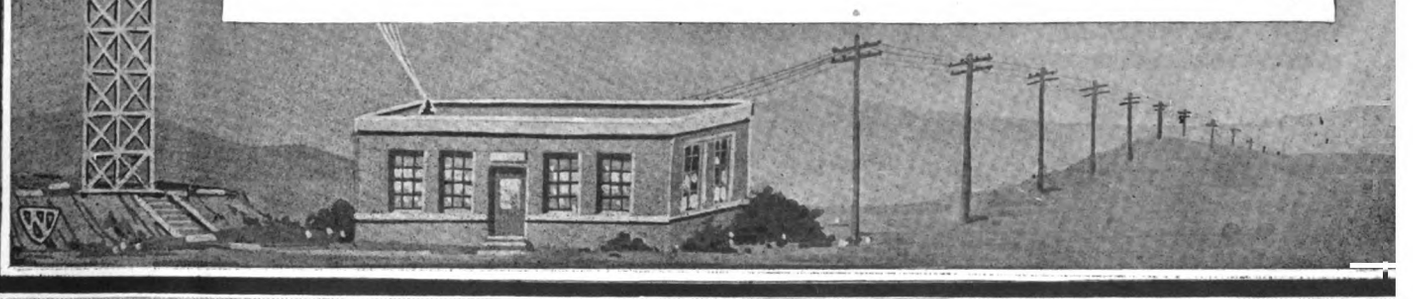
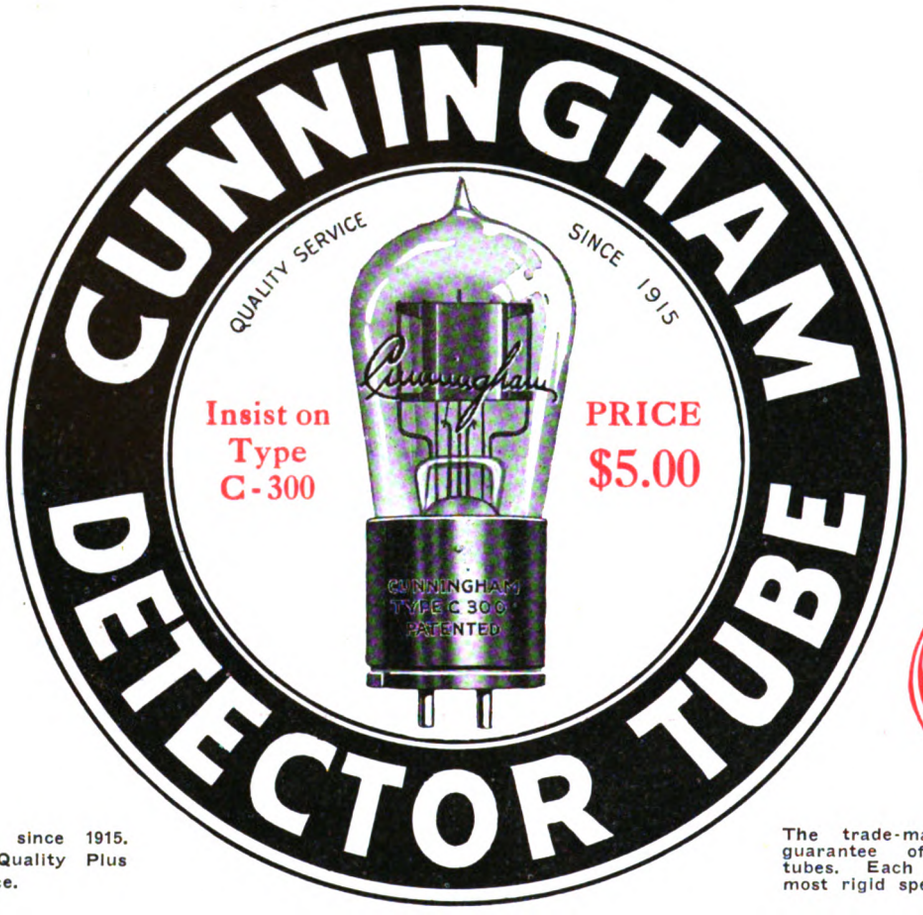
AUGUST, 1921

20 CENTS

PACIFIC RADIO NEWS

Pioneer Journal of Western Radio News and Development.





Nationally known since 1915. **General Electric** Quality Plus **Cunningham Service.**

The trade-mark GE is the guarantee of these quality tubes. Each tube is built to most rigid specifications.

Why the Amateur chooses Cunningham Tubes

CUNNINGHAM Detector Tube Type C-300 functions as a highly sensitive detector of spark radiation, a tone frequency amplifier and an oscillator for regenerative amplification and C.W. reception; also as a radio-phone detector and amplifier. It possesses these combination properties to a greater degree with the added advantages of low B battery and quietness in operation.

It possesses almost perfect uniformity in plate voltage, signal audibility and sensitiveness, sustained throughout the operating life, plus all the operating properties of the Ideal Amateur Tube. The mechanical assembly is entirely by machine, further assisting in uniformity of operation and appearance.

The customary hissing or "bubbling" has been practically eliminated in Type C-300, resulting in extreme quietness in operation, and a completely silent telephone receiver in the absence of incoming signals. This permits the reading of faint signals and exact adjustment for maximum sensitiveness.

The Amateur realizes that in Cunningham Tubes he has all that five years of service and General Electric Quality can mean to the Radio Field.

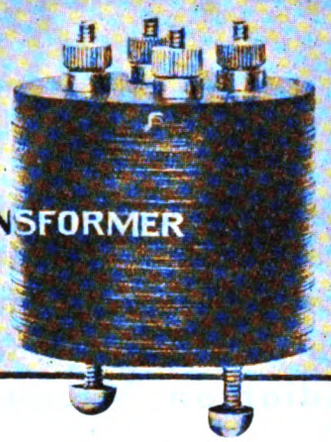
Dealers: Standard Packages F. O. B. Cleveland, San Francisco, New York. Broken Packages F. O. B. San Francisco.

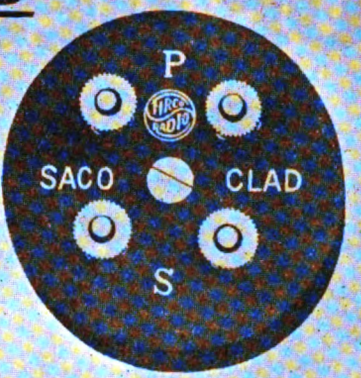
E. T. Cunningham

35 Montgomery Street — *Trading as Audiotron Mfg. Company* — San Francisco, Calif.

Since 1915

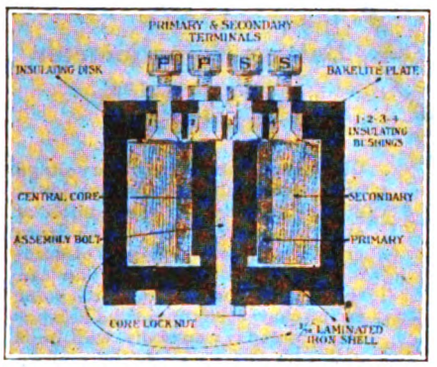
SACO CLAD





Announcing the

100% SHIELDED TRANSFORMER



The 3-16" continuous shell of laminated silicon steel serves three purposes.

(1) A perfect path for the magnetic flux.

(2) A 100 percent magnetic shield—eliminates howling on even six stages and diminishes tube noises.

(3) It is literally impossible to damage a Saco Clad by physical forces.

No other transformer at any price has such outstanding features.

Don't accept substitutes. Demand the Firco Saco Clad put up in separate cartons bearing the Firco Trade Mark.

SIX STAGES AUDIO FREQUENCY —THE BANDMASTER SAID *"STOP!"*

A week ago a stranger walked into our offices. He was soon talking about Saco Clad transformers and, without a word of exaggeration, here is what he said:

". . . and during a recent municipal demonstration with our Six Stage Saco Clad Amplifier, the amplification was so great that our radiophone music interfered with the local band and could be heard ¼ of a mile thru the hubbub of the city's noises. . . ."

Another letter from a disinterested dealer says:

". . . We have tried practically every make of transformer and believe that Saco Clad is by far the best transformer of them all. . . ."

If you study the cross section at the left, you will see the reason for these commendations.

A Summer Necessity—Saco Clads and Vocalouds

Saco Clad amplification pulls a Vocaloud (advertised last month) means you can carry on your radio activities in comfort during the hottest Summer days—just sit back and listen to loud, clear signals and radio phone concerts from the Vocaloud—no head phones or straining for weak signals. And of course, any number of friends can listen with you. This combination is economical. The Saco Clad Transformer is only $5.00; after July 15th the Laboratory Type Vocaloud will be $25.00 and the station type $30.00.

If your dealer hasn't these instruments in stock, it is easier for him to sell you something else—but you should demand that he obtain them. Then make every possible comparison.

DEALERS: We have a new loose leaf catalogue for radio dealers. A charge of $.25 is made to all except dealers. Amateurs should go to their radio dealer and ask to see this catalogue.

NOTE: Ask your dealer to show you the Firco Audion Units. They are made in two units—Standard and Midget—and are absolutely the best buy on the market.

John Firth & Company, Inc., 18 Broadway, New York

FIRCO RADIO

FIRCO Audion Detectors and Amplifiers
Radio Frequency Amplifiers
High Voltage Units
(with any primary voltage)
Baldwin Phones
Firco Vocaloud
Saco-Clad Transformer
Firco Accessories
Kolster Decremeter
United States Bureau of Standards Wavemeter
Eldredge Meters
(individually calibrated)
Brownlie Phones
(adjustable)

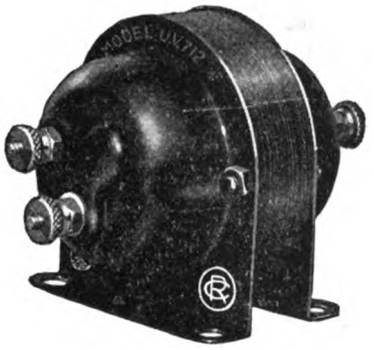
FIRCO RADIO EQUIPMENT

"Pioneers–since 1901"

For Receiving Circuits

AMATEURS

The four accessories here illustrated are made according to the same high standards set for Radiotron Vacuum Tubes — now famous throughout the amateur field.



Amplifying Transformer

Model U. V. 712

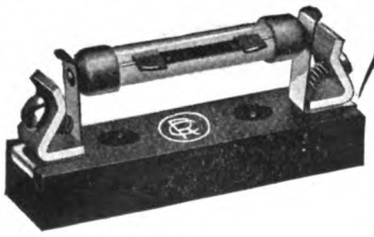
Price, $7.00

A new inter-tube tone-frequency amplifying transformer designed to make Radiotron Detector, U.V. 200 and Radiotron Amplifier Tube, U.V.201, the most effective vacuum tubes on the market today. Tests have proved this conclusively.

Special bulletin containing detailed data and circuit diagrams for the use of U. V. 712 will be sent upon request.

These Standard Grid Leaks are in use everywhere in radio circles, from the largest laboratory to the most humble amateur station. They are of rugged construction, and of uniform and constant resistance. These Standard Grid Leaks are an absolute necessity for stabilizing the operation of vacuum tube detectors and amplifiers.

Write for our Grid Leak Bulletin. It explains the use of Grid Leaks in radio-receiving circuits.



Standard Grid Leak

Complete, $1.25

Mounting only, $.50. Units any value from .15 to 6. megohms, $.75

"A" Battery Potentiometer

Model P. R. 536

Price, $2.00

Close variation of the plate voltage of detector tube, Radiotron U. V. 200 often means the reception of otherwise unreadable signals from great distances. Using our Potentiometer, Model P. R. 536, you can really locate the most sensitive point on the characteristic curve. This potentiometer is unusually well built and superior to those heretofore supplied to the trade.

Thousands of these sockets are now in use throughout the amateur field. They will fit the Radiotrons U. V. 200, 201, and 202, insuring reliable contact under all operating conditions. Moulded unit made to fit and last, and backed by the R C stamp of quality.

Standard Bakelite Socket

for Radiotrons U. V. 200, U. V. 201, U. V. 202

Price, $1.50

IMPORTANT

A full line of apparatus for C. W. transmission is now in process of manufacture and will be available September 1.

DEALERS

Here is an unusual opportunity to handle the products of the greatest organization of its kind. Be one of the first to profit by this line.

Write Today

Radio Corporation of America

WORLD WIDE WIRELESS

Sales Division, Commercial Department, Suite 1804
233 Broadway, New York City

VOLUME III AUGUST, 1921 NUMBER 1

RADIOTORIAL

By LAWRENCE MOTT, Associate Editor

"VOLUME THREE, NUMBER ONE"

TO THEM that make our existence possible, i. e.: our advertisers, our subscribers and our contributors:

GREETINGS!

With this number of "Pacific Radio News" begins our third year in the field of radio publications, and it is entirely thanks to you **all** that we have grown from our erstwhile smaller form to our somewhat large and more dignified stature!

We deeply appreciate the loyal support that we have received from you **all!**

We are happily cognizant of your assistance in so many ways!

And we are indeed grateful!

In return for the recognition that we have received we have endeavored to make the publication both interesting and palatable—in short, **worth your while!**

We do not wish to err on the side of wearying frankness—hence we go not into a treasurer's report of increase of circulation, and of advertising space. Were we so to do we might be thought to be lustily tooting our own horn—that we have no least intent of doing, as "PRN" does its own tooting!

We think, however, that we should—very respectfully—point out that this publication is the ONLY one that is not, in some way, more or less intimately connected with the trade in radio manufactures! Mind you, we do not intend to cast reflections upon any contemporary who is so connected. We are merely desirous that **you** should thoroughly understand our position—which is, in very brief:

To aid in the development of amateur radio.

To further its organization and success in all ways, and

To give due publicity to such apparata—and results attendant upon their use—as seems to us to be normal and just.

We "play no favorites," and what "tho" we have joyfully received a great many letters that are most flattering to our efforts with the publication—it will have doubtless been noted that we have never given one the light o' day in our pages—preferring that our work stand upon its **own merits**—much as an all-round **man** stands upon his own two feet, without seeking something to lean against—or upon!

We have tried to keep our pages clean of bogus and fraudulent matter—thus protecting the advertiser as well as the reader. We have sought to make our reading pages of a real value to the amateur—from the veriest tyro, to him who is far along the radio way. We have endeavored to eschew the dry-as-dust, and our generous contributors have gone to much trouble in order that the **beginner** might "get the idea" without becoming involved in too many technicalities—at first.

* * * * *

You have seen for yourselves our growth in the passed three years.

Our future lies—as must that of all publications—in the hands of our friends.

To these—and to them that we hope to make such—we express our earnest intent to keep "PRN" on a high level of radio interest, and up-to-the-minute with the latest information with regard to new apparata, legal matters appertaining unto radio, and in touch with all things of general interest to the would-be amateur, the amateur and the super-amateur!

Selah!

FIVE DAYS LATER

EFFECTIVE with the current issue, "Pacific Radio News" will be ready for distribution on the 25th of the month instead of the 20th, as has heretofore been the custom. The September number, therefore, will be ready for the mails on August 25th and should be in the hands of every Western subscriber no later than the 28th of the month. Eastern subscribers and those who purchase the publication from news dealers will receive their copies on the first or second day of the month. The closing date for advertising and editorial forms remains unchanged. All material for publication in the September number should be in our hands no later than the first of August. With the new distribution date set for the 25th of the month the publication will be on sale practically throughout the entire month bearing the date of the issue.

Subscribers who do not receive their copies on the dates mentioned above should notify us at once. All changes of address should be filed with the post office as well as with the publishers, as several dozen copies of the previous issues have been returned, due to neglect on the part of the subscriber in notifying both parties of the change.

New York Office.....147 Sixth Ave. Portland Office.....420 Bd. of Trade Bldg. Seattle Office.....419 Pioneer Bldg.
Boston Office.....18 Boylston St. Chicago Office.....1306 Hartford Bldg. London Office....62 and 8a, The Mall, Ealing

Entered as second class matter January 22, 1920, at the Post Office at San Francisco, Cal., under the Act of March 3, 1879.

RELAY TUBES & RECORDERS

By A. K. ASTER
Instructor in Physics, University of California.

IN Article III it was stated that a method for printing radio telegraphic signals by means of an ordinary Morse recorder would be described.

Let us consider the characteristics of a so-called "soft" or detectortube. See Fig. 2. It will be noticed from this curve that it takes only a small negative grid voltage to reduce the plate current to almost zero. In practice it will be found that six to eight volts negative on the grid is sufficient to practically stop the plate current. Because of the steepness of the characteristic curve, if the plate current has been nearly stopped by a negative grid voltage, it will take a very slight positive voltage on the grid to cause a considerable plate current to flow. This is the property of a "soft" tube which makes it suitable for a controlling device for a relay. See Fig. 12 for

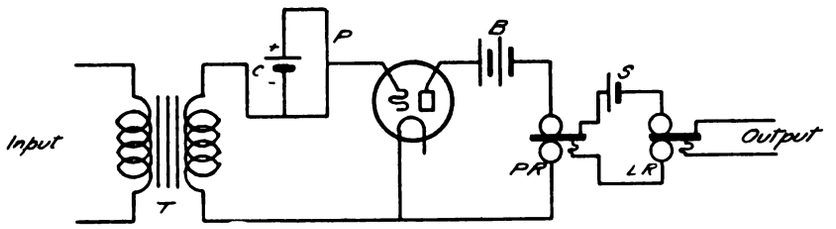


Fig. 12

connections. Hence, if in the circuit shown we make the grid sufficiently negative so that the polarized relay in the plate circuit will just cease to act, as soon as a very small a. c. emf. is impressed on the grid (an incoming radio signal), the positive halves of the a. m. grid voltage will reduce the negative charge on the grid sufficiently to allow a small plate current to flow. This change in plate current will be amply sufficient to operate the polarized relay. This arrangement has been actually used and works satisfactorily on loud signals, hence for good results one should have at least two or three steps audio frequency amplification preceding the "relay" tube.

The following points should be observed for best operation:

1. The "relay" tube should be a so-called "soft" or gaseous tube.

2. The "relay" tube should have its own plate battery, usually about 22.5 volts, so as to avoid interference from other circuits.

3. The grid battery should be about ten volts and should be provided with a smooth acting continuously adjustable potentiometer (not step by step) of at least 5000 ohms, so as not to unduly run down the battery. A graphite ord will not do, as the contacts on it are far too unsteady.

4. The polarized relay should be a high grade one of at least 10,000 ohms resistance. The relay must be connected properly in the circuit or it will not work, the binding post, as always, provided with polarized marks.

5. The extra relay should be an ordinary telegraph relay having about 500 ohms resistance. A condenser of about one-half of one microfarad capacity should be connected across the contacts of the polarized relay to eliminate sparking as much as possible. The object of the extra relay and of the condenser are to protect the contacts of the polarized relay. The battery operating this second relay should be as small as possible, but still of sufficient size to insure positive action of the extra relay.

6. The method of adjusting the circuit in Fig. 12 is as follows: Open the grid circuit and with the filament burning and plate battery connected, adjust relay. Contact so that the relay will just contact firmly as indicated by the Morse recorder, then close the grid circuit, starting with zero grid make the grid just sufficiently negative to cause the relay to release. The circuit is then ready for operation.

At this point the reader has a right to ask the following question: How about static, power line induction, noises due to street car trolleys, etc.? Will they not make an arrangement like this useless? The answer is, that they will, provided they are too strong or proper means are not provided to reduce them to an intensity where they will no longer disturb. If it becomes necessary to reduce them, a filter must be installed in the audio frequency circuit, preferably between the detector and audio frequency amplifier. See Fig. 14 for connections. In this circuit the condenser (C) has a capacity of 0.02 mfds. Both coils of the air core transformer (L) have a value of one henry each and the condenser (S) has a value of 0.01 to 0.05 mfds. and should be adjustable, at least in steps. The transformer (T) is an ordinary audio frequency amplifier transformer. The intensity of disturbances which still get through this arrangement can be controlled by the coupling at (L). It will usually be necessary to add a step to the audio frequency amplifier to make up for the losses in this filter.

It will undoubtedly take the average amateur, unless he has had considerable experience, considerable time to get an arrangement of this sort to work properly. He therefore should not become discouraged if he fails to make it work at first; he must design and make all details carefully if he is to expect results.

The following general hints will be found of value in amplifier work in general. The following are the usual causes for "noisy" operation of amplifiers, provided all, transformer, choke, etc., are properly designed:

1. Loose or dirty connections. All connections that are not made by means of substantial binding posts must be soldered. Springs in tube sockets must be sufficiently firm and properly adjusted.

2. Poor filament rheostats. These should always be of the step by step variety, provided with a good switch and never of the ordinary slide wire type. The resistance wire in the slide wire types becomes oxidized due to heating and the action of the air, and the result is that an excellent microphone instead of a good contact develops at the point where the slider contacts.

3. Defective plate batteries. Miniature storage batteries are the best. These are available on the market from the reputable battery manufacturers at a very reasonable cost. I recently investigated this matter and found that a 110 v. bank of cells would cost about the same as sufficient flashlight cells (110 v. battery) to last a year at the rate flashlight cells last when five or six tubes are operated from them. If flashlight cells are used, they should be properly mounted in containers filled with parafine and means should be provided so that individual cells may be cut out as soon as they go bad, as one bad cell is quite sufficient to make an amplifier very "noisy." A lamp of the proper voltage and size, and never a voltmeter, should be used to test cells, as a voltmeter may easily give a false impression as to the condition of a cell due to the fact that it does not draw sufficient current to actually test a cell.

4. It may be found necessary to screen an amplifier from stray fields due to lighting circuits, etc., in order to make it quiet. A sheet iron box is the cheapest and best for this purpose.

5. The connection on the filament batteries of an amplifier should always be kept clean and free from corrosion in order to insure steady operation of the tube filaments. The best way to accomplish this for either Edison or lead storage batteries is to first scrape the connection clean, then tighten the connecting bolts as tight as possible without stripping the threads and finally giving the entire terminal a coat of vaseline.

The question as to whether tubes can be successfully operated on alternating current for receiving purposes is often asked. Tests show the following results:

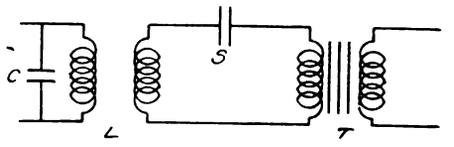


Fig. 14

1. For a single detector tube working in either an oscillating or non-oscillating circuit, fairly good results can be obtained. The hum produced by the a. c. is not sufficient to be very troublesome.

2. For an amplifier, if one does not exceed one step and is content with moderate amplification, the results are fairly satisfactory. If more than one step is attempted, the hum produced by the a. c. will drown out the signals.

3. For a. c. operation tubes having a stream line filament should always be used, as the hum is far louder with a tube having a so-called "hairpin" filament.

In conclusion, it is hoped that the material presented in this series, of which this is the last article, will be of some value to the radio amateur in solving his amplifier problems.

THE MAGNETIC AMPLIFIER

A Treatise on its Theory, Design, and Construction.
By Jennings B. Dow

Published by Permission of the Secretary of the Navy.

PART III.

FOR reasons which will be seen later, the iron core for this device will be made up of two concentric cylinders of equal length, which are to be connected magnetically by means of suitable "washers" at either end. The space included between the cylinders and the "washers" is used to house the control winding. We shall wind the radio-frequency winding axially, i. e., at right angles to the control winding to eliminate any possibility of mutual induction. See Fig. 8. The general dimensions of the core are governed by two factors, viz., the cross section of the control winding and the overall diameter of the "Litz" used in winding the radio-frequency coil.

By referring to the curves, Fig. 1,

$H = 180$

$B = 17800$

$r = 120$

$$\text{and } NI = \frac{0.8Bl}{r}$$

where NI = ampere turns

l = length of magnetic circuit (This equals twice the length of the cylinders plus twice the length of the flux path thru the "washers.")

By means of an approximation, the value of l may be found to be about 36 centimeters. Substituting the values of B, M, and l in the above equation,

NI = 4300 ampere turns required in the control winding.

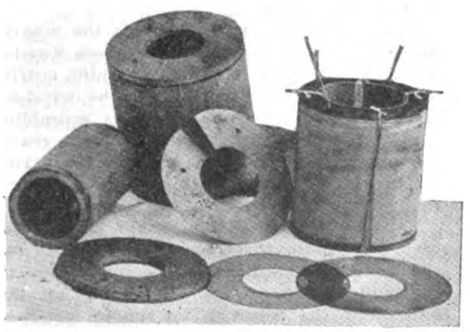


Fig. 14
Detail, 60 K. W. Relay

In this particular case, the maximum allowable control current was limited by a primary modulating device to 1.2 ampere.

$$\frac{NI}{I} = \frac{4300}{1.2} = 3600 \text{ turns required}$$

Number 20 D.C.C. magnet wire may be selected as the proper size. The method of selecting this wire will not be gone into detail with, at this time. It is based, however, upon a radiation factor of 5 watts per square inch, which is allowable for this class of solenoid construction.

With this wire, it is possible to wind approximately 600 turns per square inch of section; and a winding space six inches long by one inch in depth will be used.

The core for this device was built up in the following manner. The sheets of "Apollo," as they are obtained from stock, are 30 by 96 inches. These sheets were cut into strips 6 by 96 inches, and strips of 5 mil fish paper were cut to similar dimensions. A 3-inch wood mandrell was next made and placed between centers in a lathe and the process of winding the smaller cylinder was begun. The strips of iron and paper were wound together in order to prevent short circuited turns of iron, and successive strips of iron were insulated by overlapping the strips of paper. Twenty five complete turns of iron and paper were wound up in this manner, care being taken to wind same as tightly as possible. This made a cylinder having a wall one-half inch in thickness.

The larger cylinder was constructed upon a mandrel 6 inches in diameter and in a similar way. Only thirteen complete turns of iron and paper were used, however, in order that the cross section of the two cylinders might be equal. This made up a cylinder having a wall slightly over one quarter inch in thickness.

After each cylinder was completed, the ends were cut back one-sixteenth inch to provide a smooth surface and each cylinder was covered with a layer of cotton tape and shellaced.

The end pieces, or "washers," which connect the two cylinders magnetically, were built up of lamina of the same grade of iron as was used in constructing the cylinders. The fact that the magnetic circuit thru these "washers" had to have the same cross sectional area at all points, was carefully considered in the design of these "washers." A gap having a width of one-sixteenth inch was cut in each lamination to open the loop formed by it. This precaution was necessary in order to prevent any induced currents from flowing around the lamina when changes in current in the control winding were taking place. It must be remembered that a short circuited turn having an appreciable resistance, inductively related to any circuit in which a changing current is flowing has the property of damping the changes of current in the circuit. In assembling these "washers," each lamination was insulated from the next with 5 mils of fish paper. The "washers" were, in turn, insulated from the cylinders with 10 mils of mica, which overlapped the cylinders slightly to prevent any possibility of sparking due to induction from the radio-frequency winding.

The control winding was made in two

(Continued on page 29)

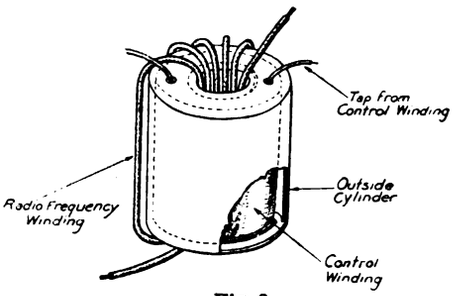
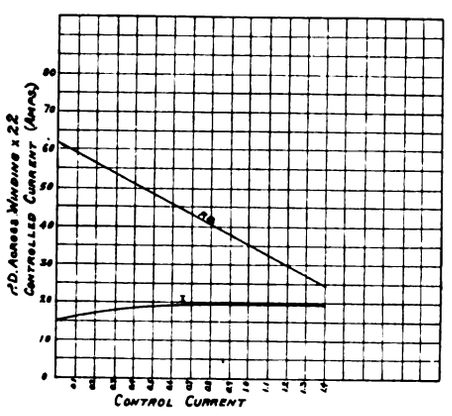
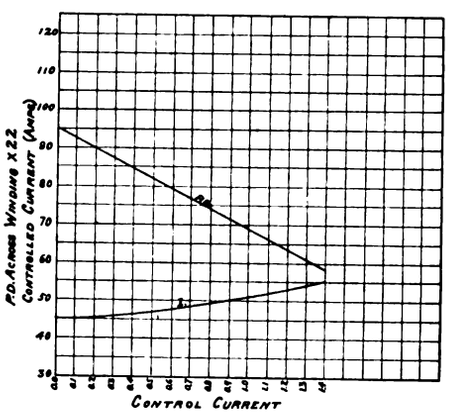


Fig. 8
View of 60 K. W. Relay



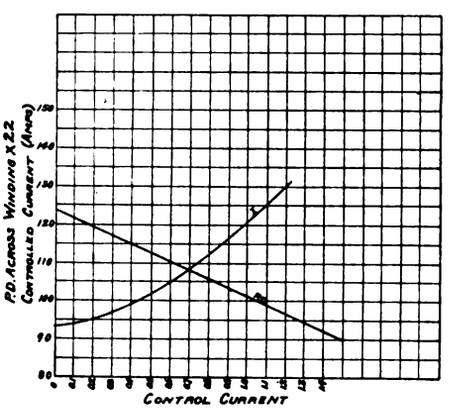
Results of 60 Cycle Tests.

Fig. 9.



Results of 60 Cycle Tests

Fig. 10.



Results of 60 Cycle Tests

Fig. 11.

Fig. 13
Partial Assembly, 60 K. W. Relay

A HARD-BOILED BUNCH

BY V. G. MATHISON

Author of the Samuel Jones Series

MAYBE some time or other while thumbin' the pages of your call-book you have come across the call letters K-V-I. If you did, they probably didn't interest you. All the book has to say is "K-V-I, Unga Island, Alaska." There ain't no details, an' the type is pretty small. By rights it should be printed in letters a foot high, while as for th' details—well, a while back I happened to get acquainted with some of 'em, as you may judge when you peruse the following:

It all started one day up in Cunningham's office, when I was grumblin' about the seagoin' wireless game.

"This goin' to sea is the bunk," I tells Cunningham. "For th' last ten years I've been hoppin' from one berth to another like a flea in a ten-cent lodgin' house, an' I'm gettin' sick of it. First thing I know I'll be growin' old an' gray at this game; an' I'll be a pretty lookin' sight poundin' brass with a long white beard draped around th' receivin' tuner, or hangin' down into th' drip-pans of th' motor generator. I'd like to land a nice steady shore job some place where I could settle down an' spend th' rest of my life in peace an' quiet."

"If you mean that, you've took the notion into your head at just the right time," exclaims Cunningham. "The Alaska Codfish Company down on Steuart street are looking for a man to go up to Alaska and run their wireless station on Unga Island."

That afternoon we breezes down to Steuart street, an' Cunningham introduces me to the big chief of the cod-fishin' concern, a gentle an' friendly ol' war-horse with a sea-tanned map an' snow-white hair.

"Unga Island is the largest island of the Shumagin group, on the south side of the Alaskan peninsula," he tells me. "It's about half way between Kodiak Island to the northeast and Dutch Harbor to the southwest. There is a naval radio station at both of these places, but none in the six hundred mile stretch between. That is why we built a station of our own on Unga Island. The station is at Unga, an Aleute village on the southern end of Unga Island, where we also have the headquarters of our cod fisheries."

"Is it a quiet place?" I asks.

"A mail boat calls at the island about three times a year," he answers. "And there is otherwise no touch with the outside world, except through the wireless station. Theree are no passenger steamers running there; in fact, no vessels of any kind but our own fishing schooners. It should be quiet enough, if that is what you want."

"Yes," I replies. "Is it a permanent job?"

"Absolutely," he answers, in a tone like he meant it. "In fact, you will be required to sign a contract to stay two years. I can assure you that you'll like Unga. You have a fine two kilowatt set to handle; and the people are very congenial."

"Then what's th' present operator leavin' for?" I asks. "Is he retirin' on account of old age?"

"No, he has—he has ceased to operate," he answers, with a queer kind of a twinkle in his eye. I didn't exactly understand that, but I guessed it was all right, an' I signs the two-year hitch.

Three days after, I gets aboard the "Maweema," an ancient-appearin' an' bad-smellin' three-masted sailin' schooner, loaded to th' scuppers with salt, an' tough-lookin' codfish snailers. A tow-boat drags us out through the Golden Gate, an' we shake out our rags to a cold head wind. Soon as we was clear of the land, all hands gets drunk. I puts in a few pleasant nights listenin' to the fishermen an' sailors forward fightin' an' howlin' an' whoopin', while in the cabin th' skipper an' the mates gambled an' squabbled an' raised particular hell. Meanwhile the wind changes into a southeasterly gale, which takes us off shore a-flyin'. The farther we went, th' harder she blowed. Jibs an' mainsail were ripped to rags; a top-mast comes down; th' deck-load goes adrift; an' to make things more comfortable, a sea tears off th' cabin skylight one night, an' I wakes up to find my grips sloshin' around in a couple feet of sea-water.

After forty-three days of head winds an' hurricanes, we sights Simeonof Island, a gigantic snow-covered pyramid of lava stickin' up out of the ocean, on the outer edge of the Shumagin group. A squally southwest gale drove us by Simeonof, an' on into the Straits of Nagai, where I had my first look at Unga Island. It was about eighteen miles long, an' maybe six wide, fringed with reefs an' rocks, an' topped with two towerin' white peaks. We comes sweepin' up Nagai Straits on the wings of the snow-storm, an' comes at last to anchor in Squaw Harbor, a little cove on the eastern side of Unga Island. Accordin' to the charts, the town of Unga was about eight miles away, on a little inlet called Delarof Bay.

The next mornin' a power-boat, the "Alasco II," comes round from Unga, an' I goes back on her. She was piloted by a crazy-lookin' highbinder with a long droopin' black moustache, an' a pair of fists like rhinoceros' knuckles. After informin' me that his name is Hammar th' Head-Cracker, he inquires who I am. When I tells him I'm a key-puncher, he looks glum.

"Yuh won't be here long," he says, darkly. Then he shuts up like a clam.

After skirtin' a few miles of high, dark cliffs, we finally swung into Delarof Bay; an' I saw the town of Unga. Down at the foot of a steep, snow-blanketed mountain I saw a gloomy-lookin' village—frontin' on the bay a hundred small houses an' shacks; down on the beach some weather-beaten warehouses an' sheds. Up on a knoll in the middle of the town stood a government commissioner's combination dwellin'-shack an' court-house; below that a hard-lookin' dance hall grinned in the face of an old tumble-down Russian church. Farther up on the rise was a cemetery twice the size of the town, bristlin' with white-painted crosses, set so thick that from the bay they looked like a field of daisies.

Just above a little wharf, juttin' out from the beach, was a steep, rocky knoll about a hundred feet high, an' on top of it were the wireless masts. They were maybe a hundred an' thirty feet high, an' four hundred feet apart, an' were loaded down with heavy guy-wires—to keep 'em from bein' blowed clean to Kamchatka, the Head-Cracker explains.

Half way down the face of the hill was the station house, a white-painted shack hangin' by its eyebrows on a narrow ledge of granite that stuck out from the cliff. The heavy swell from the Pacific was boomin' against the rocks just underneath, an' sometimes a cloud of white spray went flyin' up over the shack.

Just as we were swingin' up to the wharf there appeared a little spurt of pale-blue smoke up on the hill above the wireless shack, an' about the same instant a bullet smashes one of the window panes in the front of the pilot house.

"Duck below!" yells the Head-Cracker, as another bullet rips a cloud of splinters off the window sill, an' a third one puts a dent in the compass binnacle. Without askin' no questions, I dives inelegantly down a companionway into the engine room. As I crawls up behind the engine, on the lee side from the bullets, I sees the Head-Cracker haul a young cannon outa his jeans an' start blazin' away at the guy up on the hill. He empties his six-shooter, reloads, an' empties her again—meanwhile the fellow on the hill busts a few more panes of glass, an' puts half a dozen holes through the bulkhead. Just as the Head-Cracker was loadin' his gun for the fourth time, the shootin' from shore stops.

"Is th' battle over?" I asks, stickin' my head up through the companionway, cautious like.

"Not by a damn-sight!" roars the Head-Cracker, stowin' away his Krupp-junior. "It's only postponed till I git ashore—I'm gettin' weary of arguin' with that guy!"

"Then it was you he was bombardin', not me," I exclaims, feelin' a lot relieved.

"It's Hog-Tooth Wilson," sputters the Head-Cracker. "Coupla weeks ago we was figgerin' who'd licked the most codfish snailers last year, an' Hog-Tooth figgered he'd licked one more'n I had, so I licks him to make it a draw. Now he's goin' snoopin' 'round gunnin' for me, which ain't no way to treat a friend."

By this time we was alongside the wharf. Gettin' ashore, I meets the Brainless Swede, the superintendent of the codfishin' outfit, who shows me the way up to the wireless house. The Head-Cracker comes grumblin' along with my grips, but soon as we reach the shack he drops 'em and goes swearin' off up the hill with his hip-pocket artillery ready for action again.

The rectangular-shaped radio shack was divided off into three small rooms; one for the sendin' apparatus, a sleepin' room in the midde, and an operatin' room on the end facin' the ocean. The sendin' set was a trashy-lookin' made-to-order rig, with a lot of helices to get a twenty-five hundred meter wave—a two kilowatt panel set with a flimsy synchronous gap coupled up to an old condemned hoistin' motor that'd been

made over into an alternator. This was belted to a contrary-lookin' one-lung gasoline engine, on the opposite side of the room—about a five horse-power. A second belt from the engine went to another made-over motor, which furnished direct current to excite the alternator. The transmitter had a leaky oil condenser, a hammy-appearin' transformer, with a secondary windin' about the size of a ball of knittin' yarn, an' a phony oscillation transformer that looked like it'd been squashed by an elephant steppin' on it. That was about all there was to it, except for a lopsided name-plate on the panel, announcin' it was a "Hellkum Special"—whatever that is.

I started in right away to get the set in workin' order, but I was bothered a lot by people stringin' in with messages. One guy, a fur-trader, brought twelve at one lick.

"Some of these is kinda previous," he remarks; "but I want'a get 'em off while you're still here."

"Still here!" I exclaims. "I just got here!"

"I know it," he answers. "Otherwise, you wouldn't be here."

I didn't exactly get the drift of that just then, but I did later. By night I had the set in shape, an' fifty-one messages on file. It was snowin' an' stormin' outside, an' at 5 o'clock it was pitch dark. I figures I might's well begin tryin' to raise N-P-R, so I starts the engine; but when I gets in, I hears a devil of a racket bustin' up the ether. Listenin' awhile, I makes out it was N-P-R an' another loud synchronous spark signin' K-O-X-N, which I learns later was another codfish company station. They were havin' a grand wireless battle.

"I can pound brass a damn sight better than you ever will pound it, you mush-room-fisted son of a sourdough biscuit!" I hears the codfish code-slinger yellin' at the navy gink. "If you ever make any more breaks about my fist, I'll come up there an' make your homely map look like a busted tomato!"

"Aw, dry up, you fire-eatin' moonshine-guzzler," answers the gob at N-P-R. "You've got so many codfish fins growin' on your back you can't keep your shirt on no more,—better go jump in the ocean, where you belong, fishie."

"I'll fix you yet, you flat-footed, knock-kneed squaw-chaser!" howls the codfish key-puncher. "I'm goin' to fill you so full of lead you'll have to go to your grave in a ten-ton truck!"

This keeps on for about half an hour, until both the gadget an' the codfish desperado was so mad they could only stutter on their keys like a couple of crazy omnigraphs. At last, I risks a call to N-P-R, but all I gets is a roar of Q-R-T's for about ten minutes; then all of a sudden I hears a new fist take the key at the navy station.

"K-V-I, K-V-I de N-P-R, N-P-R," he says. "Never mind those two little honey-birds—just havin' their usual evenin' lovin' match—both full of sourdough brew—bad stuff—I got your biz of last two months—seventy-two messages—Q-R-V."

"Yes, all set," I answers. "Got fifty-one here."

About 11 o'clock I had all his messages. I starts in to shoot mine, but before I'd got more'n seven or eight of 'em away somethin' goes flooey with the transmitter. I dashes into the power room an' discovers the sendin' condenser is shot. It takes about fifteen minutes to fish the busted section out of the oil an' stick in a new one. I starts hammerin' again, but on the sixteenth message the spark goes out of synchronism, an' dies slowly away. I rambles out into the power room again, an' finds the couplin' between the gap an' the alternator is carried away. Lashin' it up temporary, I tackles the key once more, but on the thirty-third message somethin' blew up again. This time I finds the power room full of smoke, an' I discovers the transformer secondary is burnt black as a newly-wed's biscuits.

"Looks to me like I landed one nice, peaceful quiet little hell of a shore job, all right!" I mutters to myself, as I shuffles out a couple thousand transformer laminations to replace the burnt secondary.

On the forty-ninth message the engine stopped. As the lights were on the direct-current generator, this leaves the shack pitch dark. I lights a candle, an' finds the fuel-pipe to the engine is busted off the carburetor, an' gasoline is runnin' all over the floor. Blowin' the candle out quite instantly, I bandages up the pipe in the dark with a piece of friction-tape. At last, soakin' with engine oil, gasoline an' sweat, I drags through the fifty-first message, an' signin' off with N-P-R, I turns in to dream of millions of shootin' condensers an' explodin' gas tanks.

The next mornin' I meets Dopey Driffield, the government commissioner, a sleepy old worm who'd been in Unga more'n thirty years, an' who seemed to be sufferin' from a chronic case of Alaska lazyritis. He tells me he's learned somethin' about wireless from previous brass-pounders, an' has a little spark-coil ham set of his own.

"Say, what become of the operator before me?" I asks him, as we stand out in front of the town pool hall. He starts to answer, but just then a vampy-lookin' little black-eyed girl comes trippin' along an' gives me a sly, teasin' smile. I starts to return the smile, with interest, but Dopey punches me in the ribs.

"Look out!" he whispers. "That's Mexican Frank's wife—he's standin' behind you!"

I peeks around out'a the corner of my eye, an' when I sees a bad lookin' Mexican standin' close by, glarin' green-eyed at me, an' with one hand on his shootin' gear, my smile freezes fast.

"You was askin' about yer predecessors," remarks Dopey, after a minute; "I'll show you where they is."

Leadin' me out into the cemetery, just back of the town, he brings me up to three white-painted pine slabs, all set nicely in a row. Takin' a slant at the first board, I reads this cheerin' inscription, done in crooked black letters:

"HERE LIES STANLEY HINCH
A Wireless Operator
DRILLED BY LONG BILL'S COLT
On the Last Night of September, 1920."

"He was the first one," asys Dopey. "He got full of moonshine one night, an' started singin' a Hungarian op'ra under Long Bill's bedroom window. Long Bill thought he'd got bit by a Malamute mad-dog an' was dyin' from hydrophobia, so he shot him to put him out'a his misery. Bill always was a kind-hearted ol' fence-rail."

By this time I was readin' the second slab:

"HERE LIES FRANK MYERS
A Wireless Operator
STUCK THROUGH THE GIZZARD
By Dago Mike in Soapy's Barroom
December 5, 1920."

"What'd he do?" I asks.

"He was a nice boy, but he was plumb foolish," replied old Dopey, pensive-like. "He mixed into a war argiment in Soapy Komedal's soda water joint, an' said 't'hell with th' kaiser.' Right there German Charlie yanks out his gun an' makes the chauco stand up on th' bar an' repeat 'Hurrah fer th' kaiser!' fifty times, but before he could get done with it, Dago Mike, th' bartender, got peeved an' rammed a butcher knife clean through him—Mike always was a good patriotic Dago, so we couldn't blame him."

I didn't say nothin', but rambles over to the third signboard:

"HERE LIES THE LEFT FOOT AND THE RIGHT EAR OF EDGAR NELSON
A Wireless Operator
BLOWED TO HELL BY NITROGLYCERIN
February 7, 1921."

"Edgar stayed with us th' longest—three weeks," says Dopey, thoughtful-like. "One day he went to visit th' gold mine up th' bay, an' just fer a joke Hardpan Pete slips a can of triple X blastin'-caps in his pocket. Comin' back to town, Edgar fell down a cliff, an' all we could ever find was his left foot an' his right ear—we knew it was his right one because Bull Barney, th' moonshiner, had nicked it th' day before, practisin' with a new automatic. I was sorry to see Edgar go to pieces that way, but he had no business fallin' off'n the bluff."

"Seems to be a healthy place fer brass-pounders, don't it," I remarks, already seein' four little slabs in the code-slinger's row. "I know now what th' old bird in Frisco meant about that operator ceasin' to operate."

"There's only one wireless man ever stuck it out around these parts," replies Dopey, "an' that's Fightin' Hell-Fire, the guy that built this station. . He's just built another at Pirate Cove, over on Popoff Island, about twenty miles from here. The call's K-O-X-N—mebbe you've heard him."

"Yes, I did, last night," I answers. "He seems to be a lunatic."

"That he is," declared Dopey, fervently; "an' he's a tough guy. Besides his reg'lar six-shooter he packs a little Colt automatic in his mackinaw pocket; an' th' other day I seen him shoot a wart off'n Black Ola's nose at a hundred feet without even pullin' th' gun out'a his pocket—shot right through th' cloth. H'll probably be over soon's we have a storm—he has a fishin' dory with a little engine in it, but he never travels unless it's blowin' a hurricane—says he gets tired moochin' along in a boat in calm weather."

Just as we was leavin' the cemetery, I notice a couple fellows comin' with picks an' shovels.

"They're comin' t' dig a hole for Hog-Tooth Wilson," says Dopey, yawnin' like it didn't amount to nothin'. "Th' Head-Cracker plugged him last night in self-defense—Hammar never would stand fer anybody abusin' him."

Durin' the next three weeks I didn't see much of anybody. I didn't feel like venturin' out of the wireless shack, an' anyway, the set didn't give me a chance. I never got through a schedule with N-P-R without a couple of breakdowns. First a condenser would shoot; then the gap-electrodes would strike an' break off; the gasoline pipe busted again; wirin' shorted in the conduits; fuses blew; the engine coolin' tank springs a leak an' floods the joint; an' chronic hot bearin's on the alternator throwed the belt off, which wound up in the engine flywheel an' got tore to strings. Considerin' everything, I had a right pleasant time.

The engine kept gettin' crankier every day, until at last she laid down on the job an' quit fer good. I primed an' oiled an' sweated an' swore, but 'twasn't no use. The next day it was blowin' a howlin' storm. Big seas were boomin' against the rocks under the wireless house, roarin' like

(Continued on page 22)

A CONDENSER THAT HOLDS ITS OWN

If you have been experiencing trouble from condenser break-downs, here is one that will eliminate your trouble.

MR. H. C. BROWN (6CH) has a transmitting condenser that will hold its own against anything yet devised. The condenser operates on the oil-cooled principle and is remarkably efficient in operation. Many requests have been received from Pacific Coast radio men regarding the construction of the condenser and for this reason the constructional details are published herewith.

The only materials necessary for its construction are twelve aluminum plates, size 24 gauge; twelve sheets of a good grade of photo glass or window glass that is free from air-holes and other defects; a wooden tank container for the unit; two brass connecting rods for the plates and 36 lengths of No. 15 soft drawn copper wire for the use of separators.

The size of the glass plates can be obtained from the accompanying drawings. The aluminum plates must be cut as shown, with a lug cut from the same sheet as the plate itself. It will be observed from the drawings that there are two kinds of plates, left hand plates and right hand plates. Six of each are needed. The corners must be rounded as shown, and rubbed to a polish with steel wool to prevent all brush discharge. Six holes are drilled into the aluminum plates as shown in Figure 5. These holes are used to allow three separators to be riveted to the back of the aluminum plates. The separators are merely short lengths of No. 15 soft drawn copper wire, bent as shown in Figure 5. Three of these separators should be riveted to each aluminum plate as shown. The purpose of these separators is to allow the oil to circulate between the units and thereby afford an excellent cooling surface for the entire condenser, the best method of preventing break-down.

In assembling the condenser it is important that a right hand plate faces a left hand plate. All right hand plates are connected together by means of a long threaded brass rod. Nuts should be used to secure each plate to this rod. The left hand plates are assembled in like manner. Binding posts should be attached to the ends of the connecting rods for the usual terminal connections.

The container best suitable for this condenser is, of course, either a glass or rubber case but the following method of construction for a container has been in use by 6CH for a number of years and has given excellent service: Construct a hardwood box, just large enough to hold the unit snugly. Before assembling the box give it one coat of diluted Le Page's glue. After the first coat dries, apply two coats of heavy glue. Then assemble the box with nails or screws and blue the edges, being careful that the glue covers all corners of the box. Allow the glue to dry and fill the container with castor oil or a good grade of transformer oil.

This condenser has held up for many months under a strain of 45,000 volts. Many others failed to hold up under the strain. The total capacity of this condenser is .006 mf. each unit being .001 mf. capacity. To increase the capacity, add more units. It may be well to state that the entire unit should be firmly bound with tape, making it an easy matter to insert same into the container.

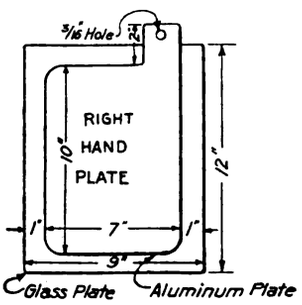


FIG. 1

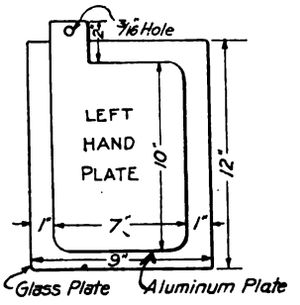


FIG. 2

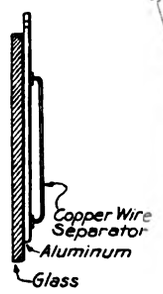


FIG. 3

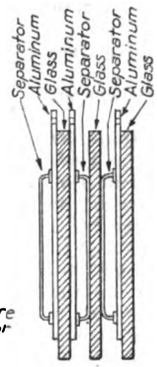


FIG. 4

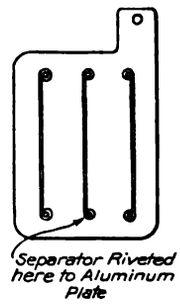


FIG. 5

STAG PARTY AT S. F. RADIO CLUB

JUNE 30th will long be remembered by the unusually large number of radio men who attended the San Francisco Radio Club's Stag Party. It was a lively affair from start to finish. Refreshments, musical numbers by radio telephone, smokes and entertainment were on the program of the evening. The radio raffle was the talk of the town. Vacuum tubes, meters, variometers, radio books, magazine subscriptions, tuners, phones, horns and an abundance of other apparata were raffled.

The affair was given wide publicity by the various radio telephones in San Francisco and was a marked financial success.

STOLEN AUTOMOBILE RECOVERED BY WIRELESS

BOSTON has recovered its first stolen automobile by means of wireless. The recovery was reported by the Cambridge police and Scouts Charles and Edwin Barney of 20 Breamore road, Newton, have now qualified as radio sleuths.

The automobile, a Peerless roadster, owned by Arthur Vinton of Highland avenue, Somerville, was stolen near Harvard Square last week. A wireless flash announcing the theft was broadcasted Saturday night, in accordance with arrangements made with the Boston Police Department, and picked up by radio amateurs within a hundred mile radius.

Early one Sunday morning Charles Barney, aged 18, assistant scoutmaster, was walking near his home on Hunnewell avenue, Newton, when he discovered a car similar to the description sent out by wireless. The young man hurried home, secured the detailed data (registration, engine, serial and model numbers)—which his brother Edwin had received with his small wireless outfit—and, finding that his information checked with that of the automobile, which was empty, promptly notified the Cambridge police.. Two patrolmen answered the call and the machine today is resting in its owner's garage.

The recovery of the machine marks the first important result secured by the Boston Police Department in sending out wireless broadcasts each night in connection with missing automobiles, men wanted for misdemeanors, missing persons, etc.

About a month ago Commissioner M. J. Crowley secured the assistance of the American Radio and Research Corporation, Medford Hillside, and nightly police reports of the above description are broadcasted from the company's high-powered sending station. Reports are telephoned from police headquarters at Pemberton Square at the close of each day to the sending station at the factory of the American Radio and Research Corporation. The reports are then flashed by both wireless telephone and telegraph. When sending out by telegraph the messages are sent very slowly at ten words a minute and are repeated three times to insure their reception. Wireless orperators within a radius of one hundred miles pick up the reports and then are asked to refer them to the local police.

Returns have shown, according to the police, that the reports are distributed in the large majority of cases. Records are at hand which show that this has been done as far west as Fitchburg and as far east as Marion.

Reports are sent out from headquarters at Pemberton Square at 7:40 p. m. and are broadcasted by wireless at 8 o'clock at the Amrad station.

As there are many thousands of interested radio amateurs in the metropolitan district, it is expected that further notable achievements will be made in the near future.

6 C H-

A SAN FRANCISCO STATION WITH AN ENVIABLE RECORD FOR LONG DISTANCE COMMUNICATION

YOU can't expect to get results from your set unless you 'stick with the ship', and it is a mighty rare occurrence that luck will bring results."—6CH.

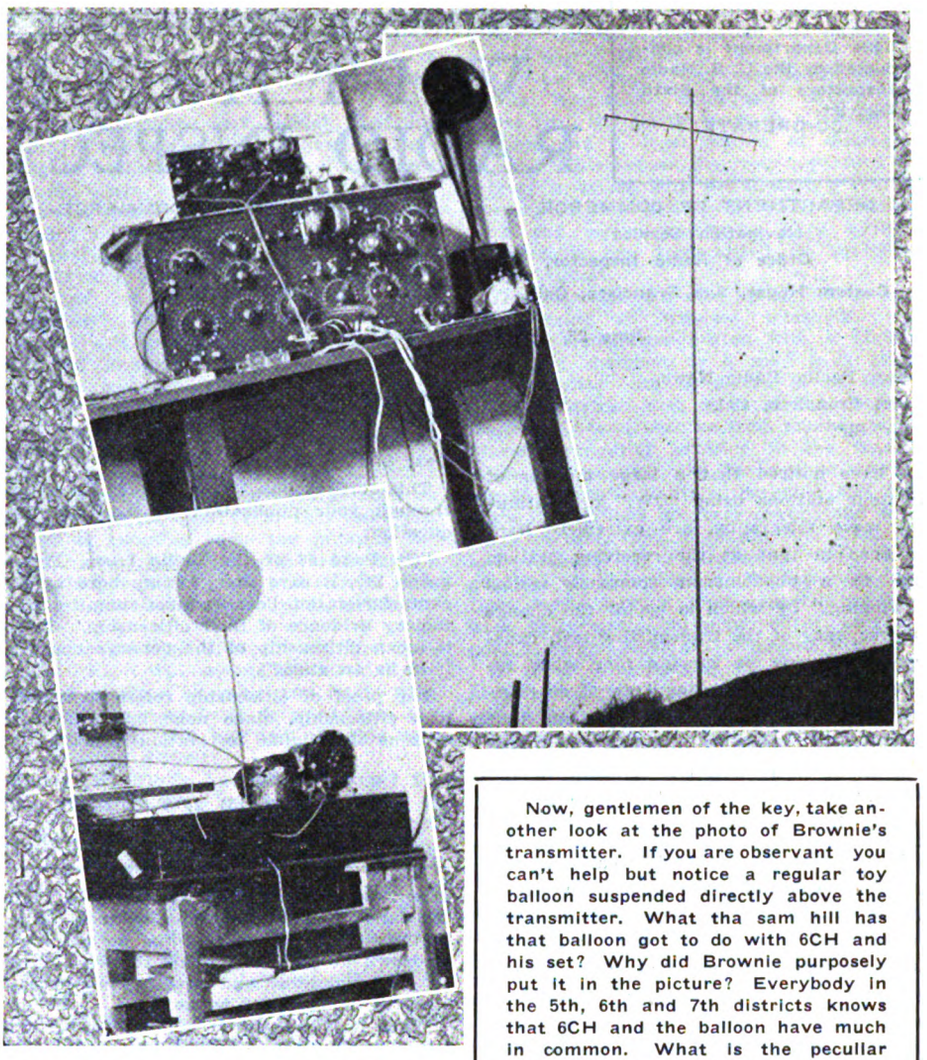
BROWNIE, as we all know him, is the proud owner of station 6CH. Why shouldn't he carry around that contented smile of his when he has the distinction of working fourteen "seven" stations the first night that he busted into the air with his 1-2 K. W. transmitter.

"If every Western amateur would play the game as squarely as 6CH," remarked a certain individual, "all would be well."

Brownie thinks nothing of standing by for three hours to give the other fellow a chance. And everybody in the West knows how things begin to move when 6CH gets started.

His radio experimenting dates back to 1914 and he has ever insisted on having one of the highest "sticks" in town. Take a look at the photo of his present mast. It is 103 feet high, while another mast, 35 feet high, suspends the other end of his six-wire aerial. The aerial is 78 feet in length; lead-in is 17 feet long, and the ground is 20 feet from his apparatus. Now, then, observe the transmitter. Everything neatly arranged—no efficiency lost, strayed or stolen. No wonder he has been heard by the following stations: Fifty stations in the seventh district, from Portland to Moscow, Idaho; Salt Lake City, Utah; Southern California, and has also worked stations in Arizona and New Mexico. His radiation is just a little under three and three-quarters amperes. Reno, Nevada, and Los Angeles have been worked between 5 and 6 P. M. Usually the station is not in operation until after 10 P. M., as 6CH has always been known as a "night owl"—being a moving picture operator. The transformer is of his own construction. It is of the closed core type with a 24,000 volt secondary. A Murdock oscillation transformer, 6-point rotary running at a speed of 3450 R. P. M., glass plate condenser of 0.006 M. F. capacity and an aerial ammeter constitutes the transmitting equipment.

His receiving apparatus is also homemade. Specially constructed honeycomb coils are used for the tuner. With this receiving set he has heard 5ZA, 6ZA, 7CC or ZM, 9UE, 9WU, 9EE, 9UV, 9AG, 8UE and others too numerous to mention. A Magnavox is used to throw the signals from the seventh district stations all over the house, using only two steps of amplification.



Now, gentlemen of the key, take another look at the photo of Brownie's transmitter. If you are observant you can't help but notice a regular toy balloon suspended directly above the transmitter. What tha sam hill has that balloon got to do with 6CH and his set? Why did Brownie purposely put it in the picture? Everybody in the 5th, 6th and 7th districts knows that 6CH and the balloon have much in common. What is the peculiar relation of one to the other? Out with it, fellows!! The editor of the "PRN" has five crisp one dollar bills that he is going to give to five of us amateurs who send in the best answers to the above question. You don't have to be a subscriber to enter the race. Get busy now—shoot in your answers and win a dollar. The names of the winners, as well as their answers to the big balloon mystery question, will appear in the next issue of the "PRN." The judges of the contest will be five prominent local radio men. All answers must be of no more than 50 words in length. Let's go!

CORRESPONDENCE FROM OUR READERS

SAN JOAQUIN LIGHT & POWER CORPORATION
General Office

Fresno, California
June 26, 1921.

Mr. P. R. Fenner,
50 Main Street,
San Francisco, Cal.
Dear Mr. Fenner:

I cannot refrain from writing my appreciation of your Radiotorial, in the July issue of PRN, on correct sending. You certainly said a mouthful, and voice my views precisely. Isn't it the truth, though, that a great many fellows have no sense of time intervals, likewise with a lot of amateur musicians. The way some of these DX operators rush through with their msgs, one would think that it was a life and death matter, only to have to ask for repeats and in that way cause considerable unnecessary interference. I have always held that amateur operators should have to send up to some standard, before being permitted a license. That would work a hardship on Radio Inspectors, most likely; but would, without any doubt, have the desired effect on code sending.

I have had fellows come to me for code tests and complain that they could not read my sending because it was too precise and machine-like. The trouble was that they were used to slipshod, careless sending and I tell them, what a small chance they would have in passing the Inspector's Omnigraph code test. While I have preached my ideas of good sending to the local amateurs, only to have it go inot one ear and out the other, it certainly gives me a lot of satisfaction to have a professional come out as you have done and take them to task. With very best wishes, I am, as ever,

Your friend,
(Signed) R. C. DENNY, 6CS.

The Formica Insulation Co. have recently appointed the Northwest Radio Service Co., 609 Fourth Ave., Seattle, the exclusive Northwest distributors for Formica sheet and tubing. This company has recently installed machinery for cutting Formica panels to any desired size.

This Department is conducted by the U. S. Radio Inspectors of the Sixth District.
CO-OPERATE!

WITH THE RADIO INSPECTOR

Questions answered by the Inspector.
No names will be printed.
Initial your letters only.

DEPARTMENT OF COMMERCE
Navigation Service
Office of Radio Inspector,
Custom House, San Francisco, Cal.,

June 26, 1921.

Editor Pacific Radio News,
San Francisco, Cal.
Dear Sir:

I have noticed that a large number of amateur stations using "CW," or continuous wave telegraphy, are extremely hard to keep in tune at the receiving station, due to a phenomenon commonly called "swinging," by which is meant the change in frequency of the transmitting test, causing a swinging or varying tone when received on a receiver using heterodyne principles. This often is so troublesome that reception is impossible at times, due to the inability of the receiving operator to follow the variations of the wave of the transmitting station.

A very common and prolific cause of this troublesome occurrence is due to the actual swing of the transmitting antenna itself. When a set is tuned, say with the antenna at rest (there being no wind to move it) it will have a definite capacity. Now, if a wind comes up, and swings the spreaders of the antenna, in such a manner that they approach nearer the earth at times (although this might be only a few inches) a great difference in the received "beat note" will be observed. This is due to the slight variations in the antenna capacity, due to the swinging, which will cause the note to vary. This can be readily eliminated by building the antenna in such a manner that it will not swing—using "downhauls" on the ends of the spreaders to keep them steady, etc. The lead-in wires should also be drawn tight, and not allowed to swing, as is common practice.

Overloaded DC plate supply generators will often cause swinging, in some circuits, also. When the circuit is loaded, the DC generator will have a certain potential. Now, when the key is opened (using pure CW telegraph) the generator will speed up due to there being less or no load. This will cause a rise in voltage, which, in turn, will result in a higher voltage being impressed on the transmitting circuit when the key is again closed. The greater voltage will cause a change in the radiated wave, due to everything in the set being at a higher potential, which will result in a variation of the note in the receiving equipment. This change is slight, it is true, but will be enough to cause a considerable change in the "beat note" at the receiver. This may be eliminated to a large extent by shunting the key with a high resistance, which should be of such value that about 25 per cent of the normal load is drawn at all times. This throws a load on the generator, and prevents an excessive rise in potential on no load.

When it is considered that on 200 meters the frequency of the oscillations is one and a half MILLION cycles, and that a change of one meter will make a change of 5,000 cycles, a very slight change will be enough to cause such a large variation of the actual frequency, that the beat note at the receiver is lost. Say you are radiating on 200 meters. Now, if the antenna swings a little, and changes the wave by a tenth of a meter (which is far beyond the reading of an ordinary wave meter), the beat note will have changed by 500 cycles, and the beat note will be absolutely lost. A much smaller change than this will usually be sufficient to set up unreadable swinging in the receiver.

Respectfully,
(Signed) D. B. McGOWN.

DEPARTMENT OF COMMERCE
Navigation Service
Office of Radio Inspector
Custom House
San Francisco, Cal.

June 21, 1921

The Editor,
Pacific Radio News,
San Francisco, Cal.
Dear Sir:

This office has been asked to reply through your publication to the following question:

"On Page 66 of the Radio Laws, Paragraph 149, it says that 'foreign born applicants for station licenses must submit satisfactory evidence of their citizenship.' Does it mean citizenship of the person's country if he is an alien?"

The proof of citizenship refers to American citizenship, since none but American citizens are eligible for station licenses.

Respectfully,
(Signed) J. F. DILLON,
Radio Inspector.

QUESTIONS AND ANSWERS

Q. Please answer through the "Pacific Radio News" whether or not it is permissable for amateurs to converse on anti-prohibition matters via radio. I have heard several amateurs converse freely on this subject and, being a firm believer in prohibition, I would like to have your opinion on the subject. It is lawful to discuss this matter by radio to such an extent that a joking matter can be made of a pre-night's "overflowing bowl" party? I have also heard amateurs invite others to their station to "have a drink."

S. L., Berkeley.

Ans. No limitation is made under the laws and regulations concerning the matter transmitted via radio, provided it does not conflict with law and order. The only definite regulations covering the above case is Paragraph 210: "No person shall transmit or make a signal containing profane or obscene words or language." It is not believed that any discussion of the kind mentioned above could be classed under this head, unless actually the operators did swear over the apparatus. A good deal of this matter is sent over the air just to act "smart," and is in most cases just mere bravado, and naturally cannot be subject to censure, unless the said operation causes interference with other communication, in which case the stations and operators would be guilty of unnecessary interference, for which they could be penalized.

Q. How long can two stations hold the air without fear of suspension of the station license? Can two stations communicate with each other for a whole hour without even waiting to hear if somebody else wants the air? If two amateurs are talking together for a long time and I want to send, are they required to stop and give someone else a chance?

C. S., San Francisco.

Ans. This depends on the class of traffic being handled, and the needs of the individual case. If the long-continued use of the air is necessary, as handling legitimate traffic, etc., while the person waiting is simply desirous of "chewing the rag," the former stations should have priority. It is the purpose of the Department that everyone should obtain the maximum benefit from the operation of their stations, hence stations unmercifully "hogging" the air are clearly guilty of violations of the laws and regulations concerning the transmission of superfluous signals, and of interference. If the stations are located in a district where traffic schedules are in effect, any unnecessary communication during the long-distance periods will be considered as wilfull interference, and the violators treated accordingly. It is probable that the case referred to in your question, the interference caused by the stations mentioned was due to the use of excessive power for short distance work—another violation of the laws and regulations.

Q. Under the new license provisions for commercial gradings, what grade of license would I receive upon expiration of my present commercial license, which has been used only in operating an amateur station during the past two years?

A. E., Oakland.

Ans. If you have not had any commercial experience you will be examined for commercial First Class Third Grade. If you have had the necessary experience (at any time, whether on the last license held or not) for a First Class Scond Grade you may be issued a license of that grade. If you can copy 25 words per minute, you may be issued a First Class First Grade License, also provided that you have had the required experience for this grade. The issuance of all these licenses will, of course, depend on whether or not you successfully pass the code tests and written examinations. The operation of an amateur station does not entitle the holder of a commercial license to renewal, except by re-examination.

