TUBE MONOPOLY ENDS

"AIDA" FIRST ETHER OPERA SEASON HIT

THOUSANDS OF FANS HEAR IT—EXPRESS APPROVAL

Three Operas Opening Week—Second Week's Programs—How Music Is Picked Up at Theater

CHICAGO.—Beginning with the opening opera "Aida," instead of the second night's offering, "Carmen." Station KYW began one night earlier than announced to broadcast the productions of the Chicago Civic Opera Association here Monday, November 15. On the two following nights in order, "Carmen" and "La Bohème" were broadcast. The successful transmission of the first three operas was beyond all expectations, supported by their experience in broadcasting the Chicago Opera during all of last year's season. Weatherbee station KYW engineers reproduced the orchestra and singers to perfection. Modulation and clarity could hardly have been better.

Many thousands of phone calls, telegrams and post cards received by Manager Weatherbee of Station KYW indicated that telephones in all parts of the country appreciated the musical treat afforded.

Operas of Second Week

The operas which were on the program for the second week at the Auditorium Theater were: Sunday afternoon, November 15, "Tristan and Isolde;" Tuesday night, "The Magic Flute;" Thursday night, "Tosca;" Monday night, "Traviata;" Wednesday night, "La Bohème;" Saturday night, "Carmen." Operas Del Tro No (The Love of Three Knaves), etc. At the time this announcement goes to press, Mr. Weatherbee, manager of KYW, was unable to say what opera would be broadcast during the second week. There was to have been at least two, and perhaps three of the operas go on the air.

How To Be Done

The evening opera always begin at eight o'clock. Central time, while three (Continued on page 2)

DE FOREST IS FREE TO USE HIS INVENTION

Unjust Deadlock Ends with Expiration of Fleming Valve Patent November 7

New Auditions on Market

President Charles Gilbert of De Forest Company Gives Interviewer Fertinent Facts

CHICAGO.—"The ending of an unjust monopoly," said Charles Gilbert, president of the DeForest Radio Telephone and Telegraph Company, when he promised a representative of RADIO DIGEST that more than one make of receiving vacuum tubes would be on the market in a few days. The expiration of the Fleming two-electrode vacuum valve patent November 7 was the occasion of Mr. Gilbert's recent visit and consequent interview.

"Now, after many years of litigation and other hindrances, Dr. Lee de Forest will finally receive what is due him. He will be able to manufacture his own invention first time in many years," said Mr. Gilbert.

Shows New De Forest Tubes

"You wanted to see these tubes we are now manufacturing, and for which we are taking orders," he continued. "Here they are. The large one is a 6-volt detector-amplifier tube. The smaller one is a 15-volt or dry battery tube with a coated filament (Continued on page 2)
Metropolitan Attitude Negative — Relay Broadcasts of Chicago Opera Next in Line

Phailing against overwhelming odds the Metropolitan Opera has kept on the air in its home city of New York. But even as the Metropolitan Opera Company reaches the halfway mark of its short season, it is obvious that the forces which have been working to bring about the dissolution of the Metropolitan are not slackening their efforts. New York is the center of the world of opera and its very proximity to the scene of the struggle makes it impossible to overlook the situation.

The Metropolitan Opera has been in existence for over a century and has been the most important opera company in the United States. It has been responsible for introducing many of the world's greatest opera singers and has produced some of the most memorable performances in the history of opera. However, in recent years, the Metropolitan has faced increasing financial pressure and has struggled to maintain its financial stability.

The Metropolitan is not alone in facing these challenges. Many opera companies around the world are struggling to survive in the face of mounting financial pressures. The pandemic has only exacerbated these difficulties, with opera houses facing cancellations and reduced or nonexistent revenue streams.

Despite these challenges, the Metropolitan has continued to perform, seeking to maintain its reputation as one of the world's preeminent opera companies. The company has been forced to innovate and adapt in order to remain viable, including by exploring new forms of distribution and engagement with audiences.

As the Metropolitan approaches the halfway mark of its season, it is clear that the future of opera in New York and beyond remains uncertain. The company will need to continue to adapt and innovate in order to survive and thrive in the face of these challenges.
**CLUB DEAF 27 YEARS, GETS BACK HEARING**

**PHILADELPHIA, PA.—**Morris Keyser, of this city, recently heard the spoken voice without an ear trumpet, for the first time in seven years. A week before he heard music for the first time on a receiving set, using headphones. He believes the Radiophone has stimulated his hearing so that he will eventually hear without artificial help.

**ELECTION BROADCAST CUTS ‘WATCH’ CROWD**

**COLUMBUS, O.—**The Columbus Dispatch’s scientifically controlled results on election night and found a notable decrease in the downtown crowd. The interested folks evidently preferred to stay at home and get the returns by radio. Despite the intense interest in the returns, the crowd of streets watching the broadcast slide results was the smallest in years.

