VOLUME 1 NUMBER 8

PACIFIC RADIO NEWS

MARCH, 1920 FIFTEEN CENTS

IN THIS ISSUE:

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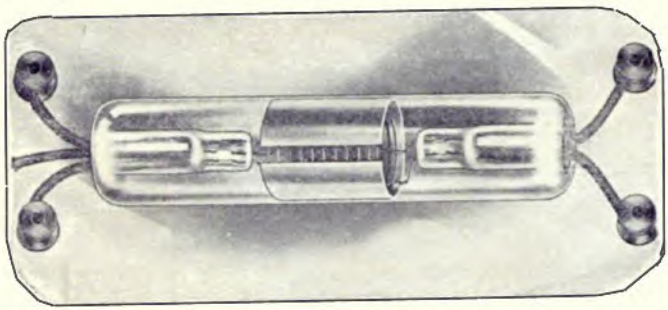

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applies this month to our N. A. A. 3000 meter tuner that has no movable coils and is the only tuner ever made that can make the changeable wave length of N. A. A. behave. The waxed in coils cut out nearly all the static. Use it all year round.

Our 200 meter tuner works on the same principle and the air seems full of bees when listening in with this tuner and using our hook up.

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Send for our circulars.

TRESCO

Davenport, Iowa

Pacific Radio News

50 MAIN ST., SAN FRANCISCO

Volume I | MARCH, 1920 | No. 8

PAUL R. FENNER, Editor | H. W. DICKOW, Advertising Manager

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Forms close on the first of the month preceding date of magazine.

Application for entry as second-class matter is pending.

How To Transmit 1500 Miles On 200 Meters With Three-Quarters of a Kilowatt

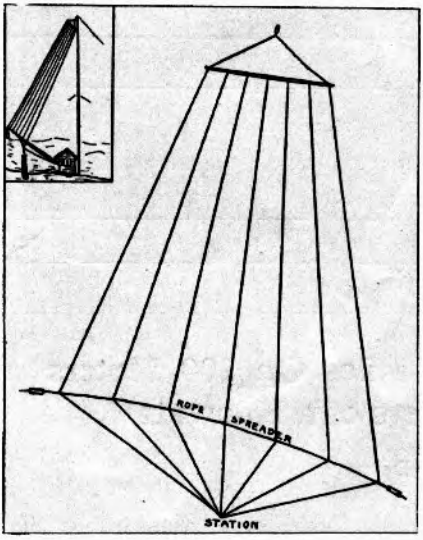
By R. C. Denny

When an amateur succeeds in covering a long distance with his set other amateurs very often say such things as, "Well, he had a high aerial," or "He has a mica condenser" and really feel satisfied that long distance work may be accomplished by having a certain single valuable asset. Let every amateur get this absolute fact in his head: Long transmitting range under the U. S. Government restrictions can be attributed not to any one point in such a set as distinguished above others, but to the merit of the entire ensemble of the set as a whole. What this really means is that every detail in the construction of an amateur transmitter, no matter how trivial or unimportant the detail may seem, is as important as any other.

As a first consideration let us take the antenna for discussion. It has been found that raising an antenna twice as high does not double the distance over which the station can transmit, but rather trebles or even quadruples the distance. There is one fact: your antenna must be high to secure maximum results. A seventy-foot high antenna is very good. If possible, make it ninety or a hundred feet high.

The second consideration in regard to the antenna is its capacity. There are more amateurs falling down on lack of antenna capacity than for any other reason. In the first place, get rid of the idea that you want a long antenna. A short one is better. The best recommendation to make in the construction of an efficient transmitting antenna is to recommend a length not exceeding one hundred and ten feet. This includes lead in. In order to get the capacity, use a number of wires—say eight or ten. A good construction is to use as long a spreader at the top of the antenna as possible —say eighteen feet long—and then, to get every ounce of capacity out of

the wires, fan them out as they reach the ground, so that the separation between wires near the ground will be from ten to fifteen feet. The accompanying cut shows a good idea for an efficient antenna.



For insulators, porcelain are the best. Ordinary porcelain cleats make excellent insulators when two or more are used in series. Too much strain, however, cannot be put on them without danger of breaking.

Another important point about the antenna is conductivity. Stranded wire should be used for the best results, as it has a low high-frequency current resistance. No. 12 copper wire, or larger, should be used if stranded wire is not obtainable or too high in cost. In using a large number of wires, well spaced, even though the conductivity of each wire is small, the great number of wires in parallel lower the resistance of the antenna as well as increase its capacity.

We come now to the lead-in. The lead-in may be defined as the conductor leading from the point where the ends of the antenna wires are brought together through to the point of connection with the oscillation transformer secondary. Every portion of this conductor must be of high conductivity at least equalling the conductivity of the total number of antenna wires. Too large a conductor cannot be used. The larger the better.

The next detail is the oscillation transformer. Both the primary and secondary must have the lowest possible high frequency resistance and also have the best of insulation.. The shape of this part of the transmitter is not nearly so important as its quality, since pancake or double helix type are both efficient if the insulation and conductivity is good.

From the other terminal of the oscillation transformer secondary we have the ground lead and ground. Here again, more than ever, we can preach low resistance or high conductivity. If we are so careful to provide a large area of good copper wire for our radio circuits above the ground, why are we so slow to realize that it is one of the biggest problems to get a low resistance contact with the "hard, cold" ground? Remember that at the point where the metal of our "ground" comes into actual contact with the earth there is a tremendous resistance. In order to overcome this resistance the only way is to provide a great number of grounds. The more parallel paths we have to lead our current to the earth the less the resistance is. Therefore, anywhere from five to ten separate and distinct earth connections should be used. Use the water pipes, the sewer pipes; bury screen as deep as necessary to get to moist soil; drive iron pipe fifteen to twenty feet into the ground, and last but not least, run separate heavy leads, well connected to these various earth contacts, to the secondary of the oscillation transformers.

(Continued on page 310)

Long Distance Buzzer Transmitters

By E. T. Jones, Radio Supervisor
Gulf District, U. S. Shipping Board

We have never been able to employ buzzers as transmitters for any appreciable distance mainly because the amplitude was not great enough and again, we could not vary the wavelength at will unless the antenna was constructed to suit the purpose. In what follows a buzzer transmitter is described which is capable of variable tuning in respect to emitted waves and wherein the amplitude is fourfold, making for exceptional distances with buzzers as a source of high frequency oscillations.

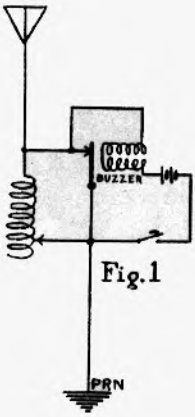


Fig.1

It was discovered that by shunting a buzzer with inductance and enough of it so that a short circuit is not formed, as shown in Figure 1, the distance the same buzzer transmitted was fourfold. Furthermore, that every time the inductance was varied, the pitch of the note was also changed and it was possible to transmit music by this new transmitter if suitable keys and units of inductances were arranged.