CONTINUOUS WAVE MATTERS

By Lawrence Mott
(Associate Editor)

Progress along all lines of endeavor that are distinctly new, is, of a necessity, somewhat slow. I have, however, been pleasantly surprised at the interest shown in CW by many operators.

There is a well-known amateur in the Southland, with a "Z" license, who is most enthusiastic, and an energetic booster. From him I have received some very excellent suggestions for CW work, and I take a great degree of pleasure in herewith reproducing parts of his missive, withholding his name only because of his especial request to this effect. Such modesty on the part of an eminently successful operator deserves a place in the spotlight of amateur radio!!

His letter follows:

"• • • • I have a suggestion to make. QRN is with us, arcs annoying many stations, and there is always the QRM to contend with. I would ask that you form some scheme for the CW stations to work on schedule, assigning each station a certain, definite time for broadcasting CW messages, preferably normal traffic, but if there is none such to transact, then a QSU or a short QST.

Now let us see how this would work out. A general plan being devised by you, the calling time for CW might begin at 9 P. M. and one might then listen in and hope to hear stations using CW as follows:

9:00 P. M. 6XAD, QST and traffic.
9:10 P. M. 6EN
9:20 P. M. 6IY
9:30 P. M. 6ALE
9:40 P. M. 6ZB
9:50 P. M. 6HU, etc.

Adding to this proposed list, times for other CW men who might wish to join us. Do you think that we might get somewhere in this way? A plan could be worked out, especially during the summer months, for the putting over of traffic in the hands of certain CW stations, and then interesting 6ZZ, 5ZA and others beyond the dead spot, to pick up Eastern traffic on CW, much as 2ZL broadcasts at 9:30, 10:30 and 11:30 P.M., getting QSL's by mail later. (See "QST" for April, 1920, Ppg. 13.) At least something can be probably worked out by you whereby the efforts of CW will be coordinated! Even the Government stations are all on a schedule and it seems to me that an informal CW schedule might promise gratifying results. • • • •"

I am forcibly and favorably impressed by the practical usefulness of these suggestions and I would earnestly ask CW men to "line up" and get going.

Some CW operators have given me their names and station details, but not enough to make a really good showing. Why not seriously consider Mr. ——'s ideas, and from the date of the appearance of this number of PRN, begin a schedule exactly as proposed in the communication that I have reproduced? Can we CW men but once let it be thoroughly understood that AT certain hours and minutes there is some CW set operating there would be much more listening-in!

The fact that CW will successfully handle traffic through QRN and QRM that would effectually "kill" spark results, is too well known to require wearying explanations on my part.

Personally speaking, 6XAD will, from July 28th, be working and listening each night from 9 to 10 P. M. The waves will be 200, 240 and 375, varying them until I can ascertain which is the more easily found and read. I rather think that the 240 will do the trick, although there are so many "broad" (!!) spark stations within 75 miles of Avalon that QRM may render the 240 wave impossible!

It is a self-evident fact, I think, that until such a time as we CW enthusiasts have a regular schedule, and abide by it, one with the other, nothing of any great satisfaction or value will be accomplished, and it seems a great pity to lackadaisically let matters "slide" in hapzard fashion, picking up CW when one "happens" across a CW note, but otherwise doing nothing systematically!

Mr. ——'s pointed remark, to the effect that the Government Stations are all on schedule, meaning, I take it, the more powerful arcs—should indubitably prove that a schedule is the only means of reliable results.

Will 6EN, 6IY, 6ZB, 6HU, and all other CW men, get in touch with me as soon as they conveniently can? Will they take the trouble of choosing some ten minutes between 9 and 11:30 P. M., in order that I may publish a list of these and rely on such operators to be "present" when called on the air?

As it is too long to wait until the September PRN I will assume the work of intercommunicating by radio and letter with all CW men who will forward me the times that they will be "on." In this way we can begin SOON!

Must CW dribble pathetically along? Or shall we, by a little co-operation, show it up for that which it really is—the most efficient and up-to-date method of radio communication!

I do not wish to be thought a "nag" or a nuisance, but it IS a pity to permit Opportunity to slip by, night after night, making no attempt even at profiting by it!!

"Time and tide" (and radio!) "wait for no man!"

Paraphrasing the famous poem:

"Let us now be up and doing,
With a heart for any fate—
Still a-listening and a-working—
Learn to tune around and wait!"

Turn to Page 21 for Schedule of C. W. Traffic

INTERRUPTERS IN VACUUM FOR MODULATION IN TRANSMISSION AND RECEPTION

By
Frank E. Summers, A. M. I. R. E.

WITH the increased use of undamped by amateurs, professionals and for waves for telegraphy and telephony commercial purposes, improvements are needed that will increase the efficiency of modulation in transmitting or receiving.

To obtain this end, I believe interrupters in vacuum will be used to a great extent in the near future. My study and research tends to prove that the air is a good conductor for electricity in wireless frequencies. To my knowledge, all CW interrupters at present are used in the open air. Why not place these interrupters in a vacuum for modulation. A vacuum will offer probably more resistance to the conduction of electricity in wireless frequencies than any other known medium.

If a Goldschmidt tone wheel is placed in a highly evacuated container, and connected in the transmitting antennae circuit, then CW could be cut up at the rate of 1000 times per second or more. This would give a musical sound in a telephone receiver when used with any damped wave detector. Could also better be distinguished from static, as any method that will cut up undamped waves after reception will also probably cut up static. This method gives very abrupt modulation and messages should carry further.

Also an ordinary relay can be used in a highly evacuated container, having in series with the electro-magnets a buzzer or howler, and a local source of electrical energy. This causes the relay armature to vibrate in phase with the armature of the buzzer, the antennae circuit being in series with the relay armature. Very abrupt modulations are transmitted to the antennae circuit.

This principle can also be applied to the transmission of wireless telephony, by using a transmitter button with a highly evacuated chamber, or a solid back type of transmitter can be placed in an evacuated container and operated by electromagnetic means, such as from another telephone transmitter exterior to the transmitter in vacuum. By this method sparking to a great extent is prevented and the voice modulations are very abrupt and will carry further, thus increasing the distance and audibility of transmission. In using granules for a microphone for low voltages, they should have a high dielectric power, such as bismuth, antimony, silver, carbon, gold, thallium, selenium, tellurium, etc.

In using a microphone for modulation of high frequency currents direct, the granules should have a high fusing value, such as tungsten, tantalum, osmium, iridium, etc. Here, probably, the dielectric power is not of much value.

The vacuum transmitter can be used for either modulating low voltage direct currents or for electric currents of a radio-frequency.

The electrodes in the Goldschmidt tone wheel and relay buzzer should be of a non-electron emitting substance, as far as practical, as substances that emit electrons easily in a liquid, vacuum or gas should not be used, as they would tend to cause sparking even in a vacuum. Electrodes of platinum, platinum-iridium or other similar non-electron emitting substances should be used. The contacts on the tone wheel should be spaced quite a distance apart, to prevent arcing. Also an exterior grounded spark gap should be used to ground the current when tone wheel breaks the aerial circuit.

But when it comes to the best substances to use in microphones as electrodes and granular material we have other laws to follow. I have seemingly discovered why carbon is the most efficient substance to use in microphones when modulating a low voltage current, namely, because of its RELATIVE HIGH RESISTANCE, FUSING AND DIELECTRIC POWER. But when it is desired to use a microphone direct to modulate radio frequencies, then carbon is not a desirable element to use, because it easily emits carbon vapor or electrons, as a transmitter made up with electrodes and granules having a relative high dielectric and non-electron emitting power should give better results, whether in a vacuum or not. I have also discovered that the difference of the resistance of carbon and metals to the conductivity of electricity having a radio-frequency IS VERY LITTLE, IF ANY. In modulating radio-frequencies carbon looses its value as having a relative high resistance. Substances having a high dielectric, fusing and non-electron emitting power disposed in a vacuum should be most efficient. A vacuum will also prevent oxidization of electrodes and granules.

Of course, when interrupters are disposed in a vacuum the heat generated cannot be so easily radiated, but practical arti-

(Continued on page 27)

HOW "B" BATTERIES ARE CONSTRUCTED

RECENT increased growth in the use and range of wireless telegraph and wireless telephone equipment is centering the attention of both professional and amateur operators on the mechanics of their outfits. Certain results are secured by amateur operators who are not technically skilled in the whys and wherefores of their equipment, but it is conceded that the normal and above normal results are procured by those who are fully and completely conversant with every mechanical detail of the outfit. Signal success in their wireless telegraph and wireless telephone operation depends upon much more than a mere speaking acquaintanceship with dots and dashes. The best equipment obtainable is none too good, for the greatest results are obtained by harmonious welding of equipment with the human element of control.

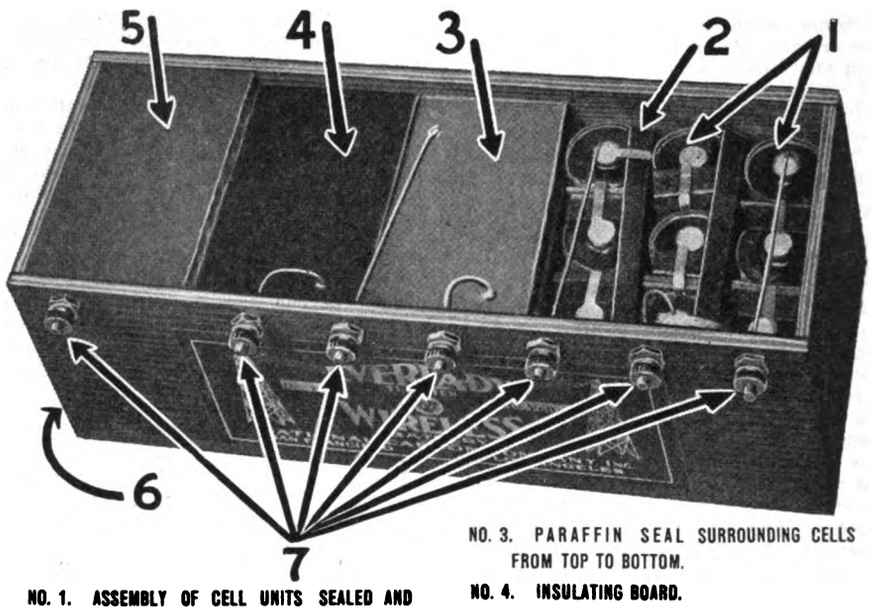
It would be highly advisable if every wireless operator could study first-hand in the factories the actual manufacture of each particular element used in his outfit. Such an opportunity would unquestionably give every operator a broader vision and make him better able to secure the best obtainable results in actual operation. But, since this is neither possible nor practicable, it behooves every operator to learn as much as he possibly can about the actual manufacture of his equipment. Most manufacturers are always glad of the opportunity to explain the methods employed in creating any of their products.

It was entirely natural that the National Carbon Company, Inc., should engage in the manufacture of both dry batteries and wet batteries for wireless telegraph and wireless telephone uses. Having been one of the pioneers in the manufacture of these two types of batteries, it required only an adaptation of their principles to the needs and requirements of this class of equipment.

An exhaustive study of the battery needs of the wireless telegraph and telephone was made, covering a period of some two years.

In the construction of Eveready batteries the manufacturers believe that they have developed a plan of interior construction that possesses many advantages, particularly as applied to those who are concerned in radio activities, either for pleasure or profit. Because of superior insulation these batteries are demonstrating remarkable ability under a wide range of climatic conditions and variations in temperatures. The importance of this particular feature of Eveready batteries is apparent to all, but more so to those who have wrestled with equipment in far-away and inaccessible places.

Construction of the No. 774 Eveready B Battery is shown in the accompanying illustration. The same general principles are followed in the manufacture of all Eveready Dry batteries for radio equipment. A study of their construction will show the extent to which the manufacturers go in securing complete insulation which extends all the way through the battery from the insulating partition separating individual cells to the paraffine impregnated container, making of the whole a unit impervious to moisture.



NO. 1. ASSEMBLY OF CELL UNITS SEALED AND CONNECTED IN SERIES.
NO. 2. INSULATING PARTITION OF SEPARATE CELLS AND CONNECTIONS.
NO. 3. PARAFFIN SEAL SURROUNDING CELLS FROM TOP TO BOTTOM.
NO. 4. INSULATING BOARD.
NO. 5. TOP SEAL OF HARD WAX.
NO. 6. PARAFFIN IMPREGNATED CONTAINER.
NO. 7. TERMINAL TAPS FOR VARIOUS VOLTAGES.

This is a 43 volt battery particularly well suited to a wide range of wireless uses. It is made up of 27 cells connected in series and allows a range of 18 to 43 volts in steps of 4½ volts. One negative and 6 positive terminals have heavy brass screws and nuts.

No. 766 B Battery contains 15 cells connected in series solidly packed and sealed in paraffine, the top with half an inch of sealing wax rendering the unit absolutely waterproof and able to withstand all climatic variations. It has 1 positive and 1 negative lead and 22½ voltage. This battery has been standardized for use in the United States Navy.

No. 765B Battery is very similar to No. 766, but is made particularly for the use of beginners and those who are mostly experimenting with wireless outfits. It contains 15 cells connected in series and has a voltage of 22½ with 1 negative and 1 positive terminal.

In the No. 746 the public is offered a battery that will produce remarkable amplification. It consists of 72 cells connected in series and delivers 108 volts. It can be used in connection with any of the other Eveready Dry batteries and will greatly increase the radius of either the wireless telegraph or wireless telephone equipment. Although a comparatively new battery, it is being widely and successfully used.

But little need be said with reference to the use of the storage battery, as it is the heart of the wireless equipment as it is the heart of the automobile. The storage battery supplies the current for the filament for the transmitting and receiving tubes and for relays and auxiliary purposes. For these uses the Eveready No. 6-1G-60 is recommended.

All Eveready batteries are manufactured in the immense plant of the National Carbon Company at San Francisco. There is an advantage in using batteries that are manufactured on this Coast, as the user is generally assured of a fresh battery and one that has not been stored for any length of time or possibly subjected to damage in the long shipment across the continent. It is also a source of rightful pride that the Pacific Coast is now producing a superior quality of batteries and emphasizes the fact that this portion of this great country is rapidly coming to the front as a manufacturing center of great importance and unusual promise.

—Not Advt.

R. H. McMANN TO HEAD RADIO DEPARTMENT OF FEDERAL TEL. & TEL. CO.

RENVILLE H. McMANN of New York City, who is a member of the Executive Radio Council of the Second District and Secretary of the Radio Club of America, has been appointed manager of the Radio Department of the Federal Telephone and Telegraph Company of Buffalo.

Mr. McMann has been interested in amateur radio for the past twelve years and has had a broad experience in the art from the viewpoint of the amateur.

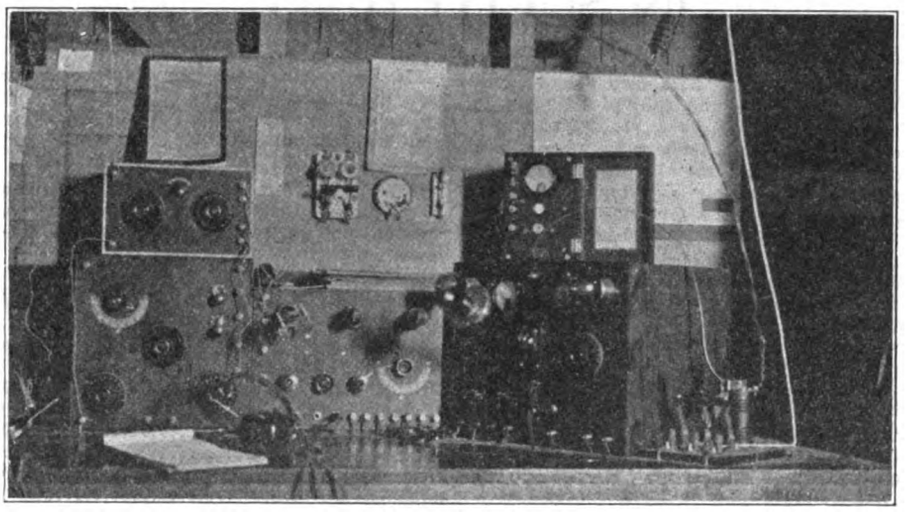
During the war he was in charge of radio telephony on the destroyer U. S. S. "Herresoff" and also for three months had charge of the installation and maintenance of radio telephony at the U. S. Naval Air Station, Cocosolo, Canal Zone.

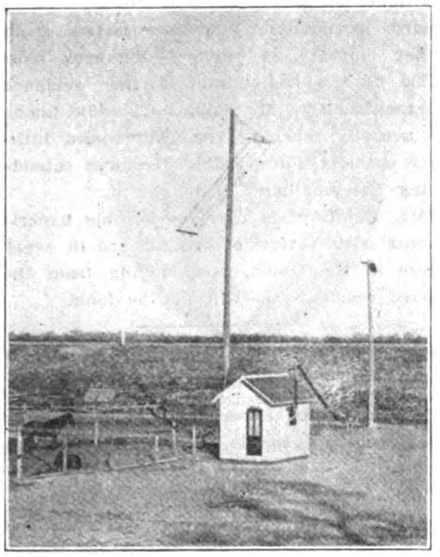
—Not Advt.

"PROFESSIONAL AMATEUR" STATIONS

6ALU—LOS ANGELES, CAL.

MR. R. P. MACKENZIE is a firm believer in CW and radio telephone transmission. The accompanying photograph of his station shows something quite out of the ordinary. Considering that the radiation of the phone set, if only half an ampere on 195 meters, it will be of interest to all to learn that 6ALU's voice has been heard by 6AGF and 6ZX. Two power tubes of 5 watt capacity are used, one in the modulating and the other in the oscillating circuit. The plate potential is 375 volts and the tubes draw in the neighborhood of 40 milliamps. 6ALU is at a loss to understand why he has not received any cards from amateurs north of Sacramento, Cal. Has anybody heard him in that part of the state? If so, he would like to have you tell him. The receiving set is of the regenerative type, constructed along the lines of the Grebe CR5 tuner. Mr. Mackenzie is treasurer of the Southern California Radio Association, the largest and most progressive radio club in the southern part of the state.

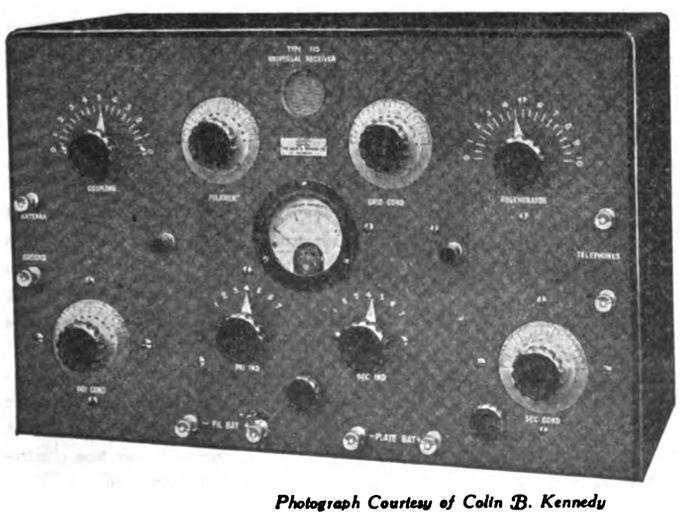




6ZX-FRESNO, CAL.

HERE we have 6ZX of Walnut Grove, Cal., owned and operated by Mr. J. V. Wise. This is a special amateur station and operates on 375 meters.. Mr. Wise sent us the accompanying photo of his station house and aerial and we will now take our readers into our confidence and tell them what's inside of the little white house, although nothing is visible in the photo except the smoke stack. The station house is 8 feet wide and 12 feet long. The transmitter (inside of the house) is adjusted to two wave lengths—200 and 375 meters. The receiving equipment consists of Turney Spider-Web inducatnces, Clapp-Eastham condensers, Brandes Navy Type phones and a one-stage amplifier. The antennae to the left of the photo is supported by a 22-foot "V" pole on top of a 35-foot building.. This is the antennae used for 200 meter transmission. The high antennae to the right is supported by a tree, whose shadow is seen in the foreground. This antennae is used for 375 meter spark work and also for receiving purposes. The levee in the rear of the station house is the S. P. company's railroad track bed and a power line of 5000 volts is carried on the poles shown in the background. Half way up the picture you can see a set of telephone wires. 6ZX says that his station will never win a popularity contest prize from the phone company. The antennae passes over these wires.

The photo shown herewith was taken from the top of a levee, 100 feet from the station house. This levee is used to keep the Sacramento River from overflowing. 6ZX is located half way between Sacramento and Stockton and Mr. Wise states that he gets more than his share of QRM.



Photograph Courtesy of Colin B. Kennedy

A UNIVERSAL REGENERATIVE RECEIVER

SPECIALLY CONSTRUCTED to detect, regenerate and oscillate on all wavelengths in common use, the receiver shown in the accompanying half-tone is a valuable asset to radio of today. It embodies a self-contained audion control unit, specially constructed automatic plate adjusting device which is controlled by the secondary tuning, gear actuated micrometer secondary adjustment, and other entirely novel features.

The receiver will regenerate freely from wavelengths as low as 175 and as high as 25,000 meters. Large balanced condensers are used for primary and secondary tuning. The inductances are bank-wound and made moisture-proof throughout. A Weston ammeter is provided to indicate the filament current consumption and special potentiometer is used for finely adjusting the plate voltage. This potentiometer is connected between the terminals of the filament battery. The complete receiver is mounted in a walnut cabinet, provided with hinges, to allow interior inspection.

—Not Advt.

2QR AGAIN HEARD IN SCOTLAND

RADIO STATION 2QR, owned and operated by Hugh and Harold Robinson at 13 Walnut street, Keyport, N. J., has just received word that their radio phone had again been heard in Aberdeen, Scotland, and also by a ship's operator in port at Tela, Honduras. The following letter from Mr. James Miller of Aberdeen, Scotland, tells of their again hearing 2QR, which makes a total of four (4) times that letters have been received from Scotland to this effect.

Copy of Letter Received by Station 2QR, Mr. Hugh Robinson, No. 13, Walnut Street, Keyport, N. J.

April 5, 1921.

Dear Mr. Robinson:

I have just received your letter and owing to my removing from Mile-End avenue it was delayed. The other letter you sent in January came when I was ill. I sent a letter in reply to that one which you don't seem to have received. I GOT YOU SEVERAL TIMES IN JANUARY AND AT THE BEGINNING OF FEBRUARY, but I had to take my set down and I haven't done anything more at it since, as I am taking the chance to improve it. I'll be ready in about a month to check you up again. I expect I'll hear you much better now and I hope to check you up without any mistakes. I HEARD YOU EVERY TIME LISTENED IN FOR YOU before I took down my set. The only thing was that my tuning was not very selective and other stations jammed me. However, I am improving that and I hope to hear you clearer. You are quite as good on the 275 meter wave as you were on the 600 wave. I'll send the details of your transmissions in a short time, as I haven't my notes here just now, also details of my set and photographs. I have only used three valves during the whole time and my aerial is 80 ft. long double, 40 ft. high, but I'll send you the whole details next mail, and also when I'll be ready to start again. I HOPE TO USE A LOUD SPEAKER AND LET A COMPANY HEAR YOU. I don't know if I'll manage, but I'll try and if I succeed then that will knock the experts' freak theory on the head. I am using an entirely new type of valve, an idea of my own, and I suppose that is the reason of the remarkable results. I WOULD LIKE TO SAY THAT YOUR TRANSMISSIONS ARE REALLY REMARKABLY GOOD. YOUR MODULATIONS ARE EXTREMELY CLEAR. THE CARRIER WAVE IS REALLY THE WEAKEST IN COMPARISON TO THE SPEECH THAT I HAVE HEARD. YOU REALLY GET REMARKABLE RESULTS. I am writing this on the train, so I hope you will be able to make it out, but I want it to catch this mail so as to let you have it as soon as possible.

Hoping to hear from you soon, and also hope to hear you speaking.

I remain, yours sincerely,

(Signed) JAMES MILLER.

Please note change of address.

Care Mrs. Barnett, 48 Albury Road, Aberdeen, Scotland.

It will be noticed that Mr. Miller states he expects to use a loud speaking horn in further tests, which indicates he is receiving 2QR very clearly. This will also allow witnesses to actually verify his reception of 2QR'S transmission.

Further details from the ship's operator who heard 2QR'S radio phone while in port at Tela, Honduras, are now on the way and he has advised that both voice and music were received very clearly.

Other record-breaking distances as given by radio stations in twenty-one states, Canada, and at sea, are given in the following list:

Radio Stations Who Have Heard Station 2QR Radio Phone Working

Cities—	Miles
Bolivar, N. Y.	350
Bristol, Conn.	110
Buffalo, N. Y	400
Ashland, Ohio	650
Dover, Ohio	650
Napanee, Ontario	400
Mokane, Mo.	1,200
Peterculter, Scotland	3,500
Burlington, Vt.	300
Chelmsford Center, Mass.	225
York, Neb.	1,400
Elmira, N. Y.	250
Jamestown, N. Y.	500
Utica, N. Y.	300
Southbridge, Mass.	190
Shamokin, Pa.	190
Olean, N. Y.	340
Monessen, Pa.	450
St. Louis, Mo.	1,052
Rockville, Ind.	862
Dunmore, Pa.	132
Canton, Ill.	975
Twin Lakes, Conn.	108
Bangor, Maine	570
Niagara Falls, N. Y.	380
Old Forge, N. Y.	185
Kalamazoo, Mich.	815
Fargo, N. D.	1,650
Williamstown, Mass.	180
Syracuse, N. Y.	275
Elizabeth City, N. C.	450
Youngstown, Ohio	600
Geneva, Ohio	530
Boone, Iowa	1,245
Kitchener, Ontario	600
Condersport, Pa.	400
Connellsville, Pa.	415
Niles, Ohio	500
Niagara Falls, Ontario	400
Hagerstown, Md.	130
Washington, Pa.	425
New London, Ohio	630
Penacook, N. H.	225
Leominster, Mass.	240
Manchester, N. H.	225
Cleveland, Ohio	550
Salem, Ohio	500
Flint, Mich.	650
Pittsburg, Pa.	425
Houma, La.	1,250
Detroit, Mich.	700
Canton, Ohio	540
Guelph, Ontario	450
Wilmington, N. C.	645
Boston, Mass.	250
Steamship Kansas	1,500
Blackstone, Va.	300
Casey, Ill.	925
Wadesboro, N. C.	465
Fort Wayne, Ind	760
Rochester, N. Y.	450
Nashua, N. H	300
Franklin, Pa.	400
Richmond, Ky.	725
Rock Island, Ill.	1,100
Farmington, Mass.	250
Wilmington, Del.	125

By States—

New York	Maine
Connecticut	Michigan
Ohio	North Dakota
Missouri	North Carolina
Vermont	Iowa
Massachusetts	Maryland
Nebraska	New Hampshire
Pennsylvania	Louisiana
Indiana	Virginia
Illinois	Kentucky

New Jersey

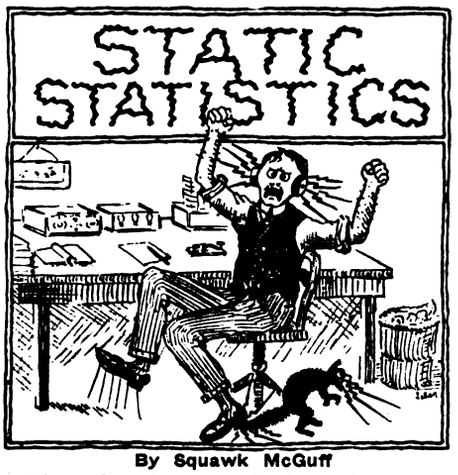
Also Canada, Scotland (Peterculter), Honduras (Tela), on Atlantic Ocean (1,500 miles).

Practically all of these distances are records which have never before been equaled by any radio phone of the small size and power used by 2QR, and many of the distances exceed those made by even the most powerful radio phone outfits in the United States.

It is interesting to note that Mr. Robinson's radio phone uses only four (4) five watt transmitting tubes, which are the smallest made, and takes it's power from an ordinary light socket using less current than an ordinary electric lamp. The whole outfit weighs less than seventy-five pounds and takes up a space approximately the size of that required for an ordinary typewriter.

These recent letters practically remove all doubt as to the genuiness of 2QR being heard in Scotland and the letters from other stations at various distances over 1,200 to 2,900 miles give further evidence to the fact that Mr. Robinson's radio phone is actually reaching remarkable and hitherto considered impossible distances considering the smallness of his outfit.

Mr. Robinson is carrying on his experiments with a view of being heard in every state in the Union, and judging from the above results, this will not be long.



By Squawk McGuff

There has been much discussion as to low and high notes, namely, as to breaking through the QRN of the summer months. The writer finds that during his long distance work that the high note is the most steady and much easier to pick out through the infernal cracking of Jupe Pluvius. From the south, 6EA comes roaring in with a high pitched note that sounds like a piccolo with the croup. 6KP has a low note and comes in very good, it is true, but the fading is very bad and at times he goes clear out, while the high note remains more steady. But I will say that while on his peak 6KP knocks 'em for a row of sliced navy beans. From the north we

Squawk McGuff

have 7DA with a falsetto, or high note (c sharp). He is practically the only "seven" that makes noise to 6APH. Of course we hear other seven stations but like 6KP they can't stand up under the terrific onslaught of Jack Dempsey Static.

Now, boys, I do not wish to enter into controversy over this problem. You have my version of the thing as I see it. Just put it down for what you think it's worth and let it go at that.

Following is a list compiled by 6APH of stations worked during the Static Season. Quite a little fete in itself:

(6LC) (6DD) (6QR) (6AV) (6EN) (6DP) (6OW) (6ZU) (6ZX) (6OH) (6KM) (7YA) (7DA) (6ADL) (6KA) (6FH) (6ACR) (5ZC) (6GP) (6ZA) 7RX (7HN) 6FT (6IC) (6KS) 7ZM (6HH) 7ZA (7DJ) (7HF) (6IM) (6AY) (6WH) (6KP) (6DS) (6IY)

Loudest and most steady DX stations heard are: 6EA, 7DA, 6KP and 7YA.

I run across Engineer McNamee of the Moorhead Company. His brainy brow was wrinkled. He appeared in the throes of the utmost dejection.

"Whassamatahyou, Mac?" says I. "Burn out another fifty watt tube?"

"Well, not exactly, but someone has been reporting our concerts nightly by telephone until he has about got my angorical goatamia." (Them's big words like engineers use. I don't know what they mean myself.)

"Well, that's strange. Very strange, indeed," says I (making off as how I am a collegiate graduate and understand big words).

"Yes, you see this unisolated categorical son of a bifurcated parallelopipigon has been undermining his rhomboidal cranial stuffing with a concatenated collection of crystallized zirconium, which is to say, he has been extemporaneously improvising bum connections on a galena detector. What he needs is a good big fat dose of hexamethylenetetramine. If I had a chance I'd soak him myself with a slug of diethysulfonmethyethyethane every night before the show starts. Then maybe he'd condescend to reduce himself to a state of innocuous desuetude, not to say hebetude, or, at least, to lay off and go to sleep."

(And when I woke up it was raining.)

LOS ANGELES SECTION

There is a fellow who I know
That always says with a sigh
If you can hear him why not me
And my answer to that is Hi.

Now that the new rules of the club are out, all a fellow has to do is read them and abide by the dictum (whatever that is). But in case he can't read he can have his grandmother write for permission to send on the air at a given time and place. They have someone to attend to such matters just as soon as he can find time. Of course time is long but it seems short for all they have to do—pole falling and all.

When it gets noisy around about the call 6AQT it is assumed the interest in radio among the femininity will be greatly accelerated. Some are wondering if it is really a (cutie) as the letters would imply. It is not known as yet whether the bunch will rush to Hollywood singly or in great numbers. Anyway, the position of 6AQT is a precarious one, any way you figure. (If I thought my correspondent wasn't kidding, I'd make a trip down myself.)

There is someone in Los Angeles called "J. D." Wonder if those are his initials or just his official call. Heard he called New Jersey one night but the latter, on account of a bad cold, couldn't answer. J. D.'s wife would have been mad anyhow because Jersey sounds feminine.

If "EB" and "AB" and "IK" should set up a second hand store they surely would get all the "beezeness" and still want more.

Arno has moved to a new location, 1045 South Bixel Street. He is waiting for his old friends to visit him and join with the new ones in the game of buying and selling.

A serious catastrophe befell one, namely, 6LC, when his transformer decided to have a smoke. It (the transformer) was rushed madly to the garbage can section of the property where a vicious stream of water put an end to its hilarity. Also its usefulness. But the loss was covered by insurance, in that, 6LC has an auxiliary stock of number twenty wire. MORAL: Beware of remote control.

About the busiest man in this radio business is the gent hunting news for this column. In fact he is so busy that if he was to pass away he wouldn't have time to lay down. Then again he has so much news he can't use it all. Mostly from a connivance to get pictures in print accrued from an idea someone has a swell station.

6ZR, who, while in Burlingame, was running a close race with Roy Gardner and the Turkish war for first page honors, has moved his limelight to Los Angeles. And I pity Los Angeles as far as the radio clientele are involved. You might as well put out the shingle "Radio Set For Sale" because you won't get a chance to use it anyhow when he opens up. He makes more noise than the blowing up of the "Maine."

A certain party claims that a message he sent was lost entransit. Says it puts him in mind of San Francisco to New York by airplane, 42 hours flying time or two months and three days elapsed time. He further affirms that the message must have went into a "tail spin" between 6KA and 5ZA. Maybe so, maybe so.

Mr. Lambert was of the old school
A little nip was his golden rule
So late one night upon the table
He thought he saw a familiar label
"Aha, my wife sleeps," he cried
As he made a leap, high and wide,
He gulped it down in one big swig
And then began a terrific jig
That would produce vociferous flattery.
It was acid for Bessey's battery.

Speaking of commercial operators, that reminds me of "Terrible" Happy Fabian of the "Wicked Watch Chain." If none of you have cast your eyes upon this wonderful linked specimen, do so, by all means, at the first opportunity. You will not need a blueprint to find it. You see the chain before you see Happy. You wonder where the chain is going with Happy and judging from the size of the chain my curiosity is aroused as to the size of the "turnip." It must be a terrific piece of gigantatism. But Happy always was a bear for conspicuousness. Years ago on the "City of Para" he was assigned. He bought up some gold braid and made himself a nifty uniform. Naughty but nifty. Now, in those days gold braid was drawing considerable water. The only man rating gold braid being the Captain exclusively. But that meant nothing in Happy's young life. With a fifteen-cent cigar, of which he smokes oodles and oodles, Happy went to the dining room, along with his gold braid. Everything went lovely until the "Old Man" appeared for his victuals. Well——I won't need to delve further on the spontaneous combustion that followed. Just sing it to the tune of: "And Happy Ain't Wearing Gold Braid Any More, tum tee, tum tum."

Goofey McGluke will now sing, "Have you examined the brake lining on your rotary," accompanied by Dinty Moore quartet.

Boys, our worries are many. Absolutely numerous. Just as soon as KET gets off of 200 meters someone has to come along that's a little more QSA. KFS, the Federal beach station, is now in operation and open for business. However it is needless to announce this, as the first night he came in so neat on 200 that everybody knew it. My advice is that KFS need not send out more QST's that he is now open, as everyone that has a receiving set knows it from 200 up. Oh please, Mr. KFS, have a heart and try to confine yourself to 600 meters. We won't attempt to speculate on what would happen if we radiated on 600. Heavens, no!!

6XAF, Mr. Best, listens in three times a week between 8 and 9 p. m. and when he hears 6APH working he removes the cap from the mica diaphragms on his fones and applies the concoction from the diaphrams to his face for a MASSAGE. This method of vibratory massaging is beneficial on account of the high frequency. The result being a vibratory violet ray effect. Those coming in contact with Mr. Best kindly take note of his ruddy complexion.

NORTHWEST BRIEFS

According to all reports, things have been more or less stagnant during the past few weeks, possibly on account of the hot weather. The banquet in Portland, however, was a howling success and everyone enjoyed themselves with a relish that would indicate other banquets are in contemplation. There were 125 or more present. This number not only comprising the district in and around Portland, but as far north as Tacoma and Seattle. Five members were present from Seattle and twenty from Tacoma. One feature of the banquet was the up-to-snuff method two members used in transporting themselves from Camp Lewis. They came via airplane.

The Secretary of the state of Washington made a special trip to Portland in order to be present, his object being to bring up the suggestion that amateurs broadcast the description of stolen automobiles.

7JW, Mr. Tait, paid me a visit recently and I was much impressed with his report of the doings in and around Portland, Tacoma and Seattle. I certainly take off my hat to this worthy disciple of the "air" clientele and if he is an example of that progressive spirit in which the northwest seems to be imbibed, I must remark that as far as enterprise is concerned, there is no better.

Miss Winnifred Dow, a leading figure in radio at Tacoma, was present at the banquet and her smiling visage was an inspiration for many. In fact, a great deal of credit goes to all of the ladies. However, I am forced to say that 7ZB was a little unobserving as to the other ladies present. His traveling mind seemily had centered in and around the Tacoma delegation. If there should be a banquet in Tacoma soon I am speculating as to the method 7ZB would use for transportation. Surely not by airplane. That would not be fast enough. Somebody's dance card would look like this: "7ZB first dance, 7ZB second dance. All dances reserved for 7ZB."

A movement is on foot to amalgamate the clubs of the Northwest. This was met with great favor at the banquet, and the machinery of details and plans will be put in motion shortly. It is planned to have a yearly convention at which each branch will be represented. It will probably be incorporated under the title of the Northwestern Radio Association.

CALLS HEARD BY WESTERN AMATEURS

This department has met with such favor that we will devote as much space to same as possible. Unusual Records are Particularly Desirable. Your list should be neatly printed in ink, using one side of paper only. All errors will thereby be avoided.

HEARD AT KMT, LIBBYVILLE, ALASKA
May 29, 1921.

6EX, 7BK, 6IM, 6AGF. Location of station KMT is Latitude 59 deg. 35 min. North Longitude 157 West.

The correct address of Mr. A. B. Lopez is 720 Santa Barbara St., Santa Barbara, Cal.

Station 6DS is located at Alhambra, Cal., instead of Alameda, Cal., as previously listed.

HEARD AND WORKED BY 6DS ALHAMBRA, CALIF.

5XD, 5YA, 5ZA, (6AE), 6AH, 6AI, (6AK), 6AN, (6AR), 6ADA, 6AAK, (6AAW), (6ABW), (6ACR), (6AGF), (6AIW), (6ANK), 6BB, 6CO, 6CP, (6DP), (6EX), 6FH, 6FI, 6FX, 6GE, (6HC), 6HH, 6HP, (6IC), 6IM, 6JJ, 6JI, 6JN, 6JR, 6JT, 6KC, 6KL, 6KM, 6MZ, DAY LIGHT, 6NH, 6OC, 6OH, 6OT, 6OW, (6PR), 6QR, 6QS, 6TC (6TV), 6TX, 6VM, 6VX, 6XZ, (6XAD), 6ZA, 6ZB, 6ZE, 6ZH, 6ZK, 6ZM, 6ZO 6ZR, (6ZU), 6ZX, 6ZY, (6ZZ), 6ZAA, 7AC, 7CU, 7IN, 7YA, 7ZJ, 9LR.

CALLS HEARD AT 6FB REDONDO BEACH, CALIF.
May 17—June 10, 1921

6AL, 6AM, 6BJ, 6FH, 6HC, 6HP, 6IC, 6IM, 6JM, 6KC, 6KM, 6MX, 6MZ, 6TF, 6TV, 6VX, 6WG, 6WN, 6XN, 6YA, 6ZO, 6ZU, 6ZZ, 6AAH, 6AFQ, 6AFU, 6AFY, 6AGF, 6AGP, 6AIH, 6AIW, 6APH, 6XAD, 7HF, 7MF.

CALLS HEARD AT 7MF EUGENE, OREGON

(6AE), 6AK, 6AR, 6AL, 6AZ, 6BP, 6DD, 6DP, 6DX, 6EA, 6EB, 6EL, 6FH, 6HE, 6IC, 6IF, 6IM, 6IW, 6IY (CW), 6KM, 6LR, 6LU, 6LW, 6LX, 6NB, 6OC, 6OH, 6OW, 6PN, 6QR, 6TV 6WZ, 6XW, 6ZA, 6ZU, 6ZR, 6ZX, 6ABM, 6AFN, (6AGF), (6AIW), (6AMW), (6ARK), 7AC, 7AD, 7AX, 7BA, 7BC, 7BH, 7BK, 7BQ, 7CB, 7CU, 7CW, 7DA, 7ED, 7FH, 7FI, 7FL, (7GA), 7GY, 7ID, 7IM, 7IN, 7GW, (7KB), 7KM, (7LD), 7LJ, 7LR, 7MW, 7NN, 7NX, 7OT, (7PH), 7QY, 9LR, 9XI (CW), 5BA, 5IF, 5ZA, 5EL.

CALLS HEARD AT RADIO STATION 7HN
May 1 to June 10

6AE, 6AK, 6AR, 6AT, 6AV, 6BR, 6BW, 6CH, 6ED, 6EN, 6EV, 6EX, 6FE, 6FT, 6HC, 6HP, 6IV, 6JR, (6KL), 6KM, 6KS, 6LD, 6MZ, 6NG, 6OH, 6PR, 6QR, 6QU, 6SC, 6TU, 6TV, 6VX, 6ZK, 6ZR, 6ZU, 6ZX, 6AAI, 6AAR, 6AAU, 6ADW, (6ABM), 6ABX, 6ACM, 6ADS, 6AFM, 6AFN, 6AFU, 6AGF, 6AID, 6AIU, 6AIW, 6AMW, 6APH, 6ARE, CW STATIONS 6AAT, 6ANJ, 7BC, 7BK, 7BQ, 7CA, 7CB, (7CE), 7DA, 7ED, (7FI), 7ID, 7IC, 7IN, 7IG, 7KM, 7KQ, 7LR, 7NL, 7NN, 7XD, 7ZD, 7ZJ.

GREATER EFFICIENCY IN RECEIVING EQUIPMENT

By Colin B. Kennedy
President, The Colin B. Kennedy Co.

THE writer has always held the opinion that the development of radio receiving equipment has not kept pace with that of the transmitting end. We have high powered transmitting stations developed to a high degree of perfection, but have not taken full advantage of the energy being brought to the receiving board.

This explains why the company of which the writer is a member has sought to specialize almost exclusively on receiving equipment, as representing the field offering the greatest latitude for constructive effort. The success attending its efforts in this direction is attributable simply to painstaking work in the development of designs calculated to give maximum effectiveness. In so doing it has made free use of the accepted and proven principles of radio engineering, and has not permitted the bugaboo of cost to swerve it toward less efficient expedients.

All circuits used in Kennedy receivers are electro magnetically coupled, this being the best known method for obtaining selectivity. This principle is fully recognized by manufacturers of high grade apparatus for commercial and military purposes, and the technical considerations are brought out and emphasized by the Bureau of Standards in various publications.*

A well defined though weak signal on a silent background is much more easily read than one of greater intensity in the presence of interference. The measured audibility of a signal is, for this reason, very deceiving, and it will be found that one showing greatest strength on an audibility meter is very often the most difficult to read on account of accompanying interference. This shows the importance of adopting means whereby the ratio of signal strength to interference is increased and is best accomplished by reducing electro static coupling and providing means for the proper control of electro magnetic coupling. The writer has been able at noon in San Francisco, for example, to copy complete messages from Atlantic Coast stations, using a small antenna suspended from an automobile with the frame of the car as a counterpoise ground, and a standard receiver without amplifiers.

The diminution of energy losses in receiving circuits is highly important on account of the minute quantities involved. This is largely a mechanical problem and the solution lies in adopting designs which tend to eliminate interaction between circuits and preventing absorption of energy by unused resonant sections.

The rapidly increasing use of continuous wave transmission at the higher frequencies, as in voice transmission, has created a demand for receivers of greater flexibility. This requirement has been anticipated and met in the newer types of apparatus manufactured by the Colin B. Kennedy Co., in which provision has been made for complete control of regeneration with resulting voice reception remarkably free from distortion.

The present day amateur and experimenter is demanding, more than ever before, apparatus embodying the above mentioned principles as a means for obtaining greater efficiency. This is a source of great satisfaction to the writer, who has always made a plea for quality in radio apparatus.

*For example, see page 45, Bureau of Standards, Bulletin 4, Radio Instruments and Measurements.

—Not Advt.

SCHEDULE OF CW TRAFFIC—SIXTH RADIO DISTRICT

By LAWRENCE MOTT, Associate Editor

(Note: Stations interested in the reception of CW may listen at the times noted, on the wave of the station listed. It is urgently requested that all operators copying the CW traffic schedule QSL the same direct to the transmitting station. Transmitting stations are politely requested to report success and work accomplished to me at Avalon, Catalina Island, California, on or before the 8th of each month in order that their efforts may be tabulated and appear in the following number of Pacific Radio News.—Associate Editor.)

Time*	Station	Wave-length	Time*	Station	Wave-length	Time*	Station	Wave-length
9:00	6XAD	240 & 375	9:45	6ALU	200			
9:05	6PI	200	9:50	6EF	200	10:30	6HK	200
9:10	6EN	200	9:55	6IT	200	10:35	6ZB	375
9:15	6WU	200	10:00	6CU	200	10:40	7ZI	...
9:20	6JE	200	10:05	6XN	...	10:45	6IY	200
9:25	6MK	200	10:10	6XD	...	10:50	6ZE	375
9:30	6ALE	200	10:15	6AQA	200	10:55	6ZX	...
9:35	6KA	200	10:20	6KP	200	11:00	5ZA	375
9:40	6HU	200	10:25	6BA	200	*P. M.		

All other CW operators who wish to join in this arrangement will please notify me as soon as practicable.

*Owing to a press of other matter, in summer evenings, 6XAD may not find it possible to be on every night.

A HARD BOILED BUNCH

(Continued from page 11)

giant cannon, an' the wind shook the shack till I half expected her to go off into the bay. Just when the gale was at its worst, I sees a little gray dory comin', divin' through the seas. In a few minutes it was in the shelter of the cove.

"It's Hell-Fire," says Dopey, who'd been tryin' to help me with the engine. The storm-king makes his boat fast alongside the dory wharf, an' comes up to the shack.

He was a big six-foot savage, an' looked like a first-class pirate, with his red mackinaw, corduroys, highcut musher boots, an' a black fur cap. He had a big gun in his belt under his mackinaw, an' walked like he was ready to start a battle on a second's notice.

"Fine weather," he grunts, rubbin' the frozen salt crust off his face onto the sleeve of his mackinaw, which was runnin' with sea water. "I hope it holds on till I get back to Popoff."

When I tells him about the engine trouble he goes into the power room, an' glares at the one-lunger.

"Buckin' again, eh!" he snarls, in a voice so hard-boiled it makes the engine look kind'a green an' sick. He squirts a little primin' in the cups, whips out a few special cuss words, punches a couple levers, an' kicks the flywheel—an' the engine begins hummin' like a Pierce-Arrow.

After I'd cleared with N-P-R, we sit by the coal heater in the operatin' room an' chewed the rag.

"Today is my twenty-eighth birthday," I remarks. "An' if some fortune teller had ever told me that on this day I was goin' to be sittin' in a shack on a sea-washed rock up in Alaska among the crowd of gunpowder maniacs, I'd a told her she was crazy."

"You say today's your birthday," exclaims Hell-Fire.

"Yes," I answers, which was the foolishest thing I ever done in my life.

"Then you gotta make a dance in th' hall tonight," he declares. "I'll go out an' tell th' gang, an' we'll make things ready."

I protests strong against that, but he tells me it's got to be done.

"To make a birthday dance is the oldest custom in the Snumagin Islands," he insists. "If you don't, they'll think you're stuck up—they'll come up here an' shoot th' shack t' splinters."

I'd seen all the shootin' I wanted already, so that night we have the dance—an' it was a dance I'll not forget. The dance hall, which was perfectly round an' about fifty feet in diameter, had once been a cyanide tank in the gold mine up the bay. It'd been roofed over, windows put in the walls, had a big coal heater on one side, an' a bench runnin' all around the wall.. It was all decorated up with paper bells an' truck, an' was lighted by a single big coal oil lamp hangin' from the ceilin'.

But if the dance hall was wild an' woolly, the dancers were wilder an' woollier. Evenin' dress was mackinaw coats, rubber boots an' shootin' artillery. The women was mostly Aleute breeds, an' all sat on one side of the hall, with the men on the other. The orchestra was a leather-lunged accordion an' a mistuned guitar, while the style of dancin' was rag, dip, shimmy or anythin' you please. The fishermen were half full of brew, an' among them I notices Mexican Frank, watchin' me with a kind'a evil eye.

Before the dancin' had been proceedin' more'n two hours, there'd been four fist fights an' a dozen cursin' matches.

"It's a pretty good dance, but it's too blame slow," grumbles Hell-Fire, about 10

(Continued on page 24)

A HARD BOILED BUNCH

(Continued from page 22)

o'clock. "I wish somebody'd start somethin' an' put a little life in things round here."

I feels pretty uneasy after this, but things goes along fairly peaceful, until at last some addle-brained boob hollers out, "Ladies choice," an' right then was where I gets in trouble. I'd been keepin' carefully away from Mexican Frank's wife all evenin', but now what does she do but come straight over an' chooses me for her partner. Everybody was pretty well tanked up with the sourdough brew, an' the roughneck orchestra tore off a wild an' woolly one-step that got faster an' crazier, until at last when the finale arrives with a grand smash of mad music, the fiery-eyed breed-girl, gone crazy with dancin' an' moonshine, throws her arms plumb around my neck an' plasters a red-hot kiss right on my lips.

The next instant, I sees a cannon spoutin' fire in Mexican Frank's fist, an' a speedy bullet clips a groove through my hair, which must'a been standin' straight on end.

"Whoopla! Hurrah!" howls Hell-Fire, joyously, producin' his forty--five centimeter howitzer an' blazin' away at the lamp. He puts it out first shot, an' then there started the blastedest pandemonious of fightin' an' howlin' an' cursin' an' shootin' you ever could imagine. It beat the roughest Tom Mix movin' picture ever made by forty times, with guns spittin' fire in th' dark an' everybody millin' an' stampin' like a crowd of wild bulls.

Seein' a gleam of light, I makes for it, an' dives through a window, landin' in a puddle of mud an' slush outside.. It was still rainin' an' blowin' an' dark as pitch, but I scrambles along the bank to my shack in about five seconds, an' gets the old gasoline mill goin'. Sittin' in, I calls C-Q a couple times, but don't raise nobody. I hears the crowd of gun-fightin' maniacs yellin' an' shootin' out among the shacks, an' comin' closer all the time. Gettin' desperate, I opens up full power an' pounds out distress signals—which I figgers I was justified in doin' under them circumstances.

"S-O-S, S-O-S, S-O-S, de K-V-I, K-V-I, K-V-I," I hammers out, slow an' heavy.

Listenin', I hears a jerky little spark start up an call:

"K-V-I, K-V-I, de N-R-X, N-R-X; this is the revenue cutter 'Unalga,' twenty miles west Unga—what's the matter? Is Unga Island sinkin'?"

"No, but it ought to," I pounds back. "Th' shootin' iron artists are havin' a grand killin' campaign, an' I'm leavin' th' island instantaneously—please ask th' skipper if he'll come by an' pick me up."

The kid on the cutter tells me to Q-R-X; but in a minute he comes back again.

"Sorry, O-M," he says, "but the skipper says he wouldn't come near that cursed Unga Island f'r all the love in heaven or all th' money in Rome—hope you come out all right."

"Yes, I'll come out with more holes 'n a colander, if I stay here——" I hesitates as a bullet splits a panel in the door, an' another one drifts clear through an' knocks the lid-lifter off the stove. "Tell your skipper I'm drivin' straight to sea in a fishin' dory, an' ask him for th' love of Peter to come an' pick me up."

I stops to listen, but about that time another bullet ploughs into my desk, maybe two inches from the key-knob; then still another one comes, sput! right into my audion-bulb, an' a piece of flyin' glass gives me a bad gash in the chin—you see th' scar's here yet.

(Continued on page 26)

A HARD BOILED BUNCH

(Continued from page 24)

Abandonin' the shack, I gets out in the rain again, an' half tumbles down the hill to the dory wharf. Climbin' into one of the dories I was somewhat acquainted with, I lets go the painter an' starts the little engine in the stern. As I dashes out into the storm there comes a rattle of heavy artillery from up on the rocks, an' a few minutes later I hears about twenty-five power dories comin' poppin' out into the bay after me, full of crazy codfishermen, still whoopin' an' shootin'.

Gettin' out into Nagai Straits, I drives straight to sea through the sleet an' rain. The fishermen seemed to get more speed out of their dories than I could out of mine, for they kept gainin' on me. Their bullets come whistlin' closer an' closer all the time, until pretty soon they began plunkin' against the side of my dory. I huddles down in the fishy-smellin' bilge water in the bottom of the boat, steerin' mostly by guess work; an' all the time the codfish dories was gettin' nearer an' the bullets was hittin' harder. At last a whistler bores through the bulkhead an' punctures the fuel tank.

In a few minutes the engine begins to miss an' slow down.. I was just beginnin' to believe it was all off with Sir Samuel Jones, when all of a sudden, crash! the dory bangs into somethin' that staves in the bow an' sends me head over heels into the ocean. My hands come against a smooth iron wall, an' lookin' up in the darkness, I sees I'm right alongside the revenue cutter "Unalga." The crew had heard me hit, an' they lowers a line, which I gets hold of. As they haul me up on deck, the cutter's searchlight starts sputterin', an' somebody turns it out onto the crowd in the pursuin' dories, who were still shootin'. In the nearest one, I could recognize Mexican Frank.

"Come back an' fighta like a man, you coward!" he howls, wavin' a smokin' high-power cannon in one fist an' some kind of a big gleamin' carvin' knife in the other. "Come back, damma you, an' I shoota you so full of lead you seenka to the bottom withouta ballast!"

"Let's get away from this god-forsaken island," mutters the skipper of the "Unalga," an' he rings the engine telegraph up to full ahead.

Half an hour later the cutter's code-slinger hunts me up with a message.

"It was routed to K-V-I, but I told N-P-R you were here, and I took it for you," he explains, handin' it to me. As I unfolds it, I sees it's all the way from Frisco, an' addressed to myself.

"Samuel Jones, Unga Island, Alaska—
With best wishes for a happy birthday; the gang and myself join in hoping you are enjoying the acme of peace and quiet at Unga.—Cunningham."

"Amen!" I mutters, as the "Unalga" hooks up to a fourteen knot clip, an' heads out to sea.

ARE YOU INTERESTED IN C.W.?

If so, write at once to our Associate Editor, Mr. Lawrence Mott, Avalon, Catalina Island, Cal., and have him arrange a calling schedule for your station. Further details of the C.W. Club's progress will appear in our next issue.

INTERRUPTERS IN VACUUM

(Continued from page 15)

ficial means may be used to cool the device, such as by radiating fins, cold air or liquids. Interrupters in a vacuum cannot probably handle as heavy currents as where they are used in open air, but for smaller currents they should be far more efficient. One way to overcome this would be to connect a plurality of interrupters in multiple.

Above interrupters can be disposed in the antennae, primary or secondary circuits for interruption either at the transmitting or receiving station of undamped waves to audio-frequency groups.

The evacuated microphone could also be used as a howler and disposed in the antennae circuit for telegraphy modulation of CW.

Above discoveries, if they prove to be correct, open up new fields of research and study which seems unlimited.

U. S. NAVY GETS FIGHT RETURNS TO HONOLULU IN ELEVEN MINUTES

Only eleven minutes and fourteen seconds after the knockout of Carpentier by Dempsey, the Honolulu papers had in their hands a press dispatch from the U. S. Naval Radio Service. The dispatch was carried on the special leased US wire and transmitted by NPG to NPM.

RADIOTRON UV 200 Gas Content Detector Tube. The DX stations are using them for that "long distance" reception. Have your friend bring his Radiotron to your station and compare it with the tube you are using; then send to your dealer for a Radiotron.

PRICE 5.00

RADIOTRON UV 201 High Vacuum Amplifier Tube. The amplifier that amplifies. The kind that gives musical signals—not musical squeal. Eliminate what you think is static but what really is nothing more than tube noises. Do this by sending to your dealer for a Radiotron UV 201.

PRICE $6.50

RADIOTRON UV 712 Intervalve Transformer incorporates certain features of construction and gives an overall efficiency not yet approached by any other type. It is a device of superior workmanship and it is not to be confounded with Intervalve Transformers designed only to be sold at a cheap price. The ratio of windings on the UV 712 Transformer is 9 to 1, a ratio found in no other instrument on the amateur market. Watch 'em copy it. The original only costs $7.00. Why buy an imitation?

GRID LEAKS are essential to get proper bias on tubes, whether they be detector or amplifier. The potential maintained on the grid is computed by Ohm's Law and it is therefore equal to the grid current times the grid resistance. With a grid resistance of two megohms and a grid current of one microampere the bias negative potential will be two volts. A grid Leak mounting and six different values of grid leak units (changeable) costs but $5.00—the benefit derived therefrom will more than pay you.

ARE YOU SATISFIED

With D-L-&-W (Delay, Linger and Wait) Service? Or are you using TRTS (The Real Time Savers) Service? If we cannot supply you from stock and cannot get it immediately for you, you hear from us as soon as a letter can get to you. Isn't that enough to satisfy you? Try TRTS service and weep no more.

SPECIAL OFFER FOR THIS MONTH

No. 14 Hard Drawn Copper Wire (aerial wire), approximately 80 feet to the pound, 47½c per lb. (This offer is open to let you get acquainted with TRTS service. If you are contemplating putting up a new aerial, or adding to the one you already have, order now—today!)

DE FOREST HONEYCOMB COILS—NEW PRICES

DL 25	$1.50	DL 300	$2.20
DL 35	1.55	DL 400	2.40
DL 50	1.60	DL 500	2.55
DL 75	1.70	DL 600	2.80
DL 100	1.80	DL 750	3.00
DL 150	1.90	DL 1000	3.20
DL 200	2.00	DL 1250	3.55
DL 250	2.10	DL 1500	3.80

Pen Brand Grid Condensers $0.65
Pen Brand Series-Parallel Switch 1.00

ADD-A STEP-UNITS

Pen Brand Detector Unit $7.75
Pen Brand Amplifier RADIOTRON UV 712 Amplifier Transformer 17.50

HORNS HORNS HORNS HORNS HORNS HORNS

PAPIER MACHE HORNS—No distortion, but a clear, sharp signal. Use your own phones with them. While they last $5.00

FORMICA PANELS

3-16 in. thick, 2¼c per square in. We cut panels to exact size and smooth off edges. For polishing, add 75c per square foot. Minimum charge 75c. Panels drilled to your specifications, $1.00 per panel.

METERS

3 in. flush type, INSULATED CASES. While they last only.

500 Volt DC meter	$14.00
100 Mil-amp. meter	6.50
300 Mil amp. meter	6.50
500 Mil-amp. meter	6.50

Get the Habit. Get TRTS Service

If your dealer does not stock Radiotron apparatus do not take something "just as good"—demand Radiotron. Request him to forward your order direct.

THE RADIO TELEPHONE SHOP

Agents for Radiotron Apparatus in Utah, Nevada, New Mexico, Arizona, California, Oregon and Washington.

175 STEUART STREET, SAN FRANCISCO, CALIF.

DEALERS: WRITE FOR OUR INTERESTING PROPOSITION

THE MAGNETIC AMPLIFIER
(Continued from page 9)

sections, each occupying a portion of a single fibre spool, which completely filled the space allotted between the walls of the cylinders. Taps from this winding were taken out thru the "washers." The details of this winding are not unlike those of any other simple form of solenoid and will not be considered here.

The radio-frequency winding was made of a special transmitting "Litz," capable of carrying 100 amperes without undue heating. Eight turns were provided and taps were taken off at each turn as shown in Fig. 12.

The artificial cooling of such a device as this is a matter of importance, as no small amount of heat is generated—this resulting primarily from eddy currents in the iron.

It was planned originally to cool the apparatus by forcing air thru the inner cylinder, but this method was soon doomed to failure in the initial tests. It was found necessary to immerse the whole apparatus in oil and to cool the oil by means of water circulation.

Preliminary tests of this apparatus, using 60 cycle alternating current in the radio frequency winding, were made to provide data for checking the design. Figs 9, 10 and 11 show the results of these tests graphically. It is interesting to note the increase in control as the ampere turns in

(Continued on page 30)

Fight Returns Reach San Francisco in Record Time

The Pacific Radio Supplies Company and the San Francisco "Call" together "scooped" their competitors in broadcasting radio reports of the big Dempsey-Carpentier fight on July 2nd. Commencing with the initial bulletins describing matters of interest at the ringside prior to the fight, the introduction of distinguished guests, etc., followed by the announcements of the entry into the ring of first Carpentier and then Dempsey, bulletins relating every incident in each round were broadcasted promptly by radiophone not more than one minute after the actual happenings at Jersey City.

The DeForest radiophone set at the California Theater, operated by the Pacific Radio Supplies Co., was connected by special telephone to the local office of the International News Service. A special sounder was connected in at the International News Service office on their special telegraph line to Jersey City. As fast as the reports came in by wire they were telephoned to the California Theater and immediately transmitted by radiophone by the operator in charge, J. W. A. Legge-Willis.

The radiophone service was so rapid and complete that bulletins had actually been given describing the first part of the fourth round before the "flash" came announcing the knockout. Considering the distance involved and the two relays necessary, i. e., from wire telegraph to wire telephone and from wire telephone to radiophone, it is believed that the speed of this service established a record in radio communication.

THE MAGNETIC AMPLIFIER

(Continued from page 29)

one winding approach the same value as those in the other for the designed value. In Fig. 11, it will be observed that one ampere in the control winding controlled 35 amperes in the other. It is evident from this that the use of the magnetic amplifier, or iron relay, is not limited to the control of high frequency currents. It is a device, the use of which is quite unlimited.

Classified Advertisements

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

RADIO CABINETS—Mahogany or oak finished or unfinished, to your design. Send rough sketch for quotation. Prompt service. Formica cut to size. Radio supplies, parts, etc. Pacific Radio Exchange, 439 Call Bldg., San Francisco, Calif.

SPECIAL machine work, wiring, drilling panels, rebuilding sets, panel polishing, nickel-plated screws and wire. Best of workmanship, best price. Get our price before having your work done. THE RADIO TELEPHONE SHOP, 175 Steuart Street.

BOXES—Quartered oak and mahogany made to your specifications. Your boxes finished in polished mahogany, or old English finish, or finish your own cabinet with TRTS Old English Stain. Easy to apply. Can sufficient to stain several cabinets, 50c. THE RADIO TLEPHONE SHOP, 175 Steuart Street.

DUBILIER CONDENSER. Brand new, never used. Cost $33.50 in San Francisco. Capacity .007, 19,000 volt secondary rating. Sell for $29. T. R. BROWN, 3675 20 th St., San Francisco.

YOU should have a copy of Lieut. E. W. Stone's "Elements of Radio-telegraphy." 400 pages of data on all sorts of radio equipment. A valuable book. The price is only $2.50 per copy, postpaid. Pacific Radio Pub. Co., San Francisco, Cal.

ARC RADIO MANUALS, compiled by the Federal Telegraph engineers of San Francisco. Tells you all you need to know about the 2 and 5 KW arc sets for ship and shore use. Sent to any address for $2.50 per copy, postpaid. Pacific Radio Pub. Co., San Francisco.

ONE CUNNINGHAM C 300 Detector Bulb. Never used. Sell for $4. RADIO, 251 Duboce Ave., San Francisco.

UNIT RECEIVING INDUCTANCES assure satisfactory, efficient, and unparalleled long distance reception of all forms of radio transmission. For long wave work our BI-LATTICE COILS (duo-lateral) need no introduction. For short wave reception a set of SINGLE LAYER COILS compares favorably with the best regeneratives; and the cost is but a fraction of the regular regenerative receiver. Send 3c for bulletin. Our prices and service will surprise you. P. J. Stockwell, Box 157-D, Reading, Mass.

Grebe model regenerative receiver and detector unit, used two months; excellent for radiophone music; first money order for $45.00 gets outfit. Phone $4.00 extra. W. G. Conger, Independence, Mo.

FOR SALE—Chemical Set. Write for list. 9AZN, 608 So. 4th St., La Crosse, Wis.

NEW APPARATUS DEVELOPED

THERE has been much excitement during the past week in the radio circles of Portland, Ore., by the completion of the first Radiotelescopograph to be manufactured by the Northwestern Radio Manufacturing Company.

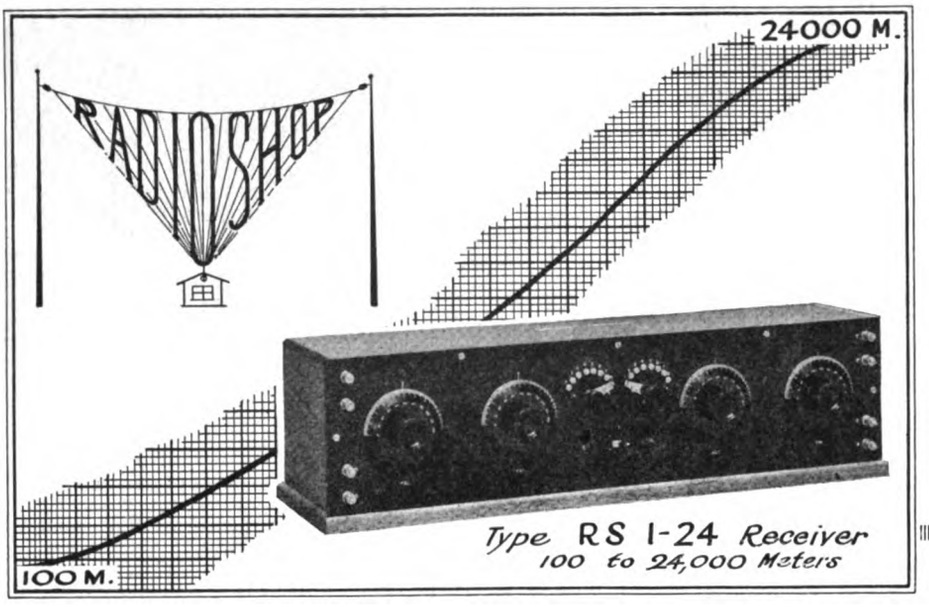
It has proven after many tests to be an excellent piece of apparatus except for a few minor points, which will be adjusted in the future so that everybody will be satisfied.

Mr. William Leidigh (7ZB ex 7DS) was appointed to try out the apparatus at his station, and after locating the wave of the Lyric show house of this city, he stated that he had a very enjoyable evening.