**BROADCASTING A “PEASANT GIRL”**

The experiments conducted at the bureau were made with a paraboloid reflector (elliptical paraboloidal type), which was designed for a 10-meter wave length. It was made of polished wooden frame with an aperture of one wave length in diameter and was suspended in the air and wires spaced one foot apart were arranged around it. The antenna located at the focus, consisted of a 50-watt triode tube. The cathode of this tube was coupled to an antenna which was a linear oscillator of the Hartley type, which was tuned to a wave length of 10 meters. The complete reflector system was arranged so that it could be rotated.

### Threaten to Halt Daytime Service

**WOAI Seeks Number of Listeners In on Market Reports—Finds Many Interested Fans**

**SAN ANTONIO, TEX.—**The owners of Station WOAI threatened to cease daytime broadcasting if market reports and news bulletins released thereon unless there were enough listeners to warrant continuance of the work. The Evening News Bulletin, which furnishes the listeners with the latest and most accurate news was discontinued.

### Kiwanis Club to Give Receivers to Hospital

**MERIDIAN, MIS.—**The gift of a Radio receiving set has been pledged to Miss Freda L. V. Brown, who is in charge of the Kiwanis Club of Meridian. The club plans a year of installations and upkeep.

### Erection of Shanghai Plant to Begin Soon

**SHANGHAI, CHINA.—President Schriever of the Federal Wireless Company who recently arrived here, says that he will begin work on a Radio station here within thirty days.

**TRY TRANSMISSION ON SHORT WAVES**

**LENGTHS BELOW TWENTY METERS USED**

Bureau of Standards experiments, obtained good directional effects. May Cut Interference

**WASHINGTON.—**The enormous increase in the use of radio telegraphy and telephony has created a demand for apparatus capable of being operated with a minimum of interference. Wherever the need is not for long-distance but for point-to-point communication, the use of a lineless receiver makes it possible to make it possible. Directional transmitters on very short waves (below 2 meters) may offer a solution to this problem.

Recent reports by Marcon, Franklin, and other firms that transmitting and receiving data have been obtained on directive radio transmission using wave lengths below 26 meters. The Bureau of Standards has just completed a series of similar experiments, the preliminary results of which confirm the work of these investigators.

### Radio Broadcasting Speeches of Postal Chiefs

**WASHINGTON.—**Radio transmission of Congressional and Postal Service speeches was successfully demonstrated to Congressmen on November 11th, to hear speeches made by the Postal Service. The test was made by Postmaster General Burtlett, Special Assistant to the Secretary and Maj. John Steele of Kansas City, Missouri, the test was conducted as follows:

1. The audio apparatus was delivered before the conference-convention of the Commercial Legion at Kansas City.
2. Radio apparatus was rigged up in the big hall at the Kansas City, Missouri where the gathering was held.

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**THE ANTENNA BROTHERS**

**Spir L. and Lew P.**

"Fading Out" or "Close Coupling"
NEW OUTFIT ADDS TO EASE OF TUNING
SET ATTRACTS INTEREST OF GEN. SQUIER

Dr. F. L. Satterlee’s Invention Makes Greater Amplification Possible Without Use of Armstrong Patents

NEW YORK—Recently Dr. Franklin LeRoy Satterlee of Flowering, L. I., surprised Radio engineers by announcing the invention of an “inductive amplifying receiver,” which gave great improvement without the use of the Armstrong patents. Although a few details as to how this is accomplished by Dr. Satterlee have been learned, detailed information is not yet available.

The name “inductive amplifying receiver” is given to the new system of George O. Squier, chief signal officer, U. S. A., Gen. Squier, when asked to test the receiver, said he could give fifteen minutes to it and, as a matter of fact, passed three hours analyzing its possibilities.

Cells Are Secret of Set

The novelty in Dr. Satterlee’s set lies in the character of winding and arrangement of the inductance. The invention uses three flat spiral wound coils similar in appearance to small telephone bell microphones. Two coils operate with a “hook” or “butterfly” motion. The third moves through an arc between the other two coils with a course similar to that made by a clock-mark when slipped between the edges of a clock. The action is like that of a three-honeycomb-cell mounting, except that the center cell can be moved toward or away from the operator.

Rough tuning is accomplished by a variable condenser and finer tuning by varying the positions of the three coils until the maximum signal is heard. The one-set unit is contained in a cabinet measuring only eight by eleven inches.

A test of Dr. Satterlee’s set as made by Capt. C. W. Chadbourne and Associate Director of the Laboratory, showed that the improved set is far superior to the conventional set and would be a great advantage in a time of war. The set is supposed to be used in the field.

Another feature of the set is that it requires no batteries, and that the receiver is operated by using a special amplifier circuit to provide for a maximum output with the minimum of power. The set operates on a single coil and requires no batteries.

Bureau Issues Booklet on Tests of Radio Apparatus

WASHINGTON.—The Bureau of Standards has prepared a pamphlet, "Tests of Radio Apparatus," for the information of those who desire to have tests performed. The bureau limits its tests of radio materials to tests for the laboratory, tests of importance to the bureau, research tests in which the bureau is to act as referee, and a few other special tests in which special reasons are given why these tests should be undertaken.