In order to prove the above facts in connection with the increased amplitude, measurements were conducted with the arrangements shown in Figure 2, where the buzzer was connected in the ordinary transmitting circuit

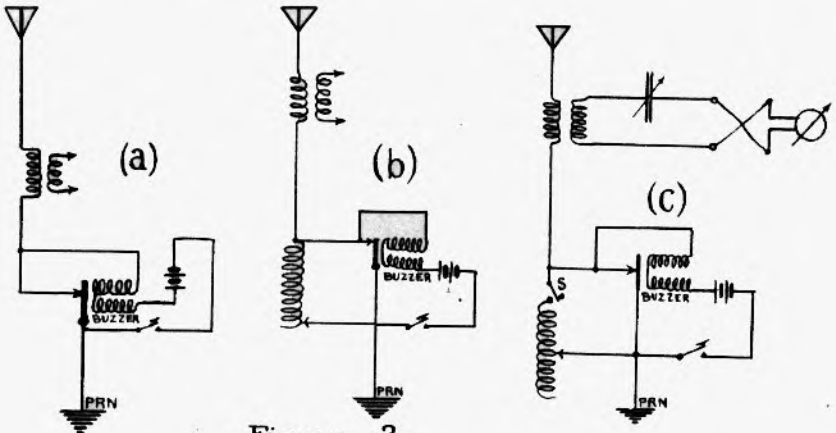
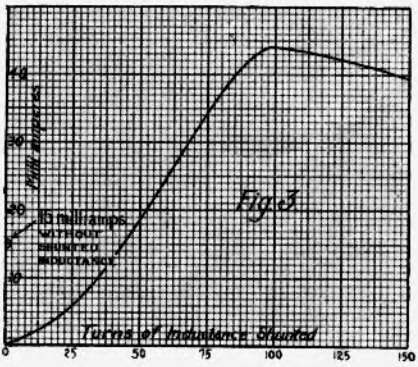
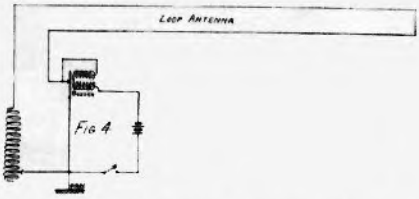


Figure 2.

(a) with a small inductance in the antenna lead, to which the measuring apparatus was coupled. At B an inductance was shunted around the antenna and ground or the vibrator contacts. At C is shown the method which was actually used during the test; the inductance to be shunted was controlled by the switch (s). Curves were drawn from the actual results and Figure 3 shows clearly the difference existing between the plain buzzer transmitter and when shunted by a suitable inductance. It clearly demonstrates the greater efficiency of the shunted buzzer type.



The circuit shown already is not just suitable for the correct operation of a transmitter and for that reason that shown in Figure 4 was developed and provides a means of tuning the antenna and employing the antenna and inductance unit as the shunt across the vibrator.



In order that the experimenter desiring to use this transmitter will not construct an antenna having a wavelength greater than 200 meters, a loop antenna, as shown in the circuit (Fig. 4), having dimensions as follows: each strand separated two feet apart, seventy feet long and thirty feet high at both ends, will serve. This provides an antenna well under 200 meters and considerable inductance can be added in the circuit to provide the shunt and coupling inductance described.

The inductance coil to be used in shunting the buzzer is wound on a bare copper wire space two feet apart cardboard tube 5 inches in diameter. Wind one layer No. 24 SCC magnet wire for a length of six inches, providing taps every half inch. Greater selectivity can be had by providing a slider. However, it is recommended that a greater number of taps be employed in its stead.

This type of transmitter should be employed throughout the country for local work to minimize the interference and trouble with amateur regulations, which are bound to follow the use of powerful transmitters for local work.

WHO HAS HEARD CONSTANTINOPLE?

Have any of you radio men heard O S M, Constantinople? This is a gigantic station located on the upper Bosphorus. During the war it was operated by the Germans to communicate with the various fronts. It was heavily guarded all during the war and no one but a general could come within miles of it. O S M is a continuous wave station of considerable power. It is now being operated by the allies.

Don't miss an issue. Write your name and address on a piece of paper and send it with $1.50 to Pacific Radio News, 50 Main street, San Francisco, Cal.

Moorhead Laboratories to Reorganize Corporation

The activities of the Moorhead Laboratories, who formerly made Moorhead tubes and electron relays, has been very obscure during the war. As a matter of fact, this corporation played an important role in the war. Moorhead succeeded in buying the rights from De Forest to make three-element vacuum tubes. With this as a trump card he went to the Marconi Company, who were powerless to manufacture tubes legally without the De Forest patents, and told them he would make tubes for them in his laboratories in San Francisco. In this way he secured exclusive right to manufacture three-electrode vacuum tubes in the United States without legal interference.

Under these arrangements the Moorhead Laboratories put out more than 150,000 vacuum tubes during the war. Fifty thousand went to the British Government and 100,000 to the United States. In addition to these he furnished the Marconi Company large quantities of the tubes for sale to amateurs.

For some length of time the financial affairs of the company have been in a chaotic condition. Now comes W. F. Williamson, a San Francisco attorney, who represents a group of the largest stockholders of the Moorhead corporation, and intends to completely reorganize the company. Stock of the former corporation sold for one dollar and is now down to twenty cents. The indebtedness is considerable, according to Mr. Williamson, but his clients are able to financially provide for any further capitalization. It is said that Moorhead is contracting to devote his entire time to the new organization for six years. He is still to be president of the company. Moorhead also grants all patent rights to the new organization which formerly belonged to him.

SAN FRANCISCO RADIO CLUB IN NEW QUARTERS

Due to the inadequate facilities for erecting a radio station at their old location, the San Francisco Radio Club has moved to new club rooms at 355 Presidio avenue.

Tables have been wired for buzzer practice and a radio set has been installed using a Tresco Long Wave Tuner. Excellent results were obtained with the receiving set. A regular course of radio instruction will soon be inaugurated.

A membership campaign is now running. The inducements to join are that new members will not have pay the first month's dues.

POMONA RADIO ASSOCIATION

The Pomona Radio Association is made up of amateurs of Pomona, Cal., and those who live in the vicinity. There are now fifteen members. Meetings are held once a week. The meetings usually begin with the usual transaction of business, followed by a lecture, and discussion on radio topics. Refreshments are always served to stimulate attendance and are well worth the 25 cents per month paid by each member.

Communications to the club should be addressed to Mr. H. C. Wright, Secretary, Pomona Radio Association, Pomona, Cal.

Division of Operations
UNITED STATES SHIPPING BOARD
Emergency Fleet Corporation
818 Gravier Street

Office of the District Auditor
For the Gulf of Mexico
818 Gravier St.

New Orleans, January 28, 1920.

Pacific Radio News,
50 Main Street,
San Francisco, Cal.

Dear Sir:

I note with great satisfaction the bold and true statements made by Mr. E. T. Cunningham, on page 267 of your February issue; and it is a crime to believe that in a free country such as ours, that even the higher courts would overrule a situation which is in the minds of all Radio Men "Strictly Deforest and the Grid" when speaking of audions, vacuum tubes or what not.

In what part of this continent can we ask the question without receiving the appreciative reply, "Dr. DeForest," and to educate the uninitiated up to the bold and convincing facts as related by Mr. Cunningham certainly is a splendid piece of American radio history, and should be remembered by all constitution loving Americans.

To my knowledge, I have never met a man engaged in the Radio Art, who did not concede the facts as related by Mr. Cunningham.

I, myself, am human, and I cannot conceive a more pitiful condition than an inventor practically robbed of his earthly possessions and more so his undisputed findings from long research and much work.

