

PACIFIC RADIO NEWS



JUNE, 1920

FIFTEEN CENTS

IN THIS ISSUE:

The Moorhead Laboratory

Communicating With Mars

Current Radio News

New Amateur Calls

First and Only Pacific Coast Publication Devoted to Radio Communication

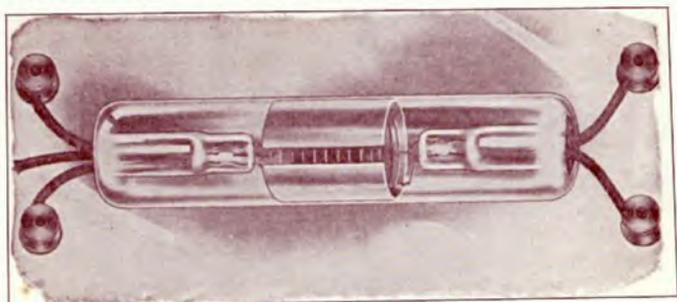
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The AudioTron Vacuum Tube is now manufactured and sold as a genuine audion licensed under DeForest Patents Nos. 841387 and 879532 to be used only for amplification in radio communication and only for experimental and amateur purposes and only in audio frequency circuits.

The AudioTron has a double filament of special thorium tungsten and the operating life is over 2000 hours. No special socket is required. The electrical and mechanical dimensions result in a heavy plate current and corresponding signal strength. Plate voltage under 40. Our guarantee insures Satisfaction.



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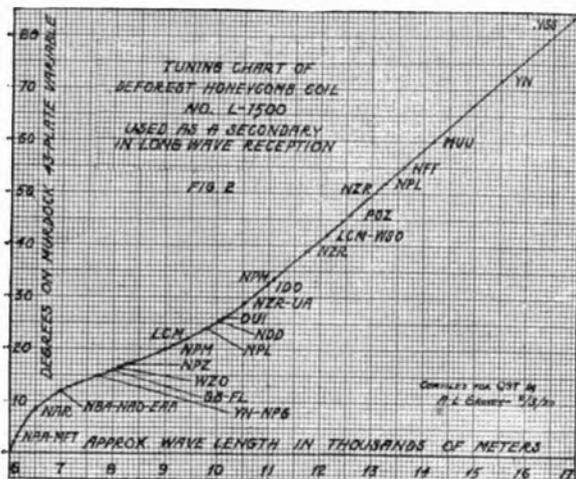
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Lick Bldg.,

San Francisco, Calif.

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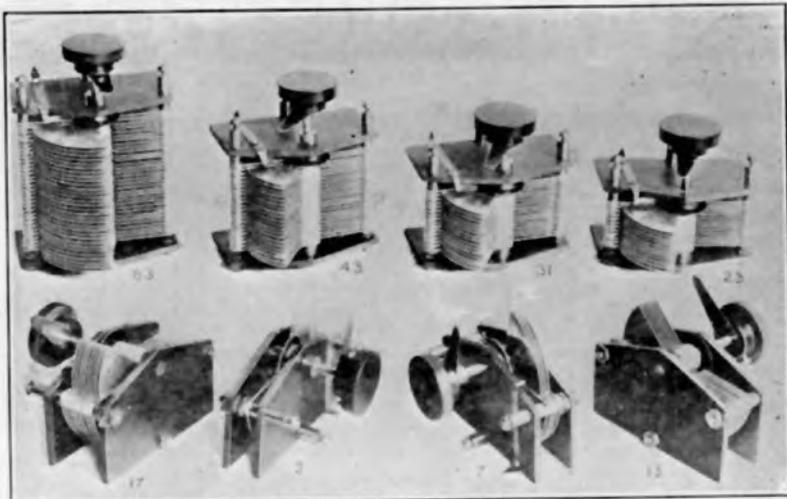
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Variable Condensers--Series "S"

For the Radio man who wants instruments that are right, in all respects, we can recommend this instrument. It is not built to sell in competition with some of the low priced instruments offered, but we are offering it at very reasonable prices, quality considered.

Bakelite-Dilecto end plates support both the moving and stationary elements. Die stamped aluminum plates and spacers insure uniform and rigid construction. Copper Ribbon connection to Moving set of plates eliminating dirty, high resistance contacts. Steel shaft, accurately ground to size. Stop pin fitted to condenser. Moving plates will stay put in any position, although movement is very smooth and easy. Bakelite-Dilecto end plates are now fitted to front and back end of all sizes listed, insuring perfect alignment.

Fitted with lathe turned knob, pointer and set screw, and mounting screws. Made for panel mounting especially. Specify the thickness of your panel and whether you want brass or nickel pointer and screws.

PRICES

No. 2—2 plate Vernier	\$1.85
No. 7—7 plate, .0001 m.f. max. cap.	\$2.15
No. 13—13 plate, .0002 m.f. max. cap.	\$2.50
No. 17—17 plate, .0003 m.f. max. cap.	\$2.85
No. 23—23 plate, .0005 m.f. max. cap.	\$3.25
No. 31—31 plate, .0007 m.f. max. cap.	\$3.50
No. 43—43 plate, .001 m.f. max. cap.	\$4.75
No. 63—63 plate, .0015 m.f. max. cap.	\$6.75

SPECIAL

We can now furnish our condensers fitted with a fine indicating dial instead of pointer. Dial is 3 1/4" in diameter, of heavy brass, black dial with white graduations and numbers.

If dial indicator is desired instead of pointer, add to above prices 75c.

Add to above prices, postage on one pound to your postal zone.

Our new catalogue is now ready for mailing. Send 5c in stamps, and your copy will be mailed at once. It is full of just what you are looking for.

The Wireless Shop

511 W. Washington St.

A. J. Edgcomb

Los Angeles, Cal.

Pacific Radio News

50 MAIN ST., SAN FRANCISCO

Vol. I

JUNE, 1920

VOL. 11

PAUL R. FENNER, Editor

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

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The Reorganization of the Moorhead Laboratories, Inc.

OF SPECIAL interest to radio circles is the recent reorganization of Moorhead Laboratories, Inc., during the last two months. This was effected largely through the efforts of Henry M. Shaw, President of the Shaw Insulator Company of Newark, N. J., and W. F. Williamson, an attorney and banker of San Francisco, the latter representing the local financial interests behind the Moorhead Company.

Mr. Shaw has been elected President of the company and will divide his time between San Francisco and Newark.

The Shaw Insulator Company controls the four-prong standard vacuum tube base in this country, as well as other elements entering into the construction of vacuum tubes. This insures prompt deliveries to the laboratories of all the material which will

be required in the construction of the tubes.



The Tubulating Operator

At the annual stockholders' meeting held in Seattle, on May 3rd, 4th and 5th, the following trustees were elected:

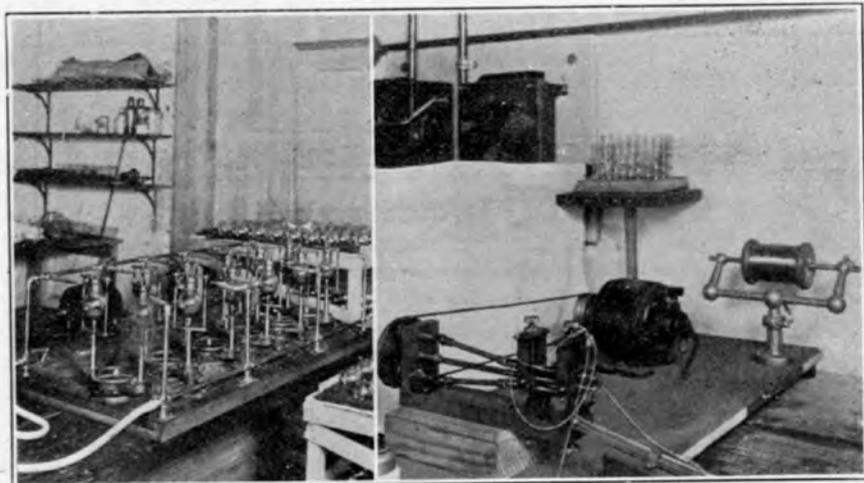
President, H. M. Shaw; Vice-President, C. M. Whitney, secretary Crown-Willamette Paper Company; Secretary-Treasurer, J. E. Allison; Chief Engineer, O. B. Moorhead; W. F. Williamson, George S. Stephens, banker.

A sales company, the Pacific Radio Supplies Company, has been organized to distribute the Moorhead products, Ellery W. Stone having been appointed as general manager. Mr. Stone resigned as resident manager of the Kilbourne & Clark Manufacturing Company to accept this appointment.

been organized and will distribute Moorhead products to Eastern territory.

Under the new organization, Mr. Moorhead is allowed to devote all his time to engineering and research work, assisted by Mr. H. R. Sprado, Lieutenant in the Signal Officers' Reserve Corps of the Army, and Mr. E. M. Borch, recently in charge of the Coast Artillery Radio School at Fortress Monroe.

Among the recent developments of the engineering department is the new based electron relay appearing



Basing Machine

Grid Winder

He was formerly United States Radio Inspector at this port and holds a reserve commission as Lieutenant in the Navy, having served as District Communication Superintendent at San Diego during the war.

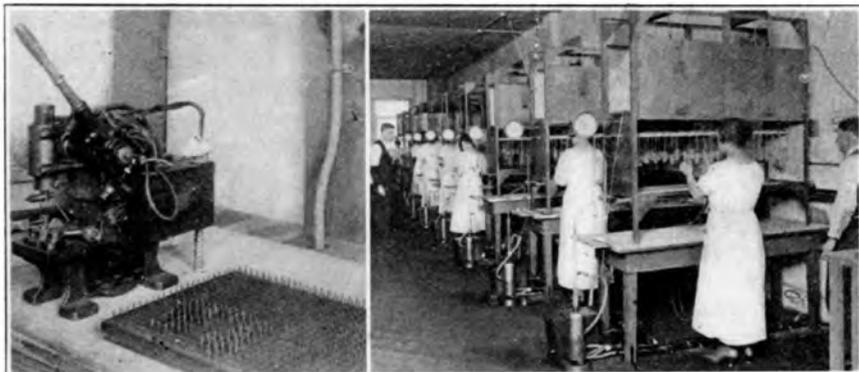
A sales distributor in the Orient has been appointed and negotiations are pending with the Japanese Government and Chinese radio interests. Orders have already been received from South American Governments.

