Educ. Soc., Oakland, Cal.	207			
KFWO	Lawrence Mott, Avalon, Cal.	211			
KFWU	Louisiana College, Pineville, La.	238			
KFWV	Wilbur Ierman, Portland, Ore.	213			
KFXB	C. O. Heller, Big Bear Lake, Cal.	303			
KFXD	Service Radio Co., Logan, Utah	205			
KFXF	Pikes Peak Broadcasting Station Co., Colo. Springs, Colo.	250			
KFXH	Biedsoe Radio Co., El Paso, Texas	242			
KFXJ	Mt. States Radio District, Inc., (Portable), Col.	216			
KFXR	Clasen Film Finishing Co., Okla. City, Okla.	214			
KFYX	Mary M. Costigan, Flagstaff, Ariz.	205			
KFFY	Carlin Radio Den, Oxnard, Calif.	205			
KFYJ	Houston Chronicle, Houston, Tex.	238			
KFYO	Buchanan Vaughn Co., Texarkana, Tex.	210			
KFYR	Hoskins Meyers, Inc., Bismarck, N. D.	248			
KGAR	Citizen Pub. Co., Tucson, Ariz.	244			
KGBS	A. C. Dailey, Seattle, Wash.	210			
KGCB	M. Brotherson, Joplin, Mo.	283			
KGCB	Julius B. Abercrombie, St. Joseph, Mo.	348			
KGCB	A. C. Dunning, Shelby, Neb.	203			
KGCB	Federal Line Stock Remedy Co., York, Neb.	333			
KGCA	C. W. Greenley, Deiorah, Ia.	280			
KGCB	Wallace Radio Institute, Oklahoma, Okla.	331			
KGO	General Electric Company, Oakland, Cal.	361			
KGTT	Glad Tidings Tabernacle, San Francisco, Cal.	207			
KGU	M. A. Arlony, Honolulu, Hawaii	270			
KGW	The Oregonian, Portland, Ore.	492			
KGW	St. Martin's College, Lacey, Wash.	278			
KHJ	The Times, Los Angeles, Cal.	405			
KHQ	Louis Wasmer, Spokane, Wash.	273			
KJBS	J. Brunton Co., San Francisco	230			
KJR	Northwest Radio Co., Seattle, Wash.	384			
KLDS	Reorganized Church of Jesus Christ of Latter Day Saints, Independence, Mo.	441			
KLS	Warner Radio Co., Oakland, Cal.	250			
KLX	Tribune, Oakland, Cal.	508			
KLZ	Reynolds Radio Co., Denver, Colo.	266			
KMA	May Seed and Nursery Co., Shenandoah, Ia.	461			
KMJ	Fresno Bee, Fresno, Cal.	234			
KMMJ	Johnson Co., Clay Center, Neb.	239			
KMO	Love Elec. Co., Tacoma, Wash.	250			
KMOX	Globe Democrat, St. Louis, Mo.	250			
KMTR	Echophone Mfg. Co., Hollywood, Cal.	238			
KNRC	C. B. Juneau, Hollywood, Cal.	208			
KNX	Express, Los Angeles, Cal.	337			
KOA	General Electric Co., Denver, Colo.	322			
KOAC	Oregon Agricultural College, Corvallis, Ore.	280			
KOB	College of Agri., State College, N. M.	349			
KOCH	Omaha Central High School, Omaha, Neb.	258			
KOCW	Okla. College for Women, Chickasha, Okla.	252			
KOIL	Monarch Mfg. Co., Council Bluffs, Ia.	278			
KOWW	Frank A. Moore, Walla Walla, Wash.	285			
KPO	Hale Brothers, San Francisco, Cal.	426			
KPPC	Presbyterian Church, Pasadena, Cal.	229			
KPRC	Houston Print Co., Houston, Tex.	297			
KPSN	Pasadena Star-News, Pasadena, Cal.	316			
KQP	H. B. Read, Portland, Ore.	213			
KQV	Doubleday Hill Elec. Co., Pittsburgh	275			
KQW	First Baptist Church, San Jose, Cal.	331			
KRCA	RCA, portable, San Francisco and Los Angeles, Cal.	305			
KRE	Gazette, Berkeley, Cal.	256			
KSAC	Kansas State Agricultural College, Manhattan, Kans.	341			
KSD	Post Dispatch, St. Louis, Mo.	545			
KSL	Radio Service Corp., Salt Lake City, Utah	300			
KSMR	S. M. Valley R. R. Co., Santa Maria, Cal.	210			
KSO	A. A. Berry Seed Co., Clarinda, Ia.	242			
KTAB	Ass. B'd'sters, Oakland, Cal.	303			
KTBI	Bible Inst., Los Angeles, Cal.	294			
KTBR	Brown's Radio Shop, Portland, Ore.	263			
KTCL	Bert F. Fisher, Seattle, Wash.	306			
KTNS	New Arlington Hotel, Hot Springs, Ark.	375			
KTNT	N. Baker, Muscatine, Ia.	331			
KTW	1st Presbyterian Church, Seattle, Wash.	454			
KUOA	University of Ark., Fayetteville, Ark.	300			
KUOM	State University of Montana, Missoula, Mont.	245			
KUSD	University of S. D., Vermillion, S. D.	278			
KUT	University of Texas, Austin, Tex.	231			
KVOO	Voice of Oklahoma, Bristow, Okla.	325			
KWCR	H. F. Paar, Cedar Rapids, Ia.	278			
KWCG	Portable Wireless Tel. Co., Stockton, Cal.	248			
KWKC	Duncan Studios, Kansas City, Mo.	236			
KWKH	W. K. Henderson I. W. and S. Co., Shreveport, La.	313			
KWSC	State College, Pullman, Wash.	349			
KWUC	Western Union College, Le Mars, Ia.	282			
KWVG	City, Brownsville, Tex.	275			
KYW	Westinghouse Co., Chicago	535			
KZKZ	Electric Supply Co., Manila, P. I.	270			
KZM	P. D. Allen, Oakland, Cal.	240			