If you have $500 to $10,000 and want to make money read this

An Illinois Radio Corporation needs $10,000 more capital to extend its operations. It is a legitimate radio enterprise that is making money now. To secure the maximum profits with the opening of the Radio season and the boom Opera has given Wireless additional capital is necessary.

If you have faith in the future of Radio and want to make money out of this big new industry here is your opportunity.

This company courts the fullest investigation and will furnish the minutest information of its financial condition and operation to those who are seriously interested in investing in a going enterprise.

Only ten thousand dollars worth of additional stock will be sold. The shares are in denomination of One Hundred Dollars and will be sold at par without commission, being paid in blocks of 5 shares or more each.

This is your opportunity to make a good, solid, substantial paying investment. If you are seriously interested address Box 3, Radio Digest.
EVER HEARD THEM? HERE THEY ARE

**Tunes of French Canuck on Ether**

Montreal, Newspaper Plant, CKAC, Broadcasts Quiet Songs of Farmers—To Reach New Orleans

**MONTREAL, CAN.—**One need not new to Quebec to hear the quaint, musical and charming songs of the habitant farmers of French Canada. If you live within 60 or 65 miles of Montreal, you can hear the best concert artists of that quaint and beautiful Canadian metropolis electric the old favorite tunes of "Aliciotta" and "The Sweet Apple Tree Behind Dad's House". The concerts are on Monday evenings, just by listening in on your radiophon.

**La Presse,** an easy channel to the largest circulation of any daily newspaper published in Canada, has installed a new high-power broadcasting station, capable of reaching habitants in greater part of the province of Quebec and the New England states. This station is electric to French-Canadians.

**44 JOIN ARGENTINA'S RADIO ORGANIZATION**

South American Fans Buy Small Sets for $38

**WASHINGTON.—**A radio organization is being formed in Rosario with forty-four members corresponding to the American organization Rosario, Argentina. It is proposed, along with things to obtain board of trade quotations from Buenos Aires by radio. Radio receivers are now made in Rosario, selling at about $10 each, United States currency. There is difficulty with customs in this country because the company in Buenos Aires has a monopoly by concession of all Radio devices. The manufacture of outfits is only experimental thus far, and it is probable that there is infringement of the basic concession of the original radio company in Buenos Aires.

Larger demands are reported by manufacturers for copper wire, sheet, tube and bar stock and copper in one form or another for use in radio outfits.

**The BIG Games**

are to be played in the next few weeks, but you may not be able to make the trip to the various stadiums, but you can hear at home everything that is going on at the games. The cheers, the songs, and then follow the game play for play. All you need is the

**Price**

Complete $35.00

(Including Phones, Tube, Aerial and Batteries)

AERIAL-A is a vacuum tube detector set, compactly and efficiently built, that will stand rough usage when necessary and is a decoration to any home.

With its perfect construction and simplicity of operation the AERIAL-A is the ideal receiving set for you. There are two dials for tuning and one rheostat for lighting both. The wiring connections are placed at the back of the machine, first for ease in connecting, and second, to increase the beauty of the set. A reasonable elimination confusion.

The AERIAL-A has been awarded the certificate of Excellence by the New York Evening Tribune. Nothing more need be said.

Don't buy a Radio Set until you have seen and heard this one

We are developing and perfecting two new vacuum tube sets to be known as AERIAL-B and AERIAL-C. Watch for our announcements soon.
DUTCH PREPARE FOR SCHEVENINGEN PHONE

WASHINGTON - The Netherlands Government is preparing to change the present Radio Station at Scheveningen with apparatus purchased from the Telephone Company. The station, which will be ready for operation in the early part of 1929, is intended to communicate with all parts of continental Europe and will provide a link in the international telephone network.

The new station will be equipped with a high degree of selectivity on all wave lengths, allowing for clear transmission of signals. It will be designed to meet the needs of modern engineering practices, including the use of independent channels for different types of communication.

The circuit is fundamental arrangements, designed to meet the circuit's requirements. Coupling may be progressive over the entire range. A wide range of antenna design is equipped with means of a continuously variable antenna condenser which may be switched into or out of circuit by a simple switch. The inducences are banked for convenience in the design of the system to meet the requirements.

The circuit may be adapted to the feeding of any number of stations.

Description of Tuning Unit

The tuning unit is mounted on the right side of the cabinet and is controlled by a knobs and levers. There are four knobs at the bottom of the cabinet. The two on the left are for the filament of the secondary, and the two on the right are for connection to a 220-volt filament. These knobs are used to control the plate potential of the secondary. The filament is supplied by the radio station and may be turned off and on by a switch. The tuning unit is designed to control the plate potential of maximum 500 volts. The tuning unit is connected to the receiver in the secondary. The two knobs are for connection to the filament of the secondary, and if the amplifier is added, they are for connection to the filament of the secondary.