An Eastern selling company, the Atlantic Radio Supplies Company, has

in the company's advertisement in this issue. This tube fills a long-felt want in supplying a "soft" detector tube with the familiar hissing point and low B battery potential characteristic of the old-style tubular electron relay, combined with the standard base.

A transmitting tube has also been developed and is now on the market, bringing the radio telephone and undamped wave transmitter to the amateur at a low figure.

The laboratories will shortly bring



Spot Welder for Grid

Evacuating Ovens and Pumps

out a rectifying tube which will enable amateurs to operate radio telephones on alternating current. One hundred and ten volt, sixty cycle, alternating current supply will be stepped up to one thousand volts, both halves of each cycle being rectified by this tube and thus providing a direct current of five hundred volts to the plate of the transmitting tube.

For amplifying work the company is supplying the familiar Navy type S. E. 1444 amplifying tube, which recent official Navy tests have shown to possess a higher amplification constant than any other tube on the market.

The Moorhead Laboratories feel,

therefore, that they have thoroughly covered the vacuum tube situation and are in a position to supply tubes of any description for any use.

The accompanying photographs show different views of the factory. About seventy-five people are employed, and the output is at present approximately eight hundred tubes per day. The factory is at present concentrating on an order for transmitting tubes for the United States Army Signal Corps.

Those in intimate touch with the affairs of the Moorhead Laboratories and its selling organizations feel sure that the Moorhead-Shaw interests will eventually control the future of the vacuum tube.

Big Radio Deal Closed

WHAT is termed by many prominent in wireless affairs "the most important radio deal yet made on this coast," has been put through in San Francisco within the past few weeks. By this transaction Dr. Lee de Forest, president of the De Forest Radio & Telephone Co. of New York, and Henry M. Shaw, president of the Shaw Insulator Company of Newark, N.J.,

have acquired a large interest in the Moorhead Laboratories, Inc., and henceforth will devote a considerable portion of their time to the conduct of its affairs.

Mr. Shaw, in fact, has assumed the presidency of the company and will divide his time between San Francisco and Newark.

(Continued on page 407.)

RADIO NEWS IN BRIEF

WHERE THE EAST IS AHEAD OF THE WEST

Wireless Telephones in Use in China

ROME, February 12.—The press today publishes an article by Sig. Marconi saying that America heads the list of all countries in the progress of wireless applications, her inventors having surpassed all others in producing practical apparatus for the transmission of the human voice through electric waves.

Sig. Marconi says that "It is a strange phenomenon that the most progressive nations of Western Europe have not yet adopted wireless telephones, while China, a most retrograde nation, daily uses wireless telephone for communications between the cities and rural districts.

"Within this year," says Sig. Marconi, "wireless telephones will substitute the present clumsy system, with great economic advantage, suppressing the costliness of their upkeep and also suppressing the interruptions due to atmospheric reasons, by which entire regions now remain isolated."—The Buenos Aires Herald.

KILBOURNE & CLARK MFG. CO. IN HANDS OF RECEIVER

The manufacture of radio and electrical equipment by the Kilbourne & Clark Mfg. Co. of Seattle, Washington, will be discontinued. The entire plant has been shut down.

FRANCE BUYS RADIO MARVEL

The greatest wireless apparatus of the world, the signals of which will be heard in any part of the surface of the earth, has just been completed by the Federal Wireless Telegraph Company in its Palo Alto plant, and has been sold through the medium of the United States Government to

the French Government for the sum of \$3,000,000.

The apparatus, which is the work of California engineers, all graduates of Leland Stanford University, is at present being installed at Croix d'Hins, near Bordeaux, and will be opened in the latter part of May.

One of the first messages exchanged will be one between the French station and the Federal Telegraph Company in San Francisco.

This means that, for the first time in history, San Francisco will be in direct wireless communication with France without messages having to be relayed from station to station.

President R. P. Schwerin and Secretary A. Taylor of the Federal Telegraph Company stated yesterday that the feat of producing an apparatus of such an immense volume reflects great credit on the California engineers responsible for it.

The new Bordeaux station will be twice as powerful as the wireless station of the Navy Department at Annapolis, which is of 500 kilowatt transmission. It will be five times as powerful as the station at San Diego, which is of 200 kilowatt—San Francisco Examiner.

SIGNAL CORPS TRAINING MEN IN RADIO WORK

During the war the Signal Corps of the United States army developed a large number of expert radio operators to take care and maintain the numerous army radio stations. These men rendered much valuable service both in this country and France, but now they are mostly back in civil life again.

To meet the demand for the large number of radio operators required by the Signal Corps, radio schools have again been established to train

(Continued on Page 405.)

Federal Telegraph Co. Develops Apparatus for Sending Three Wireless Messages Over Same Antenna

APPARATUS enabling three wireless messages to be sent simultaneously on the same antenna system, where only one could be sent before, is the newest achievement of the local plant of the Federal Telegraph Company, Chief Engineer R. R. Beal announced today. Demonstrations that have been made daily for a period of time prove the practicability of the system, which allows a telephone conversation and two telegraphic messages to be sent on the same antenna system.

The great significance, commercially, of this achievement is the reduction of expense it allows, since one station can handle the load of three.

To Develop Commercial Business

As the Federal Telegraph Company is preparing to launch into the commercial message business, this increased efficiency in radio transmission is a timely development. During the war period, when the capacity of the plant was devoted exclusively to the filling of orders for apparatus for war use, the commercial message business was suspended.

The plans for its revival include the erection of a series of stations stretching over the Pacific Coast. There will be stations erected at or near Portland, Oregon; San Francisco, or some peninsula point; Los Angeles and intermediate points, with the station in the San Francisco vicinity serving as the center.

Manufacturing Line to Extend

The building up of a general manufacturing industry in the Federal plant is the special ambition of the concern, toward which the officials of the company are now working.

Beal stated today. The manufacture of radio apparatus, he explained, is largely emergency business, and if it continues to be the exclusive output of the plant, the industry could never be stabilized.

The Federal Telegraph Company, he stated, proposes, therefore, to take on contracts for building all kinds of machinery for which its equipment is suited. As a guarantee of its stabilized ability in that line, the company proposes to develop its working organization to a force of about 200 employees, men with families who plan to locate in Palo Alto being favored for positions. At present the force includes 145 employees.—Palo Alto "Times."

Tell our readers how you made that "pet" piece of apparatus. We will send you a check for the article.

ANNOUNCEMENT!

The August, 1920, issue of PACIFIC RADIO NEWS will be increased in page size to that of the large radio publications. The enlarged issue will be ready for distribution on July twentieth. It will bring you many surprises. Get busy and write a good, snappy article on how you made your favorite apparatus. Help us make the big issues a success. We pay you for good material. Remember—there will be only one more issue of the present size. We will tell you more about the "Pioneer Journal on Western Radio News and Development" in our next issue. Don't miss it.

The Construction of Modern Radio Apparatus

By Wm. Williamson

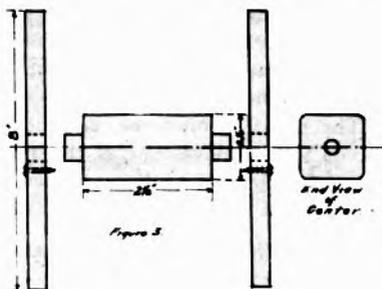
Part II.

(Continued from May issue.)

After the core has been completed, it will be necessary to wind the primary and secondary coils. The primary coils are to be wound with double cotton covered wire, and the secondaries with enamel wire. Thin sheet fibre or cardboard is to be used between layers of the primary windings. The secondary is to be wound with thin manila paper strips between layers. It will be necessary to construct a form for winding the coils. Several methods of winding may be used, but the most desirable method is to mount the winding form in a lathe, which is caused to revolve backwards, and wind all the coils with the lathe revolving. A substitute for this method can be had in the usual "breast drill," mounted in a vise, so that the handle can be turned freely, the form being mounted on a long rod, threaded at the end and mounted in the chuck.

Figure 3 shows the constructional details of a form for winding the coils for a $\frac{1}{2}$ KW transformer. Changes can easily be made for the various sizes of transformers. In the case of a form for the $\frac{1}{2}$ KW transformer winding, the center is made of a wooden block, 2.25 inches square, and 2.5 inches long between the sides of the cheeks of the form. For a $\frac{1}{4}$ KW winding the center block will be 1.75 inches square and 2.5 inches long. For a one KW winding, the block would still be of the same length, 2.5 inches, but would be 2.5 inches square.

It will be noted that the corners of the block are shown rounded; this is simply done to facilitate winding. It is very difficult to wind on a square form with sharp corners.



The two cheeks, or side pieces, may be made of $\frac{3}{4}$ inch wood, as shown, or any other convenient material. It is desirable to use round cheeks. They are held to the center block with wood screws, as shown in the drawing. Clamp the form together by means of the center rod and a large nut, fitted with a washer.

Before proceeding with the winding, a layer of hard string or twine must be wound around the center in the same manner as the wire is to be wound. This string is to be pulled out from under the coil windings after the coil has been completely wound. In this manner the completed coil will slip off easily from the winding form.

For winding the various coils the following wire will be needed:

	250 Watt		
Primary size	.....No. 16 DCC	Secondary size	.....No. 32 Enamel
Primary weight	.....4.0 lbs.	Secondary weight	.....5.0 lbs.
Secondary size	.....No. 34 Enamel		
Secondary weight	.....3.0 lbs.		
	500 Watt		
Primary size	.....No. 14 DCC	Primary size	.....No. 12 DCC
Primary weight	.....6.0 lbs.	Primary weight	.....8.0 lbs.
		Secondary size	.....No. 30 Enamel
		Secondary weight	.....7.5 lbs.