Accept my thanks in behalf of the esteemed inventor, Dr. Lee DeForest, for I know that he will be more than glad to read over these few pages.

You may make use of this if it is your policy, and I assure you that your magazine based upon such a pillar of righteousness shall never want for subscribers nor advertisers.

Very sincerely,

E. T. JONES.

Designing the Amateur Transmitting Antenna

By E. T. Jones, A.M.I.R.E.
Radio Supervisor, Gulf District, U.S. Shipping Board

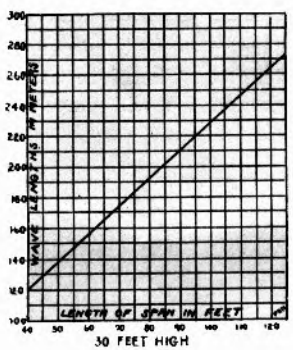


FIG. 1.

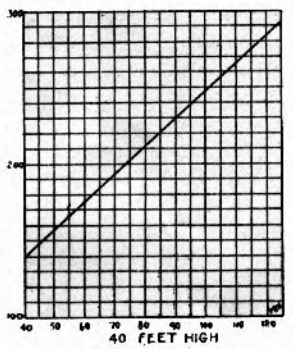


FIG 2.

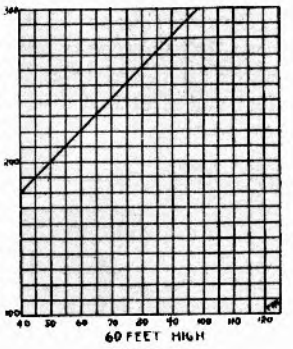


FIG. 3.

Now that the amateurs have acquired the prestige which was forthcoming for some little time and have most of the "influential" engineers and scientists pulling strings at Washington for their welfare, let them not forget their duty towards these men who have fought and won their battles several times. It is the duty of every amateur to maintain the high standard accorded him when his privileges were at stake by adhering to regulations and reducing to a minimum the amount of violations. While a great majority of the above regulations are the easiest to adhere to, the average amateur or experimenter does not know how to tune his transmitter to the wavelength of two hundred meters as prescribed by law. Column after column has been devoted to the advancement of the tuning of the circuits, both open and closed, the advisability of providing high voltage transformers to reduce the amount of capacity required, and last but not least, the elimination of unnecessary losses occurring from the lengthy leads employed by the amateur in connecting up his instruments. However, not a single word has issued from any author's pen advancing information in respect to correct design of antennae which should be employed with these short-wave transmitting sets. No matter what is done in the operating room unless we fully realize just what wave length our antenna has we are working under a handicap. The average amateur is not satisfied with the transmitting antenna (which would be highly efficient for the transmission of a 200-meter wave) for his receiving set. There is, then, but one correct solution: PROVIDE A SEPARATE ANTENNA FOR TRANSMITTING and the sky can be considered the limit for that of the receiving set.

Design of the Antenna

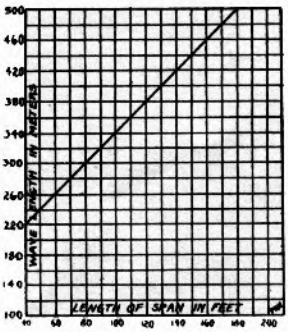
With the valuable assistance of several graphs taken from Dr. Austin's work, the amateur will have before him very valuable data which will permit him to construct an antenna best suited for the operation of his

apparatus on a 200-meter wavelength.

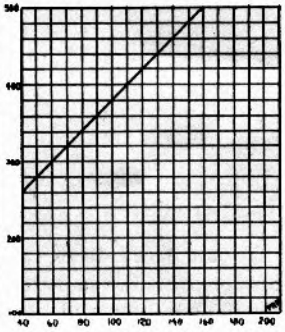
The antenna in each instance is to be composed of four wires—No. 14 bare copper wire spaced two feet apart throughout. The four lead-ins should be twisted together at a point ten feet from the ground and then brought into the sending station and connected to the apparatus.

By referring to Figure 1 it will be seen that the type of antenna described above, if raised to a height of thirty feet and stretched to a length of sixty feet, will have a natural period of ONE HUNDRED AND FIFTY-FIVE METERS. If lengthened to eighty-five feet the wavelength would be two hundred meters and at this point it will be impossible to insert inductance at the base of the antenna (in the open circuit of the oscillating transformer). It would be found that several turns of the usual amateur helix could be inserted at the base of the antenna if it were reduced to sixty feet, as the wavelength of point is 155 meters.

Figure 2 shows the wave length of the same type antenna at a height of forty feet. By referring to this graph it will be seen that if we still desired to employ an antenna sixty feet long its wavelength would be increased to one hundred and seventy-five meters. An increase in the height of the same type antenna but ten feet would cause an increase of twenty meters wavelength. Therefore, as we raise the antenna we will have to satisfy ourselves with shorter ones for efficient transmission on wavelengths under 200 meters.



80 FEET HIGH
FIG. 4.


100 FEET HIGH
FIG. 5.

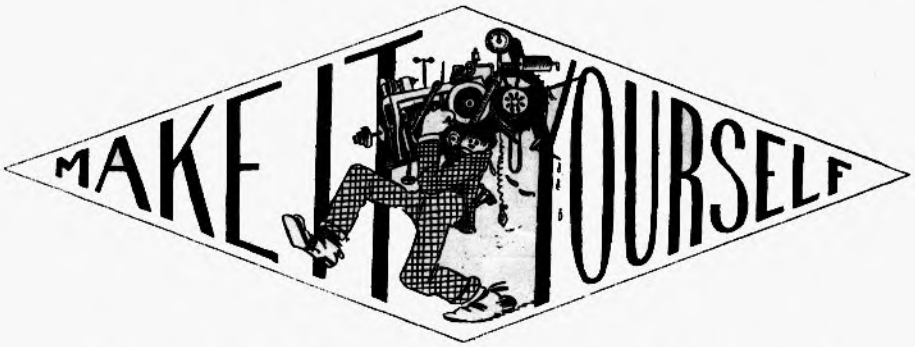
In order to use this same antenna at a natural period of one hundred and fifty-five meters we will have to make the length fifty feet, exactly ten feet shorter than when the antenna was ten feet lower.

A graph showing what happens to this same antenna when raised to a

(Continued on page 313)

ERRATA IN JANUARY, 1920, ISSUE

6CM Campbell, D. M., should have been shown as residence being R.F.D. No. 1 Burbank, Cal., instead of in Los Angeles on Highland and Shendale streets.



AN UNDAMPED TRANSMITTER OR RADIO TELEPHONE

By Robert Velner

Part III.

Panel Design and Assembling.

In the last issue of Pacific Radio News under Part II of this series, general construction data was given.

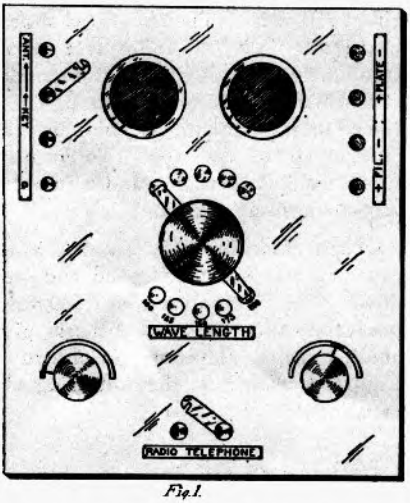


Fig. 1.