The local theatrical managers are starting negotiations with the Paramount Radio Laboratories of Oak Grove, Ore., for the purchase of large amounts of wave filter with which to line the walls of their theaters. They stated that the attendance has fallen off greatly in the past week. Mr. Austin (7XF er 7ZI), president of the Northwestern Radio Manufacturing Company, says he has more orders for this apparatus than he can fill at the present time.

Mr. J. D. Tait (7JW), president of Covey Motor Car Company, has placed an order for one of these sets. He is planning on demonstrating his cars by sending a car with a driver out over the hills and showing the buyers in his office the merits of the car via Radiotelescopograph. Not Advt.

The RADIO SHOP type "RS 1-24" RECEIVER



An original application of regenerative tuning to a receiver that covers, with the utmost efficiency, every wavelength in use today

The secret of the complete success of the "RS 1-24" receiver lies in the fact that it is not a single device covering all wavelengths but three distinct and separate combinations, all employing the unquestionably superior regenerative method of tuning.

Heretofore all multi-wavelength receivers have consisted of one form of a tuner which was usually "loaded" to reach the higher wavelengths. This method has never given complete success as the "dead end" and other self-evident losses have always decreased the efficiency on the short end of the scale, no matter what precautions, such as "dead ending" switches, have been taken to counteract it. Also it is a well known fact that the very short wavelengths require an entirely different form of tuning than can be successfully applied to the longer waves. Hence the inefficiency of "loaded" short wave receivers.

In the "RS 1-24" these faults are entirely overcome and "dead end" losses eliminated by using three separate arrangements of tuning for the three main groups of wavelengths in use today, namely—Amateur, Commercial ships and marine land stations, and the high power arc and spark transoceanic stations. These changes are made instantly in the "RS 1-24" by a three circuit "master" switch, making it possible to "step up" from amateur wavelengths to the high power arcs and sparks, and vice versa. This method permits the most highly efficient method of tuning to be applied to each individual wavelength group.

A FEW PERTINENT FACTS ABOUT THE "RS 1-24" RECEIVER:

There is absolutely no sacrifice of efficiency on any of the wavelengths covered.

The RADIO SHOP Short Wave Receiver is the most highly efficient short wave receiver on the market. The "RS 1-24" is equally efficient on amateur wavelengths, if not more so.

Tuning is accomplishd quicker, and in a cleaner manner, than in any other receiver ever built. There are no faulty "combinations." Note the simplicity of controls. Only three dials and one switch are in use on any of the three groups of tuning.

Absolutely no "holes" in the tuning range. A consistent and mighty oscillator and capable of instant non-oscillation when so desired.

The variometer principle of regeneration applied to the entire range. This fact alone speaks for the efficiency of the "RS 1-24."

Simplicity of connection to the vacuum tube control. Only four leads required, two to the grid input and two to the plate circuit.

Same vacuum tube suffices for long as well as short waves due to the remarkable flexibility of oscillation control.

An ideal receiver for C. W. and telephone work on account of the broadness of tuning available on the "stan-bi" side. Will enable you to "find" those sharp tuning tube sets.

The elimination of all plugging in and out of coils. Absolutely no other accessories required except the vacuum tube and its attendant controls.

Will enable you to hear commercial ship and marine land stations that were heretofore unheard. The 600-meter section is equally efficient as the short and long ranges.

Has a "stan-bi" position that will enable you to "find" stations that you missed entirely before.

No element of "luck" necessary for the successful operation of the "RS 1-24." It is a positive receiver designed by practical radio engineers who knew what was wanted.

Interior construction that is right, and in keeping with the exterior appearance. .No Seals. We want you to know your set.

Produced and sold at the lowest possible price consistent with the best of materials and a fair profit, by systematic workmanship.

Last but by no means least, licensed under Major Armstrong's regenerative patents and applying his unapproachable circuit to its utmost effectiveness.

MECHANICAL AND CONSTRUCTIONAL POINTS OF SUPERIORITY:

Grained and engraved Bakelite panel and dials. The latter of ample size and with an easily manipulated knob.

Genuine hand wound bank windings in connection with special form concentrated inductances that utilize every iota of the incoming energy.

Heavy "bus bar" wiring of hard bare copper reducing resistance to the minimum and insuring permanence.

Balanced type variable condensers constructed especially for the "RS 1 24." As non-shorting as a condenser can be made.

Full bearing switches that run smooth and give perfect contact.

Genuine Oak or Mahogany cabinets as desired. Hand rubbed finish.

All exposed metal parts satin nickel plated.

Over-all dimensions 7x7x25 inches. Shipping weight approximately 30 pounds.

The installation of the "RS 1-24" receiver will end all of your receiving troubles. You will have an instrument that will enable you to cover the entire wavelength range with a greater ease and efficiency than is possible with any other tuning arrangement you can buy or build. It will be the best investment you ever made from a financial as well as an efficiency standpoint.

Price, F. O. B. San Jose.....$100.00

Full instructions and blue prints accompany each receiver. In ordering be sure and specify whether oak or mahogany case is desired.

San Jose **The RADIO SHOP** *California*

HERE'S $5.00 FOR YOU!

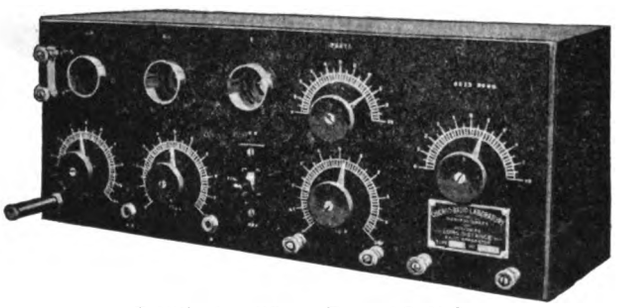
AN OFFER WITHOUT ANY STRINGS

In order to start things going with a bang this fall we will credit $5.00 on every order for one of our Z-Nith Regenerators or Amplifigons, Type AG-N-2, when such orders are sent in direct to us, *accompanied by the attached coupon.* Only one of each of these incomparable instruments sold to any individual on this offer.

The new type Z-Nith Regenerator equipped with long wave attachment with maximum of 1,000 meters and 180 degree coupling adjustment. The best regenerative receiver on the market today for spark, CW or radiophone reception.

Z-Nith Regenerator

Regular price $55.00, with coupon $50.00



Z-Nith Amplifigon Type AG N-2

The new type Amplifigon Detector-Amplifier Type AGN-2, equipped with special high voltage cut-off switch, non-squealing amplifying transformers, variable grid condenser and plate potentiometer. Ideal for use with any tuner or regenerative receiver on the market.

Regular price $89.25, with coupon $84.25

THIS OFFER GOOD ONLY DURING MONTH OF AUGUST

Write now for Bulletin F-21 describing these instruments and take advantage of this opportunity.

CHICAGO RADIO LABORATORY

6433 Ravenswood Ave.

CHICAGO, ILL.

THIS COUPON WORTH $5.00

C. R. L.
6433 Ravenswood Ave.,
Chicago, Ill.

Gentlemen:

In accordance with your wonderful August offer enclosed find $..... for which send me one.....

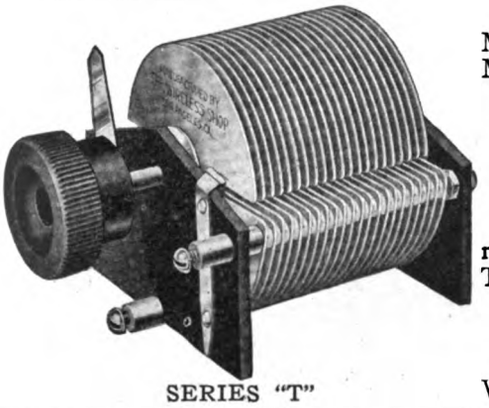
NAME.....

ADDRESS .....

TOWN.....

QUALITY OR PRICE?

Which are You interested in?



SERIES "T"

WOULD YOU RATHER TAKE AN INFERIOR INSTRUMENT AND SAVE A FEW CENTS—OR—PAY A LITTLE MORE AND GET THE BEST?

IF YOU WANT THE **BEST**—BE SURE AND SAY—

"WIRELESS SHOP PRODUCTS"

"WIRELESS SHOP" VARIABLE CONDENSERS are now recognized as the standard. Why are they so POPULAR? There's a reason—

BEST of material and workmanship—

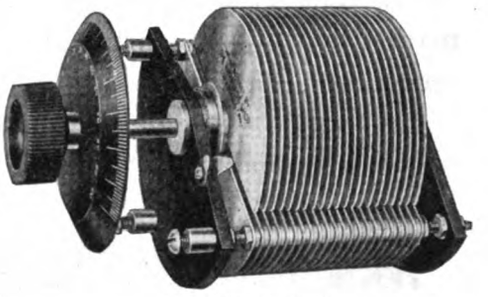
Careful inspection, and NO COMEBACKS. ISN'T THAT WORTH SOMETHING?

THE "WIRELESS SHOP" LINE INCLUDES EVERY TYPE OF RECEIVING INSTRUMENT

Our "Series T" variable condenser is the IDEAL instrument for your receiving set. Supplied with knob and pointer and mounting screws, either brass or nickle, at the following prices:

No. 20	2 plate	Vernier Condenser	$2.00
No. 70	7 plate	approximately .0001 m. f. maximum capacity	2.35
No. 130	13 plate	approximately .0002 m. f. maximum capacity	2.75
No. 170	17 plate	approximately .0003 m. f. maximum capacity	3.15
No. 230	23 plate	approximately .0005 m. f. maximum capacity	3.60
No. 310	31 plate	approximately .0007 m. f. maximum capacity	4.30
No. 430	43 plate	approximately .001 m. f. maximum capacity	5.25
No. 630	63 plate	approximately .0015 m. f. maximum capacity	7.50

Include postage for one pound to your postal zone, and insurance.



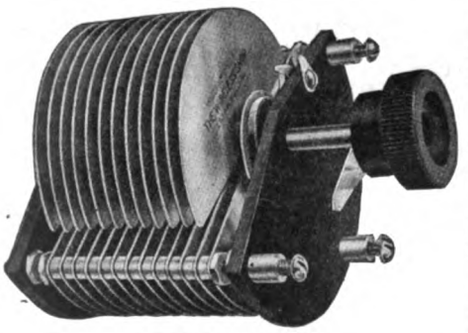
SERIES "L"

IF YOU REQUIRE A HEAVIER MODEL THAN THE "SERIES T"—OUR "SERIES L" WILL FILL THE BILL. Larger plates and heavier construction throughout. Supplied with knob and pointer and mounting screws, brass or nickel.

PRICES

No. 2300	23 plate	approximately .00075 m. f. maximum capacity	$ 6.00
No. 4300	43 plate	approximately .0013 m. f. maximum capacity	8.00
No. 6300	63 plate	approximately .002 m. f. maximum capacity	10.00

Include postage for two pounds on No. 2300 condenser and for three pounds on No. 4300 and No. 6300, and insurance, to your postal zone.



SERIES "CW"

AND—OUR SERIES "CW" IS THE **ONLY** REAL CONDENSER FOR YOUR PHONE OR "CW" SET.

The plates are amply spaced to prevent spark-over on high plate potentials, and the construction is extremely rigid. With knob and pointer and mounting screws, the prices are:

SERIES "CW"

No. 1500	15 plate	approximately .0004 m. f. maximum capacity	$6.00
No. 2500	25 plate	approximately .0006 m. f. maximum capacity	7.50
No. 3500	35 plate	approximately .0008 m. f. maximum capacity	9.00

Include postage for two pounds on No. 1500 condenser, and for three pounds on No. 2500 and 3500, and insurance, to your postal zone.

IMPORTANT ANNOUNCEMENT—Watch our add next month announcing our new VERNIER, which may be attached to any standard "Wireless Shop" Variable. And the price is so low it will surprise you. See it next month.

THE WIRELESS SHOP
A.J. EDGCOMB

511 WEST WASHINGTON STREET LOS ANGELES, CAL.

PARAGON R·A·TEN

Protection Against Regrets Absolutely Guaranteed by Originator's Name

Licensed under original Marconi & Armstrong patents

SEALS BROKEN

by popular request!

NO MORE seals on PARAGON R.A. TEN receivers,—take the panel off before you buy,—see for yourself the splendid workmanship behind the handsome cabinet,—and you will better understand the reasons for PARAGON's unequalled selectivity and amplification.

Ask your radio dealer to show you the inside construction of a Paragon. If he hasn't one in stock he will gladly get it for you.

Endorsed by prominent amateurs everywhere

SCORES of letters on file at our offices from enthusiastic amateurs, testify to PARAGON's marvellous results. The latest one as we go to press is from J. O. Smith of Valley Stream, L. I. He says, "The PARAGON R.A. TEN receiving set which has been in use at 2ZL station for the past two months has proved to be entirely satisfactory in every way, and has done everything you claimed it would do. It is remarkably efficient and selective on all wavelengths. The R.A. TEN has proved to be especially satisfactory in C.W. work, because of the *complete absence* of capacity effects."

OTHER amateurs have *"heard stations they never heard before."* A Y. M. C. A. radio school tested PARAGON in direct comparison with other leading makes, and reported that "PARAGON *fulfilled every advertised superiority.*"
Such endorsement is ample evidence that PARAGN R.A. TEN is well worth its $85.00 price.

Satisfactory performance absolutely guaranteed

THE CONTINENTAL Radio and Electric Corporation accepts full responsibility for the satisfactory performance of PARAGON R.A. TEN receivers, as long as the internal construction remains unchanged. We cannot, of course, continue to be responsible if the design or wiring has been tampered with. In actual practice, however, the results are so surprisingly pleasing that few have any desire to make any alterations. In any case, Continental will see that you get a square deal and your money's worth.

Special opportunity to radio clubs

IF YOU are an officer or member of a radio club, you will be interested in this special offer. For a short time only, radio clubs in good standing will have the opportunity of securing a genuine PARAGON R.A. TEN regenerative receiver for their club house—*absolutely FREE.* Have your President or Secretary write on the club's letterhead for particulars *at once.*

Descriptive folders on PARAGON R. A. TEN *and* PHONETRON, *the improved type of loud speaker, sent free on request. Or send 25 cents for the CRECO catalogue,—listing all the worth while equipment in use today.*

CONTINENTAL RADIO and ELECTRIC CORP.

EXCLUSIVE WHOLESALE DISTRIBUTORS FOR PARAGON R.A. TEN AND PHONETRON

J. DiBlasi, Sec. **Dept. G77 6 Warren Street New York City** *J. Stantley, Treas.*

THE RADIO DEALers listed below are progressive merchants. They are equipped to give you helpful advice and real service in selecting your radio equipment. As an indication of their up-to-date methods, they carry a complete line of Radisco apparatus, including the new vario-coupler, Radisco Coils, Better "B" Batteries, Corwin Dials, etc. Buy from the nearest Radisco agency, and be sure of satisfaction.

ALBANY, N. Y.
Shotton Radio Mfg. Co.
8 Market St.

ASHEVILLE, N. C.
Hi-Grade Wireless Instrument Co.

ATLANTIC CITY, N. J.
Paramount Radio Supply
Arkansas & Pacific Aves.

BOSTON, MASS.
Atlantic Radio Co.
88 Broad Street.

BROOKLYN, N. Y.
Kelly & Phillips,
312 Flatbush Avenue.

CHICAGO, ILL.
Chicago Radio Labs.,
1316 Carmen Ave.
Branch, Peoria, Ill.

EUREKA, ILL.
Klaus Radio Co.

KANSAS CITY, MO.
McCreary Radio Supply
4th and Delaware Sts.

McKEESPORT, PA.
K. & L. Electric Co.
427 Olive Street.

NEWARK, N. J.
A. H. Corwin & Co.,
4 West Park St.

NEW BRUNSWICK, N.J.
Geo. N. DeLaplaine,
306 George St.
8th and Magnolia Sts.

NEW ORLEANS, LA.
Rose Radio Supply,
604 Gravier St.

OMAHA, NEB.
O. B. Radio Supply Co.,
406 Brown Building.

PHILADELPHIA, PA.
Philadelphia School of Wireless Telegraphy,
1533 Pine St.,

PLAINFIELD, N. J.
Paul R. Collier,
154 E. Front Street.

PITTSBURGH, PA.
Radio Electric Co.,
3807 Fifth Ave.

PORTLAND, ME.
Atlantic Radio Co.,
15 Temple St.

PROVIDENCE, R. I.
Rhode Island Elec. Equip. Co.,
45 Washington St.

SEATTLE, WASH.
Northwest Radio Service
609 Fourth Ave.

SCRANTON, PA.
Shotton Radio Mfg. Co.
P. O. Box 3.
Branch, 8 Kingsbury St.
Jamestown, N. Y.

WASHINGTON, D. C.
Eastern Radio and Electric Co., 1405 Florida Ave., N. W.

Canadian

MONTREAL, QUEBEC
J. B. Miller,
136 Vendome Ave.,N.D.G.

TORONTO, ONTARIO
The Vimy Supply Co.,
567 College Street.

To Responsible Dealers: If you are in a town where there is no Radisco Agency, you will benefit by writing for the Radisco plan.

RADIO DISTRIBUTING CO., Newark, N. J.

RADISCO

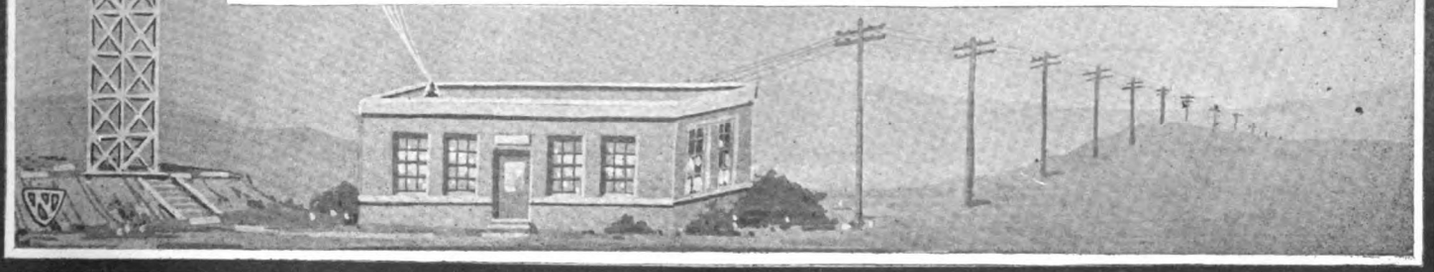
"Your Assurance of Satisfactory Performance"

SEPTEMBER, 1921

TWENTY CENTS

PACIFIC RADIO NEWS

Pioneer Journal of Western Radio News and Development.



CUNNINGHAM

TUBES MEET EVERY AMATEUR REQUIREMENT

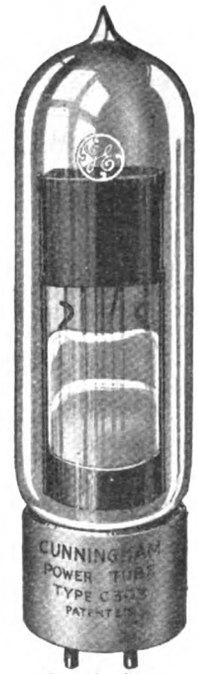
The trade-mark GE is the guarantee of these quality tubes. Each tube is built to most rigid specifications.

	C300 Gas Content Detector	C301 Pliotron Type Amplifier	C302 5 Watt Power Tube	C303 50 Watt Power Tube	C304 250 Watt Power Tube
Filament Terminal Voltage	5 V.	5 V.	7.5 V.	10 V.	11 V.
Filament Supply Voltage	6 V.	6 V.	10 V.	12 V.	12 V.
Filament Current	1.0 amp.	1.0 amp.	2.35 amp.	6.5 amp.	14.75 amp.
Plate Voltage	18 to 25 V.	40 to 100 V.	350 V. normal	1000 V. normal	2000 V. normal
Plate Current	¼ to 1 milli. amps.	1 to 5 milli. amps.	.045 amp.	.15 amp.	.25 amp.
Output Impedance	10,000 ohms	21,000 ohms at 40 Volts 14,000 ohms at 100 Volts	4,000 ohms		6,000 ohms
Amplification Constant		6.5 to 8 at 40 V. 8 to 10 at 100 V.	7.5	10	25
Watts Output			5 normal	50 normal	250 normal
Dimensions (overall)	1¾"x4 5/16"	1¾"x4 5/16"	2⅛"x5¼"	2"x7½"	5"x14½"
Base	4 Prong Standard	4 Prong Standard	4 Prong Standard	4 Prong Special	Special Mounting
PRICE	**$5.00**	**$6.50**	**$8.00**	**$30.00**	**$110.00**

Cunningham Amplifier Pliotron Type C-301

Cunningham C-300 Detector Gas Content

Cunningham C-302 5 Watt Power Tube



Cunningham C-303 50 Watt Power Tube

Cunningham C-304 250 Watt Power Tube

DEALERS: Standard Packages F. O. B. Cleveland, San Francisco, Chicago, New York. Broken Packages F. O. B. San Francisco and Chicago.

E. T. CUNNINGHAM

Trading as Audiotron Mfg. Company

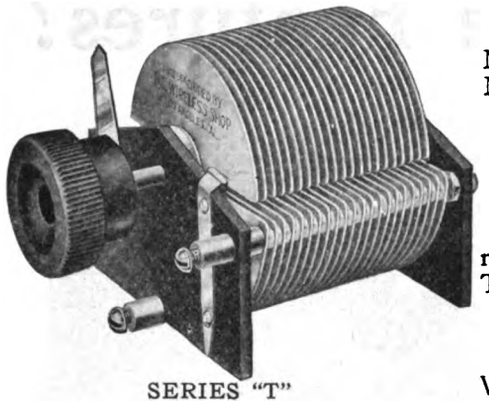
Since 1915

35 Montgomery St., San Francisco

Herbert H. Frost, Central and Eastern Representative, 154 West Lake St., Chicago, Ill.

QUALITY OR PRICE?

Which are You interested in?



SERIES "T"

WOULD YOU RATHER TAKE AN INFERIOR INSTRUMENT AND SAVE A FEW CENTS—OR—PAY A LITTLE MORE AND GET THE BEST?

IF YOU WANT THE **BEST**—BE SURE AND SAY—

"WIRELESS SHOP PRODUCTS"

"WIRELESS SHOP" VARIABLE CONDENSERS are now recognized as the standard. Why are they so popular? There's a reason—

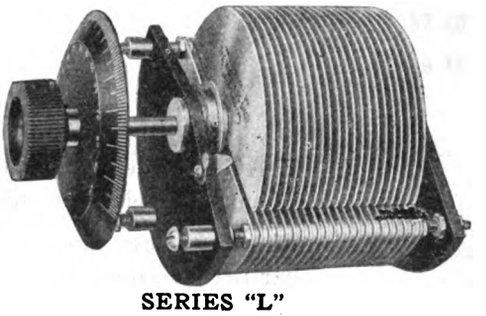
BEST of material and workmanship—

Careful inspection, and NO COMEBACKS. ISN'T THAT W ORTH SOMETHING?

THE "WIRELESS SHOP" LINE INCLUDES EVERY TYPE OF RECEIVING INSTRUMENT

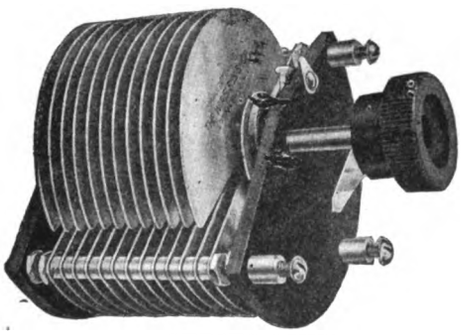
Our "Series T" variable condenser is the IDEAL instrument for your receiving set. Supplied with knob and pointer and mounting screws, either brass or nickle, at the following prices:

No. 20	2 plate	Vernier Condenser	$2.00
No. 70	7 plate,	approximately .0001 m. f. maximum capacity	2.35
No. 130	13 plate,	approximately .0002 m. f. maximum capacity	2.75
No. 170	17 plate,	approximately .0003 m. f. maximum capacity	3.15
No. 230	23 plate,	approximately .0005 m. f. maximum capacity	3.60
No. 310	31 plate,	approximately .0007 m. f. maximum capacity	4.30
No. 430	43 plate,	approximately .001 m. f. maximum capacity	5.25
No. 630	63 plate,	approximately .0015 m. f. maximum capacity	7.50



SERIES "L"

IF YOU REQUIRE A HEAVIER MODEL THAN THE "SERIES T"—OUR "SERIES L" WILL FILL THE BILL. Larger plates and heavier construction throughout. Supplied with knob and pointer and mounting screws, brass or nickel.



SERIES "CW"

PRICES

No. 2300	23 plate,	approximately .00075 m. f. maximum capacity	$ 6.00
No. 4300	43 plate,	approximately .0013 m. f. maximum capacity	8.00
No. 6300	63 plate,	approximately .002 m. f. maximum capacity	10.00

Include postage for two pounds on No. 2300 condenser and for three pounds on No. 4300 and No. 6300, and insurance, to your postal zone.

AND—OUR SERIES "CW" IS THE **ONLY** REAL CONDENSER FOR YOUR PHONE OR "CW" SET.

The plates are amply spaced to prevent spark-over on high plate potentials, and the construction is extremely rigid. With knob and pointer and mounting screws, the prices are:

SERIES "CW"

No. 1500	15 plate,	approximately .0004 m. f. maximum capacity	$6.00
No. 2500	25 plate,	approximately .0006 m. f. maximum capacity	7.50
No. 3500	35 plate,	approximately .0008 m. f. maximum capacity	9.00

Include postage for two pounds on No. 1500 condenser, and for three pounds on No. 2500 and 3500, and insurance, to your postal zone.

IMPORTANT ANNOUNCEMENT—Watch our ad. next month announcing our new VERNIER, which may be attached to any standard "Wireless Shop" Variable. And the price is so low it will surprise you. See it next month.

THE WIRELESS SHOP

A. J. EDGCOMB

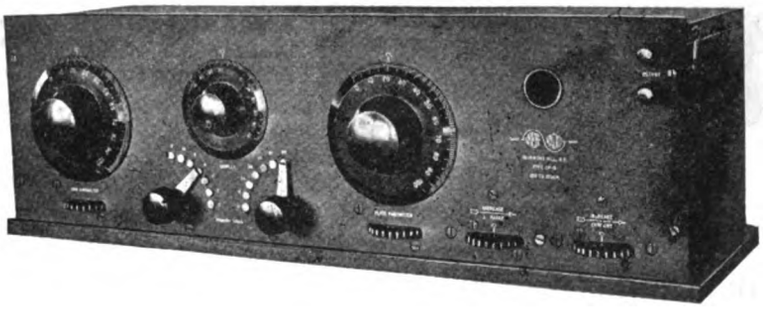
511 WEST WASHINGTON STREET LOS ANGELES, CAL.

What Other Receiver Has *These* Features?

In the

GREBE RADIO

CR-8 Short-Wave Receiver



Licensed Under the Original Armstrong Patents.

EACH element is shielded with a grounded, aluminum plate, thus eliminating troublesome change of frequency when tuning on C. W.

There are new, moulded variometers that will last a century. And new, rubber-tired verniers of a kind that make ***real*** tuning a pleasure.

Wave-change and rheostat control wheels give visual indications of the wave-length range and the resistance in the filament circuit.

Filament and plate battery binding posts are conveniently mounted for connecting through the back of the cabinet. This eliminates unsightly connections.

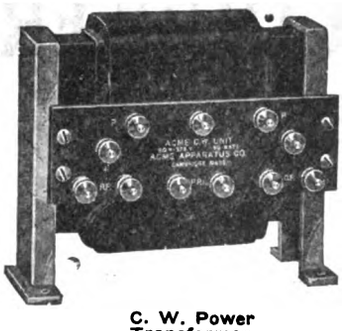
And—its range is 150 to 1,000 Meters.

The amateur who wants to "be somebody" this Fall will appreciate these features. What is far more important, he will appreciate the ***results*** this receiver will give him.

Your dealer will gladly order one of these Receivers for your inspection. Ask him for bulletin.

Bunnell & Co., J. H., New York City.
Central Radio Company Inc., Kansas City, Mo.
Continental Radio and Electric Corp., New York.
Detroit Electric Co., Detroit, Mich.
Doubleday-Hill Electric Co., Pittsburgh, Pa.
Electrical Specialty Co., Columbus, Ohio.
Holt Electric Utilities Co., Jacksonville, Fla.
Hurlburt Still Electrical Co., Houston, Texas.
Kelly and Phillips, Brooklyn, N. Y.
Klaus Radio Company, Eureka, Ill.
Manhattan Electrical Supply Co., New York, Chicago, St. Louis
Leo J. Meyberg Co., San Francisco, Cal.
Newman-Stern Co., Cleveland, Ohio.
F. D. Pitts Co., Inc., Boston, Mass.
Philadelphia School of Wireless Telegraphy, Philadelphia, Pa.
Western Radio Electric Co., Los Angeles, Cal.
Hickson Electric Co., Inc., Rochester, N. Y.

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



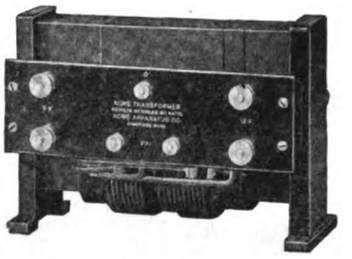
C. W. Power Transformer

Before buying any

C. W. APPARATUS

Ask for ACME Bulletins

They contain valuable information and will help you to install an efficient C. W. station.



Filament Heating Transformer

ACME C. W. APPARATUS

ACME Guaranteed APPARATUS

C. W. Power transformers

Filament heating transformers

Choke Coils

C. W. Plate transformers

Modulation transformers

Amplifying transformers

Amplifiers

Detectors

ANYONE having an alternating current can easily have a radio telephone and telegraph station.

No storage batteries or motor generator required. quired.

Filaments lighted by filament heating transformers.

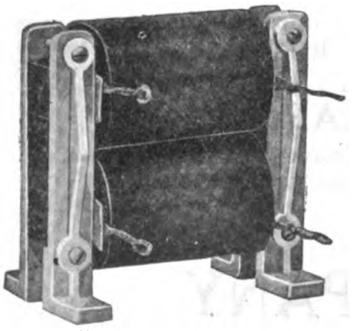
Plate voltage and current supplied by Acme transformers specially designed for that purpose.

High voltage direct current is easily obtained by rectifying the A. C. and smoothing out with Acme choke coils and condensers.

Such a station is entirely satisfactory. No moving parts to require attention. Plenty of power available. No noise.

Acme has the most complete line of C. W. apparatus. There is a specially designed Acme instrument for every special need. Use Acme apparatus thruout for smooth-working, dependable performance and high efficiency.

THE APPARATUS WITH THE GUARANTEE

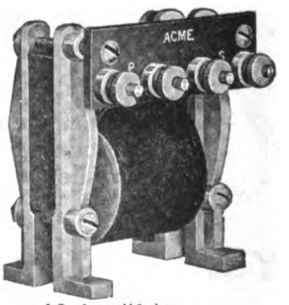


1½ Henry Choke Coil

ACME APPARATUS COMPANY

182 Massachusetts Ave.,
Cambridge, 39, Mass.

Transformer and radio engineers and manufacturers.



A2 Amplifying Transformer

VOLUME III SEPTEMBER, 1921 NUMBER 2

RADIOTORIAL

By the Editor

KEEPING AMATEUR RADIO HERE

SOME of you men close under the "wings" of the radio inspectors of the various nine districts never realize what is being "got away with" out in the little corners of the United States where radio inspectors are not manifest. Buzz, scratch, squeak; it's the old-time plain aerial spark coil bug on the job without a license. But we are broad-minded; we know this little pest is undoubtedly a young boy "crazy" to talk via radio, and, unable to secure a license, goes ahead without one, little realizing he is breaking the Federal law.

A lot of us are broad-minded, in fact, too much so. We refer to the man who has a nice set, properly tuned, a license and everything, and who communicates by radio with the unlicensed station. But, look here, read this reason: If you are going to talk to an unlicensed amateur, you are encouraging him to operate without a license. Further, you are violating the law in doing so, and it isn't healthy.

But, getting down to the fundamental idea of this RADIOTORIAL, it's KEEPING THE AMATEUR HERE. We don't want legislation that will kill the amateur game; further, we don't want laws any more stringent than the present ones on Amateur Radio. If you agree with our opinion, then DO YOUR SHARE.

At the present date amateur radio is increasing, and stations are being licensed at a tremendous rate. That means that interference is being increased proportionately. The biggest, and almost only argument the legislators can bring against Amateur Radio, is just that one thing—INTERFERENCE. All right, then let's cut INTERFERENCE down. The body of licensed amateurs about the country are to be praised, in general, for their intelligent manipulation of their apparatus to give pure and sharp waves, which minimize interference.

But, coming back to the spark coil or the unlicensed station, in general, let's weed him out entirely. "Spare the rod and spoil the child" is a slogan for application to unlicensed set operators. Unless he is shown that he must cut out the transmitting he will get unmanageable and will ruin radio for the rest of us—law-abiding citizens that we are.

How to go about it? This way: First of all, don't think of bothering to tell him, over the air, that you will report him to the radio inspector; no, that's like "telling mamma." In the first place you have no business to talk with the unlicensed station, and in the second place the offender, being out of "fist reach," refuses to obey his reprimander. The way to get him is to let him "rave" on for several nights, or weeks, and try to locate him. The simplest way, but not the most effective, is to go to all your different friends and listen in for this "bug," and by comparing audibility or loudness of his signals, and finding his approximate location, run him down by finally finding his antenna. If you are lucky, you can hear him give his address to some friend offender, and thus have no trouble. Then there is a third method—the most interesting, and one which will be remarkably effective. This is by using a coil or loop antenna, as used in a radio compass station ,and by securing the assistance of one other station. A map of the city or country should be procured, the distance between the two stations calculated, or measured, and by securing two angles, observed while receiving from the unlicensed station, the exact position the unlawful "bird" is occupying on the map is found. The rest is easy.

Then, when you've "got" him, what to do with him? Call on him, introduce yourself, tell him why you called and ask him whether he doesn't think he ought to stop taking the law in his own hands. Cases such as these must be handled diplomatically, gentlemanly and not in a spirit of superiority. If the "unlicensee" is a young boy and appears particularly insistent to continuing operation, try explaining to his parents what the boy is really doing—disobeying Federal law.

The last resort should be to report an offender to the government, namely, the radio inspector. If the right kind of treatment is given the last resort will be unnecessary.

Such work among us of the licensed amateurs will assist the government in keeping radio laws in observance and will be one big block in the building of permanent legislation, allowing amateurs to operate without fear of impending curtailment.

OUR NEW ADDRESS

"Pacific Radio News" is now being printed in our co-operative plant at 151 Minna Street San Francisco.

Please use our new address in your correspondence to us.

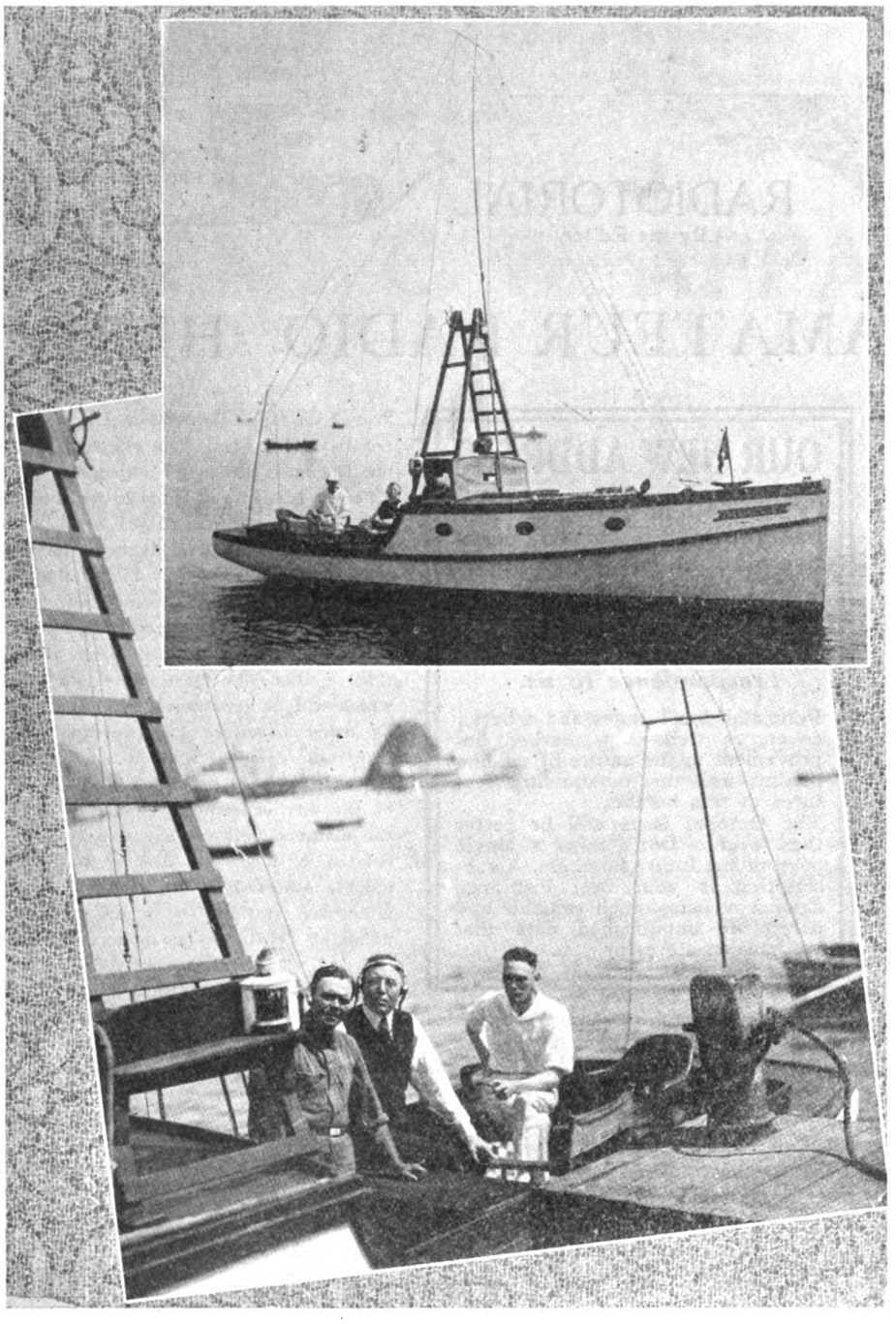
Four additional pages and a better cover, as well as a marked improvement in the nature of reading matter, are the outstanding features of this number.
The October issue will be better than ever. Don't miss a single copy of the future numbers. A subscription is your best insurance against missing much valuable and heretofore unpublished data that we have in store for you.

New York Office.....147 Sixth Ave. Portland Office.....420 Bd. of Trade Bldg. Seattle Office.....419 Pioneer Bldg.
Boston Office.....18 Boylston St. Chicago Office.....1300 Hartford Bldg. London Office....62 and 8a, The Mall, Ealing

Entered as second class matter January 22, 1920, at the Post Office at San Francisco, Cal., under the Act of March 3, 1879.

WIRELESS AS AN AID TO PLEASURE

Below we have a photo of Mr. Lawrence Mott's wireless-equipped fishing boat, "Mable F." The equipment has already proven its worth, not only from a standpoint of pleasure but from a practical nature as well. Mr. Mott wears the receivers almost constantly while on a fishing trip. The "folks at home" put in a call for the mainland via the Avalon radio telephone and the message intended for Mr. Mott is spoken to the party on the other end of the line. In the lower photo U. S. Radio Inspector Major J. F. Dillon is seen "listening-in" to the Avalon radio telephone. To the left of the Major is our Associate Editor, Mr. Lawrence Mott.



Description of set on U. S. Deputy Game Warden, Lawrence Mott's fast fishing crusier, the **"Mable F"***—from which he has killed many record swordfish and tuna in Southern waters.*

Antenna: Rigged as shown in photograph —No. 14 soft-drawn copper—50' in length, all told. The receiver consists of a Remler panel amplifier—1 tube—operating in conjunction with very sensitive variometers. By the aid of a separate coil in the antenna he gets up to 600 meters, and has excellent audibility while at sea, fishing, up to distance of 150 miles—that is unusually good, when the comparative size of the antenna is considered. While after tuna, in the Santa Barbara Channel, Mr. Mott has heard amateur stations in Los Angeles and the surrounding country. The radio telephone between Avalon and the main land is QSA almost everywhere among the Channel Islands—Santa Cruz, San Miguel, San Clemente, etc. An effective ground is obtained by making fast a lead to the frame of the engine—thus connecting, through the shaft, directly to the water.

CURRENT
ILLUS

S.S. ALASKA'S RADIO BRINGS HELP TO DOOMED VESSEL

The radio hero of the "Alaska"

JOHN J. MICHELSON is the radio hero of the ill-fated "Alaska," which went to her doom on Blunt's Reef, August 6th, in a dense fog. The general public has learned little of the radio operators and the manner in which they conduct themselves while the grim reaper of death took with him more than a score of the passengers and crew of the doomed vessel.

Newspaper reports were loud in their praise of the many heroes of the day—but what was said about Michelson? **Practically nothing!** Were it not for the manly courage of the radio man in the performance of his duties the casualty list would, no doubt, have been swelled.

Michelson was on watch when the ship crashed into the reef. The second officer rushed into the radio cabin with instructions to send distress signals. The captain followed the second officer with similar instructions. SOS calls were intercepted by the S. S. "Anyox" and the S. S. "Wahkeena," as well as by the Radio Corporation station at Bolinas, Cal. The engine room was flooded soon after the vessel struck. Michelson states that power from the emergency radio batteries enabled him to communicate for almost 15 minutes with the "Anyox." So rapidly did the vessel sink that the radio room was soon flooded with water and communication was interrupted.

The radio operator stuck to his post until the last possible moment. Only a handful of the crew and passengers were now aboard. The last life raft was being launched just as Michelson was leaving the radio room. Together with the second operator, A. G. Peery, he boarded the last raft, under instructions from the chief officer, and six hours later the majority of the survivors were safely aboard the "Anyox."

The radio equipment of the "Alaska" was of the Kilbourne and Clark manufacture, controlled by the Ship Owners' Radio Service.

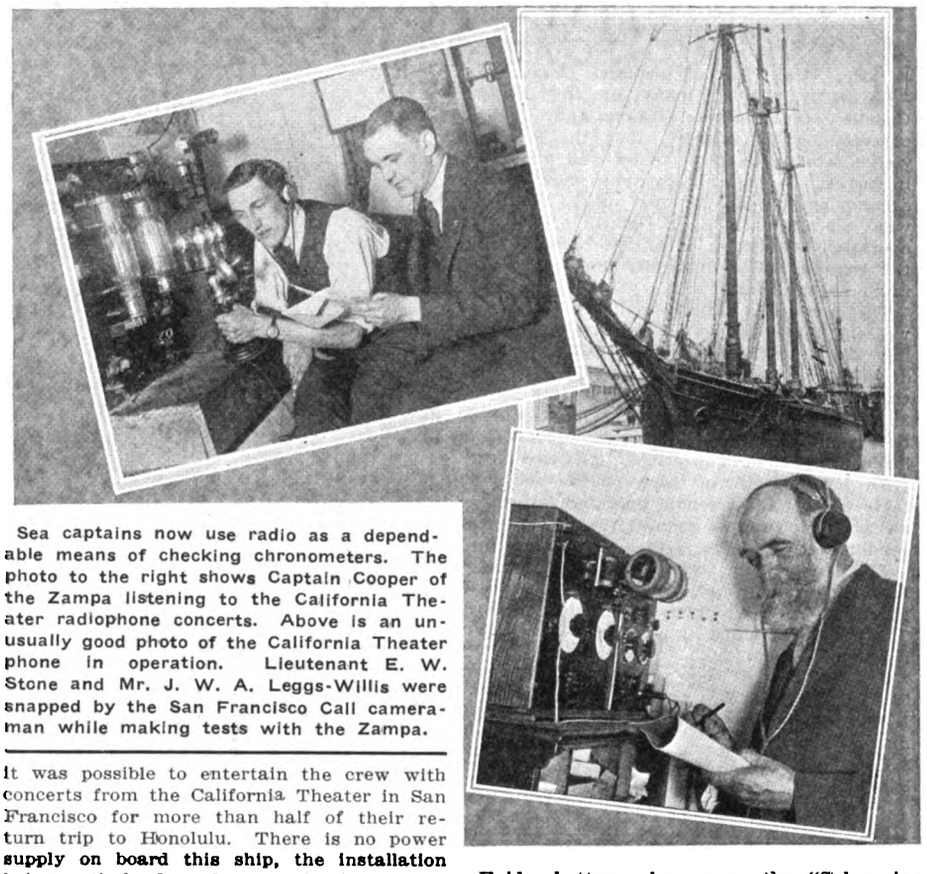
ADIO NEWS
RATED

RADIO ON SAILING SHIPS

EARLY in the month of June of this year the sailing schooner Zampa arrived in San Francisco with a cargo of copra from the Hawaiian Islands. The Zampa is owned by the Hon. Henry E. Cooper, former Judge of the Federal District Court of Hawaii, and was purchased by him in Honolulu early this year.

On arrival in San Francisco Judge Cooper arranged with the Pacific Radio Supplies Company, local distributors for the De Forest Radio Telephone and Telegraph Company, to have a complete receiving set installed on this ship, the main object being to receive time signals while at sea for checking the ship's chronometers. The necessity for the absolute accuracy of these instruments, in order to find the ship's position, is obvious. The engineers of the Pacific Radio Supplies Company installed a DeForest multi-wave tuner and a combination detector and amplifier panel.

While in San Francisco Judge Cooper became interested in the numerous radio concerts being broadcasted daily, and so added to his installation a loud speaker horn with microphone attachment. With this addition it was possible to entertain the crew with concerts from the California Theater in San Francisco for more than half of their return trip to Honolulu. There is no power supply on board this ship, the installation being entirely dependent on the 140-ampere Exide battery, known as the "Submarine Special." The antenna consists of two wires rigged between the main mast and mizzen, a spread of about 30 feet, with 140-foot lead-in thru the deck into the cabin. Judge Cooper was easily able to operate this set without any previous radio experience and is now considering the installation of complete radio telephone equipment for his ship.

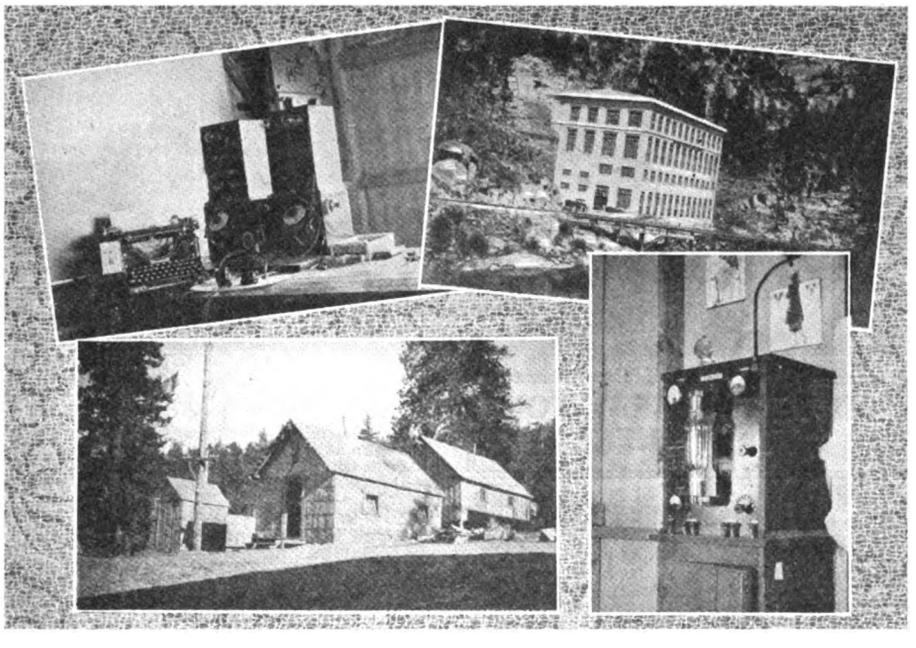


Sea captains now use radio as a dependable means of checking chronometers. The photo to the right shows Captain Cooper of the Zampa listening to the California Theater radiophone concerts. Above is an unusually good photo of the California Theater phone in operation. Lieutenant E. W. Stone and Mr. J. W. A. Leggs-Willis were snapped by the San Francisco Call cameraman while making tests with the Zampa.

C. W. STATION AT BIG CREEK

By S. E. HYDE

WITH headquarters at Big Creek, California, 40 miles up in the mountains, from Fresno, Calif., there is going forward a hydro-electric project on a large scale by the Southern California Edison Company of Los Angeles. Two large power-houses have already been completed in the Big Creek Gorge and are shooting "juice" to Los Angeles and vacinity at a pressure of 150,000 volts. A third is under construction. Big Creek, at an altitude of 5000 feet, is connected by telephone and telegraph directly with the Los Angeles offices.



Two thousand feet higher, at the further end of Lake Huntington, lies Camp 60, the lower terminus of a 13-mile tunnel which will bring water from Florence Lake through a 9,000-foot mountain (Kaiser Pass) into Lake Huntington. Half way to Florence Lake on an angle with the tunnel survey lies Camp 61, where an "Adit" is being cut into the mountain side so that work on the tunnel may be pushed forward from both ends and also in the middle, thus expediting its completion.

Up in this country winter starts about September, with snow falling, and continues through to April. During this time it was found impossible to keep up telephone lines, due to storms, snow and ice.

The Edison engineers decided that CW transmission was the only thing that would enable reliable communication to be kept up with Big Creek between Camp 60 and Camp 61. In winter the only means of communication with the exception of radio is a dog team, as the roads are buried deep in snow.

The three radio sets are identical at each station. The transmitter consists of a ½ KW DeForest Oscillion Transmitter. A 1500 volt DC generator supplies the plate current and a 37 volt DC generator feeds the filament of the Oscillion tube. Voice modulation by telephone transmitter can be employed, but telegraphic operation is much quicker and more reliable.

These sets are supplied with energy from a 30,000 volt transmission line running from Big Creek, which also furnishes energy for

(Continued on Page 71)

7JW- PORTLAND, OREGON

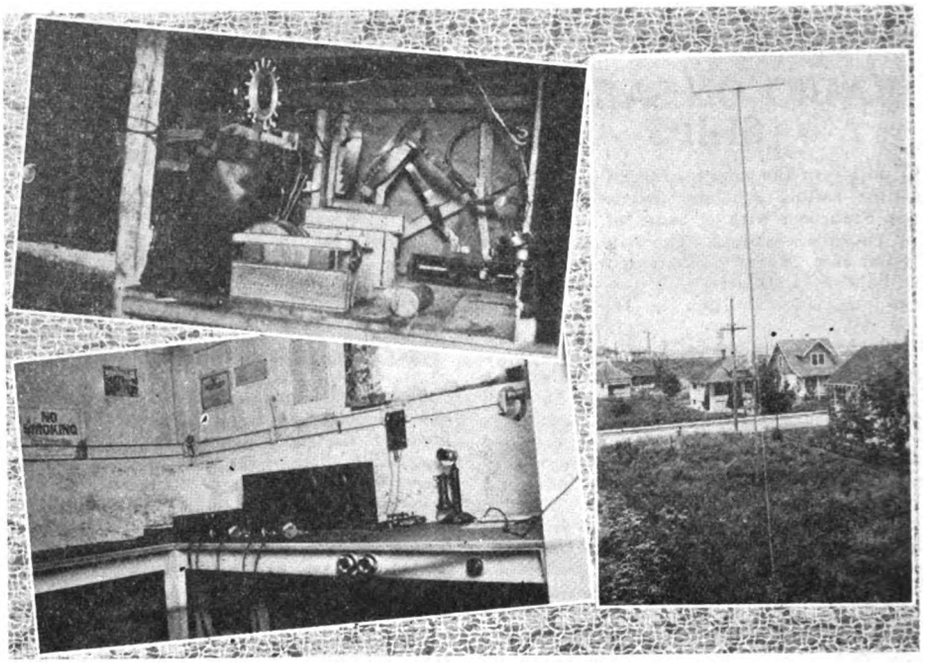
MR. JACK TAIT of Portland, Oregon recently visited many of the Pacific Coast's "star" amateur stations and has discovered, to his surprise, that the stations visited are in no respects as well arranged in reality as the photographs show. The accompanying illustrations of 7JW show what his station looks like when it is in full operation—not when it is "re-vamped" for the camera and sent on its journey to the radio publications.

The receiver is entirely made up of Northwestern Radio Mfg. Co. apparatus, consisting of a regenerative receiver and two steps of amplification. The receiving set and transmitter controls are in a small room, 8x10 ft., while the transmitter is placed at the other end of the house to facilitate short leads and ground connections. The two large push buttons on the edge of the receiver table control the solenoid operated antennae switch, which can be seen at the right of the sending set.

The transmitter consists of a homemade 1 K. W. transformer, pancake O. T., glass plate condenser and non-synchronous rotary. The tone is obtained by a 16-point disc turning up 1750 rpm.

The aerial is 62 feet at the high end and 54 feet at the lead-in end. It is a four-wire L. The lead-in comes directly down into the magnetic switch.

Because his spark is not heard every night, is no sign that he's not on the job.



THE "WESRAD" RADIO TELEPHONE STATION

A Powerful Los Angeles Tube Set that radiates two and one-half amps

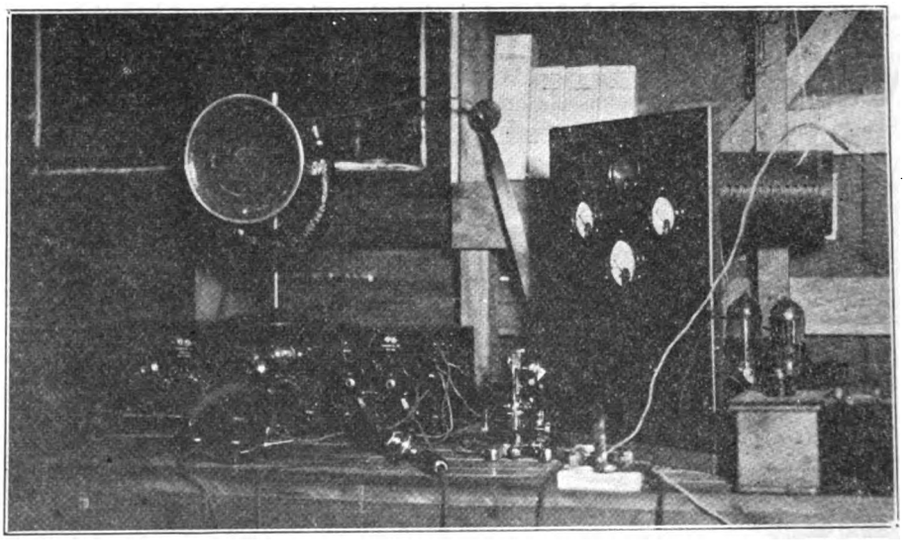
RADIO Station 6XD, operated and controlled by the Western Radio Electric Company, 550 South Flower Street, Los Angeles, Cal., is now transmitting radio telephone concerts every Tuesday and Friday evening between 8 and 9 o'clock.

A specially constructed transmitter is used which employs two Cunningham 50-watt tubes, one as an oscillator and the other as a modulator. The Colpitts oscillator circuit in conjunction with the Heising system of modulation seems well adapted to this type of transmitter.

At present, with 860 volts on the plate and a total space current of 200 milliamperes the radiation is 2½ amperes on 325 meters. A few changes will probably be made in the power input shortly which should materially increase the radiation.

Arrangements have been made with Richardson's Music Shop in Los Angeles to furnish all the latest Victor Records as soon as they are ready for distribution so the concerts have the added attraction of being of assistance in selecting new records for the listener's own phonograph.

Although the concerts have been held for only two weeks, and practically no announcement has been made of them, the music has been reported very clear in San Diego, Santa Barbara, Walnut Grove (6ZX), Oakland, and also in practically all the nearby towns. This is really excellent work considering the fact that it requires sharp tuning to find that "melodious meter" and much better records are expected as soon as the concerts become generally known.



HAVE YOU SENT FOR YOUR PRIZE?

Mr. W. H. Kirwan of Davenport, Iowa, who so successfully conducted the Washington Birthday Relay, has informed us that several of the Pacific Coast winners of the contest have not as yet sent for their prizes. The following is a list of winners in the fifth, sixth and seventh districts:

Leander L. Hoyt and friends, Hayward, Cal.: Clpp Eastman ZRF Reg. Receiver.

Miss Winnie Dow, Tacoma, Wash., one baby carriage, or if she does not need it just yet, she can have the Navy Type Tuner, donated by Sears Roebuck & Co., of Chicago and Philadelphia.

M. S. Andelin, Richfield, Utah, gets the of Pasadena, Cal., received the same type of Chicago Radio Lab. Zenith Generator.

N. Hood, Casper, Wyo., gets the Grebe CR3A Regenerative receiver.

H. Berringer, Burlingame, Cal., gets the two-step Amplifier from Montgomery Ward Co., of Chicago and Kansas City. This will help him to get even better signals from the east.

F. Mahr, San Francisco, Cal., 1 0-1 HW Eldridge Meter; donated by J. Firth Co.

J. Martin, Amarillo, Texas, 1 0-1 HW Eldridge Meter; donated by J. Firth Co.

R. Willison, Portland, Ore., 1 No. 3 Condenser with dial; donated by Chelsea Radio Co., Chelsea, Mass.

Rev. Father Burns, Marshall, Texas, 1 pair Baldwin-Brownlee type phones.

M. Powell and D. Culbert, both of Warren, Arizona, received each a UV 200 bulb, donated by the Radio Corporation of America. R. Taggert and F. Weyerhauser, both tube, as well as R. Scott, of Douglas, Arizona.

(Continued on Page 62)

ROBERT GARCIA IS WORLD'S YOUNGEST LICENSED RADIO OPERATOR

ROBERT GARCIA, 7-year-old son of Allen Garcia, director for Charlie Chaplin, is the youngest licensed radio operator in the world. Official confirmation of his success in passing the amateur operator's examination with a percentage of 92 was recently received from Major J. F. Dillon, U. S. Radio Inspector at San Francisco.

Mr. Allen Garcia has released the following statement for publication in "Pacific Radio News":

From the time that his father took an interest in radio (November, 1920), Robert would read the catalogues and manufacturers' advertisements which most every aspirant to the realm of Radio is inevitably equipped with, he would ask father some then rather embarrassing questions regarding hookups and frequencies, oscillations, amplifications, and such many other things that poor father then could not answer, that made the latter sit up nights and study till early morning so as not to fall in the estimation of his son; for to his son, he, the now erstwhile 6BJ, was Mr. Allan Garcia-Hertz-Marconi-Bellini-Armstrong, et al, and everything that meant anything in the evolution and construction of radio. Along about that time father put away the crystal and loose coupler in favor of vacuum tubes. Robert took an interest in the discard, and while father was away would dissect the coils to see how they were made, and would try to hook them up in every manner conceivable, not even overlooking the electric iron or the vacuum cleaner, fuse blocks on the lighting circuit or the door bell. In fact, he left nothing undone, but he still had a lot to learn. Then he hit upon the idea that if father would let him listen on his set he would learn the code and be able to copy. So father turned the set over to him in the day time with the understanding that he learn the code first by heart in two days. Within 24 hours he accomplished that, and later would sit for hours till he heard someone sign at a speed that he could copy. He was a little sticker, remaining at the set for three or four hours at a stretch. Later, when father took out a license and was assigned a call, Robert's interest was increased 'till he had to be shown the workings of every part of the transmitting set and given a concise explanation of everything, including circuits. For several days the lad went around drawing circuits on the back of everything in the house, and, strange to say, once shown a circuit, no matter how complicated, he could reproduce it by memory, and has several of his original drawings now that can't be improved on for detail. Five weeks before Robert passed his examination he could not copy even at the rate of five words per minute, but he showed sufficient interest that he begged his father to let him take the test. Seeing that the boy rally meant business, he made up his mind to coach him and give him a chance. First he made him copy a buzzer, sending words of two or three letters, then increasing speed 'till the boy acquired a speed of twenty words per minute. Then words of greater length, and finally numerals and words were resorted to 'till he could copy 50 or 100 words in succession. In the meantime he would explain to the youngster the theory of both transmitting and receiving sets, using the technical terms and paralleling them with a kindergaten explanation so that the little mind could readily understand. That done, he gave the boy a copy of the regulations regarding the transmission of signals, etc., and laid out a certain amount to memorize so that he would understand the meaning and would be capable of writing it word for word whenever called upon to do it in the future. This he accomplished beyond the father's wildest expectations. Then came the big surprise. He had but five weeks in which to prepare for his examination. When he took the test everyone that saw him smiled and felt that he was there merely to please his father's vanity. Several lads, many years his senior, fell by the wayside, and several men tried in vain to pass the test. He just smiled all through the three solid hours of his examination and if anyone said anything to him he would answer with a broad smile and wink, as if to say "watch me fool them," and he, only a child of seven years, did what very few ever accomplished—PASSED WIT 92 PER CENT.

Since passing the examination two manufacturers have honored him with parts for the set he is going to install. He has filed an application for a station license and is going to put it up himself. He has declined an offer to install the set and begs his father to let him do it all alone.

NEW RADIO TELEPHONE SCHEDULES

RADIO TELEPHONE CONCERT AND NEWS SCHEDULES.

PACIFIC COAST RADIO STATIONS.

California Theatre (DeForest Radiophone) operated by Pacific Radio Supplies Company of San Francisco.

Concerts: Daily, except Sunday, 4 p. m. to 4:30 p. m. and 7:15 p. m. to 7:45 p. m., 9 p. m. to 9:45 p. m. Sunday concerts 11 a. m. to noon.

Press on CW: Daily, except Sunday, 7:45 p. m. to 8 p. m.

Wave length: Tune sharp on 1,250 meters. Power 1-2 K. W. Range 1000 miles.

Nature of Press: Coast League Baseball Scores, National and International News Items.

The Pacific Radio Supplies Company will offer the following prizes to those who report, with correctness, the results of the schedule as stated herewith:

PRIZES OFFERED: One A.P. tube for complete list of records played at any concert, heard over 200 miles, said list to be mailed within 24 hours after the close of the schedule.

TWO A. P. Tubes for same results over 500 miles.

THREE A. P. Tubes for same results over 800 miles.

All replies should be addressed to the Pacific Radio Supplies Company, 638 Mission St., San Francisco, Cal.

6XW—PRESIDIO OF SAN FRANCISCO

Concerts: Wednesday evening from 8 to 9 p. m. Sunday evening from 8 to 9:30 p. m.

Wave Length: 390 meters.

Operated by: Students of Signal Corps Radio School. Thirty minutes is devoted to the answering of radio queries on Sunday nights by Sgt. Tavers, in charge of the radio telephone station at the Presidio.

6XG—FAIRMONT HOTEL, SAN FRANCISCO

Concerts: Monday, Thursday and Saturday evenings from 7:45 to 9 p. m. In these concerts is included the usual press and baseball schedule, as well as weather reports and stock quotations. Afternoon concerts are held daily, except Sunday, from 4:30 to 5:30 p. m. Press, weather reports and stock quotations are also sent on the latter schedule.

Wave Length: 350 meters.

Operated by: Leo J. Meyberg Co., 428 Market St., San Francisco.

6XAE—RADIO TELEPHONE SHOP

Concerts: Tuesday and Friday evenings. 8 to 9 p. m.

Wave Length: 425 meters.

Operated by: Radio Telephone Shop, 175 Steuart St., San Francisco.

6XAC—COLIN B. KENNEDY CO.

Concerts: Monday and Thursday evenings, 8 to 9 p. m.

Wave Length: 430 meters.

Location: Los Altos, Cal. (about 40 miles south of San Francisco).

Operated by: Colin B. Kennedy Co., Rialto Bldg., San Francisco.

6XD—WESTERN RADIO ELECTRIC CO. LOS ANGELES, CAL.

Concerts: Tuesday and Friday evenings, 8 to 9 p. m.

Wave Length: 325 meters.

Location: Los Angeles, Cal.

RADIO DEALERS AND MANUFACTURERS OF SAN FRANCISCO TO ORGANIZE

A meeting of the radio dealers and manufacturers of San Francisco and the bay cities was held at the Engineers' Club on August 19th. A stag dinner, lectures by well known local radio men and many vitally important discussions were the features of the evening. Further details of the organization and its purposes will appear in the next issue of this magazine.

NORTHWEST RADIO MANUFACTURING COMPANY ISSUES CATALOG

A well illustrated catalog, printed on an excellent grade of paper, and describing in detail the apparatus manufactured by the Northwestern Radio Manufacturing Company, of Portland, Oregon, has recently been brought to our attention.

The catalog contains bulletins Nos. 1 to 8 that deal with the various products of the northern concern.

REPAIR OF VACUUM TUBES ORDERED DISCONTINUED

RADIO CORPORATION LOGICALLY ANSWERS IMPORTANT QUERY

FOREWORD

(It affords us a great deal of satisfaction to reproduce verbatim a copy of a letter that Mr. Ira J. Adams—of The Radio Corporation of America—was so polite as to write me, in answer to my query—that is also reproduced herewith.

The reason for the prominent publication of these communications is that both the editor and I overload our waste paper baskets daily—queries all of: "Where may vacuum tubes be repaired?" And: "If they may not be repaired, WHY not?" And so forth—ad infinitum!

A politely explicit letter from the Eastern Vacuum Tube Laboratles,—whose advertisement to do repair work on tubes was carried in our pages in a previous number—has reached me to the effect that their efforts along these lines had been put a stop to, said efforts being considered an infringement of patent rights—Q. E. D. by the communication from Mr. Adams!

The entire position is now made clear, we think, and I should like to thank our correspondent for the conciseness of his missive.

Mr. Adams is, I believe, the Legal Luminary of The Radio Corporation, and hence preeminently in a position to set these matters right!)

MR. MOTT'S LETTER TO MR. BUCHER

TWIN SUNSHINE
Avalon, Catalina Island
California

June 26th, '21.

Very Kind Friend Bucher:

It has been suggested to me—NOT by my editor, however!—that I take up the matter in PRN of the repairing of vacuum tubes.

In order to see how affairs stood I sent three of your UV202's to the firm whose letter I enclose, and would ask you to be so good as to return.

The pertinent question that is uppermost in my mind is: HOW can a Company or Corporation order the discontinuance of REPAIRS to their manufactures—when said repairs involve no re-selling under another title, or in any way threaten the original patent?

To the man-in-the-street the conditions—as stated in Hardy's letter—savor muchly of a gentle spirit of "hold up" on the part of the Controlling Manufacturers—in which it would appear that they say: "NO! Our tubes may not be repaired! NEW ones must be procured from us!"