The primary coil is to be wound in layers, and each layer separated from the next by a strip of thin fibre, or cardboard, cut to a width of exactly 2.5 inches and of sufficient length to completely insulate one layer from the next. The secondary is also wound in layers. Use insulating paper strips between each layer of the secondary winding. It is best to secure a roll of paper from a paper supply house, cut to the exact width, as it is almost impossible to cut by hand and still make a neat job of it. Thin manila paper is about the best material to be found for this purpose. We are now ready to wind the primary coil.

It is desirable to wind the primary coil first, unless the builder has had experience in coil winding, as it is easier to become accustomed to the "feel" of the winding machine with heavy wire than it is with the small secondary wire. Take the end of the primary wire and bend it at an angle of 90 degrees, about one foot from the end. This will serve as the lead from the lower end of the coil. Now take a piece of tape and slip it over the wire in such a man-

ner that it lays flat across the winding form with its two ends away from the loose end. The succeeding turns will then hold it firmly in place.

Now proceed and wind the first layer. It will be found that if the wire is allowed to run naturally from the supply spool, and if the hand that guides the wire is held about a foot away from the form, the turns will slip into place with very little difficulty and a smooth, firm layer will result. Continue winding until you reach the end of the layer, wind a piece of the fibre or cardboard insulating material over the layer and continue with the next layer. All succeeding layers are wound in like manner.

Solder a tap to the fifth, fourth and second layers from the top in order to permit variations of power. When the primary winding has been completed, the coil and form are removed from the winding machine, one end of the cheek loosened and the string pulled out from under the first layer of the winding. Wind several layers of tape around the coil to hold the layers firmly in place.

(To be continued.)

DANIELS WILL USE RADIO PHONE

While on the way to New York with the Atlantic fleet, Secretary of the Navy Josephus Daniels will talk with the people of the city by wireless telephone from the flagship Pennsylvania on Saturday morning. His speech will be delivered to the public in Times Square by means of amplifying devices installed by the

Navy Department co-operating with The New York Times radio receiving station on the roof of the Times building.

A group of wireless experts from the navy are now equipping the Times radio station with a "magnavox" and receiving horn, capable of making Mr. Daniels' voice audible for at least a block above the traffic noises of Times Square.

RADIO CLUB NEWS

THEY'RE AT IT AGAIN!

The San Francisco Radio Club, Inc., has completed arrangements for a checker tournament to be played by wireless. Contestants for the game have taken a lively interest in the affair, and the club will offer prizes to the winner. The prizes will be in the form of radio apparatus or exemption from payment of dues for certain periods.

All radio amateurs of the city and bay counties will receive the necessary information relative to the marking of the checker boards and checkers and can thereby follow up the game as it progresses.

For further information address the Checker Committee, 355 Presidio avenue, San Francisco.

NEW MONTEREY RADIO ASSOCIATION

On March 15, 1920, amateurs of Monterey and vicinity organized the Monterey Radio Association. Progressiveness is the keynote of the newly organized club, and amateur radio communication will benefit thereby.

An up-to-date receiving set will be installed shortly. Station "6DI" will be used for transmitting by means of remote control from the club room.

The following officers were elected at the initial meeting: Harry A. Greene, Jr., President; Herbert Hand, Vice-President; Stanford J. Wood, Secretary.

Communications from other clubs will be appreciated and should be addressed to the Secretary, 512 Watson street, Monterey, Cal.

RADIO CLUB HAS TRANSMITTING SET

The Polytechnic Radio Club of San Francisco has recently installed a transmitting set and claims the distinction of being the first high school radio club to transmit radiograms in the vicinity of San Francisco. Meeting nights have been changed from Saturday to Friday. A membership campaign is now in progress. Initiation fees have been temporarily suspended.

SOUTHERN CALIFORNIA HAS LARGE RADIO ASSOCIATION

Under the name of the Radio Association of Southern California, a number of enthusiastic radio men have organized a radio club in Los Angeles and although the club has held but four business meetings, the membership has already reached the total of eighty, with prospects of doubling the membership during the coming month. Meetings are held in the Y. M. C. A. building. Professor Budolski delivered a lecture on "Telephone Receivers and Transformers" at the last business meeting.

The object of the Association is to promote the art of radio communication in Southern California, and the regulation of traffic, both for local and long distance work.

The initiation fee is fifty cents, an exceptionally low fee, and the annual dues are \$2. A cordial invitation is extended to all amateurs of Southern California to attend the meetings.

For further information address the Secretary, Radio Association of Southern California, Room 600, Y. M. C. A. Bldg., Los Angeles, Cal.

AMATEUR LICENSE REVOKED

The station and operator licenses of Philip Scofield, 430 Kingsley street, Palo Alto, California, have been cancelled by the local radio inspector. Scofield was accused of using profane language "over the air." The radio inspector has stated that this is the first offense of using obscene and profane language and warns all operators to refrain from the use of same.

MILWAUKEE AMATEURS' RADIO CLUB

After being disbanded for the duration of the war, the Milwaukee Amateurs' Radio Club of Milwaukee, Wisconsin, has regained its former status and "Business As Usual" is now their slogan.

Regular meetings of the club are held every Thursday evening at 8:00 P. M. in the Trustees' room of the Milwaukee Public Museum. A snappy business meeting takes up the early part of the evening. Lectures by prominent radio men are then delivered, followed by a general discussion on radio by the membership.

Under the leadership of Mr. Elmer Schoepfer, the club is organizing a radio class, in order to prepare members for commercial licenses.

As a special feature the club maintains a catalogue distribution service and has all the late radio publications on sale on meeting nights.

Visitors are welcome at all meetings and communications from other radio clubs are invited. Address communications to Executive Headquarters, 2319-2329 Wells street, Milwaukee, Wis.

NEW SUBSCRIBERS

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

AMATEUR WIRELESS ASSOCIATION ACTIVE

The reorganization of the Astoria Amateur Wireless Association effected recently, with E. P. Hawkins as president, Carl Josephson as vice-president and E. A. Smith as secretary-treasurer, will stimulate anew the active interest in the radio game which was suspended at the outbreak of the war. The association has a charter membership of fifteen.

The aim of this association is to place all amateur wireless men of the lower Columbia River district under one head in order that the full educational value, as well as a pleasant pastime, may be obtained out of this work. A chain of relay stations to Portland is contemplated.

Classes will be held each week under the supervision of Messrs. Hawkins, Josephson and Smith, all of whom are experienced commercial operators, and the boys will be given every opportunity to improve themselves in all branches of wireless communication.

CONFERENCE ON COMMUNICATIONS

President Wilson today nominated A. S. Burleson, United States Postmaster-General; Rear-Admiral Benson and Walter Rogers to be the North American members at the international conference on communications.

The conference meets shortly in Washington to consider the international aspects of communication by telegraph, telephone, cable and wireless in the entire world and adequate facilities for international communications on a fair and equitable basis.

A dollar bill brings you PACIFIC RADIO NEWS for nine months.

Marconi Company Loses Fight for Millions

INVOLVING wireless patent infringement claims of \$7,000,000, a decision was handed down on May 3rd by the United States Circuit Court of Appeals sustaining the decision of the United States District Court at Seattle against the Marconi Wireless Telegraph Company in its suit against the Kilbourne & Clark Wireless Company of Seattle.

The original suit was brought in 1915. The decision sustaining the findings of the lower court in favor of the defendant company is made by Justices William H. Hunt, William S. Gilbert and Erskine M. Ross.

The decision covered only a phase of the action, this being a direct suit against the Kilbourne & Clark Company in which approximately \$3,000,000 was claimed for alleged infringement on the Marconi patented mechanism. Another action for \$4,000,000 damages, instituted by the Marconi

Company against the United States Navy, is pending in the Federal Court of Claims, it being held in this pleading that the Navy is using the Kilbourne & Clark mechanism without regard for the alleged Marconi rights.

In its answer the Kilbourne & Clark Company held that there was no infringement, as it used a set entirely distinct from the plaintiff company. On December 11, 1916, the United States District Court in Seattle adjudged that certain of the claims of the Marconi Company regarding what are known as the Oliver J. Lodge patents were sustained, but that the patent right had expired and no damages should be forthcoming. Certain other claims of the Marconi Company were held valid, but it was held that there was no infringement on the part of the defending company.—San Francisco Call and Post.

OARD TO ESTABLISH AGENCIES

It is the intention of the Oard Radio Laboratories to establish agencies which will be controlled by local radio operators in all important cities in the United States, and under their plans, those with a thorough understanding of the radio amateur and his requirements will be afforded an opportunity to take up radio sales work.

Mr. W. A. Vetter, formerly with the Marconi Wireless Telegraph Company, as superintendent of construction, has resigned his position and accepted a partnership with Mr. A. S. McKenzie of the Pacific Radio School.

Mr. Vetter is well known in radio circles on the Pacific Coast and has eleven years of radio experience to

his credit. He will take an active part as instructor at the school.

Heard at 6BN, San Francisco, for month of February: 6AK, 6BQ, 6CV, 6DK, 6DH, 6EA, 6EB, 6EN, 6FE, 6HH, 6JD, 6ZA, 7AD, 7CC, 7DK, 7CW, 7YS, 7ZB, and have worked 6ER.

RADIO CLUB SECRETARIES

will do well to keep us informed of the activities of their clubs and will benefit by writing for information regarding special subscription offers to club members.

PACIFIC RADIO NEWS

How about that article you were going to write for PACIFIC RADIO NEWS? We pay you for good material.

With the Manufacturers

NEW COMPANY ORGANIZED

A new radio organization by the name of the Pacific Radio Distributing Company has been formed in the city of Pomona, California.