Station	Owner and Location	Meters	Station	Owner and Location	Meters	Station	Owner and Location	Meters
WEAL	Cornell University, Ithaca, N. Y.	254	WIBM	Billy Maine, Chicago, Ill.	216	WOO	Hotel Jamestown, Jamestown, N. Y.	275
WEAM	Borough of North Plainfield, N. J.	261	WIBR	Thurman A. Owings, Weirton, W. Va.	203	WODA	O'Dea Temple of Music, Paterson, N. J.	391
WEAN	The Shepard Co., Providence, R. I.	267	WIBS	Lt. T. F. Hunt, Elizabeth, N. J.	233	WOI	Iowa State College, Ames, Iowa	270
WEAO	Ohio State University, Columbus, O.	394	WIBU	The Electric Farm, Fayette, Wis.	222	WOK	Neutrowound Radio Mfg. Co., Homewood, Ill.	217
WEAR	Willita Storage Battery Co., Cleveland, O.	230	WIBX	WIBX, Inc., Utica, N. Y.	234	WOKO	Earl B. Smith, Patterson, N. J.	233
WEAU	Davidson Bros. Co., Sioux City, Ia.	275	WIBZ	A. B. Trum, Montgomery, Ala.	231	WOO	John Wanamaker, Philadelphia, Pa.	508
WEBC	W. C. Bridges, Superior, Wisc.	242	WIL	Benson Radio Co., St. Louis, Mo.	273	WOOD	Grand Rapids Radio Co., Grand Rapids, Mich.	242
WEBD	Elec. Equipment & Service Co., Anderson, Ind.	246	WIOD	Carl S. Fisher Co., Miami, Fla.	248	WOQ	Unity School of Christianity, Kansas City, Mo.	278
WEBH	Edgewater Beach Hotel, Chicago, Ill.	370	WIP	Gimbel Brothers, Philadelphia, Pa.	358	WOR	L. Bamberger & Co., Newark, N. J.	405
WEBJ	Third Avenue, R. R. Co., New York	273	WJAC	Jackson's Radio Elec. Co., Waco, Tex.	400	WORD	Peoples Pulpit Assn., Batavia, Ill.	275
WEBL	Radio Corp. of Am., (Portable)	226	WJAG	Norfolk Daily News, Norfolk, Nebr.	470	WOS	State Market Bur., Jefferson City, Mo.	441
WEBO	Tate Radio Co., Harrisburg, Ill.	226	WJAK	Kokomo Tribune Station, Kokomo, Ind.	254	WOWA	Wain Main, Ft. Wayne, Ind.	227
WEBR	H. H. Howell, Buffalo, N. Y.	244	WJAM	D. M. Perham, Cedar Rapids, Ia.	268	WPAK	N. D. Agricultural College, Agricultural College, N. D.	275
WEBW	Beloit College, Beloit, Wisc.	268	WJAR	The Outlet Co., Providence, R. I.	306	WPAP	Palisades Amusement Park, Clifford, N. J.	360
WEBZ	Savanna Radio Corp., Savannah, Ga.	349	WJAS	Pittsburgh Radio Supply House, Pittsburgh, Pa.	275	WPCC	N. Shore Congre. Church, Chicago	258
WEEI	Editor Co., Boston, Mass.	349	WJAX	Voice of Jacksonville, Fla.	337	WPDQ	H. L. Turner, Buffalo, N. Y.	205
WEHS	Robert E. Hughes, Evanston, Ill.	203	WJAZ	Zenith Radio Corp., Mt. Prospect, Ill.	372	WPG	Municipality Atlantic City, N. J.	300
WEMC	Emm. Missionary College, Merrien Springs, Mich.	286	WJBA	D. H. Lentz, Jr., Joliet, Ill.	207	WPRC	Wilson Radio, Harrisburg, Pa.	216
WENR	All-Amer. Radio Corp., Chicago, Ill.	266	WJBC	W. M. Clum, St. Petersburg, Fla.	254	WRAA	Penn State College, State College, Pa.	261
WEW	St. Louis University, St. Louis, Mo.	360	WJBE	Hummer Furn. Co., La Salle, Ill.	234	WQAC	Gish Radio Service, Amarillo, Tex.	234
WFAD	Dallas News & Journal, Dallas, Tex.	476	WJBF	Financial Journal, St. Petersburg, Fla.	254	WQAE	Moore Radio News Station, Springfield, Vermont	246
WFAM	The Times, St. Cloud, Minn.	273	WJBI	R. S. Johnson, Red Bank, N. J.	219	WQAM	Electric Equipment Co., Miami, Fla.	263
WFAV	University of Nebr., Lincoln, Nebr.	275	WJBJ	Ernest F. Goodwin, Ypsilanti, Mich.	233	WQAN	Scranton Times, Scranton, Pa.	250
WFBC	1st Baptist Church, Knoxville, Tenn.	250	WJBO	Gushard Dry Goods, Deratur, Ill.	270	WQJ	Calumet Tinbo Broadcasting Co., Chicago, Ill.	448
WFBE	J. V. De Walle, Seymour, Ind.	226	WJBU	V. Jensen, Lew Leans, La.	268	WRAF	Laporte Radio Club, Wash., D. C.	224
WFBG	W. F. Gable Co., Altoona, Pa.	278	WJBV	Bucknell University, Lewisburg, Pa.	212	WRAH	S. N. Read, Providence, R. I.	235
WFBJ	Galvin Radio Supply Co., Camden, N. J.	236	WJBT	Omro Drug Store, Omro, Wis.	228	WRAM	Economy Light Co., Escanaba, Mich.	256
WFBM	St. Johns University, Collegeville, Minn.	236	WJBY	J. S. Boyd, Chicago, Ill.	238	WRAM	Lombard College, Galesburg, Ill.	244
WFBP	Onondaga Hotel, Syracuse, N. Y.	252	WJCB	Henderson & Ross, Oesterville, Mass.	280	WRAY	Antioch College, Yellow Springs, O.	263
WFBW	Merchants Lighting Co., Indianapolis, Ind.	268	WJCC	Electric Construction Co., Gadsden, Ala.	270	WRAW	Avenue Radio Shop, Reading, Pa.	238
WFBZ	Maryland National Guard, Baltimore, Md.	254	WJDD	Order of Moose, Mooseheart, Ill.	370	WRBC	The Berachah Church of Philadelphia, Gloucester City, N. J.	280
WFCI	Knox College, Galesburg, Ill.	254	WJDR	Detroit Free Press and Detroit Radio Phonograph Co., Pontiac, Mich.	517	WRCC	Immanuel Lutheran Church, Valparaiso, Ind.	278
WFCM	Frank Crook, Inc., Pawtucket, R. I.	229	WJEB	Radio Corp. of Amer., N. Y. C.	405	WRCD	Radio Corp. of America, Washington, D. C.	469
WFCO	Chicago Fed. of Labor, Chicago, Ill.	492	WJED	Radio Corp. of Amer., N. Y. C., Bound Brook, N. J.	455	WRCE	Wynna Radio Co., Raleigh, N. C.	252
WFDL	F. D. Fallain, Flint, Mich.	234	WJEF	WKAJ broadcasting Co., Milwaukee, Wis.	261	WRFO	Wynna Radio Co., Raleigh, N. C.	252
WFDK	Strawbridge & Clothier, Philadelphia, Pa.	395	WJFK	Radio Corp. of Porto Rico, San Juan, P. R.	341	WRG	Reo Motor Co., Lansing, Mich.	286
WFKB	F. K. Bridgman, Chicago, Ill.	317	WJKA	Mich. Agric. College, Lansing, Mich.	284	WRH	Washington Radio Hospital Fund, Wash., D. C.	256
WFLR	R. M. Lander, Brooklyn, N. Y.	205	WJKB	WKAJ, Inc., Toledo, Ohio	261	WRHM	Rosedale Hospital, Minneapolis, Minn.	252
WFLM	Lancaster Elec. Supply Co., Lancaster, Pa.	248	WJKA	Laconia Radio Club, Laconia, N. H.	224	WRH	Doron Bros., Elec. Co., Hamilton, O.	270
WGBB	H. H. Carman, Freeport, N. Y.	244	WJKB	Arrow Batt. Co., Chicago	288	WRM	University of Illinois, Urbana, Ill.	273
WGBD	1st Baptist Church, Memphis, Tenn.	278	WJKB	Sanders Bros., Joliet, Ill.	283	WRMU	A. H. Grebe & Co., Inc., Motor City, Mich.	234
WGBF	The Finkle Furniture Co., Evansville, Ind.	236	WJKB	K & B Elec. Co., Webster, Mass.	270	WRNY	Experimenter Pub. Co., N. Y. C.	245
WGBH	Port Harrison Hotel, Clearwater, Fla.	266	WJKB	Frank V. Brenner, Jersey City, N. J.	235	WRR	City of Dallas, Tex.	246
WGBI	Scranton Broadcasters, Inc., Scranton, Pa.	240	WJKB	N. B. Watson, Indianapolis, Ind.	244	WRST	Radiotoll Mfg. Co., Inc., 5 First Ave. Bay Shore, N. Y.	216
WGBR	Marshfield Broadcasting Association, Marshfield, Wis.	229	WJKB	C. L. Carrell, (Portable) Chicago, Ill.	216	WRVA	Laurus & Bros. Co., Richmond, Va.	256
WGBS	Gimbel Brothers, New York, N. Y.	316	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WRW	Tarrytown Research Laboratory, Tarrytown, N. Y.	273
WGBU	Florida Finance Co., Fulford, Fla.	278	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WSAL	S. Playing Card Co., Cincinnati, O.	326
WGBX	University of Maine, Orono, Maine.	234	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WSAJ	Grove City College, Grove City, Pa.	293
WGES	Oak Leaves Broadcasting Station, Oak Park, Ill.	250	WJKB	Fred L. Schenewold, Chicago, Ill.	220	WSAN	Allentown Call, Allentown, Pa.	229
WGHB	G. H. Boules, Developments, Clearwater, Fla.	266	WJKB	H. L. Ansley, Birmingham, Ala.	225	WSAR	Doughty & Welch Elec. Co., Fall River, Mass.	254
WGN	The Tribune, Chicago, Ill.	303	WJKB	Gospel Tabernacle, St. Petersburg, Fla.	280	WSAX	Zenith Radio Corp., Chicago, Ill.	268
WGMU	H. H. Grebe & Co., Inc., Richmond Hill, N. Y.	236	WJKB	Edward A. Date, Kenosha, Wis.	428	WSAZ	Chase Electric Shop, Pomeroy, Ohio.	244
WGCP	May Radio Broadcast Corp., Newark, N. J.	252	WJKB	Kodel Radio Corp., Cincinnati, O.	326-422	WSB	The Atlanta Journal, Atlanta, Ga.	428
WGHB	G. H. Boules, Clearwater, Fla.	266	WJKB	Hill Richards, Oklahoma City, Ok.	275	WSBC	World Battery Co., Chicago, Ill.	288
WGHP	G. H. Phelps, Inc., Detroit, Mich.	270	WJKB	1st Presbyterian Church, Tulsa, Okla.	250	WSBF	Stix Baer and Fuller, St. Louis, Mo.	273
WGMU	Grebe & Co., Richmond Hill, N. Y.	236	WJKB	1st Presbyterian Church, Tulsa, Okla.	250	WSBT	South Bend Tribune, South Bend, Ind.	275
WGR	Federal T. Mfg. Co., Buffalo, N. Y.	319	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WSCO	Wittenberg College, Springfield, Ohio.	248
WGST	Ga. School of Tech., Atlanta, Ga.	270	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WSDA	7th Day Adventist Church, N. Y. C.	263
WGY	General Elec. Co., Schenectady, N. Y.	380	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WSKC	World's Star Knitting Co., Bay City, Mich.	261
WHA	University of Wisconsin, Madison, Wis.	535	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WSM	National Life and Accident Ins., Nashville, Tenn.	283
WHAD	Marquette Univ., Milwaukee, Wisc.	275	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WSBM	Singer Amus. Co., New Orleans	319
WHAM	Eastman Sch. Music, Rochester, N. Y.	478	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WSHM	Shattuck Music House, Owasso, Mich.	240
WHAP	Taylor Finance Corp., N. Y. C.	231	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WSMK	S. M. K. Radio Corp., Dayton, O.	275
WHAR	St. Norbert's College, De Pere, Wis.	250	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WSOE	School of Engineering, Milwaukee	246
WHAS	The Courier Journal-Times, Louisville, Ky.	400	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WSRO	H. W. Fahlander, Hamilton, Ohio.	251
WHAV	Wilmington Elec., Wilmington, Del.	266	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WSSH	Tremont Temple Baptist Church, Wash., D. C.	484
WHAZ	Rensselaer Institute, Troy, N. Y.	280	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WSUT	State University of Iowa, Iowa City, Ia.	484
WHB	Sweeney School Co., Kansas City, Mo.	366	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WSVS	Seneca Vocational School, Buffalo, N. Y.	219
WHBA	Shaffer Music House, Oil City, Pa.	250	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WSWS	S. W. Straus & Co., Woodale, Ill.	275
WHBC	Rev. E. P. Graham, Canton, Ohio.	254	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WTAB	Daily Herald, Fall River, Mass.	266
WHBD	C. W. Edward, Bellefontaine, Ohio.	222	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WTAD	R. E. Compton, Carthage, Ill.	236
WHBF	Beardsley Co., Rock Island, Ill.	222	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WTAG	Telegram, Worcester, Mass.	545
WHBG	John S. Skane, Harrisburg, Pa.	231	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WTAL	Toledo Radio & Elec. Co., Toledo, O.	252
WHHC	Hickson Elec. Co., Rochester, N. Y.	258	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WTAM	Warland Storage Batt. Co., Cleveland	389
WHBJ	Laver Auto Co., Ft. Wayne, Ind.	234	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WTAP	Cambridge Radio Elec. Co., Cambridge, Ill.	242
WHBL	C. L. Carroll (Portable), Ill.	216	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WTAQ	S. Van Gordon & Son, Osseo, Wis.	254
WHBM	C. L. Carroll (Portable), Chicago.	233	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WTAR	Reliance Radio Co., Norfolk, Va.	261
WHBN	1st Ave. Methodist Church, St. Petersburg, Fla.	238	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WTAW	Agricultural & Mech. College, College Station, Tex.	270
WHBP	Johnstown Auto Co., Johnstown, Pa.	256	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WTAX	Williams Hardware, Stretator, Ill.	231
WHBR	Scientific E. & M. Co., Cincinnati, O.	216	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WTIC	T. J. McGuire, Lambertville, N. J.	261
WHBQ	St. Johns Meth. Church, Memphis, Tenn.	233	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WUBO	W. J. Jansen, New Orleans, La.	476
WHBU	B. L. Bing's Sons, Anderson, Ind.	219	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WWAE	Electric Park, Plainfield, Ill.	248
WHBY	St. Norbert's College, De Pere, Wis.	250	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WAO	Michigan College of Mines, Houghton, Mich.	263
WHBZ	D. R. Cleveland, Philadelphia, Pa.	216	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WWGL	Radio Engineering Corp., Richmond Hill, N. Y.	213
WHDI	Wm. Hood Dunwoody, Inc., Minneapolis, Minn.	278	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WWJ	Ford Motor Co., Dearborn, Mich.	266
WHEC	Hickson Elec. Co., Rochester, N. Y.	258	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WWL	Detroit News, Detroit, Mich.	353
WHFC	Hotel Flanders, Chicago, Ill.	259	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WWL	Louisa University, New Orleans, La.	275
WHH	George Schubel, New York, N. Y.	361	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216	WWRL	Woodside Radio Lab., Woodside, N. Y.	259
WHK	Radio Air Service Corp., Cleveland, Ohio	273	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216			
WHO	Bankers Life Co., Des Moines, Ia.	526	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216			
WHT	Radiophone Broadcasting Corp., Derrfield, Ill.	400	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216			
WIAD	H. R. Miller, Philadelphia, Pa.	250	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216			
WIAS	Home Electric Co., Burlington, Ia.	254	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216			
WIBA	Capital Times, Madison, Wisc.	236	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216			
WIBG	St. Paul's E. P. Church, Elkins Park, Pa.	222	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216			
WIBH	Elite Radio, New Bedford, Mass.	210	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216			
WIBJ	Frederick B. Gittell, Flushing, N. Y.	219	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216			
WIBL	C. L. Carrell, Chicago, (Portable)	216	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216			
WIBO	Nelson Bros., Chicago, Ill.	226	WJKB	W. C. Carrell, (Portable) Chicago, Ill.	216			

TABLE FOR CONVERSION OF FREQUENCIES AND METERS APPEARED IN RADIO WORLD dated May 1, 1926. See on receipt of 15c, or start your sub. with that number. RADIO WORLD, 145 W. 45th St., N. Y. C.

Impromptu Uncle Saved By Religion

Suddenly Called on to Entertain With Bedtime Story,
He Takes a Remark of Dr. Cadman's as Cue
And Makes a Success

Do you know how it feels to be suddenly called upon, thousands of miles from home, to face the mike and tell bedtime stories to the children of the radio audience?

Only those who at some time have been asked to say a few impromptu words in broadcasting studio or elsewhere before the microphone can possibly picture such a situation.

While visiting station 5CL at Adelaide, South Australia, Phil A. La Brie faced this test. He visited J. L. Smallacombe at the station in connection with some Fada radio matters. Mr. Smallacombe is known to the kids of his land as Uncle Radio. It was around 6 p. m. and the bedtime stories were on the air. Uncle Radio, King Electron and Auntie Peggy were having a great time and their listeners a better one. While La Brie rested the bedtime stories went on apace.

"I sat there in front of a little table and smoked my pipe," said Mr. La Brie. "As I watched their antics I could not help thinking that if the listeners-in were enjoying it as much as I, then this particular period was undoubtedly a genuine success. Comedy seemed to be at its height when, presently, Uncle Radio exclaimed: 'Oh look! See who is with us, a great big Uncle from the United States.' And then he proceeded to give a description of me.

"The next thing I knew Uncle Radio was saying: 'Now, listeners-in, you will hear a few stories from Uncle Sam,' and the microphone was placed on the table in front of me. Both Uncle Radio and King Electron left the studio. There I was, alone with the mike and Auntie Peggy, who remained at the piano.

"To make matters worse I had not been introduced to her. You will understand the situation and my sense of loneliness much better when I tell you that one does not get very far in South Australia socially unless he is properly introduced. Formality is one of the necessities to promote social contact in this part of the world. Glancing over in Auntie Peggy's direction got me no look of encourage-

ment from her. She kept her eyes right on the music in front of her.

"If ever there was a time when I needed a friend it was this particular moment. There I had let my thoughts wander away on the rapid comedy of the entertainers of the studio. I had swelled out at the description given of me and thought the idea of giving my dimensions a very jolly one, to say the least. The introduction came so rapidly I had not got out of my contemplative mood. I might as well confess at this point that not only had I never before listened-in in my native country when the bedtime stories came over the air but actually could not recall having heard any when a kid myself. I actually suffered mike fright.

"And what do you think crashed through my brain all of a sudden? A remark that I heard Rev. Dr. S. Parkes Cadman make at the Young Men's Conference in Brooklyn, N. Y., over the air one night a long time ago! Yes, sir, religion came to my rescue. I don't know how I did it, but starting out with the remark of Dr. Cadman I managed to put over a talk that was distinctly religious in its nature.

"I talked and talked and when I had been going along some time an announcer handed me a slip of paper on which was written: 'You have four minutes to go.'

"I learned afterward that I had carried on for thirty minutes altogether. Although I made a pretense at jumping on the studio management for putting over such a stunt on me when I was unprepared, my wrath had subsided by the next day when the mail brought fifteen letters asking for Uncle Sam to come on the air again. The following day brought the total number of letters to 300."

As a result of the first talk and because of the increasing number of letters that came in, the station asked Mr. La Brie to continue his talks. He prepared a series, going on the air four evenings in succession, and entertained the children and grownups.

The enjoyment was mutual.

Nibbling by Mouse Costly to Financier

Trouble with growingly poor reception, Bertram Reinitz, of 127-A Clarkson Ave., Brooklyn, N. Y., financier, bought set of six new tubes, total price \$15. No improvement, so he put in two new variable condensers, at \$10 a pair.

His A battery was 4-volts, to feed type 99 tubes, and the leads ran through the floor from the cellar. One night when he went into the cellar to make sure the family casks of vinegar still were intact

his wife called to him that the set suddenly had started to be scratchy again. He glanced at the battery leads in the cellar and there he saw a mouse nibbling the insulated wire. The mouse evidently had enjoyed almost nightly contacts with the small current, like a child playing with a shock machine. The wire was weak from being nibbled. Reinitz fixed this, totally shielded the leads, and radio serenity ensued.

A POPULAR QUARTET



THE EVEREADY HOUR MIXED QUARTET and a chain of stations, and who appear in New York City. Left to right, Charles Rose Bryant, contralto, and

Casting Radio Is Baffling

Players Must Not Exceed
Be Given Audition to
Problems in Radio

The radio presentation of moving picture scenarios, one of the features of WJZ's Thursday evening programs for the past six months, is more difficult than would appear on the surface, according to Colonel C. T. Davis, who makes the adaptations.

The movie scenarios, when received, cover a story requiring from one to three hours, four to ten reels, to relate pictorially. The cast of the movie is always larger than that possible to use in the radio presentation.