Kindly assimilate the fact that I am NOT criticising—nor would I venture so far as to suggest the way in which the GE and the Radio Corp should carry on their business—BUT do you not think that were tubes' repair possible—even, shall we say, that the GE company perform such repairs on their own tubes, at a just cost—that the sale would be enhanced, and for the reason that so many amateurs are afraid of going into CW—as matters now stand—their fear consisting in the fact that tubes may not be repaired, and the average amateur pocketbook cannot stand the drain of repurchases, ad libitum! In other words: were the GE to repair their tubes, the original sales would—far from being diminished—be enhanced, as a vast number of amateurs, feeling secure in their ability to have repairs made, would enter the CW field at once!!

I am willing to wager—tho' not a "Gambiin' Ma-an"—that such a scheme would be effective in BOOSTING sales!

Let me put it in another way: Supposing that the Wisconsin Motor people—three of whose powerful engines I use in slow and fast craft—should say: "Very sorry, Mr. M., but you may not go to a shipyard or machine shop to have our engines repaired! You must buy a new one!" The case is directly similar to that of the tubes, as the GE is—to all intents and purposes—the only firm on the market, and controls all patents in sight!!

Hence, ere I dash blithely into print with an article that might produce an entirely erroneous impression—and which, under NO circumstances would I do!—would YOU, my friend, be so charitable as to sit ye doon and let me have the Official Viewpoint—from Ye Powers that Be in the Radio Corp? I—thank—you!!

Hope that you liked the way the article looked in PRN? Questions pour in! I refer 'em all to One EEB!!!

Cheerily and gratefully yours,
(Signed) LAWRENCE MOTT.

THE RADIO CORP. ANSWERS AS FOLLOWS:

RADIO CORPORATION OF AMERICA
233 Broadway,
New York.

July 11, 1921.

Mr. Lawrence Mott,
Twin Sunshine,
Avalon, Catalina Island,
California.

Dear Sir:

I have your letter of June 26th addressed to Mr. Bucher.

You commence with an erroneous assumption. Under our patent laws a company cannot, and, so far as I know, none attempt to, "order the discontinuance of repairs" when such do not "in any way threaten the original patent."

The reason you can repair your Wisconsin engine, to which you refer, is because you do not "threaten" the patents on the same. You add new bearings, piston rings, gaskets, etc., that are not part of the patent combination on the engine.

Now, in respect to vacuum tubes, the renewal of filaments certainly does "threaten" our patents. The patents to Fleming and DeForest, without mentioning many other patents that we control, claim the filaments as one of the elements of the tubes. The filament is part of the patented combination. Furthermore, the Tungsten filament itself is covered by many patents. The methods of sealing the filaments are patented. Furthermore, to renew the filaments is not a "repair." It is a RECONSTRUCTION under our patent laws, and it is not permissable. The decisions on this point are so in accord that there is no doubt at all in regard to the legal situation.

Laymen are not impressed by the expounding of patent law, so let us examine this matter from a common sense viewpoint. We have spent an enormous amount of money to develop and acquire rights under inventions and will continue to do so. In return we get 17 years' lawful monopoly under our patents on our discoveries and inventions. Often, as was the case with vacuum tubes, a substantial part of the life of the patent expires before there is any market for the patented thing. Therefore, we should not be begrudged the benefits to which we are lawfully entitled.

If we were to refrain from prosecuting infringements due to so-called "repairs," our patents on vacuum tubes would be practically valueless to us. After a few years of supplying the demand there would be enough tubes on the market to take care of the major portion of the needs, and the so-called "repair men" would reconstruct these tubes then on the market and leave us the minor part of the business of supplying new tubes. We could not compete with a little "fly-by-night" "repair man" in renewing the filaments. He would be entirely free of the patent and development expense and his overhead would be a trifle. These "repair men" would not spend any money for research and development and we would not if the profits were to go to them.

Our patent laws benefit the public. They exist for this reason. If the laws were to be made so we could not stop the so-called "repair" of tubes the public might obtain cheaper tubes for a while, but they would not get the super-vacuum tube that is surely coming in the future, if we are given just protection under the present patent laws to assure a reasonable return for the immense amount of money that we are spending and will spend for future development.

You may be correct in your statement that the public and the Radio Corporation would benefit by our renewing the filaments in our tubes. On the other hand there might not be any such benefit. I am inclined to think there would not, or such program would already be under way. However, I am not familiar with manufacturing conditions and I will refer this to the proper department for consideration.

I am glad of this opportunity to give you our viewpoint as the course we are taking is entirely justified under patent laws, and, I believe, also by sound reasoning, and if I have been able to convince you I will have rendered a service to the public. If I have not convinced you I will be glad to discuss the matter further.

Very truly yours,
(Signed) IRA J. ADAMS.

THE MAGNETIC AMPLIFIER

A Treatise on its Theory, Design, and Construction

By Jennings B. Dow

Published by Permission of the Secretary of Navy

PART V.

THE KEYPORT EXPERIMENTS

THRU the courtesy of Commander H. G. Shonerd, U. S. N., District Radio Material Officer, Thirteenth Naval District, and Lieutenant Commander Frank Luckel, U. S. N., District Communication Superintendent, Thirteenth Naval District, the United States Naval Radio Station at Keyport, Washington, was made available for experimental work by the author on May 24, 25 and 26, 1920. Only a 30 K. W. arc was available at the time, for the 60 K. W. arc had not as yet been installed. This limited the tests to the control of but half of the designed power, and the results were affected accordingly. However, as the reader will find, very encouraging results were obtained and the adaptability of the iron relay to the control of the output of a high-power arc was proved beyond a doubt.

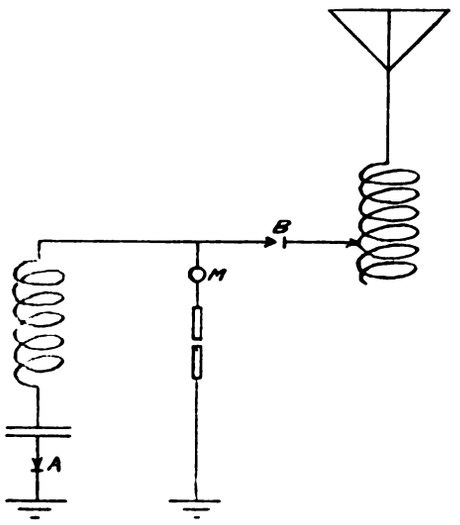


Fig. 15 shows the circuit in use at Keyport.

"A" is a key in the ground lead of the dummy antenna circuit. This key is normally closed.

"B" is a key in the lead from the positive electrode to the loading inductrance. This key is normally open. "B" breaks in running water and "A" in oil.

The amplifier was first inserted in the circuit at "n" with eight turns in the radio-frequency winding. "B" was held closed and "A" open, and it was found impossible to start the arc, regardless of the saturation of the iron. The current thru the control winding was limited to 1.3 ampere by the applied voltage of 60, which was obtained from storage batteries. It was deemed unadvisable to use the 110 volts D. C. supply from the station's power plant in these experiments because of a possible danger from unforeseen inductive effects in the amplifier.

The radio-frequency winding of the amplifier was next tapped off so as to include only one turn in the arc circuit. The arc could be maintained without difficulty. Following data was obtained:

Control Current	Antenna Current
0	33
1.3	44

Two turns of the radio-frequency winding were next used. Following data was obtained:

Control Current	Antenna Current
0	33
1.3	47

With three turns of radio-frequency winding in use, the following data was obtained:

Control Current	Antenna Current
0	31
1.3	52

At this point the choking effect of the iron was plainly evident, for some difficulty was experienced in maintaining the arc. Unaccounted for changes in the period of oscillation of the circuit were caused by this device. With only one turn of inductance in use, the wave length was changed from 5400 meters to 5660 meters and with either one, two or three turns in use a powerful harmonic existed on 5400 meters. This harmonic was apparently unaffected by the inductance of the device.

THE END.

THE ANSWER TO THE BALLOON MYSTERY

"Brownie, the Balloon Man"

IF Mr. H. C. Brown (6CH) will be so good as to call on the editor of this magazine, he will be only too glad to show him the many letters that have been received of late in answer to the big balloon mystery and station 6CH. However, it will not be possible to print the answers received, with but a few exceptions, as most of the answers deal at length with "hot air," "wind," "smoke," etc., etc.

Fellow readers of the PRN, we are ashamed of you for sending us such answers to a really sensible question. Why should "Brownie" and the balloon both be full of "hot air" or "wind"?

After all the time and money that we have spent on this contest we feel that both "Brownie" and ye editor have received a raw deal. We would gladly distribute the five one-dollar bills among the five most sensible answers received to the big question, but we can't do this because the answers are all incorrect. Some of our readers compared 6CH and the balloon to the extent that "they both rise to the ether," "both work in the air," "travel through space forever," "both fly high," and oodles of other modest quotations.

(Continued on Page 76)

CORRESPONDENCE FROM OUR READERS

San Francisco, Cal., August 3rd, 1921.
Editor of "Pacific Radio News,"
151 Minna Street,
San Francisco, Calif.
My Dear Editor:

A long time ago, when PRN was a mere baby, I received a copy of the FIRST NUMBER, which asked me to subscribe for a year and help the Pacific Coast to have a magazine devoted to the highest ideals of Radio Amateurs. I read the number from cover to cover and immediately sent in my subscription and a letter congratulating the management for their venture into such a needed periodical, and all through the three years of its publication you have stood for the same standard of "THE BEST IN RADIO" for the "BEST IN RADIO," and permit me to say that it is my belief that PRN has helped to do more for the Pacific Amateur than all the other magazines combined, because it is OF US AND FOR US. Because of this I am going to infringe a little while on your good nature and ask you to help solve a timely nuisance.

We are in the age of Radio telephones now and with such excellent stations as the Fairmont, Presidio, California Theater, and numerous others giving concerts every evening between 8 and 9:30 why is it that a few inconsiderate amateurs insist on making life miserable for those of us who enjoy a few moments of the concerts so ably rendered? It does seem to me that 6—— could wait until after 9:30 to ask 9PDQ if his spark was O.K. and augment the agony by calling for a straight 15 minutes and signing off about 99 times, as though we didn't know who the nut was that was causing the disturbance. There is nothing I so fervently despise as a chronic complainer, but this is my night to crab and I am not alone, either, when I crab about the way some fellows of the cigar box variety are butting in on the concerts. These boys who are kind enough to give their time for the few minutes of pleasure they afford for the thousands of listeners should be appreciated and encouraged to the small extent of at least being afforded the freedom of the ether without having our loud speakers knocked off the shelf by some bush-whacking half Kw, who is so selfish as to believe that he is the only one to be considered. I do not believe it is the fellows who are doing the best work that cause the trouble, but, at any rate, something should be done for the good of all in this one respect. I am aware of the fact that there is no law to curb this growing evil, but certainly a fellow who has intelligence enough to delve into radio ought to have decency enough to "pipe down" and respect the right of the majority of us, who enjoy the fruits of our labor. ALL WE ASK IS TO GIVE US A CHANCE.

With best wishes to yourself and PRN,
Very sincerely,
(Signed) H. C. MACQUARRIE.)

ERRATA

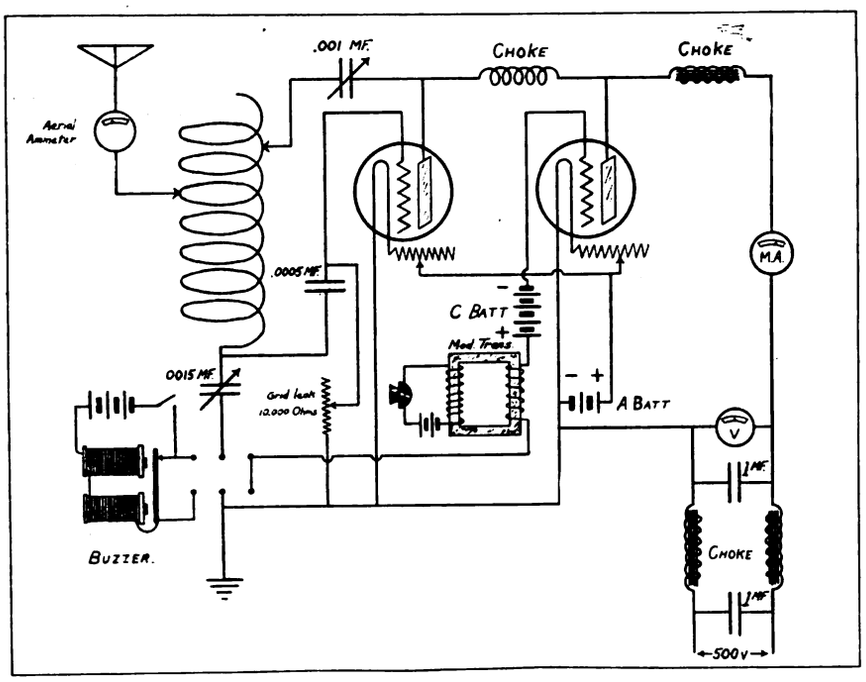
On Page 34 of the August issue there appeared an article entitled **"New Apparatus Developed."** This article should have been run under the head of Northwest Briefs in the Squawk McGuff column, for which it was originally intended.

THE PROGRESSIVE C. W. CLUB OF CALIFORNIA

CONDUCTED BY LAWRENCE MOTT, ASSOCIATE EDITOR

Wiring Diagram of the Fairmont (6XG) Radio Telephone

Herewith is the wiring diagram of the Fairmont Radio Telephone Station in San Francisco. This phone set has just been reported heard 1600 miles west of San Francisco by the radio operator on the S. S. "West Hixon." The various condenser capacities are clearly shown on the diagram. The inductance values and sizes of meters necessary to duplicate the 6XG transmitter were given in our July number.



REVISED C. W. SCHEDULE

Time (P. M.)	Station	Wave length	Name and Address.
9:00	6XAD	240 & 375	L. Mott, Avalon, Cal.
9:05	6PI	200	B. McGlashan, 2333 W. 21st St., Los Angeles.
9:10	6EN	200	H. Duvall, 4965 Wadsworth, Los Angeles.
9:15	6WU	200	C. Richardson, Los Angeles.
9:20	6JE	200	C. E. Blalack, Los Angeles.
9:25	6MK	200	L. B. Benjamin, Los Angeles.
9:30	6ALE	200	W. W. Lindsay, Los Angeles.
9:35	6KA	200	F. E. Nikirk, Los Angeles.
9:40	6HU	200	H. G. Beck, Wilmington, Cal.
9:45	6ADU	200	R. P. McKenzie, Los Angeles, Cal.
9:50	6EF	200	C. G. Widing, Los Angeles, Cal.
9:55	6IT	200	C. E. Rich, Glendale, Cal.
10:00	6CU	200	C. F. Filstead, Los Angeles, Cal.
10:05	6XN	375	A. A. Kluge, Los Angeles, Cal.
10:10	6XD	375	Western Radio, Los Angeles, Cal.
10:15	6AQA	200	G. S. Tichenor, Los Angeles, Cal.
10:20	6KP	200	O. S. Garretson, Eagle Rock City, Cal.
10:25	6BA	200	H. Newman, Wesrad, Los Angeles.
10:30	6HK	200	F. Croswell Jr., Los Angeles, Cal.
10:35	6ZE	375	D. B. McGown, San Francisco.
10:40	7XF	375	Northwestern Radio Mfg. Co., Portland, Ore.
10:45	6ZAD	375	J. J. Mahler, Napa, Cal.
10:50	6ZX	375	J. V. Wise, Fresno, Cal.
10:55	5ZA	375	Louis Falconi, Roswell, New Mexico.
11:00	6KH	200	C. Maass, San Francisco.

IMPORTANT ANNOUNCEMENT

The above schedule will only remain in effect for a limited time. The large number of new applications received for the C.W. Club makes it necessary for Mr. Mott to split up the working nights of C.W. stations in order that the last calling schedule will be no later than 11 p. m. Under the provisions of the new schedule each station will be allotted a ten-minute period for calling and testing every other night instead of a five-minute period every night, as is the present custom. The new schedule will be mailed to all members at an early date, stating the date on which it will become effective.

THE RADIO TELEPHONE REPORTER

AN EASTERN radio corporation recently performed one of the most unique and spectacular news services of modern times. Located at the Delaware and Lackawanna Railroad terminal, Hoboken, N. J., was a powerful radio telephone transmitter and receiver utilizing the big steel tower formerly employed at this station in wireless train dispatching. From this central point was broadcasted every important incident round by round of the big Dempsey-Carpentier fight.

More than 300,000 ear witnesses heard the fateful knockout count while located many miles away. In fact, listening-in stations all over the country caught the words and in turn relayed the news farther on to more remote points, so that the event was heard throughout the United States from the Atlantic to the Pacific coast in the same unique manner. In addition to the amateurs, hundreds of vessels, near and far from New York harbor, had also "tuned in," and passengers and crew alike heard not meaningless telegraphic signals, but the actual voice of the radiophone reporter announcing in the same manner as an eye witness would the essential features of what was going on in the arena.

This scientific feat, which marks a new era for radio telephony, was made possible by the combined efforts of the General Electric Company and the Radio Corporation of America. The first organization, by furnishing the necessary apparatus, and the second by installing and placing the set in operation and performing the multitude of details which this feat involved to make it a success.

The feat was primarily devised to help the Committee for Devastated France as well as our own Navy League. Wireless amateurs within a radius of 200 miles were asked to help by offering their services in erecting suitable receiving equipment at local theaters, halls, sporting clubs, auditoriums, Elk, Masonic and K. C. clubhouses and

(Continued on Page 68)

WITH THE RADIO INSPECTOR

This department is conducted by the Radio Inspector of the Sixth District. Questions are answered free of charge. Your name will not be published. Initial your letters only.

Send Your Questions to: Radio Inspector's Dept. "Pacific Radio News"

DEPARTMENT OF COMMERCE
Navigation Service
Office of Radio Inspector
Custom House
San Francisco, Cal.
August 1, 1921

The Editor
Pacific Radio News,
San Francisco, Cal.
Dear Sir:

One of the first circular letters issued by me to the amateurs of the 8th Radio District, in 1913, contained the following admonition: "Remember that the law limits your wave length to 200 meters.

"Always listen in carefully, with your receiver well adjusted, before using your transmitter.

"Do not send if it seems probable that your transmission will interfere with the correspondence being conducted by other operators.

"Cease sending immediately when requested to do so by Commercial, Government or other stations having important business to transact.

"Never use your transmitter during the period allotted for transmitting time and weather reports by broadcasting stations. This data is regarded as essential for the public at large and careless interference with the reception of the same will jeopardise the continuance of your license, whether commercial or amateur.

"Endeavor to exercise the same degree of courtesy in the conduct of your radio correspondence that you would use in your personal intercourse with your friends and associates. An observance of this rule will materially aid both you and they in obtaining the optimum results from the operation of your stations."

Experience through the intervening years seems to have demonstrated the wisdom of that advice, hence those who have the true interest in the welfare of amateur radio at heart, will do well to adhere to the same strictly.

Of the faults common to the average amateur operator's, two are the most grievable —the use of unnecessary power and the use of superfluous and senseless chatter through the ether circuit. It is quite usual in listening in during the evening to hear your friend across the street, using full power, sending: "How is my spark?—How do you get me now? and again—I have just chased a fly off my condenser, does it make any difference in my tone? Nuf Sed."

The inspection service of the California district is proud of the amateur organizations in its territory, and particularly of the San Francisco Radio Club, Inc., the Bay Counties Club and the Southern California Radio Association, which is a potent factor in the co-ordination of amateur radio affairs within its sphere of influence and in the enforcement of the radio laws and regulations, in so far as they apply to the government of amateur operation. The spirit of co-operation and progressiveness manifested by the members of these clubs may serve well as an example for other kindred organizations. The members of the Sunset Radio Club have also perfected an excellent organization which, while smaller than some of the others, is equally efficient.

All applicants for amateur radio licenses are advised to join their local radio club, and once admitted to take an active interest in its affairs. The tendency is to "Let George do it," and to that spirit is due the failure of many new organizations, which actually contain splendid material for a high grade club.

(Signed) J. F. DILLON,
U. S. Radio Inspector.

Questions Answered BY THE Radio Inspector

Mr. R. M., Berkeley, Cal., writes: "I have moved my station from Los Gatos to Berkeley, Cal., and would like to know if the Radio Inspector of this district should be notified of the change."

Ans.: Yes. It is absolutely unlawful to operate unless the station license is returned, and the address changed thereon.

Q.—Is it against the law to transmit while a radio concert is in progress, or is this only a "friendly agreement" among all concerned? What bearing has this on concerts sent from Government stations? D. F., S. F., Cal.

Ans.: Yes, if any interference is caused. Refers to all stations.

Q.—Under what conditions can I have my call letters changed? At present I have a three-letter call. Can I have it changed to a shorter call of two letters? S. J., Berkeley, Cal.

Ans.: No two-letter calls available, and it will be impossible to make such a change.

Q.—Does the Radio Inspector tune amateur stations the same as he tunes ship stations and can I operate my station lawfully by making a rough guess at my wave length, comparing it with waves used by amateurs in my district? L. C., Fruitvale, Cal.

Ans.: No. It is up to the individual owner to tune the station himself, and he will be responsible for the same. It is not a function of the Radio Inspector's office to tune stations. The wave length adjustments are only checked, in order to ascertain their correctness and compliance with the law.

A certain local station "hogs" the air considerably, and is on the job practically all the time. He makes a considerable disturbance on account of the excessive power he uses, and generally makes it almost impossible for other local stations to work when he is on. Have the other stations any right to complain? KT. SF, Calif.

Ans.: Yes. It is the purpose of the Department to allow all stations the same privileges, and this station is clearly in the wrong, first for using excessive power, and second for causing unnecessary interference. The offender's licenses may be suspended or cancelled, if authentic information, including dates, and time, is sent to the Inspector's office, and if it is found that the accused station is at fault.

Q.—Are amateur license examinations held daily in San Francisco? B., S. F., Cal.

Ans.: Amateur license examinations are held at 9 a. m. sharp, on Mondays, Wednesdays and Fridays only. Commercial examinations are held on Tuesdays and Thursdays at the same time. These are all held at 215 Custom House, in San Francisco, Calif.

Q.—Will my service with the U. S. Coast Guard entitled me to the 20 per cent credit in a commercial examination? C. P., Seattle, Wash.

Ans.: Provided you have had three months' service, or more, actually operating radio apparatus, you will be entitled to 20 per cent experience credit. This must be supported by letters, discharge papers, or other evidence of service.

Q.—Are radio traffic officers or "air policemen" officially recognized by the Department of Commerce or only by radio clubs who appoint them? Must they be commercially licensed? F. P., Pasadena, Cal.

Ans.: They need not be comercially licensed. The appointment is solely up to the individual club appointing them; however, as they are assisting in the enforcement of the radio laws, and aiding in the elimination of unnecessary interference, they are thus recognized by the Department of Commerce, over other stations.

Q.—I reside at Santa Barbara. To whom do I apply for a license in this vicinity? E. R.

Ans.: Apply to Radio Inspector, 215 Custom House, San Francisco, Calif., and the necessary forms will be sent you.

Q.—The law says that only one-half KW shall be used when a station is within five miles of a Government station. Will it be permissible to use two 250-watt tubes, equal to a half KW, in a CW set, or will this be unlawful, due to the fact that CW carries so much further than a spark? C. A., Oakland, Cal.

Ans.: The law states: "One half kilowatt **transformer input,**" therefore, as it would require considerable in excess of 500 watts input (on the plates on the tubes) it would be unlawful.

Q.—Are there any vacancies as radio clerk (male) in the Radio Service of the Department of Commerce? When are examinations held and where? T. S., San Francisco.

Ans.: Apply to Civil Service Secretary, Postoffice, San Francisco, who can give all details of the examinations.

CHANGE OF STATION ADDRESS

6AFX has moved his station from 32 Walnut Ave., Los Gatos, Cal., to 1820 Carleton Street, Berkeley, Cal.

A STILLY MYSTERY

BY VOLNEY G. MATHISON
Author of the Samuel Jones Series

WHEN I escaped by the skin of my teeth from the gang of yellin', ravin' six-shooter artists at Unga I thought I was through with Alaska forever. But here I was mistaken. The ornery crowd on the cutter that rescued me dumped me ashore at Kodiak; and there I would've stayed an' starved to death if it hadn't been for Iceberg Olsen, the local agent for the Alaska Codfish Company.

"Ay tank you better go back to Unga," advises Iceberg, when I'd told him how the gun-fightin' codfish snailers shot up the wireless shack an' chased me to sea in a dory in the middle of the night.

"Them didn't mean no harm; them was yust tryin' to initialate you. Ven them is finished you are vun of der boonch."

"Yes, one of the bunch up in the cemetery, you mean," I answers.

"Veil, look at Hell-Fire, th' vireless feller vat built das Unga an' Pirate Cove stations—he bane in Alaska five year, an' he swvears now he can't live novheres else."

"Yes, but he's a lunatic," I objects.

"Das all right—ven you ha' bane hyar five year you'll be th' same vay," argues Iceberg.

So at last I gives in, and Iceberg takes me back to the westward in a company gasboat. With the help of the Brainless Swede, the company's Unga agent, he patches up a peace treaty between me an' the Mexican who'd tried to carve me up because his wife smiled at me; an' then I goes to work pluggin' up the bullet-holes in the walls of the little wireless shack, which hangs by its teeth on a granite ledge half way down the face of a rocky bluff overlookin' the bay. By the time I'd plugged the forty-first an' final hole, the boomin' of the breakers down among the rocks an' the salt spray flyin' up over the shack had got me to feelin' quite at home again. Besides, I had a good many visitors congratulatin' me on my return an' bringin' messages to go out; for with the exception of a mail-boat two or three times a year, K-V-I is the only link between Unga island and the outside world.

That evenin' I cranks up my old one-lung gasoline mill to shoot my string to N-P-R, but when I shoves on the key she fails to spark. Lookin' over the old junk-pile transmitter out in the power room, I couldn't see nothin' wrong, at first—an' then I makes an amazin' discovery. The big copper spiral primary of the oscillation transformer mounted on the front of the panel had disappeared! I rubs my eyes an' looks again, but there was no gettin' around it—the thing was gone.

Next day I does some inquirin' around town, but, failin' to dig up any traces of the strayed helix, I finally decides to make a trip over to K-O-X-N an' see if Hell-Fire could give me something to make a new one with. Borrowin' a power dory, I makes the twenty-mile trip up the Straits of Nagai and around Popoff Island to Pirate Cove. Makin' my boat fast alongside the codfish wharf, I breezes up to the station, which consists of two buildings—an engine house an' a operatin' shack.

As I comes up, I observe a big flywheel an' a sooty cylinder-head lyin' out in front of the engine house; an' from the open door is emenatin' a blaze of cuss-words that would burn the aluminum paint off'n a steam radiator. Lookin' inside, cautious-like, I sees sledge hammers an' cogwheels an' piston rods scattered all over the place; an' lyin' on his back under the remains of the engine, with his legs wrapped around the other flywheel is Hell-Fire tellin' the world what he thought about diesel engines an' the scoundrel that invented 'em. His face was all smeared up with grease an' graphite, an' he was clutchin' a big monkey-wrench in one fist an' a bottle of hooch in the other.

Seein' me, he crawls out from under the wreck an' gets up.

"Nice day," he says, spittin' out a mouthful of soot an' kerosene an' takin' a swig on the bottle, "Have a drink."

"No, thanks," I replies, observin' the embellishment of grease an' grime remainin' on the bottle neck; "I'm lookin' for somethin' to make a helix out of—somebody's stole the primary of my oscillation transformer."

"Why, I took that!" says Hell-Fire, frownin'. "Th' way ya left that night, I didn't think you'd ever come back. I took the spiral tubin' to make a new still out of—my old one's plumb worn out."

"Still!" I exclaims.

"Do I look like a white-robed angel of prohibition?" growls Hell-Fire, wipin' his face on a old grimy engine rag. "C'me an' have a peek at her—it's time to give her a new charge of brew, anyway."

He leads me down the beach to a little boulders an' cracked lava rocks. Followin' boulders an' cvracked lava rocks. Followin' him inside, I sees my copper helix in a salmon barrel full of cold water, the upper end soldered into a five-gallon coal oil can sittin' on a camp stove, an' the other end protrudin' out through the side of the barrel an' curvin' gracefully down into a demijohn. She had steam up an' seemed to be goin' full blast.

"I'll give ya some solid bar to make a new primary with," says Hell-Fire, shiftin' the full demijohn from the copper tube an' settin' up a empty one. "It ain't no use fer you to take the tubin' back—somebody else'll swipe it again fer th' same thing. Wireless sets made fer Alaska all ought'a have solid copper helices."

"An' a conspicuous sign on 'em so statin," I adds. "But, say, while I think of it, I'm goin' to put you next to somethin'. When the cutter dumped me off at Kodiak there was some queer guys aboard, an' I heard 'em talkin' about plans bein' under way to clean out all the hooch-makers around the Alaska peninsula with a fine-tooth comb shortly. Better look out with this rig."

"Humph! They been tryin' to spot the dynamite fact'ries 'round these islands fer three years, without findin' enough hooch to intoxicate a grasshopper," sniffs Hell-Fire. "Anyway, I got a contract to deliver sixty gallons of triple-strength white lightnin' to Unga fer th' Fourth a July—an' in Alaska ya hafta keep yer word or git shot."

We return to the engine house, an' Hell-Fire digs up a couple lengths of soft copper bar. Then he picks up his wrench an' his hooch an' crawls back under his engine; an' I gets into my dory an' sets out on the return trip down the Straits.

Two hours later, as I was doublin' Cross Island, where the village of Unga comes to view, nestlin' at the foot of a high, snow-ridged mountain, I espies a low gray top-mast schooner beatin' swiftly out of the bay. She looks like a fur pirate or a seal poacher, but when I makes the landin' at Unga I finds out different.

"It was the mail schooner," says old Dopey Driffield, combination judge, postmaster, an' everythin' else, who was buzzin' excited like around a pile of packages an' mail sacks. " And,say by Jove, you ought'a seen the female passenger what come ashore off here—a dream, a livin' angel in petticoats!"

"No angel never come off'n that piratical-lookin' fore-an'-after," I tells him. "An' you ain't competent to judge an angel anyway—every codfish snailer in the Shumagin Islands knows you're nuts over everythin' that walks with a skirt on it, black or white."

"Wait till ya see her," returns Dopey, lookin' offended. "She's a young authorette makin' a trip to collect up story-writin' materials. She's gone up to arrange fer lodgin's with Hog-Tooth Wilson's widow. She's a bird—a reg'lar little dove. Why, 'longside her physic, or whatever ya call it, th' best lookin' female in this village's got a shape like a dead codfish!"

"Well, that's what they have, anyway," I retorts. Leavin' Dopey to his mail bags an' several suitcases, which he says belongs to the girl, I starts up to my shack. On the way I notices a tall, nosey-lookin' guy with a grip goin' into Soapy Komedal's Bedbug Barracks—the town's only hangout for strangers.

"Who is that guy?" I inquires of Hammar the Head-Cracker, who was standin' alongside the company cook house, with a uneasy look on his face, watchin' the stranger.

"Nobody knows," he answers, fingerin' his Krupp junior uncertain-like. "Tin-Pan Smith asked him, but he told Tin-Pan it wa'nt none of his damn business. I feel like takin' a shot at him on general principles."

"Better wait," I advises him. "I heard Cyanide Simpson say he was expectin' a guy from Treadwell to look over a new quartz vein in his old mine up the bay. Maybe it's him."

The followin' evenin' I had a new helix all made an' was just paintin' a sign on a chunk of cardboard, "Solid Copper; Don't Take," to hang on it, when I espies Dopey's angel strollin' on the hill up above the wireless shack.

Now everybody knows that every time I fool with a female I get roped. The last time it was a pretty baby in a Frisco cafeteria, who jipped me out of four thousand bones I'd worked hard for smugglin' pearls, an' then runs off an' marries a gob. But this girl keeps stickin' around on the hill, an' pretty soon I gets to thinkin' maybe she's lonesome. It bothers my conscience so much that at last I goes an' brings her down to the shack—and she was pretty.

She looked young an' slim an' a triffle tired; her hair was brown an' she had eyes to match, soft, warm brown eyes that looked lonesome an' cuddly, like they wanted to make friends but were a little bit afraid. She certainly looked out of place in such a wild an' woolly layout; an' I tells her so.

"I'm on the way to some friends at Dutch Harbor," she answers. "I really never dreamed of stopping here, but there was a big tall gentleman on the schooner who told me so much about the moonshiners and sourdoughs that live among the Shumagin Islands that I just had to stop. Why, I'd just give the world to see a real honest-to-goodness Alaska moonshiner and his hiding place."

"Guess I'll have to take you over to visit Hell-Fire," I laughs, and then I tells her about the Pirate Cove brass-pounder and his joint down in the rocks.

"I'd just love to see him!" she exclaims, plumb delighted. "If you really will take me over there some time, I—I don't know how I ever could thank you!"

"I'll take you," I promises her. She stays an' watches me clear N-P-R, an' then I takes her home. It was about 10 o'clock when I leaves her with Hog-Tooth Wilson's widow an' stumbles back through the pitchy darkness out to my shack to grab off the arc press that loops the loop every night from Frisco to Tokio. I reaches the shack an' a bunch of choice file stuff goin' from N-P-M to N-P-O. After press, I stays on, listening in. On a real Alaska night signals come in strong at Unga on a single bulb that would come weak in the States on a two-step amplifier—an' this was a real Alaska night, clear and cold, and not a trickle of static. The grasshopper jabber of J-J-C and the heavy fist of N-S-S, the synchronous note of Mexico City and the flute of Nauen—all the high powers of the world were coming soft an' clear on their tunes—and then there was a scratch an' a click and the signals were gone!

The bulb was still burning, the secondary circuit was still oscillating; I feels all the con nections, and nothing was wrong. From eighteen thousand meters I runs the scale down to two thousand; then jumps over to short-wave sparks an' goes on down to six hundred—and not a chirp. The air was dead! Half an hour later I was still there with the cans on, sittin' like a petrified mummy, when click! back comes the signals, soft an' clear as ever.

Next morning I goes up the hill to examine the aerial for a swingin' ground—but there was no possible chance. There wasn't a stay within ten feet of aerial or lead.

Still puzzlin' over the mystery, I makes ready to take Alice Loring for a trip over to Pirate Cove; but just as we were startin' who comes shootin' into the bay in his dory but Hell-Fire himself. His draggled fur cap was hangin' on one side of his head, his corduroys an' mackinaw were full of mud, an 'on his grimy face was the glare of a scalp-huntin' savage.

"Revenue cutter raided me two o'clock this mornin'!" he whoops, as he makes the fish wharf. "They landed in their boats an' come straight to the dynamite works an' smashed up everythin'—somebody tipped me off! I was down in the shed gettin' out the Fourth of July order—just got away by the wink of a eyelash!" He starts to spit out a battalion of cuss words, but notices the girl alongside me an' chokes 'em off.

I introduces him to Alice, an' then the Head Cracker comes down on the wharf with a face on him like a funeral an' calls me aside.

"There's a horrible mystery goin' on 'round here," he says, nervous-like. "Late last night I seen somethin' snoopin' down to th' beach round th' back way behind Hold-Up Harry's shack—a black figger with a black bundle or somethin'. I sung out at it, but there wa'nt no answer, an' before I could shoot th' thing dis'peared. I looked fer tracks this mornin', but th' ground's froze too hard."

"I had a phony experience last night myself," I starts to answer, but the Head-Cracker cuts me off.

"Wait, I didn't tell you it all yet," he says, peevish-like. "That stranger's gone—clean vanished. Should'a shot him yesterday while I had a chance. An' 'nother thing's dis'peared, too—th' cook house ladder. Greasy Bill couldn't get on th' roof this mornin' t' clean th' chimbley, an' we didn't git no breakfast yet—dammit anyway."

"It's blasted mysterious," I agrees. "I don't make head or tail of it—only I've got a feelin' that that tall stranger tipped the cutter some way about Hell-Fire's joint."

"No, you're wrong!" flares up Hell-Fire, who'd come up with the wide-eyed Alice to listen. "I know who done it, all right; it was Yeast-Cake Johnson's gang over on the mainland. Ol' Yeast-Cake warned me he was goin' to fix me if I didn't lay off cuttin' into his Unga trade—an' he's done it."

"That's a dirty outrage!" busts out the Head-Cracker, forgettin' all about the night's mysteries. "We'll get th' gang together an' go'n shoot Yeast-Cake's outfit off'n th' map—underhanded business dealin's like that don't go 'round these islands!"

"That's what I come fer," replies Hell-Fire. "We hafta go in two boats—one gang to Portage Bay to draw Yeast-Cake's crowd down out of their hangout up in Silver Valley, an' the other bunch to go to Balboa Bay an' foot it over th' mountain to the head of Silver Valley an' come down on Yeast-Cake from behind. We gotta save his plant—it's th' only big one left in commission, an' if we lose it we'll hafta celebrate th' Fourth a July with soda water an' peanuts."

"The Head-Cracker hikes off to round up the codfish smailers, but they was mostly out on the fishin' grounds; so the expedition had to be postponed till the next day.

That night, as I was grabbin' off the press, the queer stoppin' of the signals comes on again. The set was entirely dead for about twenty minutes; then all of a sudden she starts perkin' again, same as ever. Next mornin' I hunts all over the blamed rig, looks at the aerial switch an' wirin', but there was absolutely nothin' wrong.

Meanwhile the codfishers an' Hell-Fire went away in two gas-boats on the thirty-mile trip to the mainland, to do battle with Yeast-Cake—an 'that evenin' they comes back hoppin' mad, without havin' fired a shot.

"Th' cutter cleaned 'em out!" howls Hell-Fire. "Landed a gang of hooch-hunters in Balboa Bay early this mornin', an' they sneaked over th' mountain an' come down on Yeast-Cake's outfit while they was all asleep. They nabbed every one 'cept Prune-Juice Pete, who was doin' sentry duty down on the Portage Bay beach—they're a bunch of dirty sneaks, ambushin' honest people that way!"

"I tell ya' there's a dark an' dang'rous mystery campin' in this town!" glooms the Head-Cracker, lugubriously. "I seen that black thing flittin' 'round again last night."

Everybody was upset over the news of the raid, but Alice Loring was even more put out than all the hooch-gulpin' codfishers.

"Oh, dear, I'm so disappointed!" she exclaims when we tell her about it. "Here I've come all this way to see a real Alaska moonshiner at his work, so I could write a story about him, and now that miserable old revenue cutter has got the only outfit left. I always have the meanest old luck, anyway," and her soft brown eyes looks kind'a teary.

"Yes, it's a rotten shame," I agrees, an' I was sincere, for I was thinkin' of the Fourth of July, "but if you'll just stick around, somebody else'll start a new one before long."

In a day or two things had quieted down a little, but I notices that Hell-Fire, instead of going back to Pirate Cove where he belongs, keeps hangin' around Unga. I soon sees that he's dead stuck on Alice, an' I didn't like it much. I went to visit her pretty often, but Hell-Fire does the same. Pretty soon we wasn't on speakin' terms any more, an' our mutual enmity was growin' like a sore boil. Things drags along this way in the kind of smoky calm that goes before the storm until one day I hears that Hell-Fire is buildin' a new still up in Gumboot Hansen's fish shed for Alice's special benefit.

Right then I sees I gotta step fast in this kind of competition; so I gets busy with a piece of pipe an' an old barrel an' a camp stove an' makes a fake still in the engine room of the wireless shack. Hell-Fire had saved one demijohn of choice hooch from the wreck of his joint at Pirate Cove, which he'd stowed in my shack; an' I takes this an' runs it into a can with a valve in the bottom, so I could give a exhibition with it when the proper time comes. When I had it all fixed I goes to see Alice. Hell-Fire was there the first time I come, but at last I finds her alone.

"I'm gonna trust you with a big secret," I tells her, serious as a cemetery. "Nobody knows it, but I'm the biggest moonshine manufacturer in the Shumagin Islands."

"You are!" she exclaims, her brown eyes wide open. "Honest!"

I takes her out to the shack an' shows her the phony outfit, an' she falls for it like a duck.

"Hell-Fire's an' Yeast-Cake's rigs were tin-can toys 'longside of his apparatus," I tells her; "this whole shack is nothin' but a hooch factory—the engine gas tank an' th' coolin' tank an' the radio apparatus cabinets an' everything else around here is chock full of it." While I gives her this spiel, I makes a fire in the camp stove an' runs Hell-Fire's hooch out of the can back into the bottle. She smells of it, an' was tickled to death.

"Oh, you're just wonderful!" she exclaims, givin' me a pretty sweet look. "I just adore you!"

"So do I you," I answers, all of a sudden, comin' up close to her. "You're too young an' good to be driftin' round this wild an' woolly country alone," I tells her; "what's the use of writin' flub for a bunch of bilious old editors that won't buy it anyway—wouldn't you rather be married to a nice big husky moonshiner——" I tries to put my arm around her, but she blushes an' shoves me away with a strength I'd never imagined she had an' beats it.

That night the signals went out again for the third time. Somehow it made me feel gloomy, an' the next mornin' when the Head-Cracker, wearin' a face like a tombstone, tells me he'd seen the mysterious spook again the night before, I feels still gloomier. I tramps around the shack all day sufferin' with what a high-brow inkslinger would call a presentiment of impendin' calamity.

(Continued on Page 60)

SHOULD THE SHIP OPERATOR USE HIS OWN APPARATUS?

The following letter is from a commercial operator who has made a detailed study of the situation.

STANDARD OIL COMPANY
(Incorporated in California)
COMPANY CORRESPONDENCE
San Francisco, Cal., July 19, 1921

Editor, "Pacific Radio News,"
151 Minna Street,
San Francisco, Cal.
Dear Sir:

There has from time to time been some discussion among commercial radio operators in regards to the custom of many operators having their own receiving equipment on vessels. After thinking the matter over and studying the question I wish to set forth some views on the subject as follows:

In the first place, it is a money investment that brings no returns. Of course, one might argue that if some operators feel like investing their money in something that brings no return, it is their private affair. In this case, however, it ceases to be a wholly private matter, because it does injury to the man that cannot afford or does not feel like furnishing receiving apparatus of his own.

Second, and more important, it is strictly against the rules of the employing or service companies to use other apparatus than the standard furnished by them. Remember, the service companies are **paid** to furnish all apparatus and **they do so.** If the steamship company, which pays cold cash is satisfied with the apparatus furnished by the service company, why in the name of Heaven should not this apparatus be satisfactory to the operator? Is it not a fact that years and years before there was such a thing as audions or amplifiers or regenerative circuits that the radio business was conducted just as satisfactory as it is today? I am ready to state that it was conducted more satisfactorily. So the service company has full right to expect the operators of 1921 to be as capable as they were in 1910 or 1912. It takes no ability to receive with an audion, but it is an **art** to get business through with a crystal detector. You will not usually learn in any school or from any books how to adjust a crystal to its highest efficiency.

Third, it is **unlawful**—or so they say—to use the amateur audion for commercial work. If it is unlawful for the service or steamship company to make use of the audion, I gather that it is equally unlawful for the operator to use it. Some operators are so very accommodating that in order to get time signals and a few items of press, they violate the injunctions and counterinjunctions of the courts. After all, you must be looked upon, by different interested parties, as a perfect fool! I have heard officials of some companies classify you as such. And what else would you expect?

Fourth, the apparatus put aboard by the service company, for which the steamship company pays money (always remember that), is the only **legal** apparatus to be used on the ship. Now, mind this, that should something happen and should your private set fail during such a time, you might kiss your license good-bye forever. Besides, the master could also get in trouble for allowing unstandardized apparatus to be used, And another important point, which I got from an insurance attorney, is that the insurance people would have a good case against the steamship company, in case of accidents. The apparatus placed on the vessel is in the records as the ship's equipment and no operator has the right to remove it or to substitute it for any old thing that he thinks is better. No more right than the master has to throw the lifeboats overboard and replace them with something else of his own fancy.

If the apparatus placed on the vessel is not modern, if you cannot get results from it, then it is your **duty by law** to notify the master to this effect, explaining to him the why and wherefore, and then it is up to him to see that things are remedied. Do you happen to know that the radio law says that such apparatus and operators are under the control of the master? Don't come and tell me that "the skipper will not listen to you." He will listen to you if you present things in a proper manner and know what you are talking about. Bear this in mind: It is your duty to notify the master, not to make alterations or substitutes without notifying him.

This practice of every operator making up some sort of a "rig," any old way, must be stopped. If it cannot be stopped by appealing to common sense it must be worked through other channels. It may be necessary to have the masters of vessels take action. After all, it is his business to see that proper apparatus is at all times available for use. It is a perfect disgrace to behold what one sees on some ships. Loose wires all over, bare joints and switches, hundreds of holes drilled in tables, bulkheads and ceiling, the whole affair looking like it had just emerged from a typhoon. What are we coming to? Does it mean that every amateur in the land must try his experiments at the expense of the safety of life and property of the Merchant Marine? Is it possible that you are so overworked with hand sending that you must put in a relay and a "bug" to send one or two messages per day, and chuck the regular sending key under the table?

Have those of you, who have been telegraphing only six months or a year already got the "cramps" so you cannot send without a "bug"? Better see a doctor about it. Is it such a great stunt in these days to hear Germany in the Pacific that it is worth $300 to $400 of your money in order to do so? Did you ever see the chief engineer bring a feed pump of his own aboard, because the ship's pumps were not satisfactory? Did you ever see the captain purchase a whistle and install it because the ship's whistle was not loud enough? These apparatus cost no more than a good receiving set. Why should you be the only "mutt" on the vessel? No wonder the ships' officers smile sarcastically at the "Wireless Operator!" Did you get that? If you are an experimenter stay at home and experiment. Bring out something worth while and don't go around and make a mess of every ship station you come to and, incidentally, make a fool of yourself and the rest of us.

(Signed) **CARL E. SODERSTORM.**

SIXTH DISTRICT AMATEUR STATIONS

6APT	T. F. Chapman	1601 Oakland Ave., Piedmont, Cal.
6APU	H. Jones	224 Ricardo Ave., Piedmont, Cal.
6APV	L. G. Snell	407 West Ave. 52d., Los Angeles, Cal.
6APW	B. S. Pigg	405 N. Maryland Ave., Glendale, Cal.
6APX	E. D. Barcus	Route, 2, Box 611, Los Angeles, Cal.
6APY	W. Haines	212 W. Lomita Ave., Glendale, Cal.
6APZ	W. Minkler	868 Locust St., Riverside, Cal.
6AQA	G. S. Tichenor	421 West Adams St., Los Angeles, Cal.
6AQB	C. Farnham	Thermalito Street, Oroville, Cal.
6AQC	C. Wilson Jr.	3040 Benvenue Ave., Berkeley, Cal.
6AQD	J. & G. Utschig	1468 9th Ave., San Francisco, Cal.
6AQE	C. R. Wallace	3430 33rd St., San Diego, Cal.
6AQF	E. G. Mahn	Route 1, St. Helena, Cal.
6AQG	R. Williams	3114 Ellis St., Berkeley, Cal.
6AQH	Richmond Union H. S.	Richmond, Cal.
6AQI	D. C. McNeely	1840 62nd St., Berkeley, Cal.
6AQJ	J. H. Knost	90 North Church, Tucson, Ariz.
6AQK	G. Parsons (Portable)	El Cajon, Cal.
6AQL	J. H. Gunning	820 30th Street, Los Angeles, Cal.
6AQM	H. D. Thompson	137 16th Street, Eureka, Cal.
6AQN	J. A. Young	Weaverville, Cal.
6AQO	M. Stefanini	527 Summer Street, Eureka, Cal.
6AQP	H. M. Keith	211 South Orange Street, Brea, Cal.
6AQR	P. L. Toll	Prospect Ave., Arcata, Cal.
6AQS	H. & M. Pitts	510 North Milton Street, Whittier, Cal.
6AQT	M. D. Graham	6784 Hollywood Blvd., Hollywood, Cal.
6AQU	H. Becker	1117 West 45th Street, Los Angeles, Cal.
6AQV	E. Gilbert	2010 41st Street, Los Angeles, Cal.
6AQW	J. A. Betterley	Eureka Camp, Pine Knot P. O., Cal.
6AQX	J. McNeal	108 Marengo Street, Alhambra, Cal.
6AQY	N. O. Glover	1073 Lincoln Ave., San Diego, Cal.
6AQZ	S. G. Estes	Del Mar, Cal.
6ARA	G. F. Zobel	352 Lake Street, San Francisco, Cal.
6ARB	C. Duncan	3029 Baker Street, San Francisco, Cal.
6ARC	R. M. Farnsworth	Colusa, Cal.
6ARD	H. Glidden	Sutter, Cal.
6ARE	D. Van Lennep	Orange Street, Auburn, Cal.
6ARF	J. Duggan	115 Elm Street, Woodland, Cal.
6ARG	S. Gross	614 East Ninth Street, Los Angeles, Cal.
6ARH	G. Stevens	77A Pearl Street, San Francisco, Cal.
6ARI	J. M. Swindt	580 Columbia Ave., Pomona, Cal.
6ARJ	J. W. Cook	Sanger, Cal.
6ARK	G. P. Johnson	731 South State Street, Ukiah, Cal.
6ARL	G. Pitman	854 Cedar Street, Alameda, Cal.
6ARM	C. Van Sickel	100 Gleason Ave., Vallejo, Cal.
6ARN	L. Eaton	390 62d Street, Oakland, Cal.
6ARO	F. A. Rupert	307 North Curtis Avenue, Alahambra, Cal.
6ARP	G. Smith Jr.	729 S. Broadway, Santa Maria, Cal.
6ARQ	J. Spatafore	3131-A Folsom Street, San Francisco, Cal.
6ARR	J. J. Sawyer	1850 Atlantic Avenue, Long Beach, Cal.
6ARS	E. L. Hesse	236 Stewart Street, Reno, Nev.
6ART	F. G. Dunnington	348 Fourth Street, Long Beach, Cal.
6ARU	H. E. Christensen	Manti, Utah.
6ARV	R. F. Austin	210 West Third Street, Riverside, Cal.
6ARW	E. Wyatt	4071 Ibis Street, San Diego, Cal.
6ARX	R. M. Moore	252½ North Main Street, Tucson, Ariz.
6ARY	L. C. Gearcy	1525 I Street, Eureka, Cal.
6ARZ	F. S. Hannah	Puente, Cal.
6ASA	S. McKinley	1241 East Brill Street, Phoenix, Ariz.
6ASB	D. V. Russell	113 West Ash Avenue, Brea, Cal.
6ASC	P. Sapp	1107 West 45th Street, Los Angeles, Cal.
6ASD	F. Brininstool	1205 North Stoneman Ave., Alhambra, Cal.
6ASE	H. Benioff	P. O. Box 477, Claremont, Cal.
6ASF	C. M. Robertson	29 Birch Street, Redwood City, Cal.
6ASG	B. H. Reinhart	60 Rivioli Street, San Francisco, Cal.
6ASH	J. L. Slater Jr.	52 California Street, San Francisco, Cal.
6ASI	W. Werner	3039 Adeline Street, Berkeley, Cal.
6ASJ	Charles Leonard Elvin	929 60th Street, Oakland, Cal.
6ASK	B. Knopf	268 Walsworth Avenue, Oakland, Cal.
6ASL	L. C. Anderson	615 Cole Street, San Francisco, Cal.
6ASM	B. R. Hassler	4329 Townsend Avenue, Oakland, Cal.

STATIC STATISTICS

By SQUAK McGUFF

I was reading in the last issue of this magazine as where a contest was inaugurated in connection with my old brother-in-law 6CH, meaning he was my bitter opponent. Me and him always got along fine till he beat my record. Us bein' bitter friends now, I think we will be quite more QSA unfriendly when he sees what I got to say about this contest.

So far so good. So further so worse.

This here contest, so I read, is limited to 50 words in describing the contents of the balloon or what connection has the balloon to 6CH's station. Now if any of you disciples of Ben Franklin are pussonally acquainted with Brownie you will perceive as well as I that 50 words is a mythe. Ferthermore, over and above or under the last statement anybody that ever LISTENED to him (I said LISTEN) because I never heard anybody get a chanct to talk when in his company, as he is very polite and entertains with a languish flow of vocabulary that knocks you speechless right from the start, and before you recover from that one he follows with another. About all you get to say is Hello and Goodbye. However, you take your own chances on getting in even that as after my experiences I don't guarantee nuthin whatsoever. Yes, anyone that ever visited him, unless, of course, he is deaf, dumb and lost the sight of both eyes, will know that 50 words has absolutely nothing in common with 6CH's station.

From a numerical standpoint, of course, I have lost the contest right now, as I am particularly and enormously over the 50-word deadline. But the funny part of the whole thing is I could describe it in the breviest of brevity, but nobody would understand it but me and a few of his victims from that barrage from Fort-Under-His-Nose. If you have difficulty in locating the geographical position of that fort, look on Brownie's countenance map. It's plainly marked with a big (O) circle with a graphaphone hooked up, with the proper amplification, in back of the spot to attract your attention.

Well, taking everything as a HOLE, and considering very carefully, my answer is that the balloon is obviously and ostensibly full of WIND.

P. S. —If I win the crisp notes I'll give 'em to Brownie to square myself after this.

I have had so many requests to visit my station on acct of its doing such good work I thought it would be a good idea to publish directions of how to get to it. Of course if you ain't interested you don't need to read further, but if you are follow me closely as my spelling is bad and grammar worser and I'll admit it takes close concentration to see what I'm driving at. All right, shoot. Well it's all very simple. Just go to the front office and get a written permit. Now take this permit to the elevator man. He will give it to a guard on the top floor. The guard will inspect the pass. Here you must be prepared to submit to a physical examination if requested as persons with weak hearts may suffer a shock on sight of such a good set. I have noticed extreme nervousness in many cases, therefore I must be protected. The guard will then give it to the office boy, who in turn will present it to my secretary. He will inform you I am out.

6MX says: "Anyone hearing my station within one block please send a night letter. Anyone hearing it within two blocks please wire me collect. But anyone hearing me over three blocks put in a long distance call collect." He would be so tickled at this remarkable distance he would gladly pay a nickel.

6AR, formerly of San Francisco and Sacramento, has moved his set in the Sierras some 200 miles south and east of Fresno, where he is showing the way to the boys of that section for long distance work. He is piling up some good records, both in distance and messages handled.

6AIW, of Roseville, is in San Francisco for the summer and making considerable noise. He sure has a healthy wallop, that is far-flung, in characteristics at least.

6AS, erstwhile target for humorists and others, is no more an inspiration for comedians. The worm has turned. He struck it so rich that he now works to his entire satisfaction. If he keeps on at the present rate he will be a mark of envy instead of humor. He claims a vertical antenna turned the trick. Which all goes to show that he who laughs last is the most tickled. Heh, Heh.

Hal Shaw, formerly one of the 6BN wizzards, who worked from Siberia to Wampazoogas, Alabama, in their palmy days, just returned from a trip to Colusa. He reports that 6AAW is batting around .1000 into that hamlet. In the vernacular of the diamond this would indicate that 6AAW has some station. The Irish would say more power to him, but that would not be appropriate here, as he is using all the law allows now.

5ZA, Louis Falconi, Roswell, New Mexico, whom we all have heard from border to border (and then some), reports things are very slack in his section. The static is so bad that it is almost impossible to keep the fones on at this time of the season. He reports that all the boys in his section are working on their sets and constructing MORE-AMP antennaes. "Watch 'em smoke this fall," he says.

TACOMA

Sunday, July 25th, the Radio Club of Tacoma gave a picnic on the shores of American Lake—a famous resort near Camp Lewis. The ceremonies began with a lunch. 7ED took the lead from the start and furnished the musical entertainment while devouring the watermelon. He sailed in with such relish and guesto that members of the club were fearful lest he finish first, thereby eliminating the music. The best selection was rendered with his tomato soup.

Immediately following the dinner (and musical entertainment) — selection rendered being principally the Soup Spoon Whistling Shimmy—a tug of war was started. Seattle won the silver loving cup in this event.

Following the tug of war a baseball game was next on the program. Portland walked away with the honors. The prize in this case was a "side-swiper" donated by 7BC. It had rubber contacts. Portland has a grudge against "cooties" and is only awaiting another opportunity to eliminate one more side-swiper.

During the afternoon and evening the time was consumed by swimming, dancing and canoe parties. Airplane rides were also on the program. During the late evening a marshmellow roast was indulged in, during which Mr. Nicholson rendered several vocal spasms. His offerings were very good, only that he did not have the variety of flats and sharps that 7ED displayed while devouring his soup.

Portland members remained over for the Tacoma club meeting on Tuesday. The picnic program went through very nicely and was enjoyed immensely by everyone.

Seattle at last has a radio club. The title has been announced as THE TOTEM RADIO CLUB. Seattle has been going to have an organization for so long that we had given up all anticipation of such a thing. Now that they have, Tacoma and Portland are waiting and watching—waiting for an invitation to eat. 7ED has already gone into training and expects to make an opera glass finish.

Bremerton also is getting into the limelight with a club of some 35 members. They were represented at the last meeting of the Tacoma Radio Club, club, where the matter of amalgamation was discussed. The Bremerton plenipotentiaries spoke in favor of the connecting link. Some even going so far as to prophesize the whole Pacific Coast would soon be one huge organization. They followed this with the announcement, however, that they were not running in opposition to any club or clubs, but seek to harmonize and co-operate with them all. The plans will soon be published for the perusal and digestion of the general amateur public.

7BA was at the picnic with his saxaphone quartet and the music was so tempting that even "Grandpa Leidigh" almost indulged. Owing to the fact that he had a sore footsie he was asked to give a practical demonstration of the latest in the lame-duck step. This he did and got by with it so nicely that he has been limping ever since.

LOS ANGELES

In Los Angeles we see many things. On a recent visit our Major Dillon and Mr. Dickow were madly enthused not only with Radio but also piscatorial activities. The Major landed such a big one that he consumed some three hours of his time and also his strength to land it.

It's a long story. Mr. Mott of Catalina was the host. Up to the present moment, however, I have been unable to discover as to whether there were hostesses. But where there's hosts there's hostesses. Both men, however, left their happy homes behind.

I met both men upon their arrival home. Their appearance was that of a vimy ridge hero who had been gassed, shell-shocked and humiliated by the Germans. Dickow was bandaged from head to foot, while the Major was in a precarious state. "Sunburn" was what they told me. Poison oak was what it looked like. But what worries my detective instinct is how in the world they could get poison oak fishing from a launch.

Major Dillon and Dickow were enthralled with the picturesque scenery of Catalina. The wonderful beaches, and, above all, the latest in bathing suits. If they could speak French their expressions would be as follows: "Oh, zowee. Ze wonderful sights on ze beeeeeeech. Oo la la, juss like my own Parees."

And again I ask "how could they get poison oak on a launch?" They went fishing, I know. Also it sounds fishy.

NEWLY DEVELOPED APPARATUS

A NEW DIAL

A non-warping, perfect alignment and smooth-running dial has made its appearance on the radio market. It incorporates the DeForest knob and Condensite dial, and is not effected by heat or exposure to the sun. It is made in two sizes, three and four-inch diameters, and can be used with either a 1-4 inch or 3-16 inch shaft. It is being distributed by the Radio Telephone Shop of San Francisco.

CALLS HEARD BY WESTERN AMATEURS

This department has met with such favor that we will devote as much space to same as possible. Unusual Records are Particularly Desirable. Your list should be neatly printed in ink, using one side of paper only. All errors will thereby be avoided.

List of Calls Heard By 6ANK
I. A. Weihe, Sparks, Nevada
July 1 to 28, 1921

6AAW, 6ABM, 6ABN, 6ABU, 6ABW, 6ACR, 6AEO, 6AFH, 6AFN, 6AFU, 6AGH, 6AGN, 6AGV, 6AID, 6AJH, 6AJR, 6AJS, 6AJW, 6AK, 6ALS, NAMW, 6ANR, 6AOX, 6APH, 6AR, 6ARC, 6ARS, 6ASJ, 6AW, 6CH, 6DA, 6DP, 6DQ, 6DS, 6EB, 6EN, 6FH, 6GK, 6HH, 6HX, 6KA, 6KM, 6KP, 6KS, 6KW, 6LC, 6BC, 6OH, 6OM, 6PJ, 6PP, 6PQ, 6PR, 6TV, 6XZ, 6ZAA, 6ZK, 6ZR, 6ZN, 6ZU, 6ZX, 7BM, 7DA, 7JW, 7YA, 7ZJ.

The following calls were heard in full daylight—sun shining (one tube): 6AFN, 6ABN, 6AGF, 6AGN, 6KW, 6ABW. Also heard Avalon radiophone with sun shining. Signals QSA.

On July 26, at 8:30 p. m. I heard a fone station transmitting music. It was the station of E. A. Portal, of Los Altos. 6XA?

6AR, 6BH, 6HC, 6HD, 6HB, 6IM, 6IV, 6KC, 6MZ, 6NY, 6OD, 6OL, 6PS, 6PR, 6QA, 6TV, 6TX, 6ZB, 6ZN, 6ZU, 6ZX.

6AAG, 6ABP, 6ADX, 6AFW, 6AGF, 6AGN, 6AGS, 6AHA, 6AHU, 6AIB, 6AIC, 6ASH, 6ASK, 6ALK, 6ALP, 6APH, 6APV, 6AQS, 6AQP, 6ARC, 6ASB, 6ASY, 6ASX, 6ATG.

CALLS HEARD BY 7MF, EUGENE, ORE.

Canadian 5BA, (6AE), 6AK, 6CH, 6CP, 6DD, 6DM, (6EX), 6FH, (6GF), 6HC, 6IM, 6IY, CW, 6KA, 6KM, 6LR, 6LK, 6MZ, 6PJ, 6QR, 6WQ, 6ZA, 6ZM, 6ZR, 6ZX, (6ABM), (6AIW), (6ARK), (6AMW), (6AIR), (6ALE), 6ALU, CW and phone, 72S, 7AY, 7BA, 7BC, (7BK), 7CN, (7CC), (7DA), 7DJ, 7DP, 7EX, 7FI, (7GA), 7HC, (7IY), 7JW, (7KB), (7KJ), (7KM), 7KW, 7LR, (7LG), 7LW, (7MW), (7NN), 7OT, 7PK, 7QQ, (7RA), 7WT, cw, (7ZJ), 7ZM, 7ZL and 7ZZ.

Calls Heard by 6AS, San Francisco

(6AID), (6ALE cw), (6AFN), (6AFG), 6AR, 6EA, 6EB, (6DP), (6EN), *HY, (6KP), 6KA, (60H), 6DA, 6PJ, (6SK), (6TV), 6WH, 6ZU, 7DA, 7IM, 7KJ, 7MF, 7IW, (7ZJ).

Anyone hearing 6AS please QSL. Address 3675 20th St., San Francisco.

Calls Heard at 6MX, San Francisco, from April 1 to July 22, 1921.

6AR, 6AY, 6DP, 6EA, 6EB, 6EN, 6FI, 6FH, 6FJ, 6FM, 6GP, 6EG, 6IC, 6JC, 6JI, 6KA, 6KC, 6KM, 6KP, 6KS, 6LC, 6LU, 6LX, 6MK, 6MZ, (6OH), (6OW), 6PP, 6PJ, 6QR, 6SK, (6TV), 6TC, 6UO, (6VX), 6WD, 6ZO, 6ZU, 6ZX, 6AAK, (6AAU), 6AAS, 6ABW, (6ABM), 6ABX, 6ACR, 6ACY, 6ADL, 6AEI, 6AEL, 6AEV, 6AFN, (6AGF), 6AID, (6AIW), 6ATH, 6AKW, 6ALM, 6ARS, 7UC, 7CW, 7DA, 7HF, 7HN, 7IW, 7KJ, 7KM, 7MF, 7QQ, 7YA, 7ZJ, 7ZZ.

Anyone hearing 6MX please QSL. All letters answered.

Calls Heard By 6AR, Northfort, Cal.

(6AK), 6AS, (6CH), (6DP), (6DS), (6EA), (6EB), (6EN), (6ER), (*FH), (6FT), (6GF), (6HC), (6KA), and C. W., (6KS), (6KP), (6LC), (6OH), (6PR), (6SK), (6TV), (6VX), (6WH), 6WZ, (6ZN), (6ZU), (6ZX), (6AAW), (6ABW), 6AFN), (6AGF), (6AHU), (6AIW), (6AGM), (6ALU), (CW), (6AMN), (6APH), (6AQU), (6ARC), (6XAD—EW), (7DA), (70ZCW), 7OZCW), 7XFCW, (7ZQ).

Calls Heard By 7BH, Salem, Oregon

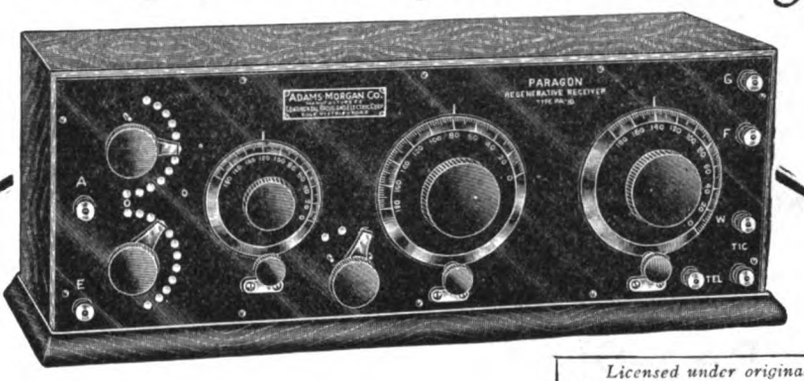
5ZA, 5IF, (6ZR), 6ZX, 6ZU, 6IZ, 6MC, 6FE, (6RN), (6FH), (6OH), (6QR), 6AE, 6AK, 6EB, 6FJ, 6JD, 6JE, 6JM, 6QM, 6PR, 6OT, (6GF), 6DP, (7AD), (7BH), (71Y), (7BQ), (7LI), (7ED), (7DP), (7JW), (7DA), (7GA), (7XF), (7ZJ), (7KB), 9WU, 9OE, 9YB, 9BW, 9FI.