Noting the difficulty with which apparatus was obtained by the Southern California amateurs, two young men of Pomona decided to organize a radio company and reduce the long delay necessary to get any piece of apparatus.

Although this company will keep on hand a complete stock of Doron, Teco, Parkin-Remler, Amrad, Wilcox and other well known brands of apparatus, they intend to specialize in raw materials and parts, as there is a much larger demand for these than for the finished products.

The aim of this organization is to sell high-class apparatus in conjunction with high-class service.

A NEW VARIOMETER

The variometers recently placed on the market by the Radio Shop of San Jose, promise to be one of the most valuable additions to the amateur field in some time. Regenerative receiving sets are, without a doubt, the most efficient for short wave communication, but due to the mechanical difficulties involved in the construction of the variometers necessary for such sets, very little success has been attained by those who desire to construct their own apparatus. The Radio Shop, through their extensive manufacturing facilities, have developed this unit to mechanical and electrical perfection that leaves nothing to be desired. The extremely small clearance between the rotating

and fixed windings results in a range of wave lengths not before obtainable. These variometers were designed expressly for a range of from 100 to 500 meters, but good regenerative effects are obtained at frequencies of over 600 meters. Their simplicity for panel mounting is another very desirable feature. This firm is also placing on the market a small vario coupler for use in connection with the variometers, resulting in a combination that guarantees maximum strength of signals combined with great selectivity. The fact that one of our leading manufacturers of high-grade receiving apparatus uses the Radio Shop variometers in his regenerative receivers speaks well for their efficiency.

The Radio Engineering Company of Baltimore, Md., has recently been incorporated with a capital stock of \$25,000. This company, although young in the field, is manufacturing an excellent grade of radio apparatus, especially apparatus for short wave relay stations. Among the new apparatus they will have for distribution shortly is a novel short wave regenerative receiver, detector and amplifier controls, a beautiful sending key and several sizes of transformers. A new and unique tubular bulb adapter will also be placed on the market by this firm and they are contemplating something new and original in antenna transfer switches and oscillation transformers.

The firm is under the management of Charles E. King, E. B. Duvall, and J. Q. A. Holloway, all well known in radio circles.

Mars is Silent to Earthly Calls

(From the "Evening Sun," Omaha, Neb., April 22, 1920)

Mars did not send a communication to the earth last night, or if it did the message did not reach the wireless station near Omaha.

Dr. Frederick E. Millener, wireless scientist, sat all night trying to pick up any signal which the Martians may have started across interplanetary space with the object of telling people of this earth that other intelligent beings were abroad in the universe. At daylight this morning Dr. Millener issued the following statement:

"The early part of the evening we were troubled with heavy static so that it was impossible to hear anything except stations in South America, Europe and the United States. During the later hours of the night when the wireless was stretched to its fullest extent to hear interplanetary communication, we heard nothing that could by any stretch of the imagination be construed as a message from Mars.

"Our experiments will be continued again tonight."

The feature of the big station is the unusual wave length and the complete mechanism for clarifying and analyzing sound. The aerial is a dead wire 81,000 feet long.

The 20,000 meter coupler and the 81,000 foot aerial were swung into the circuit and the wave gradually lengthened. All the notes of the scale sounded higher and higher until the highest tone passed beyond the hearing and above the range of earthly wireless.

As the station started searching through the infinite regions of interstellar space, all sounds ceased. The wave was far above the sounds

of the earth and nothing would have been recorded except sounds of a wave length which no sending station on the earth could have produced.—Omaha Evening Sun.

The Latest Spooif

Some of the London newspapers are running the so-called Marconigram mystery for considerably more than it is worth. The story is, of course, that certain mysterious Morse code signals—they do not pretend to amount to messages yet—have been received from nowhere by some Marconi operators. And the Northcliffe press is booming the superstition that they are messages from some other planet, possibly Mars, which is, only about thirty-five millions of miles off, trying to ring us up. Serious scientific folk are lending their authority to the supposition that it "may" be a planet calling us, and in these days, when the shams exploded in the early Victorian days are once more popularly swallowed, some people may believe it. A thing which it is perfectly impossible to disprove is always a fairly safe thing to attempt to prove. But the conception of Morse code signals from Mars is carrying credulity rather far even in these days. Probably the explanation is that the Martians want to know what won the "2:30!"

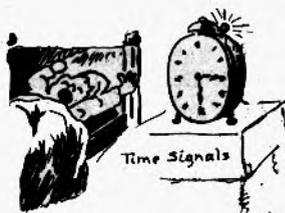
MORSE MESSAGES FROM THE MAN IN THE MOON

For several days operators of the Australian wireless service have picked up mysterious unaccountable signals.

NATIONAL RADIO SELLS RIGHTS

President J. B. Ruegg of the National Radio Company received a wire from the company's attorney, Frank Golden, to the effect that a deal had just been closed with a Vancouver syndicate whereby the company disposes of its Canadian patent rights to the Canadian Radio Telegraph and Telephone, Ltd., for a consideration of \$500,000.

Payment is to be made in 6 per cent debentures of the Canadian company, maturing over a period of two years. Harry Pearce and Gwynne H. Meredith are the men who signed the contract for the Canadian corporation. The deal was closed yesterday following a successful conversation on the company's instruments between Victoria and Vancouver.



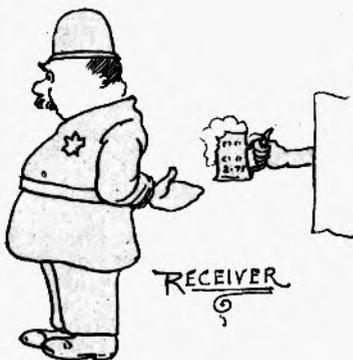
Wireless Telephony



North Gets First Line

The closing of this deal also indicates that the first commercial wireless line to be placed in operation on this continent will be between Seattle and Vancouver. The National Radio Company announces that it will erect a permanent station at Seattle, while the Canadian syndicate plans similar steps at Vancouver.

The National Radio Company has been experimenting with the wireless telephone and telegraph for ten years, but its efforts were practically suspended during the war period when the government took all wireless matters under control. The company owns the Jaenke patents; also the McCarty, though the latter are not employed at present.



MISSES THE NEWS

A man interested in radio who is not a subscriber to PACIFIC RADIO NEWS misses a great deal.



WHEN A FELLER NEEDS A FRIEND

Sixth District Amateur Stations

6PI	McGlashan, B. S.	2333 W. 21st St.	Los Angeles, Cal.
6PJ	Schmidt, H. D.	27 Dakota Av.	Santa Cruz, Cal.
6PK	Wilson, L. R.	319 E. 14th St.	Tucson, Arizona
6PL	Brockaway, D. C.	4402 Sunset Blvd.	Los Angeles, Cal.
6PM	Conner, L. H.	2017 J St.	Sacramento, Cal.
6PN	Stewart, L. M.	3850 7th St.	San Diego, Cal.
6PO	Doty, Paul I.	9 Pine Av.	San Jose, Cal.
6PP	Mattoon, Stanley.	7364 Hollywood Blvd.	Los Angeles, Cal.
6PQ	Finley, M. H.		Santa Ana, Cal.
6PR	Willey, O. F.	89 May St.	Santa Cruz, Cal.
6PS	Reilly, R. J.	2170 Hobart St.	Los Angeles, Cal.
6PT	Easton, G. E.	505 Madison St.	Monterey, Cal.
6PU	Alford, J. H.	Box 248 R. R. 42.	San Jose, Cal.
6PV	Hammerly, H. C.	527 Merrimac St.	Oakland, Cal.
6PW	Wilson, P. S.	136 Caine Av.	San Francisco, Cal.
6PX	Early, F. J.	525 Manila Av.	Oakland, Cal.
6PY	Bowers, P.	364 Santa Clara St.	Oakland, Cal.
6PZ	Noak, H. P.	309 Perry St.	Oakland, Cal.
6QA	Doig, J. R.	4437 View St.	Oakland, Cal.
6QB	Burgess, A. M.	8125 Geary St.	San Francisco, Cal.
6QC	Polytechnic Radio Club.	Frederick, nr. 1st Av.	San Francisco, Cal.
6QD	Uecker, W.	3590 Lincoln Av.	Alameda, Cal.
6QE	Shaw, H. R.	897 California St.	San Francisco, Cal.
6QF	Schack, Fred	1014 Castro St.	Oakland, Cal.
6QG	Montgomery, A. R.	512 E. 9th St.	Los Angeles, Cal.
6QH	Lifschiz, P.	1257 Guerrero St.	San Francisco, Cal.
6QI	Jefferies, K. W.	Route 1, Box 180.	Monrovia, Cal.
6QJ	Rickey, F. H.	278 Molino Av.	Long Beach, Cal.
6QK	Bell, R. H.	482 Callisch St.	Fresno, Cal.
6QL	Pitter, E. M.	2910 P St.	Sacramento, Cal.
6QM	Griffin, E. J.		Williams, Cal.
6QN	Barbier, K.	1561 Jackson St.	Oakland, Cal.
6QO	Weeks, G. N.	1535 E. 38th St.	Oakland, Cal.
6QP	Simpson, R. J.		Ross, Cal.
6QQ	Belcher, F. G.	241 W. Kalima St.	San Diego, Cal.
6QR	Lewis, G. M.	221 West St.	Reno, Nevada
6QS	Leyer, L.	1515 Shattuck Av.	Berkeley, Cal.
6QT	Wilson, K.	1801 Vine St.	Berkeley, Cal.
6QU	Pickard, C. J.	660 19th St.	Richmond, Cal.
6QV	Wattson, H. B.	110 Los Robles Av.	Pasadena, Cal.
6QW	The Radio Shop.	Bank of Italy Bldg.	San Jose, Cal.
6QX	Welch, C. V.	959 E. 4th St.	Pomona, Cal.
6QY	Chase, F.	24 Walnut Av.	Santa Cruz, Cal.
6OZ	White, R.	453 Oakland Av.	Pasadena, Cal.
6RA	Jones, D. P.	620 Mariposa St.	Oakland, Cal.
6RB	Pfeiffer, V., Cooney, G.	Box 219 M. R. A.	Los Gatos, Cal.
6RC	Teeter, F. K., Jr.	365A 11th Av.	San Francisco, Cal.