The first task is to "boil down" the story to a few scenes which will carry the full thread of the plot and not exceed twenty-five minutes. The number of characters must then be cut to not more than four or five, because with more than that number in a radio play the audience, using the sense of hearing only, are not able to distinguish the characters by their voices, and become confused. When these two things have been accomplished, the real work starts.

The dialogue is written with the idea of not wasting a word. With the radio adaptation completed, the casting is started. This is often the most difficult task of all. Often fifty or more persons are tried for a single part.

Although at most only four or five per-

TET ON THE AIR



TET, featured regularly from WEAF daily at the Radio Industries Banquet, Harrison, tenor; Betsy Ayres, soprano; Wilfred Glenn, basso.

Radio Play Singing Work

...ve, and Often 250 Must
Get This Number—
...ted Movie Plots

ons are needed, each one must possess
voice typical of the part he or she is to
play and at the same time the voice must
not be close enough in tone quality to
another voice in the same cast or con-
fusion of the listeners will result.

When the cast has been completed, the
"speakie" goes into rehearsal, at first only
dialogue, and on the last four or five, the
musical setting is rehearsed with the play.

Brokenshire Honored At Seaside Pageant

Norman Brokenshire, one of radio's
most popular announcers, was selected to
serve as master of ceremonies and official
announcer at the Atlantic City Pageant,
held in Atlantic City on September 8, 9,
and 10. This was the first time in the
history of the pageant that a radio an-
nouncer had been chosen for this import-
ant work. Last year De Wolf Hopper
served in a similar capacity.
In selecting Mr. Brokenshire, of station
WJZ, to fill this key position in the
pageant ceremonies, the committee was
influenced by the widespread popularity
of the radio fans' idol, as he is referred
to in broadcasting circles.

Officials Alarmed Over Interference

Commerce Department Fears Trouble Unless Industry, Broadcasters and Public Unite to Obtain Legis- lation—Hoover Declines to Head Union

WASHINGTON.

Chairmanship of a permanent organiza-
tion of the radio industry, including
manufacturers, broadcasters and the pub-
lic, has been declined by Secretary of
Commerce Herbert Hoover.

Expressing the desire to see the crea-
tion of such an organization which would
help to relieve the threat of confusion this
Winter before the enactment of legisla-
tion, Secretary Hoover nevertheless as-
serted that it would be impossible for him
to accept the post.

The offer of chairmanship of the or-
ganization was made to Mr. Hoover by
the Radio Section of the Associated
Manufacturers of Electrical Apparatus.

In the absence of Secretary Hoover
from Washington, Acting Secretary
Stephen Davis said he believed condi-
tions might be very bad at the beginning
of the radio season this Fall unless some
such an organization begins to function.

Officials of the Department of Com-
merce, while refusing to interfere in any
way, are daily becoming more concerned
over the broadcasting situation. With
new applications for licenses pouring into
the office of the Chief Radio Supervisor,
prospects are that nearly 100 new stations
will take advantage of the Department
of Justice ruling that under the existing
law there is no authority for the limita-
tion of stations or allocation of wave-
lengths.

Many complaints reached the Depart-
ment of Commerce last Winter due to
many stations interfering with one an-
other. At that time there was some
semblance of order and most of the
powerful stations enjoyed a 10-kilocycle
separation from others.

With stations taking matters into their
own hands, the old 10-kilocycle separa-
tion scheme has been abandoned and, for
that matter, so has every other rule de-
vised for the elimination of interference.

Chief Radio Supervisor Terrell is al-
ready preparing for the downpour of pro-
tests or complaints of interference which
is expected when the season opens up.
Mr. Terrell is contemplating having
printed several thousand copies of a letter
explaining that the Department of Com-
merce is powerless to do anything to
help. It is expected to use this letter to
answer complaints of interference.

If reception this Winter proves as good
as normal, the former class B band will
probably be as congested as was the
former class A band. In such an event,
fans may be able to obtain satisfactory
reception only from their local station.

Sets Were Popular With Vacationists

LOS ANGELES.

Letters from radio followers on vaca-
tions have been heavy, according to a
check made by KNX. Many more motor
tourists, it seems, took radio equipment
along with them this year than ever
before.

Although Summer reception isn't con-
sidered equal to that of Fall and Winter,
some good distance reports have come in.
In checking over the letters people in
the Owens River Valley have no difficulty
in listening to KNX and other Los
Angeles stations, it would seem from the
glowing accounts that are given.

Kingdom for a Word To Describe-er-ahem

- Is a saxophone player an artist?
- Is a ukulele player a musician?
- Is a tenor a performer?

These and similar questions are troubl-
ing KFI, which is in search of a term
that will satisfactorily describe all who
perform nightly before the nation's
microphones.

A term generally applied is "artist," but
KFI hesitates to apply this term indis-
criminately. The word "musician" does
not include all who have to deal with the
microphone, even when qualified as
"radio musician," and, strictly speaking,
"performer" cannot be used as a general
term, since it suggests visual action, while
"entertainer" lacks dignity.

Over a year ago KFI coined the word
"receptionist," which has come into com-
mon usage with the general betterment

of programs, it being undoubtedly un-
dignified to refer to "fans" in the same
breath with a Brahms concerto, while
"listener" does not fully connote the very
important part that is being played in
radio by the audiences of today. KFI
believes that it will be necessary to coin
a word that will as aptly describe the
people behind the microphone as "recep-
tionist" does those before their loud
speakers.

"Microphonist," "microphoner," "micro-
tician," and even, facetiously, "radiator"
have been suggested. In this day of pun-
gent and powerful additions to our mother
tongue it should be a simple matter to
find the word it is looking for so KFI
issues a cordial invitation to all two-fisted
word coiners to join in the search for a
term that will properly enrich the Ameri-
can language.

A THOUGHT FOR THE WEEK

WHEN a round-cheeked baby will clap its pudgy hands on hearing the radio and a dear grey-haired old lady will at the same time grow enthusiastic over a number that dims her eyes or makes them glow with a new fire—then indeed have we a God-given something that brings joy and contentment into our more or less drab lives.

RADIO WORLD

REG. U.S. PAT. OFF.

The First and Only National Radio Weekly

Radio World's Slogan: "A radio set for every home."

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SHOW NUMBER
SEPTEMBER 11, 1926

TURKEYGRAMS

By TIM TURKEY

An ice-cream cone is not a cone at all but a horn.

The R. C. A. may sue Gertrude Ederle and Mille Gade, claiming that it has a patent on swimming the channel.

The thing to avoid at a radio show is to have the public come in simply to see competing manufacturers hand out circulars to one another.

Anybody with half an eye can light a quarter ampere tube properly without matches or blowtorch.

The Nobel prize ought to go to the fellow who designed the perfect 1-dial set.

All Hail the Show

THE show is a well-established adjunct of trade life today, because it gives the manufacturers opportunity to display their new wares, opens these products to quick and extensive public view, and enables members of the trade to meet one another to mutual advantage. In radio the show plays a double purpose, in that it deeply interests both the trade and the public at large, in the same way as does the automobile show.

This year there is only one radio show in the Borough of Manhattan, New York City, the Radio World's Fair, at New Madison Square Garden. The one that was to have been held competitively at Grand Central Palace was abandoned, under pressure of manufacturers, who saw no advantage in duplication, but only doubled expense. The booths, equipment, personnel, signs, folders, etc., constitute expensive items, some of the largest manufacturers expending as much as \$7,000 or \$8,000 on these, so the motive for desiring only one radio show is apparent.

The dates for the show in New York City, September 13 to 18, were aptly chosen, because the event thus falls at a time when interest in radio has gained a high point, after the usual Summer retardation. The fact that all booths were sold long before the opening day, and that the show and the concomitant Industries Banquet were eagerly discussed for several weeks prior to the opening of these events proved again the felicitous circumstances.

Particularly this year has there been manifestation of a better spirit of co-operation among manufacturers. They are beginning to realize that the success of the individual concerns hinges on the success of radio as an industry, and petty considerations and personal advantages were swept aside in the spirit of greatest good for the greatest number.

These facts show that radio is rising to a higher plane and that the selfishness and cunning that marked much of the merchandising in this field in years gone by are being supplanted by co-operation and goodwill. For a five-year-old industry radio has accomplished a great deal and it is a satisfaction to record the new spirit of friendly assistance that marks manufacturing enterprises in the industry.

The Patent Chain

THE patent victory won by the Radio Corporation of America, the General Electric Company and the Westinghouse Electric & Manufacturing Company, with their Alexanderson patent, has an interesting bearing on the regeneration situation, in which virtually the same parties lost out to Dr. Lee De Forest.

The case decided in Trenton, N. J., in favor of the three companies, and against the Splittdorf Electric Company, concerned the plaintiffs' patent, obtained by E. F. W. Alexanderson, now chief engineer for General Electric, for the coupling of multiple stages of radio frequency amplification. Thus it is assumed that any receiver consisting of more than one tube as the radio component (as distinguished from the audio amplifier) would constitute an infringement, unless a license were obtained. The tuned radio frequency set is particularly affected.

It so happens that the regenerative receivers enjoying the greatest vogue consist of a stage of tuned radio frequency amplification ahead of a regenerative detector, hence if Dr. De Forest is confirmed in his rights as the inventor of regeneration, the limitation for practical receiver use might be to 1-tube sets, followed by suitable audio, and this would strike a heavy blow at the value of the re-

generation patent. Of course there are many other uses for regeneration not derogated by the decision in the Splittdorf case either actually or inferentially. These include the transmitters used by stations and might even have some bearing on the Super-Heterodyne patents, depending on what court construction is placed on the plate inductance or capacity, or combination thereof, found in the oscillator hookup of all Super-Heterodyne sets.

A comment occasionally heard whenever the R. C. A. or any of its allied companies wins a patent victory is that the trust is trying to monopolize radio. But a patent is nothing if not a monopoly, and it is this monopolistic right that patent owners have spent their efforts or their good money to enjoy. The monopoly in restraint of trade mentioned in the anti-trust laws has nothing to do with this, as the trust's position on patents has been rather in promotion of trade than in restraint of it, and the R. C. A. and its allies have done more for radio as an industry and have shown more decency as non-infringers than all of their detractors put together.

Tuning Through Locals

AN editor of one of the New York newspapers recently purchased a well-made and efficient Neutrodyne, comprising six tubes, but the set would not tune through powerful locals to bring in distant stations. The set owner had to wait until the strong locals had signed off before he could get much DX, so he sought the advice of a service expert. The set was duly examined by the expert, who reported it was in fine condition, and that inability to tune through strong locals was an inevitable condition. This was a frank statement, but the set owner remonstrated he had been led to believe otherwise from advertisements that the manufacturer had published in the very newspaper on which the disappointed purchaser was an editor.

It is asking too much to expect that the run of sets, especially the well-designed ones, will tune through powerful locals to get distant stations located on the tuning dial somewhere between these strong transmitters. To accomplish that requires that the receiver's ability in separation of stations be so great as to be too great, for when selectivity is pressed beyond a certain point you get distortion. Now, the set user does not want a receiver that distorts for any reason. Cutting off side bands of the carrier wave by too much selectivity is a form of distortion particularly hard to remedy. If the purchaser is so meticulous about his tubes, audio amplifier and speaker, so that sounds will come from the speaker in a natural way, he does not want all his efforts nullified by over-selectivity introduced ahead of the detector.

Yet when he demands that a set be able to tune through strong locals in an air-congested area like the Metropolitan District, he is asking for just such a receiver. If the manufacturer led him to expect too much the blame indeed rests largely on that source of misinformation. "Incomplete advertising" is the soft impeachment whereby this condition is described.

Public Be Served

"Broadcasting is one industry that is based entirely on the slogan, 'The Public Be Served and Pleased,' and public protest against broadcasters whose wave choice is unfortunate will immediately and automatically correct any troubles that may arise while stations are experimenting with new wavelengths."

—Frank Reichmann.

Steinmetz's Tests of High Voltages

Next to the Last Chapter of Great Scientist's Life Tells
of His First Experiment with a 220,000-Volt
Transformer—Glimpses at Family Life

[Earlier chapters of the interesting life of Charles P. Steinmetz, great electrical scientist, were published in the four preceding issues. Next week the biography will be completed. The death scene will be depicted.]

By John W. Hammond

For nearly ten years before Steinmetz first took up the question of transmission, the transformer and the multi-phase distribution system had caused the alternating current to become universal for long-distance work. The demand for electricity for power as well as for lights had been successfully met by the multi-phase system, as it offered an easy engineering method for operating both lights and motors from the same circuit.

As desirable transmission distances increased, the voltage had to be increased likewise, in the interests of economy. And then new problems arose. The size and character of the copper transmission cables became an important matter, as at high electrical pressures corona losses were encountered.

Current Leakage

A certain proportion of the electric current would leak out from the cable, so that some of the electrical energy which started from the generator would be lost on the way. It would disappear, instead of going into the electrical apparatus at the receiving end, to perform work.

Another problem arose as soon as engineers tried to send electric current at higher voltages. In the generating stations where the step-up transformers were located, it was noticed that the electrical apparatus of the station was disturbed by current leakage. This became serious in some of the larger stations, threatening to upset entire systems, especially when sub-stations were connected to the main generating stations.

Dr. Steinmetz began working on these and similar problems with much energy. He helped establish a special training course at the General Electric works, where engineers could study the subject of transmission.

An experimental transformer was set up, which operated at 220,000 volts, the first time such a high voltage had ever been tried anywhere. He visited power houses in some of the big cities, like Chicago, where the demand for electricity was growing very fast, and where, consequently, the problems were becoming serious.

Invents Transmission Method

Finally Dr. Steinmetz, after a number of years of study, invented an entire system of electric current transmission. This system worked well: it cleared up quite a few of the problems which had previously been puzzling the engineers.