Heard During July By 6SU, Stockton, California

6AH, 6AR, 6CU(CW), 6DP, 6EA, 6EB, 6EN, 6EX, 6FH, 6FT, 6FX, 6GF, 6GP, 6GQ, 6IC, 6IF, 6II, 6IM, 6KA, 6KC, 6KP, 6KS, 6LC, 6MH, 6MZ, 6OA(C.W.), 6PJ, 6PM, 6SK, 6TV, 6XC(fone), 6XG(fone), 6ZK, 6ZN, 6ZU, 6AAW, 6ABM, 6ABW, 6ABX, 6ACR, 6AEI, 6AFN, 6AFT, 6AGF, 6AGM, 6AIN, 6AIW, 6AJE(C.W.), 6AJH, 6ALE(C.W.), 6ALM, 6AOD, 6APH, 6ARC(C.W.), 6ARG, 6ARS, 6ATG, 6XAC(fone), 7BK, 7BQ, 7DA, 7QQ, 7ZJ.

PARAGON R·A·TEN

Protection Against Regrets Absolutely Guaranteed by Originator's Name



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READ 2ZL'S LETTER

This hearty endorsement of Paragon R. A. Ten from so distinguished an amateur as J. O. Smith, of Lynbrook, L. I., deserves your careful attention. Mr. Smith has had ample opportunity for comparisons, and his experience in radio lends weight to this expression of approval.

Here is the letter:

The Paragon R. A. Ten receiving set which has been in use at 2ZL station for the past two months, has proved to be entirely satisfactory in every way, and has done everything you claimed it would do. It is remarkably efficient and selective on all wave-lengths. It has proved especially satisfactory in C. W. work, because of the *entire absence* of capacity effect.

(*Signed*) J. O. SMITH.

Ask your radio dealer

Ask your dealer to show you a Paragon R. A. Ten Regenerative Receiver. If he hasn't one in stock, he will quickly get one if you ask him for it.

The Seals have now been broken on all Paragons to let you see the splendid inside construction. Examine the details carefully, and you will see that Paragon is well worth its $85.00 price. Remember, when you buy a Paragon, you get your money's worth in the splendid materials and workmanship. The marvelous selectivity and unequaled amplification cost no more than you would pay for inferior engineering principles.

RADIO CLUBS: Be sure to get the details at once about our special offer to recognized radio clubs. For a short time only you can secure a genuine Paragon for your club house, absolutely FREE.

Exclusive Wholesale Distributors for Paragon R. A. Ten and Phonetron

Descriptive folders on Paragon R. A. Ten and Phonetron, the improved type of loud speaker, sent free on request. Or send 25 cents for the CRECO catalogue—listing all the worth while equipment in use today.

CONTINENTAL RADIO and ELECTRIC CORP.

EXCLUSIVE WHOLESALE DISTRIBUTORS FOR PARACON R.A. TEN AND PHONETRON

J. DiBiase, Sec. **Dept. G 78 6 Warren Street New York City** *J. Stantley, Treas.*

CORRECTION

In the August advertisement of the Atlantic Radio Company, the prices of the Westinghouse Tuner, and Detector-Amplifier were given as $85.00. The correct price, as quoted in this month's advertisement, is $65.00.

A STILLY MYSTERY

(Continued From Page 55)

That afternoon a Aleute kid brings me a note:

"Meet me on Gold Bluffs at four o'clock and you'll never regret it. ALICE."

Somehow the note didn't cheer me none; but I locks up the shack an' hikes the four miles up the beach to Gold Bluffs, which is up close to Cyanide Simpson's gold mine. When I gets up on the bluffs, who should I find strollin' around up there but Hell-Fire. I sits down on a rock without sayin' nothin' to him, expectin' him to go on, but he just keeps hangin' round. At last, when the hands of my Ingersoll had slipped around to near four o'clock I sees I got to do something. I goes up to Hell-Fire an 'invites him to beat it.

"Go to hell!" he answers, an' takes a swipe at me. I pokes him in the snoot, an' then we clinches an' rolls around among the rocks, until at last we goes over the bluff an' falls in the bay.

The water was deep under the bluff an' cold as ice, so it was lucky that old Cyanide comes along just then in his gas-boat an' picks us up. Soon as I'd got my breath an' wits back, who does I see sittin' alongside of Cyanide but the tall stranger from the mail schooner!

"This is Mr. Wendell," says Cyanide, noticin' my stare. "He's the su-veyor I was lookin' fer from th' Treadwell Company—bin up to th' mine with me th' last two weeks."

Right there I begins to do some tall thinkin'.

"Say, look here," I says to Hell-Fire, speakin' to him for the first time since the plunge; "did you have a date with Alice up on Gold Bluffs?"

"I did," he says.

"So did I," I tells him. I was beginnin' to see light, but I saw a lot more when we got down abreast of Unga, an' sees the cutter "Unalga" steamin' off down the Straits of Nagai. All the codfish snailers in town was clustered up on the bluff around the wireless shack, an' they was clean wild.

"Where'n hell'n blazes ya been!" howls the Head-Cracker, as we makes the landin'. "Your shack is wrecked from stem t' stern, an' that little angel-eyed vampire's gone off in the hooch hunters' boat!"

Hell-Fire an' I sprints up into the shack—an' talk about a wreck! The walls were bored full of holes, an' planks were ripped up out of the floor; cans of lubricatin' oil were chopped open, an' the engine gas tank was split from top to bottom. There was a big hole punched through the sendin' transformer secondary; the coolin' tank was busted open ;a can of yellow house paint had been smashed over the alternator, an' the gizzards of my oil condenser was lyin' in a mess of glass an' tinfoil all over the floor.

"I don't get it," mutters Hell-Fire, dazed-like. "What for?"

"I told that little sweet essence of sulphuric innocence that this was a hooch fact'ry," I groans. "I haven't got the brains of a new-born jackass!"

Just then we hears the Head-Cracker bellowin' to us from among the rocks down below the shack, an' we breezes out.

"Here's what th' spook was carryin' 'round in th' dark!" he yells, pointin' to a black suitcase lyin' hid under a boulder. "Looks like little dimply darlin' fergot to

(Continued on Page 64)

CONTEMPLATED DISTRIBUTION OF MISSOURI MARKET NEWS BY RADIO

By Daniel C. Rogers, State Marketing Bureau, Jefferson City, Mo.

THE Missouri State Marketing Bureau of the Board of Agriculture, with headquarters at Jefferson City, Mo., is working out extensive plans for giving Missouri farmers government news by radiophone.

The government market news information will be received at the radio office of the State Marketing Bureau off the leased wire of the United States Bureau of Markets. That wire will connect Jefferson City with the office of the bureau at Washington, as well as with practically all of the large grain, live stock, hay, fruits and vegetables, dairy products, and other markets in the United States.

A powerful transmitting set will be installed at the offices of the State Marketing Bureau at Jefferson City, located in Missouri's beautiful new capitol building whose dome is 280 feet from the ground. From this central point of the state the radiophone should operate at its maximum efficiency to the advantage of Missouri farmers. The services is expected to be begun early in the fall.

The Missouri State Marketing Bureau will organize the wireless amateurs in that state, of which there are several hundred, widely scattered in rural communities, into a state organization for receiving and distributing the market news information. A continued campaign will be made to install radiophone receiving outfits in every town of any size in the state. Newspapers, banks, rural telephone exchanges, farm bureau offices, live stock shipping associations, elevators and other headquarters interested in receiving and distributing government market news information on farm products will be requested to co-operate in this new undertaking.

During the strawberry shipping season from Southwest Missouri last May the Missouri State Marketing Bureau purchased a radio receiving outfit for receiving strawberry market news at Monett, Mo., which was undoubtedly the first radio equipment ever purchased by a state or national agency for the purpose of receiving and distributing market news information for the farmer.

Similar service is being rendered in the watermelon district of Southeast Missouri, with the big watermelon shipping season opening up in that part of the state the latter part of July.

The purchasing cost of a radio receiving set does not exceed and may be less than the cost of transmitting the market news information for a single season, to market news field stations by the commercial telegraph company. There is no comparison between the swiftness of sending the news information by commercial telegraph com-

(Continued on Page 66)

CALLS HEARD BY 6BF, SANTA PAULA, CAL., MONTH OF JUNE—NO AMPLIFICATION

6AAG, 6AAH, 6AAK, 6AAT, 6ABB, 6ABG, 6ABM, 6ABP, 6ABW, 6ACU, 6ADA, 6ADH, 6AE, 6AEI, 6AFN, 6AGF, 6AGL, 6AGP, 6AHW, 6AID, 6AIU, 6AIW, 6AJK, 6AKL, 6ALI, 6ALR, 6ALU, 6ALV, (6AOZ), 6APH, 6AQU, 6AR, 6ARS, 6ATD, 6ATG, 6ATS, 6ATY, 6AX, 6BW, 6DP, 6EF, 6EN, 6EX, 6FJ, 6FT, 6HC, 6HH, 6IY, 6JI, 6KI, 6KM, 6KP, 6KS, 6LC, 6LL, 6MK, 6MZ, 6NG, 6NY, 6OH, 6PR, 6QC, 6SK, (6TG), 6TV, 6VM, 6VX, (6VZ), 6WZ, 6XAD, 6XZ, 6YA, 6ZB, 6ZM, (6ZN), 6ZR, 6ZX, 6ZZ, 7HF.

STATIONS HEARD DURING DECEMBER, JANUARY AND FEBRUARY, ON A ONE STEP, BY 7ZT, VANCOUVER, WASHINGTON

5FL, 5IF, 5XB, (5ZA), 5ZR, 5ZU, 8ML, 8ZR, 8ZY, 9AE, 9AGN, 9AIG, 9EE, 9EQ, 9HM, 9JN, 9LA, 9LR, 9OE, 9WU, 9XI, 9YI, 9YW, 9ZC, 9ZJ, 9ZL, 9ZN, 9ZQ.

Besides this list of "Calls heard" 7ZJ (ex 7CU) has been reported heard by 9AHG, Conneaut, Ohio; 8ZY, Defiance, Ohio; 9DIL, Milwaukee, Wis.; 9KL, Spring Valley, Ill.; 9AAF, Indianapolis, Ind.; 5AL, Greenville, Texas, and by George Sturley (ex 7BJ), oprr. S.S. Reuce, while docked at Chignik, Alaska, a distance of 1600 miles.

CALLS HEARD AND WORKED DURING THE MONTHS OF MAY AND JUNE BY WITH DUE APOLOGY

One paragraph of our August issue Radiotorial states that "Pacific Radio News" is the only radio publication not connected, more or less, with the radio trade. This paragraph should have read: "—not connected with the trade, associations or organization—". It was not the intention of the writer of the Raditorial to cast reflection upon the A.R.R.L. or "QST," as he himself is a member and booster of that organization.

HAVE YOU SENT FOR YOUR PRIZE?

(Continued From Page 48)

H. Brewer, Emeryville, Cal.; A. E. Bessey, Sunnyvale, Cal.; T. House, Dublin, Texas; M. Apple, McKinney, Texas, and R. Scott, Douglas, Ariz., also received a UV200 bulb, donated by the Radio Corporation of America. Winners can secure the tubes by writing to the "QST" at Hartford, Conn. L. Peine, of Houston, Texas, received a Cunningham C-300 tube, donated by the Audiotron Mfg. Co. M. Koupal, Eugene, Oregon, received a one-year subscription to "Radio News."

From all indications the West made a grand showing in the Relay, and "Pacific Radio News" herewith extends congratulations to the winners and conductors of this interesting test.

The October issue of "Pacific Radio News" will be out on September 25. Several additional pages of reading matter and a number of generous improvements will tend to make it a most interesting edition. Better subscribe today.—Advt.

RADIO APPARATUS

Distributors of Reliable Radio Apparatus to Schools, Colleges, Radio Clubs and Experimenters All Over the World!

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SERVICE FILLS ORDERS ON EVERY CONTINENT!
WHY NOT LET US SERVE YOU?

"PITTSCO"
SERVICE REACHES ALL OVER THE WORLD!
WHY NOT LET IT REACH YOU?

AMPLIFYING TRANSFORMERS

No. UV-712 Radio Corporation, new type, just out. (For radiotrons) ... $7.00
No. 226-W Federal ... 7.00
No. 231-A General Radio, new type.. 5.00

MODULATION TRANSFORMERS

No. A-3 Acme, unmounted ... 4.50
No. A-3 " semi-mounted ... 5.00
No. A-3 " fully mounted ... 7.00
No. 231-M Gen. Radio, new type, just out! (for radiotrons) ... 5.00

AUDION CONTROL PANELS.

No. RORH Grebe, in cabinet with tickler connections ... 17.00
No. 330 Remler, with "A" Battery potentiometer ... 8.00
No. P-1 Paragon, moulded type, very small and compact ... 6.00

"B" BATTERIES.

No. 7623 Standard, small 22.5 volts.. 1.50
No. 7625 " large 22.5 volts.. 2.65
No. 7650 " variable 22.5 volts 3.50
No. 766 Eveready, large 22.5 volts... 3.50
No. 766-A Eveready, large, variable.. 3.00
No. 763 Eveready, small, 22.5 volts.. 2.25
No. P-1 "Sorsinc," new type, just out! 22.5 volts, extra long life.... 4.00

AMPLIFIERS.

No. RORK Grebe two-step with automatic filament control ... 55.00
No. RORD Grebe Det. and two step with automatic filament control... 75.00
No. P-1 Amrad Type A, two step.. 39.50
No. DA Westinghouse, det. and two step, just out! ... 65.00

CONDENSERS. (Fixed mica type)

No. ROCC Grabe .0002 Mf. ... 1.00
No. ROCD " .0005 Mf. ... 1.20
No. ROCE " .001 Mf. ... 1.60
No. ROCF " .005 Mf. ... 3.80
No. ROCA " .0002 Mf. and .5 meg. leak ... 1.20
No. ROCB " .0002 Mf. and 3 meg. leak ... 1.20

GRID LEAKS.

No. MW-1 Radio Corporation, .5, 1, 1-5, 2, 3 or 5 megohms complete... 1.25
Grid leaks only ... .75
Bases only ... .50
No. 21 Chelsea, variable .5 to 5 megohms ... 3.00

LOUD SPEAKING DEVICES

Type R-3 Magnavox loud speaker, latest model, just out!... 45.00
No. P-1 "Vocoloud" Station type.... 30.00
No. P-2 " Laboratory type. 25.00
Magnavox Radiophone transmitter tone-arm ... 37.50

REGENERATIVE RECEIVERS.

No. CR-2 Grebe 175-680 meters..... $41.00
No. CR-3 Grebe 175-680 "Relay-special"; splendid set ... 65.00
No. CR-3A Grebe 175-375 meters, with tube control, complete set ... 36.00
No. CR-5 Grebe 175-3000 meters, "Super-special" with tube control, complete set. Ideal for jewelers.... 80.00
No. CR-6 Grebe 175-680 meters, receiver, det. and two step amplifier self contained, complete set ... 200.00
No. CR-7 Grebe 500-20000 meters "Long-wave special" with tube control, complete set. Ideal for arcs 210.00
No. RA Westinghouse, 180-700 meters, new type, just out!... 65.00

PLUGS.

No. 50 Pacent universal type ... 2.00
No. 1428-W Federal, brass ... 2.00
No. 1428-W " silver-plated .. 2.50

JACKS.

No. 1421-W Federal open circuit .... .70
No. 1422-W " closed circuit .. .85
No. 1423-W " two circuit 1.00
No. 1435-W " automatic filament control type ... 1.20
No. 1438-W Federal Auto filament type ... 1.50

MICROPHONES.

No. 260-W Federal hand type ... 7.00
No. HM-100 DeForest hand-type 6.00
No. 5176-A Conn. with short adjustable arm, ideal for panels ... 4.25

RHEOSTATS.

No. 214 General Radio 2-5 Ampere type, just right for one UV-202 5-watt radiotron tube ... 2.50
No. 132 National Controller type, 6.4 amperes, just right for 1 UV-203 5-watt radiotrons ... 5.50
No. P-1 Paragon, very compact 1.75

SOCKETS.

No. MW-1 Radio Corporation type... 1.50
No. 156 Gen. Radio ... 1.50
No. 550 Murdock ... 1.00
No. S-2 Radio Service double ... 2.50
No. S-3 Radio Service triple ... 3.50
No. UV-203-A Radio Corporation type for the UV-203 50-watt tube ... 5.00

RECTIFYING DEVICES.

No. P-1DeForest rectifying tubes for radio-phone work ... 7.00
No. FF France battery booster, 6 amps, for charging batteries ... 15.00

RECTIFYING DEVICES.

No. P-1 Tungar 2 amp. size complete. $18.00
No. P-2 Tungar .5 amp. size complete 28.00
No. UV-216 Radio Corporation 20-watt "Kenotron" Rectifier ... 7.50

TELEPHONES

Type C Baldwins, Navy type ... $16.50
Type E Baldwins, ultra-sensitive ... 20.00
Type F Baldwins small, super-sensitive ... 21.00
Brandes "Superiors" ... 8.00
" "Trans-atlantics" ... 12.00
" "Navy type" ... 14.00
" New headband only ... 1.50
" New double cord ... .75

VACUUM TUBE. (Radiotrons)

No. UV-200 Radiotron detecter ... 5.00
No. UV-201 " amplifier ... 6.50
No. UV-202 " 5 watt transmitter ... 8.00
No. UV-203 Radiotron 50 watt transmitter ... 30.00
No. UV-204 Radiotron 250 watt transmitter ... 110.00
Note: All radiotrons sent postage and insurance prepaid to any part of U. S. A. Radiotrons always in stock.

STORAGE BATTERIES.

No. BX-3 Harvard 6 volts 40 ampere-hours, complete ... 16.50
No. BX-5 Harvard 6 volts 60 Amp-hours ... 18.50
No. BX-7 Harvard 6 volts 80 Amp-hours ... 24.50

VARIOMETERS.

No. 200 Tuska, moulded type ... 6.25
No. 200-A Tuska, moulded type with dial ... 7.25
No. 345-G Murdock grid type ... 7.50
No. 345-P Murdock plate type ... 7.50
No. 346 Murdock Vario-coupler ... 8.50
No. ZRV Clapp-Eastham Variometer with dial ... 6.50
No. ZRV-A Clapp-Eastham Variometer only ... 5.75
No. P-1 Turney's spider web inductance; ideal on radio-phones ... 5.50

POTENTIOMETERS.

No. 214-C General Radio "A" Battery type, 400 ohms, ideal with radiotrons ... 4.00
No. 93 Remler "A" Battery type..... .75
No. F-743 Clapp-Eastham "B" Battery type, 5000 ohms, fully mounted 3.00
For panel mounting ... 2.50
No. PR-536 Radio Corporation "A" Battery type ... 2.00

RESISTANCES. (Phone work)

No. 1 Ward Leonard 5000 ohms 2.25
No. 2 Ward Leonard 1000 ohms..... 3.50

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F. D. Pitts Co., Inc.

12 Park Square **Dept. E** **Boston, Mass., U. S. A.**

A STILLY MYSTERY

(Continued From Page 60)

tell her hooch huntin' pals t' pack it away."

I recognizes the suitcase as one of those of Alice Loring's that I'd seen the day she came. We opens the thing—an' then we stares. Neatly stowed inside was six dry batteries and a spark coil, about a one-inch, with a key an' a little enclosed micrometer spark gap screw on top. Besides this there was two coils of thick silk cord, a small electrose strain insulator with a hook at each end, a sharp-pointed brass rod, an' two wrenches. There was no receivin' gear.

"Sufferin' damnation!" howls Hell-Fire, doublin' up like he was shot. "I'm a fish—I'm a salmon!" an' he starts eruptin' a blaze of profanity that makes the rocks smoke.

"One of the gobs at N-P-R give me a complete line on this dame a couple years ago," he snarls. "She's Soft-Eyed Sadie, th' slickest female gumshoer in th' Alaska dry squad. She used to get next to the hooch plants by lovin' up some simp ,an' then she'd shoot the dope out to the cutter in code—but the ops used to suspect th' code an' tip off th' boys, so she got up this rig. When she has her dope lined up she chooses a dark night, unfastens the lead-in an' hangs it off on that electrose insulator, an' clips that longest flexible cord onto the lead-in. The other cord an' the rod is for the ground—she must'a put it down in the water here. The cutter copies her on a three-step.

"She pulled the same stunt on th' gobs at N-P-Q once—she packed a ladder half a mile to get up to the lead-in, an' when she couldn't get th' lug off she got into the station with a passkey durin' the night an' opened the aerial swich—course she'd had the simps to show her around the place beforehand. Nobody ever saw her rig, but an op on the cutter spilled the details to one of the captured gobs when he was brought aboard prisoner by the hooch hunters. She must'a left it hid here last night, intendin' to take it off in the boat today, an' forgot it."

"I guess that's how Greasy Bill's ladder disappeared," I says; an' then we observes that we're all standin' on that very thing.

"I s'pose my bottle of hooch went, too," glooms Hell-Fire, when we were alone, a little later. "It was in your shack."

"No; it's saved," I announces. "I had a hunch this mornin' an' put it down in the fish shed."

And that night we drinks it all. Next mornin' I recovers consciousness lyin' on my chest over the top end of one of my hundred an' thirty foot wireless masts. Lookin' around, I observes Hell-Fire droopin' similar over the end of the other one.

"Good mornin' to you," I hollers across to him. "How's your busted heart?"

"All healed," Hell-Fire hollers back. "To hell with women!"

"Hell with 'em," I agrees, an' then we climbs down an' shakes hands.

THE END

CONTEMPLATED DISTRIBUTION OF RADIO MARKET NEWS BY THE MISSOURI STATE BOARD OF AGRICULTURE.

(Continued From Page 61)

panies and radio to a field station from either St. Louis or Kansas City.

A radio receiving set is now being operated by the State Marketing Bureau at Jefferson City to receive government market news information now broadcasted daily from the KDEL office operated by the Post Office Department at St. Louis, Mo. This information is being given to local newspapers and the Associated Press.

The plans for putting into operation this most elaborate system of distributing market news information to farmers ever undertaken by any state, or even the Federal Government, has been generally pronounced feasible by the majority of the larger manufacturers and jobbers of radio equipment.

At first no attempt will be made to expand the work in Missouri further than installing receiving sets at some important office in each of the several important towns of every one of the 114 counties in Missouri.

Sufficient interest has already been expressed in the project to warrant the belief that farmers, bankers, county agents, newspapers, rural telephone exchanges, dealers in farm products, merchants and others, will liberally subscribe to the purchase and maintenance of one of these radiophone outfits in their respective communities, which cost would be only trivial when thus apportioned between the leading citizens of a given community. In fact, the cost for maintaining such a service by individuals is not expected to be prohibitive within the near future. In view of which fact, the State

(Continued on Page 79)

STATIC ELIMINATION

By Hubert E. DeBen

ALL attempts at static elimination have failed. It is a universally known fact. Practically every one of us has tried, at some time or other, a contrivance of our own design, in an attempt to do away with static. As usual, the result is a complete failure. And why all this failure? Simply this: Heretofore nearly every experimenter has tried to eliminate static by trying to keep it out of the receptor circuit; naturally the audibility of radio signals were reduced in proportion to the static audibility. It is impossible to eliminate static altogether, but is IS possible to reduce its intensity so that radio signals can be read through it.

Let us determine what static is, what it is caused by, and how. The following theorization of static is based on the popular theory of electricity and may be accepted as substantial. All clouds contain two electric fluids, called negative and positive electricity; in any uncharged cloud these fluids exist in equal amounts; the fluids are separated from each other by friction, so that one of the two clouds, which rubbed together, retains a surplus of one fluid, while the other cloud has a surplus of the other fluid; each cloud is thus charged oppositely; clouds carrying opposite charges, when coming in contact with one another, in an effort to reattain their normalcy, discharge to each other their surplus of either fluid; this electrical discharge causes the atmospheric disturbance which is commonly termed static.

The striking electrical similarity of radio and static disturbances is that they are both etheric disturbances caused by discharges of an electrostatic nature. They are both alike electrically; it is, therefore, logical that one

(Continued on Page 72)

THE RADIO TELEPHONE REPORTER

(Continued From Page 52)

other public gathering places; nearly 100 in all. A nominal admission fee was charged on the day of the fight, and the voice bulletins sent by the big station at Hoboken were heard by the crowds almost simultaneously with the time of their actual happening at Jersey City. The returns from these sources were turned over to the two organizations mentioned above.

Apparatus Employed

The apparatus consisted of a 1500-watt radiophone transmitter employing six 250-watt radiotron vacuum tubes. These vacuum tubes, by the way, are the lamps which have well nigh revolutionized the radio field and which directly make radio telephony possible today.

A special motor-generator was erected near the set which furnished a potential of 2000 volts necessary for the plate excitation of these vacuum tubes. The filaments of the tubes were heated by means of a separate low voltage winding arranged on the machine. The vacuum tubes and all other auxiliaries are contained in one unit, as shown in one of the above photographs, the panel of which contains all necessary switches for power control and wave lengths. The set was built by the General Electric Company expressly for the Radio Corporation.

The antenna, which is clearly shown in the second photograph, was stretched between the skeleton steel radio tower shown and the clock tower of the D. L. & W. terminal. It is of the "T" type and consists of four No. 14 stranded phosphor-bronze wires, 450 feet long with a 250-foot lead-in. It has a natural period of 740 meters and spreads about 250 feet above the ground. This antenna was energized by a current of 15 amperes furnished by the transmitter which in radiophone circuits is considered a great deal of current to radiate in the air. The wave length to which it was necessary for radiophone receivers to tune up to was 1600 meters.

Reporting the Fight

The actual reporting was done in the following manner: Mr. D. Sarnoff, general manager of the Radio Corporation of America, and Mr. J. A. White, editor of Wireless Age, were located at the ringside in the press stand and took turns at reporting the most important features over a private telephone wire furnished for the occasion through the courtesy of the American Telegraph and Telephone Company, leading direct to the radio room at the Lackawanna terminal. The news was given round by round and incident by incident, and at the other end were typed directly from the telephone and handed to the radiophone operator, Mr. J. O. Smith, a well-known radio amateur, in the form of bulletins. The latter immediately spoke into the regular mouthpiece shown on the radiophone panel, so that hardly a minute was lost between the actual incident and the spoken voice in the air.

Several thousand letters have since been received by the Radio Corporation from amateurs located up to distances of 500 miles from the scene of action remarking upon the unusually clear voice of the speaker and enthusiastically voicing their approval at the success of the experiment, for it was the first time in the history of radio that the results of a boxing match were broadcasted by radio telephone.

Robert Garcia, youngest amateur in the world, was the main feature of attraction at a recent meeting of the Southern California Radio Association at Los Angeles. Radio Inspector Dillon was one of the distinguished persons present. Young Mr. Garcia made a very nice little talk in which he thanked Major Dillon for his license. The young lightening-shaker is just 7 years of age and holds an amateur first grade ticket. He took a great liking to the radio inspector and sat upon his lap during the session.

Master Garcia was presented with sufficient apparatus by the various manufacturers of Los Angeles to complete a set he is installing.

$5 $3 WIN A PRIZE $5 $3 $2 $1

For the man writing the best true story of how he stopped an unlicensed amateur from operating, with satisfaction to both parties, we will give a prize of $5.00 Second best story $3.00, third best $2.00, and fourth best $1.00. The winning story will be published in PACIFIC RADIO NEWS and will be paid for at usual space rates in addition to the prize of $5.00.

MEYBERG

The Largest Radio Stock on the Pacific Coast

San Francisco

Send for 32 Page Remler Catalogue — Just off Press

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Everything the Amateur Wants

Stocks Guaranteed—Prompt Service from either address

VACUUM TUBES

C300 Cunningham Detector	$ 5.00
C301 Cunningham Amplifier	6.50
C302 Cunningham 5-Watt Power	8.00
C303 Cunningham 50-Watt Power	30.00
UV200 Radiotron Detector	5.00
UV201 Radiotron Amplifier	6.50
UV202 Radiotron 5-Watt Power	8.00
UV203 Radiotron 50-Watt Power	30.00
Moorhead Electron Relay	5.00
Moorhead VT Amplifier	6.50
Moorhead VT Transmitter	7.50
Moorhead Rectifier Tube	9.75

All tubes postage prepaid.

AMPLIFYING TRANSFORMERS

231A General Radio	5.00
226W Federal	7.00
A2 Acme, Unmounted	4.50
A2 Acme Semi-Mounted	5.00
A2 Fully Mounted	7.00
UV712 Radiotron	7.00

EVEREADY BATTERIES

765 Small 22½ Volt B	2.50
766 Large 22½ Volt B	3.50
774 Variable 43 Volt B	5.00
746 Special 108 Volt Amp. B	16.50
6 Volt 40 Amp. hr. Storage	18.20
6 Volt 60 Amp. hr. Storage	20.80
6 Volt 80 Amp. hr. Storage	24.05

REMLER APPARATUS

500 Moulded Bakelite Variometers	6.00
503 Moulded Bakelite Variocouplers	5.40
100 3-in. Bakelite Dial and Knob, 3-16 in, or 1-4-in.	1.00
330 Detector Panel Moulded Bakelite	8.00
331 Amplifier Panel Less Transformer	6.00
333 Amplifier Panel Less Transformer (With cam switch.)	9.00
810 Jr. Rheostat	1.00

REMLER APPARATUS

813 3 Amp. Panel Type Rheostat	$ 1.75
94 A Battery Potentiometer Unit	.75
94 Knob and lever for above	.45
96 Variable Grid Leak	.60
97 Fixed Grid Condenser	.35
400 3 Coil Mounting on base	6.50
3 Coil Mountings for Panel Mtg.	3.60

JEWELL METERS

0-100 Milliamps Flush Mtg.	8.00
0-250 Milliamps Flush Mtg.	8.00
0-500 Milliamps Flush Mtg.	8.00
0-15 Milliamps Panel Mtg. back-con.	15.00
0-500 Volt Meter	16.00
0-1000 Volt Meter	23.00
0-1500 Volt Meter	29.00
0-1, 0-2, 0-2½, 0-5, Thermo coupled Radiation Meter Flush Mtd.	12.00

MOTOR GENERATORS

Westinghouse 100 Watt 110 Volt 60 Cycle AC 500 Volt DC	85.00
Westinghouse 250 Watt 110 Volt 60 Cycle AC 1000 Volt DC with 87 Volt Grid Bias Tap.	145.00

CW APPARATUS

Pacent Universal CW Condensers, any capacity	2.00
CW Tuning Inductance	8.00
Variable Grid Leak 8000 ohm	3.00
Wireless Shop Condenser, 0008	9.00
231M Modulation Transformer	5.00
Kellogg Transmitter	3.50
Kellogg Transmitter, adjustable arm	4.75

TELEPHONES

Brandes Superior	8.00
Brandes Trans-Atlantic	12.00
Brandes Navy	14.00
Baldwin Type C Navy	13.75
Baldwin Type E	15.00
Baldwin Type F	16.25
Murdock No. 55 2000 ohm	4.50
Murdock No. 55 3000 ohm	5.50

JACKS AND PLUGS

Federal 1421 open Circuit Jack	$ .70
Federal 1422 single Circuit Jack	.85
Federal 1423 double Circuit Jack	1.00
Federal 1435 automatic Filament Control Jack	1.20
Federal 1438 automatic Filament Control Jack	1.55
Western Electric Plugs	1.30
Federal Plugs	2.00
Pacent Universal	2.00

SOCKETS

92 Remler Socket	1.50
156 General Radio	1.50
550 Murdock	1.00
R300 DeForest	1.60
DeForest Moulded Bakelite	1.40

VARIABLE CONDENSERS

230 Wireless Shop Panel Mtg. .0005	3.60
430 Wireless Shop Panel Mtg. .001	5.25
630 Wireless Shop Panel Mtg. .0015	7.50
1 Chelsea Mtd. .0011	5.00
2 Chelsea Mtd. .0006	4.50
3 Chelsea Unmtd. .0011	4.50
4 Chelsea Unmtd. .0006	4.00

REGENERATIVE RECEIVERS

Myco D12 175 to 25000 meters Detector 2-step Amp. less Coils and Tubes	165.00
CR3 Grebe Relay Special	68.00
CR3A Grebe Tube Control self-contained	47.50
CR5 Grebe 175-3000 meters tube control	85.00
CR6 Grebe 175-680 meters Det. 2-step	210.00
CR7 Grebe 5000-20000 Long wave Special	220.00

Every Wireless Experimenter should have a copy of our 200-page catalogue. 35 cents in stamps will bring it to your door, or it will be sent upon the receipt of an order covering $1.50 purchase.

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Send for Our Concert Schedule

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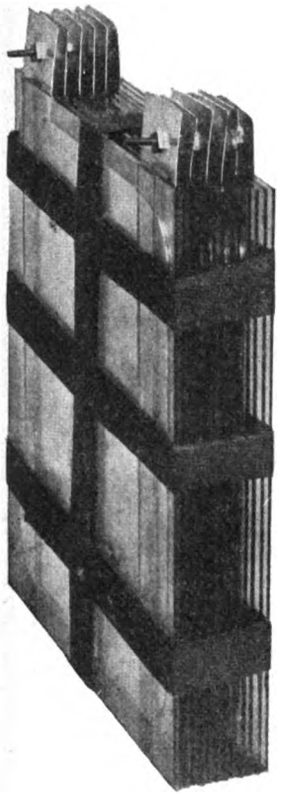
THE "BROWNIE" CONDENSER



An Oil-Immersed Condenser that will increase you radiation—

This is the type of condenser used by 6CH in his long distance work. Will not blow on a full K.W. Absolutely guaranteed to hold up or we will at once return your money. Constructed of a good grade of glass and aluminum plates. Glass insulating separators used. Capacity .006 mf. Container is made of hard oak and is leak-proof. Two large terminal bushings and binding posts, ae well as a safety gap, are mounted on top of the case. Large can of castor oil supplied with each condenser. Will increase your radiation considerably. Brush discharge reduced to a bed-rock minimum. If you want to be a "DX" man this season, you must use a reliable condenser.

PRICE ONLY $17.50

Rheostat and Dial Conbined

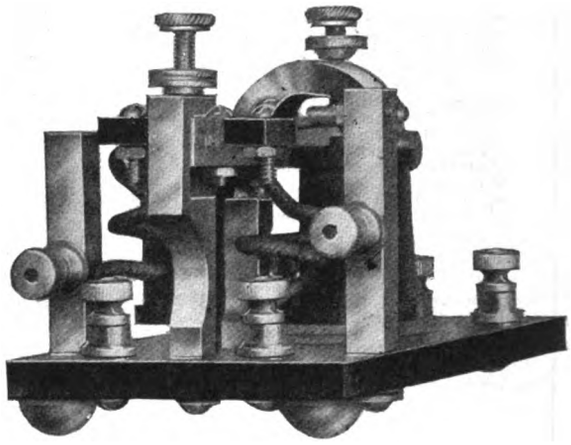
The latest invention of the Parkin Mfg. Co. is the new dial-rheostat. Both in one unit. Can be easily mounted on your panel. Has 3-inch dial, brilliant white enamel engraving. Off position for the rheostat. 360 degree rotation. Brass bearings. Bakelite knob. Rheostat will carry 2 amps. Resistance 5 ohms. Brass parts all nickel plated. The rheostat is secured in a groove under the dial. True running—smooth action. Send for one today. You will be pleased with it. The workmanship and design are perfect. And the price will knock you dead.

$1.75 POSTPAID

Break-in Keys

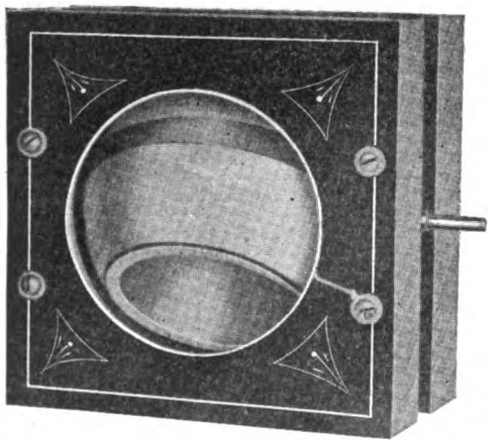
Dozens of Break-in-keys were sold last month. Have you heard 'em work on the air? Just listen to the fellow stop sending when someone else "butts in." Send and receive at the same time with this key. It handles 1 K.W. and is the simplest thing in the world to install. Breaks the transformer circuit, shorts the receiving set and shorts the phones,—all in one operation. Press the key and you send. Release the key and you receive. Works on three volts. No aerial switch or key needed if you use this system. No switches to throw—the relay does all. Ask your dealer to show it to you.

$9.75 Prepaid to any part of the U. S. Full directions for operating and complete wiring diagram given with each instrument. All orders filled immediately—No delays.



The peace-maker of the air

VARIOMETERS $4.50
VARIOCOUPLERS $3.50 FOR SEPTEMBER



These instruments are ideal for radio telephone concert reception. A complete regenerative set of two variometers and one variocoupler can be constructed at small cost.. Think of it—only $12.50 for the three of 'em. This special price offer is for the month of September ONLY! All orders must reach us before September 30th. IMMEDIATE DELIVERY—ORDERS SHIPPED ON THE DAY WE RECEIVE THEM. The variometer is constructed of high-grade material and the workmanship is of the best possible. We will refund your money, without question, if these instruments are not all we claim. 25c must be added for postage on each instrument.

Remember—your order must be in by Sept. 30th

Another New One Bakelite Encased Amplifying Transformer

Just out! This new transformer is a dandy. Well made. Enclosed in a BAKELITE CASE—no metal used in the transformer, except the core. Has composition binding posts — another good feature. If it don't work as good as any transformer you have ever tried, send it back to us and we will return your money. Can be mounted in any position. The price is unusually low for a good transformer. Try one of them—a test will mean that you will use them exclusively for your amplifier. Mailing charges 15 cents.

ONLY $3.75

WESTERN WIRELESS WORKS

5534 EDGERLY ST. OAKLAND CALIF.

The following dealers carry our Break-in-keys:

RADIO TELEPHONE SHOP, SAN FRANCISCO.
BENWOOD CO., ST. LOUIS, MO.
AMER. ELECTR. TECH. APPLIANCE CO., N. Y.
LEO J. MEYBERG CO., SAN FRANCISCO.
AM. RADIO SALES & SERVICE CO., MANSFIELD, OHIO
MESCO, ST. LOUIS, MO.

C.W. STATION AT BIG CREEK

(Continued From Page 47)

the mining machinery, lighting, etc. It was the constant breaking of this transmission line in winter that resulted in the use of CW for communication purposes.

At Big Creek Radio a relay may be connected with any of the Edison offices, so that the operator in Los Angeles can, if necessary, operate the radio key; this constituting "Distant Control." By connecting the same relay to Western Union lines time signals are daily sent out at noon, for the operators at 60 and 61 to get the "tick." The receiver consists of one DeForest Audion Control Panel, Type P-100, used in connection with two Vernier variable condensers of the same make, Honeycomb Inductances and one Two Step Audion Amplifier, type P-200.

The antenna in the case of the three stations utilizes 150 foot pine trees (with branches partly stripped off) for masts, suspending 5 wires (T type) 200 feet long and approximately 140 foot high. These stations have "Limited Commercial" licenses and are authorized to communicate only the company business. Two operators are employed at each station, but a continuous watch is not maintained.

It might be interesting to note that the International Morse Code is used exclusively on the Edison system, both radio and wire. For the latter a tone wheel is employed to give a musical hum to the signals on the wire. Telephone receivers are used.

These CW stations are delivering the "goods," as they are handling (each station daily) an average of 2,000 words, not including about 1,000 words of press matter for the benefit of the employes.

MEYBERG PHONE HEARD 1600 MILES

6XG, the radio telephone station of the Leo J. Meyberg Company, was reported QSA at a distance of 1600 miles west of San Francisco by the radio operator of the S. S. "West Hixton."

STATIC ELIMINATION

(Continued From Page 67)

cannot be eliminated from an electrical circuit without the proportional elimination of the other.

The elimination of static by treatment of radio wave-decrement, has been tried and failed utterly because of the greater audibility of static on all waves, caused by the more powerful electrical discharges.

The physical difference between radio and static lies mainly in their sounds. There are two kinds of sounds, viz: music and noise. Musical sounds are produced by regular vibrations, and excite a sensation which lasts a perceptible time without noticible change. Sounds which are produced by irregular vibrations, and which possesses none of the above characteristics are called noises. The steady high-pitched tones of radio transmitters may readily be distinguished as musical. The low, irregular sound of static is classed as noise. An instrument capable of separating these two sounds solves the static interference problem.

It was found, by experiment, that the most complete way of separating composite sounds was by the use of resonators. The writer constructed a form of resonator consisting of two brass half-spheres—a small brass tube projected from the center of one sphere, to which was attached a stethoscope; a watch-case receiver was mounted in the other. These spheres were mounted on a base with their openings facing each other, —the adjustment allowing separation and turning of the spheres.

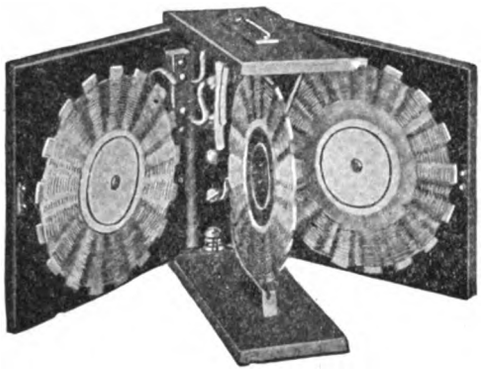
Very encouraging results were abtained with the watch-case receiver connected to an ordinary regenerative circuit, minus amplification. A point is reached in the adjustment of the resonator where static audibility is considerably reduced, and radio signals can easily be read through it. The static is NOT totally eliminated by this process; its audibility is simply reduced to a point where it ceases to seriously interfere with the reception of radio signals. A microphone was tried in place of the stethoscope with slightly better results.

The operation of the resonator may be explained thusly: In the adjustment of the resonator for loudest radio signals we tune it to the same mode of vibratian as the radio-signal tone; thus tuned, it is insensitive to the different static mode of vibration.

Elimination of static by the "sound treatment" method offers much room for development and experimentation. It is hoped that this article will serve as a source of encouragement to experimenters.

Editor's Note: This principle is employed in the "Nostat," perfected by Mr. Arthur H. Lynch.

SPIDER WEBS-



Cut Shows Front Panel Removed

Exclusive Westinghouse Agents for our Territory

are now manufactured on a large enough scale to have the price

REDUCED TO

lower than originally.. A **complete** regenerative set, the equal of any, for only

$5.50 Plus 30c Postage

The New 3000 Meter Set Will Be Out Soon

Distributed Exclusively in the West through

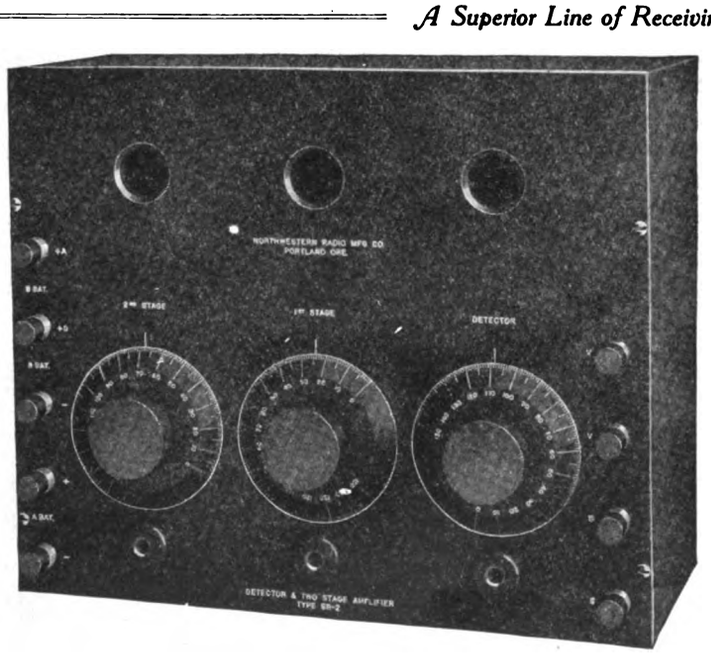
HERROLD LABORATORIES

"Everything for the Amateur"

467 SO. FIRST STREET **SAN JOSE, CALIF.**

NORTHWESTERN RADIO

A Superior Line of Receiving Apparatus



Detector and two stage amplifier Type SR-2. Size of panel 10 1-2x12 3-4. Complete less tubes and battery $70 f.o.b., Portland.

A detector and two stage amplifier that will give you results. This instrument is in use in many stations in the Northwest and its performance is a proven fact. You must see this set to appreciate its value. Material and workmanship are the best.

Specifications — Panel quarter inch grade XX bakelite dilecto. Gorton pantograph engraving. Oak Cabinet finished in flemish oak.

Knobs and dials are machined from sheet bakelite and turn TRUE. All socket supports are constructed of bakelite and cast aluminum.

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NORTHWESTERN RADIO MANUFACTURING CO.

1556 East Taylor Street **Portland, Oregon**

When writing to Advertisers Please mention Pacific Radio News

Classified Advertisements

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

RADIO CABINETS—Mahogany or oak finished or unfinished, to your design. Send rough sketch for quotation. Prompt service Formica cut to size. Radio supplies, parts, etc. Pacific Radio Exchange, 439 Call Bldg., San Francisco, Calif.

"LEARN THE CODE, THE EASIEST WAY. Key and buzzer practice sets with lever key code and instructions. Price $1.75 postpaid. Hytone adjustable buzzers 60c. Ajax Electric Co., 8 Palmer St., Cambridge 38 Mass."

FOR SALE—Hawkins Guides complete; Year Book 1914 and 1915; Wavemeter by Maubourgne; Engineering Principles by Lauer & Brown; Wireless Instruction by Hawkhead; Vacuum Tubes by Bucher; Wireless Telegraphy by Stanley; Storage Batteries by Niblett; Wireless Pocket Book by Fleming; 175 copies Experimenter, Wireless Age and Radio News 1914 to 1921. Excellent care has been taken of these books. What cash offer for the lot, F. O. B. Charleston. PEARCE, box 618, Charleston, Washington.

$3 brings you a Roller-Smith panel type hot-wire Ammeter, new, tested and in perfect condition. Regular price $13. Range, 0-2.5 Amp. Ideal for small C. W. transmitters. Unusual opportunity. Send prepaid or parcel post, C. O. D., for $3. Better act today, as the quantity is limited. C. J. GOETTE, 2JU, 1624 Hamilton Ave., Woodhaven, N. Y.

UNIT RECEIVING INDUCTANCES assure satisfactory, efficient and unparalleled long-distance reception of all forms of radio transmission. For long wave work our BI-LATTICE COILS (duo-lateral) need no introduction. For short wave reception a set of SINGLE LAYER COILS compares favorably with the best regeneratives; and the cost is but a fraction of the regular regenerative receiver. Send 3c for bulletin. Our prices and service will surprise you. P. J. Stockwell, Box 157-D, Reading, Massachusetts.

PUT YOUR STATION IN THE DX CLASS. Use a real synchronous gap. We can also furnish you with a Oscillation Transformer to match. Write for particulars and photographs. Let us quote you on parts for your CW set. Radio Supply and Mfg. Co. 23 Merriam Place, St. Paul, Minn.

CABINETS: Quartered Oak and Mahogany Cabinets made to your specifications. Finished or unfinished. Only the best material, workmanship and design used. Our cabinets contain no nails. Radio Telephone Shop, 175 Steuart St., San Francisco.

YOU should have a copy of Lieut. E. W. Stone's "Elements of Radio-telegraphy." 400 pages of data on all sorts of radio equipment. A valuable book. The price is only $2.50 per copy, postpaid. Pacific Radio Pub. Co., San Francisco, Cal.

ARC RADIO MANUALS, compiled by the Federal Telegraph engineers of San Francisco. Tells you all you need to know about the 2 and 5 KW arc sets for ship and shore use. Send to any address for $2.50 per copy, postpaid. Pacific Radio Pub. Co., San Francisco.

HOME MADE RECEIVING SET COMPLETE. Large bakelite panel and ase with rheostat and switches. Double filament tube. Eveready Storage Battery and Franco B Battery. Mica Grid Condenser and Fixed Condenser. Three large Murdock Variable Condensers with oil case. Twelve Honeycomb coils on plugs. Two Honeycomb coil adapters. This entire set for $40. Mesco radio buzzer, $1.50; Mesco Key, $1.50; Federal Amplifying Transformer, $5; Porcelain Base Rheostat, 50c; DeForest Tube, never used, $4.50; General Radio Base, $1.25; Common Base, 40c; two Spark Coils, $1 each; three Western Radio Unit Loads in case, Seven Point Switch, $1.25 each. Everything for $55. Martyn Cooney, 475 30th St., San Francisco, Cal.

A CLERGYMAN, wishing to dispose of his wireless outfit. offers some attractive bargains, viz: Remler panel, complete with bulb and B battery, $10.00; Paragon V.T. control, with B battery, $6.00; Universal receiving transformer, 2500 meters, $8.00; France battery charger, with ammeter, $10.00, and many others. For particulars address "PRESBYTER," this office.

A AIR HOG
By Squawk McGuff

I have been wondering all along
Just when I'm doing right or wrong.
Am I ever going to get in good
With this fighting amateur brotherhood?

If you have your set tuned to the minute,
And you give her all you can get in it;
Cut through static, rain, wind and fog
You go in the class of a air hog.

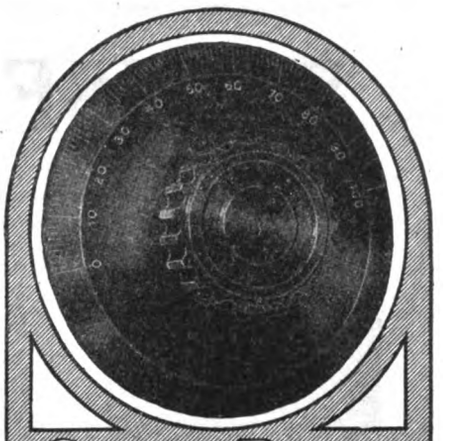
So often do I hear this phrase
That I never heard in bygone days.
They say I make considerable noise
And get the goat of all the boys.

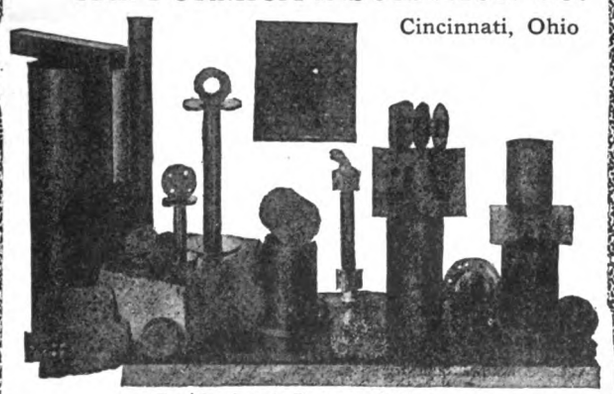
In the good old days of nineteen ten
You could always talk, no matter when,
But now-a-days there's too many in
It takes some spark to get thru the din.

How about the fellow who doesn't use N. A.?
Gets his party, then don't know what to say
Except "73" o.m. how do you get me?
I am just wondering, what is he?

How about the guy that sits on his key
Just to take his spite on somebody.
And is always reporting to satisfy a whim
Ah, I am wondering, what do you call him!

How about the pest with a glass arm?
Makes a noise like a Frisco fire alarm!
Who continually motions to close so and so
Does he hook up with principles of radio?





THE ANSWER TO THE BALLOON MYSTERY

(Continued From Page 51)

Only one man has the correct answer. He is 6AS—and he happens to be Brownie's brother. Step forward, please, 6AS, and collect your debt from us. Almost everybody knows that many years ago 6CH gambled with death and eternity in the performance of his duties of a "Balloon Daredevil." He has told you this story on the air many times and his radio shack is decorated with several photographs of the "Balloon Man." Many a time you have seen him hanging to the parachute ring with only the help of his toes. And, after all that he has told you, the many replies that we get to the question deal with nothing but "wind." So here's the answer:

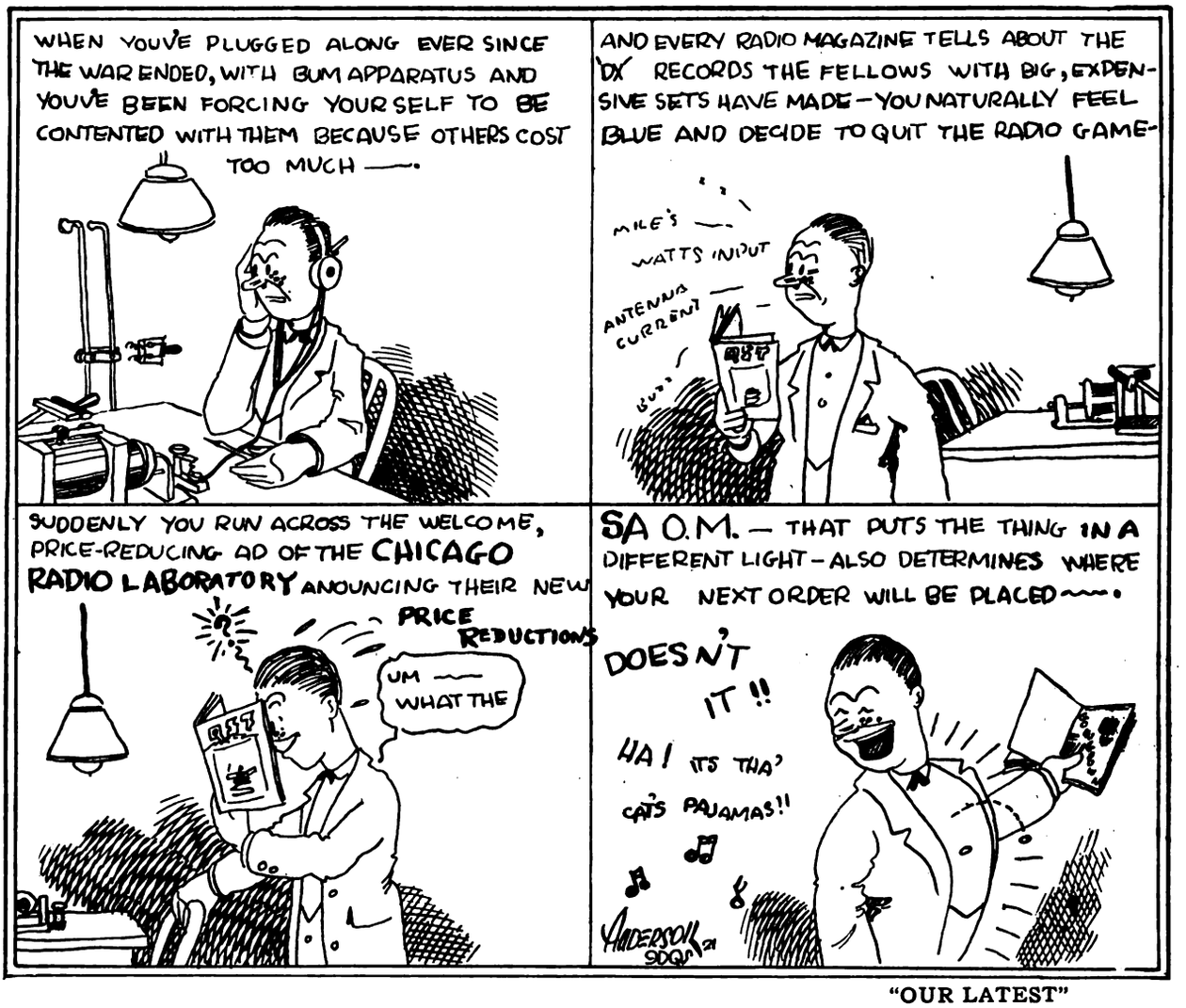
"The relation of Brownie to the balloon, or vice versa, is that "the air is their hangout."

ERRATA

On page 15 of the August issue there appeared an article by Mr. Frank E. Summers, entitled "Interrupters in Vacuum for Modulation in Transmission and Reception." The word DIELECTRIC is frequently used and the attention of our readers is called to the fact that this word should read DIAMAGNETIC throughout the article.

Don't forget to read the Classified Ads on Page 74.

Don't Feel Blue—Let the Tubes on your C. W. Set do that!



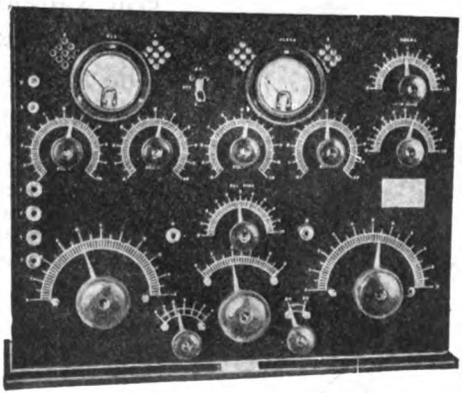
"OUR LATEST"

"Z-NITH" RADIO APPARATUS

Has Been Reduced in Price Approximately 15 Per Cent on Each Instrument.

These prices represent our contribution toward the reduction of the "High Cost of Radio."

Instrument	Old Price	New Price
Z-Nith Regenerator	$ 65.00	$ 55.00
Amplifigon AGN-1	75.00	64.00
Amplifigon AGN-2	105.00	89.25
Amplifigon AGN-3	135.00	115.00
Hyrad Disc	12.00	10.50
Hyrad Non.-Syn. Gap	65.00	49.00
Hyrad Syn. Gap	125.00	105.00
Jeweler's Time Rec.	75.00	69.50
Multiceiver MC-3	265.00	236.00
Altaceiver CW-3	300.00	254.00
C. R. L. Regenerette	12.75	12.75
One-Step Amp. AM-1	33.50	28.50
Two-Step Amp. AM-2	65.00	55.00
Detector AD	20.00	17.00
Detector ADP	30.00	25.00



Z-NITH MULTICEIVER MC-3

The most complete, efficient and flexible receiver ever designed. Described in detail in our Catalog F-21. Write for it.

CHICAGO RADIO LABORATORY

Office and Factory, 6433 Ravenswood Ave. **Testing Station 9ZN—5525 Sheridan Road**

CHICAGO, ILLINOIS

CONTEMPLATED DISTRIBUTION OF RADIO MARKET NEWS

Continued from page 66

Marketing Bureau of Missouri is looking forward to encouraging the installation of inexpensive radiophone equipment in thousands of farm homes throughout Missouri.

If this ambitious program is worked out to a success, there will be a new version in Missouri of the old poem entitled "Why Boys Leave the Farm." In addition to receiving valuable market information on wheat, live stock, cotton, fruits and vegetables and other farm products farmer boys and girls in Missouri will be able to sit in their homes and entetrain their friends by listening to a concert given by the Minneapolis Symphony Orchestra at Minneapolis, or to Galli-Curci in Chicago or New York. Hundreds of other events of intense interest are witnessed daily by boys all over the United States who have installed radio outfits at their homes.

Alfred Tennyson in his poem entitled "Locksley Hall," written in 1842, said:

"For I dipt into the future, far as human eye could see
Saw the Vision of the world, and all the wonders that would be;

"Saw the heavens fill with commerce, argosies of magic sails,
Pilots of the purple twilight, dropping down with costly bales;

"Heard the heavens fill with shouting, and there rain'd a ghastly dew
From the nation's airy navies grappling in the central blue;

"Till the war-drum throbb'd no longer, and the battle-flags were furl'd,
In the Parliament of man, the Federation of the World."

Truly, it does not seem to be such a "dip" into the future as far as Tennyson prophesied concerning commerce and naval engagements by air craft to the realization of the wonderful possibilities of the wireless telephone and telegraph. By "dipping into the future" only a few years, however, the Missouri State Board of Agriculture believes that thousands of Missouri citizens may be able to sit in their homes and hear the delegates in the legislative halls at Jefferson City relative to the "farmers' monopoly on food products," the question of "regulating airship traffic," and other important future topics for legislative consideration.

The first really big step in the Missouri program will be a radio exhibit at the Centennial State Fair to be held in Sedalia, August 8-20, 1921. This new idea in connection with a market exhibit at an agricultural state fair will certainly fit into the Centennial program,—Missouri's celebration of her 100th birthday. One does not have to go back into Missouri history or the history of the nation 100 years to make a comparison of the slow means of communication of former years to that of the wireless telephone as it has been so excellently perfected within recent years. This and other comparisons between modes of travel, communication, and living in Missouri in 1821, when that empire state was admitted into the Union, and 1921, will be made by hundreds of other exhibits at this great midwestern Centennial State Fair.

Doubtless, the radio market news furnished to the farmers attending the Missouri State Fair will remind them that marketing problems in the state in 1821 were quite different from those of today. Most any kind of news in that day in Missouri was more of a curiosity than an every day occurrence or necessity. Certainly market news of any kind for the farmer was unheard of in 1821. If it had been available, the crop of the next season would have been ready for market before the market news concerning the preceding crop could be received.

Who will venture to picture the state of affairs that will exist, not only in agriculture but in every activity of life, when the wheels of evolution shall have brought Missouri farmers back to Sedalia in 2021 to celebrate the state's second anniversary?

After the State Fair has ended commences the circuit of county fairs which last until the middle of October. While it may be impossible to get into each of the 114 counties of that big state, the Missouri Board of Agriculture intends that its State Marketing Bureau shall establish radio connections with many of the county fairs and its offices at the State Capitol at Jefferson City. This work will bring the feasibility of distributing government market news from the offices of the State Marketing Bureau at Jefferson City to the farmers in every county of Missouri in an intensive and practical manner. The installation of many radio outfits to connect the various counties with market news headquarters of the State Marketing Bureau will undoubtedly follow in the wake of this means of demonstrating the practicability of connecting the smaller towns and even the farm homes with the outside world by radiophone.

No let-up in this demonstration work is anticipated by those in charge of the work in Missouri. Connections will be made from time to time between the State Marketing Bureau offices at Jefferson City and various meetings of farmers and farm organizations, such as Farmers' Week, held at Columbia annually, various agricultural conventions held in St. Louis and Kansas City, meetings of Farm Bureaus, Farm Clubs, Granges and Unions.

Both manufacturers and jobbers of radio equipment are taking a keen and active interest in the Missouri program and will assist it by very substantial and effective means. It offers the first opportunity in the history of the radio for the promoters of the science of wireless communication to assist in a big program of showing the people of any state the value of the wireless telephone and telegraph.

Led by the State Marketing Bureau within the borders of their own state, Missourians, the "show you" folks, are going to be "shown" one of the most remarkable advantages offered by modern science. Other states will undoubtedly follow the example set by that great agricultural state.

Arrangements will be made to invite President Harding to speak from Washington to the Missouri State Fair folks during the two weeks' fair. Governor Arthur M. Hyde also will address the Missouri crowds by radiophone several times during the Centennial State Fair. Daily market news will be distributed through the crowds, and radio concerts will be given during the period of the great Centennial State Fair.

The equipment is being furnished by the Benwood Co.

Do Amateurs Realize the Wireless Opportunities that Await Them?

How the President of the National Radio Institute Answered this Question when it was Put up to Him. What would You have Said? Is the World's Fastest-Growing Field actually going to slip away from those best able to Cash in Big on it? These are Questions which will Interest Every Radio Amateur.

THAT was one of the questions recently put up to me by a well-known authority visiting Washington. "In your opinion," he said, "do amateurs realize the wireless opportunities that await them?" For a moment I was stunned! Then I replied, "Yes, with just one 'but.' I think that amateurs are well aware of the tremendous expansion of wireless that is daily going on. They realize that it is sweeping the world like wildfire. BUT I do not think that they realize what this means to them—they do not realize that they can easily get the 'plums' that the field offers. They have the 'jump' on everyone else, and they should realize now that 'the fastest-growing field in the world' besides being a fascinating hobby is a wonderful, opportunity-filled field offering splendid present advantages—and growing so rapidly that the future is beyond estimation!"

I wonder if many amateurs have ever considered the fact that what is to them a fascinating hobby is also a fascinating profession, filled with big opportunities that they can easily share whenever they are ready to do so. It's only a short step for them now to a splendid field that they can put their hearts into—and offering a bigger future than older businesses which are overcrowded.

Mr. James E. Smith, President, National Radio Institute

Big Opportunities Are Knocking—Are Some of Us Saying "Please Go 'Away and Let Me Sleep?"

After the caller who started me thinking about this matter had left, I jotted down on my pad some of the items which I had recently noted regarding wireless expansion. On land and on sea big opportunities are opening, and even greater uses for wireless are being found every day. No doubt you, too, have read these items, but I am going to have them printed here because I want to impress upon you what this tremendous expansion can mean to **you.**

When I read every day how wireless expansion is sweeping over the world I often say to myself, "Big opportunities are knocking—I wonder if amateurs realize that they can cash in big on this growing field. While opportunities knock, I wonder if some aren't saying, 'Please go 'way and let me sleep.'" Of course, they aren't sleeping by any means, but I want all of them to know just how easy it is to fully qualify for a field which is undeniably filled with greater advantages than most others in the world today.

EASY TO QUALIFY IN SPARE TIME—AT HOME

I want to tell you—without obligation to yourself in any way—more about wireless opportunities and how you can take advantage of them. I would like to tell you about our Institute, which is officially recognized by the United States Department of Commerce and whose name heads the list of the schools recommended by the U. S. Shipping Board. This National Radio Institute was the original and is today the oldest and largest school in America teaching wireless by mail. The government allows our graduates five to ten points credit when taking First Grade Government License examinations. We have graduates in almost every part of the world who have quickly qualified through the special method through which we make Wireless amazingly easy for anyone to learn completely at home in spare time.

These are some of the main points about this Institute and I am sorry I haven't room to tell you all of them. I should like to tell you more about our wonderful new methods of teaching, about our remarkable new invention, the "Natrometer," which each student gets free, and which almost cuts in half the time necessary to learn Wireless thoroughly. Then, too, I'd like to tell you about our free Post-Graduate Course and about "Dots and Dashes," about our Diploma, our Relay League, Employment Service, and about our special easy-payment plan. But there is not enough room here to tell you about all these things so I am going to ask you to write me for a new interesting booklet we have gotten up.

WRITE ME FOR BOOKLET

A little coupon is being put here so that you can save yourself trouble in sending for this illustrated booklet, "Wireless the Opportunity of Today." By mailing this coupon you will not be obligating yourself in any way and no solicitor will call upon you. But the coupon will bring you some mighty interesting facts about Wireless Opportunities and about how you can quickly and easily qualify for them—at home and in your spare

Won't you mail this little coupon at once? Whether you are a junior Radio Amateur and want to learn all about Wireless or whether you are anxious to fully qualify so as to enter the wireless profession now in one of the fine opportunities open on land or on sea—write me for this booklet. All that I ask is that you write as soon as possible. And—since there is no obligation—why not write me today?

P. S.—By the way, we are making a special short-time offer, for a strictly limited time, in which we are giving all new students, our complete new course in Wireless Telephony FREE. Mail the coupon direct to me, today, and let me tell you about it by return mail. Mr. James E. Smith, President, The National Radio Institute, Dept. 299, Washington, D. C.

Residence schools in Washington and Baltimore.