Seventh District Amateur Stations

7EX	Wharton, E. L.		Glasgow, Mont
7EY	Ashla, C. N.	150 E. Terrace St.	Portland, Ore.
7EZ	Morgan, E. W.	530 Temino Av.	Portland, Ore.
7FA	Forrest, J. C.	438 High St.	Bellingham, Wash.
7EB	Richie, C. E.	631 Main St.	Klamath Falls, Ore.

Seventh District Amateur Stations---Continued

7FC	Young, L. S.....	1055 Hancock St.....	Portland, Ore.
7FD	Moore, Alvin.....	634 E. 65th St. N.....	Portland, Ore.
7FE	Richards, F. T.....	6325 5th Av. N.E.....	Seattle, Wash.
7FF	McCullough, G. B.....	608 S. 2nd St.....	Tacoma, Wash.
7FG	Fifield, Roy.....	278 Baldwin St.....	Portland, Ore.
7FH	Bird, Vernon J.....	416 W. 12th St.....	Vancouver, Wash.
7FI	Campbell, D. W.....	204 Spaulding St.....	Pullman, Wash.
7FJ	Byerly, L. A.....	909 Bryce St.....	Portland, Ore.
7FK	Wetzel, T. A.....	904 Vancouver St.....	Portland, Ore.
7FL	Gray, F. F.....	1208 2nd St.....	Butte, Mont.
7FM	McBride, J. E.....	Cor. Bella and 25th St..	Boise, Idaho.
7FN	McMillan, Roy M.....	3727 Pacific Av.....	Tacoma, Wash.
7FO	Wallgren, Lloyd.....	2124 Wetmore Av.....	Everett, Wash.
7FP	Shaver, J. D.....	939 The Alameda.....	Portland, Ore.
7FQ	Goddard, L. R.....	527 Water St.....	Tekoa, Wash.
7FR	Jones, H. L.....	1208 W. 70th St.....	Seattle, Wash.
7FS	Dupuy, Hiram, Jr.....	3621 N. 26th St.....	Tacoma, Wash.
7FT	Teed, Currie N.....		Kuna, Idaho.
7FU	Oldfield, Willis.....	1221 Colby Av.....	Everett, Wash.
7FV	Countryman, W.....	2022 Oakes Av.....	Everett, Wash.
7FW	Phelps, H. C.....	409 North E St.....	Tacoma, Wash.
7FX	McKeon, Theo.....	2920 Rucker St.....	Everett, Wash.
7FY	Harrington, C. A.....	104 N. 6th St.....	Boise, Idaho.
7FX	Yadon, C. M.....	1611 Johnson Av.....	Klamath Falls, Ore.
7GA	Beamer, C. R.....	343 E. 35th St.....	Portland, Ore.
7GB	Hurley, C. B., Jr.....	508 N. Yakima Av.....	Tacoma, Wash.
7GC	Aldrich, C. V.....	337 N. 4th St.....	Corvallis, Ore.
7GD	Person, J. M.....	740 Schuyler St.....	Portland, Ore.
7GE	Maybee, L. C.....	528 Bridge St.....	Tacoma, Wash.
7GF	Dyer, L. G.....	761 75th St. N.....	Seattle, Wash.
7GG	Crockett, C. D.....	1420 Hawthorne Av.....	Portland, Ore.
7GH	Mix, G.....		Moscow, Idaho.
7GI	Bogue, H. B.....		DuPont, Wash.
7GJ	Noorlin, P. V.....	46 9th St.....	Portland, Ore.
7GK	Linsley, C. H.....	1249 Centre St.....	Evanston, Wyo.
7GL	Jean, C. E.....	1103 E. 64th St.....	Tacoma, Wash.
7GM	Hendry, J. B.....	720 S. Grant Av.....	Tacoma, Wash.
7GN	Newton, C. A.....	3920 N. 26th St.....	Tacoma, Wash.
7GO	Goodwin, C. R.....	445 W. Commercial St.....	Salem, Ore.
7GP	Cunston, Allan.....	903 6th St.....	Olympia, Wash.
7GQ	Koupal, M. D.....	161 11th Av.....	Eugene, Ore.
7GR	Schrotke, Q. R.....		Bothell, Wash.
7GS	Evanson, L.....	518 N. 79th St.....	Seattle, Wash.
7GT	Offield, C. R.....	8415 Dayton St.....	Seattle, Wash.
7GU	Deady, J. M.....	150 27th Av.....	Seattle, Wash.
7GV	Pollock, E. D.....	2707 10th Av.....	Seattle, Wash.
7GW	McCulloch, M. E.....	814 S. 15th St.....	Tacoma, Wash.
7GX	Patterson, F. L.....	865 Williams Av.....	Portland, Ore.
7GY	Selby, E. C.....	1481 N. 20th St.....	Boise, Idaho.
7GZ	Clark, Leo C.....		
7HA	Churchill, H. B.....	705 Belmont St.....	Salem, Ore.
7HB	Smith, G. M.....		Eatonville, Wash.
7HC	Emery, G.....	611 Malden Av.....	Seattle, Wash.
7HD	Thibodo, A. A.....		Seaside, Ore.
7HE	Gilliland, M. P.....	753 Brasee St.....	Portland, Ore.
7HF	Skinworth, H. M.....	1151 Charnelton St.....	Eugene, Ore.
7HG	Williams, H. C.....	402 E. Jefferson St.....	Boise, Idaho.

Subscription Contest News

Only a few more days, fellows, and the subscription contest will be brought to a close. On June first we will distribute the prizes and coupons. This means that you have but several days left in which to boost your credits.

You can't expect to buy that new radio set with two or three coupons. Why not put every last ounce of ambition and energy into the work before the contest closes and get every radio bug in your locality to subscribe? The names of the winners will be published in our next issue, together with a list of apparatus that has been awarded them.

A copy of the Contest Coupon, that will be awarded for every subscription sent in, is shown below. These coupons will be mailed to you on June second. This is your last chance to get something for nothing. Take advantage of the opportunity and make your credit total worth while.

Here's how you stand on May tenth:

Gilbert Earle, Berkeley, Cal.....	5
Asa S. Keller, Monroe, Wash.....	2
Martin L. Jones, New Orleans, La....	1
J. V. Husen, San Francisco, Cal.....	1
Oliver Wright, Pasadena, Cal.....	2
Charles F. Filstead, Los Angeles, Cal.	1
Carl E. Roth, Napa, Cal.....	0
Herbert Vincent, Fresno, Cal.....	0
E. W. Leeper, Long Beach, Cal.....	1
Laurence J. Hall, San Francisco, Cal.	2
Earl H. Andreen, Superior, Wisc.....	2
Harold M. Huston, San Fernando, Cal.	0
James Walker, San Dimas, Cal.....	0
Omar Humphrey, Jr., Seattle, Wash...	0
J. Prendergast, San Francisco, Cal...	10
T. K. Teeter, San Francisco, Cal....	1
N. G. Hueter, San Francisco, Cal....	0
E. L. Chaix, San Francisco, Cal.....	1
Albert O'Neil, St. Paul, Minn.....	0
P. Byrne, San Francisco, Cal.....	1
Irving H. Baum, San Francisco, Cal...	3
Kenneth Hupp, Berkeley, Cal.....	0
Clarence Harris, San Francisco, Cal...	2
L. Aufdenkamp, Laguna Beach, Cal...	1

AWARDED TO		COUPON
CONTEST	Of..... By PACIFIC RADIO NEWS For Securing a One Year Subscription	COUPON
This coupon is good for 50 cents in trade at any Radio House Listed in the contest notices in "Pacific Radio News." It may be used with or without money in purchasing radio apparatus.		
COUPON No.		PACIFIC RADIO PUB. CO. By
Not good after Aug. 30, 1920 PACIFIC RADIO PUB. CO., 50 Main St., San Francisco, Cal.		

WESTERN RADIO LABORATORIES GO OUT OF BUSINESS

Mr. George E. Murphy, manager of the Western Radio Laboratories of San Francisco, announces that

the company has discontinued to manufacture radio apparatus and the plant at 156 Second street is no longer in operation.

Why don't you subscribe?

NEW RADIO BOOK

Lieutenant Ellery W. Stone, U. S. N., general manager of the Pacific Radio Supplies Company, the sales organization of the Moorhead Laboratories, is at present engaged in the revision of his book, "Elements of Radiotelegraphy," for the publication of a second edition, which will appear this fall.

The first edition of Lieutenant Stone's book appeared in October, 1919, and was reviewed in these pages some months ago. Over 300 copies of the book are being sold per month, necessitating a new edition at an early date.

The second edition will be revised to include all the latest radio developments, containing many new photographs and material relative to the Alexanderson radio frequency generator, new types of spark apparatus, and the vacuum tube. An additional chapter will be added on the latter subject, making the book the most up-to-date radio text book available.

The present edition has been highly complimented for the excellent appearance of the photographs and diagrams, and it is expected that the many additional photographs planned for the second edition will result in an even better appearance. The book is bound in leatherette, in the Navy colors, blue and gold.

COMMERCIAL RADIO MAGAZINE PUBLISHED IN NEW YORK

The United Radio Telegraphers' Association of New York is now publishing a monthly magazine, "The Radio Telegrapher," in the interest of commercial radio. Mr. C. C. Levin, publisher of the paper, promises to keep commercial men informed of all developments in the "big game."



"At Last—a Real Job and Real Money!"

"And if only I'd started earlier, I could have had them five years ago. I didn't realize at first what spare time study would do for a man. Taking up that I. C. S. course marked the real beginning of my success. In three months I received my first promotion. But I kept right on studying and I've been climbing ever since."