Steinmetz continued to amaze his fellow engineers by his remarkable mathematical ability. He could carry the table of logarithms, one of the most important and complicated tables of higher mathematics, in his mind.

Because of his astounding mathemat-

ical achievements, and because of the tremendously valuable work he was doing, people began to call him the "Wizard of Schenectady." Others called him the "little giant." Everyone recognized him as an engineering and scientific genius.

Rises to Higher Planes

Slowly, yet unmistakably, his wonderfully useful life was building itself higher and higher—a tower of splendor for all men to see and feel better for having seen it.

Meanwhile, throughout 1902 and during more than half of 1903, the work of building Dr. Steinmetz's new residence on Wendell Avenue went forward.

When finally finished, the house was large and imposing. It seemed to be the special desire of Dr. Steinmetz that it should have an abundance of space. Perhaps the most interesting part of the house was the private office and museum of Dr. Steinmetz.

He had a fine collection of rare postage stamps, for some of which he had paid a good deal of money. He had collections of geological specimens, iron ores and minerals: of Indian flint arrow-heads and curious smooth stones, pebbles and sea-shells; of old note-books, hour glasses, incandescent lamp bulbs, curious toys and some fine examples of carving.

He was an enthusiastic photographer. For twenty-five years he took pictures at his home and his camp. He had between eight hundred and a thousand photograph negatives, all carefully filed away in envelopes.

A House of Charm

Mr. and Mrs. Hayden, after their wedding, lived in a flat not far from Dr. Steinmetz's home. They had hardly been back two days before Dr. Steinmetz came over to see them. All that summer he frequently visited the Haydens in their home. Then one day in the early fall he invited them over to see his new residence. He took them all through the different rooms, and they found it indeed a charming house. While they were speaking of its attractive appearance, Dr. Steinmetz suddenly remarked:

"Why don't you both come here to live. We shall all have a home here together. It will be pleasant for everyone."

The suggestion was quite a surprise to Mr. and Mrs. Hayden. And yet it seemed the most natural thing to do, and they were really attracted by the house. So the end of it all was that they did go there to live.

That is how Dr. Steinmetz came to have a home after living as a bachelor with a few friends in a knock-about manner for nearly fifteen years.

His Family Circle

From this time until his death he always had a family circle. And the happiest period of his life was during the years that the three Hayden children were growing up, calling him "grand-daddy," and letting him join in their good times.

It is most interesting to observe that although he received a larger salary than

A TROUBLE LAMP



A SMALL 3-volt lamp mounted on a stick suitably connected to dry cells gives a handy light when working in a set on trouble shooting.

almost any other engineer of the General Electric Company, yet never in his whole life did he ask for big pay.

Had he done so, doubtless he would have received such pay. The General Electric Company, or any other company, would have paid him as much money as he wished, because of his tremendous usefulness to the company. But Dr. Steinmetz never asked for more than he actually needed. It seems clear that he would not have taken more.

For fully twenty years of his life, Dr. Steinmetz studied lightning. In making this study, he was trying to discover the cause of sudden, unexpected high-voltage currents that caused damage to the electrical machines in power houses and to the cables of transmission lines, unless they can be prevented.

He found that lightning was one of the causes of such destructive currents. Lightning does not often actually strike an electrical transmission system. But it may come so close to the wires that it causes what is known as an "induced current" in the electrical system, which is a much greater current than the system can stand without breaking down.

Dr. Steinmetz found that although lightning was often the original cause of disturbances on electrical systems, the actual damage and destruction was not done by the lightning. It was done by the electrical energy of the system itself, produced by the electric generators in the regular way. This line energy would break its bounds, or get out of control, when lightning occurred within a certain radius of the system.

As electrical systems increased and the energy which they handled grew from thousands of horsepower to tens of thousands, and from tens of thousands to hundreds of thousands, it became necessary to protect them from lightning in the most reliable manner that could be thought out.

(Broadcast by WGY)

300 Exhibit at Show At a Cost of \$150,000

Radio World's Fair, Greatest Exposition of Industry,
Attracts Attention World Over—Great Business
to Be Transacted There, Says Irwin

By Eric H. Palmer

Hundreds of thousands of persons awaited the first glimpse of the marvelous new radio receivers and accessories designed to meet the expanding needs of the radio public for bringing home the deluxe entertainment that will be on the air in the future. All these sets, hundreds of them, with all that pertains to their operation, are shown under a single roof during the one week Radio World's Fair in New Madison Square Garden, New York City.

It is a spectacle to evoke genuine enthusiasm not only because of the advanced designs of the apparatus, but because of the picturesque setting under which 1927 Radio will make its official bow. Every indication is that the Radio World's Fair is the greatest radio exposition ever held in New York.

It Is International

The Radio World's Fair, as the name indicates, is international in scope. Features of interest across the Atlantic and Pacific Oceans are staged, and of course America leads the world in the production of efficient receivers, as it does in broadcasting. Representatives of a dozen foreign governments and many foreign concerns are present to witness the display and to participate in the events.

Every state in the Union and every province in Canada appears in the registration book of visiting experts and merchandisers.

Above all, from the standpoint of public interest, the exposition is the opening gun in the radio year. What happens within the spacious auditorium is conveyed to 10,000,000 listeners by radio, 20 stations standing by to transmit the entertainment by notable artists and famous men and women in the political, theatrical and business life of the nation.

There are 300 exhibits at the Radio World's Fair. All the prominent radio manufacturers of the United States display their new sets and accessories. It is calculated that each exhibit represents an expenditure, on the average, of \$5,000. More than \$150,000 has been expended in preparing for the exposition and for the actual construction and decoration of the immense arena and exposition halls in New Madison Square Garden.

More Room

The new Garden provides about 30,000 more square feet for the purpose of the Radio World's Fair than were available in old Madison Square Garden, where the first Radio World's Fair was housed, with overflow exhibits at an adjacent armory.

Additional space than which ordinarily is provided has had to be furnished through the boarding over of several thousand seats alongside the arena floor. About 40 exhibits are housed under these unique conditions. To take care of these extra exhibitors, \$20,000 has been spent. All this was made necessary because for the first time since the radio industry became one of America's great-

est there is only one national radio exposition in New York.

In 1924 and 1925 there were two shows held simultaneously, at great inconvenience to the public and very large extra expenditures to the industry.

All this has been done away with by the action of the industry in uniting with the Radio World's Fair as its principal exposition.

Only One National Show

A show was originally scheduled for the Grand Central Palace under the auspices of the Radio Exhibition Corporation, but after a series of conferences between the representatives of this corporation and the Radio Manufacturers Association, a statement was issued by George A. Scoville, president of the Board of Directors of the Radio Exhibition Corporation, asking that all exhibits be shown in one place. Every effort has been made by Radio World's Fair management to take care of the extra responsibilities entailed.

Thus, Radio World's Fair is not only the official exhibition of the Radio Manufacturers Association, as in past years, but represents all manufacturers in the industry that are not actually affiliated with that organization.

The public thus gains by viewing all the exhibits in one location and for a single price of admission.

Nine months have been spent in arranging details of the show and the most elaborate program in the history of radio has been worked out.

It begins with a parade on the morning of September 13 down Broadway to City Hall, New York City, where Mayor Walker reviews the procession and greets the visiting manufacturers and special guests of honor.

Heading the procession is a portable broadcasting station 6XBR, owned by Warner Brothers, motion picture producers. A program broadcast from this mobile station is retransmitted by WFBH, the Hotel Majestic station. 6XBR, which sends on a wave of 102 meters, has been heard in almost every state and province in Canada and also in England.

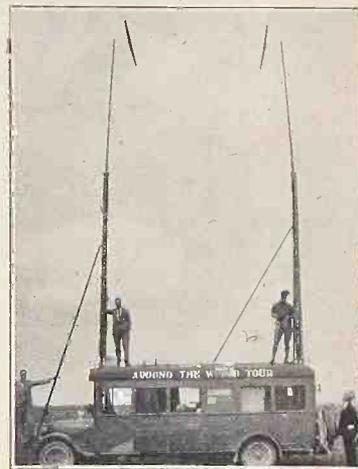
Mrs. Harrauff's Record

Mrs. Lotta Harrauff of Princeton, Ill., Queen of America Radio for 1926-7, will be received by Mayor Walker. She will be special guest of honor at the Radio World's Fair.

She will fly on Sunday morning, September 12, from her home to Chicago, in a specially engaged airplane, and board the Twentieth Century Limited with her secretary, Miss Todd Beyer. Before she leaves she will be the guest of the people of the city of Princeton, where her husband is postmaster and where she has been leader in cultural circles for many years.

The American radio public is already familiar with Mrs. Harrauff and her wonderful success in broadcast reception, not only because she has been announced as a winner of the annual Radio World's Fair competition among feminine fans, but because she has broadcast her senti-

HERALDS BIG EVENT



PORTABLE broadcasting station 6XBR, owned by Warner Bros. Pictures, Inc., heads the parade of the radio industry through Broadway, New York City, in connection with the opening of the Radio World's Fair in New Madison Square Garden. A special program was broadcast with some celebrated announcers at the microphone of this mobile station.

ments with regard to the merits of radio in the interest of the American home, over stations WMCA, WOC, WGR, WTAM, and others. Her talented daughters, Helen and Melvira, have appeared on the same programs in song and instrumental selections. Thus the family represents a home typical of the benefits that radio is bringing to the people in general, the underlying reason why she was selected for the honor of being "Mrs. Radio."

The opening ceremonies at the Radio World's Fair will be transmitted by WLWL, WEAN, and WNAC. Governor Alfred Smith will officially declare the exposition open. He will present the silver trophy to Mrs. Harrauff, and bestow his official congratulations upon Arthur T. Haugh, President of the Radio Manufacturers Association, and upon U. J. Herman and G. Clayton Irwin, Jr., co-directors of the exposition. President Louis B. F. Rayeroff of the Radio Section of the Associated Manufacturers of Electrical Supplies will be on hand to represent the members of that organization.

An extraordinary entertainment program will be a feature. In the limelight will be a famous crooner of southern songs, Miss Caroline Lee, winner of third prize in the Radio Queen Contest, who is another guest of honor and will be heard later on in the week through station WRNY in a special concert.

Of very special interest is the international amateur set building test.

England accepted the challenge to show its finest home-constructed sets. Twenty-seven of the finest have been sent here, following elimination contests held in London. They will be judged for efficiency and beauty of workmanship alongside at least one hundred five radio sets built by America enthusiasts, including several girls.

\$100,000,000 Business

"About \$100,000,000 worth of business will be done at the Radio World's Fair," declares General Manager Irwin. "We count on an attendance of 10,000 dealers and jobbers. Estimates of radio business next year run to \$600,000,000. Big gains are being made in the export of American sets, parts, and accessories, despite restrictions in several countries."

THE RADIO TRADE

R. C. A. Wins Suit Against Splitdorf

Gets Injunction and Order for Accounting of Profits Tuned Radio Frequency Set Held to Infringe Alexanderson Invention

TRENTON. The Radio Corporation, the General Electric Company and the Westinghouse Electric & Manufacturing Company, petitioners, as owners of a licensee under the Alexanderson coupled radio frequency patent, won the suit instituted against the Splitdorf Electrical Company. Federal Judge Bodine handed down the decision. The inventor of the coupling was E. F. W. Alexanderson, now General Electric's chief engineer. The patent was granted in October, 1913, hence has four years to run. It relates to the coupling of one radio frequency stage to another and ap-

plies, it is said, to all RF receivers, especially the popular tuned RF sets in use today.

The court ordered the defendant to

New and Improved
**FRESHMAN
MASTERPIECE**
AT AUTHORIZED
FRESHMAN DEALERS ONLY

make an accounting of profits and issued an injunction.

It was contended by the petitioning companies that they hold exclusive patent rights on the tuning systems now in general use on radio sets. Alexanderson, (Concluded on page 24)

It Makes A Great Difference

The Best Aerial Wire Money Can Buy!—For Real Distance—75 feet long—large soft drawn enameled copper wire wound with 1,000 feet of copper wire. You Will Be Surprised at the Results. C. O. D. \$5.00, Plus Postage. Money back if it does not deliver results. YOU be the judge!
WOUND AERIAL WIRE CO., Reedville, Va.



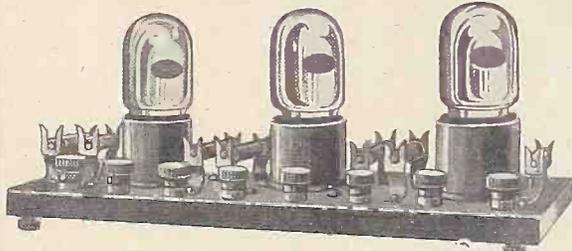
When you see this trade-mark on a condenser or resistor, you know that all the questions were taken out of it before it was put on sale.

Used by The Browning-Drake Corporation and National Companies as standard.

Tobe Deutschmann Co.
Engineers and Manufacturers
Cambridge, Mass.

A REVELATION IN TONE QUALITY GENERAL RESISTOR RESISTANCE COUPLED AMPLIFIER

The only Automatic filament control Amplifier on the market



Type 7G Resistance
coupled Amplifier,
\$11.00

With two General Resistor Hi Mu and One General Resistor Power Tubes as Illustrated. Unconditionally Guaranteed **\$24.00**

Tested and Approved by Herman Bernard
NEEDS NO ADJUSTMENT. SEE IT AT THE SHOW, GET IT FROM YOUR DEALER OR DIRECT FROM US.
General Resistor Co., Inc. 190 Emmett St., Newark, N. J.