In the bottom of the cabinet are the terminals of all the posts of that unit as indicated in the illustration.

The two taps switches in the center of the tuning panel control the filament of the secondary. The switches to the right of the secondary. The two switches are for the filament of the second. The switches are for the filament of the secondary. The switches are for the filament of the secondary.

The two switches in the upper left-hand corner control the coupling of the secondary circuit, and the switches in the upper right-hand corner control the coupling of the plate circuit. The switches in the lower right-hand corner control the coupling of the plate circuit.

SPECIAL SALE

Radio Supplies purchased here are sold under a positive guarantee of satisfaction. We carry the largest stock of first quality merchandise.

U. S. A. Signal Corps Aviation Type

194-W Western Electric Phones

Each Phone Cap is covered with large soft rubber cushions, and an adjustable head rest goes with each cap! They are used to pass the Government specifications for sensitivity and loudness, and are used by the U. S. Army Signal Corps, Type B. C. 14-A. We were lucky enough to secure a limited number of these wonderful radio sets, which have just been manufactured. Supply is limited, and complete delivery in every way, with wave length range, 200 to 660 meters. $23.95

SIGNAL CORPS SUPER SENSITIVE

MICROPHONE TRANSMITTERS

VARIOMETERS

VARIOCOUPLES

HONEYCOMB COILS

1,500 Turn, $1.50
1,250 Turn, $1.50
25, 35, 50 and 75 Turn, 40c

43 PLATE Variable Condenser
$1.75
23 PLATE Variable Condenser
$1.45
11 PLATE Variable Condenser
$1.35
5 PLATE Variable Condenser
$1.25
3 PLATE Variable Condenser
$1.15
Sponge Rubber EAR CAPS
Pair 50c
DIALS—2, 3 and 4 in.
25c
3,000 Ohm HEAD PHONES, Now
$3.65
HEAD BANDS, Now
50c
Thordarson Amplifying TRANSFORMERS...
$2.95

We Guarantee All Merchandise Purchased of Us

Chicago Salvage Stock Store
509 S. State Street, Chicago, Ill.
Radio Receiving Sets

Kennedy Regenerative Receiver-Amplifier

As the fourteenth of the series of standard receiving sets, Radio Digest illustrates herewith the Type 220 Regenerative Receiver and Type 525 Amplifier, manufactured by the Colin B. Kennedy Company of San Francisco and St. Louis. This receiver is licensed under the Armstrong United States Patent No. 1,113,149. Full installation and operation instructions will be found on page six. Although the amateur may not possess this particular make of apparatus it will be well for him to study the diagram and instructions carefully. The numerous points of similarity in standard types of sets will enable amateurs to derive considerable benefit from each set of instructions.
Radiophone Broadcasting Stations
Corrected Every Week.

In Two Parts—

The broadcasting directory is the most complete and authentic list of Radiophone Letters. It is being sent various stations every day for information. No other paper or source provides the data given here. The idea is original and a service which RADIO DIGEST has obtained from the source of its information, not only in the location index, but in the schedule list. The latter, however, is divided, one half appearing this week, and the other half appearing next week. It is believed the improvement will be greeted as welcome by many readers.

The station schedules, given here, are listed alphabetically by call letters. Following the call is given the city and state, then the station's frequency (in frequency we mean kilocycles), the miles of range of the station, the number of the station, and the hours of operation, and the kind of time used.

The state, city and call list appears with the first half of the station schedule every other week and is merely an index. One wishing to find the calls of the stations in his vicinity, will find this index useful. Two successive issues of RADIO DIGEST will give one the most complete and accurate list of broadcasting stations obtained.
Hearing Strange Tongues

Long Distance Reception Puts Up Various Languages O n the telephone, you can ask to have the local telephone operator give you the name of WOAI's owner. The operator then puts a circuit through, and the voice of the man who does not sound like the one you had expected may not sound like the one you had expected, but you can make it out if you try hard enough. It is quite possible that the voice may be one that you have never heard before. It might even be a voice that you have never heard before.

Mine Disasters Destroyed

Transmitter Taken Into Mine for Tests T he new type of radio transmitter for long distance communication was installed in the mine shaft of the new coal mine at Scranton, Pennsylvania. The transmitter was installed for the first time in a mine shaft, and the results obtained were quite satisfactory. The transmitter was found to be entirely reliable and was taken out of service at the end of the day without any difficulty.

Aid to Meteorology

Farthest North Station Center of Activity L ast winter, an American engineer, Hubbard D. I., of the United States, built a radio station on the east coast of Greenland. The station was built to provide weather information to the Navy ships in the Arctic. The station has been in operation for several months and has been sending out regular reports to the Navy. The reports are sent out over the radio waves and are received by the Navy ships in the Arctic.

Condensed

By DIELICT

A friend of mine recently stepped into a large store in one of the Eastern states and inquired about the wireless set which was being sold by the store. The salesclerk, who seemed to know very little about it, told him that he could not do anything about it, as the store had no knowledge of it. However, he did say that some other store in the city might be able to help him.