Figure 1 above, shows a compact way to mount the radio telephone and undamped wave transmitter using a small panel. In the upper part of the panel, in the center, are mounted two standard vacuum tube sockets. To the left are four binding posts for the antenna, ground and telegraph key connections. On the right are the binding posts for the filament and plate current. In the center of the panel may be seen the wave length changing switch. This is really very easy to make and is of great value in the operation of the set in order to be able to work through any interference that may arise. A detailed diagram of the switch and the two balancing condensers (the knobs of which may be seen below the wave length switch in the above drawing), is shown in Figure 2. The arms of switch levers at L are insulated from one another, each arm making contact with a strip of brass fastened to the panel. Two small variable condensers are placed in the cricuit at X and Y. While these are not absolutely essential they will greatly assist in making the transmitter more efficient. These variable condensers should be very small, for example, three half round stationary plates of 1½ inch radius and two movable plates to fit. When taps are taken from the inductance care should be taken to tap equal amounts from the ends to the center

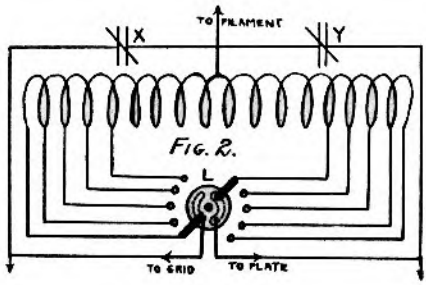


Fig. 2.

of the coil. This must be done so that whichever points the wave length switch is on, there will always be equal amounts of inductance from the center of the coil through the taps at both ends of the coil, thus making the grid end of the inductance resonant to the plate end. The small variable condensers, called balancers, are used to tune the grid and plate circuits to precision.

Near the lower edge of the panel are two binding posts marked "Radio Telephone." These are the binding posts 10 and 11, explained in the preceding issue. The secondary of the telephone transformer is connected to these binding posts when it is desired to use the transmitter as a telephone. The use of the three binding posts marked "Ant." and "Key," Figure 1, are also described in the preceding installment.

RECTIFIER FOR HIGH VOLTAGE AND FILAMENT CURRENT

In tube transmitters and even in receivers one of the most expensive units is the battery for lighting the filament and the one for supplying the current to the plate. With a view to cutting down the operating costs of these units a rectifier will be described which will supply direct current for operating both the filament and plate circuits of tube transmitters and receivers. It has been proved and tried that an alternating current may be so rectified that it can be used for even telephone conversation on tube transmitters.

Figure 3 illustrates a circuit which has been found to give satisfaction on small tubes now on the market such as the VT, Audiotron, etc. These small tubes operate best as a generator of oscillations when a voltage of close to 500 is supplied to the plate.

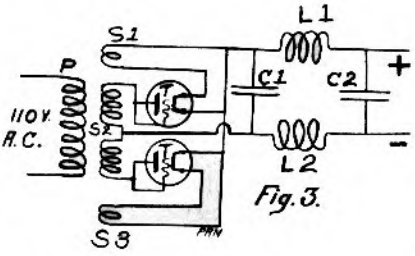


Fig. 3.

Western Electric VT1 tubes require about 350 volts. The apparatus shown in Figure 1 is as follows; a small transformer, having several secondaries which supply current for the rectifier tube filaments as well as the current to be rectified; two vacuum tubes, used as rectifiers, and a smoothing out system.

The transformer is of about 30 watts capacity and is both step up and step down. One secondary gives 500 volts potential and the two others give about 6 volts. The core is shown in Figure 4, and has the following dimensions:

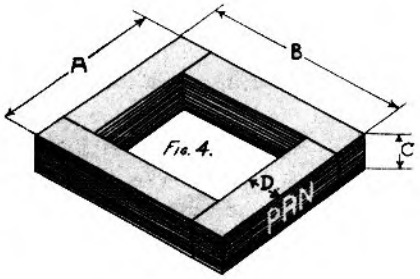


Fig. 4.

A—3.5inches
B—5.0 inches
C—1.0 inch
D—1.0 inch

It is built up of strips of silicon steel about No. 28 guage, the larger strips being 1x4 inches and the short 1x2:5 inches. The strips are either cut from a sheet of silicon steel with a pair of snips or in a cutting machine. The sheet iron sold in hardware stores or tinners' shops will answer the purpose nearly as well and can be substituted without noticeably poorer results. After cutting the strips are staggered as shown in Figure 4 and the complete core is built up on the two long sides and one end. After the coils are wound and slipped into place the remaining end strips are placed in to complete the core.

The primary — for 110 volts, 60 cycles, alternating current — consists of 660 turns of No. 20 B and S gauge double silk wire. This is wound on a small wooden form the size of the core (1-inch square) plus insulation and is wound in two coils of 330 turns each for the two legs of the core. After this is finished and covered with insulating paper, the secondary is to be wound for the filaments. This will consist of forty turns of No. 20 B and S guage double silk-covered wire. A layer of insulating paper—or, better yet, empire cloth—is then wound over this coil and the high voltage secondary is wound on. The high voltage secondary coil is composed of about 3000 turns of No. 28 enamel or silk-covered wire (for approximately 450 volts, plate potential), but a greater or less number of turns can be wound, depending on what plate potential is desired. Taps may be taken out at 2000, 2500 and 3000 turns to provide several different voltages.

After assembling it is well to mount the transformer on a wooden base or in a box, or in any convenient manner. The two primary coils are then connected in series. The two low-voltage secondaries are connected to the filament terminals of standard tube sockets, as shown in Figure 3. It may be necessary to connect small rheostats in this circuit if the voltage is slightly above that required for the bulbs. For example, four-volt filaments will in all probability require rheostats. The two secondaries are next connected so that the center connection is at exactly one-half of the total secondary potential. The other ends of the two secondaries go to the plate terminals of the standard tube sockets and it is also well to connect the grid terminals to the same posts, since they are not made use of in this rectifier circuit, and the use of both grid and plate together increases the active surface for rectification.

The current, which is now rectified by the two bulbs, is still not regular or smooth enough to be used for high-voltage source. In order to "iron out" the irregularities in the current, condensers C1 and C2 are used in conjunction with inductances L1 and L2, Figure 3. The condensers are the ordinary waxed-paper type, such as are used in telephone ringers, and should be of at least one microfarad capacity each. If obtainable, condensers such as are used on long distance telephone lines where a voltage of 1000 is employed are the best. The inductances L1 and L2 are iron core inductances of as low a direct current resistance as possible, but with as high an impedance to alternating current as can be obtained. A core of iron wire one inch in diameter and eight inches long wound with three or four pounds of No. 20 wire will give good results. The old type "make and break" gas engine ignition coils also answer the purpose very well. The details of these inductances and condensers are

not at all critical, the chief necessity being to have them large enough. If a humming is heard in the receiver, which is copying the tube oscillator using current from such a rectifier, it shows that there is either not enough inductance or capacity. With a little experimenting and adjustment of inductance and capacity the circuit can be so perfectly balanced that it is impossible to hear the hum.

The terminals marked plus and minus, Figure 3, are those from which the high voltage direct current is drawn for the plate circuit of the vacuum tube transmitter.