"RAMBLER-SIX"

THE ONLY REAL **\$90** PORTABLE
without tubes or batteries

Satisfaction Guaranteed

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Approved by Radio World Laboratories

American Interstate Radio Service
183 Greenwich Street, New York City
Distributors, Jobbers, Dealers, write for special trade terms

IMPROVE
YOUR RADIO RECEPTION
BY USING



A strong hand-turned rock maple pole which gives a quick, convenient method of erecting a dependable antenna. Single or 8 foot lengths. Will fit any roof—single or multiple wire antennas. Will carry the heaviest sleet covered antenna in strong wind without weakening. Neat in appearance. Can be set up or dismantled without danger of causing leaks in roof. Complete set, includes three steel guy rods 3/4" in diameter, adjustable, pulley, nab irons, roof sockets, anchor pins and full instructions, price 5 foot mast, each \$3.50, 8 foot mast, each \$4.25. Ask your dealer.



The WAVE-X Condensing Antenna is an aerial that can be quickly erected on wall, chimney or roof, anywhere 5 foot square is available. Several on one roof without interference. Provides sharper tuning, increases selectivity and is non-directional. Twelve durable highly conductive, non-corrosive looped aluminum wire feelers reach out in all directions. Perfectly insulated to prevent losses. Only one upright to erect, only a hammer and a screwdriver needed. No. 2, with 8 foot pole ready to install with all accessories and full instructions \$12.50. No. 3, for side wall or chimney mounting \$12.50.
DEALERS—There's a big demand everywhere for RED-MAST and WAVE-X—write for our dealer sales plan now!

ZINKE CO. PRESSED METAL MFG. CO.
Chicago, Ill. Waukesha, Wis.

FREE RADIO CATALOG



Special Summer
Bargain Bulletin

Parts, accessories, kits and sets—all the best and the latest. A \$1,000,000.00 Radio Stock to choose from. A copy of this unusual catalog is yours for the asking. Just drop us a line—now.

DEPT. R.W.

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STOCK STORE**
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LIMITED
TIME OFFER!

For a limited time only, genuine World Storage Batteries can be gotten at actual cost. Every cent of profit has been cut out in order to keep our full factory organization busy during the slack season. Prices below are lowest in history.

World Batteries are nationally known for dependable, long wearing performance. Solid Rubber Case prevents acid and leakage.

Send No Money!

Just state battery wanted and we will ship same day order is received, by Express C.O.D. subject to examination on arrival. 5% discount for cash in full with order. Send your order now and get your World Batteries at actual manufacturing cost.

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1219 So. Wabash Avenue
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Sold Rubber Case
Radio Batteries
6-Volt, 20-Ampere \$10.50
6-Volt, 120-Ampere \$12.50
6-Volt, 140-Ampere \$13.25

Set your Radio Dial for the new 1000 w. World Station W.S.B.C., Chicago. Interline, 9 grams every night.

Sold Rubber Case
Auto Batteries
6-Volt, 11-Plate \$10.50
6-Volt, 12-Plate \$12.50
12-Volt, 12-Plate \$15.25

2-Year
Guarantee
Bond
in Writing

Approved and Listed as Standard by Leading Authorities including Radio News Laboratories, Popular Science Institute of Standards, Popular Radio Laboratories, Radio Broadcast Laboratories, Radio in The Home, and Reflex, Inc.

(Concluded from page 23)

they alleged, sold his rights to the General Electric Company. The latter concern, contended the petition, licensed the Radio Corporation to manufacture and sell the invention.

The Splitdorf Company was accused of embodying the device in a radio set known to the trade as Type R-500. Answering that contention the Splitdorf executives argued that the system was in popular use prior to the Alexanderson patent and sought to show that the patent did not comply with Federal regulations. It was further asserted that the Splitdorf Company was licensed by the United States Navy Department and that the use of the disputed system was under that license.

"Of course," said Judge Bodine in dismissing the latter contention, "the circumstance that defendant has a license from the Navy Department to use the Schloemilch and von Bronk patent (a later patent) does not avoid infringement of the patent in suit."

Frost Is Honored At Farewell Banquet

The place of radio in the American home and the part the Middle West has played in the development of the industry were points stressed in an address by Major Herbert H. Frost, past president of the Radio Manufacturers' Association, and General Sales Manager of E. T. Cunningham, Inc., at a banquet in his honor at the Palmer House, Chicago.

This occasion, which was sponsored by twenty-one radio trade organizations, was a farewell by more than 200 members of the radio industry in the Middle West to Major Frost, who recently removed to New York.

Paul B. Klugh, executive chairman of the National Association of Broadcasters, presided. Among the speakers were: A. J. Carter, president of the Carter Radio Company; Frank E. Watts, general manager of "Electrical Goods"; Curtis C. Wessel, editor, "Phonograph & Talking Machine Weekly"; Colonel A. C. Clifton, Signal Corps U. S. Army, and Harold J. Wrape, president, Federated Radio Trades Association.

Major Frost received a handsome silver loving cup from his many friends in the radio industry and was also presented with a sabre by the American Signal Corps Association, of which he is a member.

Freshman Introduces His Supreme Effort

The distinctively beautiful Freshman console known as the 6-F-11 is the captivating product of the Chas. Freshman Co., Inc. Built in a rich grained mahogany having a soft and alluring finish and equipped with a licensed cone type speaker, designed especially to reproduce the exceptional quality and volume of the new and improved receiver, this creation has been named "The Masterpiece of Masterpieces."



CHAS. FRESHMAN

The receiver itself has been designed to employ the new R. C. A. power tubes, with the result that great volume with wonderful clarity of reproduction is the outstanding feature. In conjunction with the A-B-C Power Supply unit which the Freshman Co. manufactures, the console can be operated from the light socket.

The mellowness of tone is called really surprising, the lower notes being brought out with fidelity, thus enriching the reproduction until it is realistic. It is Freshman's supreme achievement in the radio field.

PATENT YOUR IDEAS

Inventions developed. Patents secured in the U. S. and Foreign countries. Satisfactory Terms. Write, call or phone HANOVER 3662 for confidential advice and Invention Recording Blank.



NATIONAL in name NATIONAL in fact

There is not a small corner of this United States in which NATIONAL Browning-Drake Radio Frequency Transformers, NATIONAL Velvet Vernier Dials and NATIONAL Variable Condensers are not known and appreciated. This really applies to the whole world.

You can draw your own conclusions about the popularity of NATIONAL Radio Set Essentials. Ask anyone that uses them. Send for Bulletin 116-RW. Be sure you get genuine NATIONAL products.

NATIONAL COMPANY, INC.
Engineers and Manufacturers
W. A. READY, President
110 Brookline Street Cambridge, Mass.

THE 1927



The something big in radio you have been waiting for is here. Published exclusively in

The Radio Man's Magazine

249 West 53rd St., New York, N. Y.

Your Copy is ready!
Send us twenty-five cents.

CONSTRUCTION OF RADIO PHONE AND TELEGRAPH RECEIVERS by M. B. Sleeper sent on receipt of 75c. Guaranty Radio Goods Co., 145 West 45th Street, New York City.

BUILD 'EM YOURSELF

With our Kit of Parts you can easily and quickly build a set of four powerful, compact, real D. X. Transformers at home and save half the cost.

INTERMEDIATE TRANSFORMERS

All coils, Silicon Steel Laminations, Cases, Terminal Plates, Screws, Nuts, Filter Condenser Instructions, Etc.,—Matched Coils.

\$12.00 Postpaid

RADIO CONSTRUCTORS' SERVICE

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SUMMER PREMIUM SUBSCRIPTION OFFER

For NEW RADIO WORLD Subscribers Ordering NOW

Radio World has made arrangements

—To offer a year's subscription FREE for any one of the following publications with one year's subscription for RADIO WORLD

- RADIO NEWS or
- POPULAR RADIO or
- SCIENCE AND INVENTION or
- BOYS' LIFE or
- RADIO DEALER or
- RADIO (San Francisco) or
- RADIO AGE.

This is the way to get two publications

- for the price of one:
- Send \$6.00 today for RADIO WORLD
- for one year (regular price)
- for 52 numbers)
- and select any one of the other
- nine publications for twelve months.
- Add \$1.00 a year extra for
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- Present RADIO WORLD subscribers
- can take advantage of this offer by
- extending subscriptions one year
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RADIO WORLD'S SPECIAL TWO-FOR-PRICE-OF-ONE SUBSCRIPTION BLANK

RADIO WORLD, 145 West 45th Street, New York City.

Enclosed find \$6.00 for which send me RADIO WORLD for twelve months (52 numbers), beginning..... and also without additional cost, Popular Radio, or Radio News, or Science and Invention, or Radio Dealer, or Radio (San Francisco), or Radio Age, or Boys' Life (or \$10.00 for two yearly subscriptions.) (No other premium with this offer.)

Indicate if renewal. Offer Good Until Sept. 15, 1926

Name
Street Address
City and State

Bruno Announces Drum Control Series

The Bruno Radio Corporation, 20 Paynter Avenue, Long Island City, N. Y., has just placed on the market a drum tuning control, in conjunction with a complete set of already assembled models built around this control. The line is known by the trade name Unitune. The basic structure is the pair of drums to tune two condensers, mounted with shafts to left and right, instead of forward. The Bruno quartzite 99 RF and 3-circuit coils and the Bruno .0005 mfd. straight line frequency tuning condensers are the other adjuncts used in the factory assemblage of the models.

A bronze panel plate is furnished with all the models, except the pair of drums when obtained alone, but even with these mounting frames are supplied. A description of the new line, one of the few lines on the market making drum control available to home constructors, follows:

Unitune Model 2C—Two Bruno .0005 mfd. straight line frequency tuning condensers, insulated from each other electrically, but mounted on an aluminum frame; pair of drums that emerge through a slot in the front panel; embossed bronze panel plate. The drums are separately constituted, but vary on 10 degrees from each other, obviating any need for small equalizing condensers for unified tuning.

Unitune Model RF—Consists of Model 2C, plus two Bruno 99 RF transformers, completely assembled electrically and mechanically. Wave range, 200 to 550 meters, exceeding the broadcast band.

Unitune Model TK—Consists of model 2C, plus one Bruno 99 RF transformer and one Bruno 3-circuit tuning coil. A small knob will actuate the rotor.

Unitune Model CF—Consists of same as model TK, except that the 3-winding coil

has a fixed tickler coil, which may be tuned or otherwise affected by a variable condenser, or governed by a variable resistance.

The Unitune Model CC is different from the others, consisting of one left-hand condenser, controlled by the left section of the split drum control, and a Bruno three circuit tuner, whose tickler shaft is controlled by the other section. This is a whole high amplification receiver unit, requiring only the usual accessories such as sockets, fixed condensers, etc., to make an operating set.

Unitune Model BD. This consists of two condensers and two specially wound coils designed for use only in the B-D circuit.

GREEKS SET WAVE LIMIT WASHINGTON.

The Greek Government has prohibited the operation of all private wireless receivers having a wavelength of over 2,000 meters, according to a report to the Department of Commerce. Owners of installations having a receiving capacity of a wavelength higher than 2,000 meters have been required to bring their apparatus to the electric plant for adjustment.

**WORLD'S FINEST
LOUD-
SPEAKER**



A three-foot cone speaker—unit developed by the inventor of the Trapadyne. Easily assembled, saving 80% of the cost. Complete Kit with blue prints sold on rigid money-back guarantee—shipped prepaid or C.O.D., \$10.

Engineers' Service Co.

25 Church Street New York

Battery Company Promotes Officials

A. L. Humphrey, chairman of the board, Westinghouse Union Battery Co., announced changes in the sales, engineering and executive organization. C. H. Smith, vice president and general manager, has been made president and general manager. D. W. Souser has been appointed assistant to the president. J. K. Ross Duggan, manager of export, has been promoted to vice president of sales. J. L. Rupp, sales manager has been promoted to vice president of engineering. G. B. Cushing, assistant sales manager, has become sales manager.

STARK JOINS FRESHMAN

Kimball Houton Stark, well known in radio circles, has joined the Freshman Company as purchases, materials and production control executive.

Greater Distance Finer Selectivity Greater Power

with

AERO COIL SUPER-SENSITIVE INDUCTANCE UNITS



Tuned Radio Frequency Kit

\$12.00

Replace your present inductances with this Aero Coil Tuned Radio Frequency Kit. It will positively improve the performance of your receiver. Special patented Aero Coil construction eliminates radio frequency losses. You will notice instantly, a tremendous improvement in volume, tone and selectivity.

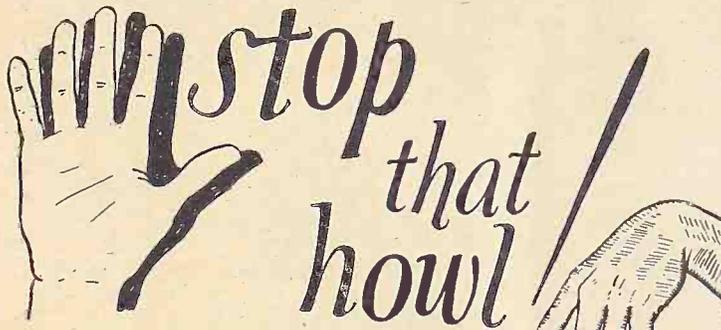
This kit consists of three matched units. The antenna coupler has a variable primary. Uses .00035 condenser. Coils are uniformly air spaced. No dope is used. Consequently they tune into resonance on a "knife's edge."

FREE with Each Kit

Eight-page color circuit, layout and instruction sheet for building the super-sensitive 5-tube Aerodyne Receiver, packed with each kit. Get yours TODAY from your nearest dealer.

AERO PRODUCTS, INC.

Dept. 108 1772 Wilson Ave.
CHICAGO, ILLINOIS



SEE that rubber jacket about to descend on the "howler"? Once this "howl absorber" slips over a tube the howl stops for once and all!

No more ruined reception. The thick shield of live rubber effectually soaks up the trouble-making vibration.