What I Jotted Down

Here are the items I jotted down on my pad, showing how Wireless is growing by leaps and bounds all over the world. Let me tell you what this world-wide sweep of wireless expansion means to you and to your future.

A $20,000,000 American corporation has been formed to establish wireless stations in every part of the globe.

The U. S. Merchant Marine operates over 30,000 vessels. Wireless is now a necessity on ships.

The Chicago Tribune now receives foreign news by wireless. Other papers are calling upon Wireless too.

Huge wireless stations are springing up all over the world. Saint Assise, France; Bordeaux, Ville Juif, and Lyons, France; Peking, China; Geneva, Switzerland; Shanghai, China; Fiji Islands; Warsaw, Poland—and these are but a few.

Many railroads are calling upon wireless to dispatch trains and carry on communication. The Lackawanna, The Louisville & Nashville, The Canadian-Pacific, The Nashville, Chattanooga & St. Louis, are some of them.——New York, Cleveland, Chicago and Detroit are connected by an inter-city wireless service.

Criminals are being intercepted by wireless through the Police Department of New York, Dallas, Chicago, and other cities.

Brokers, Bankers, Merchants, Manufacturers and other business concerns are calling upon wireless. John Wanamaker, Goodyear Rubber Co., Standard Oil Co., New York Stock Exchange, are only a few.

Farmers are getting Market and Weather reports daily by wireless in all sections of the country.

New wireless stations are springing up in every part of America. Belfast, Maine; Cape May, N. J.; East Pittsburgh, Pa.; San Francisco, Cal.; Helena, Montana; Seattle, Washington; Mobile, Alabama—these are but a few.

The Aerial Mail Service of the Post Office Department already has 12 radio stations in operation.

The Japanese are constructing a powerful station in the Orient.

A big new wireless service is being established between England and France.

The Federal Telegraph Co. is establishing a complete chain of stations on the Pacific Coast.

Messages are sent from the Philippine Islands to Washington (10,000 miles) in 3 minutes.

Daily wireless service between the United States and Japan is in full operation.——St. Johns, New Foundland, is operating a large service.

Danzig, in Europe, is carrying on large wireless operations.

Three tremendous stations are operating on Long Island at Easthampton, Port Jefferson, and East Moriches.

South America is planning to establish a chain of stations at Rio de Janeiro, Asuncion, Buenos Aires and Montevideo.

One single American concern offers wireless communication between the United States and France, England, Germany, Norway, Denmark, Sweden, Finland, Poland, Honolulu and Japan.

And these are only a few of the examples showing how Wireless expansion is spreading over the whole earth. It brings you amazing opportunities—and you can now easily grasp them.

MAIL THIS COUPON TODAY

Mr. James E. Smith, President,
National Radio Institute,
Dept. 299, Washington, D. C.

Send me your FREE book, "Wireless, the Opportunity of Today." Tell me about your Institute and your special short-time offer.

Name .....

Age ..... Occupation .....

Address .....

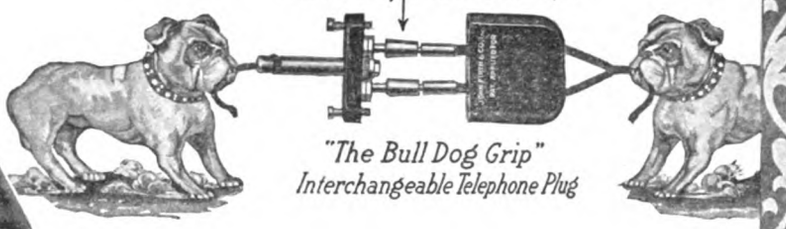
City ..... State .....

[ ] I am interested in a sea position.

[ ] I am interested in a land position.

Announcing the

FIRCO PLUG



Grips like a Bull Dog

Press the chucks outward, insert any standard telephone cord tip, and then,—"The harder you pull, the tighter it grips." The same slight pressure instantly releases the tips, so that you can use the plug for another instrument.

You can change from one pair of tips to another in less than 10 seconds. No forcing, no filing, no soldering.

The "Bull-Dog-Grip" makes a perfect electrical connection. Other exclusive Firco improvements reduce the capacity effect and dielectric loss to a minimum.

The Firco Radio Plug is provided in two styles, flat, and a new round type, similar to the U. S. Signal Corps standard.

With the round type, all that is necessary to get at the chucks is a few turns of the outer insulating sleeve. No screws to remove, no tools needed.

The flat type is made small and compact for use in small space and corners. A few turns of a screw driver releases the insulating sleeve.

Bring your station up-to-date. Use plugs and jacks thruout. Insist on Firco Plugs in individual cartons from your radio dealer. They fit all standard jacks and cost no more than other plugs without these exclusive improvements.

PRICES

FIRCO PLUG
(Patent applied for)
No. 34A, Flat type.....$2.00
No. 34B, Round type... 2.50

VOCALOUD
Station type $30.00
(In solid mahogany cabinet)
Laboratory type $25.00
(Mounted on adjustable metal base)

SACO-CLADS $5.00
(In individual cartons)

VOCALOUD

This clear-toned loud speaker is proving the sensation of 1921 radio. No batteries, no adjustments, no extra equipment. Just hook a Vocaloud in and get your signals QSA—all over your house.

SACO-CLADS

The 100% shielded amplifying transformer. No magnetic leakage and no howling. Six steps are entirely practical without howling or squealing. Provides the correct ratio of impedence for modern VTs.

Patent applied for

If there is any Firco product your dealer does not carry, send two cents for illustrated leaflet. Ask your radio dealer to show you the new Firco loose-leaf catalogue. Mailed direct for 25 cents.

John Firth & Company, Inc., 18 Broadway, New York

FIRCO RADIO

FIRCO Audion Detectors and Amplifiers
Radio Frequency Amplifiers
High Voltage Units
(any primary voltage)
Baldwin Phones
FIRCO Vocaloud
Saco-Clad Transformer
FIRCO Plug & Accessories
Navy Standard
Leyden Jars
Kolster Decremeter
Eldredge Meters
Brownlie Phones
Seibt Scientific Instruments

FIRCO RADIO EQUIPMENT

"Pioneers–since 1901"

Introducing

THE PEN BRAND DIAL

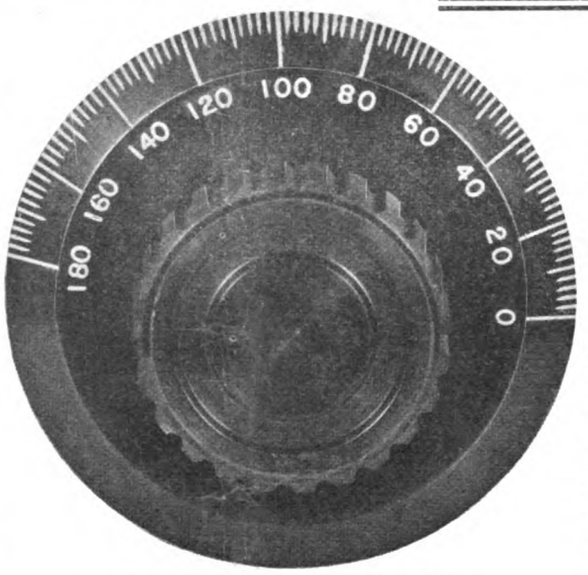
A three inch

CONDENSITE DIAL

(Unbreakable) with a large

DeForest Knob

3-in. diameter - $1.30
4-in. diameter - 1.75



"THE PEN BRAND 3 IN. DIAL"

At Last

A dial with a REAL knob. This dial is, without doubt, the prettiest instrument of its kind that has yet appeared on the market. It affords the user a very close adjustment on condensers or variometers on account of its generous sized knob. It fits harmoniously with the knobs used on DeForest instruments. This instrument is made of CONDENSITE and is indestructable. And it is lined straight. Specify PEN BRAND dials on the set you are constructing.

3-in. diameter. Price....$1.30
4-in. diameter. Price.... 1.75

FORMICA PANELS

3-16th thick. 2¼c per square inch.

Cut to **exact** sizes, with edges smoothed off. To find the exact cost of a Formica Panel (3-16th thick) multiply the heighth by the length to get the square inches, and multiply the square inches by .02 1-4, which gives the exact price of the panel in dollars and cents.

For polishing panels to a high gloss finish, add 75c per square foot. 75c minimum charge.

Marking out panels for drilling, $2.00 per hour.

For drilling panels bought from us, we charge $1.00 when panel is "center-punched."

NEW—B BATTERIES

REAL 45-volt B Batteries, at last. The Battery is made up of 33 cells, instead of the usual 30 cells as found in other batteries. Has seven positive terminals, starting with approximately 18 volts and the last tap is 45 volts. This Battery made especially for amplifier sets and for Electron Relay tubes. Price $5.00.

COME TO US WITH YOUR PANEL TROUBLES AND SAVE MONEY

PEN BRAND PRODUCTS

Pen Brand Series — Parallel Switches, now	$1.00
Pen Brand Grid Condensers, now	.65
Pen Brand Small Switch, DeForest knob	.45
Radio Corporation Grid Leaks	1.25
Murdock No. 55 2000-ohm phones	4.50
Murdock No. 55 3000-ohm phones	5.50
DeForest f-500 Rheostat, new.	1.75
DeForest all bakelite socket, new	1.50

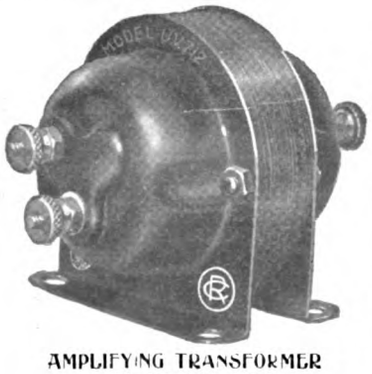
CABINETS

made to your specifications. Quartered oak or mahogany, finished or unfinished. Hinged top cabinets cost but a few cents more. Come in and see the ones we offer. They are the best obtainable.

AERIAL WIRE—SPECIAL

No. 14 hard drawn copper wire, 50c per pound (about 80 feet to pound). This offer expires September 25th. All orders must be in by that time. Here is your chance to get a new aerial at a reasonable price.

When in need of apparatus get TRTS (the Real Time Savers) service. Orders shipped the same day as received on nearly all standard makes of instruments. All materials sent parcel-post prepaid.



AMPLIFYING TRANSFORMER
Model U.V. 712
Price, $7.00

A new inter-tube tone frequency amplifying transformer designed to make Radiotron Detector, U.V. 200 and Radiotron Amplifier Tube, U.V. 201, the most effective vacuum tubes on the market today. Tests have proved this conclusively.

Special bulletin containing detailed data and circuit diagrams for the use of U. V. 712 will be sent upon request.

Thousands of these sockets are now in use throughout the amateur field. They will fit the Radiotrons U. V. 200, 201, and 202 insuring reliable contact under all operating conditions. Moulded unit made to fit and last, and backed by the R C stamp of quality.

STANDARD BAKELITE SOCKET
for Radiotrons U. V. 200, U. V. 201, U. V. 202
Price, $1.50

THE RADIO TELEPHONE SHOP

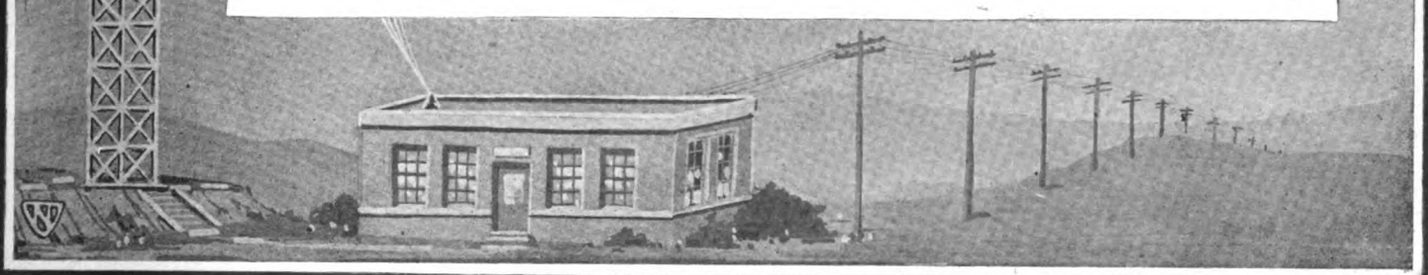
Agents for Radiotron Apparatus in Utah, Nevada, New Mexico, Arizona, California, Oregon, Washington.

175 STEUART ST. **SAN FRANCISCO, CAL.**

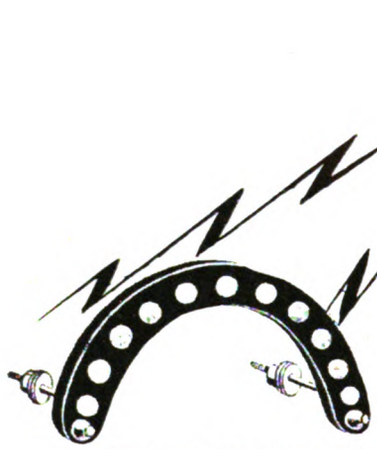
OCTOBER, 1921 TWENTY CENTS

PACIFIC RADIO NEWS

Pioneer Journal of Western Radio News and Development.



REMLER ACCESSORIES FOR CUNNINGHAM RECEIVING TUBES



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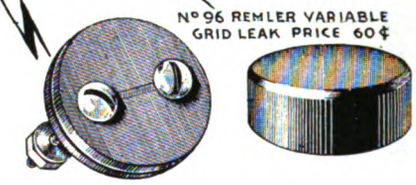
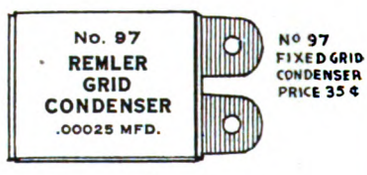
UNIT ONLY PRICE 75 ¢

CUNNINGHAM C-300 GAS CONTENT
DETECTOR PRICE $5.00



No 96 REMLER VARIABLE
GRID LEAK PRICE 60¢



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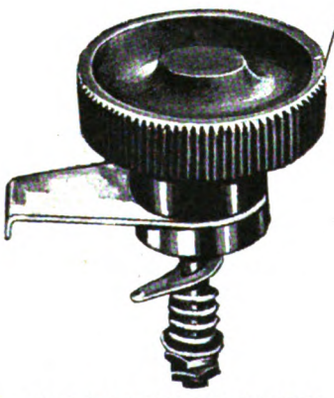
FIXED GRID
CONDENSER
PRICE 35 ¢



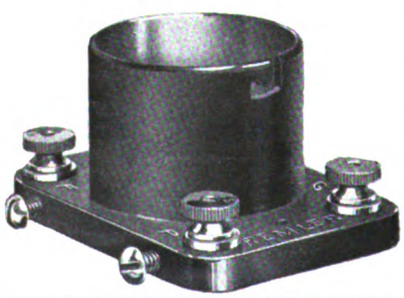
No 95 PLAIN TYPE ROTARY LEVER
SWITCH 1" RADIUS PRICE 60 ¢

No 810 REMLER JR. PANEL
RHEOSTAT 4 OHMS RESISTANCE $1.00

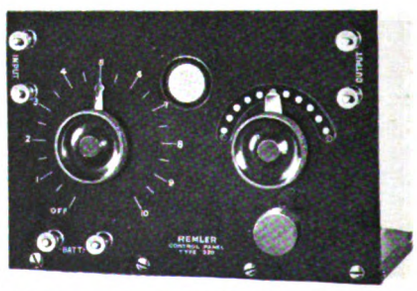
Remler Guarantee

THE value of any guarantee is not in the wording, but in the policy back of it. My policy (Audiotron) known since 1915—that the customer is always right—is your absolute guarantee of a square deal. Remler Apparatus is fully guaranteed and any item can be returned for exchange, or if you wish, your money will be refunded in full.

E. T. Cunningham



No 92 REMLER BAKELITE MOLDED VT. SOCKET
PANEL OR TABLE MOUNTING PRICE $1.50



REMLER TYPE 330 DETECTOR PANEL WITH A-BATTERY
POTENTIOMETER PLATE VOLTAGE CONTROL $8.00

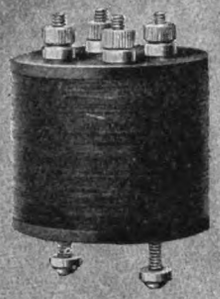
REMLER RADIO MANUFACTURING COMPANY

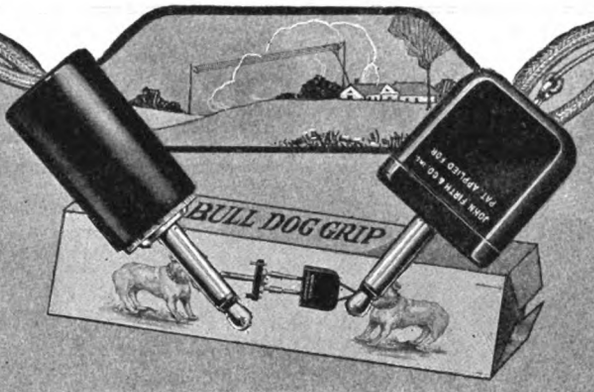
163 SUTTER ST.
San Francisco, Cal.

E. T. CUNNINGHAM
General Manager

154 W. LAKE ST.
Chicago, Ill.

Apparatus that Radiates Quality

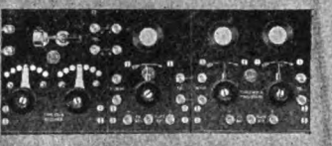




FIRCO SACO-CLAD
amplifying transformer

FIRCO RADIO EQUIPMENT

FIRCO VOCALOUD
Station Type



THERE might be a full page ad devoted to every instrument on this page. But the actual apparatus is far more convincing than anything we could say. So we simply refer you to your dealer. He has our elaborate loose-leaf catalogue, and will gladly obtain any instrument you ask for. In fairness to yourself, insist on examining Firco instruments before you buy.

Firco Saco Clads
(Patent applied for thruout the world.)
100% shielded. No magnetic leakage, and no howling even with six steps. Price, in individual cartons, $5.00.

Firco Standard Apparatus
Equal to apparatus supplied to the Government. Solid mahogany cabinets. One to six-step amplifiers. Detector and two-step, shown, $75.00.

Firco Audion Sockets
¼" Bakelite base, nickeled brass tube, wide phosphor bronze contacts, and other exclusive features. Unequalled value. Single, $1.10; Triple, $3.50.

Brown Phones
Standard of Great Britain and Europe. Ultra-sensitive, 4000 ohms. Weight only 10 ounces. Reduced in price Type A, adjustable, $18.00, was $22.00; Type D, for phone work, $16.00 was $20.00.
Imported Seibt Adjustable Phones, 2000 ohms, $12.75

Vocaloud
This clear-toned loud speaker is proving the sensation of 1921 radio. No batteries, no adjustments, no extra equipment. Station type, in Polished mahogany Cabinet, as shown, $30.00; Laboratory type, mounted on adjustable base, $25.00.

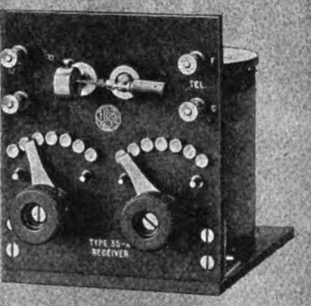
Firco Midget Units
Quality equal to Standard Apparatus, but greatly simplified. Set of three units (Tuner, detector and 2-step), $56.00; Tuner, $15.00; Detector, $11,00 and other units at equally reasonable prices.

Firco-Eldredge Meters
All nickel plated flush type. 600 volt meter, with multiplier, $14.00. Other ranges, moderate prices.

Firco "Bull-Dog-Grip Interchangeable Telephone Plug.
Insert or remove any standard cord tip in 10 seconds. Then, "The harder you pull, the tighter it grips." Type 34A. flat, $2.00; Type 34B, round, $2.50.

Leaflet describing any one instrument, sent for your dealer's name and 2 cents. Loose-leaf catalogue, 25 cents.

FIRCO MIDGET UNITS
(Tuner, detector and 2-step, $56.00)



FIRCO STANDARD
Detector and 2-Step

FIRCO VACUUM
TUBE SOCKETS

FIRCO MIDGET
receiving UNIT

John Firth & Company, Inc.
18 Broadway New York
"Pioneers - Since 1901"

FIRCO RADIO

IMPORTED BROWN
supersensitive PHONES

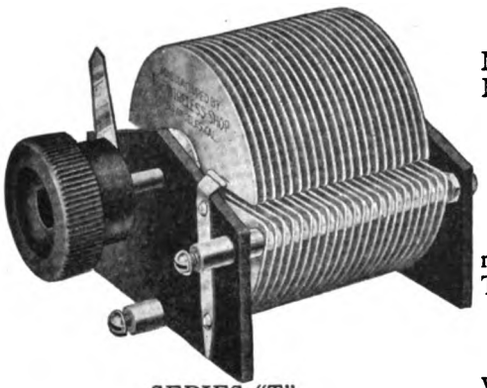
FIRCO 600
Volt METER

THESE NEW FIRCO RADIO INSTRUMENTS are typical of the quality of apparatus which we have been supplying to the Government departments for many years—yet the prices are unusually low.

And remember, only a few of the instruments are illustrated here. ***John Firth.***

QUALITY OR PRICE?

Which are You interested in?



SERIES "T"

WOULD YOU RATHER TAKE AN INFERIOR INSTRUMENT AND SAVE A FEW CENTS—OR—PAY A LITTLE MORE AND GET THE BEST?

IF YOU WANT THE **BEST**—BE SURE AND SAY—

"WIRELESS SHOP PRODUCTS"

"WIRELESS SHOP" VARIABLE CONDENSERS are now recognized as the standard. Why are they so popular? There's a reason—

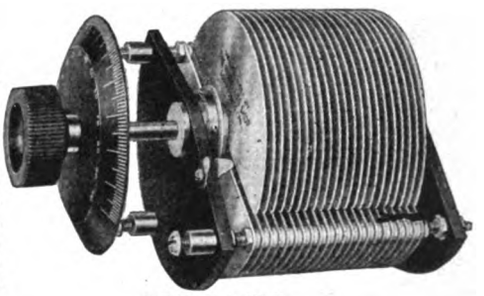
BEST of material and workmanship—

Careful inspection, and NO COMEBACKS. ISN'T THAT W ORTH SOMETHING?

THE "WIRELESS SHOP" LINE INCLUDES EVERY TYPE OF RECEIVING INSTRUMENT

Our "Series T" variable condenser is the IDEAL instrument for your receiving set. Supplied with knob and pointer and mounting screws, either brass or nickle, at the following prices:

No. 20	2	plate Vernier Condenser	$2.00
No. 70	7	plate, approximately .0001 m. f. maximum capacity	2.35
No. 130	13	plate, approximately .0002 m. f. maximum capacity	2.75
No. 170	17	plate, approximately .0003 m. f. maximum capacity	3.15
No. 230	23	plate, approximately .0005 m. f. maximum capacity	3.60
No. 310	31	plate, approximately .0007 m. f. maximum capacity	4.30
No. 430	43	plate, approximately .001 m. f. maximum capacity	5.25
No. 630	63	plate, approximately .0015 m. f. maximum capacity	7.50



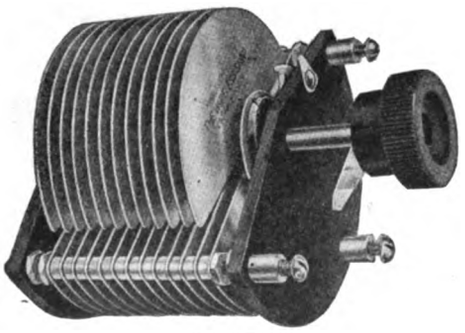
SERIES "L"

IF YOU REQUIRE A HEAVIER MODEL THAN THE "SERIES T"—OUR "SERIES L" WILL FILL THE BILL. Larger plates and heavier construction throughout. Supplied with knob and pointer and mounting screws, brass or nickel.

PRICES

No. 2300	23	plate, approximately .00075 m. f. maximum capacity	$ 6.00
No. 4300	43	plate, approximately .0013 m. f. maximum capacity	8.00
No. 6300	63	plate, approximately .002 m. f. maximum capacity	10.00

Include postage for two pounds on No. 2300 condenser and for three pounds on No. 4300 and No. 6300, and insurance, to your postal zone.



SERIES "CW"

AND—OUR SERIES "CW" IS THE **ONLY** REAL CONDENSER FOR YOUR PHONE OR "CW" SET.

The plates are amply spaced to prevent spark-over on high plate potentials, and the construction is extremely rigid. With knob and pointer and mounting screws, the prices are:

SERIES "CW"

No. 1500	15	plate, approximately .0004 m. f. maximum capacity	$6,00
No. 2500	25	plate, approximately .0006 m. f. maximum capacity	7.50
No. 3500	35	plate, approximately .0008 m. f. maximum capacity	9.00

Include postage for two pounds on No. 1500 condenser, and for three pounds on No. 2500 and 3500, and insurance, to your postal zone.

IMPORTANT ANNOUNCEMENT—Watch our ad. next month announcing our new VERNIER, which may be attached to any standard "Wireless Shop" Variable. And the price is so low it will surprise you. See it next month.

THE WIRELESS SHOP

A. J. EDGCOMB

511 WEST WASHINGTON STREET LOS ANGELES, CAL.

VOLUME III OCTOBER, 1921 NUMBER 3

PACIFIC RADIO NEWS

ARTHUR H. HALLORAN
Editor
LAWRENCE MOTT
Assoc. Editor
H. W. DICKOW
Business Manager
151 Minna Street,
San Francisco, Cal.
Nov. Issue forms close on Oct. 1st.

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RADIOTORIAL
By the Editor

Wherein the New Editor Introduces Himself

AT his first appearance before the reading public he is to serve, an editor is expected to drop the mantle of his multiple personality so as to draw a pen picture of himself and to outline his editorial policy. Thereafter "never again" on the tall, vertical pronoun.

Arthur H. Halloran,
Editor of "Pacific Radio News"

So I, Arthur H. Halloran, being duly sworn, do depose and say that I am a Westerner by birth, an engineer by profession, a publisher by vocation and a radio enthusiast by avocation. As a boy I learned to set type, was editor of two amateur papers, and was manager and editor in turn of an engineering magazine at the University of California. Then I was with the Mining and Scientific Press for three years as associate editor and as advertising manager, with the Journal of Electricity for ten years as managing editor and have just ceased to act as Pacific Coast representative of the McGraw-Hill Book Co. I am young enough to play with my own two boys and old enough to enjoy a heavy reputation as a scientific high-brow. Furthermore, I have been actively identified with several electrical associations.

My intention as editor is to carry on the good work that has already been started in these columns, with the hope of making each issue bigger, better, and brighter than the one before. New features and new departments are to be added. The needs of the beginner, as well as those of the more advanced worker, are ever to be kept in mind. The enlarged scope of the paper will be made evident by the new name RADIO, which will greet you on the cover of the next issue. Yet all of the old features that have endeared P. R. N. to the hearts of its readers will be retained. Especial attention is to be paid to C.W. work under the direction of Mr. Lawrence Mott, who will continue his writings as associate editor.

You and I are young in the world of radio, which opens up a vast new continent for discovery and development. Radio communication is making the world, and mayhap the universe, smaller. Maxim predicts wireless transmission of power. Marconi believes that he has intercepted messages from Mars. The man who says that something is impossible is interrupted by some one doing it. Every day witnesses new applications of the hitherto dark octaves of etherial vibrations. Yesterday's dreams are today's experiments and tomorrow's actualities. There is always something new and interesting to learn in radio, and it is my function as editor to help you in so doing.

But this can be done satisfactorily only by your letting me know what kind of articles you would like to read and by your submitting news about your work for publication. When you solve some knotty problem, when you hear some interesting bits of news, or when you learn of something that will help your fellow worker in the radio field, send it along so that it may be printed. "Your light is none the less for having lit that of your neighbor"; your magnet is none the weaker for having magnetized his; your radiations are none the less powerful for being picked up by some distant amateur.

Also let me know what is your big problem, what there is about radio that you do not understand, and what kind of articles you prefer to read. Your criticism or praise, your questions or needs, will be my guide in trying to give you the kind of a paper you want to read. An editor is not a mind-reader but must depend upon constant expressions of opinion from his readers in order to help them and hold their interest. It is really the readers that make a paper. You can help to make RADIO the foremost paper in its field. The more you help the better you will be served.

Therefore let it be our slogan—yours and mine—"All together, all the time, for everything in radio."

ARTHUR H. HALLORAN.

(Radiotorial Continued on Next Page.)

RADIO PATRIOTISM AND PREPAREDNESS

By Lawrence Mott, Associate Editor

IT was the immortal Theodore Roosevelt who cried: **"Preparedness"** from the housetops! And yet no American that ever lived desired **peace** with greater intentness than did President Roosevelt. But he was thoroughly aware of the fact—since, adequately proven!—that "Peace" is as yet by no means universal in the hearts of mankind. I remember one of his favorite maxims: **"It is a good lesson for nations and individuals to learn, never to hit if it can be helped, and never to hit soft!"**

Under the Harding administration many strides forward have been taken, and are being taken, for the well-being and safety of the nation, and the War Department, recognizing the potential value of the cordial and sympathetic co-operation of **amateur radio energy,** has decided to undertake a carefully-laid plan to further encourage amateurs in their radio efforts, and at the same time to lay the foundations for a **most useful**—and very large—body of men, should occasion ever arise for their need.

Through the courtesy of The Signal Officer, Ninth Corps Area, stationed at San Francisco, I have been supplied with as much data as is—so far—available—and that deals with the formation, in November, of a force to be officially known as **"Organized Reserves"**—of which The Signal Corps, Reserve, will be one branch. Members of this Corps will be taken from the amateur rank and file, according to certain qualifications and gradings—to be formally announced at a later date.

Ere I proceed to give a brief resume of the intents of the War Department along these lines, I would **earnestly** point out to all amateurs that this is an opportunity—not only to advance their own radio education, vastly—but an opportunity of great strategic value, of vast importance, and one that no red-blooded American amateur radio operator—boy or man!—should heedlessly pass by! To me, the greatest sin of them all is: **lack of patriotism!** In other words—the spirit that permits **Bill** to go out and fight!

The story—writ' large in the Hall of Eternal Records—telling of American deeds on European fields of battle must ever be an incentive to us who follow after! An incentive to emulate, that must NOT be allowed to become tarnished by Time and dulled by Forgetfulness!

Now then: (quoting from official information):

"Congress has authorized the organization of a branch of the Army of the United States, to be known as the **'Organized Reserves.** Training will be given members, subject to the availability of appropriations, by attendance at camp for a period probably not to exceed two weeks each year, all clothing, equipment, and subsistence to be furnished by the United States for the purpose and period of training, and the regulations provide that each member of the Reserve Corps reporting at camp will receive five cents per mile travel allowance.

"The mobilization of the members of the enlisted Reserve Corps is effected through mobilization of the organizations to which they are assigned or attached. Orders directing mobilization will be transmitted through the usual channels. If a certain Signal Corps Unit were ordered out for two weeks' training, members of the unit would be notified, and—according to existing regulations—would be given 60 days in which to prepare for leave of absence from their usual duties.

"In order to have the most successful period of training, members of the radio company should be as nearly radio operators as possible, before going to camp. Training before going to camp is, therefore, **essential.** This is important, also, in that were an **emergency to develop,** these men would be ready immediately upon mobilization to give our Army the very best, quickest and most available communication possible—by radio telegraphy.

"There are apparently two methods of procedure: **First**—to fill up the organization with amateurs who are well advanced in radio, and who may be used as a nucleus for the organization of a Corps radio net, purposed to give instruction in radio telegraphy, and which would begin functioning immediately the organization is completed. **Second**—to secure as the balance, those amateurs whose education can be advanced by such code training and other instruction as the Signal Corps is able to provide, by using the means at hand—particularly the new stations under construction—and by correspondence instruction.

"As to those of the first class mentioned: There is little that can actually be done for them in instruction, except perhaps high speed code training and the development of their knowledge of Signal Corps duties, by distribution of Signal Corps literature and subsequent discussion of same by correspondence. The establishment of the Corps Area amateur reserve net would of course include the stations now controlled and operated by the amateurs of the first class, and control stations could be established which could co-ordinate the practice traffic. In addition, it is thought entirely practicable to grant permission to any amateurs, members of the Reserve Corps to visit any of the Signal Corps stations and "sit in" under the direction of the operator in charge, and thus secure practice in handling traffic. No practice code or traffic should be handled on a wave or at a time which would interfere with the regular American Radio Relay or other amateur activities

"The training in code will be a function of the Signal Corps stations now under construction. It is possible that outlying stations, owned and operated by members of the Reserve Corps, would be called upon to relay practice traffic and code, and, if so, the Signal Corps would furnish (if it can be arranged), the relay apparatus. Also, in an emergency the more powerful and better of the amateur stations would certainly be of great assistance to the Army. Relaying is mentioned because we do not know as yet just what results will be secured from the new Signal Corps stations.

" It is hoped that the second class mentioned will be, at first, in the minority. In any event, their education must be undertaken. It is probable that a correspondence course on Signal Corps radio equipment, which would obviously be a course of instruction covering radio in general, and only specializing on Signal Corps radio equipment, would be entirely feasible. In addition, the Signal Corps would attempt to send out code instruction to this class—also, at regular intervals to maintain liaison by correcting code lessons sent in.

"The radio stations under construction in the Ninth Corps Area will be at the Presidio, San Francisco, California; Fort D. A. Russell, Wyoming, near Cheyenne; and at Fort Douglas, Utah, near Salt Lake City. If the tube transmitters work as expected, a daylight range of 1000 miles C. W. transmission should be secured, and at least 300 miles daylight telephone transmission. Several others are being constructed throughout the country and will form the Army radio net of the United States. At such places as the Signal Corps School of Presidio of San Francisco, instruments will be available for the calibration of amateur sets, and every assistance will be given members of the Reserve with a view to the development of their sets and advancement of their education. It is contemplated that at scheduled times, signals will be sent from the Signal Corps stations in this Corps Area on certain definite and standardized wave lengths, which will be of great assistance to operators in the precise calibration of their receiving apparatus.

"The time is not quite ripe for applications to be filed for membership in the Reserves. Complete information regarding this will be published as soon as available.

"If the patriotically inclined young man can only be made to realize that he is a part of the 'big scheme' and that he or his station may be called upon to actually function as an invaluable link in our lines of communication, were a national crisis to arise, it is possible he may give his sincere co-operation to the development of our amateur radio reserve. There is a large quantity of first class, live amateurs, of eligible age, who would surely make up the personnel of a fine organization. It is hoped that we can interest men of good education, so that the organization as a whole will be composed of the very 'top-notchers' of the amateur fraternity."

More words of mine are unnecessary!

The above MUST appeal to American youth and manhood! I shall be deeply interested to watch future developments, as my faith in my fellow countrymen is **—unbounded!**

I would suggest that all inquiries for further information be addressed directly to **The Signal Officer, Ninth Corps Area, The Presidio, San Francisco**—and not to me, as I should but have to make inquiry of him —anyway!

LET'S GO!

Construction of a 20-Watt C. W. and Radio Telephone Set

By O. Schuwendt

A COMPACT and efficient four-tube C. W. and radio telephone set built by the writer may be duplicated by any experimenter who will study and apply the directions in this article. The set, as originally designed and built, uses four 5 watt V.T.2 transmitter tubes as oscillators. With a plate voltage of between 350 and 375 volts no difficulty is experienced in obtaining a radiation of between ¾ and 1 ampere, although with Radiotron, Cunningham or A.P. transmitter tubes, which the writer advises the prospective builder to use in the set, a radiation of between 1½ and 2 amperes should be easily obtained without overloading the tubes.

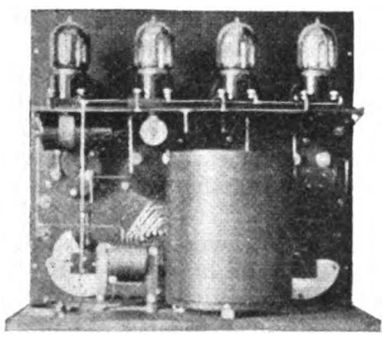


Fig. 1 (Above) Rear view of panel.

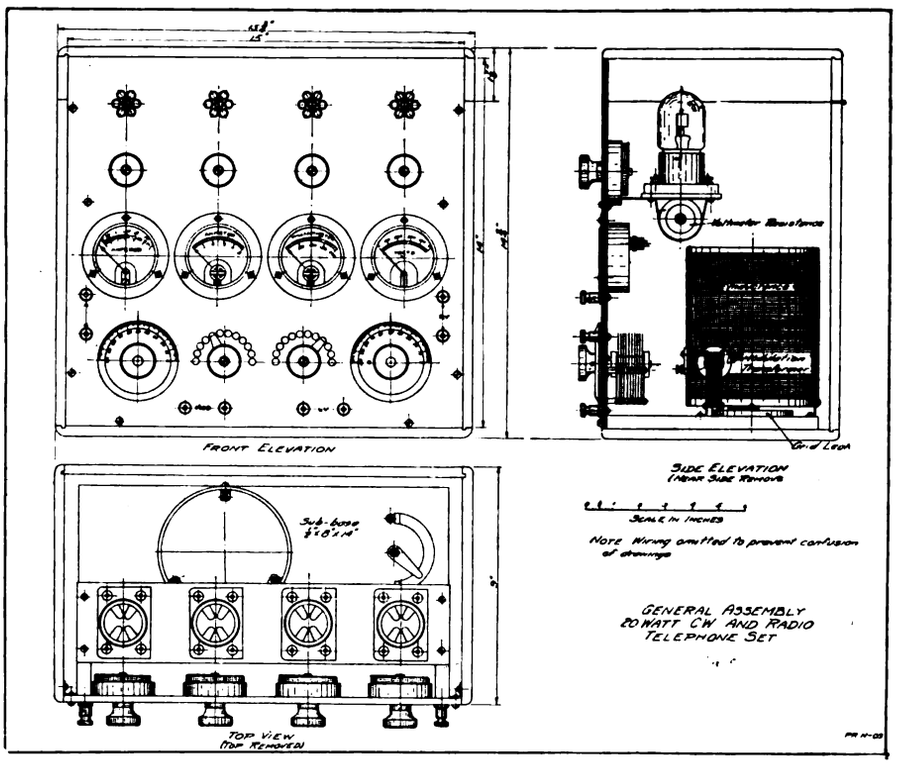


Fig. 2 (To Right) General Assembly Drawing.

The arrangement of the various pieces of apparatus required in the construction of a highly efficient C.W. transmitter must be compact. Short connecting leads are essential. But compactness must not give way to efficiency. The general arrangement of mounting the apparatus shown on the panel in illustration is an excellent one. Care must be exercised in wiring the transmitter in such a manner that the high tension leads will not interfere with those carrying the low tension current. Nickel plated hard-drawn copper wire is well adapted for the bus-bar type of connections. Rounded corners and firmly soldered connections will not only add to the appearance of the wiring, but will prevent loss from leakage. All connections terminating into binding posts should be soldered. Do not depend on screw-and-nut connections. They will often work loose.

Fig. 1 is a rear view of the panel removed from the cabinet. The builder should note especially the rigid type of bus wiring used, all connections being as straight and direct as possible. Fig. 2 is a general assembly drawing which will help to make clear certain points which cannot be readily seen from the photographs.

Referring to the drawing Fig. 2, the holes at the top of the panel are for observing the brilliancy of the filaments when the tubes are lighted. The rows of knobs, directly below these holes, are the knobs of the rheostats for controlling the filament current of the tubes. The row of meters below the rheostats are, from left to right, hot-wire ammeter, filament ammeter, plate milliammeter and voltmeter. Below these meters are the aerial tuning condenser, wave length switch, plate circuit switch and grid condenser. The two binding posts at the left of the panel are for aerial and ground connections, while those at the right are for connection to the high voltage source. The two lower right hand posts are for filament current, while the two at the lower left are for the source of modulation and are connected to the primary of the modulation transformer. By connecting either a battery and microphone or a buzzer and battery in series with a key to these posts the set may be used for voice transmission or buzzer modulated telegraphy respectively.

No means is provided in the set proper to change rapidly from one method to the other, but this can easily be taken care of by means of a small single pole double throw switch outside the set. For straight C. W. telegraphy the writer believes that the best method to use is the compensated wave, by placing a key in the ground lead with seven or eight turns of heavy wire wound in a coil 3 inches in diameter connected across its binding posts. This will make the emitted wave length about 8 meters longer with the key up than when it is depressed, and on 200 meters this is enough difference to eliminate the sound of the other wave when tuned to either one.

In Fig. 3 is shown the wiring diagram from which can be seen that the circuit used is the familiar Colpitts with grid method of modulation. While this method of modulation is not the best, it is the belief of the writer that the set will be used more for straight C. W. telegraphy than for either buzzer modulated telegraphy or radio telephony by the average experimenter, and therefore the builder can afford to sacrifice somewhat on the degree of modulation in order that he may have the two extra tubes available for use as oscillators and consequently more output without using a complicated switching arrangement to accomplish this, as would be the case if they were used for modulating.

In the wiring diagram the following designations are used:

L—Inductance (see further description).
C-1—Aerial tuning condenser .001 mfd.
C-2—Grid condenser .0005 mfd.
C-3—Filter condensers 1 mfd. 1000 volt tested.
R-1—Filament rheostats.
R-2—Grid leak 10,000 ohm semi-circular graphite potentiometer.
B-1—Filament battery. Low voltage A.C. from step down transformer may be used.
B-2—6 volt battery to operate buzzer and transmitter for modulation.
MA—Milliammeter.
A—Filament ammeter.
V—Voltmeter.
HWA—Hot-wire ammeter.
HFC—High frequency choke coil.
AFC—Low frequency choke coils.
MT—Modulation transformer.
Buz.—Buzzer.
Mic.—Microphone transmitter.
Sw.—S.P.D.T. switch for changing from voice to buzzer modulation.
G.—High voltage generator or other source of high voltage.

The range of the milliammeter and the hot-wire ammeter will be determined by the kind of tubes that are to be used. If the builder intends to use A-P tubes the range may be 0-200 milliamperes while the hot-wire ammeter may be 0-2 amperes. Although the above milliammeter will just cover the current consumption of four Radiotron or Cunningham tubes when operating under normal load, it is well to have a meter which has a small surplus in range. A stock range meter for 300 milliamperes would be preferable to the 200 milliampere instrument for these tubes. The hot-wire ammeter should likewise be of greater range for these tubes and should be the next stock range or 3 amperes. The filament ammeter may have a range of 5 amperes for A-P tubes or 10 amperes for the other tubes, but if A.C. is used to light the filaments, it should be replaced with a 0-15 volt A. C. voltmeter connected across the filament terminals instead of in series, as the ammeter is shown in the diagram. The hot-wire ammeter might well be of General Radio make, while the other instruments might be Weston or Jewell. The voltmeter V, should have a range of 500 volts, as the voltage that may be used on the Radiotrons might run up to 400 or 450 volts for a short time if the tubes are to be overloaded.

Panel

In constructing the set it is well to start with the panel. In Fig. 3 a complete drilling layout is given with the centers of all holes, except those which will vary for different kinds of instruments, etc., that may be used, located with respect to two edges of the panel. The sizes of drills are also given and it will be seen that they are sizes that every amateur has, or should have, on hand, as they are often needed in construction of instruments.

Before attempting to do any drilling the panel should be layed out full size on a sheet of drawing paper with all holes located on it. This sheet should then be fastened to the Bakelite or Formica panel and the centers for the holes marked through on to the panel with a sharp prick punch. This method gives a good center for the drills and insures the holes being exactly where they are wanted. It is a good idea to drill through the panel with a small drill for all holes before using the specified size of drill. In drilling the observation holes a hole should be drilled through the panel with a small drill as stated above and then the countersinking should be done on both sides with the ⅜-inch diameter drill, after which the hole is drilled through with a ¼-inch diameter drill. The hole is countersunk on the rear side of the panel more as a matter of neatness than anything else.

The holes for the meters present the only difficult part of the panel, and if they are cut out with a bracket saw very little difficulty should be experienced. However, if the builder does not have such a saw it will be necessary to drill a series of small holes around the circumference of the openings and afterwards smooth the hole up with a half-round file. It should be noticed that two dimensions are given for the holes for mounting the tube shelf brackets. This is on account of the difference in size of the A-P and the Radiotron or Cunningham tubes. If the builder is not certain which type of tube he will use it would be best to drill for the latter tubes as, although the A-P tubes will be rather low behind the observation holes, they can easily be seen, and this will prevent the necessity of changing the drilling later in case the tubes are changed.

The tube shelf is an easy job requiring only a few holes to be drilled, as shown in Fig. 3. Remler sockets are used and the holes provided for table mounting are to be tapped for 6-32 machine screws. They are then placed one a time in the proper position on the tube shelf and the holes spotted on it. The holes are then drilled with a No. 27 drill and 6-32 machine screws ½ inch long are put through from the under side into the holes that were tapped in the socket base.

The brackets for mounting the shelf on the panel will need no description and should be made to the dimensions shown in Fig. 3 if Paragon rheostats are to be used. However, if other types of rheostats are used the builder should make sure that the shelf will clear them by at least ½ inch.

The sub-base should be made of wood ½-inch thick by 8 inches by 14 inches and should be fastened to the panel by means of two round head nickel-plated wood screws, put through the holes provided for that purpose. The sub-base should be given a coat of shellac before fastening it to the panel.

Inductance

The inductance, L, is wound on a Formica tube 5 inches in diameter and 6 inches long with ten grooved turns to the inch turned in its outer surface. It should be wound with either No. 12 or No. 14 bare copper wire, preferably the former if Radiotron tubes are to be used. Taps should be taken off every five turns, giving a total of fifty-five turns for the twelve taps. These taps should be made with the same size wire as that with which the inductance is wound and should be soldered on to the proper turns after the tube is wound.

The inductance is fastened to the sub-base with the supports shown in Fig. 3 and should be placed directly in line with the aerial switch on the panel, with the back part flush with the rear of the sub-base, as can be seen from the top view in Fig. 2. The taps should be brought to the switch points in as neat a manner as possible and should be kept as far apart as possible. When properly done they will fan out in a neat semi-circle. The points of the two switches are connected together with the same size wire as the inductance is wound with, in such a manner that the two outside taps are connected together, and any other tap on one switch is connected to the corresponding tap in rotation on the other side. This can be seen in Fig. 1. The best method of fastening the wires to the taps is to drill a hole a short way into the tap just large enough for the wire to slip into and then solder it in place. This method is also used in fastening the wiring of the set to the binding posts.

The aerial and grid condensers can be of any make so long as they have the plates sufficiently spaced to permit their being used on 500 volts without breaking down.

Transformers

The 10,000 ohm potentiometer used for a grid leak is mounted on the sub-base as can be seen in the top view, Fig. 2. The modulation transformer is also mounted on the sub-base and is preferably of Acme or other standard make, although if the builder desires he can build a serviceable one himself according to dimensions given in Fig. 3. The core is made up of thin transformer core iron ½ inch wide to the dimensions of 1¾ inches by 2¼ inches. The primary consists of about 300 turns of number 26 S. C. C. wire and has a few layers of fish paper or heavy shellaced paper over it. The secondary is one section of Ford spark coil secondary with about half the wire removed. The exact amount to remove will have to be determined by trial, as the entire secondary has too high a resistance and the tubes will not oscillate with it all in. Enough should be left so that the ratio of primary to secondary turns is not too small for good modulation. A suggested method of mounting is given in Fig. 3.

The high frequency choke coil, H. F. C. in the diagram, is wound with about 300 turns of No. 26 S. S. C. wire on a thread spool. The hole in the spool is plugged with wood and two small brass angles are made and fastened to the spool ends with small wood screws. Holes are drilled in the other legs of the angles to match the holes in the tube socket bases and it is then mounted under the tube shelf by means of two screws which also hold a socket in place. The external resistance for the 500 volt voltmeter is fastened under the shelf in a similar manner with a strip of brass. This method of fastening can be seen in Fig. 1. No definite dimensions for the angles or strap can be given as the size of the spool and resistance may vary in each particular case.

Although the filter system can be mounted directly in the cabinet it is preferable to mount it in a box or cabinet near the motor-generator set or near the transformer and rectifier if rectified A. C. is used. Although 150 milliampere capacity choke coils could be used they would be overloaded, and if the set were to be used for very long stretches, would be inefficient. It would, therefore, be advisable to use 500 milliampere capacity choke coils. The condensers should be tested at not less than 1000 volts even though no greater plate voltage than 350 volts is used, as a high voltage surge may cause a condenser of lower voltage capacity to puncture even on that low voltage.

The generator is preferably one for 500 volts, as with a 5000 ohm variable resistance in the field circuit the voltage can easily be brought down to 350 volts and yet the operator will have a chance to use a higher voltage if necessary or desirable.

Cabinet

The cabinet is built of ⅜-inch mahogany to the dimensions shown in Fig. 2. The joints should be

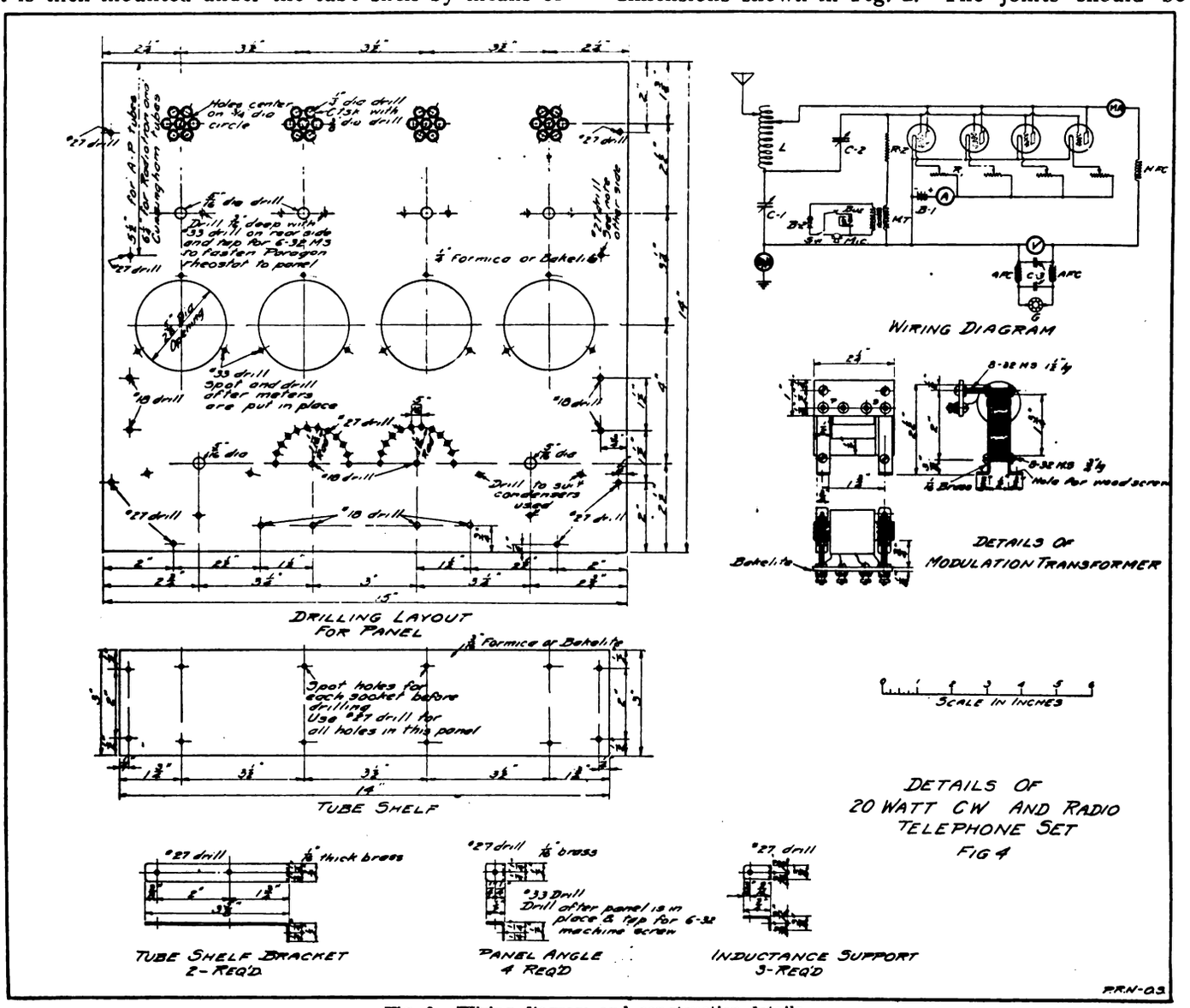


Fig. 3. Wiring diagram and construction details.

made with some form of lock joint to prevent the wood from warping and pulling apart. The cover is hinged at the back to allow removal or insertion of tubes and inspection of the interior. Small strips about ⅛-inch thick and 1 inch wide are glued on the inside on each side of the cover and are allowed to go about ¼ inch below the bottom edge so that when the cover is closed they are inside of the bottom part of the cabinet, preventing the cover from twisting side ways. The panel is fastened in place by means of the small brass angles shown in Fig. 3. They should be fastened to the inside of the cabinet in the proper place and then the holes spotted to match those in the panel, after which they should be drilled and tapped for machine screws to hold it in place, as noted on the drawing. The cabinet should be finished and given a good polish.

A word about the wiring: This should all be done with the same size wire as used in the inductance and should be bare copper. . All joints are soldered wherever possible and connections are made as straight and short as possible and kept well apart.

Operation

In operating the set the tubes should first be lighted and the high voltage turned on. Care should be taken to have the aerial circuit connected to the set, as this forms part of the circuit. The bulbs will not oscillate when it is disconnected and also will be overloaded.

The switch connected to the aerial binding post and the condenser C-1 determine the wave length, while the switch connected to the plates is varied to find the best point of coupling for the various wavelengths employed. With the aerial switch set on about the third or fourth point from the left, according to the size of the aerial, vary the capacity of C-1 until maximum radiation is obtained. Then vary the plate circuit switch until maximum radiation is obtained. Maximum radiation will usually be obtained with a minimum reading of the plate milliammeter. The adjustments should all be gone over a second time as they are dependent on one another and a change in one adjustment usually requires a slight change in the others.

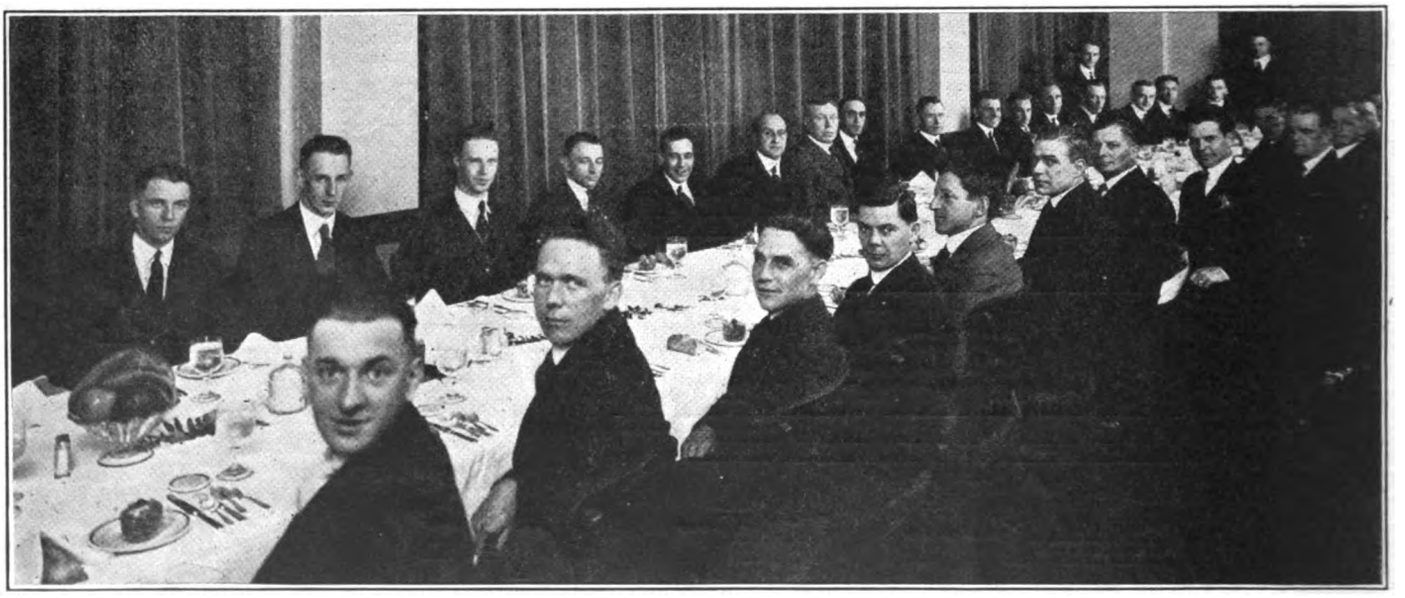
The grid condenser should be carefully adjusted when using voice or buzzer modulation, as upon this depends the clearness of modulation in this system. The grid leak should also be carefully adjusted as a certain value is necessary to make the tubes oscillate properly. It is also necessary to change its value according to the number of tubes in use, for less number of tubes the resistance being made higher. Once set it needs no further adjustment so long as the tubes themselves or the number of tubes are not changed.

RADIO DEALERS GET TOGETHER

Plans for an organization of those interested in better service to the buyers of radio equipment were discussed during a get-together meeting of California radio dealers and manufacturers called at the Engineers' Club, San Francisco, August 19th, by H. W. Dickow, of the Pacific Radio News. As a result, the Pacific Radio Trade Association was successfully launched September 16th with the adoption of a constitution and by-laws, the election of officers and the appointment of committees to work for the betterment and stabilization of conditions in the radio business.

After dinner at the first meeting, which was enlivened by special radio music from the California Theater, Mr. Dickow, as toastmaster, introduced Major J. F. Dillon, U. S. Radio Inspector, who encouraged the formation of such an association and gave statistics showing the rapid growth of radio activities on the coast. H. L. Newnan of Los Angeles was next called upon to speak for Southern California and assured the support of the south for such a movement. Arthur H. Halloran was then introduced as the new editor of Pacific Radio News, and gave an address on the benefits and advantages that had been derived from co-operation by other branches of the electrical industry. After a general discussion by all present it was decided to form an association, Mr. Halloran being elected temporary chairman and Max Loewenthal, secretary pro tem. Lieutenant Ellery W. Stone and E. T. Cunningham were requested to represent the association at the Chicago meeting of the American Radio League.

Proceedings of the organization meeting of September 16th will appear in these columns next month.

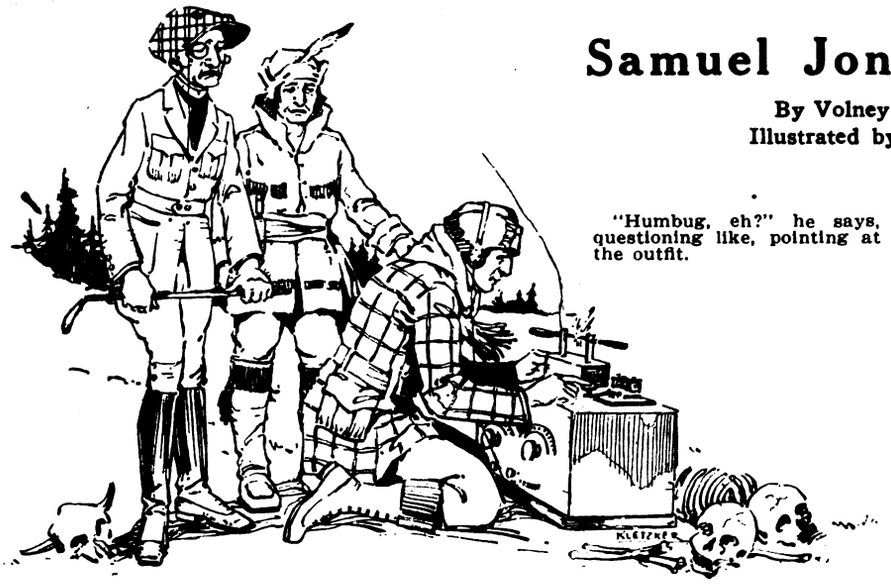


GET-TOGETHER DINNER OF CALIFORNIA RADIO DEALERS AND MANUFACTURERS

Starting at the left and going around the table those present at the initial meeting are seen by the picture to be E. G. Arnold, D. Lambert, Harry J. Rathbun, F. P. Ingel, H. J. Malarin, Max Loewenthal, Major J. F. Dillon, H. W. Dickow, A. H. Halloran, E. L. McDonnell, F. W. Maxwell, L. H. Waldron, E. T. Cunningham, S. Peterson, L. O. Fassett, E. G. Danielson, H. L. Newnan, O. H. Miller, J. A. Ramsey, L. Ets Hokin, N. R. Kuhn, J. W. A. L. Willis, E. W. Stone, D. E. Lyon, J. L. Swindelle, A. F. Pendleton, J. K. Fairchild, H. C. Hopkins, A. E. Evans, V. G. Mathison and Edward McGuire. In charge of the concert were: B. F. McNamee of the Pacific Radio Supplies Co., and E. A. Portal of the Colin B. Kennedy Co.

Samuel Jones—Humbug

By Volney G. Mathison
Illustrated by H. Klatz-Ker



"Humbug, eh?" he says, questioning like, pointing at the outfit.

OLD MUCKASHOUK, the Snow-Eater, doesn't believe in wireless. Muckashouk is an Aleute chief with a pedigree as long as the Alaska peninsula upon which he was born—a grouchy old Indian with a widespread fame as a hunter and guide on the bear-trails of the mainland, up behind the Shumagin Islands.

For forty years he had been coming from his dugout over at Portage Bay in his kyak to Unga Island to buy tea and sugar at the Alaska Codfish Company's trading store at Unga; and all those forty years nothing had ever happened at the little codfishing village worthy of his notice until Hell-Fire, the white-man lunatic, came from Frisco with a load of poles and boxes and machinery and built K-V-I.

Hence, Muckashouk was more astonished than he would admit, when he came to Unga after a long absence to find two tall masts up on the hill, where there had never been anything before but a flagpole; and down on the ledge on the face of the cliff below, a whitepainted shack with a black pipe sticking out of one end, showing that it contained one of the gasoline-demons that bark and belch fire and go like blazes.

Intensely curious, Muckashouk footed it up the hill and studied the tall, straight masts, with their taut steel stays and shining goose-egg insulators, and the thin gleaming bronze strands that were stretched between. He mooched down to the shack, obtained admittance, and inspected the gasoline abomination and the big black iron pigs that were belted to it; stared at the clocks with the senseless dials; listened with much mystification to the cheeping of the snow-birds in the black snuff-boxes; and bravely held his ground when the fire-devils spit their purple flames from the teeth of the humming wheel.

But even all these strange things were hardly enough to convince Muckashouk that the flustery, bristle-haired *wirelessuck* fellow could really talk to the people five days away in Dutch Harbor and Mershovoi, without sending a messenger in a boat. However, he risked three good round cart-wheels and some small change to venture a message to Mouksic, the Medicine Man at Kodiak, requesting him to send by the spring mail-boat, just leaving, some medicine for a sick Malamute dog that Muckashouk had brought along with him from the mainland.

A message from Unga to Kodiak is relayed from N-P-R to N-P-Q, thence to N-P-S; and perhaps through the carelessness of some gob suffering with an overcharge of home-brew, Muckashouk's message was lost in transit.

The mail schooner came, but brought no medicine, the sick dog died, and Muckashouk had fresh proof that all white men are liars. Standing over his deceased Malamute, he glanced contemptuously up at the masts and stays and copper wires on the hill.

"Humbug!" he growled, deep down in his throat; and, having thus fully and completely expressed his opinion of radio, he relapsed into his customery silence and wordlessness that would have made the glummest Scot a magpie in comparison. From that time Muckashouk nursed an undying grudge against devil-fire machines and *wirelessucks* in general.

And so matters stood the following spring when our old friend Samuel Jones breezed in on one of the company's fishing schooners, to pound the brass at K-V-I.

Having been duly initiated by the codfish-snailers, and later going through an unfortunate affair with a female gumshoer of the Alaska dry-squad, Samuel Jones had a few days of calm before the next hurricane burst upon him, in the shape of his lordship, Sir Ambrosius Brawley, in his radio-equipped steam yacht, "*Elizabeth*," on a tour round the world.

Sir Ambrosius had heard of the famous grizzlies of the Alaskan peninsula, and, determined upon a hunting-expedition, he anchored his trim yacht off the village of Unga and came ashore to negotiate for hunting-equipment and a guide.

Guns and provisions were had at the company's trading-store; and Muckashouk, on his semi-annual visit to the village, was signed up as guide. Tin-Pan Smith and Hammer the Head-Cracker, along with two Aleutes, were taken on as packers, and Greasy Bill shipped as cook. While preparations were under way, Lord Brawley called upon Samuel Jones and made an unexpected request. Could Mr. Jones, in view of a specified liberal remuneration, arrange a portable radio outfit and accompany the expedition, in order that his lordship might be kept in touch with her ladykins aboard the "*Elizabeth*"?

The Brainless Swede, supe of the Alaska Codfish Company, was strong for the idea. He would be glad to see K-V-I closed up for a few weeks; it would give him a rest from the eternal howls from the home office for less expense and more fish. But Samuel Jones had a premonition that fresh calamity would surely befall him, were he to go wandering with this dense and dudish monocle-juggler, on the trails of the mainland grizzlies. He could not openly refuse without bringing down upon himself the stigma of being a timid tenderfoot, and that meant much attendant evil; so he prudently chose a convenient loophole of escape.

II

"LIKE to go first-rate,' I assures Sir Ambrosius; 'but I haven't got anything I could rig up a portable set with.'

"'Don't let that worry you, Sam,' chips in old Dopey Driffield, postmaster, squaw-masher, an' town pest. 'Ya kin have my ham set Hell-Fire fixed up fer me. I'm tired a it, anyhow.'

"'Thanks, Dopey,' I answers, glarin' at him. There was no refusin' now. A dory-carpenter slaps together a light box, in which I puts Dopey's loose-coupler an' audion-panel, his two-inch spark-coil, straight-gap, sendin'-key,an' a little aerial-switch. In another box, I stows eighteen dry-batteries, six for the audion an' twelve for the spark-coil, which I figures will hold up for intermittent work durin' the three or four weeks of the huntin'-trip.

"The carpenter also fixes up a light, jointed wooden mast, which along with a couple of insulators and a coil of aerial-wire, I puts aboard the gas-boat Sir Ambrosius has chartered to carry us to the mainland.

"Seein' the outfit come aboard, old Muckashouk looks it over with an angry frown; then, with a kind'a sour smile, he studies me a while out of the corner of his eye.