In closing it might be mentioned that the condenser and inductance circuit shown in Figure 3 may be used to smooth out the current coming from a direct-current high-voltage generator — for example, the curent from a ship's dynamo—to enable this source of current to be used for receiving tubes. Care must be used, however, in providing a potentiometer for tubes not requiring the full voltage.

The oscillator described in this article was successfully used to transmit messages fifteen miles on seventy-five meters, employing a two-step amplifier for receiving.

SAN FRANCISCO RADIO CLUB HAS HIGH JINKS

The San Francisco Radio Club believes in the saying, "All work and no play makes Jack a dull boy." That is one of the reasons why the high jinks held by the club in Veteran's Hall on December 16th was so successful. It was an open house night; everyone was welcome. Corn cob pipes were distributed and good tobacco for all kept the pipes burning and the hall full of smoke.

Hot dogs in rolls were served during the evening and no one left hungry; but the real main event of the evening was a raffle.

Tickets sold for only 5 cents a chance. Some of the articles won that evening were: Murdock tuner, Murdock variable condenser, pair of phones, a pound of good galena, two vacuum tubes, switch points and knobs and subscriptions to Pacific Radio News. The vacuum tubes were donated by the J. Meyberg Company of San Francisco.

Funds obtained from the raffle will be used to equip new club rooms with a modern radio installation.

An experimental meeting was held on December 22nd. Professor Tinsley of the Polytechnic High School demonstrated the advantages of the new honeycomb wound coils. He also showed the boys how to wind them.

Any men wishing to join should send in applications to the club at once, as the membership number is limited.

HERE'S A CHANCE FOR INVENTORS

Operators claim that the continued wearing of head telephone receivers is the cause of baldness. It is said that the bands which pass over the head exert a pressure sufficient to stop the circulation of blood to the scalp, thus starving the hair at that place and causing it to stop growing and finally to fall out. In the Orient one can see Chinese women who have grown bald where the head band, peculiar to the Chinese hairdressing style, has been pressing the scalp too much. This further supports the theory to a reasonable extent.

The question is: who is going to invent a device that will eliminate our worrying over the formation of a fly's skating rink on our "sconces"?

With the Manufacturers

HIGH TENSION INSULATING STANDARDS

Something that has been needed for a long time is the high-tension insulating standard put out by the Toledo Radio Specialties Company of Toledo, Ohio. A type of insulator of this kind is indispensable for holding antenna and all other high-tension leads in place without electrical losses caused by leakage.

This insulator is made of "Electrose," which in itself speaks well for its high quality and efficiency. A square brass plate is fastened to the bottom of the insulator for fastening it to the wall or table. The other end is furnished with a clip to hold copper tubing or may be ordered with a special clip or fastening for any purpose desired.

OARD RADIO LABORATORIES

With the object of supplying the Pacific Coast radio trade with a thoroughly complete line of both radio apparatus and parts, the Oard Radio Laboratories, whose manufacturing plant is located at Stockton, California, has begun an aggressive campaign through the California Electric Supply Company of San Francisco for both professional and amateur patronage.

With the closing of contracts between the two firms, the California Electric Supply Company is making steps to cover all important cities and towns in California, Oregon and Washington through their salesmen, and the next few months will see all centers well stocked with Oard radio apparatus.

In a talk with a representative of Pacific Radio News, Mr. Oard said: "Our line will be an unusually complete one and will include practically everything in radio material. Particularly will our supply of parts prove of interest to those who construct their own apparatus, as every possible need of the constructor will be met. Our finished apparatus line will also be one that will introduce a number of new types of apparatus which in laboratory tests have shown astonishing results."

It is stated that in private tests conducted at the plant in Stockton that a number of remarkable disance records on 200 meters have been made, the results of which will shortly be made public. The Oard catalogue is now in the process of compiling and will shortly be ready for mailing.

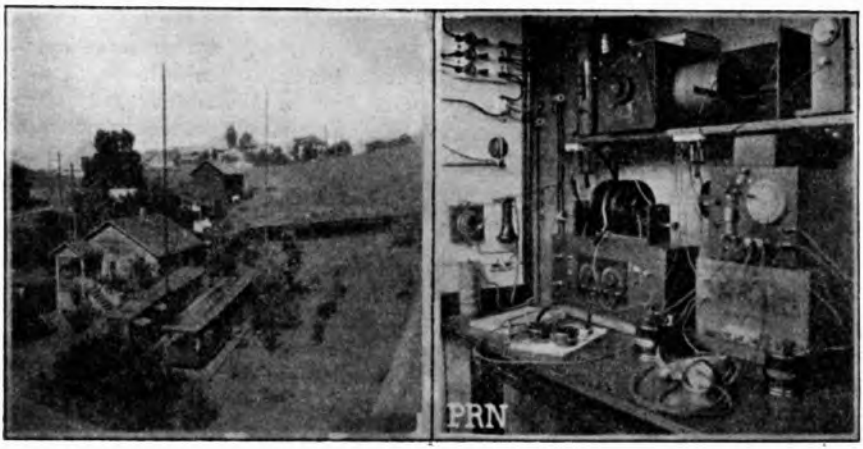
A special testing room has been provided at the California Electric Supply Company in San Francisco and all apparatus is tested before sale by the customers themselves. A type AW1 receiving cabinet, one of the most elaborate of radio receptors yet seen on this coast, together with a complete telephone transmitter, is being installed in this room and the radio fraternity in general is cordially invited to call and "listen in" at any time.

NEW CORPORATION FORMED

The Halcum Radio Company, Incorporated, is a new corporation recently organized under the California state laws. The capital stock is $100,000, of which $50,000 is subscribed and paid up. This corporation takes over the former business owned by Mr. G. F. Haller, known as the Halcum Radio Company.

(Continued on page 313)

AMATEUR STATION OF L. F. SEEFRED



Above are shown two photos of the amateur station 6 E B, owned by L. F. Seefred of Los Angeles, California. The antenna is 45 feet long and 51 feet high and is composed of 4 conductors of seven-strand No. 22 copper.

The receiving equipment consists of two couplers, one for long waves and another for short waves. Waves from 200 to 12,000 meters length can be copied with them. The other equipment is a single oscillating audion, Baldwin mica diaphragm phones, which saw service in France and Germany, and two Murdock variable condensers.

The transmitting set, not shown above, comprises a ½-KW Jefferson transformer, oil immersed condenser, non-synchronous rotary spark discharger and "pancake" type oscillation transformer.

Mr. Seefred says he has worked with 5ZA, 6AE, 6BQ, 6EJ and 7ZB. He hears the following stations in the sixth district: 6AL, 6AM, 6AT, 6BA, 6BB, 6BJ, 6BR, 6BZ, 6CE, 6CI, 6CL, 6CO, 6CQ, CCS, 6DK, 6DY, 6FE, 6GQ, 6GL, 6RN, and in the seventh district, 7ZB, 7CR and 7DK.

ARE YOU INTERESTED IN JOURNALISM?

And do you want to learn news reporting? Do you also desire to reimburse yourself for the trouble you go to?. If your heart is with us—that is, if you are "sold" on Pacific Radio News and want to pull with us—write to the editor, Pacific Radio News, 50 Main street, San Francisco, California.

DO YOU KNOW

THAT it is said, the only thing that limits the shortness of the wavelength of oscillations from a vacuum tube is the length of the leads necessary?