You can get it for every size tube!

Just ask your dealer, or write.

National Distributors for the U. S. A.
SPARTAN ELECTRIC CORPORATION
350 West 34th Street, New York City

Manufactured in the U. S. A. by
SCIENTIFIC PRODUCTS CANADA, LTD.



PRICE
75 CENTS
EACH

Improved Diamond is Here

THE Diamond of the Air, designed by Herman Bernard and popularized by RADIO WORLD, appears in an improved form this season, the kit being available for home constructors with such advances in efficiency as the inclusion of the new Bruno straight line frequency condensers, the Bruno encased moulded Bakelite dials, the Bruno ruby light switch, Patent X sockets and panel handsomely decorated. The panel view is shown on page 27, the name-piece, Diamond of the Air having as a background a coruscating diamond design very exquisitely contrived.

The kit is licensed under the Armstrong regenerative patent, No. 1,113,149, under a contract with the Clapp-Eastman Co., with the approval of the Westinghouse Electric & Manufacturing Co. The complete kit is being marketed by the B. C. L. Radio Service Corporation, while the basic kit, consisting of coils, condensers, dials and light switch, etc., is manufactured by the Bruno Radio Corporation. The complete kit, of course, consists of the basic

kit and the rest of the parts, such as fixed condensers, leaks, mountings, runo transformer, type D; Amperites, drilled and engraved panel, Bretwood variable grid leak, Bruno brackets, etc., necessary to construct the entire set.

A glance at the panel view shows that there are three jacks, one at left, for loop, in the event it is necessary to resort to loop operation, next the detector output jack; then, at right the final audio output jack. In lower center is the Bretwood Variable Grid Leak.

The circuit diagram is just the same now as it was last season, consisting of a stage of tuned radio frequency amplification and a regenerative detector followed by a first stage of transformer coupled audio and two stages of resistance coupled audio. The General Resistance Co. resistors are furnished with the complete kit, also the panel as prepared by the Century Panel Company. The fixed condensers are manufactured by Aerovox.

Readers of RADIO WORLD will remember that the Diamond of the Air gained great popularity last season, and that this continued even through the Summer months. Experiments conducted during that period showed that the circuit, as originally designed excellently met the needs of the incoming season, and that there was no necessity for any change. The whole story of how to build the receiver is described in Mr. Bernard's illustrated booklet published by RADIO WORLD, and with which a blueprint is supplied. For those who are using panels of their own a namepiece will be furnished free on application to Namepiece Editor, RADIO WORLD, 145 West Forty-fifth Street, New York City.

The circuit is adaptable for use in conjunction with B eliminators and also for

inclusion of a special detector tube, such as the Ce-co Type H, or the CX300A or UV-200A. It will require no change of part. If a throbbing effect develops when a B eliminator is used, known as the "steamboat" or "motor-boating" effect, then it will be advisable to connect a high resistance, about 5 megohms, from the grid of the first audio to the plate of the second audio tube, leaving the other parts just as diagrammed in the blueprint. A variable high resistance affords greater flexibility for this purpose, the setting being changed until that point is reached when the motor-boating completely disappears. Unless a variable leak is employed in this connection it may be necessary to experiment with different values of fixed resistances until the correct one is discovered.

Another point worth considering is that sometimes in audio amplifiers using resistance coupling one will find it desirable to employ a choke coil instead of a leak in the grid circuit of the final audio tube, and this suggestion is passed on to all Diamond fans in the event they may desire to try it, although it is seldom necessary to resort to this, even if a B eliminator is used.

The circuit is one that will stand up under comparative tests. The radio frequency resistance of the coils and condensers is low, the regenerative effect and control are smooth, and the amplification at radio frequencies is exceedingly high. The set is selective and fans who have tried it out over long periods in places where selectivity is absolutely necessary report complete satisfaction.

If volume is lacking it is usually due to incorrect connection of the audio transformer, the secondary being mistakenly placed in the plate circuit of the detector tube and the primary in the grid circuit of the second audio tube. When the transfer of primary to plate circuit and secondary to grid circuit is made the fans who have volume trouble write in to tell about the great pep that the set has.

Manufacturers have become enthusiastic over the circuit, too, and are laying comparative plans to give it the support that it deserves.

Sets will be on exhibition at the Bruno booth at the Radio World Fair, New Madison Square Garden, New York.

AEROVOX

"Built Better"

Fixed Condensers and Resistors

Specified by Herman Bernard in the

NEW, IMPROVED

"DIAMOND OF THE AIR"

Aerovox Wireless Corp.

489-491-493 Broome St., New York City

THE DIAMOND
A BADGE OF MERIT

Join the Happy Thousands Who Triumphantly Built This 5-Tube Set!

Real
Know
Quality!

A Great Summer
Receiver

Easy to
Tune, Easy
to Build!

Herman Bernard, designer of this wonder circuit, has written an illustrated booklet on "How to Build RADIO WORLD'S Improved Diamond of the Air." Send 50c and get this booklet, including a full-sized wiring blueprint and free nameplate.

Outstanding Features of Set: (1) Fans, charmed by tone quality, sensitivity and selectivity, report speaker reception of far-distant stations with great volume. (2) A 2-tube earphone set, a 5-tube speaker set, and a separate 3-stage audio-amplifier for immediate use with any tuner, are combined in one. (3) No rheostats are used. (4) The set is inexpensive to construct and maintain. (5) The set works from outdoor aerial or loop, hence no aerial problems present themselves, in city or country.

Send \$6 for year's subscription and get booklet, blueprint and nameplate FREE.

[Newsdealers or radio dealers, order the booklets with blueprints included, in quantity, direct from American News Co. or Branches.]

Radio World, 145 West 45th St., New York City
Namepieces Free to All



Fool Proof

AMPERITE—the perfect filament control. Takes the guess out of tube control. No knobs to turn. Makes tubes last longer. Makes any novice a master operator. Specified in all popular construction sets. \$1.10.

Three No. 1A Amperites and
One No. 112 Amperites
Used in the new and improved
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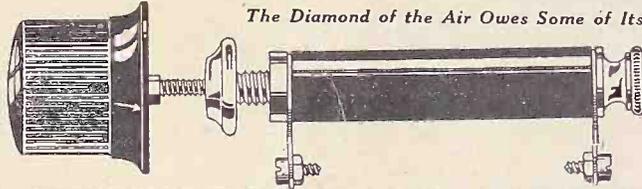
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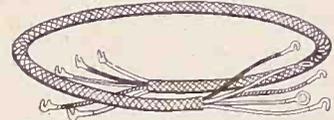
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(Concluded from page 8)

be completely described in the second
constructional article of the 1927 Vic-
toreen series and will appear in full bloom
in the September 25 issue.By the way—each one of these articles
will be complete in itself and in the de-
scription of his amplifier Mr. Lynch will
not only give complete instructions for
using it with his Super-Heterodyne but
also will tell how it may be used to ad-
vantage with any other form of receiver.There is no doubt about the growing
tendency among many toward operating
radio receivers directly from the light
socket and the third article in the RADIO
WORLD series will cover this subject very
completely. It will have as its first ob-**CLOSEUP** of the National velvet
vernier, variable ratio illuminated
dial. Two of this type are used in
the 1927 Victoreen. A switch at low-
er left turns on or off the small
bulb used for illuminating the scale.jective the operation of the 1927 Super-
Heterodyne and the Lynch Power Am-
plifier with the necessary accessories used
in this fashion and will be a logical follow-
up of the first two articles, but it will il-
lustrate in graphic fashion how the same
methods may be employed in connection
with other forms of receivers and amplifying
equipment.New devices, such as trickle chargers,
automatic change-over switches and
various type of B supplies, are rapidly ap-
pearing on the market and it is Mr.
Lynch's purpose to show some of their
uses, first in connection with his own de-
signs and then with other receivers, par-
ticularly the new designs being brought
out on the market this fall.The final article in this important series
will describe the building, installing and
operating of a filament lighting supply
from 60 cycle alternating current lines,
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plifier and B Supply.

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erative low-loss sets, 25c each. M. Solberg, Box
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containing complete constructional data and di-
agrams, with blue print, 50c. Guaranty Radio
Goods Co., 145 West 45th Street, New York City.**HOW TO USE AERIALS IN GROUND AND
WATER**, by Lewis Winner, appeared in RADIO
WORLD, dated May 29. Sent on receipt of 15c,
or start subscription with that number. RADIO
WORLD, 145 W. 45th St., N. Y. C.**THE BROWNING-DRAKE CIRCUIT**—Text and
illustrations covering this famous circuit starting
with our issue of Aug. 14. The 3 numbers sent
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St., N. Y. C.**"LIBERTY AFLAME"** and other verses, by
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cloth; sent postpaid for \$1.00. Columbia Print,
145 West 45th Street, New York City.**BLUE PRINT FOR 1926 DIAMOND OF THE
AIR** sent on receipt of 50c. Guaranty Radio Goods
Co., 145 West 45th Street, New York City.**A BUILT-IN SPEAKER SET**, by Herbert E.
Hayden, **POWERTONE IN OPERATION**, by
Capt. F. V. O'Rourke, **THE NOVICE'S NOOK**,
by James B. Scully, appeared in RADIO WORLD
dated May 22. Sent on receipt of 15c, or start
sub. with that number. RADIO WORLD, 145
W. 45th St., N. Y. C.**THE BRETWOOD GRID LEAK** will aid you
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45th St., N. Y. C.**A DISCUSSION ON SELECTIVITY**, by J. E.
Anderson, appeared in RADIO WORLD, dated
June 19. Sent on receipt of 15c, or start sub-
scription with that number. RADIO WORLD,
145 W. 45th St., N. Y. C.**SELL AND INSTALL RADIO SETS**. With a
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p. m. from WGBS, Gimbel Bros., N. Y. City,
315.6 meters. He discusses "What's Your Radio
Problem?" Listen in!**GETTING MAXIMUM RESULTS** with Super-
Heterodynes by Herman Bernard appeared in
RADIO WORLD dated May 15th. 15c per copy,
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WORLD, 145 West 45th St., N. Y. City.**DESIGN DATA FOR RADIO TRANSMIT-
TERS AND RECEIVERS**, by M. B. Sleeper, sent
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45th St., N. Y. C.**DETAILS OF WIRING THE DC B ELIMIN-
ATOR**, Part II, by Lewis Winner, appeared in
RADIO WORLD dated April 24. Sent on re-
ceipt of 15c, or start sub. with that issue. RADIO
WORLD, 145 West 45th St., N. Y. C.

TUNING PUTS CONDENSER IN AIDING PHASE

(Concluded from page 10)

the dotted line, Fig. 4, a current will flow out of the condenser through the wire.

This action can be tried by taking a large by-pass condenser, say of 1.0 mfd. or more and placing the B battery terminals across it. A very slight spark or none at all will be noticed both on contact and when the connection is broken.

However, when a short-circuiting wire is placed across the terminals a heavy spark will be emitted. The voltages produced in the condenser then help the incoming voltage instead of lagging behind, as in the case of the inductance.

While there can be no flow of current in the sense of a steady current, if alternating current is applied to the plates, it may be seen that there will be a flow as the condenser empties and fills periodically with the pulsations of the current. Taking as an analogy a pipe connected to a reservoir, as shown in Fig. 5, the water would flow into the tank and then out again as the pressure was varied.

In direct current the pressure remains the same and the tank fills up to a certain level and stays there, while in the case of an alternating current the pressure would be alternately maximum positive, zero, and maximum negative, and the tank would alternately fill and empty and there would be a flow of current first in one direction and then in the other.

As said before, the lines of magnetic force formed around a wire will produce a current in another wire when the lines cut through. Heretofore we considered only the cutting of the lines in the one coil.

If there is another coil forming a circuit placed near a coil in which alternating current is flowing, as shown in Fig. 6, a current of electricity will flow in the coil B of the same frequency as in that of A. We may get an electrical alternating current into a circuit without actually employing a generator directly in the circuit. Suppose now we place a condenser in series with the coil as shown in Fig. 7. How will such a circuit act? We are very much interested in this com-

ination, as it is used as the basic principle in almost all tuning operations in the electric receiver.

Low Resistance

With a given frequency induced in the coil having a certain inductance there is a certain amount of resistance to the current flow due to the inherent resistance of the wire and also to the fact that there is an opposing electromotive force. For the time being let us forget the resistance due to the material and size of wire and consider only the opposing voltages or resistance.

Now also let us remember that with a given frequency a condenser has a voltage which is in phase or helping the source. If the capacity and inductance are brought to the proper value then, the two voltages formed respectively in the inductance and capacity will be in opposite directions and will cancel each other out. Then there will be virtually no resistance at all to the incoming voltage except that of the wire itself. This is the condition which is found in radio circuits when the circuit is in tune or resonance.

With any given frequency there will be a certain value of inductance and capacity in which the resistance is at a minimum. According to Ohm's law, I (current) equals E (voltage) divided by R (resistance) and, as may be seen, the lower the resistance the greater the current and the more power in the circuit. The condenser in the radio receiver is ordinarily made variable and adjusted to a desired frequency.