RADIO INDI-GEST

And a Broad-Cast to Their Eyes E verybody knows that when the barometric pressure is low, the radio waves are weak. This is because the ionosphere is disturbed, and this affects the radio waves. However, when the barometric pressure is high, the radio waves are strong. This is because the ionosphere is not disturbed, and the radio waves can travel farther.

When Winter Comes

Dear Sirs: I am a radio enthusiast and I have been listening to the Broadcast for several years. I have found it to be of great interest and I have enjoyed the programs that have been broadcast. I have also found that I can understand the programs much better when I listen to them on the radio than when I watch them on television. In addition, I have found that I can understand the programs much better when I listen to them on the radio than when I watch them on television. In addition, I have found that I can understand the programs much better when I listen to them on the radio than when I watch them on television. In addition, I have found that I can understand the programs much better when I listen to them on the radio than when I watch them on television. In addition, I have found that I can understand the programs much better when I listen to them on the radio than when I watch them on television.

Ask the Editor—He Can Tell You A few questions are asked of the Editor of the Radio Digest, and what he replied:

Q: What is the best way to submit manuscripts and radio scripts?
A: I would suggest submitting them via email or snail mail. You can also submit them through the website.

Q: What are the benefits of having a personal radio station?
A: Having a personal radio station can provide you with an opportunity to express yourself and share your ideas with others.

Q: What is the future of radio broadcasting?
A: The future of radio broadcasting is uncertain, but it is likely that it will continue to evolve and adapt to changing technologies and consumer preferences.

Q: What are some of the challenges facing the radio industry today?
A: Some of the challenges facing the radio industry today include increasing competition from other forms of media, changes in consumer behavior, and the need to adapt to new technologies.

Q: How can radio stations increase their audience?
A: Radio stations can increase their audience by focusing on specific target audiences, leveraging social media, and creating engaging content.
Use of the Radio Receiving Set in the Home
Part XII—Maintenance
By H. M. Toone

There are always certain inspections, repairs and adjustments necessary to radio receiving sets which, if properly installed, should not require any appreciable attention on the part of the owner. A radio receiver, particularly the more elaborate vacuum tube types, will not operate indefinitely without attention, any more than any other electrical appliance. The primary causes of trouble are so relatively simple as to require but a minimum degree of know ledge to enable the owner to perform periodic renewal of the crystal or periodically breaking the crystal and reconnecting it.

In the universal means of checking B batteries it is by no means an infallible method.

Very often a battery may be deteriorated to a point where one or two of the filament filaments have high internal resistance and will be bad enough to reduce the service of the receiver on the vacuum tubes, but the same battery may be perfectly constant on the filament of a voltmeter. This is because very rapid fluctuations of voltage will always affect the plate circuit with the crystal polarity relation. The positive side of the battery should always be on the plate side of the tube.

The diagram of a mechanical type of rectifier for charging batteries is shown in Figure 45. The alternating current supply is stepped down to low voltage through a transformer. This low voltage alternating current is applied to a magneto with a field actuated by a vibrating armature. The armature is designed and balanced to vibrate at one particular frequency, which is the rated frequency of the rectifier. The vibrating armature carries a contact which, when the armature is toward the electro-magnet, engages a similar but stationary contact. These contacts close every time the armature is toward the electro-magnet. The storage battery is connected in a circuit which is closed by these contacts and whenever the contacts are together, current will be passed through the battery. The contacts are closed only on one side of the alternating current cycle so that the current passing through the battery is always in one direction. The vibrations of the armature must be exactly synchronized with the alternating current frequency. A second electro-magnet coil on the same core as the first is shunted directly across the battery, the inductance of the direct current flux (Continued on page 12)
Freak Hook-Up for Regenerative Set

Variocoupler and One Variometer in Hook-up

Just what makes the performance of this freak hook-up particularly satisfactory for long-distance work will have to be left to more praying minds than my own. But however freakish it may be, I have received W8HWH, W8JZ, WAAG, W8AT, W8BAA, and a dozen others without trouble, although the enclosed diagram shows an attached amplifier.

All that is required for this set is a variocoupler, a variable-tap variable condenser, a two plate variable condenser, which can be made up as a part of a grid condenser, a rheostat with variable resistance, and a detector outfit. A volt-ohm-meter is also necessary because of the critical tuning of this circuit. It must be made perfectly to tune and it will cut out any trouble with the variocoupler, which is the variable condenser for 625-cycle work. It will also be useful to have two or three taps of this kind. It is done for the adjustment of the circuit to various conditions of efficiency. A voltmeter is used for the meter, and another for the condenser, which is very helpful in tuning the circuit. The remainder of the hook-up is a simple affair. The instructions given in the diagram will guide you through the necessary adjustments of the various instruments to the best advantage.