THAT if we could get this wavelength short enough, we would have the sensation of light?

THAT this form of light or sensation of light might be without heat, and that this has baffled science?

THAT although more inductance is needed to get to a certain wavelength, very much more selective tuning is obtained with a series condenser in the antenna circuit of a receiver, than if a shunted condenser were used?

THAT the size and resistance of the ground lead is one of the most important factors in determining the decrement of a transmitter?

THAT in order to be sure of a low decrement you cannot have too many separate grounds and leads of large enough wire?

THAT most of the so-called kick-back in an amateur's set is not kick-back at all, but is due to currents induced into the power or lighting supply leads directly from the antenna?

WELL KNOWN RADIO EXPERT OPENS SCHOOL AT SAN JOSE

As we go to press we learn that Mr. T. Lambert, one of the best known wireless men on the coast, has organized the San Jose Radio Institute, an institution devoted to the study of practical radio. Mr. Lambert's past activities as a manufacturer and operator of commercial wireless apparatus, as well as Director of Instruction at Marconi Institute, make him highly capable to prepare those who plan to enter the commercial field. His school is being equipped with modern type apparatus, both commercial and experimental, and the course, in addition to the regular code and technical instruction, will cover all practical radio measurements and the handling of commercial traffic. During the war Mr. Lambert achieved great success at the Marconi Institute with his original methods of preparing men for all branches of the radio service, in the minimum of time, and it is assured that his new school will be very successful.

POLYTECHNIC RADIO CLUB

The Polytechnic Radio Club will hold an "Open Night" on Saturday evening, March 6th, 1920, at their club room at the Polytechnic High School of San Francisco, Cal.

Regular code practice will be given and the club's receiving set will be in operation. Interesting experiments conducted by the electrical committee will be a feature of the evening.

All are invited to attend.

PACIFIC RADIO NEWS

SUBSCRIPTION CONTEST

ENDS MAY 1, 1920.

NOW IS THE TIME TO ENTER AND WIN

50 cents worth of Radio Apparatus for each Subscription you secure

YOU CAN'T LOSE

In the last issue of the Pacific Radio News we gave you the first hints of the fairest subscription contest ever run. Just think of it; you get 50 cents worth of radio apparatus for every single subscription sent in. Isn't that "easy money" for you? A fifty cent coupon will be issued to every contestant for each subscription. These coupons will be redeemed by the following firms at their face value:

Leo J. Meyberg Co., 428 Market St., San Francisco, Cal.
C. Brandes, Inc., 32 Union Square, New York City.
Colin B. Kennedy Co., 140 Second St., San Francisco, Cal.
Remler Radio Mfg. Co., San Francisco, Cal.
Tresco, Davenport, Iowa.
Oard Radio Laboratories, Stockton, Cal.
Audiotron Sales Co., Liek Building, San Francisco, Cal.
Halcun Radio Co., San Francisco, Cal.
Radio Apparatus Service, Washington, D. C.
Parkin Mfg. Co., San Rafael, Cal.
Western Radio Laboratories, 156 Second St., San Francisco, Cal.
Toledo Radio Specialties Co., P. O. Box 343 Central Sta., Toledo, O.
Radio Equipment Company, 1525 N. Fawn St., Philadelphia, Pa
Shotton Radio Mfg. Co., Scranton, Pa.
A. H. Grebe & Co., 10 Van Wyck Ave., Richmond Hill, N. Y.
Modern Radio Equipment Co., Elizabeth, N. J.
Wireless Specialty Apparatus Co., Boston, Mass.
The Acme Apparatus Co., 27 Windsor St., Cambridge, Mass.
The Western Radio Electric Co., 512 E. Ninth St., Los Angeles, Cal.

Others will be announced later. Your coupons may be used singly or in combination with others or cash. For instance if you wish to have a tuner selling for $15.00, just send in thirty fifty cent coupons, or, for example, twenty coupons and five dollars. In other words, use the coupons just like money.

DON'T FORGET THAT

PACIFIC RADIO NEWS is a comparatively new magazine and there are thousands of radio men everywhere who will subscribe if YOU will take their subscriptions.

Sixth District Amateur Stations

6FH	Steen, H. H.	2007 K St.	Sacramento, Cal.
6FI	Oard, Paul		Stockton, Cal.
6FJ	Barrett, E. D.	960 18th St.	Merced, Cal.
6FK	Trim, DeLoss P.	4033 Louisiana St.	San Diego, Cal.
6FL	Metcalf, D. E.	1825 So Ardmore Ave.	Los Angeles, Cal.
6IG	Gooding, H. L.	C. & A. Smelter	Douglas, Arizona
6IH	Lauze, Wm.	2424 Eye St.	Sacramento, Cal.
6II	Pearce, N. A.	2022 28th St.	Sacramento, Cal.
6IJ	Young, C. A.	704 E. Park Ave.	Eagle Rock, Cal.
6IK	Sprado, H. R.	1807 Balboa St.	San Francisco, Cal.
6IL	Gray, R. A.	1056 W. 53rd St.	Los Angeles, Cal.
6IM	Erler, R. J.	940 Tennessee St.	Vallejo, Cal.
6IN	Technical High Radio Club,	Broadway	Oakland, Cal.
6IO	Holmes, J. M.	720 So. 11th St.	San Jose, Cal.
6IP	Hurlburt, P. A.	140 Sacramento St.	Pasadena, Cal.
6IQ	Hone, W. R.	323 N. College Ave.	Los Angeles, Cal.
6IR	Barcus, N. W.	495 Jefferson St.	Pomona, Cal.
6IS	Ross, M. F.		Baldwin Park, Cal.
6IT	Rich, C. E.		Glendale, Cal.
6IU	Ogden, H. S.	722 So. Hanover St.	Los Angeles, Cal.
6IV	West, L. E.	1495 Victoria Ave.	Riverside, Cal.
6IW	Pennybacker, G. B.	235 Maple Ave.	Manteca, Cal.
6IX	Hansen, Victor	1443 Martel Ave.	Hollywood, Cal.
6IY	Banks, Dr. A. E.	Timken Building	San Diego, Cal.
6IZ	Hudgins, A. A.	845 "B" Ave.	San Diego, Cal.
6JA	Erickson, E. C.	358 Lisbon St.	San Francisco, Cal.
6JB	Weintraub, F. M.	96 Castro St.	San Francisco, Cal.
6JC	Roberts, H. W.	5327 Monte Vista St.	Los Angeles, Cal.
6JD	Bitz, V. M.	825 53rd St.	Los Angeles, Cal.
6JE	Blalack, C. E.	P. O. Box 111	Hopland, Cal.
6JF	Browning, S. D.	786 "B" St.	Hayward, Cal.
6JG	Schwenden, C. A.	170 So. Rowan Ave.	Los Angeles, Cal.
6JH	Olmstead, C. B.	259 23rd Ave.	Los Angeles, Cal.
CJI	Jackson, M. S.	833 17th St.	San Diego, Cal.
6JJ	Stockholm, V. S.	164 Effie St.	Fresno, Cal.
6JK	Scofield, P. F.	430 Kingsley Ave.	Palo Alto, Cal.
6JL	Storie, M. S.	74 So. 15th St.	San Jose, Cal.
6JM	Dennis, B. H. and Taylor, C. A.	Chalsworth & Hollister St.	San Fernando, Cal.
6JN	Breuer, H.	1284 W. 67th St.	Emeryville, Cal.
6JO	Coppa, J.	279 E. St. John St.	San Jose, Cal.
6JP	O'Leary, B. W.	5426 5th Ave.	Los Angeles, Cal.
6JQ	Norton, B. R.	825 21st St.	Napa, Cal.
6JR	Eiferle, C. F.	2020 Rutherford St.	Oakland, Cal.
6JS	McCauley, H. S.		Guerneville, Cal.
6JT	Andelin, M. S.	80 2nd Ave.	Salt Lake City, Utah
6JU	Francisco, W. E.	538 37th St.	Oakland, Cal.
6JV	Spencer, H. E.	R. F. D. Box 14	Rivera, Cal.
6JW	Tylor, O. B.	352 Illinois St.	Pomona, Cal.
6JX	Best, G. M.	419 Golden Gate Ave.	San Francisco, Cal.
6JY	Pashgian, A.	211 So. El Molino Ave.	Pasadena, Cal.
6JZ	Beckel, A. H.	372 25th Ave.	San Francisco, Cal.
6KA	Nikirk, F. E.	3936 Dalton Ave.	Los Angeles, Cal.
6KB	Klahn, L. L.	27 Chenery St.	San Francisco, Cal.
6KC	Jacob, R.	2701 University St.	San Diego, Cal.
6KD	Irey, E. R.	683 State St.	El Centro, Cal.
6KE	Taft, Leslie	5653 De Longpre Ave.	Los Angeles, Cal.
6KF	Binkley, R. E.	339 Fresno Ave.	Fresno, Cal.
6KG	Bellsnap, C. R.	6516 Fountain St.	Hollywood, Cal.
6KH	Fleming, R. P.	606 San Benito St.	Los Angeles, Cal.
6KI	McIntosh, H. S.	322 E. Cypress St.	Glendale, Cal.