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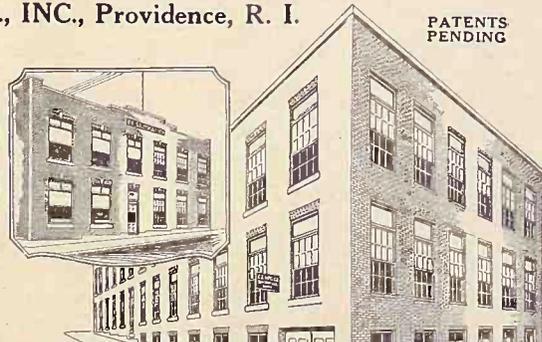
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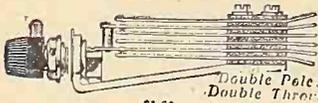
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- 1926:
- Jan. 2—The 2-C Set for Simplicity, by Capt. P. V. O'Rourke.
 - Jan. 9—The 4-Tube DX Symphony Set, by A. Irving Witz. A Skillfully Made 1-Dial Set, by Herman Bernard.
 - Jan. 16—Anderson's 5-Tube Quality Receiver. The Raytheon B Eliminator, by Lewis Winner.
 - Jan. 30—An Individual AF Amplifier, by H. E. Hayden. Trapping Out Super-Power in New Jersey, by Capt. P. V. O'Rourke.
 - Feb. 27—The 4-Tube DX Dandy, by Herbert E. Hayden. Umbrella Aerial for DX, by Hugo Gernsback.
 - Mar. 6—The 1-Tube Set, by Capt. O'Rourke. The Chemistry of Batteries, by A. B. Reid.
 - Mar. 13—The Non-Regenerative Browning-Drake Set (Part 1), by M. B. Sleeper. The Tectron Eliminator, by Lewis Winner.
 - Mar. 20—The Super-Heterodyne, by J. E. Anderson. A 2-Tube Speaker Set, by Percy Warren. The Browning-Drake Set (Part 2), by M. B. Sleeper.
 - Mar. 27—An Economical 4-Tube Set, by Edgar T. Collins. A Practical B Battery, by Capt. P. V. O'Rourke. Tectron Trouble Shooting, by Lewis Winner.
 - April 3—How to Get DX, by Capt. P. V. O'Rourke. A Compact B Supply, by Lewis Winner.
 - April 17—The New 1-Dial Power-tone, by Capt. P. V. O'Rourke. The Action of Transformers, by Lewis Winner.
 - May 1—New Multiple Tube, by Herman Bernard. The Aero All-Wave Set, by Capt. O'Rourke. Kilocycle-Meter Chart. An Analysis of Detection, by J. E. Anderson (Part 1).
 - May 8—A Study of Detection, by J. E. Anderson (Part 2). To Wind a Loop on a Card-board Frame. How to Refine Resistance AF, by Theo. Kerr.
 - May 15—Super-Heterodyne Results Brought up to Maximum, by Herman Bernard. The Truth About Coil Fields, by J. E. Anderson.
 - May 22—A Built-in Speaker Set, by Herbert E. Hayden. The Power-tone in Operation, by Capt. P. V. O'Rourke.
 - May 29—Aerials to Ground and Water, by Lewis Winner. Economized Filaments, by J. E. Anderson. How to Get DX, by John F. Rider.
 - June 5—Five-Tube Compact Receiver, by J. E. Anderson. A Tester for Tube Circuits, by Spencer Hood. Problems of Portables, by Hugo Gernsback.
 - June 12—The Light 5-Tube Portable, by Herman Bernard (Part 1). The Rogers-Schudt Receiver, by Wm. A. Schudt, Jr. (Part 1). The Freshman Masterpiece, by A. W. Franklin.
 - June 19—Selectivity's Amazing Toll, by J. E. Anderson. The Light 5-Tube Portable Set, by Herman Bernard (Part 2). The 4-Tube Rogers-Schudt, by Wm. A. Schudt, Jr. (Part 2).
 - June 26—The Vitoreon Portable, by Herman Bernard (Part 1). The Manufacture of a Tube, by F. C. Kelley. The Light 5-Tube Portable, by Herman Bernard (Part 3). The Rogers-Schudt Circuit (Part 3 concluded), by Wm. A. Schudt.
 - July 3—Set with a 1-Turn Primary, by Herman Bernard. Part 2 of the Vitoreon Portable, by H. Bernard. Trouble Shooting Article for The Light 5-Tube Portable.
 - July 10—A Rub in Single Control, by Herman Bernard. A DX Double Regenerator, by Capt. P. V. O'Rourke. A 2-Tube Dry Cell Receiver, by Samuel Schmalz.
 - July 17—A Double Duty Loop Aerial, by J. E. Anderson. How to Measure Coupling, by John Rider. A 1-Control Crystal Set, by Smedley Lyons.
 - July 24—Why the Super-Heterodyne Is the Best Set, by Herman Bernard. A 1-Tube Refiner Receiver, by H. A. Reed.
 - July 31—What's Best in an AF Amplifier, by Herman Bernard. A 6-Tube Reversed Feedback Set, by E. B. Humphrey.
 - Aug. 7—The 5-Tube Tabloid, by A. Irving Witz. The Wiring of Double Jack, by Samuel Lazer.
 - Aug. 14—The Improved Browning-Drake, by Herman Bernard (Part 1). Storage Batteries, by John A. White.
 - Aug. 21—A New Stabilized Circuit, by E. H. Loftin and S. Y. White (Part 1). The Browning-Drake, by Herman Bernard (Part 2).
 - Aug. 28—The Constant Coupling, by E. H. Loftin and S. Y. White (Part 2). The Browning-Drake, by Herman Bernard (Part 3).
- Any copy, 15c. Any 7 copies, \$1.00. All these 29 copies for \$4.00, or start subscription with any issue. RADIO WORLD, 145 West 45th Street, New York City.

Lewis-Werrenrath Songs for Banquet

The largest audience that has yet listened to any singer is expected to hear Mary Lewis, famous soprano of the Metropolitan Opera, when she broadcasts simultaneously from 33 stations throughout the country, on the night of September 15.

The occasion is the annual Radio Industries Banquet at the Hotel Astor, held in connection with the Radio World's Fair, New Madison Square Garden. Miss Lewis will be the headliner, singing through the courtesy of A. Atwater Kent,

whose series of winter concerts will be announced soon.

Miss Lewis and Reinald Werrenrath, both Victor artists, will sing together the "Barcarolle" from "Tales of Hoffman." Miss Lewis will then sing the aria from "Louise," following with a group of three short songs, "The Land of the Sky Blue Water," by Charles Wakefield Cadman; "Ay, Ay, Ay," the now famous Spanish song, by Osman Terez Sreire, and "The Answer," by J. Huntington Terry.

It was in "Tales of Hoffman" that Miss Lewis made her operatic debut in London at the close of which it became necessary to turn out the lights to stop the applause and send the audience home. This followed her now internationally known successful singing of "Marguerite" in "Faust" before the brilliant audience in Vienna, where she was hailed as "greater than Jeritza," the great Austrian prima donna.

Miss Lewis left Europe earlier than she intended in order to be here for the big radio event.

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Schedule of Meetings As Adjuncts of Show

The trade and station meetings at the Hotel Astor, in conjunction with the show and the banquet, are scheduled as follows:

Monday, September 13th at 2 P. M., open meeting for all broadcasters.

Tuesday, September 14th at 10:30 A. M., annual meeting of National Association of Broadcasters. Members only.

Wednesday, September 15, general conference of entire radio industry.

NEW CORPORATIONS

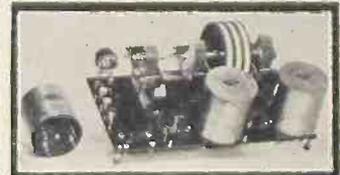
Model Radio Shop, N. Y. C., \$10,000; J. Fanelle, I. L. Garbin, H. Turkel. (Atty., Schaefer & Ostrow, 15 Park Row, N. Y. C.)

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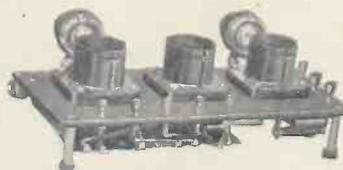
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Metrodyne Super-Seven Radio

A single dial control, 7 tube, tuned radio frequency set. Approved by America's leading radio engineers. Designed and built by radio experts. Only the highest quality low loss parts are used. Magnificent, two-tone walnut cabinet. Artistically gilded genuine Bakelite panel, nickeled piano hinge and cover support. All exposed metal parts are beautifully finished in 24-k gold.

Easiest set to operate. Only one small knob tunes in all stations. The dial is electrically lighted so that you can log stations in the dark. The volume control regulates the reception from a faint whisper to thunderous volume, 1,000 to 3,000 miles on loud speaker! The Metrodyne Super-Seven is a beautiful and efficient receiver, and we are so sure that you will be delighted with it, that we make this liberal **30 days' free trial offer**. You to be the judge.



**30
Days' FREE Trial**

**6
Tube Set
\$48.50
RETAIL PRICE
Completely
Assembled**

Metrodyne Super-Six

Another triumph in radio. Here's the new 1927 model Metrodyne 6 tube long distance tuned radio frequency receiving set. Approved by leading radio engineers of America. Highest grade low loss parts, completely assembled in a beautiful walnut cabinet. Easy to operate. Dials easily logged. Tune in your favorite station instantly on same dial readings every time. No guessing.

Mr. Howard, of Chicago, said: "While five Chicago broadcasting stations were on the air I tuned in seventeen out-of-town stations, including New York and San Francisco, on my loud speaker horn, very loud and clear, as though they were all in Chicago."

We are one of the pioneers of radio. The success of Metrodyne sets is due to our liberal **30 days' free trial offer**, which gives you the opportunity of trying before buying.

MAIL THIS COUPON
or send a postal or letter. Get our proposition before buying a radio. Deal direct with manufacturer—**Save Money.**

Mail COUPON Below!

Let us send you proof of Metrodyne quality

F. L. Warnock, Greentown, Ind., writes: "I received the Metrodyne in good shape and am more than pleased with it. Got stations 2,000 miles away."

C. J. Walker, Mariposa, Calif., writes: "Received my Metrodyne Single Dial set O. K. I believe that these one-dial sets are going to be excellent sellers. I had no trouble in tuning in stations enough to satisfy anyone, so you will please send me another set."

Roy Bloch, San Francisco, Calif., writes: "Very often we travel from New York to the Hawaiian Islands quickly—from station to station—by means of the little tuning-knob which operates the electrically-lighted dial. The Metrodyne Single Dial Set is much easier to operate than any radio set I've ever seen."

We will send you hundreds of similar letters from owners who acclaim the Metrodyne as the greatest radio set in the world. A postal, letter or the coupon brings complete information—testimonials, wholesale prices, and our liberal **30 days' free trial offer**.

METRO ELECTRIC COMPANY
2161-71 N. California Ave., Dept. 607
Chicago, Illinois

Gentlemen:
Send me full particulars about Metrodyne 6 tube and 7 tube sets and your **30 days' free trial offer**

Name _____
Address _____

If you are interested in AGENT'S proposition, place an "X" in the square

METRO ELECTRIC COMPANY
2161-71 N. California Ave. • Dept. 607 • Chicago, Illinois

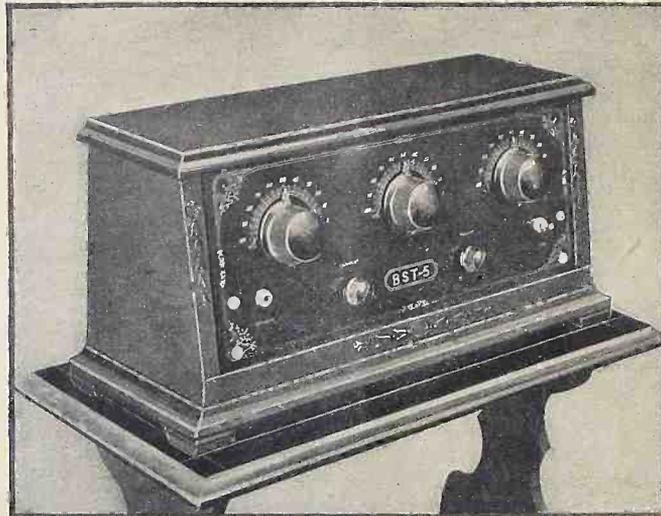
New
Model

BST-5

Shielded
Receiver

A \$75 Set Sold Direct From Factory at \$40

Satisfaction
Guaranteed
or Money Back



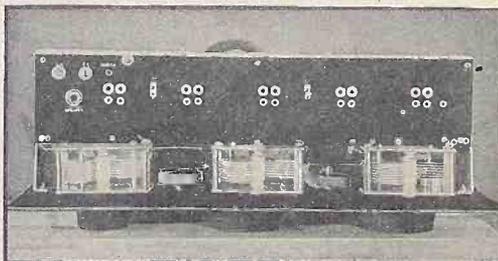
B—beauty
S—selectivity
T—tone

New model cabinet base 21" long by 8" wide, height 9½", top 21" by 6".

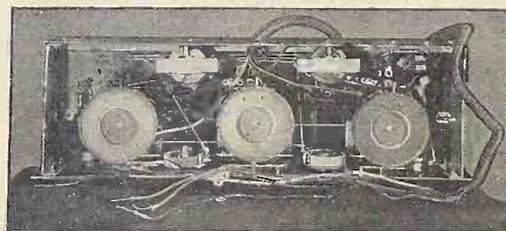
THIS highly sensitive, powerful and selective BST-5 radio receiver has all up-to-the-minute improvements. Heavy aluminum automobile type chassis, shielded against stray currents and distortion. Flexible grip, Universal type sockets, eliminating microphonic noises. Has provision for battery eliminator and any power tube. Fahnestock clips on sub-panel for adjusting C battery, has voltages for power tube. Efficient on either long or short aerial, including indoor aerial. This BST-5 sets a new standard for true tone values and selectivity. This BST-5 gives greater volume than many six-tube sets and consumes less current.

28 Stations in 3½ Hours

Mr. E. H. Thiery, Tax Collector, New Hartford, Conn., writes: "I am well pleased with my BST. In three hours and a half last night I got the following stations: WTIC, WJZ, WGY, WBZ, WPG, WNAC, WMSG, WEEL, KDKA, WAAM, WEAN, WSAR, WJBI, WMAC, WLWL, WJAR, WAHG, WBNY, WESH, WSN, WHK, WMCA, WRVA, WHN, WHAR, WWJ.