Every mail brings letters from some of the two million students of the International Correspondence Schools telling of advancements and increased salaries won through spare time study. How much longer are you going to wait before taking the step that is bound to bring you more money? Isn't it better to start now than to wait five years and then realize what the delay has cost you?

One hour after supper each night spent with the I. C. S. in the quiet of your own home will prepare you for the position you want in the work you like best.

Yes, it will! Put it up to us to prove it. Without cost, without obligation, just mark and mail this coupon.

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BOX 9379, SCRANTON, PA.**

Explain, without obligating me, how I can qualify for the position, or in the subject, before which I mark X.

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City _____ State _____

7-28-19

Radio on Seaplanes

By Robert Hills and Walthew Barnes

The Navy seaplane of today carries radio as a part of its equipment. Every time a plane makes a flight a series of messages concerning its position and condition are transmitted to the base.

The quenched transmitters on the larger planes are made by the Cutting Washington Company. The power used to operate these sets is obtained from a five hundred-cycle generator mounted on the upper wing. This generator has a propeller on the end of the shaft and is turned by the wind when the plane is in motion. At the average speed of seventy miles an hour the generator turns at five thousand revolutions per minute, generating a half K.W. of power, which is directly led to the primary of a high voltage transformer. This current is broken up by a sparkless key of novel design, which has a small light mounted on the base determining whether or not there is power.

The instruments are arranged very

compactly, all being mounted around an oscillation transformer. Directly in the center of this transformer is a hot-wire ammeter, which indicates the radiation, maximum being five amperes and minimum three. In order to regulate the radiation the plates of the quenched gap are made movable, providing a way of lengthening or shortening the spark. The gap is constructed in three sections, the two end sections being movable. This is mounted on the front of the small panel below the oscillation transformer, while behind it is the condenser, being of the mica type; also the high voltage transformer previously mentioned.

The receiving set uses a bulb detector and two-step amplifier, which, with other instruments, is mounted in a neat and compact cabinet. The tuning is done exclusively by means of a variable condenser, the apparatus being conductively coupled.

The small scout planes carry no

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., required by the Act of Congress of August 24, 1912, of PACIFIC RADIO NEWS, published monthly at San Francisco, California, for April 1st, 1920.
State of California
County of San Francisco—ss.

Before me, a notary public in and for the State and County aforesaid, personally appeared Paul R. Fenner, who, having been duly sworn according to law, deposes and says that he is the Editor of the Pacific Radio News and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:
 Publisher, Pacific Radio Publishing Co., 50 Main St., San Francisco, Cal.
 Editor, Paul R. Fenner, 50 Main St., San Francisco, Cal.
 Managing Editor, None.
 Business Manager, H. W. Dickow, 50 Main St., San Francisco, Cal.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.)
 Paul R. Fenner, 50 Main Street, San Francisco, Cal.
 H. W. Dickow, 50 Main Street, San Francisco, Cal.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

PACIFIC RADIO PUBLISHING CO.,

By PAUL R. FENNER, Editor.

Sworn to and subscribed before me this 25th day of March, 1920.

MARGUERITE S. BREUSER,

(My commission expires January 8, 1922.)

Sworn to and subscribed before me this 25th day of March, 1920.

(Seal)

receiver, but are signalled to by means of the panel system, which is a purely visual means of signalling from ground to airplane.

The principal feature of the transmitting set is the mounting of the instruments inside of the generator case, which is attached to the upper wing. The key and ammeter arc, of course, mounted in the operator's cock-pit.

The antenna is practically the same on all types of planes. It is composed of a stranded phosphor bronze wire, weighted with a lead "fish." When the plane gets to a reasonable altitude the operator reels his antenna out through a reel on the side of the fuselage, which lowers his "fish" about two hundred and fifty feet. The pilot notifies the operator before he hits the water so that he may reel his antenna in.

The standard wave lengths used in seaplane communication are three hundred and fifty and four hundred and seventy-five meters, all work being carried on on these waves.

The one great point that the manufacturers of airplane radio apparatus are striving for is simplicity, and this has been attained to a high degree in the modern equipment.

Are you a subscriber?

METEOR ELECTRIC CO.

309 So. Flower St.,
Los Angeles, Calif.

MANUFACTURERS & RETAILERS
OF

RADIO APPARATUS

Also Parts and Supplies.
We Have An Exchange Dept.
Used Apparatus Bought, Sold and
Exchanged.

SAVE MONEY

BY TAKING ADVANTAGE OF
OUR SPECIAL COMBINATION
SUBSCRIPTION OFFER.

PACIFIC RADIO NEWS
AND Q. S. T.

\$3.00 FOR A YEARLY SUBSCRIP-
TION TO BOTH

PACIFIC RADIO PUB. CO.,
50 Main St., San Francisco.

(Continued from Page 390.)

young men for this work. One of these schools is now at the Presidio of San Francisco and has nearly two hundred students taking the course of instruction. Under the guidance of expert instructors, the students are given a thorough course in electricity, radio, theoretical and practical, so that a man will learn to construct and design a radio station as well as only operate it.

PACIFIC RADIO SCHOOL

ARC AND SPARK SYSTEMS

THE MOST UP-TO-DATE AND EXCLUSIVE RADIO SCHOOL IN THE WEST. LATEST TYPE POUlsen 2 KW ARC TRANSMITTER AND INDEPENDENT TYPE ONE KW 500 CYCLE SPARK SET. EQUIPMENT IN ACTUAL OPERATION.

NAVY STANDARD RECEIVING SET WITH AUDION AMPLIFIER.

UNDER THE PERSONAL SUPERVISION OF ADDISON S. MCKENZIE, CHIEF ELECTRICIAN, U. S. N. R. F., FORMERLY INSTRUCTOR AT MARE ISLAND NAVY YARD AND W. A. VETTER, FORMERLY CONSTRUCTION FOREMAN FOR THE MARCONI WIRELESS TEL. CO.

INSPECTION INVITED. SEND FOR DESCRIPTIVE CIRCULAR.

433 NEW CALL BUILDING

SAN FRANCISCO

The Colin B. Kennedy Co.

ANNOUNCES

the opening of

Office and Salesrooms

**209-211 Rialto Building
San Francisco, Cal.**

The demand for our apparatus that put us far behind in filling orders early this year has steadily increased so we enlarged our force, improved our manufacturing facilities and are now able to make delivery WITHOUT DELAY.

The Rialto Building office will enable us to give proper attention to our increased volume of business and better service to our retail customers. Our complete line of apparatus "built to a standard, not to a price." will be on display. The phone number is Sutter 5367, but you will find it worth while to call in person.

LARGEST STOCK OF RADIO APPARATUS

on the

PACIFIC COAST

IMMEDIATE DELIVERY

LEO. J. MEYBERG CO.

428 Market St.

San Francisco, Cal

When writing to Advertisers please mention this Magazine

(Continued from page 389.)

The Moorehead Company's plant on Mission street is today the largest factory in the world devoted to the manufacture of vacuum tubes.

Before leaving for the East today Dr. de Forest expressed the belief that the Moorhead Laboratories were now embarked on a successful career. He said the shutting down of the Moorhead plant this spring had left the market almost bare of their product, and that a very wide demand might now be expected, particularly from the amateur field.

He placed the number of wireless amateurs in the United States at not less than 200,000.

Rapid development of the wireless telephone also has opened a new field to the Moorhead product, the Moorhead bulb being used in receiving, amplifying and transmitting. By the use of the Moorhead bulb's messages are now readily transmitted a distance of 200 miles by the radio telephone.

The Moorhead Company still has large unfilled contracts with the United States Government and the Marconi Company. It has hitherto marketed its product in the United States through the agency of the latter company, but will shortly enter the wholesale and retail field itself.

Mr. Shaw, to whose efforts the reorganization of the company is largely due, was called to San Francisco late in March on an hour's notice. Shaw is a large manufacturer of telephone and wireless supplies.

Others who were instrumental in the company's reorganization and who will have a hand in the direction of its affairs include: George C. Stephens of Stephens & Co.; Charles M. Whitney, vice-president Crown-Willamette Pup & Paper Co; and W. F. Williamson, an attorney.

(Continued on page 408.)

The Stranger In Our Midst

It was the day before the passenger ship arrived in San Francisco. One of the passengers, a Russian, who was unable to speak any language other than his own, asked the radio operator, whom he heard could understand his tongue, if he knew of a good hotel to stay at while in San Francisco. The operator, who happened to have some hotel and other advertisements in a pigeon hole on his desk, gave him one, but, unknowingly, he gave him the wrong ad.

When the Russian disembarked he showed it to a taxi driver. The fellow shook his head and gave him a puzzled look. He presented it to a policeman, but he waved him away. The "soda slinger" in a nearby sweet-shop looked at the slip and started to giggle; she referred him to the cashier. The cashier glanced at it, signed his name on it, and gave him \$1.50. The Russian, considerably out of patience and more puzzled than ever, bolted out of the place.

"Naw," answered the next man he showed it to, "that's out of my line; I'm a brick-layer."

"Sure," said the newsboy, "that's what I want; me and Jimmy Black got a set last month. But say, old man, come around tomorrow; I'm kinda short on jack today."

He accosted several persons before he found one who could understand his lingo. After the Russian explained what he wanted he showed him the slip. And here's what was printed on it:

"Subscribe to the Pacific Radio News, \$1.50 the year. Write full name and address here."

**PIN A DOLLAR
BILL TO THIS
COUPON AND
MAIL IT
TODAY**



**Our
Special
Offer!**

Please enter my subscription to **Pacific Radio News** for 9 months. The remittance of \$1 is enclosed.

Name.....
Address.....

"B" MERACO Batteries

Volts. Standard
22.5 B A-2 type. Postpaid **\$1.20**

Guaranteed on a money back basis.

Write for free bulletin describing
 our other styles

Mercury Radio Appliance Co.