Seventh District Amateur Stations

7AA	Renfro, H. E.	7319 48th Ave. S.	Seattle, Wash.
7AB	Craib, D. F.	2146 N. 69th St.	Seattle, Wash.
7AC	Kraft, Vincent I.	5503 14th Ave. N. E.	Seattle, Wash.
7AD	Brott, Francis J.	Walk 1, No. 10	Seattle, Wash.
7AE	Hastings, L. E.	2709 N. Cedar St.	Tacoma, Wash.
7AF	Spike, F. C. J.	Div. St. and Yakima Ave.	Tacoma, Wash.
7AG	Truesdale, H. M.	2770 E. 53rd St.	Seattle, Wash.
7AH	Benzon, Clarence.	3641 14th Ave. W.	Seattle, Wash.
7AI	Woodward, D. L.	369 14th St.	Portland, Ore.
7AJ	Mossman, F. B.	3015 N. 26th St.	Tacoma, Wash.
7AK	Belling, J. E.	3232 13th Ave. W.	Seattle, Wash.
7AL	House, Kenneth A.	130 Polk St.	Moscow, Idaho
7AM	Tingstad, A. E.	2507 I St.	Tacoma, Wash.
7AN	Williams, Chas. E.	8326 13th Ave. N. W.	Seattle, Wash.
7AO	Haw, L. G.	14th S. and Bayview	Seattle, Wash.
7AP	Smith, T. T.	1306 E. 75th St.	Seattle, Wash.
7AQ	Hoyt, Leander L.	506 Columbia St.	Seattle, Wash.
7AR	Bostwick, Robt. J.	2906 West Eaton St.	Seattle, Wash.
7AS	Eastman, Fred	1506 28th Ave. W.	Seattle, Wash.
7AT	La Pine, Earl	2301 East Madison St.	Seattle, Wash.
7AU	Webster, J. L.	2568 12th Ave. W.	Seattle, Wash.
7AV	Mahoney, L. F.	421 Schuyler St.	Portland, Ore.
7AW	Ganer, B. C.	3750 N. 30th St.	Tacoma, Wash.
7AX	Hagen, Bert W. R.	101 S. 11th Ave.	Yakima, Wash.
7AY	Slauson, W. E.		Bear Creek, Mont.
7AZ	Solomon, J. A.	7200 28th Ave. N. W.	Seattle, Wash.
7BA	Richard, Merle C.	3024 S. 9th St.	Tacoma, Wash.
7BB	Cookingham, M. G.	516 N. Cushman Ave.	Tacoma, Wash.
7BC	Benoit, Neville R.	5046 S. L St.	Tacoma, Wash.
7BD	Atchison, R. R.	656 E. 44th St. N.	Portland, Ore.
7BE	Bitter, Harold H.	3015 S. 11th St.	Tacoma, Wash.
7BF	Rebman, Edward.	3110 Sunderland St.	Seattle, Wash.
7BG	Weingarten, K. W.	3219 N. 24th St.	Tacoma, Wash.
7BH	Scott, Clive	345 S. 14th St.	Salem, Ore.
7BI	Smith, Lester		Tekoa, Wash.
7BJ	Sturley, George	206 E. 17th St.	Vancouver, Wash.
7BK	Mason, Howard F.	3335 33rd Ave. S.	Seattle, Wash.
7BL	Nelson, Mikko	5446 S. Junette Ave.	S. Tacoma, Wash.
7BM	Ball, C. W.	Route 1	Bellingham, Wash.
7BN	Henny, Geo. C.	530 Heights Terrace	Portland, Ore.
7BO	Lavallee, D. X.	4034 38th Ave. S.	Seattle, Wash.
7BP	Willison, R. A. Jr.	765 Melrose Drive	Portland, Ore.
7BQ	Allen, Hugh E.	701 State St.	Pullman, Wash.
7BR	Swan, E. N.	1461 Portsmouth Ave.	Portland, Ore.
7BS	Humphrey, O. J. Jr.	605 Boylston Ave. N.	Seattle, Wash.
7BT	Nelson, Geo. A.	4028 East K St.	Tacoma, Wash.
7BU	Hoag, Morris		Sheridan, Wyo.
7BV	Kennedy, C. F.		Kelso, Wash.
7BW	Hoffman, Carl A.	718 Sunset Ave.	Seattle, Wash.
7BX	Taylor, Floyd F.	227 N. Miller Ave.	Burley, Idaho
7BY	Bert, Wilfred K.	1924 9th Ave. W.	Seattle, Wash.
7BZ	Robbins Ernest O.	300 Fir St.	Olympia, Wash.
7CA	Schaaf, Edward A.	6302 22nd Ave. S.	Seattle, Wash.
7CB	Dow, Winifred E.	2329 S. K St.	Tacoma, Wash.
7CC	Woodworth, Jack.	107 Almon St.	Moscow, Idaho
7CD	Liffring, A. F.		Creston, Mont.
7CE	Reichert, H. G.	818 N. L St.	Tacoma, Wash.
7CF	Alexander, Roy J.	5046 S. K St.	Tacoma, Wash.
7CG	Kennison, C. J.	1521 Alturas St.	Boise, Idaho
7CH	Hoover, J. R.	1005 Harrison Blvd.	Boise, Idaho
7CI	Carleton, M. G.	1067 E. Burnside St.	Portland, Ore.
7CJ	Capehart, Carl R.	6314 S. Yakima Ave.	Tacoma, Wash.
7CK	Rooney, Joseph	214 Olympic Place	Seattle, Wash.
7CL	McMillan, W.	157 Harrison St.	Seattle, Wash.