The arrangement of this panel is as shown in the diagram. The honeycomb coils are mounted on the outside of the panel. The panel is shown in close-up view, and the arrangement of the various parts is clearly shown. The 625-cycle circuit is shown in detail, and the various connections are clearly indicated. The panel is made of wood and has a belt and loop connection for the various parts.

Mounting for Honeycomb Coils

The illustrations show a new and unusual mounting for honeycomb coils. With this mounting there is no coil on the outside of the panel. The panel is shown in close-up view, and the arrangement of the various parts is clearly shown. The 625-cycle circuit is shown in detail, and the various connections are clearly indicated. The panel is made of wood and has a belt and loop connection for the various parts.

Efficiency of Radio Systems

In the operation of the radio probe, it is indeed surprising to note the lack of proportion between the hundreds of watts of input at the transmitter and the exceedingly few watts of the received signal. The received signal is no greater than the noise in the receiver, and it is the noise that is the problem. The noise is due to the various circuits and to the noise in the receiver itself.

Old Records Make Complete Sets

Records do not have to be new to be used in this set. The old records can be used as the input for the variocoupler, and the record player can be used as the output. The record player is connected to the variocoupler through a coupling circuit, which is a simple affair. The coupling circuit consists of a variable condenser and a rheostat. The variable condenser is used to tune the circuit, and the rheostat is used to control the voltage. The coupling circuit is shown in detail in the diagram.

Increase Your Range

By adding a Perfectly Constructed Variable Condenser to Your Set

Your present receiver may be improved by adding a variable condenser to the circuit. This will increase the range of the receiver and make it possible to receive signals from a distance. The variable condenser is connected in parallel with the grid condenser and is used to adjust the tuning of the circuit. The variable condenser is shown in detail in the diagram. The coupling circuit is shown in detail, and the various connections are clearly indicated. The panel is made of wood and has a belt and loop connection for the various parts.

USE OF RADIO SET

(Continued from page 11)

and the alternating flux from these magnet coils is exerted on the amperes to enable perfect synchronization with the alternating current supply. The storage battery may be inserted in any polarity without changing the sign of the polarized pole,

Amateur in series with the battery circuit, enabling the charging current to be reduced. This should be kept relatively low and high charging is not required. A long, light charger is better for charging battery than a short, heavy one. With the exception of the rectifiers on the market which have charging rations of from two to eight amperes. The battery should be kept well charged when the current is not required. An over-night charge once every two weeks will keep the battery in good condition and permit use of the set for several hours without the risk of complete failure of battery voltage.

(End)
Reinartz Circuit for Use with Panel Sets
Hook-Up with Two Stages of Audio Frequency Amplification
By H. J. Marx

The popularity of the Reinartz tuning units has been such that the
demand is too great for one man to handle. The situation has
led to the production of a Reinartz unit with two stages of audio
amplification. This will make it easier to get a good-soldered joint and
aid in the selection of the right type of audio transformer. The
use of two stages will also make it easier to select the proper
capacitor for the second stage of the amplifier.

Winding the Spider Web Coil
In winding the coil, the wire should be
fed in and out of the barrel of the
frames with an even tension through
out the entire length. The turns should
not be made in the same place. The
same turns should be taken in steps
each one on the top of the next one. The
winding should be continued in this
manner until the entire length of wire is
wound. The turns are counted from each
tap point. In this way about two complete extra
turns are accumulated. In taking off a tap a
one-inch loop is started in the wire, and the
holes are continued, afterwards the
winder is removed from the
frames in preparation for soldering leads.
The first and second stage consists of 60
turns, with a tap every fifteen turns.

Connecting Three Tap Leads
In soldering the connections to the con-
tact points it is advisable to first tin the
soldered points. This will make it
necessary to get a good-soldered joints and
aid in the selection of the right type of
coaxial cable. The lead to the second stage
is taken from the second stage to the
primary of the transformer. The lead to the
primary of the transformer is taken from the
second stage to the primary of the transformer.

LIST OF APPARATUS

Three Vacuum Tubes
Three Tube Sockets
Three Rheostats
Two A.F. Transformers
Two Phone Condensers 10,000 mfd.
One Variable Condenser 60,000 mfd.
One Grid Condenser 300,000 mfd.
One Grid Condenser 60,000 mfd.
One Grid Condenser 300,000 mfd.
Three Lever Switches

Radio Used as Barometer
Many experienced Radio enthusiasts are able to predict with a fair degree of ac-
curacy the advent of cloudy or rainy
weather. When the "nose" is wet and
foggy, or when it breaks out in a rain
shower, it is usually a sign that a
thunderstorm is imminent. This is
accurate in most cases, although there are
occasions when it fails to work. In such
cases, the spider web coil may be used to
predict the weather.

How to Mount the Crystal
A popular way of mounting the crystal is in the
cup of a socket. The leads are then attached to the
socket and the crystal is placed in the cup. The
leads are then attached to the crystal with either
tape or a small amount of cement. The crystal is
then mounted in the cup and the socket is
attached to the receiver. The crystal is
then adjusted to the correct position for
maximum reception.