Top inside view showing compact aluminum shielded indestructible chassis.



Bottom inside view showing improved foolproof curkoid coils and rigid construction, with complete harness for simple installation.

Direct from factory to you
Immediate Delivery *Send Check or P. O. Money Order*

\$40.00

GUARANTY RADIO GOODS CO., 145 West 45th St., New York, N. Y.

RADIO WORLD Guarantees the Responsibility of This Advertiser

HAMS' AMITY BUILDS UP AS NATIONS SNAP

Political Differences Between Countries, Even When at White Heat, Do Not Deter Amateurs' Friendship Clasp Over the Seven Seas.

In these days when many nations are embroiled in domestic and foreign difficulties and when war seems just around the corner for some of them, a reassuring and peaceful note is struck by the radio hams, as the amateurs are called—those thousands of young men and boys of every nationality who are nightly conversing on the air and establishing friendships far and wide.

A few months ago these young men, working in code, were blamed for most of the interference that hampered broadcast programs. They kept pegging away, however, improving their transmitters, and today if you go down low enough on the wave scale you will find them reaching out, almost completely, round the world, to extend the hand of fellowship.

Cover Great Distances

Everyone knows that these experimenters in code transmission exist, but most folks think that the conversation range is only a few miles. Very few know the romance and the thrill there is in the nightly air journeys of these boys, for most of them are just boys.

William E. Jackson, of Schenectady, is a graduate of Brown University and is now employed in the radio department of the General Electric Company. He has been dabbling in radio for years and ust now he is working a crystal controlled transmitter, 2AHM, whose note has been heard in the far corners of the earth. He been dabbling in radio for years and just two-way communication with operators in 42 countries and these air chats have been followed by exchange of letter and card. Others have done as well or nearly as well as Jackson and he and these others are establishing a basis of international friendship.

Got Spitzbergen

Jackson worked the Chantier, the base ship of Commander Richard Byrd, while the boat was at Kings Bay, Spitzbergen, and relayed many messages from correspondents to "The New York Times." Communication was maintained with the Chantier after the ship left Spitzbergen for England and the operator at sea reported 2AHM exceptionally clear and, because of its crystal control, always reliable.

He has exchanged letters and messages with operators in the Philippines, New Zealand, Australia, South Africa, Greenland, Tasmania, Hawaii, India and practically all the countries of Europe and South America. He has a treasured library of cards from friends of the air and to those unfamiliar with the fraternity of hams, these are just a jumble of letters and code.

These cards carry the call letters of the writers.

Truphonic Power Amplification

Is No Mere Improvement, It

Now Perfects Radio Reproduction

Buy it as

COMPLETE ACCESSORY
SEPARATE UNITS
CATACOMB ASSEMBLY

You can now buy real amplification. The one new and outstanding radio achievement of the year, so far announced, is the revolutionary method of amplification, invented by the well known scientist, H. P. Donle. By the use of this method it is for the first time possible to preserve the clarity of the detector tube over the full range of the musical scale and at a volume as great as that achieved by any other form of amplification.



An Accessory for the Complete Set

Music from your radio can now surpass that from the most expensive modern set unless Truphonic equipped. Just connect the cables of the Truphonic Power Amplifier to your batteries, shift the audio tubes from your set to the amplifier sockets, add one power tube, plug in the adapter at the detector tube and connect the loud speaker. You'll be amazed at the sudden transformation.

Complete amplifier ready to attach to set. No. 304, List price \$20. (Includes battery leads, output unit for protection of loud speaker, with power tubes and connecting adapter).

Individual Units for the Service Man

If you are remodeling or building a set, the individual couplers which make up the amplifier can be purchased stage by stage. Each coupler, as well as the output unit, is mounted in a separate iron clad case.

The bracket arrangement makes it possible for each case to be mounted in any position desired. Each unit is compact, equipped with leads, and perfectly fitted for permanent installation.

Individual Truphonic Couplers
Truphonic Output Unit

No. 301, List price \$5.00 per stage
No. 300, List price \$5.00

Complete Catacomb Assembly for the Set Builder

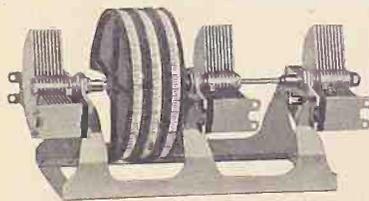
It is especially the Truphonic Catacomb Assembly which is creating enthusiasm among set builders. Every integral part so obviously and quickly slips into place that you have it together almost before you realize it.

There is no drilling of panel, no mounting sockets or binding posts to bother with. The Gang Socket with its unique contacts is one reason for the ease of assembly. This moulded socket panel covers the lacquered steel catacomb containing three Truphonic couplers and an output unit. It has one piece of metal for all common filament contacts, and continuous metal from plate and grid terminals to connected apparatus. The whole assembly is remarkably small and compact, simplifies your construction problem, and lessens considerably the number of soldered joints in your set. If you have never dared tackle or had the time for set building before, you can certainly do so now with perfect assurance.

Truphonic Catacomb Assembly. (Three couplers, output unit, sockets, catacomb, battery cables)
With six sockets
With seven sockets

No. 306, List price \$20.
No. 307, List price \$22.

You swing from station to station, moving all condensers at once with the fingers of one hand. Then without shifting the fingers, you adjust each condenser for maximum volume. Here you have all the advantages of single contact without its limitations.



- No. 2172—Double Condenser \$8.00
- No. 2173—Triple Condenser 10.00
- No. 2174—Quadruple Condenser 15.00
- No. 2170—Double Condenser, tickler controller 10.00



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WRITE TO DEPT. 54.

ALDEN MANUFACTURING COMPANY

Springfield, Mass.

FREE!!

This handsome VALET Auto-Stop Razor FREE—with every five months' subscription to "Radio News" or "Science and Invention" or "Amazing Stories"

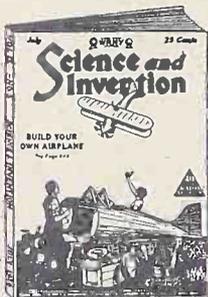


In order to acquaint the readers of this magazine with these great publications, we are making, for a limited time, a special reduced rate and are also giving FREE one complete VALET Auto-Stop Razor outfit.



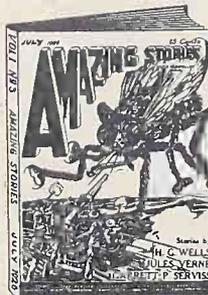
For only \$1 (Regular Newsstand price \$1.25) you can obtain any one of these magazines for five months and also, one FREE Razor—

RADIO NEWS is the largest radio magazine published. It is the outstanding authority in the radio field, carrying more new developments, more hook-ups and more news than any other radio magazine.



RADIO NEWS has been radio's greatest magazine since the very beginning of radio broadcasting.

Every day, in all corners of our busy world, Scientists are at work on new Inventions, developing marvelous machines for the progress of the world or compounding strange chemicals for many uses. All these things are shown in the novel magazine "SCIENCE AND INVENTION."



There is also a big Radio Section to "SCIENCE AND INVENTION" for beginners.

Marvelous, Amazing Stories by great men such as Jules Verne, H. G. Wells, etc., appear in this new magazine AMAZING STORIES every issue.

Stories of flying into space at dazzling speed on a comet; Mesmerizing the dead, remarkable situations of all kinds. Tremendously interesting—yet instructive.

Keeps you in touch with the writings of the men with the greatest imaginations in the world.

EXPERIMENTER PUBLISHING CO., Inc.
53 Park Place, New York, N. Y.

Gentlemen: Enclosed find \$1 for 5 Months' subscription to RADIO NEWS or SCIENCE and INVENTION, AMAZING STORIES and 1 Free Auto-Stop Razor advertised above.

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If you wish 2 magazines send \$2—three magazines \$3

EXPERIMENTER PUBLISHING CO., Inc.

53 Park Place New York, N. Y.

Radio World's "BEACON" receiver has a particularly pleasing panel layout. Only 3 instruments show—2 MAR-CO illuminated controls, and the illuminated filament switch.



Hair-trigger tuning response flashes in the spotlight of beauty

MAR-CO Illuminated Controls, \$3.50 each

MAR-CO 4" vernier dials, [fit any set] nickel plated \$2.50 gold plated \$2.75

New MAR-CO rheostat dial 75c



Two-thirds actual size

The receiver you equip with MAR-CO controls differs from any dial operated set.

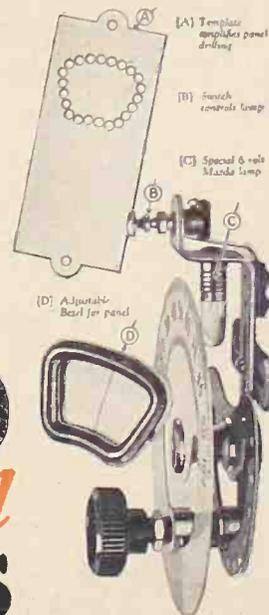
In micrometer fineness of control—in swift certain response—in utter absence of "play"—the new MAR-CO illuminated control is approached only by the celebrated MAR-CO dial. Perfection of gearless "friction-drive" is yours *only* with MAR-CO tuning.

Searching action, in keeping with 1927 broadcast conditions

—flashing beauty . . . in step with 1927 standards of set design

—these advanced features distinguish your MAR-CO equipped set.

Any set you build, or remodel, can have MAR-CO controls. Scales read 0 to 100, or 100 to 0, as desired. Packed with each control is a special MAZDA bulb which runs on your regular "A" battery or on a separate "C" battery. The template, also included, reduces the panel mounting to a simple 10-minutes' diversion. The instruction booklet illustrates 15 standard makes of condensers fitted to MAR-CO controls. Send now for your copy. Martin-Copeland Co., Providence, R. I.

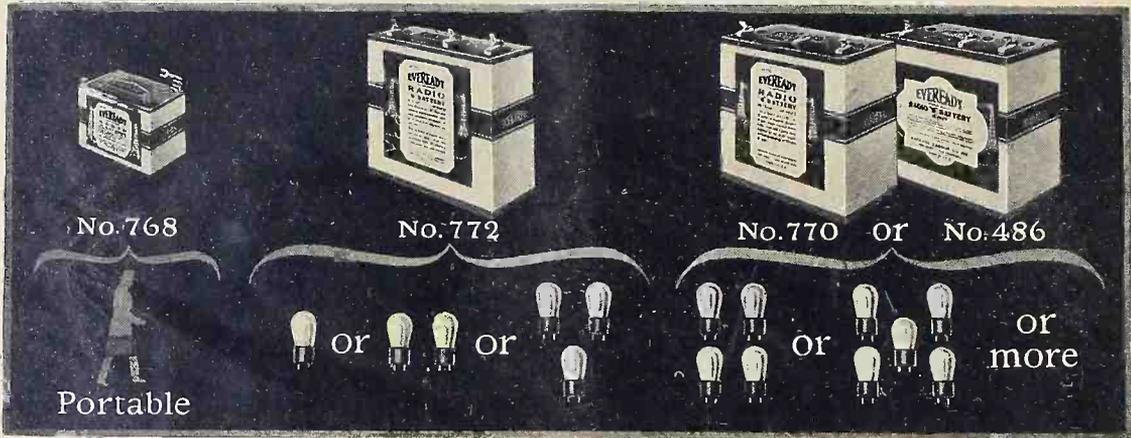


MAR-CO

Illuminated

CONTROLS

Perhaps you, too, can cut your "B" battery costs in half. Just follow the chart. It gives you the secret of "B" battery economy.



THOUSANDS of people have made the discovery that Eveready "B" Batteries, when used in the proper size, and on sets equipped with a "C" battery*, are a most economical, reliable and satisfactory source of radio current.

Here is the secret of "B" battery economy, reliability and satisfaction:

On all but single tube sets—Connect a "C" battery. The length of service given below is based on its use.*

On 1 to 3 tubes—Use Eveready No. 772. Listening in on the average of 2 hours daily, it will last a year or more.

On 4 or more tubes—

*NOTE: A "C" battery greatly increases the life of your "B" batteries and gives a quality of reception unobtainable without it. Radio sets may easily be changed by any competent radio service man to permit the use of a "C" battery.

Use the Heavy-Duty "B" Batteries, either No. 770 or the even longer-lived Eveready Layerbilt No. 486. Used on the average of 2 hours daily, these will last 8 months or longer.

These figures are based on the average use of receivers, which a country-wide survey has shown to be two hours daily throughout the year. If you listen longer, of course, your batteries will have a somewhat shorter life, and if you listen less, they will last longer.

Evereadys give you their remarkable service to the full only when they are correctly matched in capacity to the demands made upon them by your receiver. It is wasteful

to buy batteries that are too small. Follow the chart.

In addition to the batteries illustrated, which fit practically all the receivers in use, we also make a number of other types for special purposes. There is an Eveready Radio Battery for every radio use. To learn more about the entire Eveready line, write for the booklet, "Choosing and Using the Right Radio Batteries," which we will be glad to send you on request. There is an Eveready dealer nearby.

Manufactured and guaranteed by
NATIONAL CARBON CO., INC.
 New York San Francisco
 Canadian National Carbon Co. Limited
 Toronto, Ontario

Tuesday night means Eveready Hour—8 P. M., Eastern Standard Time, through the following stations:

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| WJAR—Providence | WTAM—Cleveland |
| WELI—Boston | WWJ—Detroit |
| WTAG—Worcester | WGN—Chicago |
| WFI—Philadelphia | WOC—Davenport |
| WGR—Buffalo | wcco (Minneapolis) |
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EVEREADY
Radio Batteries
—they last longer