PACIFIC RADIO NEWS
Subscription Contest
You Can't Lose!

50 cents given for each subscription sent in.

GRAND PRIZES:

To the contestant securing the greatest number of subscriptions, in place of coupons, we will give
1 Type SWR-6 short wave regenerative Receiver catalogued at $70.00. Made by The Colin B. Kennedy Co., San Francisco.

To the contestant securing the second greatest number of subscriptions, in place of coupons, we will give
1 Vacuum Tube Cabinet, listed at $25.00, made by the Western Radio Laboratories, and a Tresco 2,000 meter wave tuner.

As a third prize, in place of coupons, we will give
1 Acme Quarter K.W. Transformer, listed at $19.00.

At the date of going to press with this issue only a very few contestants have entered and there is a great chance to enter now and win the first prize. Don't delay entering and remember

You have till midnight of May 1, 1920, to get Subscriptions in the Mail to receive credit.

The names of all contestants will be printed next month
SIGN THE BLANK BELOW AND SEND IT IN

ENTRY BLANK

PACIFIC RADIO NEWS,
50 Main St.
San Francisco, Cal.

I hereby enter my name as contestant for the Pacific Radio News subscription contest starting February 1st, 1920, and ending May 1st, 1920.

Name.....

Address.....

City and State.....

(Continued from page 292)

The next points to consider are those in connection with the closed circuit. First in consideration let us take the condenser. There is no doubt that the mica and glass dielectric type of condensers are the best. However, a glass plate condenser immersed in oil beats them all. Even in mica condensers it is impossible to get rid of brush and leakage without immersing this important unit in oil. Transformer oil should be used, although any oil of high insulating value is satisfactory. No amateur will be satisfied with an ordinary plate glass condenser after he has used one immersed in oil. From the condenser let us turn to the rotary spark gap, which is the most common type of discharger used.

A high speed rotary with about twelve studs, such as the Murdock Co. makes, is considered to be very efficient. The accuracy of spacing the rotating plugs is very important and each plug should be equally spaced around the periphery of the rotor. The sparking distance should be by no means greater than a thirty second of an inch. If the stationary plugs cannot be closed in this close, the moving plugs must be evened up. In the most efficient gaps, under normal working conditions, a clearance of one-sixty-fourth of an inch can easily be secured.

Compressed air spark gaps are said also to be very efficient, especially for 60 cycle work It is understood that one will soon be on the market. In spark gaps, as well as in the other transmitting apparatus, high insulating quality should be considered.

The high voltage transformer should be all that the name indicates. The secondary voltage should be very high so that a satisfactory spark will occur with the use of a few plates of condenser.

Tuning is a matter to which no little amount of care must be given. Many transmitters fall down on long distance range because the fundamental of the antenna circuit is near two hundred meters and the closed oscillating circuit is working on a harmonic of about 400 meters. If a wave meter is used to tune the circuits care should be taken that the true fundamental wave length is heard in the phones of the wave meter. Several sharp points are usually heard in the phones. The coupling between the transmitter and the wave meter should be increased. until the pure wave is heard. This is always the loudest one. Be sure that all ground and antenna leads are disconnected from the oscillation transformer secondary while trying to get the wave length of the closed circuit.

The fundamental of the open circuit is easy to secure if the ground—antenna circuit is of low resistance as it should be. In making such a calculation with a wave meter, couple the oscillation transformer as far apart as possible and disconnect the condenser leads of the closed circuit.

The author has gathered the data in this article from actual experience at his station in Fresno, Cal. This station is heard consistently in Seattle, Washington; Roswell, New Mexico; and Houston, Texas, and also at many intermediate points.

(Continued from page 298)

height of sixty feet is shown in Figure 3. Here it is seen that an antenna of the foregoing type only forty feet in length has a natural period of one hundred and eighty meters. Figures 4 and 5 will prove of value to those desiring to build antennas for receiving with greater natural periods than 200 meters; that is, if they are constructed along the lines pointed out in the beginning with four wires of No. 14 bare copper spaced two feet apart and having their leads brought together ten feet from the ground.

If the amateur uses these graphs in designing his transmitting antenna he will be taking one more step towards better co-operation in the widespread endeavor to cut down interference from amateur installations being not properly tuned.

(Continued from page 303)

The corporation will engage in the manufacture of commercial and amateur radio equipment and all allied branches of the radio manufacturing business.

The Halcum Radio Company, Inc., has new quarters at 548 Howard street, San Francisco, having about five times the space of the former location on Market street, and a large amount of new machinery is being installed.

They will handle one of the largest stocks of radio apparatus on the Pacific Coast of their own manufacture and that of eastern manufactures such as Clapp-Eastham and Murdock.

Mr. G. F. Haller is president of the new concern and Mr. Henry K. Goldberg is secretary and treasurer.

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Please do not ask us to start your subscription with back numbers as our supply is exhausted.

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ADVERTISEMENTS IN THIS SECTION ARE THREE CENTS PER WORD NET. REMITTANCE, IN FORM OF CURRENCY, MONEY ORDER OR STAMPS, MUST ACCOMPANY ORDER.

AUDIO frequency amplifying transformers $4.00 P.P. One transformer with one Western VT-1 gives an energy amplification of 450 times. ADAMS & HULLIARD, 5410 Fulton St., Chicago, Ills.

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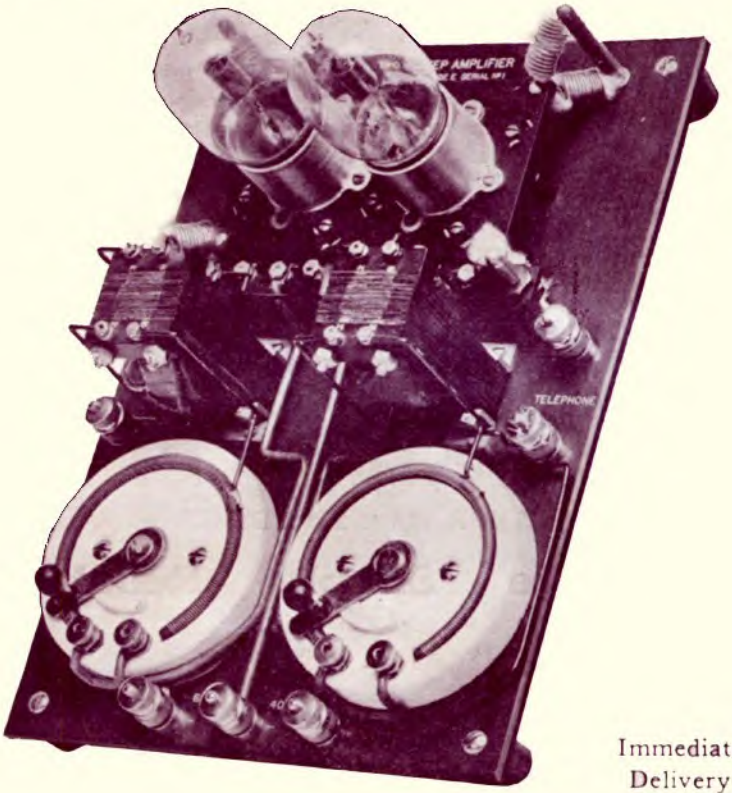

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