Dept. C-1, 672 Broadway,
 Brooklyn, N. Y.

You can now get

RADIO APPARATUS

on the

Installment Plan

Full particulars, including the
 RVA BULLETIN each month,
 Loose-Leaf Binder, and Bargain
 Supplement sent on receipt
 of ten cents, 1c stamps or
 coin.

J. Donald Vandercook

P. O. Box 396

LOMBARD, - - ILLINOIS

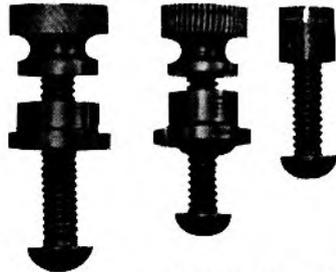
(Continued from page 407.)

O. B. Moorhead remains as chief
 engineer and will have full charge
 of experimental work.

Ellery W. Stone, former resident
 engineer and branch manager here
 for Kilbourne & Clark Manufacturing
 Co., has been appointed sales
 manager for the Moorhead Labora-
 tories and will represent the Shaw
 and De Forest interests in that enter-
 prise. During the war Stone was the
 naval officer in charge of the big
 radio station at San Diego, and prior
 to that was radio inspector for the
 United States Government at this
 port.—S. F. Call-Post.

Radio Binding Posts! Switch Points! STD. Commercial TYPE

HERE THEY ARE
 THE 3 BEST SELLERS



No. 022 No. 021 No. 055

1/16" Larger than actual size
 High Nickel Polished Brass

SPECIAL INTRODUCTORY PRICE:

- 1 Doz. Lots No. 022 (7/16" dia.) \$1.15
- 1 Doz. Lots No. 021 (3/8" dia.) \$1.00
- 3 Doz. Lots No. 055 (1/4" dia.) \$1.05

Mailed Free anywhere in U. S. A.
 upon receipt of P. O. Order

(Our switch points will not work loose)

Dealers
 Radio
 Manufacturers

We are largest
 manufacturers of
 these goods exclus-
 ively in the West.
 Write for Discount.
 Quick Deliveries

Service Production Co.

1074 Oak Street San Francisco, Cal

Perfect Tone Increased Range Low Decrement

You have heard the piercing tone of a synchronous spark. You know the superior characteristics of synchronous spark transmitters. Heretofore the bulk and expense of a motor generator and the practical necessity of D. C. supply have prevented the use of such transmitters by amateur stations.

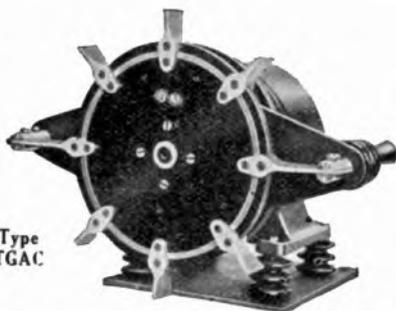
The



Synchronous Rotary Gap

possesses all the advantages to be gained by the use of motor-generator equipment with none of the expense. You can use the Grebe Synchronous Gap on your A. C. Line.

Type
TGAC



A. H. GREBE & CO., Inc., 73 Van Wyck Blvd., Richmond Hill, N. Y.

Pacific Coast Representative Maurice Raphael, 414-5 Walter P. Story Bldg., Los Angeles, California

Radio Amateurs of the West

We wish to announce that we are distributors for Remler, Parkin, Doron, Teco, Amrad, Wilcox, and other well known brands of apparatus.

While we specialize in raw materials and parts, we are about to place on the market, a high grade receiving set of our own design and manufacture, to be sold at the remarkable price of ten dollars.

If interested send 4c for illustrated circular.

The Pacific Radio Distributing Company

Pomona

California

"The Radio Telegrapher"

Official Organ

UNITED RADIO TELEGRAPHERS' ASSOCIATION

Room 303

44 Broad Street, New York

Read about what's going on among the Commercial, Navy and Army operators

ON SHIPBOARD

AT SHORE STATIONS

AT HOME AND ABROAD

Subscription Price \$1.50 yearly, 15 cents a copy

When writing to Advertisers please mention this Magazine

Parkin Rheostat Now \$1.00

WHY PAY MORE?

when this is the easiest mounted, smoothest running, best rheostat on the market.



(Actual Size)

No. 35 Parkin Panel Type Rheostat (Pat. March 30, 1920) has easily renewed resistance unit mounted on back of moulded Bakelite Knob. Shaft is moulded into knob, cannot come loose. "Off" position provided .30 degree rotation insures fine adjustment.

Write for descriptive circular of audion panels, switches, binding posts, contacts, etc. Dealers: Write for proposition

PARKIN MFG. CO.
San Rafael, Calif.

ACE

"You'd be Surprised"

at the distance, strength of signal and freedom from Q. R. M. you get with Ace equipment. The type T. T. Tuner is the kind you want for that extreme long distance work through the worst Q. R. M. Doc Ace has the right dope when he says "You may pay more, but you can't buy better."

Type T. T. Regenerative Tuner, range 150 to 2750 meters, F. O. B. Cincinnati, \$55.00.

The Precision Equipment Co.

2437 Gilbert Ave., Dept. F,
Cincinnati, Ohio

Pacific Radio Exchange

We cater to your requirements,
Large or Small
Radio Apparatus Sold, Bought and
Exchanged

Write us your wants. We have no
catalog but can fill your order.

433 New Call Bld., S. F. Cal.

"Quality and Service"
Our Motto

WESTERN RADIO ELECTRIC COMPANY

BRANDES MURDOCK DEFOREST FEDERAL
ACME REMLER AMRAD WESRAD

Remember our Motto
and Tell Us Your Needs

512 East Ninth St.,
Los Angeles, Cal.

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Amateur Agents Wanted

The Oard Radio Laboratories, manufacturing a complete line of radio apparatus, offer to live, energetic radio amateurs and experimenters the opportunity to establish themselves in an attractive and well paying business, acting as agents for Oard Radio material. No investment is required. Agents may use all or spare time.

Territory is open in all principal cities of the United States, with the exception of San Francisco and Stockton. Each agent chosen will be equipped with a full line of samples, and will be paid on a direct commission basis. To those who show ability, permanent agencies will be allotted, and protection over definite territory assured.

Applicants must be over 18 years of age and must have actual radio experience, either commercial or amateur, with preference to those engaged in relay work, or long distance communication, although the last is not absolutely necessary. Two references must be furnished, together with all information of value, age, experience, etc., in applicant's first letter, to insure attention.

Commercial operators, actually employed, particularly on Pacific Coast and Orient runs, are also requested to communicate with us. We have an attractive proposition to offer along the same line as above.

No investment is required, but pep, ginger, and a thorough understanding of amateur wireless is essential. If you haven't these, don't write. If you have, get your name in before the next one in your territory does.

Give full particulars in your first letter as above set forth. Photographs of yourself and your station will likewise help and will give you preference over those furnishing less complete details.

Address

Oard Radio Laboratories
STOCKTON, CALIFORNIA

"Your Ears Tell"



Tresco Tuners Deliver the Goods

A TESTIMONIAL
Point Pleasant, N. J.
TRESCO,
Davenport, Iowa,
Gentlemen:—

Some time back you will remember that I bought a 20,000 meter coupler from you and now I wish to tell you of the wonderful results that I have had from it. I was very timid about buying this coupler, as I got stuck with a set of honeycombs, but now I am glad I got that coupler as I would not part with it for anything.

I could get results with it just as you show the hook-up but with a little altering I got it to working so that I have heard NPL, BZR, NAR, NFF, NDD, NSS, POZ, OUI, IDO, PL, YN, LCM, and many others that I do not call to mind just at this writing. This is no bull, either; all straight stuff. I am using one bulb—a VT, 3 variables, Baldwin phones, and your Tresco coupler.

Anybody that contemplates buying one of these couplers should not hesitate, as they are the greatest thing out, take it from me. Hoping you are selling lots of these couplers and thanking you for such a wonderful instrument, I am

Yours very truly,

R. VAN CAMP,
Radio Station 2VC.

Be a sport and send 5c for our latest Catalogue.

BURGESS "B" BATTERIES

SEVERAL
SIZES
FOR
SPECIAL
WORK



SEND FOR CATALOGUE
**BURGESS BATTERY
COMPANY**

HARRIS TRUST BLDG. - CHICAGO, ILL.

VARIABLE CONDENSERS

	KD.	ASSEM.	APP. MF
7 Plate	\$1.00	\$1.40	.000125
13 Plate	1.55	2.00	.00025
23 Plate	2.15	3.00	.0005
43 Plate	2.60	3.60	.001
63 Plate	4.00	5.45	.0015

These variable condensers are made of hard drawn polished brass which insures the user the lowest high frequency resistance with the least hysteresis effect.

All variables are built with a top and bottom bearing and take up on these bearings, which insures smooth running without binding. Parts are all made in dies giving accuracy and ease of assembly.

We have one of the finest machine shops on the Coast for the manufacture of radio apparatus to your order. Build your own set, we can make the parts.

Radio-Frequencies Company

3635 South Park Avenue

Los Angeles, Cal.

HALCUN

NEW 40 PAGE CATALOGUE JUST OFF THE PRESS

Sent to any address on receipt of 4c in stamps



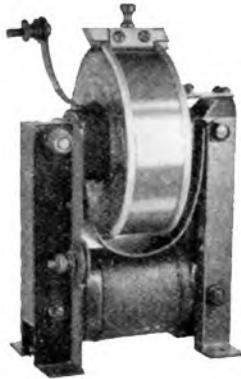
Halcun Radio Company, Inc.

548 Howard Street

San Francisco, Cal.

800 Miles on 1-4 K.W.

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Is the distance claimed by F. M. Preucil (9CF), 174 N. Scoville Ave., Oak Park, Ill. Who will be the first to transmit 1000 miles on this 1-4 K.W. transformer?

Send your records to this office.