"'Humbug!' he croaks; after which he freezes up once more, like a mainland glacier.

"At last we gets headed up the Straits of Nagai for the mainland, an' the '*Elizabeth*' follows us up to Portage Bay, where she drops anchor. We piles our gear ashore in Man-Eater's Cove, where we spends the first night. Next mornin' the packers bundle up the stuff, which, as Tin-Pan remarks to the Head-Cracker, is enough to fit out an invasion into Siberia.

"For three days we struggles up Skelcton Gulch to Dead-Man's Plateau, a broad piece of high snow-country, about twenty miles inland from Portage Bay, surrounded by great mountains of snow-covered granite, an' Pavloff Volcano smokin' in the background, like a gigantic inverted ice-cream cone. Off to the south'ard, we could see the Shumagin Islands, lookin' like white sugar lumps in the Pacific; an' on the other side of the peninsula, to the north, we could make out great fields of pack-ice floatin' on the

cold, gray surface of the Bering Sea.

"'It's a grand sight, ain't it!' I exclaims to Tin-Pan, alongside me.

"'Yes, fer a tenderfoot that ain't got nothin' else t' do but look at it!' growls Tin-Pan, throwin' his enormous bundle down in the snow. 'I'd like t' know what his dukelet's got in this ship-load I bin packin' all over th' 'Laska peninsula. It's big enough to contain a coupl'a circus tents an' all th' side-shows.

"Muckashouk had brought us up alongside of Silver Creek, where there was water, an' alder-brush for a fire. We clears away a place an' make camp. There was one little tent for his lordly skeezix, an' another larger one for the remainin' seven of us.

"Greasy Bill fixes up some supper, after which Sir Ambrosius opens up Tin-Pan's pack an' takes out a rubber bundle an' some wooden sticks. We couldn't make head or tail of the thing till he sets it up;—an' then we sees it's a foldin' bath-tub!

"'Well, I'm a dirty salmon-eater!' groans Tin-Pan, as he watches his lordship settin' up over the tub a little tent, which was also in the bundle. 'T' think that Tin-Pan Smith, who's et more sour-dough biscuits than any denizen livin' on this here peninsula, should live to see hisself packin'—that! I'm ruined! I'm disgraced fer life!' an' he begins to sniffle.

"'It's a howlin' outrage!' sympathizes the Head-Cracker, with a catch in his voice. 'I never thought people could be so cussed ornery. Hereafter, we pack no bundles without seein' what's in 'em!'

'About this time Sir Ambrosius has his bathin' establishment ready for operation.

"'Aw—I sy!' he chirps to Greasy Bill, who's just finished cleanin' his fryin'-pan. 'Would you be so kind as to procure a drop of watuh in one of those tin—aw—containuhs and heat it a bit oveh th' fiuh. I 'aven't had a blooming bawth these three days—I feah I shall become ill!'

"'Ill,' he says!!' sniffs the Head-Cracker, 'I bet old Muckashouk here ain't had a bath in fourteen years!

"'Fifteen,' says Muckashouk.

"Cursin' under his breath till he was black in the face, Greasy Bill gets a can of water an' holds it over the fire on a stick ,while Sir Ambrosius holds onto his monocle an' superintends the job.

"Meanwhile, the Head-Cracker helps me stick up the jointed wireless mast in a crevice of a handy granite cliff, an' I manages a kind of a ground in the creek. Openin' up the apparatus-box, I adjusts the coil for a nice, smooth spark. By the time I had her all ready it was about dark, so I gives the '*Elizabeth*' a call.

"It was all of twenty miles from Dead-Man's Plateau to Portage Bay, but we were on pretty high ground, an' anyway in Alaska wireless gives results; so I wasn't much surprised to hear the bird on the yacht come back, right off the bat. When Sir Ambrosius finishes his bath, I asks him if he's got any message.

"'Why—aw—yes,' he replies, pleased-like, 'You may inform her ladyship that the expedition is progressing—aw—beautifully; and that I have just had my bawth. Indubitably she will be glad to know that.

"As I works the '*Elizabeth*' I notices that old Muckashouk keeps stickin' around, watchin' me with a kind of a sour smile! an' somehow it bothers me a good deal.

III

THE huntin' progresses with pretty good success; Sir Ambrosius succeeds in baggin' a couple of old mangy-lookin' trophies; an' everybody seems to be quite contented except myself. Old Muckashouk keeps worryin' me more all the time. Whenever I work the outfit, he stands around with a kind of a dark, broodin' expression on his homely map, until finally I begins to feel sure that he's plottin' some kind of devilment against me an' the outfit.

"One day Muckashouk tells Sir Ambrosius about a famous buryin'-ground of the Aleutes, called Skull Island, thirty miles out in the Bering Sea; an' of course old I-Say makes up his mind he's got to see it.

"He tells us to break camp, but right then there begins a row about that bath-tub. Sir Ambrosius tries to insist on somebody packin' the thing, but the Head-Cracker rises up an' delivers a oration on the freedom of America an' human rights an' liberties that would'a made Daniel Webster sound like a street-corner sky-pilot on a soap-box.

"'We absolutely an' perpetually refuse to be dishonored an' polluted by a horribul rubber bath-tub!' he concludes, wrathful-like. 'We've packed feather pillers, an' we've packed canned termaters—we've even packed bakin'-powder,—but we don't transport that outrageous article from this place, even if the hills fall an' the mountains bust open!'

"So Sir Ambrosius packs it himself.

"We moves camp down to Herendeen Bay, over on the Bering Sea side of the peninsula, where Muckashouk charters a small open gas-boat from an old Indian shackin' there. As we planned to come back a different way, we stows all our gear in the boat.

"Right here, I gets my old reliable hunch that calamity is comin' my way on this trip, an' I tries to head it off.

"'We better not go out there,' I advises Sir Ambrosius, 'I heard a weather report from Dutch Harbor that a terrific southwest hurricane is comin' this way. Safest thing is to go back to Portage Bay.

"'You lie!' snaps Muckashouk, with a black scowl, 'Me long time savvy—no come storm!'

"So we embarks; an' it was my luck that the sun shines an' the sea lies calm, like it never does in the Bering Sea once in fifty years. The gas-boat chugs along before a light southwesterly breeze; an' every little while old Muckashouk would squint up at the clear sky, an' then sneer scornful-like at me an' my wireless-box, until he blasted near gets my goat.

"Early in the afternoon, we sights Skull Island, a low, flat chunk of bare-lookin' black rock, about two thirds of a mile long, an' maybe half as wide, standin' solitary and gloomy out in the sea.

"'I don't like th' idea a comin' way out here in this rickety old tub,' grumbles the Head-Cracker, gazin' anxious-like back at the mainland, already droppin' down below the horizon. 'There's a current runs like blazes out here; an' if we break down, it'll take us straight out into th' Berin' Sea about seven miles an' hour.

"I soon observes that this is a fact, for it takes us a long time to get up to the island. As we get close, I can see that the island is fringed with dark bluffs of volcanic rock, an' small reefy coves scattered in among 'em, one of which we runs into. Makin' a landin' we all pile ashore, leavin' Muckashouk in charge of the boat.

"We scrambles up onto the rough black rock above the beach,—an' then we halts right there. Standin' thick everywhere among the rocks an' boulders were hundreds upon hundreds of rude, elevated platforms, each bearin' a shapeless, half-rotted bundle.

"'This is a reg'lar old-time Siwash buryin'-ground, all right,' mutters Tin-Pan, pointin' at the old rusted guns an' pots an' kettles on the platform, alongside the bundles. 'That's the way they bury 'em—up in bird's nests, with all their worldly goods along with 'em.'

"A few of the open-air graves looks kind'a recent, but most of 'em was old an' fallen to pieces. The ground was all littered up with the old rifles an' kettles, mixed up with bones an' skulls an' skeletons scattered in every direction. There was no part of the island free of 'em—even down on the beach, I notices ribs an' backbones strewed around among the rocks. It was a hair-raisin' sight; an' it didn't take me long to get enough of it.

"'Nix on this!' I declares. 'I'll be havin' th' jim-jams for th' next six months—me for the boat!

"'You said it!' pants Tin-Pan, followin' hard after me, 'I ain't got no longin' fer a residence round this here island!'

"'Neither me!' shivers the Head-Cracker. We all hot-foots it back down to the beach,—an' Sir Ambrosius ain't hangin' behind none to speak of. When Greasy Bill cranks up the engine, I notices that she don't seem to sound right; an' sure enough, just as we shoves off, she stops dead.

"'Smells like gasoline's been leakin' some place,' sniffs the Head-Cracker.

"Tin-Pan rams a stick down in the gas-tank, an' turns ta sickly green.

"'She's bone dry!' he gasps.

"Lookin' over the pipin', I discovers that it's cracked off at the carburetor, an' let the tank drain down into the slush-water in the bilges.

"'We're in fer it now!' mumbles the Head-Cracker, talkin' like his mouth is full of glue, 'We could make a sail out'a our blankets, but the wind's blowin' dead off the mainland—prob'bly'll keep blowin' that way till next fall, too. An' we can't buck that current paddlin'—this clumsy old tub ain't no Aleute kyak.'

"'I thought I seen a extra ten-gallon can of gas someplace,' puffs Greasy Bill, who's rummagin' around in the bow; 'but I was mistaken.'

"'Aw—I sy!' chirps Sir Ambrosius, who's just beginnin' to get it through his dense bean what's happened. 'We really must do something. The idea of spending the night 'ere among these bones and things is—aw—rawther disagreeable, don'cha know!'

"'Disagreeable be ———!" busts out the Head-Cracker, 'It's one rotten blazin' blasted devil of a mess! There ain't even fresh water on this pile 'a bones an' rock!'

"'Stop talkin' like that!' yells Tin-Pan, jumpin' up an' glarin' at the Head-Cracker. 'I can't stand it! I can't stand it, I tell ya!'

"There was a gloomy silence; an' then Muckashouk, wearin' his old sour smile, speaks for the first an' last time durin' this conference.

"'*Wirelessuck!*'

"'Sufferin' cats, what's the matter with me!' I exclaims, jumpin' up. We gets the box of apparatus out of the boat, an' the gang sets up the little mast. In about fifteen minutes the outfit is ready for action, but by this time my enthusiasm is fallin' off.

"The island bein' low an' flat, there was no way to get more antenna elevation than the thirty feet of the single mast. The '*Elizabeth*' was about fifty miles away, with a range of mountains between, an' it looked like a slim chance

(Continued on Page 112)

The C. W. Club of California

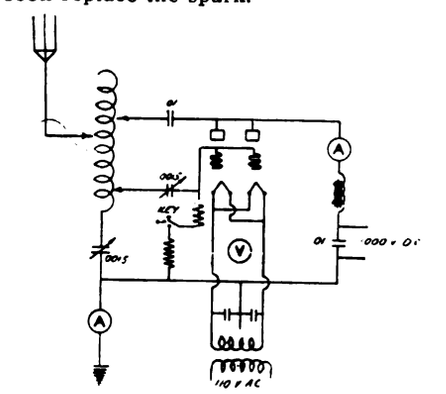
Conducted by Lawrence Mott, Associate Editor

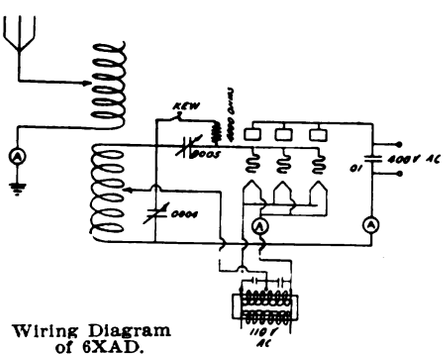
DESCRIPTION OF 6XAD, CATALINA ISLAND

With the installation of his new 50-watt tube set, our associate editor, Mr. Lawrence Mott of Avalon, Cal., has one of the most up-to-date stations in Southern California. From the half-tone of his new station you can see that the spark has absolutely no chance at 6XAD.

Mr. Mott's first C.W. set employed 5-watt tubes. Exceptionally good work was accomplished with his initial equipment. The rapid development of C.W. and the advent of larger power tubes on the market prompted 6XAD to take another step in the direction of better C.W. work.

There is only one non-commercial station on Catalina Island and that is 6XAD. We will expect numerous record-breaking reports from Mr. Mott during the coming winter season. By that time, no doubt, the C.W. Club of California will be a "going concern" under the supervision of the Avalon station, and the use of C.W. for relay work in the West will soon replace the spark.





Wiring Diagram of 6XAD.

At the extreme left is seen the power plant especially built by the Advance Electric Co., of Los Angeles, to operate the 100-watt set—on 375. A 110 a.c. motor drives the generator, that delivers from 100 to 1000 volts d.c., and a plate current up to 500 milliamps. By a step-down transformer, shown next to the right, the filament current for the Radio Corporation tubes (203) is derived, from 1-10 volts.

Next comes the 2-tube transmitter itself, which the Western Radio Electric Co., Los Angeles, helped him build, using the above-mentioned tubes as shown in the accompanying print of hook-up. From 1.9—3.1 amps is the range—so far—in antenna current. But Mr. Mott is installing compltee new ground and aerial systems in the early autumn, by which he will attain far better results than this!

(Continued on Page 92)

6XAD'S HOOKUP

Our readers will remember the photo of 6XAD's little C.W. set used by Mr. Mott some months ago. Look at the station now—C.W. apparatus from one end of the table to the other. All transmitting apparatus was constructed to Mr. Mott's specifications. Everything is downright modern. Looks like 6XAD will soon compete with 2QR in working Scotland.

LARGE NUMBER OF C.W. CLUB MEMBERS MAKE NECESSARY THE FOLLOWING REVISIONS IN SCHEDULE:

MONDAY, WEDNESDAY and FRIDAY nights these stations listed herewith will call for ten minutes each at the allotted period.

Time	Station	Wave	Name and Address
9:00 p.m.	6XAD	240 & 375	Lawrence Mott, Avalon, Cal.
9:10 p.m.	7OZ	200	Garrett Lewis, 1745 Willamette St., Eugene, Oregon.
9:20 p.m.	6PI	200	B. McGlashan, 233 W. 21st, Los Angeles.
9:30 p.m.	6EN	200	H. Duvall, 4965 Wadsworth, Los Angeles.
9:40 p.m.	6WU	200	C. Richardson, Los Angeles.
9:50 p.m.	6JE	200	C. Blalack, Los Angeles.
10:00 p.m.	6MK	200	L. B. Benjamin, Los Angeles.
10:10 p.m.	6ALE	200	W. W. Lindsay, Los Angeles.
10:20 p.m.	6KA	200	F. E. Nikirk, Los Angeles.
10:30 p.m.	6HU	200	H. G. Beck, Wilmington, Cal.
10:40 p.m.	6ADU	200	R. P. McKenzie, Los Angeles.
10:50 p.m.	6EF	200	C. G. Widing, Los Angeles.
11:00 p.m.	6IT	200	C. E. Rich, Glendale, Cal.

TUESDAY, THURSDAY and SATURDAY NIGHTS the following stations will call for ten minutes each:

Time	Station	Wave	Name and Address.
9:00 p.m.	6UC	200	C. F. Filstead, Los Angeles.
9:10 p.m.	6XN	375	A. A. Kluge, Los Angeles.
9:20 p.m.	6XD	375	Western Radio, Los Angeles.
9:30 p.m.	6AQA	200	G. S. Tichenor, Los Angeles.
9:40 p.m.	6KP	200	O. S. Garretson, Eagle Rock City, Cal.
9:50 p.m.	6BA	200	H. Newman, Wesrad, Los Angeles.
10:00 p.m.	6HK	200	F. Croswell Jr., Los Angeles.
10:10 p.m.	6ZE	375	D. B. McGown, San Francisco.
10:20 p.m.	7XF	375	Northwestern Radio Mfg. Co., Portland.
10:30 p.m.	6ZAD	375	J. J. Mahler, Napa, Cal.
10:40 p.m.	6ZX	375	J. V. Wise, Fresno, Cal.
10:50 p.m.	5ZA	375	Louis Falconi, Roswell, New Mexico.
11:00 p.m.	6AKH	200	C Maass, San Francisco.

These changes were made necessary by the ever increasing number of members who are joining the C.W. ranks. Many requests have been received to give each station ten minutes' working time instead of five minutes, as has heretofore been the custom. In order to make this change, it was necessary for us to split up the working nights of the members, giving them an opportunity of working ten minutes every other night instead of five minutes every night. There will be no regular calling and working schedule on Sunday nights. This will be made a "free for all" evening and is favored by the majority of the members.

We cannot impress upon the members too strongly the fact that the editor of this department desires to have a monthly report of the C.W. work accomplished during the month. This information will be published monthly on this page, and it is to the interest of all concerned to have each and every member send in a list of C.W. stations worked and heard during the month. This department is to be the mouthpiece of the ever growing C.W. organization that is being formed on the Pacific Coast. Photographs of stations entered in the above schedule are particularly desirable. Most of all we will ask you to send us some "C.W. BRIEFS" every month. Tell us what new wrinkles you have found in your C.W. work. Everybody wants to know about them. Let's make this the livest and fastest growing C.W. Club in the field. You can do your share by sending a monthly report to Mr. Mott at Avalon.

On the operating desk are: a Kennedy long-wave receiver and Kennedy 2-step amplifier; a Grebe short-wave, and 2-step amplifier—with special "pickle tube" detector; and on the extreme right is the transmitter used for short wave lengths—operating on 110 a.c., taken from the city main, through a special transformer. Radio Corporation tubes—UV202—5-watt—are used on this set, and Mr. Mott has been reported at 2000 miles' range on it. The amperage of the smaller set is from 1.2—2 amps, with three tubes working.

As Mr. Mott is also U. S. Deputy Game Warden at Catalina his passion for big game fishing is clearly shown by the excellent photographs on the wall of his den—all of swordfish, and tuna, taken by him and his guests—all fish more than usually large. What with being an ardent angler, that which he calls "an overworked writer," and a close follower of the radio trail, our Associate Editor has not overly-much time to let the grass grow either beneath his fingers or his feet!

C. W. NEWSLETS

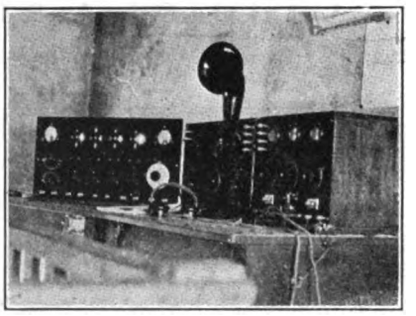
6AUL has been heard in British Columbia. He uses a four-tube set, hooked-up in Heising style.

6AUN has been heard by 7ZJ and 7EN. He used, at the time, a small set employing only one five-watt tube. His radiation without overload was eight tenths of an amp. Great work for only one tube. His new set will bring better news next month.

6AKH has almost finished his classy four-tube C.W. set. The Heising circuit will be used. Two separate panels comprise the transmitter. One is a power panel, the other is the oscillator panel. An ESCO 100-watt motor generator will feed the animal. A photo of the station will appear in an early issue on the C.W. page.

Many fellows won't have a C.W. set unless they can also have a spark set for calling purposes. What's the use of such foolishness with 26 members already signed-up for the C.W. Club? The trouble with C.W. is that the fellows will not tune for it. Don't keep your dials stuck on 200 meters. C.W. tunes too sharp. Juggle those dials a little and you'll be surprised at what you'll hear. But remember—you must tune sharp.

Wm. Woods, formerly of Oakland, Cal., has moved himself and his station to British Columbia. He is going to install a powerful C.W. set in the Barron Hotel and expects to have it on the job in about a month. That's a good place for a C.W. station, as it will be the aim of every C.W. Club member to work with Woods. He will broadcast the latest quotations on "Canadian Club" and other wet goods of old-time fame. Treat him right on the air and he will send you an invite to come up there to spend your vacation. Photo and full description of his new set coming up.



6AWT

6ALE has done some dandy work with his C.W. set. Look at this list of "heard and worked": 5ZA, on I.C.W. Very QSA. (6EN), (6EX), (6GN), (6HP), (6KP), (6MH), (6OH), (6PJ), (6TV), (6WZ), (6XD, phone), (6ZN), (6ZX-200 miles daylight), (6AAK), (6ABW), (6AGF), (6ALU, I.C.W.), (6AMW), (6APH), (6AUL—phone and C.W.), (6ZAD—CW. old 6IY, (7ED), (7BK), (7KM), (7MF), (7ZJ). Great work, 6ALE. Keep it up.

7MF of Eugene, Oregon, and 7OZ, also of Eugene, have built 10-watt C.W. sets and tests have been arranged for the end of this month.

Mr. D. H. Keet of Riverside, Cal., reports that two new 100-watt C.W. sets will be in operation in that city within a few weeks. The Southland is going wild over C.W.

Mr. H. Romander of Smith River, Calif. (near the Oregon line) is building a 50-watt C.W. set. It will be on the air within a month.

6ZN. will also be on the job with a 100-watt C.W. set.

6GR will content himself with 10 watts.

6ASJ says that he wasted just about enough time fooling around with I.C.W. and will hereafter stick fast to the pure and unadulterated C.W. Next!!

6AUL of 'Frisco is being heard very nicely in Reedley, Calif., says Mr. Lindsay Jr. His C.W. signals are also coming through in grand style.

6ZAD has been pounding-in heavy on his C.W. The gang "down south" say he's very QSA.

6ALE, Mr. Lindsay, Reedley, Cal., says that he receives dozens of letters and cards from fellows who have been hearing his C.W. Almost everybody who writes 6ALE wants to know all about his set, how to build it, how it is wired, etc. The best way to answer that question, Mr. Lindsay, is to send the dope to the editor of this page. We'll put it in shape for you, and everybody in the U.S. will know about 6ALE.

MY EXPERIENCES WITH C.W.

By C. Chandlee Pidgeon

RECENTLY an article on the construction of a $100 C.W. set was brought to my attention. Being a C.W. experimenter, I at once became interested, but the cost of construction of the set that I had planned was prohibitive. I therefore studied advertisements in the radio magazines and consumed the contents of the various CW catalogues with the result that it was possible for me to construct a CW set for $50. The following is a list of what I used for the construction of the same:

6 lbs. Silicon Steel at 35c	$ 2.10
1-2 lb. No. 30 enameled wire	1.06
1 lb. No. 20 SCC wire	1.58
18 ft. No. 14 DCC wire	.30
3 power tubes	24.00
3 sockets	4.50
3 rheostats (2½ amp.)	5.25
1 key	2.00
36 ft. copper tubing	4.12
Incidentals	5.00
Total	$49.91

The wire and silicon steel were used for building a transformer to supply the filaments and plate current for the tubes. The set may either be self-rectifying or an electrolytic rectifier may be used with choke coils and condensers for the smoothing out circuit, such as used by Dunnam at 3AAO.

I have a motor-boat coil, the secondaries of which are wound with No. 37 enameled wire. These will act as choke coils. I will make a core for each, using the silicon steel for this purpose. The secondaries of a quarter inch spark coil will do just as well. The electrolytic rectifier may be made from sheets of lead and aluminum, suspended in jelly glasses. The solution can be of either ammonium phosphate or a saturated solution of borax and water. The electrolytic condenser is constructed of aluminum about ½ inch thick. Two plates are suspended in small jars containing a solution of ammonium phosphate or borax. The above apparatus covers the "incidentals" listed in the price column above.

The silicon steel is also for a transformer core. Cut it to a size of 5 inches square on the outside and 2 inches square for the inside with 1 inch by 1½ inch cross section. The primary will require 458 turns of No. 20 SCC wire. The filament winding consists of 34 turns of No. 14 DCC wire. The plate circuit will require two windings, each of 1500 turns of No. 30 wire.

A good 23 plate condenser may be used for tuning. The construction cost can be still further reduced by substituting 7-22 stranded phospher bronze wire for the copper tubing. If an ammeter is required for the antenna circuit the construction cost will be increased by $6. A couple of small spark coils for the chokes can be obtained from practically any automobile repair shop.

The following letter is published for the purpose of showing our readers the wide scope of "Pacific Radio News."

TRANSLATION FROM THE FRENCH.

RAOUL MOHA

Electrician—Radiotelegrapher, Member of the French Society for the Study of Radio.

11 Avenue Pasteur, Alger, Algeria.

Mr. Raoul Moha sends his best 73's to the Manager of the Pacific Radio Supplies Co., for the address of which he is indebted to that fine magazine, Pacific Radio News. On the strength of this advertisement he earnestly beeseches that he be sent a free sample, without duty, of the A-P Rectifying tube, said tube to be used to change 110 volts 50 cycles to 350 volts direct current.

He also wishes information on sockets for these tubes, as well as data on the primary and secondary of the step-up transformer required; likewise data on the inductances required for filtering the output of the rectifiers. In all the foregoing give the sizes of the wires, the thickness of the sheets, and the dimensions of the magnetic circuits.

(Signed) Thanks in advance,

R. MOHA.

WITH THE RADIO INSPECTOR

This department is conducted by the Radio Inspector of the Sixth District. Questions are answered free of charge. Your name will not be published. Initial your letters only.

Send Your Questions to: Radio Inspector's Dept. "Pacific Radio News"

September 1, 1921.

Editor Pacific Radio News,
San Francisco, Calif.

Dear Sir:

It has come to my attention that many amateurs are breaking the U. S. radio laws, both as regards to power and to wave length.

One evening recently I heard a station start up, and call another nearby to ask on what wave he was sending, showing that he had no idea himself whether his apparatus was adjusted to comply with the requirements of the law. I checked this party, and found that he was on about 260 meters. The station with whom he was working came back at him, and told him that he was OK, and on 200, which shows how very accurate (?) such a practice is.

This appears to be a common custom among many amateurs, although they do not realize that they are breaking the law by so doing. The only safe and proper way to tune a transmitter is to use a wavemeter (strange to say), whose extreme simplicity is usually not recognized by the majority of amateurs. A small variable condenser, with about a 25 turn inductance coil, such as a honeycomb, with the addition of a crystal detector, makes a wavemeter of fair efficiency, with a pair of telephone receivers to indicate resonance. There is nothing difficult about that, certainly, and in most cases all of these instruments can be found around even the smallest amateur station. The calibration of the instrument is a puzzle to most, however, but even this can be done very simply, by comparison with a standard instrument. The meters of this department are available for this purpose whenever amateurs wish to avail themselves of the privilege, for which service there is no charge.

Another evening I measured the waves of eight stations, all within a period of about a half an hour, and of the eight, seven were transmitting on wave lengths in excess of 200 meters, and one of these was on about 280 meters. Proper action was taken in all cases.

In spite of repeated warnings, there still seems to be a large number of amateurs who do not know that the law requires a reduction of power when working with nearby stations. The law states that "a minimum of power necessary to insure safe communication" shall be used at all times. According to some of the signals I have heard, it seems that a half kilowatt is needed to insure safe (?) communication over a distance of a few miles, in many cases, and a large number of stations seem to work with this efficiency (?) all the time. Amateurs may be interested to know that if detected, this will constitute sufficient evidence for the suspension, or even the possible cancellation of their licenses.

Respectfully,

D. B. McGOWN,
Assistant Radio Inspector,
U. S. Dept. of Commerce.

Questions Answered BY THE Radio Inspector

Q.—When a commercial operator's license is suspended does he lose the usual 20 per cent credit when applying for a renewal of the suspended license after it expires? (L. C., San Francisco.)

Ans. No, although he will not be allowed to apply for re-examination until the suspension period is over. Whether or not he may apply for a license of higher grade than he holds will also be given consideration, in connection with the suspension, when he apply for a new license.

Q.—In your estimation, what is the best formula for calculating the natural period of an aerial when its length, number of wires, etc. are known? (C. J., Alameda, Cal.)

Ans. The best formula to use to get the natural period of an antenna is to MEASURE IT. There is no formula that is accurate. The old system of multiplying the mechanical length of the antenna system by 4.5 gives a rough approximation, although it is at best very inaccurate. One with experience can usually judge the natural period almost as well as it can be calculated by ordinary means. So many factors, such as nearby metallic objects, sag of wires, etc., enter into the matter that it is almost impossible to calculate it exactly.

Q.—Can you briefly tell me what new radio agreements were made at the recent radio communication conference in Europe? (K. M., Oakland.)

Ans. No definite data yet received on this matter.

Q.—Will it be possible for the Radio Inspector's office to inform me whether a Canadian license operator can secure employment legally at a U. S. land station if he passes the U. S. commercial examination? (A. DeC., Victoria.)

Ans. According to the U. S. Radio Laws a Canadian, or any foreigner, may operate a U. S. Radio Station, either ship or land, provided he has a valid commercial license of the grade required for the station at which he desires to operate.

Q.—After reading the editorial in the September issue of "Pacific Radio News" in which the editor states that unlicensed stations should be warned in person by local amateurs before being reported to the Radio Inspector, I would like to ask if the editor is correct in this statement. Should not the Radio Inspector be notified at once in order to have the law enforced? (B. F., Pasadena, Cal.)

Ans. In most cases it will be found that the offender operating unlawfully is doing so without knowledge of the laws he is breaking, and a word from someone interested will usually serve as sufficient warning, and will cause the guilty person to obey the law, although the Radio Inspector's office should also be notified.

Q.—I desire to install C. W. transmitters in Nevada to communicate between various offices of a certain company in that state. We will handle business pertaining to the company only. Can these stations be licensed under the amateur class or must they be commercially licensed and have commercial men to operate them? No paid business will be handled. (C. N., Nevada.)

Ans. They must be licensed as limited commercial, which will restrict them to operation between the stations of the company, on certain specified wavelengths designated on the license. They will not be allowed to communicate with any other stations, under these licenses, except in emergencies. If it is found that the effect of their radiated energy reaches the coast, they must be classed as "coastal" stations, and at least commercial second class licensed operators will be required. If they are classed as "inland" stations the class of operators will be designated in the license, when issued. Suggest that you write to the Radio Inspector's Office, 215 Custom House, San Francisco, Calif., for further information.

Q.—Why are there no women operators employed at land stations? I have heard that the government regulations do not permit their employment as ship operators, but does this also apply to land stations? (Mrs. S., San Francisco.)

Ans. No restrictions are placed on the sex of applicants for radio license, nor on where they may be employed. It is understood, however, that there is little, if any opening for women at any radio stations. This office has no record of any women being employed at any radio stations, either ship or shore.

Q.—I have read much about transmitting with an ordinary buzzer and learn that it can work several miles under good conditions. Must such a miniature device be licensed in order to be allowed to operate, especially where it may be situated in a remote part of the state? (A. D., Sacramento, Cal.)

Ans. Yes. This station MAY INTERFERE with the reception of signals or radiograms the origin of which is beyond the state, and therefore such a station must be licensed.

Q.—When the Department of Commerce confiscates an amateur's equipment does the amateur have it returned to him when his license for operating the station expires? (G. D., San Diego, Cal.)

Ans. According to law, confiscated apparatus becomes property of the government, and will not be returned to the former owner at any time. Apparatus

SEIZED, during the war, by the navy department, may be returned to the owned, upon application to the District Communication Superintendent, of the Naval District in which the seizure was made although it is believed that most of this apparatus is already in the hands of its proper owners.

Q.—I have a small radio telephone set. Can I play music for the benefit of other amateurs? (A. M. B., San Francisco.)

Ans. No. Concerts must only be sent out by certain stations designated for that purpose by the Radio Inspector, at designated times. If anyone was allowed to send them out promiscuously, it would cause endless interference, and trouble, as well as monopolization of the "circuit" by one party to the exclusion of all others.

EXAMINATION FOR RADIO INSPECTOR

The United States Civil Service Commission announces an open competitive examination for radio inspector on October 5, 1921. Vacancies in the positions of radio inspector and assistant radio inspector in the Bureau of Navigation, Department of Commerce, at $1,800 to $2,200 a year, and in positions requiring similar qualifications, at these or higher or lower salaries, will be filled from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion. The duties will be primarily to inspect the radio apparatus on steamships, to insure its compliance with the law, and to inspect shore stations. The inspectors may also be called upon to examine radio operators. The duties of radio inspectors require some office experience, therefore competitors should outline fully in their applications any office experience they may have had. Competitors will be examined on theoretical and practical questions in the construction, use, and adjustment of radio apparatus and auxiliaries (rating of 50) and education and experience in the line of the required duties (rating of 50).

Applicants must have received a bachelor of science degree from a school of recognized standing, such educational training to have included a special course in radio or kindred sciences, or show that they are senior students in such institutions; or have had the equivalent of a high school education and at least two years' experience in special radio work, such as the manufacture, installation, or adjustment of commercial or governmental wireless apparatus. It is essential that applicants be wireless telegraph operators.

Applicants must have reached their twenty-first but not their fiftieth birthday on the date of the examination. These age limits do not apply to persons entitled to preference because of military or naval service.

Applicants should at once apply for Form 1312, stating the title of the examination desired, to the Civil Service Commission, Washington, D. C., or to the Secretary of the United States Civil Service Board at any place listed hereon. Applications should be properly executed, excluding the medical and county officer's certificates, and filed with the Commission at Washington in time to arrange for the examination at the place selected by the applicant.

CALL LIST OMISSIONS

The list of Pacific Coast amateur stations in our September issue did not contain the name and address of station 6AQQ. In order to complete last month's list our readers should include the following: 6AQQ, A. H. Furst, 843 East Central Ave., Redlands, Cal.

Sixth District Amateur Stations

Call	Name—	Address—
6ASN	D. Koch	2043 Berryman Street, Berkeley, Cal.
6ASO	J. P. Hickey	149 Sixth Avenue, San Francisco, Cal.
6ASP	C. F. Lard	5815 Ayala Street, Oakland, Cal.
6ASQ	F. J. McLung	302 South Rugby St., Huntington Park, Cal.
6ASR	Wan Chan Chock	Beretania St., Honolulu, T. H.
6AST	R. F. Legge	3016 Benvenue Avenue, Berkeley, Cal.
6ASU	E. Sibbett	13 Parkside Drive, Alameda, Cal.
6ASV	D. G. Chilson	Tucson, Ariz.
6ASW	I. Coffey	Gonzales, Cal.
6ASX	A. W. Williford	3265 Central Avenue, Alameda, Cal.
6ASY	R. H. Plimpton	2508½ Palm Drive, Los Angeles, Cal.
6ASZ	E. S. Graham	1189 Dolores Street, San Francisco, Cal.
6ATA	A. & L. Newman	1700 Sonoma Ave., Berkeley, Cal. (Portable.)
6ATB	P. Langrick	510 North Lake Street, Los Angeles, Cal.
6ATC	K. W. Kent	53 Hernandez Avenue, Los Gatos, Cal.
6ATD	J. R. Casey	Auburn, Cal.
6ATE	H. Adams	1238 S. Ninth East St., Salt Lake City, Utah.
6ATF	W. B. Bruce	139 South Walnut Street, Brea, Cal.
6ATG	R. Robinson	520 Rose Avenue, Long Beach, Cal.
6ATH	M. E. Johnson	1 East Second St., Ephriam, Utah.
6ATI	A. Watson	1204 H Street, Eureka, Cal.
6ATJ	F. Nickson Jr.	416 Sixth Street, Petaluma, Cal.
6ATK	H. Hammerly	529 Merrinac St., San Francisco. (Portable.)
6ATL	H. L. McIntosh	312 East Mill Street, Santa Maria, Cal.
6ATM	D. Likes	137 Richards Street, Fallon, Nev.
6ATN	M. E. Stuart	Fallon, Nev.
6ATO	E. G. Bowman & T. F. Holmes	Thacher School, Ojai, Calif.
6ATP	O. White	Nogales, Ariz.
6ATQ	H. A. Wall	Mt. Pleasant, Utah.
6ATR	C. Urquhart	403 E St., Eureka, Calif.
6ATS	R. Fludge	19th Ave. & Sloat Blvd., San Francisco.
6ATT	Pomona Fix. & Wir. Co.	Pomona, Calif.
6ATU	C. Henninger	R. F. D. 1-4-215-J, Oakland, Calif.
6ATV	John Utschig	1468 Ninth Ave., San Francisco.
6ATW	J. Eliassen	317 Ramona Ave., Berkeley, Calif.
6ATX	H. C. Gregory	Vendime Ave., Daly City, Calif.
6ATY	T. L. Graham	1189 Dolores St., San Francisco.
6ATZ	G. Evans	3042 Delaware St., Oakland, Calif.
6AUA	L. Ziegler	4601 Pasadena Ave., Los Angeles, Calif.
6AUB	H. Compton	3369 28th St., San Diego, Calif.
6AUC	H. Hostetter	3754 Oregon St., San Diego, Calif.
6AUD	J. Elmer	2020 Monroe Ave., San Diego, Calif.
6AUE	M. D. Ball	1168 22nd St., San Diego, Calif.
6AUF	J. F. Thomas	St. Joseph High School, San Jose, Calif.
6AUG	H. Vettel	Hornbrook, Calif.
6AUH	D. Bergstedt	Magnolia Ave., Pasadena, Calif.
6AUI	F. W. Robinson	903 Pine St., Oroville, Calif.
6AUJ	P. Peterson	1213 E. Wash. St., Phoenix, Ariz.
6AUK	A. Burley	Newcastle, Calif.
6AUL	H. O. DeLa Montanya	2830 11th Ave., Oakland, Calif.
6AUM	C. H. Romander	Smith River, Calif.
6AUN	C. A. Messineo	1730 Page St., San Francisco.
6AUO	J. J. Wallace	831 Sacramento St., Vallejo, Calif.
6AUP	J. F. Brady	2012 Pacific St., Alameda, Calif.
6AUQ	R. M. Heintz	653 Miramar Ave., San Francisco.
6AUR	W. A. Carlson	1710 34th Ave., Oakland, Calif.
6AUS	E. E. Vetter	912 Persia Ave., San Francisco.
6AUT	R. E. Esparza	1915 Lincoln Ave., Alameda, Calif.
6AUU	H. A. Tattenham	316 Richland Ave., San Francisco.
6AUV	E. T. Cole	116 Florida St., Vallejo, Calif.
6AUW	R. Ghidella	2051 Leavenworth St., San Francisco.
6AUX	R. H. Hanlon	437 Walnut St., San Francisco.
6AUY	R. Moore	2612 Buena Vista Ave., Alameda, Calif.
6AUZ	E. M. Hall	931 61st St., Oakland, Calif.
6AVA	G. Deaner	154 J St., Tulare, Calif.
6AVB	C. A. Pearson	2323 F St., Sacramento, Calif.
6AVC	J. M. Boyd	Twelfth & Market Sts., Oakland, Calif.
6AVD	J. R. Alsip	R. F. D. No. 3, Box 735, Watts, Calif.
6AVE	J. C. Graner	1121 Santa Clara St., Vallejo, Calif.
6AVF	J. H. Hadley	1190 Jackson St., San Francisco.
6AVG	R. Winenow	269 Richland Ave., San Francisco.
6AVH	R. Richardson	4358 Foothill Blvd., Oakland, Calif.
6AVI	L. C. Cole	753 E. Third St., Los Angeles, Calif.
6AVJ	M. S. Wood	483 L St., Dinuba, Calif.
6AVK	H. V. Rugh Jr.	2425 Alhambra Ave., Alhambra, Calif.
6AVL	F. L. Walker Jr.	Westwood, Lassen Co., Calif.
6AVM	R. Zimmerman	Capay, Calif.
6AVN	T. Shaw	150 W. Third St., Claremont, Calif.
6AVO	B. McMahon	Compton, Calif.
6AVP	E. E. Barnett	548 W. Sixth St., Long Beach, Calif.
6AVQ	H. Knagh	250 Thrift St., San Francisco.
6AVR	C. Yates	R. F. D. No. 3, Box 104A, Fullerton, Calif.
6AVS	H. Norek	506 Orange Ave., Long Beach, Calif.
6AVT	H. Frame	2533 Brant St., San Diego, Calif.
6AVU	K. Lambkin	114 Bonito Court, Ontario, Calif.
6AVV	M. Ports	3265 Belmont St., Fresno, Calif.
6AVW	R. Garcia	1003 N. Coranado St., Los Angeles, Calif.
6AVX	G. G. Monck	2330 Third St., San Diego, Calif.
6AVY	L. P. Simpson	1040 W. 51st Place, Los Angeles, Calif.
6AVZ	W. J. Edwards	2221 Hunt St., Monterey, Calif.
6AWA	P. H. Adams	756 E Avenue, Coronado, Calif.
6AWB	J. H. Smith	320 Milford St., Glendale, Calif.
6AWC	G. C. Callender	139 Jessie St., Manteca, Calif.
6AWD	E. Owen	2302 Garfield St., Monterey Park, Calif.
6AWE	H. C. Rider	933 N. Harvard Blvd., Los Angeles, Calif.
6AWF	A. Chamberlain	106 W. Third St., Los Angeles, Calif.
6AWG	R. Squire	39 Granada St., San Francisco.
6AWH	E. J. Seely	540 So. 9th East St., Salt Lake City, Utah.
6AWI	N. S. Beesley	1917 Raymond Ave., Los Angeles, Calif.
6AWJ	S. W. Lohman	4408 Santa Monica Blvd., Los Angeles, Calif.
6AWK	B. Fredenthal	527 Euclid Ave., Ontario, Calif.
6AWL	W. Weitman	2424 Sixth Ave., Los Angeles, Calif.
6AWM	F. W. Wood	1418 Malvern St., Los Angeles, Calif.
6AWN	A. E. Moorhead Jr.	284 Perkins St., Oakland, Calif.
6AWO	W. Phillips	905 York St., Vallejo, Calif.
6AWP	E. Thacher	407 W. First St., Santa Ana, Calif.
6AWQ	F. W. Hadley	San Simeon, Calif.
6AWR	D. G. Hewitt	Box 596, Stanford University, Calif.
6AWS	H. D. Schmidt	383 Ocean Ave., Santa Cruz, Calif.
6AWT	B. Molinari	653 Union St., San Francisco, Calif.
6AWU	W. Stonerook	3702 Utah St., San Diego, Calif.
6AWV	C. H. Weatherhill	1509 G St., Reedley, Calif.

Seventh District Amateur Stations

Call.	Name.	Address.
7OA	William Thurlow	300 N Street, Hoquiam, Wash.
7OB	Arthur Hagerman	Y. M. C. A., Baker, Ore.
7OC	H. H. Clark	599 Pershing St., Portland, Ore.
7OD	M. B. McBride Jr.	1031 N. 23rd St., Seattle, Wash.
7OE	H. S. Pyle	810 Warren Ave., Bremerton, Wash.
7OF	V. C. Johnson	1014 Glass Ave., Spokane, Wash.
7OG	E. A. Elge	418 N. Benton St., Helena, Montana.
7OH	G. S. Felkert	402 N. 17th St., Corvallis, Ore.
7OI	P. M. Smith	R. F. D. No. 3, Powell, Wyo.
7OJ	L. U. Bennett	Port Townsend, Wash.
7OK	Frederick Koelsch	103 Jefferson St., Boise, Idaho.
7OL	Roy Smith	202 First Street South, Burley, Idaho.
7OM	Harold Woodyard	Sunnyside, Wash.
7ON	Sheldon Hagen	807 24th Ave., Seattle, Wash.
7OO	G. O. Leonard	1827 Fourth Ave. W., Seattle, Wash.
7OP	H. E. Williamson	316 Union St., Seattle, Wash.
7OQ	R. E. Peratovich	Bay View, Alaska.
7OR	A. H. Lillibridge	506 E. A St., Moscow, Idaho.
7OS	C. F. Burdick	Casper, Wyo.
7OT	B. B. Bliss Jr.	417 Bannock St., Boise, Idaho.
7OU	W. K. Stockdale	Prosser, Wash.
7OV	F. J. Campbell	Second St. N., Forest Grove, Ore.
7OW	Edwin Eby	782 Front St., Salem, Ore.
7OX	W. A. Hazelwood	Myrtle Point, Ore.
7OY	J. R. Truman	848 Ocean Drive, Bandon, Ore.
7OZ	Garrett Lewis	767 Hawthorne Ave., Portland, Ore.
7PA	H. W. Randall	1212 Stark St., Pullman, Wash.
7PB	R. T. Jones	116 Edison St., Portland, Ore.
7PC	Herbert Chase	2010 Water St., Olympia, Wash.
7PD	B. C. Hendricks	Cornelius, Ore.
7PE	L. C. Grove	Kenai, Alaska.
7PF	Glen Goudie	2818 Victor Place, Everett, Wash.
7PG	K. H. Ellerbeck	2019 Nob Hill, Seattle, Wash.
7PH	R. M. Gardner	R. A. Box 292A, Eugene, Ore.
7PI	R. K. Moore	115 First St., Wolf Point, Mont.
7PJ	D. P. Scaife	288 Eighth St., Marshfield, Ore.
7PK	D. K. Boyd	Second Ave., Glasgow, Mont.
7PL	C. H. Ackerman	305 Fifth St. S., Glasgow, Mont.
7PM	H. C. Manning	4324 8th Ave. N. E., Seattle, Wash.
7PN	B. L. Davis	8523 12th Ave. N. W., Seattle, Wash.
7PO	G. E. Kinsey	907 W. 58th St., Seattle, Wash.
7PP	Stadium High School	First and E St., Tacoma, Wash.
7PQ	Arthur Harding	1120 N 97th St., Seattle, Wash.
7PR	Leland Harris	3232 38th Ave. S. W., Seattle, Wash.
7PS	Arthur Randall	2802 22nd Ave., Seattle, Wash.
7PT	E. P. Coulter	529 Third St., Helena, Mont.
7PU	E. L. Hansen	R. F. D. No. 2, Powell, Wyo.
7PV	J. M. Dickenson	434 17th St., Corvallis, Ore.
7PW	C. W. Gabrielson	Puyallup, Wash.
7PX	L. A. Kobe	Powel, Wyo.
7PY	Hans Waale	Nampa, Idaho.
7PZ	Walter Bone	Carneyville, Wyo.
7QA	H. M. Hassell	120 E. 60th St., Seattle, Wash.
7QB	Kenneth Field	306 E. Olive St., Seattle, Wash.
7QC	J. F. Bunting	1907 1st Ave. W., Seattle, Wash.
7QD	D. H. Bunch	1015 Spur St., Aberdeen, Wash.
7QE	W. H. Motz	4608 J St., Tacoma, Wash.
7QF	S. W. Ostrom	4840 48th St. S. E., Portland, Ore.
7QG	G. R. Salisbury	1951 Third Ave. W., Seattle, Wash.
7QH	H. M. Reynolds	3817 Densmore Ave., Seattle, Wash.
7QI	J. D. Keating	1315 Sandy Blvd., Portland, Ore.
7QJ	Frederick Lindstrom	Powell, Wyo.
7QK	R. R. Patrick	Eastonville, Wash.
7QL	Alva Flippin	Rainier, Ore.
7QM	R. E. Welch	1005 N. Normandie St., Spokane, Wash.
7QN	A. Z. Lillian	620 21st Ave. N., Seattle, Wash.
7QO	J. C. Mitchell	1622 Mellrose Ave., Seattle, Wash.
7QP	Howard Liebe	204 N. 22nd St., Portland, Ore.
7QQ	Chris Engleman Jr.	321 W. 32nd St., Vancouver, Wash.
7QR	C. V. Annin	Myrtle Point, Ore.
7QS	E. W. Henry	5505 36th Ave. S. E., Portland, Ore.
7QT	Clarence Hurd	1514 Willamette St., Eugene, Ore.
7QU	F. R. Cartan	1461 Monroe St., Corvallis, Ore.
7QV	John Munzenrieder	515 First St., Helena, Mont.
7QW	Jay Isham	820 Dalton Ave. W., Spokane, Wash.
7QX	F. A. Koehler	314 S. 12th St., Corvallis, Ore.
7QY	Victor Chambers	Nineteenth St., Cottage Grove, Ore.
7QZ	D. W. Cathcart	1505 E. 66th St., Portland, Ore.
7RA	M. A. Hauge	5635 11th Ave. N. E., Seattle, Wash.
7RB	R. G. Farrah	700 E. 26th St., Vancouver, Wash.
7RC	Barton Stanier	Spruce St., Myrtle Point, Ore.
7RD	Charles Parmelee	Sunnyside, Wash.
7RE	N. H. Foster	N. Water St., Ellensburg, Wash.
7RF	H. E. Nelson	Centralia, Wash.
7RG	E. J. Hoff	927 Irving St., Astoria, Ore.
7RH	P. E. Nolte	Camp Lewis, Wash.
7RI	John Soderstrom	823 Thornton St., Aberdeen, Wash.
7RJ	G. O. Campbell	2443 Fifth Ave. W., Seattle, Wash.
7RK	H. L. Haven	1123 Burwell St., Bremerton, Wash.
7RL	G. W. Garman	1366 31st Ave. S., Seattle, Wash.
7RM	H. A. Burgess	9260 California Ave., Seattle, Wash.
7RN	Kenneth Paton	Cashmere, Wash.
7RO	R. G. Heitkemper	439 E. 10th St. N., Portland, Ore.
7RP	E. R. Simpson	1004 Leonard St., Portland, Ore.
7RQ	D. E. Renlokle	Cashmere, Wash.
7RR	Jeffery Klichli	319 N. 33rd St., Billings, Mont.
7RS	L. E. Scriven	2118 Lingerwood St., Spokane, Wash.
7RT	E. S. Callies	2815 Pacific Ave., Hoquiam, Wash.
7RU	N. J. Bruck	744 Kearny St., Portland, Ore.
7RV	Wm. Morton	6523 45th Ave. S. E., Portland, Ore.
7RW	D. E. Schultz	2423 Birch St., Astoria, Ore.
7RX	L. F. Shields	Box 21, R. F. D. No. 1, Salem, Ore.
7RY	L. F. Zimmerman	Owyhee St., Ontario, Ore.
7RZ	V. B. McCulloch	323 N. Conant Ave., Burley, Idaho.

CORRESPONDENCE FROM OUR READERS

Walnut Grove, Cal.,
August 9, 1921.

Editor, "PRN,"
151 Minna St.,
San Francisco, Cal.

Dear Sir:

Just thought I would listen-in during the early morning hours to see what has been doing on the air. To say the least, it is certainly surprising to hear what was done through the heavy interference.

A few nights ago 6EA of Los Angeles gave a message to 7DA (now 7ZT) direct and a QSL of an OK was received right off the bat. A few minutes later 6EB of Los Angeles also worked 7DA. The interference was heavy at the time and kept me jumping in an endeavor to get both stations. The distance is about 900 miles by air line from 6EA to 7ZT.

Then 6AJH exchanged greetings with 7ZJ through heavy atmospherics. The San Diego arc spoiled the fine work of the morning hours.

While writing you this letter, I am listening to 6MH working with 7ZJ and they don't seem to be having much of a hard time in doing so. In this case the distance is another 900 miles and I hear two other fellows working at the same time, all of which goes to show that much work is being accomplished during the early morning hours.

All of the stations mentioned above are spark equipped. I am situated just half way between these stations and have, therefore, a fine chance to get an idea of what is going on from all directions.

Respectfully,
(Signed) J. W. WISE, 6ZX.

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310 West 14th Street,
New York City,
Sept. 1, 1921.

Editor "Pacific Radio News,"
Pacific Radio Publishing Co.,
San Francisco.

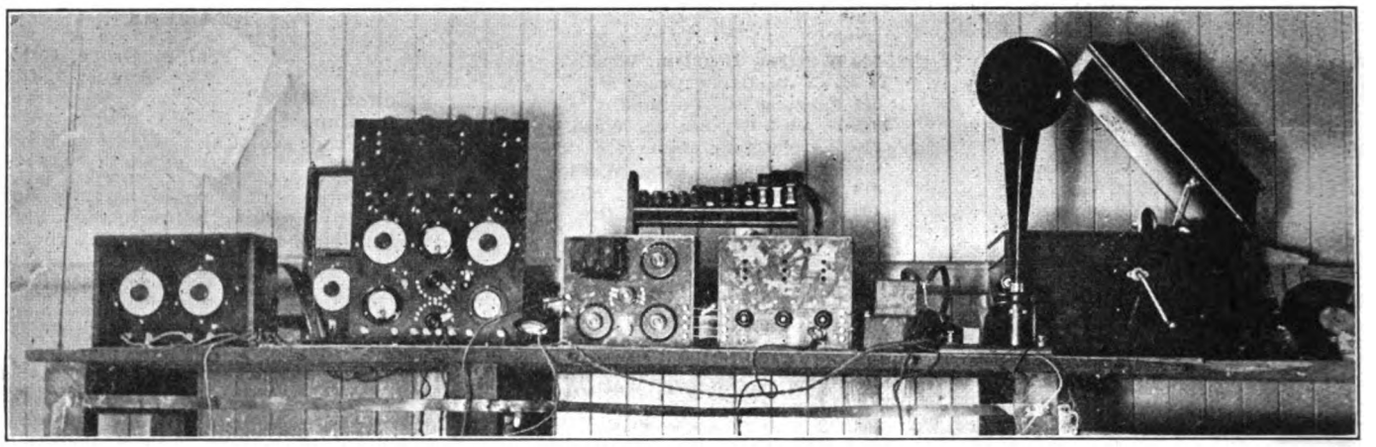
My Dear Editor:

I read with much interest an article by Mr. Carl E. Soderstrom in the September issue of P.R.N., in which he states his views concerning private apparatus aboard merchant vessels. I heartily agree with Mr. Soderstrom in some of his views, but on the other hand I believe it is an injustice to the operators en large, that some should use or be permitted to use a sensitive detector and amplifier (vacuum tubes) while others dare not, owing to existing regulations.

I understand that the shipping board permits the use of vacuum tubes, and I know that various foreign vessels are using vacuum tubes in their regular equipment. I consider it unfair to those who must use the regular equipment, that is, crystal detectors, although the latter can get traffic through just as well with a little more patience.

In this connection I would like to call Mr. Soderstrom's attention to his letter of October 8, 1920, printed on page 81 of the November, 1920, issue of P.R.N., in which he reports hearing San Diego press 4,000 miles in daylight and Annapolis and Balboa while at London, using a Kennedy Long Wave Receiving outfit with one auditron bulb. If the above performances don't contradict every reason Mr. Soderstrom gave for not using private apparatus aboard merchant vessels, I'd like to know—"How Come?"

Yours very truly,
(Signed) MONTE COHEN.



Radio Telephone Shop Concert Set.

RADIO TELEPHONE SHOP CONCERT SET

Every Tuesday and Friday night from 8 to 9 you have heard the radio telephone concerts broadcasted from the Radio Telephone Shop in San Francisco, but you have never had the "inside dope" of 6UV. The picture tells the whole tale. The more you look at it the more you will learn about the "TRTS" station.

Mr. A. F. Pendleton, proprietor of the Radio Telephone Shop, personally operates the station twice weekly for the benefit of the many hundreds of "listening-in" radio fans along the Pacific Coast. Radio concerts, exclusively, are broadcasted on 425 meters and reports of the reception of music have been reported from stations as far north as Seattle, Wash. Ships at sea have heard Mr. Pendleton's voice while 800 miles from San Francisco.

The main radio transmitter panel can be seen to the left of the picture. Four power tubes of the 5-watt size are used. The antenna for radio telephone transmission is hardly 50 feet above the ground. To the right of the telephone transmitter panel is the reeciving equipment. The two units are of the Pen Brand Type A detector and two stages of amplification are used for receiving purposes. The Magnavox does the rest. A Columbia phonograph and a generous supply of the latest records were loaned to the Radio Telephone Shop for the musical program.

Mr. Pendleton is one of the radio telephone pioneers of the West. His first telephone made its debut on the air about a year and a half ago. At that time radio concerts were a distinct novelty and to Mr. Pendleton goes much of the credit of being the "founder" of the local air concerts.

The station is specially licensed by the Department of Commerce for experimental work. It is located close to the San Francisco water front, on Steuart Street. Several of the large commercial radio companies have branch offices on that same street and this familiar by-way of the commercial operators has taken on the nickname of "Radio Row."

NORTHWESTERN C.W. STATION WORKS ALASKA ON ONE TUBE

The following letter is from Nelson Lagoon, Alaska. It was sent to 7OZ, telling him of the fine work that he is doing with his C.W. set, using only one 5-watt bulb and A.C. for the plate voltage.

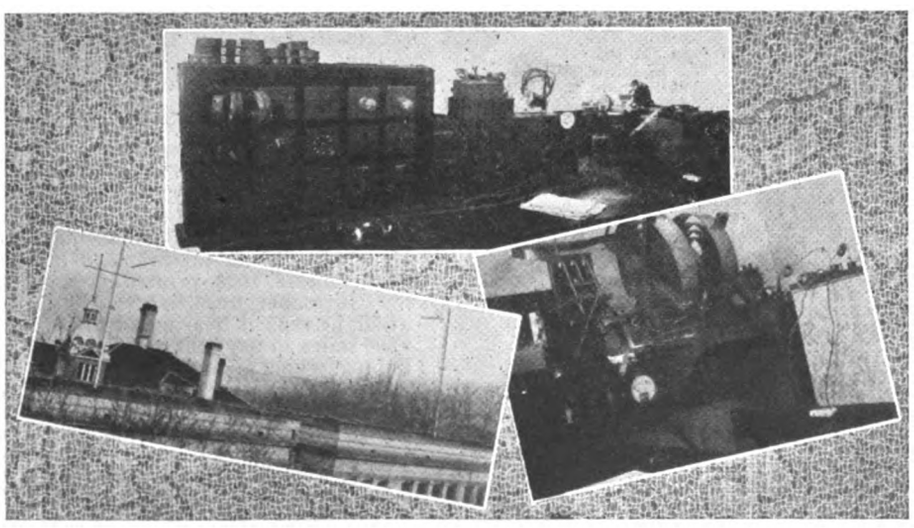
Nelson Lagoon, Alaska, July 6, 1921.
Garrett Lewis,
Radio 7OZ,

Dear Friend Lewis:

It would probably interest you to know that your C.W. signals were heard with good audibility at Libbyville, up in Bristol Bay, Alaska.

John Hertz, old 7ZB, was the boy who heard you. He did not make notation of the exact date, but it was about the 11th of June. He also has heard 7BX's spark, as well as several "six" stations.

73 and C. U. L.
(Signed) RALPH WILLISON, 7BP.



7YA—Boise, Idaho.

7YA—BOISE, IDAHO

We have often wondered what 7YA looks like, as we all have heard him. Here's all the important dope, including photos, of the Boise station that is mentioned on the air almost every night from one end of the coast to the other.

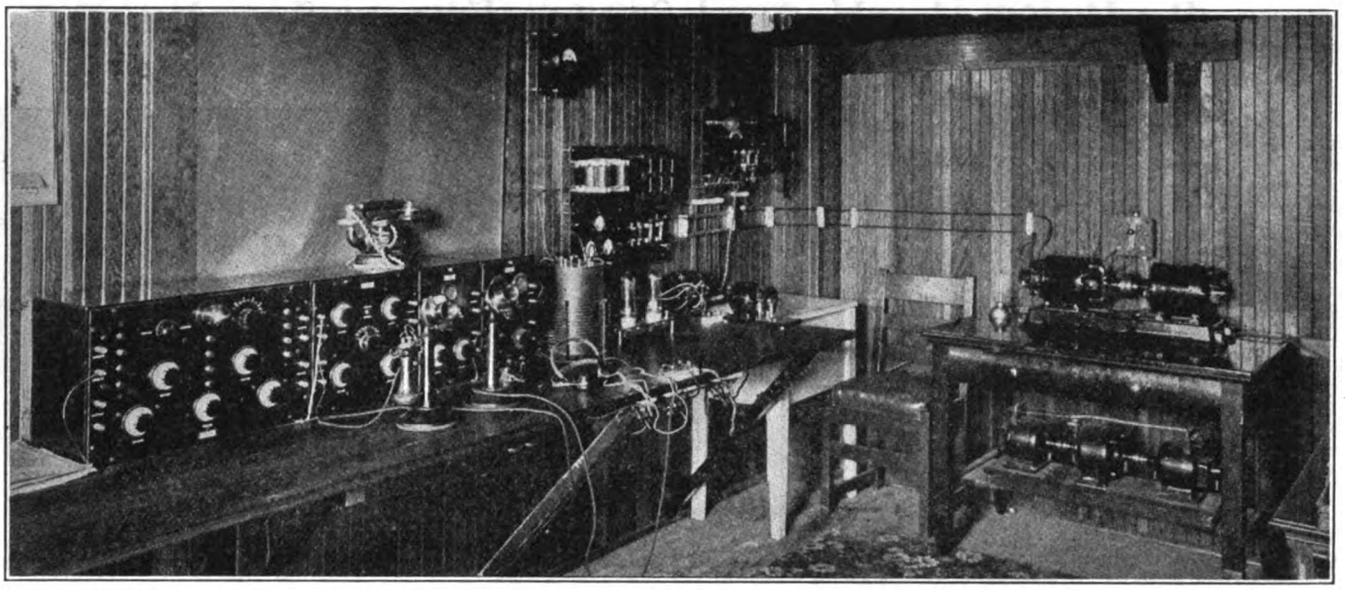
7YA is located in the Boise High School and has been shut down at times during the summer vacation. More than 100 cards were received during January from various stations hearing 7YA—so many, in fact, that H. E. Redeker, the station operator, experienced difficulty in answering them all. Mr. Redeker is an instructor at the school and is assisted in the work of the station by E. O. Selby, a student operator.

The aerial is clearly shown in one of the photos. Two masts, 45 feet high, mounted on the roof of the school, suspend an aerial 125 feet long. Another aerial about 115 feet long of the inverted L type is also used. The lead-in is a length of No. 4 copper wire, 55 feet long. Four No. 10 insulated copper wires soldered to the water pipes in the building are used for the grounding system.

These pipes lie directly under the aerial and act somewhat like a counterpoise. The fundamental wave length of the transmitting aerial is 375 meters. A 2 k.w. oil-immersed transformer, closed core magnetic leakage type, formerly used by H. A. Rawson of Kuna, Idaho, is responsible for the QSA juice that 7YA shoots into the air. The transformer was built by the General Electric Company according to Mr. Rawson's specifications. The condenser is also oil-immersed. It has 6 x 8-inch copper plates, each plate being separated by three sheets of 8 x 10-inch photographic glass.

The gap is the heavy Meteor type, provided with variable speed control. The O.T. is a "DX-52" with 3-inch copper ribbon on both the primary and secondary windings. The radiation on 1 k.w. is almost 7½ amps, according to readings obtained from a Jewell thermo-coupler ammeter. A DeForest unit panel receiver was used throughout the last season.

The greatest official working distance of 7YA is with 9NJ, Ames, Iowa. Signals have also been heard at Madison, Wis., and with generally good audibility within a radius of 1000 miles. A station at Riverside, Cal., reports signals from 7YA strong on a crystal detector and a ship station stated that 7YA could be heard "all over the cabin" while the vessel was more than 1000 miles northwest of Seattle.



Kennedy Telephone Station at Los Altos.

KENNEDY RADIO TELEPHONE TRANSMITTING STATION

Among the radio telephone installations on the Pacific Coast, that of the Colin B. Kennedy Company of San Francisco has been exciting a great amount of interest and comment, due both to its excellent modulation and to the distances over which transmission has been successfully achieved.

The Kennedy experimental station, whose call is 6XAC, is at Los Altos, about 40 miles south of San Francisco on the peninsula and on the inland side of the coast range. The installation is at the home of Emile A. Portal of that company, who is responsible for the operation of the station.

The photograph which is reproduced herewith shows the interior of 6XAC with the exception of the phonograph used for transmitting music, which is at the right. The receiving equipment is shown at the left and consists of the following old-type Kennedy units, a Type 100 long wave receiver, a Type 200 short wave receiver, a Type 300 audion control panel, and a Type 520 two-stage amplifier. Mr. Portal states that he expects to replace all of this in the near future with two of the new receiving units recently developed by his company—a Type 110 universal receiver and a Type 525 two-stage amplifier. A Magnavox and two-stage Magnavox power amplifier complete the receiving equipment with which Mr. Portal has at various times entertained his neighbors within a radius of from three to four miles, as previously recorded in these columns.

The transmitting equipment, as is indicated by the picture, is extremely simple. Two 50-watt Cunningham tubes are used, one as modulator, the other as oscillator. The filaments are heated by current drawn directly from the 10-volt secondary of a 60-cycle transformer having a neutral point. The plate current is supplied by the 1000-volt generator of the 275-watt motor generator outfit shown on the table at the right. Double choke coils and fixed condensers are used in smoothing out the commutator ripple. A modulation transformer of special design is employed in connection with a high duty telephone transmitter for voice and a Magnavox tone arm transmitter for the music. The necessary meters are mounted conveniently on panels for the observation of the different variable quantities of voltage and current. The normal radiation of the station is three amperes.

The circuits and constants used are developments of the Kennedy laboratory and will be made public at a later date.

The antenna used for transmitting is of the cage type 55 feet long and about 100 feet high. Two other single wire antennas are available for reception when desired.

6XAC transmits music three times a week, on Monday and Thursday evenings between 8 and 9 o'clock, and on Sunday afternoons from 3 to 4. The wave length is 430 meters.

In the short time that this station has been operating some very interesting reports of its reception have been received. Excellent reception on a single tube has been reported from all parts of California, Oregon and Washington, and from various points in British Columbia, Idaho and Nevada. The latest to report is Great Falls, Montana, with a single tube! Some almost unbelieveable reports have been received of reception with very poor antennas. Judging from the splendid work accomplished by this telephone at the time of year it has been operating, we look forward to exceptional results during the coming static-free season.

RADIO STATION 6DD—GRASS VALLEY, CAL.

"It works as good as it looks," says Mr. Phil Keast, referring to the accompanying illustration of his cleverly arranged station. A Radio Shop regenerative receiver with a three step amplifier and a Magnavox comprise the essential parts of the receiving equipment. A 5-watt power tube is used for the third step of amplification with very good results.

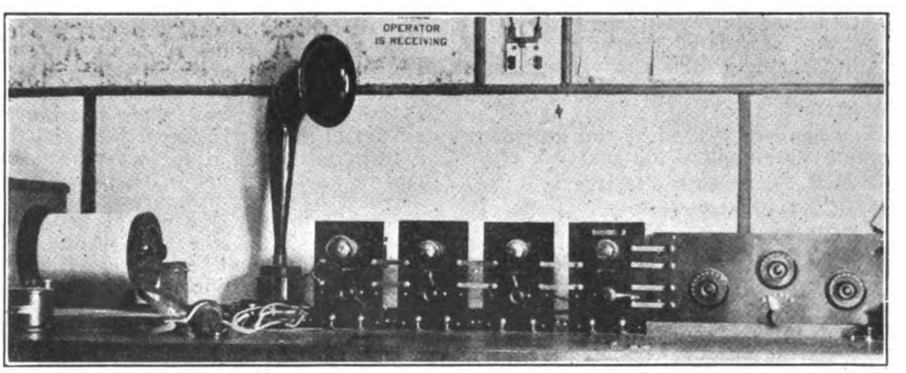
The transmitter consists of an Acme 1-k.w. transformer, synchronous gap, home-made oil condenser with glass plates 1-4 inch thick and a Wesrad oscillation transformer. No especial records have been broken in transmitting, but stations in Idaho have often been raised. With the addition of the synchronous gap 6DD will be able to do still better work.