Amplifying Buzzer Tone
When making detector adjustment tests, ordinary magnetic buzzers are
usually used. Although quite conven-
tient, the fact that it is not as de-
structive a circuit as could be wished for.

Correction
Refer to the diagram shown on page 13 of the November issue. The leads
on the two right hand contacts of the rotary switch 14-15 are to be
connected to the generator and the primary of the transformer. In the
original illustration—which would short circuit the antenna to the ground.
This hook-up, to be used with a ground connection in conjunction with a loop aerial, will prove interesting to the radio listener who is unable to erect an outdoor antenna. The practical results in the desig

**PRACTICAL REGENERATIVE LOOP SET**

This hook-up, to be used with a ground connection in conjunction with a loop aerial, will prove interesting to the radio listener who is unable to erect an outdoor antenna. The practical results in the design is that the antenna is placed in series with the plate circuit. In addition, the ratio of the voltage applied to the regenerative amplifier on the plate of the first tube. Thus, a double-regenerative effect is obtained. Naturally, due to the sensitivity of the double tube, the direction of the loop will be very critical.

The primary of the variocoupler should be one with plenty of turns in order to give sufficient inductance, so that the wavelength of the variable condenser, which should be of 600 microfarads capacity, will be in the neighborhood of five hundred meters. The capacity of the variable condenser should be of the vernier type, in order to facilitate close tuning.

The grid condenser of the first tube should have a capacity of about 0.950 microfarads. The grid leak and condenser unit on the detector tube should be a minimum of 0.003 and 0.0025 microfarads, respectively. The grid potential of the first and second stages is controlled by the 40-kilohertz potentiometer which is connected across the 6- volt filament storage battery.

Two radio frequency transformers are used for the two stages of R.F. amplification. The plate batteries consist of a 220-volt and 45-volt unit connected in series. On the one side of the primary of the two R.F. transformers is the plate circuit of the last tube, all connected to the positive terminal of the 45-volt battery, thus obtaining a total of 271 volts on the plate circuit of the last tube. The primary of the audio frequency transformer is connected between the two units thus placing a 25-volt potential on the plate of the detector tube.

Separate rheostats are used on all four tubes. The detector tube, naturally, is a soft tube, while the other three are hard amplifying tubes. The variable condenser between the plate and grid circuits need not have a maximum capacity of more than 0.050 microfarads.

In tuning, the coupling between the primary and plate circuits should be set at zero. Then the primary circuit is adjusted by means of the top switch and variable condenser. Then the plate circuit is tuned by means of the coupling, the plate condenser, and the direction of the loop. The maximum directional effect of the loop should be realized before the coupling and capacity are adjusted.

The adjustment of the potentiometer and rheostats are the final steps in tuning. This circuit will be found very effective for long distance loop reception.

**The Reader’s View**

Butte, Montana, Heard From

As the columns of your publication will serve best in a mass of the numerous requests from the operators of transmitting stations in our United States and a portion of our neighboring dominion on the north, not applying more stringently to the Sixth District of which I am located in about the same region, I must say as regards modulation, distance, class of music and other entertainment, together with information of more or less value to thinking people. I wish it to be well understood that their efforts are not in vain, and that every word or signal they send is a way to the most remote corner of my house.

The only tie I have is directed against certain stations who have the same ideal with the object in view other than that of advertising their talents and music to the advantage of the most popular hour, 6 to 9 P.M.

At times do you wonder how to conduct myself. Give a cowl enough rope and it will hang itself. Every time that I find myself in Butte, Montana.

**Ground**

Using a home-made receiving set consisting of a variometer regenerative set with detector and one tube amplifier, he has been getting several of the eastern broadcasting stations quite regularly.

In each case long distance reception is caused, as a great many by some freak atmospheric condition. However, I don’t think the average receiver would play any part in the case. When I tuned in on some long distance station I generally (not always) hear it till the end of the program, and it has happened once but the next night not as well.

I am located about 1,500 miles north of Portland, Oregon, and have been tuned during the past week by KDKA, KDKA, WBAP, KDKA, and WBAP.

We have about 2,500 miles from here, but even so, I heard their programs on the nights of September 20 and 21, a period of about forty-five minutes each night.

WBAP of Fort Worth, Texas, is also heard quite regularly.
Questions and Answers

A-Numbered Q. & A. 1434 on this page is given on the diagram of circuit of Reinitzer Tuner with one stage of Radio and two stages of audio frequency amplification.

Interference (1185) CGL, Jackson, Mississippi

1. Is there any five-wire, single-coil, re- generative receiver and do all my tuning within one receiver with one motor and the tinter coil. The set works fine and when I adjust the motor I hear both at Detroit, and WHB, KED, WOR, WOC, WBBM, WLW and WZAT, practically every night.