Power Factor 91%

Oscillation Transformers, Condensers, Rotors for Rotary Spark Gaps. Our 1 K.V.A. Wireless Transformer has a 25,000 Volt Secondary.

Write for our new catalog "T-21"

Thordarson Electric Manufacturing Co.

501 S. Jefferson Street

Chicago, Ill.



Pat. App. for

Attention Amateurs!

This is the adapter which tubular bulb owners have been looking for

Price \$1.50

Radisco Agency
We make special instruments
to order



Eastern Agents

INTERNATIONAL ELECTRIC CO.

226 A Fulton St.,

New York City

Dealers write for propositions.

Amateur Wireless Equipment Co.

1390A Prospect Ave.,

Bronx, N. Y.

Learn How to Make the 90c. Vacuum Tubes and Time Tested Apparatus as Described in the
RADIO BUYER'S and BUILDER'S HANDBOOK
NOW (by an Amateur of fourteen years' experience) **OUT**
The only book which DESCRIBES and SIMPLIFIES many
New Radio Inventions and Improvements

(Some of which have never been made public yet) including
NEW HOOKUPS to MAKE all the APPARATUS you use MORE EFFICIENT

This book will contain nearly 200 pages, many diagrams, and about 30 full page halftones of simple efficient apparatus, inc. 16 scale cutouts—in black and white.

THE FIRST THOUSAND WILL BE \$1.00 PER COPY.
Send now for **FREE SAMPLE ILLUSTRATED** pages, OR **ASK YOUR DEALER TO SHOW YOU THIS BOOK.** Watch the magazines for some of the writer's latest works.

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A 90c **EXPERIMENTAL VACUUM VALVE DETECTOR**, sensitive and made in a few minutes from finished parts easily obtainable at any time.

Radio "Tricks of the Trade"—Solid Silver Switch Points for 3 to 5 cents each.
A **NEW Combination Switching Key—Low Cost Amplifying Transformer.**

New!

Variable Duplex Oil Condensers for sending and Receiving with Switch.
How and Where to Buy Second Hand Radio and Electrical Apparatus Cheap.
A Rectifying Gap Motor which supplies "B" Battery current or "A" current.
A Simple Calibrated Hot Wire Ammeter, not affected by weather. Very Fine!
Many New and Good Ideas on "A" and "B" Batteries of Little Cost.
Commercial Type Rotary Quenched Gaps of Low Cost, Like the Above.
New Cheap Honey-Comb Type Receiving Coils for all Waves. Silver contacts.
Second-hand Electrical Motor-Generators up to ½ H. P. for \$6.00. Modern Type.

Also many other methods of saving time and money on Better Apparatus.
11 Barnes Rd., Newton, Mass.

R. U. CLARK, 3rd or **YOUR DEALER**
11 Barnes Rd., Newton, Mass.

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CLASSIFIED ADVERTISING

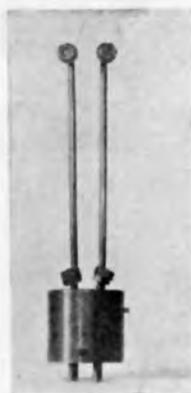
ADVERTISEMENTS IN THIS SECTION ARE THREE CENTS PER WORD NET. REMITTANCE, IN FORM OF CURRENCY, MONEY ORDER OR STAMPS, MUST ACCOMPANY ORDER.

The RADIO EXCHANGE deals in all classes of second hand and new apparatus. Business is done on a consignment basis, 20%. Send in all stuff that you want to sell and we do the rest. Send charges prepaid. Full line of transformers, condenser jars, tuners, aerial switches, audion control panels, wire for honeycombs, keys, amplifiers, switches and everything needed by the amateur. \$20 aerial switches going for \$5.00. Snap. THE RADIO EXCHANGE, 354 PERRY STREET, OAKLAND, CAL.

THREE TESTED CRYSTALS of galena and a detector stand for 75 cents. Best crystals in the world. Radio Sales Co., 251 Duboce Ave., San Francisco, Cal.

VACUUM TUBE SETS! I have the following for sale: Control panel with two DeForest condensers, "B" battery and beautifully finished panel, \$45. One home-made control panel for \$7.50. Hard rubber front receiving set in mahogany case containing 2 DeForest adapters for coils, 2 large DeForest variable condensers, 1 phone switch and connection posts, \$55. Will sell all three sets for \$75. Call at 1403 9th St., Oakland, Cal.

FOR SALE—Receiving cabinet with complete set of honeycomb coils, also pair Baldwin phones. All nearly new and in perfect condition. Send for description and photo. E. Bancroft, Sonoma, Cal.



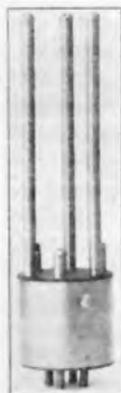
TUBULAR
BULB
ADAPTER
\$1.50

VARIABLE
GRID LEAKS

A NEW TYPE OF
EXTREMELY EFFICIENT
RECEIVING SET
Write for Literature

Sonoma Radio Laboratories
Box 297, Sonoma, Sonoma Co., Cal.

Audiotron
Adapter



Pat. applied for

Price \$1.75
Post Paid

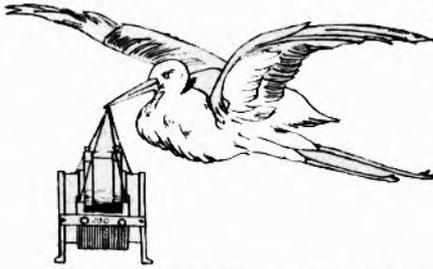
Q --- S... T-

The East Meets the West Amateurs Win

A long felt want realized at last. An Adapter for the Audiotron and a Real One! It took the TeCo Specialists a very short time to find out what the Amateur wanted and the results have far exceeded our expectations.

Another result of our ingenuity is the Honey Comb Coil Adapter which is meeting with immediate success. See add in Q. S. T. Our Audiotron Adapter fits any standard four point socket thus eliminating the use of special panels. Be progressive and get on the TeCo Band Wagon. Send at once for our products and save money.

THE TECO RADIO CO
P. O. Box 3362, Boston, Mass.



THE
Acme Apparatus Company
 announces the birth of
Another Radio Transformer
 Named
ACME 250
 Weight 13 lbs.

250 Watts, 250 miles—a mile per watt

ACME 250 has inherited the high efficiency, excellent operating characteristics, rugged construction and attractive appearance of its older brothers, and has come to fulfill the demand for a transformer which, though it may not present as good a front, can make itself heard in any company.

The ACME cry is 800 cycles strong.

Price: \$16.00 Dressed—\$13.00 Undressed—110 volt, 60 cycles, $\frac{1}{4}$ KW.

Acme Apparatus Company

21 Windsor Street,

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BAKELITE-DILECTO

The standard insulating material for all radio work. Water-proof, permanent, strong, used by all important manufacturers of wireless apparatus and others requiring the utmost in insulation.

Furnished in **sheets, rods and tubes.**

We also manufacture VULCANIZED FIBRE in sheets, rods and tubes and CONITE, a special insulation, in sheets or rolls from .005" to .020" thick.

Let us show you how our standard products can be made to solve your insulation problems.

THE CONTINENTAL FIBRE CO.

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ELECTRON RELAY

TWO NEW TYPES OF VACUUM TUBES FOR EXPERIMENTERS



THE MOORHEAD PERFECT



THE MOORHEAD VT
AMPLIFIER-OSCILLATOR

VACUUM TUBE COMBINATION

—perfected to meet the increasing demand for tubes of superior efficiency, wherein all desirable characteristics are combined without subordinating any essential elements. A combination of two or more *VT tubes as amplifiers* with an *Electron Relay* as the *initial detector* or oscillator is the *ideal receiving combination* for long distance amateur or long wave reception. Both types of tubes are *rugged* in construction and unqualifiedly guaranteed.

THE MOORHEAD ELECTRON RELAY \$6

The Electron Relay is the original tubular vacuum valve brought out by this company in 1915, now supplied with the standard four prong base for convenience. This tube has the familiar "hissing" point and low B battery potential characteristic of the perfect vacuum detector. Of all vacuum tubes the Moorhead Electron Relay is the most efficient spark receptor.

THE MOORHEAD VT AMPLIFIER-OSCILLATOR \$7

The VT Amplifier-Oscillator is the Navy SE 1444 "hard" tube and is designed and manufactured expressly for amplification and oscillation purposes. Particular attention is invited to the large amplification constant of this tube. Recent official Navy tests show conclusively that the Moorhead VT tube has a **higher amplification constant** than any other vacuum tube known to the radio art.

Immediate deliveries. Order from your dealer or direct.

*Dealers
write for prices
and particulars*

BOTH TUBES LICENSED UNDER THE DEFOREST AUDIN AND FLEMING PATENTS.

*Amateurs
write for descriptive literature*

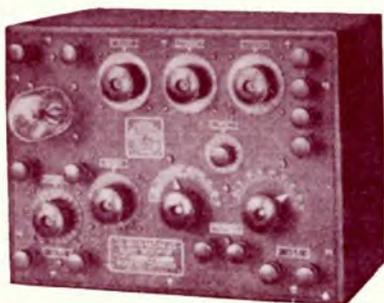
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"RW4" Size 12"X9"X6 1/2"

Mignon "RW4"

Undamped Wave
Receptors

NO Loose Couplers
Loading Coils
Variometers
Amplifiers

Strongest, Most Distinct Signals

— IMPORTANT NOTICE —

The Mignon System Apparatus, RW 1, RW 2, RW 3 and RBD 8 are no longer manufactured and are superseded by the improved RW 4, UW 1 and BD 1. These apparatus are manufactured exclusively by the MIGNON MFG. CORP., sole owners of the MIGNON SYSTEM PATENTS (see U. S. Letters Patent No. 1329672).

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Damped and Undamped Wave Apparatus for all purposes

Endorsed by Radio Department
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