I am troubled very much from interference and it seems as though some nights I can't separate the stations from another. What good results do I do on the 440-meter station or while only one of the 250-meter stations are operating. Occasionally the set takes sharply and a two or three degree turn on the con- denser will always change the station and its carrier wave out completely.

2. Will you please tell me what changes or ad- ditions I can make on this set to make it more valuable? The nearest station is in Atlanta, Ga., or about 371 miles and the other stations are from 450 to 500 miles.

A-Noting your letter and the difficul- ties you are experiencing along the line of interference, I am sure you can only say that much is a very common lot and it is difficult to avoid where stations are close in proximity are broadcasting on the same wave length. A practical way to eliminate interference with the type of receiver set you describe is to make vernier adjustments on all controls.

I think that you have every reason in spite of annoyance be congratulated upon your record of long distance reception and believe that with the use of ad- justments advised you will be able to over- come your difficulties to a great extent.

Can't Get Pacific Coast (1178) FNL, Virginia, Minnesota

1. I am using the R. C. of a hook-up with a few minor changes. (Drawing enclosed.)

2. Please give me the proper procedure of tuning this circuit.

A-Antenna Inductance consists of 350 turns of No. 24 wire on 24-inch tube taking away every 15 turns to non- harmonics suitable for this? I have tried different values, but have been unable to make them oscillate.

3. Why can't I get the Pacific coast stations? Do you think a few more stages of Radio or help? Also, do you think I must more stations in the daytime? I've only tried 4 stations in WHAP. Seems to me WHAP should come in.

A-By using a 100-meter wave, 411 wire aerial, 35 feet high. Would you obtain greater strength by using a No. 24 wire aerial?

4. What audibility value has regeneration? Suppose I use a varioriten in my plate circuit. Would it be equivalent to one stage of audio frequency? I am using a 150 volt 6R45 tube.

5. Once before you stated that stepped down alternating current could be used on the existing coil of a Magnavox if the current were not. Would an electrolytic rectifier be suitable? How many jars should I have? I haven't a very good ground, as there are no water or gas pipes in my loc- ation. Would you recommend a counter-

polish? If so, will you please give speci- fications?

A-We have carefully noted sketch and wiring diagram. Answers to your inquir- ies are as follows:

1. The most satisfactory method for tuning will be to tune audio frequency to highest stations and then radio frequency. At best this is a difficult set to operate.

2. By using proper size honeycomb coil you should have no difficulty in making them oscillate.

3. Pacific Coast stations are very diffi- cult of reception because of interesting mountains. Daytime reception is not as tolerable because of interference and because of the effect of the moon's rays which guide the waves.

4. Stranded wire would be advisable for antenna and elevating it more would help for long distance reception.

5. Reception was greater value than two stages of audio frequency amplification. A variometer in the plate circuit of the detector tube will satisfy.

6. Would advise use of electrolytic rectifier as it will cause a displace- ment hum or the fact that rectifiers are not one hundred per cent efficient in their rectification.

7. Would not advise use of counterpoles for receiving. Would rather advise the use of large metal plates buried in the earth, or better still in a well or cistern, being sure that they are well soldered to lead-in wire.

Ground in Well

1175, AM, Poonah du Chene, Win.

1. Is it possible to light the filament of an neon lamp with alternating cur- rent? If so, how?

2. If I increase the height of my aerial, will it make broadcasting louder?

3. Is there a device which will make 40 feet deep make a good ground if well con- nected?

4. Should the lightning ground be sepa- rated from receiving ground?

5. I have a short wave, regenerative set, 166-200 meters. Could I place a booster coil in the circuit to receive strong air- and space waves of higher wave lengths?

6. Can body capacity be done away with? If so, how?

A-1. It is possible to light filament with alternating current, but not advisable as the alternating current hum will drown out signals.

2. Elevating aerial will somewhat in- crease the sound of receiving, but more noticeable the range of receiving set.

3. There will be a well very satis- factory.

4. It does not matter materially whether or not the lightning ground is separate from receiving ground.

5. A regenerative set is not designed for the kind of work suggested and it would not be advisable to make the addi- tion of loading coil to receive spark sta- tions.

6. Body capacity can be eliminated by shielding plate. An article on this subject appears on page thirteen of June 24th issue of RADIO DIGEST.

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Edouard Coterouil as Don Basilio, the music master in "Barber of Seville." Coterouil is a distinguished French baritone.
Moffett Photo

Too much cannot be said of the ability of Ava Ludmilla (upper left) the nineteen-year-old premiere donna of the Chicago Opera. Ducommun Photo

Ira Bourke as Urashia. Urashia is the subject of the first act of "Aida." This was the first Chicago Opera of the season.
Moffett Photo

Edith Mason as Madame Butterfly in the opera of that name. It was in this role that the popular American soprano achieved her sensational debut last year at the Chicago Opera.
Hutchinson Photo

Here is Irene Pavlova again, this time as Mercedes in "Carmen." "Carmen" was the second opera to be broadcast by station KYW this season.
Moffett Photo