A radio telephone transmitter, similar to the one used at the Fairmont Hotel, San Francisco, is under construction.

HOTEL OAKLAND HAS RADIO TELEPHONE

P. D. Allen, formerly radio officer in charge of the U. S. Navy receiving station at Honolulu, T. H., has installed a radio telephone transmitter in the Hotel Oakland, Oakland, California.

Mr. Allen is operating the station in conjunction with the Western Radio School, of which he is the director. Press is sent daily on 325 meters, from 7:15 to 7:30 p. m. Concerts are broadcasted on Tuesday and Friday evenings from 8 to 9 p. m. There are no Sunday concerts. Press matter is supplied by the Oakland Tribune for broadcasting. Mr. Allen is one of the "old timers" of the West in the radio game. He holds an extra first grade radio license, has had a number of years of sea service to his credit and is a "thoroughbred" radio man in every respect.



6DD—Grass Valley, Calif.

Radio in the United States Forest Service

F. K. Teeter Jr.

Each year thousands upon thousands of dollars of timber are wasted by that ravaging menace, fire, most of which is caused by the carelessness of man. To overcome this terrible waste, congress enacted laws, creating the United States Forest Service, a body formed to protect our forests from fire and to prosecute those who through their carelessness have caused these gigantic losses.

Every means of communication has been used by this department, to aid the cause the telephone, the heliograph, wigwag, and other well known means of signalling, until 1919, when radio was given its chance. The officers of the forest service and United States Army Air Service met together and planned the use of radio and airplanes, for the use of locating fires, for after our late war experience in spotting artillery shots over the line and reporting back by radio, why would it not be just as easy for a plane to fly over the forests and report any fires spotted back to its base. This method was used successfully during 1919 and 1920, and early in 1921 the Forest Service thought that this could be perfected to a greater degree by installing receiving stations at each forest headquarters.

They then appealed to the Air Service for equipment, which was granted, and to the Department of Commerce for the most reliable source of operators, and, as usual, the reply was to make the selection from the amateurs. Mimeographed blanks were then sent to all licensed amateurs, with the request that they fill them out and return to the Mather Aviation Field, at Sacramento, Calif. After these blanks had been returned, fifteen men were selected and the following stations created:

Station.	Call.	Wave Length.
Sisson	SN	350
Weaverville	WE	350
Alder Springs	AL	350
Mineral	ML	350
Quincy	QY	485
Santa Barbara	SB	350
Orleans	OS	350
Nevada City	NY	485
Placerville	PE	485
Sonora	SR	485
North Fork	NK	350
Hot Springs	HS	350
Los Angeles	LA	350
Yreka	YA	350
Happy Camp	HC	350

You will notice the wave length of some of the stations are different, the reason for that being to prevent any conflict in messages of one patrol with that of another.

At each airplane patrol base there is a C.W. and modulated buzzer transmitter, for broadcasting QST's to various forest stations, same working on 350, 485 and 600 meters.

The equipment used by the ground reception stations is as follows:

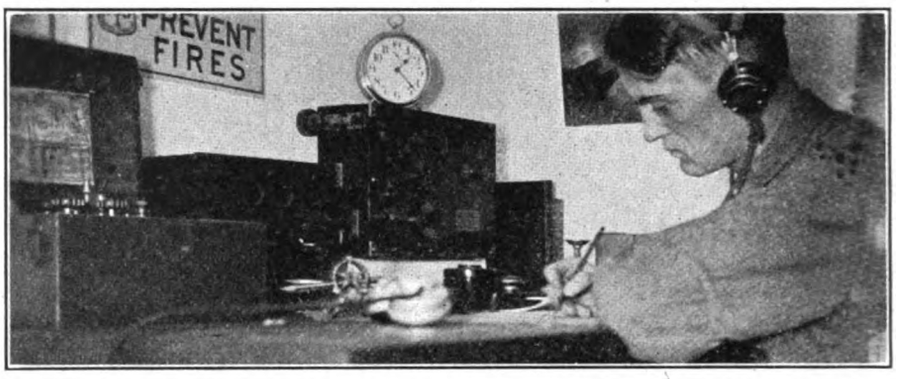
1 SCR 59, airplane receiver.

1 BC 14, crystal receiver.

1 SCR 72, 2-stage amplifier.

2 pairs, Western Electric phones.

The SCR 59 receiver is designed for usage in a 'plane, and consists of a straight tuner, tapped off to four contacts, having a condenser in the antenna circuit for fine adjustment and an audion detector and two-stage amplifier; the whole being enclosed in a case 10x12 inches.



The author at his set. During the war Mr. Teeter was president of the San Francisco Radio Club, which he held together during this trying period with but four members.

The BC 14 is an army field set, being a loose-coupled outfit with a galena detector, and is for emergency use in case of a breakdown in the SCR 59.

The SCR 72 is an army two-stage amplifier, for use with the SCR 59, giving a total of four steps, but as yet I have not used this amplifier because with SCR 59, the signals from the planes when close are of such audibility that it is uncomfortable to allow the phones to remain upon ones' head, and at all times the planes are readable up to 80 miles and then they are about back to their base.

The planes are equipped with 1-8 kw. 500-cycle spark transmitters, consisting of a generator and exciter, driven by a small propeller, a transformer, a mica condenser and inductance, the whole being mounted and enclosed in a torpedo shaped shell, and placed on the running gear of the plane. The only equipment kept in the plane is a key and a radiation ammeter. The antenna consists of a single stranded wire with a lead weight attached to one end, which is known as a fish, from its shape. The use of this fish is to keep the antenna from tangling around the control wires and also give a vertical component to the antenna, in order to overcome a purely directional effect of radiation. Upon landing the antenna is drawn up upon a reel in rear of the observers' seat. The engine of the plane is used for a ground.

I can now see in the minds of the readers, the doubt of efficiency of this arrangement: there only being a transmitter on the planes with no receiver, and a ground station, with a receiver, but no transmitter. Or in other words, how is the observer in the plane going to know whether the ground station is getting him OK or not? To overcome this, if a fire is spotted, it is sent, repeated, repeated 15 minutes later, and when nearing the air patrol base, it is given them and they in turn telephone it to forest headquarters in which the fire is located. On my patrol I have had five fires reported, to date, and on the five fires I have been able to get it OK the first, second, third and last time, and upon inquiring of other ground stations have found that they have done as well as I.

We also use a panel system as another safeguard against inefficiency. These panels are twelve feet long and three feet wide and are placed in a conspicuous place, in order that planes may readily see them.

All fire messages are sent in code, it being found necessary to use a code in order to save time, as a few minutes may mean whether we have a big fire or a small one. The code adopted being as follows:

Fire Call—FFF

New or Old Fire

New—N. Old—O.

Location

T—Township. R—Range. Section S & Subdivision

Sizes—S

G—Single Snag. M—Camp fire. R—Sq. Rods. A—Acres.

Cover C

T—Timber. B—Brush. O—Open. X—Burn or Cut Over.

Slope—S

L—Level. G—Gentle. S—Steep.

Wind Velocity and Direction—W

N—North. S—South. E—East. W—West.

The patrols carry maps of the territory over which they fly, these maps being divided into townships, ranges, sections, quarter sections, and also show all lookouts, mountains, rivers, railroads and anything which tends to help in the description and location of a fire. Duplicates of these maps are kept at each air patrol base and also at each forest headquarters, and any fires located are marked on these maps with red pins, and after the fire is out a black pin is substituted, so by this means the observers and forest men at all times know what fires are burning and their condition.

The average patrol flies about 400 miles per day, keeping a log of flights and observations.

Each ground operator is required to keep a log, and to mail same together with all copies of messages sent him from the planes. He is also required to keep a pin map and to confirm all fires by telephone, though where some of the stations, such as Sisson, Yreka and North Fork, which have transmitters, same is confirmed by radio, and communication is also kept with outside forest offices.

During 1922 or 1923 both planes and ground stations will be equipped with CW and radio telephone outfits, and then the peak of efficiency will have been reached, though the present system is working very satisfactorily.

Static Statistics from Everywhere

By Squak McGuff

Hello, "fellers," how's my spark? How do you get me? QRK, QRH, QTC, QRU, QSL, GE. "73," nil, cul, too much QRM, pls, qrx, etc.

Oh, yes, I just received a delayed reply in connection with the balloon contest; i.e. 6CH's station. But first I'll have to go into a few details lest you get entangled with misapprehension. Sgt. Lufkin, who visits frequently at 6CH, noticed the 'fones were cracked. "How come?" he says to 'CH. "I threw them at a party who caused unnecessary QRM," says 'CH.

So now here comes the sequel. The delayed reply says:

"After careful consideration and concentration I am imbued with the idea that the balloon is for safety first. I noticed that when the door is opened the balloon blows to one side and 6CH invariably makes a quick movement as though he were sitting on the 110 A.C. I thought perhaps he might be inflicted with the St. Vitus' dance; but no, I believe he thinks someone is about to throw something from behind. Possibly a rolling pin from the party of the second part, who has called him many times for dinner."

If it wasn't that the contest is officially off I would award Mr. Lufkin the crisp notes.

The next verse is entitled: "Oh, who told Mr. Tate they were electrose?" accompanied by the Sun (son) who melted them. Miss Snodgrass will follow with: "It's some hot in Vacaville" at the organ.

Sergeant Lufkin is no more. At least the Sergeant part of it. He has checked out of Uncle Sam's brown suit and leggins. He goes about in a disillusioned manner, scratching his lower limbs. He cannot get accustomed to the fact that his leggins are loose. Civilian clothes ain't got no leggins, Mr. Lufkin.

I have a friend in the East who has written me. He did not sign his name. Of course, there is no way of telling whether he is a friend. At any rate he must be a friend because he says he is a radio bug. So am I. He writes in a style that has something in common with Ring Lardner. His ideas are like those of Kerensky, while he is practical like Mr. Ponzi.

He delves into doing away with Q.R.N. and other subjects of lesser importance with a deal of perseverance. He says that subjects like Q.R.N. are his selections of discussion. Mainly because he doesn't know anything about it. Neither does anybody else. That's why he can talk about it without being interrupted. Everybody takes it for granted he knows his business.

So he tells the Fordham Radio Club of New York many things. About Q.R.N. They, of course, don't know what he is talking about. I listened to an engineer lecturing one night. I couldn't just say whether he was talking English, French or Eskimo. When he finished they all clapped. I clapped, too. Fine speech! Hooray! I wouldn't know what this man was talking about either, only I have it down in black and white.

He says in part:

"A Flash! Lightning! And what did I see—Nothing. It was dark. "Stars were shining in the heavens." Of course when I read that I knew he was conducive to bugs. And how could it be a storm? Perhaps someone fired at me point blank. Blank cartridge. No. There it was again. A Flash! Gracious! The goose pimples pimped out on my purple flesh like gooseberries. Aha. What was that? That bright light on the ground. Presto—a lightning bug. No, my friends, it's quite plain. History tells us that QRN is only in the summer. So is the lightning bug. Am I not right? I am. Therefore, we, as amateurs, us radio men, us bugs, we must exterminate this bug."

Professor Goosepimple here concluded. It was a great speech. They all clapped. Great excitement prevailed.

MORAL: When it's time to clap. Clap. Hooray!!

PUBLIC RECOGNITION OF A RADIO RECORD.

This illustration is self-explanatory, the text reading: "By use of a vacuum tube two amateur operators at Keyport, four miles from here, on Oct. 6, 1920, created a new wireless record by transmitting to Scotland with 1000 watt power a phonograph record.

The little lady sat in the parlor sewing. It was stormy outside. Little drops of rain pattered on the pane. The little lady, whose hair was gray, lived in a little gray house. 6CH lived next door.

She was humming an old lullaby as she sewed. Hark, what was that? Rats!! Certainly not. Her house was clean. A rat would starve to death therein. Hark. What was that? It was in the attic. Unmistakably it was a noise. She became nervous. She telephoned. "Hello. Is this the police? Well, there is a burglar in my house. Come quick."

Four burly, freckle-faced, red-haired Irish protectorates of the law rushed to the scene of the alleged criminal's activities.

"Listen," said the little lady.

They did.

A weird cadence emanated from the general direction of the stove pipe.

"Aha," says the burly captain. "He is still there. Let us attack." They rushed the garret. It was empty. (Brownie had stopped sending next door.)

After a thorough search they went down stairs. The officer reached for a glass of water. A hot spark reached out and got him when his bony finger was within an inch of the spigot. "Whoop." he yelled. The light went out. He reached up to turn it on. "Whoop," he yelled, as a full 1250 volts nipped his finger.

"Lady," he said, "this is beyond us. There is a deep plot here. Something superhuman. We must call in our physics department."

The next day 6CH heard about the commotion. Now 6CH is foxy. You have to hand it to him for brain work. He gently slipped upon the roof of the little lady's house and grounded the stove pipe. The police department is still watching the house. But 6CH hammers away in peace and the little lady in the little gray house is wondering. Wondering how in the world things come and go so quickly.

TACOMA

"Tacoma promises some photos of the leading stations in that territory." That's what they tell me in a letter. Well——. We are reserving the space, Tacoma. Come across.

In their onward flight of progress and aggressiveness the Tacoma Club has annexed another strategical victory in securing a room in the Chamber of Commerce. They are allowed full freedom of the rooms and contemplate the installation of a long and short wave receiver therein.

Tacoma says that the Portland Club has put into effect a new set of traffic laws. They don't seem to grasp the meaning at all. They want to know since when has Tacoma become a suburb of Portland. They well realize that their Portland brothers are fast; but that they are altogether too far ahead of the times.

According to Portland's view, we might say that Spokane's mayor and council will soon be out of a job. New York is going to annex it. Imagine meeting a friend on Broadway in New York and upon inquiry as to where he is residing: "Oh, yes, I live over in Spokane; got a commuter's ticket" ? ? ? ?

But taking it all-in-all, Tacoma thinks Portland's club is absolutely O.K.—inasmuch as Portland and Tacoma both wish to do "DX" work this winter. So Tacoma asks Portland: "For the love of Mike be reasonable and amend some of 'them there' stringent policies."

7CE is getting to be a regular "C.W." wizard. He has now arrived at the point where he can argue with 7KM, and believe-you-me it takes somebody who knows something to do that. He should have a Croix-de-combat. So far as known he is the only person having the necessary nerve to even think of such a thing. Well—it's the survival of the fittest. May the best man win. Stay with 'em, 7CE.

Hey, Skinnay! Has anybody got an X-ray tube for Otto Nicholson to experiment with? If you have any old junk aroun' mail it to him. He would sure appreciate it.

Tacoma says to Seattle: "Why all the high power for short distance work?"

7LV, Al Stenso, is recovering from an operation and will be back shortly. "Al" has had a hard time of it, and the "gang" all welcome him back with best wishes.

The following appeared in a newspaper of recent date: "An official in Washington said it was hoped that in the near future radio phones could be utilized to broadcast weather and market reports and other information. Such a system, he said, would eliminate the telegraphic code and make it possible for reports to be received in homes."

(Continued on Next Page)

I wonder if he gets his news by runner. There must be some delay. We, of the Pacific Coast, have been doing this very thing for almost a year.

News from the WEST must be subject to "indefinite delay."

I also noticed in another part of the paper that "for the first time a dance in New York had been held to radio music. And the surprising feature of the whole thing was that the MUSICIANS WERE 30 MILES AWAY."

This certainly is interesting to us on the Pacific. But not NEW. The interesting part is that we are glad our Eastern brothers are following in our footsteps, even though they have been two years tardy. They dance to music from San Francisco in Tacoma, received on a GALENA detectors—800 miles.

PORTLAND

Portland announces that in order to get the proper harmony and co-operation for the coming winter campaign they must have rules. As a result they have got together and blossomed out with the following set of regulations. Woe be to the Adam's Apple that bubbles derogatory thereto.

1. Portland police report will be cleared between 9:30 and 9:45. (If you think the "cops" are after you, cause a lot of QRM.)

2. At 9:45 p. m. traffic manager, or one of his assistants, will ask for reports from long distance stations in Portland and vicinity and all stations will promptly report the traffic on hand, stating the number of messages for north, south and east. They will then QRX 'till 10 p. m., at which time the traffic is open for northern stations. As soon as one station clears his hook north he should QSQ the next man or sign off "CLR." It is intended that all northern traffic will be cleared by 10:30 p. m.

3. At 10:45 traffic will open for the south in the same manner as the north. Southern traffic will be limited to 11:00 p. m. (TAKE NOTICE ALL YOU SIXES.)

4. At 11:30 all eastern traffic will be cleared in the same manner.

5. Promptly upon completion of all traffic the traffic manager will come in and advise ALL CLEAR. As soon as eastern traffic has been cleared stations will be free to chew the fat, make tests, talk to Mars, etc. But, in the event a long distance station says QRJ-1, it is up to you to tell him QSU at schedule for traffic.

Traffic manager 7XF
First assistant 7ZT
Second assistant 7ZB
Third assistant 7ED

"Your co-operation is requested."

7BP, who has just returned from Alaska, where he spent the summer operating at KXV, says: "There are two things that smell like fish, one is fish and the other is Eskimos." Ralph is the same old man except for a slight change in his fist, which has taken on "oil tank" characteristics.

Royal Mumford (7ZJ) is with us again. He has been spending the summer on his homestead at Randall, Wash. He says the fishing and hunting were great. When he did not indulge in the above mentioned sport the time was spent planning that spark for the coming winter. "Long May She Oscillate."

7ZK, the first operator on the S. S. "Senator," has been taking in some of the big stations on his travels up and down the coast, and he says the Northwestern stations can easily hold their own with most of the Southern stations which he has visited. New ideas obtained while visiting these stations were many and he expects to try them upon retiring to amateur life.

7ZB and 7ED have only been on the job about every other night of late. There has been much speculation as to what their occupation is during these other nights. Some say "Moonshine," others say "Peaceful Dreams." From my calculations I would not say "Moonshine" because of their ability to hold the air down three nights a week. Again, I would not say "Peaceful Dreams" because why not take turns at "Dreamland" and not leave such frightful gaps in the air? But what is it? I am not Sherlock Holmes. I give up. Anybody that can put any light on the subject please do so at once.

7ZT, ex 7DA, is getting in a few late hours. He has the same old 200 meter spark with the addition of a 375 meter wave.

SCIENTISTS HEAR RADIOPHONE LECTURE

One of the features of the recent meeting of the American Association for the Advancement of Science at the University of California was the first scientific lecture ever delivered over the air when Clyde Young of the Associated Press (our own Squak McGuff) spoke on "Wireless Telephony" from the station of the Leo J. Meyberg Co. at the Fairmont Hotel in San Francisco. The lecture lasted half an hour and every word was distinctly heard. Mr. Young was thanked over the telephone by the convention delegates for his lecture.

WIRELESS AT THE NORTH POLE

Dr. Donald McMillan, who sailed recently for a couple of years in the Far North near the magnetic pole, will have a wireless outfit adequate to reach civilization at many points, and can not only cheerfully keep in touch with everything that is doing, from Balkan wars to football scores, but can obtain scientific information of great importance. For example, if a magnetic storm starts up he can at once be informed of the exact moment of the first fling of the needle elsewhere, and will be in position to check the simultaneity of the onset of the storm and its exact correlation with the magnetic elements close to the north magnetic pole. With good luck he can get more information about the earth's magnetism and its correlation with solar disturbances in the next two years than has been obtained in the last 200.

PITTSBURGH RADIO ENGINEERING SOCIETY OUTING

The Radio Engineering Society of Pittsburgh held its third annual outing on Saturday, August 6, at the Pines. The affair proved to be the most successful of its kind ever held in Western Pennsylvania. An elaborate program was carried out and many prizes were given.

Among the events were speed contests of twelve and twenty-five words per minute, magnet and insulator races and competitive pie-eating contests. Prizes were also awarded for the best C. W. transmitter and receiver, best wavemeter and best workable old relic. The apparatus judged in these contests was all of amateur construction.

Among the 300 present were many well known eastern radio men, such as F. H. Schnell, of Hartford, Conn., traffic manager of the A. R. R. L.; F. S. McCulloch, of Cleveland, now vacuum tube expert of the Westinghouse Electric & Manufacturing Co.; Frank Schlamaker, of Mars, Pa.; L. M. Ripple (Radio 8 J. U.); C. D. Emery (Radio 8 P. E.), of Canton, Ohio; Roland F. Palmer (Radio 8 D. E.), of Akron, Ohio; J. J. McKinley (Radio 8 A. J. P.), of Uniontown, Pa.; C. M. Charpenmug (Radio 8 W. R.), of Connellsville, Pa.; John C. Stroeble (Radio 8 Z. W.), and William C. Kirbach, of Wheeling, W. Va.; John G. Hoop and Prof. R. C. Colwell, of Beaver Falls, and Frank H. Freshwater, of Rochester, Pa.

At a technical meeting held just before the chicken and waffle dinner, Mr. Schnell gave a short talk on "Traffic Regulations," followed by Mr. Frank Conrad, whose topic was "Continuous Wave Transmission." J. C. Stroeble spoke on "Cage Antenna Characteristics"; F. S. McCulloch spoke on "Power Tubes," and Mr. E. P. Wiggin delivered an interesting paper on "The Antenna Radiation System." Mr. W. K. Thomas (Radio 8 L. F.), whose radiophone has been heard in the Catalina Islands, discussed "Spark and C. W. Transmission," and Mr. Rosenberg, publicity engineer of the Westinghouse Company, spoke on the broadcasting feature of the Westinghouse Station K. D. K. A.

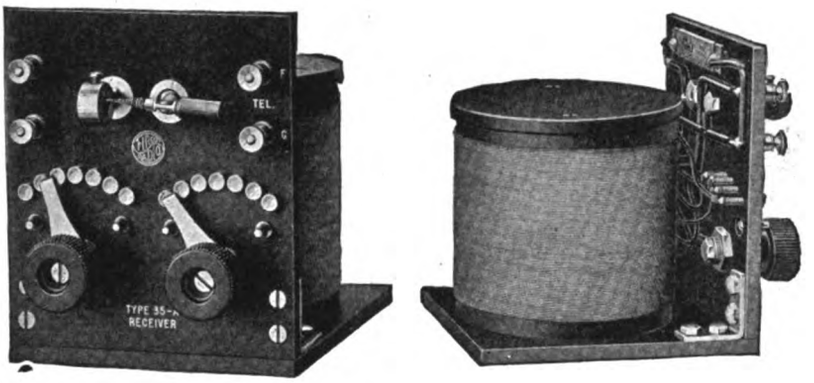
REGULAR CLUB ROOMS FOR CHICAGO CLUB

The Southside Radio Association now has regular club rooms at 2512 Blue Island Avenue. The rooms are open at all times and meetings are held each Thursday evening. A high class receiving and sending set has been installed and an effort is being made to make this club the best of its kind.

New Apparatus and Supplies from the Radio Manufacturers

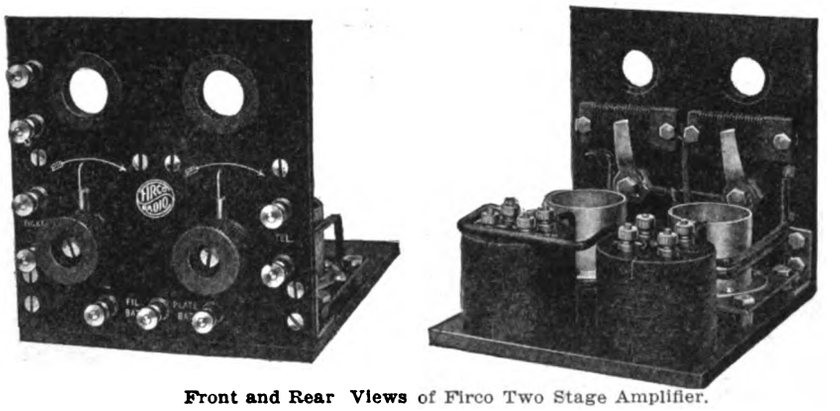
FIRCO MIDGET INSTRUMENTS

A complete crystal receiver set and an audion amplifier recently has been provided for the amateur who wants a small receiving set at low first cost. These are the Midget instruments manufactured by John Firth & Co. Inc., of New York City.



Front and Back Views of Firco Midget Receiver with Crystal Detector.

The receiver, as may be noted from the accompanying front and rear views, is a well made single circuit with a sensitive galena detector. The finish and workmanship are in every respect equal to larger standard sets manufactured by this company. The 1-4-inch Bakelite panel, like those in the Midget amplifier set, are 5 1-4 inches high. The binding posts likewise are arranged so that several units can be set alongside of each other and 3-4 inch busbars used to connect them.



Front and Rear Views of Firco Two Stage Amplifier.

The amplifiers are available in either one or two stages. They are equipped with Saco-Clad 100 per cent shielded transformers and are provided with Bakelite-base audion sockets and complete Firco air cooled rheostats. These have been successfully applied to six-stage amplification, wiring diagram for which will be published in an early issue. No. 14 hard-drawn copper wire insulated with varnished sleeving is used throughout, all connections being carefully soldered. All metal parts are made of heavy nickeled brass.

WIMCO ISSUES C.W. CATALOG

The Wireless Manufacturing Company of Canton, Ohio, has issued a catalog of C.W. transmitting and receiving equipment that contains many illustrations and descriptions of the latest types of C.W. apparatus. Every radio man should have a copy of the WIMCO catalog—if he is contemplating on going into the C.W. field.

WESTINGHOUSE CO. INSTALLING INTERWORKS RADIO SYSTEM

The Westinghouse Electric & Manufacturing Company is arranging to demonstrate on a large scale one of the important commercial uses of radio apparatus by installing an interworks system of wireless telegraphy and telephony. Factories at East Pittsburgh, Pa., Newark, N. J., Bloomfield, N. J., Springfield, Mass., South Philadelphia, Pa., Cleveland, Ohio, and elsewhere have been, or will be, equipped with high-powered transmitting and receiving sets, and it is expected that much of the pressing correspondence between these factories will be conducted by means of this system in the near future.

Several of the stations, notably those at East Pittsburgh, Cleveland, Springfield and Newark, are already in operation. The East Pittsburgh station (KDKA) has become well known to all wireless operators (professional and amateur) because of its nightly broadcasting of concerts, addresses, church services, government agricultural reports and other interesting radio-phone messages.

WESTINGHOUSE ACQUIRES STOCK IN RADIO CORPORATION OF AMERICA

The Westinghouse Electric & Manufacturing Company have sold the assets of the International Radio Telegraph Company to the Radio Corporation of America, retaining certain patents, and rights in foreign fields. They have also obtained a substantial interest in the stock of the Radio Corporation of America and made commercial agreements with them regarding the sale of radio devices which are manufactured by the Westinghouse Electric & Manufacturing Company, and which they will continue to manufacture. They have also retained certain rights in the wireless field, among which is the broadcasting of information.

PARKIN DIAL TYPE RHEOSTAT

For the man building his own set a new dial type rheostat from the Parkin Manufacturing Co., of San Rafael, Calif., will prove a time and money saver. The non-corrosive resistance element is carried in a groove in the back of a three-inch molded Bakelite dial, which has a glossy black finish, all figures and graduations being filled with brilliant white enamel. The dial clears the panel by 1-16 inch, and runs true and smooth. A stop engages the stationary contact at the extreme positions, an "off position" being provided. The carrying capacity is 5 amperes, and the resistance 5 ohms, the full circle rotation insuring fine adjustment.

Parkin Dial Type Rheostat.

FILAMENT CONTROL JACKS

By Cyril J. Staud, B. Sc.

In accord with the general trend of the times, which is away from the multiplicity of switches which marked the "big set" of former days, is brought forth by the Federal Telephone and Telegraph Company the so-called filament control jacks.

They do not differ in construction from other types of standard telephone jacks, but their use in the hook-up given by the accompanying figures is a recent development.

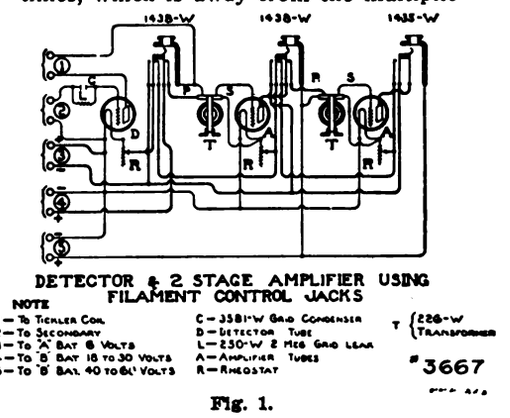


Fig. 1.

(Continued on Page 118)

Report of First Annual Convention

Official Photograph of American

THE first convention of the American Radio League at Chicago, August 30-September 3, was a great success, both from point of numbers attending and from value of the discussions held. About 1200 delegates registered, and a large number of people visited the radio show held in connection with the convention.

The delegates were registered at the two convention hotels, the Sheridan Plaza and the Edgewater Beach. Convention meetings were held in the Auditorium of the Swift Grammar School and the radio show was staged in the Broadway Armory, Broadway and Thorndale streets. All convention activities were thus fairly well centered and at a distance of about five miles from the center of town, or the loop. This was a decided advantage in being near Lake Michigan in view of the extremely hot weather which prevailed generally.

Most of the delegates had arrived on Tuesday, August 30, and while no program was scheduled for this day, all hands were busy in getting located, meeting other delegates and the exhibitors—in getting their booths ready for the following (opening) day.

The convention was opened by the President, Mr. Hiram Percy Maxim, at 10:30 a. m. on Wednesday, August 31, at the Swift School. This followed the assembling of delegates for the accompanying photo. The actual number registered, however, is not shown in the picture—at least twice as many delegates not arriving in time.

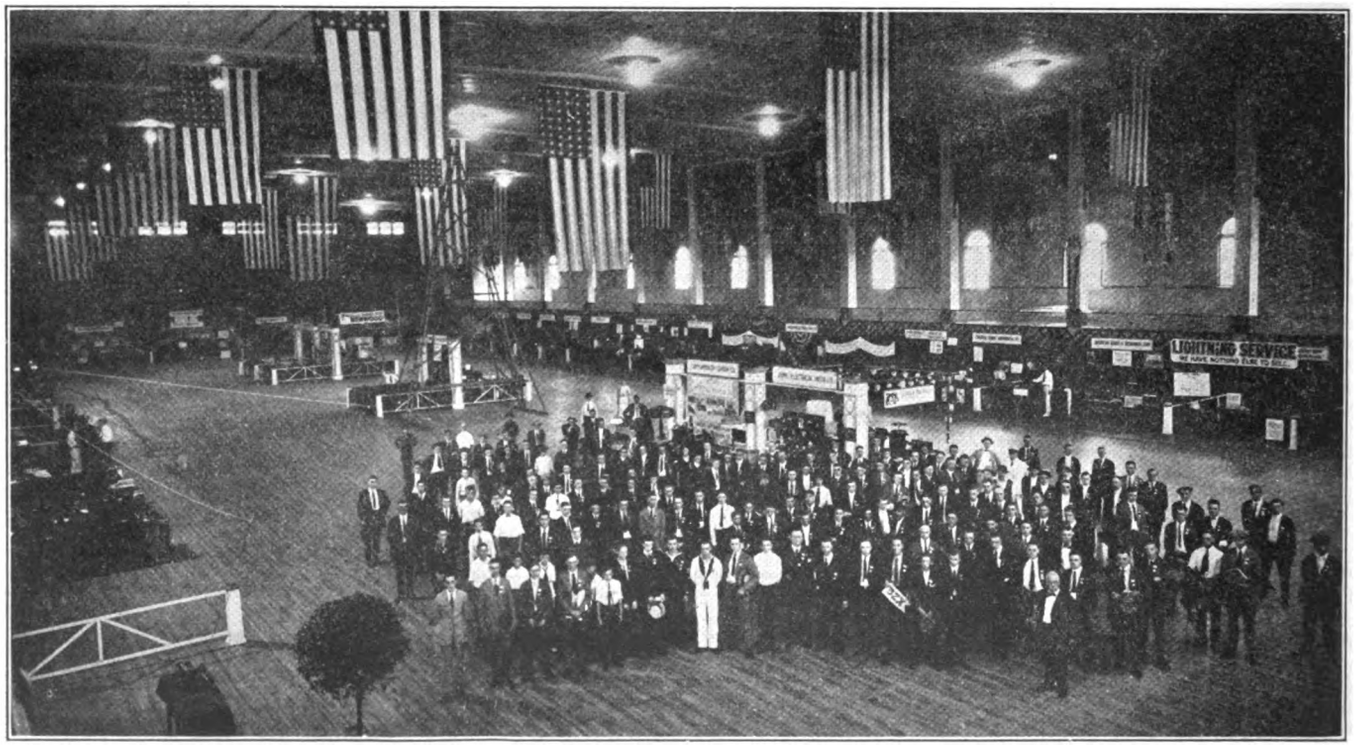
Mr. Maxim read a formal speech in opening the convention, and characterized it as an epoch-making event in Citizen Radio. Plans for making the A. R. R. L. international in scope were outlined and mention made of the fact that delegates from every state in the Union were present, Canada, Alaska and South America.

He declared that electric power, generated at some great water falls, will ultimately be flashed by wireless to factories and cities thousands of miles away. He pictured vast possibilities for this scientific feat.

"There will have to be the discovery of some new materials and some new scientific principles before this transmission is possible," he said. "It is reasonable to hope that some day men may transmit electric power by wireless. It may be the next great electrical invention, although not in sight just yet."

He also predicted that conventions in the future will be held by wireless with delegates sitting at home, hearing motions and speeches over wireless telephones. He gave as an example a recent test in Washington where an aviator made a speech to 10,000 persons assembled a mile and a half away from the point over which he was flying.

Addresses were also given by the rep-



Radio Show in Connection With Convention.

American Radio Relay League, Chicago

Radio Relay League Convention.

resentative of the Mayor of Chicago and Coroner Hoffman of Cook County. The latter spoke in a humorous vein and stated that he was glad to meet the delegates in a social and not an official capacity. It appeared that the coroner's chief claim to radio recognition lay in his being the official donor of the land on which the station of Mr. R. H. G. Matthews, 9ZN, is erected.

The Secretary of Commerce, Hon. Herbert Hoover, sent as his representative, the radio inspector in charge of the Bureau of Navigation, Mr. Terrell, who

U. S. Navy Exhibit of Radio Controlled Boat.

gave a short address, stating that he had been sent to the convention by Mr. Hoover to learn wherein the department could best serve the needs of the radio amateur, through the A. R. R. L.

A short and interesting talk was given by Lieut. Parmenter, officer in charge of the Naval Radio School at the Great Lakes Naval Training Station, representing the commandant of the Ninth, Tenth, and Eleventh Naval Districts.

Other addresses were given by officials of the A. R. R. L. and others.

At the afternoon session, several speeches and talks were given, including discussion of interference, control, time, revision regulations, traffic regulations and observance of radio laws.

The big event of the night session was the debate between M. B. West, civilian radio aide at the Great Lakes station and Lieut. Ellery W. Stone, general manager of the Pacific Radio Supply Co., of San Francisco, on the subject of power factor in radio circuits. The nature of the discussion will be better understood by a reference to the articles by the above men in the February, April and July issues of "QST". Lieut. Stone contended that contrary to Mr. West's statement, the inductive and capacitive reactances in a freely oscillating radio circuit, or in a forced oscillating radio circuit tuned to resonance with the impressed frequency, are equal and opposite in value, the resistance is the only impedance in the circuit and the power factor of the circuit is unity. Mr. West finally conceded all disputed points except that unity power factor obtains in a freely oscillating circuit such as a gap circuit. Accordingly, the matter was referred by telegram to the Radio Section of the Bureau of Standards, which wired back stating that in radio circuits as outlined above, the inductive and capacitive reactances are equal and opposite in value—the resistance thus being the only impedance in the circuit. This telegram was read to the convention at the second evening meeting and a committee was appointed to decide which contestant had won the debate. The committee, however, decided to remain neutral on the matter and in their report stated that the two contestants had been arguing from different premises—a fact which was clearly evident the night preceding. Lieut. Stone requested that the Bureau of Standards' telegram be read into the minutes of the meeting and rested his case on the bureau's telegram.

Further talks followed on spark transmission and reception.

On the following night, the convention was given over to a consideration of Spark vs. C.W. To start the meeting, a talk was given on "Vacuum Tube Construction," by Lieut. Stone. This talk was illustrated with 20 photographs of the plant of the Moorhead Laboratories of San Francisco.

One point brought out in Lieutenant Stone's talk was that the reason that resistance coupled radio frequency amplifiers for 200 meters had not been successful was due to the form of coupling and not to the capacity of the tube. The very fact that tuned output circuits can be employed for this purpose is proof that the capacity of the A-P tubes at least is small enough. The trouble lies in the carbon resistance coupling, which acts as a very low resistance to radio frequency, and in fact such carbon rods are used as kick-back preventers in transmitters. Mr. R. H. G. Matthews of Chicago and convention manager, stated to the convention that Major Armstrong had made the same statement to him a few days before the convention, and the matter of designing a special tube for r.f. amplification was thus proved to be unnecessary.

A number of excellent educational lectures were given on the following day, and in the evening K. B. Warner spoke on "Effect of Radiophone on Traffic Work"; S. Kruse on "Fading Phenomena" and H. M. Anthony on "Sidelights on Radio Development."

The final banquet and dance was held at the Drake Hotel on the evening of September 3. The feature was the club roll call. In addition to these formal features the committee had arranged many novel and enjoyable forms of entertainment which were greatly enjoyed by all present.

SAN FRANCISCO RADIO CLUB NOMINATES NEW OFFICERS

At the regular monthly business meeting of the San Francisco Radio Club, Inc., held on September 1, the following nominations for officers were made: President, H. W. Dodge, H. W. Dickow and E. Schivo; vice president, C. Thompson, S. Fass, M. Heeder; secretary, H. W. Dodge and E. Schivo; treasurer, C. Schomaker (elected); sergeant at arms, M. Heeder and E. S. Peterson.

Election of officers will take place on October 6. Installation of officers on October 13. The newly elected officers will be installed by a prominent radio official of San Francisco. All local radio men, amateur or commercial, are invited to attend the installation. A lively program for the occasion has been arranged.

WESRAD NOW AT OAKLAND

Western Radio Electric Co., of Los Angeles, has opened a branch at 274 Twelfth street, Oakland, Calif., where the radio amateur may get anything that he wants in the way of radio equipment and supplies, including general laboratory apparatus. The same Wesrad Service that has proven so popular at Los Angeles is now available to the San Francisco Bay radio enthusiasts. B. R. Norton has charge of the new Oakland store.

CALLS HEARD BY WESTERN AMATEURS

This department has met with such favor that we will devote as much space to same as possible. Unusual Records are Particularly Desirable. Your list should be neatly printed in ink, using one side of paper only. All errors will thereby be avoided.

CALLS HEARD BY 6AS, SAN FRANCISCO

(6AK), (6DP), (6EB), 6ED, 6FH, (6IC), 6KP, 6LC, 6MH, 6MN, 6PJ, 6ZX, (6ABW), (6ADL), (6AGF), 6AAK, 6AID, 6AJH, (6ALE, CW), 6ACR, (6AQU), 6AMW, 7BP, 7ED, 7GA, 7IN, 7IU, (7OZ), 7ZB, 7ZT, (7ZJ).

CALLS HEARD AT 6OC, SAN FRANCISCO, AUGUST 14-31, 1921

(6DP), (6FH), (6IC), (6KP), (6MH), (6PJ), (6PR), 6TF, 6ABP, (6ABW), (6ADL), 6AEW, (6AGF), (6AIB), (6AJH), (6ALE), (6AMW), (6AQU), (6AVB), (7BP), 7ED, 7IN, 7IU, 7GA, 7KM, 7QQ, (7OZ), 7ZJ, (7ZT).

September 1, 1921.
6IC, 2408 O St., Sacramento, Cal.
The Pacific Radio News,
San Francisco, Cal.
Dear Sir:

Am inclosing a list of calls heard during the month of August 1 to August 31, to be printed in your next issue of the Pacific Radio News:

6AE, (6AR), (6AS), (6AV), 6AAK, 6AAW, 6ABG, CW, (6ABJ), 6ABP, 6ACR, 6ACY, (6ADL), 6AEI, 6AER, 6AFH, 6AFO, (6AGA), (6AGF), 6AID, (6AJH), 6AJK, (6ALE), 6ALU, (6AMW), 6ANK, 6APE, 6APH, (6AQU), 6ATQ, 6AVV, 6BK, (6CH), (6DP), (6DY), 6DS, 6EA, (6EN), 6EX, 6FK, 6FT, 6GI, 6HC, 6HP, 6HY, (6IM), (6KA), (6KC), (6KP), 6KS, (6LC), 6MH), 6MN, (6OC), (6OH), (6OM), (6PJ), 6PO, 6PR, (6TF), 6TV, 6VX, 6WO, 6WR, 6WZ, 6ZC, 6ZAE, (6ZN), 7AY, (7AD), 7BK, (7BP), 7CB, 7CN, (7ED), (7GA), (7IN), 7IF, 7IW, 7IV, 7IY, (7KM), 7OZ, (7QQ), 7XD, 7ZA, 7ZB, (7ZJ), 7ZM, 7ZQ, 7ZS, (7ZT), (7ZW), YA.

Using one tube and spiderwebs. Thanking you in advance, I am

E. STADLER, 6IC.

LIST OF CALLS HEARD AT RADIO 6IV, FROM MARCH 30 TO AUGUST 2

5ZA, (6AE), 6AH, 6AR, 6BW, 6CA, 6DA, 6DP, 6EA, 6EB, 6EN, 6ER, (6EX), 6FE, 6GF, (6GM), 6GP, (6GT), 6HC, (6HG), 6HK, 6HY, 6IF, 6IG, 6IH, (6IR), 6IS, 6JM, 6KA, 6KC, 6KM, 6KP, 6KS, 6KX, 6LC, (6LI), 6MR, 6MZ, 6NC, 6OH, 6OT, 6OW, 6PJ, 6PO, 6PR, (6QR), 6TC, (6TF), 6TV, 6UN, 6VX, 6WH, 6WZ, 6XAD, C.W.; 6ZA, 6ZAA, 6ZE, 6ZH, (6ZJ), 6ZN, 6ZR, 6ZU, (6ZX), 6ZZ, 6AAG, (6AAH), 6AAT, C.W.; 6AAW, 6ABM, 6ABW, (6ACG), 6ACM, 6ACR, 6ACY, 6ADA, 6ADL, 6AFN, 6AGF, 6AGL, 6AGN, (6AGP), 6AHV, 6AIB, (6AII), (6AIO), 6AIK, 6AIU, 6AIW, 6AJH, 6AJL, 6AKL, 6ALE, C.W.; 6ALU, voice; 6ANK, 6APH, 6APO, (6APZ), 6ARI, 6ASS, 6ATB, C.W.; 6ATG, 6AUL, C.W.; 7CN, 7DA, 7ZJ.

HEARD BY 6ABW, ROSEVILLE, CAL.

6AE, (6AS), 6AAK, (6ABM), 6ACY, (6ACR), (6ADL), 6AIP), 6AID, (6ALE), (6ALU, C.W.); 6AMU, 6AOX, 6APH, 6AQU, 6BW, (6DP), (6IM), 6KM, (6KS), (6MH), (6OC), (6PJ), (6PR), 6TV, (6TF), (6VX), (6WZ), (6ZN), (7BC), (7BK), (7BG), (7DA), (7ED), (7IU) ,7JU, 7KB, 7KJ, 7KM, 7BR, 7WJ, 7XD, 7ZI, (7ZJ).

CALLS HEARD BY 6BF, SANTA PAULA, CAL., FOUR NIGHTS, AUG. 1-4, INCLUSIVE

6AE, 6AK, 6AR, 6DP, 6EN, 6EU, 6FT, 6GY, 6HC, 6HH, 6HT, 6IB, 6KA, 6KC, 6KM, 6KP, 6MH, 6MK, 6OH, 6PJ, 6PP, 6PR, 6TV, 6UO, 6VV, 6VX, 6WZ, C.W.; 6ZN, 6ZX, 6AAK, 6AAT, C.W.; 6AAW, 6ABW, 6ACR, NAEI, 6AER, 6AFN, 6AGF, 6AGN, 6AJH, 6AKL, 6ALE, C.W.; 6ALU, C.W.; 6ALV, 6AMK, 6AMW, 6ANJ, 6ANP, 6AOR, C.W.; 6ARC, C.W.; 6XAD, C.W.; 7PP, 7YA.

PAUL K. CHURCHILL.

CALL HEARD AT 6AJH, SAN YSIDRO, CAL., DURING JULY AND AUGUST

5IF, 6MK, 6ZN, (6ALU), 6AE, (6MZ), (6ZX), 6AMQ, 6AK, (6NY), 6AAG, 6AMN, 6DP, (6OC), (6AAK), (6AMW), 6EA, (6OL), 6AAU, 6ANK, (6EN), (6PJ), 6AAW, 6AGN, 6ER, 6PO, (6ABP), 6ALK, 6EX, 6PR, (6ABG), (6APH), (6FT), (6QJ), (6ABW), (6AQU), (6PG), (6SK), (6ACY), (6ATG), (6HY), (6TV), (6ADX), 6ATQ, (6IF), (6VX), 6ADF, 7DA, (6KA), (6WH), 6AFN, 7ZJ, 6KH, 6WI, (6AGF), 6KM, (6WR), (6AIB), (6KP), (6WZ), (6AID), (6LC), 6DA, 6AJK, (6MH), (6VV), (6ALP).

(Continued on Page 107)

CALLS HEARD BY 6AQT DURING JULY AND AUGUST

6AE, 6AK, 6AR, 6CH, 6DP, 6EX, 6FK, 6GO, 6GY, 6HC, 6HP, 6IC, 6JR, 6JW, 6KC, 6KM, 6LN, 6MW, 6MZ, 6OC, 6OH, (6PJ), 6PR, 6SK, 6TH, 6TV, 6VX, 6WO, 6WZ, 6ZU, 6ZX, 6AAK, 6AAR, 6ABW, 6ADA, 6AGF, 6AHN, 6AID, 6AIW, 6AIP, 6AJH, 6AKL, 6ALE, I.C.W.; 6AMW, 6APH, 6AWZ, 6ALA, 6APE, 6XAD, I.C.W.; 7GA, 7ED.

Calls Heard During Daylight

6MZ, 6AJH, 6AKL.

Anyone hearing my I.C.W. please QSL M. Graham 6784 Hollywood Boulevard, Hollywood, Cal.

Riverside, Cal., Aug. 8, 1920.

Pacific Radio News,
San Francisco.
Dear Sirs:

Please find enclosed list of stations heard. Some were heard with single coils and tickler and others with a variometer set. Only one bulb was used:

6AA, 6AR, 6ER, 6GJ, 6GM, 6GT, 6HC, 6HY, 6IF, 6IR, 6IS, 6IV, 6KM, 6KP, 6LC, 6LJ, 6LS, 6LY, 6MK, C.W.; 6PJ, 6RK, 6WS, 6ZJ, 6ZX, 6AAG, 6AGQ, AHU, 6AIW, 6AJK, 6ALE, C.W.; 6ALP, 6ALU, C.W.; 6AMW, 6AOE, 6APH, 6APZ, 6AQU, 6ARE, 6ASB, 'HM'-Telephone, 'RA'-phone.

I have no license yet, but am waiting for it, and expect it daily. Will probably put in a 100-watt C.W. set this summer and get started in time for the winter work.

Yours truly,
DONALD H. KEET,
469 Lime Street.

HEARD ON ONE-STEP BY 6AUN, 1730 PAGE ST., SAN FRANCISCO

6AE, 6AP, 6EA, 6EB, 6HH, 6IC, 6IO, 6KA, 6KP, 6LC, 6MN, 6OH, 6PJ, 6TV, 6ZX, 6AAK, 6AAP, 6AGF, 6AID, 6AIL, 6ALE, 6AVB, 6AWH, 6XAC, 6XAD, 7BK, 7BP, 7CA, 7CC, 7KJ, 7QQ, 7XD, 7XF, 7ZT. Anyone hearing 6AUN please QSL.

CALLS HEARD AND WORKED RADIO 6AQU, H. B. BECKER, 1117 W. 45TH ST., LOS ANGELES, CALIF., DURING THE SUMMER MONTHS

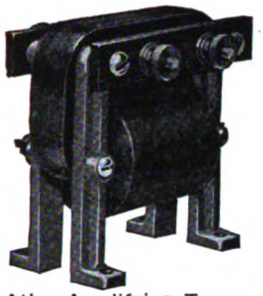
(6AE), (6AK), (6AR), (6AS), 6CV, (6DP), (6EP), (6EX), (6FK), 6FH, 6FX, 6GF, (6HC), (6HP), 6HX, (6IC), 6IM, (6KC), 6KM, (6MZ), (6OC), (6OH), 6OT, (6PJ), (6PR), 6SK, (6TV), (6VM), 6VX, (6WO), 6WZ, (6ZB), 6ZU, (6ZX), 6AAK, 6ABW, (6ACR), (6ADA), (6AED), (6AFY), 6AFN, (6AGF), (6AID), (6AIP), (6AJH), (6AKL), (6ALA), 6ALE, (6AMW), 6ANK, 6ANZ, 6APH, (6ARW), (6AVB), 7BP, 7GA, 7IU, 7KM, 7ZJ, 7ZT.

Will be glad to hear from anyone hearing me.

C.W. STATION 6AWT IN SAN FRANCISCO REPORTS THE FOLLOWING HEARD:

6AE, 6CV, 6EA, 6EB, 6HH, 6IC, 6KA, 6KP, 6LC, 6LX, 6MH, 6MN, 6RZ, 6BX, 6AAP, 6ADL, 6AGF, 6AID, 6ALE, 6AVB, 6AWH, 6XAC, 7BC, 7BK, 7BP, 7CA, 7CC, 7ED, 7KJ, 7KM, 7QQ, 7XD, 7XF, 7ZB, 7ZJ, 7ZQ, 7ZT. All stations were heard during the month of August.

READ THE CLASSIFIED COLUMN, PAGE 124.



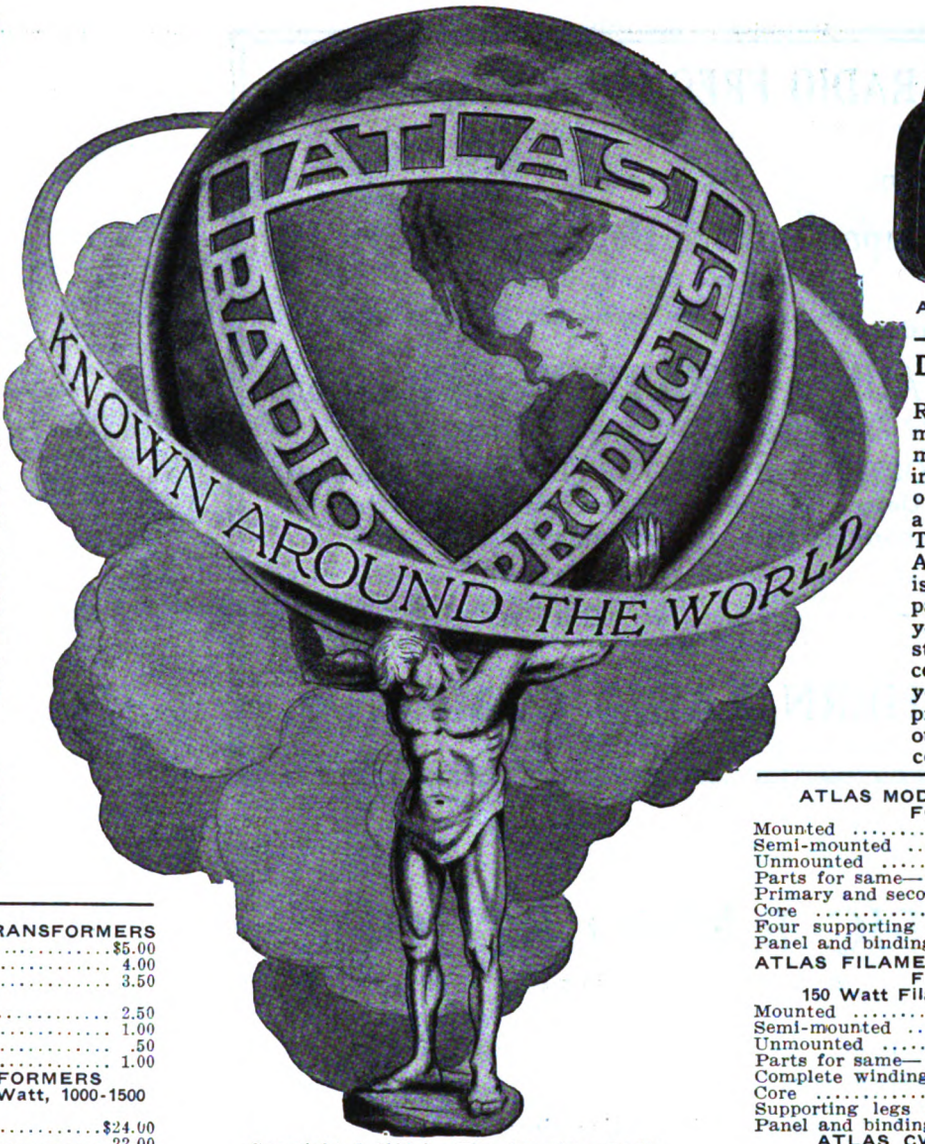
Atlas Amplifying Transformer, Mounted

AMATEURS

The greatest of all Radio seasons is before you. ATLAS RADIO PRODUCTS are here to make it one of greatest success and achievement. Do not buy until you are thoroughly familiar with the excellence of ATLAS APPARATUS. Send ten cents in stamps for our catalogue of the latest CW telegraph and telephone instruments, receiving sets, parts and raw materials.

PRODUCTION

As the output of ATLAS instruments is limited to 15,000 for the next two months, you are advised to ORDER AT ONCE.



Atlas Amplifying Transformer, Unmounted

DEALERS

The debut of ATLAS RADIO PRODUCTS marks a new high water mark in Radio. ATLAS instruments include only the most efficient and most demanded. The distributing of ATLAS APPARATUS is your opportunity paramount. Do not buy your fall and winter stock of CW and receiving apparatus until you have seen ATLAS products and secured our catalogue and discount schedule.

ATLAS AMPLIFYING TRANSFORMERS

Mounted	$5.00
Semi-mounted	4.00
Unmounted	3.50
Parts for same—	
Primary and secondary	2.50
Core	1.00
Four aluminum legs	.50
Panel and binding posts	1.00

ATLAS CW TRANSFORMERS
Plate Transformers, 500 Watt, 1000-1500 Volts

Mounted	$24.00
Semi-mounted	22.00
Unmounted	19.00
Parts for same—	
Complete windings	15.00
Core	4.00
Supporting legs	3.00
Panel and binding posts	2.00

ATLAS CW CHOKE COILS 1½ Henry 500 M.A.

Double semi-mounted	$ 7.50
Single semi-mounted	5.50
Unmounted, double	6.00
Unmounted, single	4.00
Parts for same—	
Coils, each	2.00
Core	2.00
Supporting legs	1.50

ATLAS VARIOMETERS
For Plate—For Grid (Specify Which)

Complete variometer	$ 6.00
Rotor, unwound	1.00
Stators, unwound	1.00
Rotor, wound	2.00
Stators, wound	2.00
Bearings, each	.50
Rods	.50
Binding Posts	.25

ATLAS SUBMOUNTED PANEL SWITCH

Each	$1.50

ATLAS SUBMOUNTED VARIABLE GRID LEAK ON PANEL, $1.50

ATLAS DETECTORS

Panel	$ 5.00
Panel, engraved, etc.	10.00
Cabinet, engraved, etc.	15.00

ATLAS CABINETS

For 5½x6⅝ in. panel, hinged top, 6 in. deep	$4.50
For 10x6⅝ in. panel, hinged top, 6 in. deep	5.50
For 19x6⅝ in. panel, hinged top, 6 in. deep	6.50

ATLAS DX-52 SUPER OSCILLATION TRANSFORMER $25.00

ATLAS SYNCHRONOUS AND NON-SYNCHRONOUS MOTORS $30.00 UP

ATLAS CW POWER TRANSFORMERS
50 Watt, Secondary 375 Volts, Filament Windings, 10 V. Variable

Mounted	$14.00
Semi-mounted	13.00
Unmounted	11.00
Parts for same—	
Complete windings	9 00
Core	2.00
Supporting legs	2.00
Panel and binding posts	1.00

ATLAS CW POWER TRANSFORMERS
200 Watt, Secondary 350 and 550 Volts, Filament Winding 12 Volts Variable

Mounted	$19.00
Semi-mounted	17.00
Unmounted	15.00
Parts for same—	
Complete windings	12.00
Core	3.00
Supporting legs	2.00
Panel and binding posts	2.00

ATLAS FILAMENT HEATING TRANSFORMERS
75 Watt, Filament Voltage 8-10

Mounted	$11.00
Semi-mounted	10.00
Unmounted	8.50
Parts for same—	
Complete windings	5.00
Core	3.50
Supporting legs	1.50
Panel and binding posts	1.00

ATLAS CW TUNING INDUCTANCES
6 Inch Formica Tubes No. 8 Enameled Wire

25 turn inductance	$ 8.00
30 turn inductance	9.00
45 turn inductance	10.00

ATLAS MODULATION TRANSFORMERS

Mounted	$ 5.00
Semi-mounted	4.00
Unmounted	3.50
Parts for same—	
Primary and secondary	2.50
Core	1.00
Four supporting legs	.50
Panel and binding posts	1.00

ATLAS FILAMENT HEATING TRANSFORMERS
150 Watt Filament Voltage 10-12

Mounted	$16.00
Semi-mounted	14.00
Unmounted	12.00
Parts for same—	
Complete windings	8.00
Core	4.00
Supporting legs	2.00
Panel and binding posts	2.00

ATLAS CW CHOKE COILS 1½ Henry 150 M.A.

Double, semi-mounted	$ 5.50
Single, semi-mounted	4.00
Double, unmounted	4.50
Single, unmounted	3.00
Parts for same—	
Coils, each	1.50
Core	1.50
Supporting legs	1.00

ATLAS AMPLIFIERS

Panel, 1 step	$13.00
Panel, 2 step	25.00
Cabinet, 1 step	18.00
Cabinet, 2 step	30.00

ATLAS COMBINED DETECTOR AND AMPLIFIERS

Detector and 1 step panel	$23.00
Detector and 2 step panel	35.00
Detector and 1 step cabinet	28.00
Detector and 2 step cabinet	40.00

ATLAS CW CIRCUIT DRIVER

For measuring inductance, capitance and wave length	$40.00

ATLAS RECEIVING AND POWER TUBE RHEOSTATS

6 ohm 1.5 ampere for receiving tubes.	$1.00
6 ohm 7 ampere for 5 to 50 watt power tubes	$2.00
4 ohm 16 ampere for 50 to 250 watt power tubes	5.00

ATLAS SPECIAL RHEOSTATS FOR CONSTANT VOLTAGE CONTROL OF POWER TUBES

50 ohm 3 ampere at 110 volts for primary control of 5 watt power tubes	$5.00
50 ohm 7 amperes at 110 volts for primary control of 50 watt power tubes	10.00
50 ohm 15 ampere at 110 volts for primary control of 250 watt power tubes	15.00

Prices quoted on other sizes on request.

THE AMERICAN RADIO SALES AND SERVICE CO.

Mansfield, Ohio, U. S. A.

NORTHWESTERN RADIO ASSOCIATION
Portland, Oregon

Editor P. R. N.,
San Francisco, Calif.
Dear Sir:

The amalgamation of all the radio clubs of the Northwest is well under way, and it is expected to result in better co-operation and understanding between the various radio bodies of the Northwest.

The organization is to be called the "Northwestern Radio Ass'n." The different clubs, such as the present Portland, Tacoma and Seattle clubs will be branches of the N. R. A. and will be addressed as follows: "Northwestern Radio Association, Tacoma Branch," etc.

The leaders of the different branches will meet at different times during the year at some central town to carry on any legislative business necessary for the good of the association.

The first and greatest task to be handled by the new association is to bring an International Convention of all radio men, including amateurs, commercial operators, radio manufacturers, radio engineers and inventors from all over the world to Portland, Oregon, in 1925.

This will be during the "Atlantic-Pacific Highway Electrical Exposition" and all attending this convention will not only be lucky enough to be present at the convention, but will see the greatest exposition the world has ever seen.

Now we well realize that it will be impossible for this association to make a success of this convention without the co-operation of the various radio papers and journals. The "Pacific Radio News" is one of the papers we are very anxious to have back of us in putting this convention through. We well realize that it will be almost four years before the convention, but an undertaking of this size cannot be successfully carried out in much shorter time.

We hope to see your paper back of us by helping us put this thing through, by articles in its favor in your editorials and columns

Fraternally yours,

(Signed) **C. B. CRITESER, 7DA.,**
N. R. A. Publicity Agent.

Editor's Note: We're with you to a sizzle, fellows.

"HUMBUG"

(Continued from Page 90)

on a two-inch coil an' a bunch of half-dead dry batteries.

"However, soon as it was dark, I adjusts the gap for the best spark I can get, which isn't very good, an' tries a few calls. I soon sees I'll never raise the yacht this way, an' I decides that the best chance we got its to broadcast distress signals, in the hope of pickin' up some vessel in the Bering Sea.

"It was well after dark now. A pale, sickly moon was shinin' down on the cold, black lava-rock; and down among the boulders on the beach, the Bering Sea swashed dismal-like.

"'S-O-S S-O-S S-O-S Stranded on Skull Island,' I begins repeatin' over an' over, slow an' steady. The gang, shiverin' in the damp, raw southwest wind, all stands around that little flickerin' blue spark, which keeps gettin' rougher an' weaker' every minute, until at last it breaks down altogether.

"As I tinkers with the vibrator, givin' it a lighter tension, I observes Muckashouk standin' alongside me with his old tauntin' smile.

"'Humbug, eh?' he says, questioning-like, pointin' at the outfit.

"'No, blast you, no humbug!' I howls, jumpin' to my feet. 'Get away from me an' stay away from me, before I knock your blasted block off!'

"I fusses around with the coil a little longer, but the batteries are about gone, an' at last I gives it up.

"'We'll haft'a wait an' see if anybody's picked it up,' I tells the bunch. 'If nobody shows up by tomorrow night, the batteries'll be recuperated a little, an' I'll try again.

"We sets up the tents an' rolls into our blankets, but we don't sleep much. Mornin' comes, cold an' clammy. We makes a fire with some of the alder boughs from the old burial platforms, an' sit around, miserable an' gloomy, all day. No boat shows up, an' I don't expect none.

"That night I sends out the distress signals again, but in a few minutes the batteries drop down to nothin.' I hooks in all the audion batteries, but it didn't help none. Meanwhile, old Muckashouk comes hangin' round again with his blasted insultin' smile. As I close up my apparatus-box, I can see he's goin' to speak. Pretty soon he comes out with it.

"'Humbug now?'

"Well, I gets's so blasted mad I near to chokes.

"'Say, I told you to keep away from me!' I yells, steppin' up to him and shakin' my fist in his face. 'Things is bad enough without a miserable old flea like you naggin' around makin' 'em worse! Now you shut up an' keep shut up, or I'll bust your homely old map!'

"We spends another night an' day of misery, gettin' more despondent all the time. The weather is gloomy an' cloudy, with the raw, wet southwest wind still holdin' on. In the afternoon, I tinkers with the coil again, but the batteries are sweatin' all over now, an' so near dead I can't get a buzz.

"'S'all off,' I tells the bunch. 'We're up against it!'

"Nobody says a word. Pretty soon old Muckashouk gets up from the rock he's sittin' on, an' shuffles over to me.

"'Uh-huh, humbug now, eh?' he remarks, with his sour smile.

"I bounces to my feet, aimin' to smash him in the face, but just as I was about to let drive, I gets a queer hunch.

"'Yes!' I says, all of a sudden, sittin' down again, beaten-like. 'It's humbug.

Wireless is all humbug. Heap plenty rotten humbug! More humbug than missionaries an' tin-horn gamblers;'

"'*A-a-ah! Asisth-tuck!*' croaks old Muckashouk; an' we're all amazed to see that he's kind'a smilin' all over. 'No tell truth, die—tell truth, no die!' Beckoning to us to follow, he leads us down to the beach; an' there stowed away among the boulders, is the ten-gallon can of gasoline we'd missed from the boat!

"'Well, don't that beat yuh!' sputters the Head-Cracker.

"'It does,' I answers, solemnly.

"Muckashouk stoops down to pick up the can of fuel—an' then he stops an' stares with a sickly look on his wrinkled face. We all look, an' see, around the bottom of the can, some little puddles of gasoline. Tin-Pan grabs the empty can, an' turns it over. Along the bottom edge is a nasty rusty crack, about half an inch long.

"'Double-crossed hisself!' mutters the Head-Cracker. 'Serves him right!'

"'Never mind him—how about us?' busts out Tin-Pan, wild-eyed.

"Old Muckashouk's sour smile was clean gone now.

"'Me darn fool!' he says. Then he hangs his head an' stumbles off.

"A little later we have a conference. I suggests we try to sail or row the boat, in spite of the wind an' current, but the sourdoughs veto that idea, declarin' it would only be committin' suicide.

"'We know this place,' says the Head-Cracker. 'Durin' these spring months of th' year the Aleute burial parties have the fight of their lives sometimes with this current—even in their narrow, speedy kyaks;—an' in this old tub we'd go straight out into the middle of the Berin' Sea.'

"That night, the southwest wind brings a cold, gray fog out over the water, makin' a clammy ghost-land out of the island. About two in the mornin' I was dozin' by fits an' starts, half froze to death, when all of a sudden Tin-Pan flies up out'a his blankets with a blood-curdlin' screech that brings us up all standin'.

"'Ow! Help! Help!' he howls. 'They're walkin'! Them skulls an' bones is walkin'!'

"'Sufferin' wildcats! Where?' I yells, my hair standin' on end.

"'Everywhere! All around here!' blubbers Tin-Pan, hoarse-like. 'One bony clatterin' skuluton with long black hair on its skull come an' grinned right in my face!'

"'Yer gittin' out'a your head, Tin-Pan,' says the Head-Cracker, soothin'-like; but I notices he looks around pretty sharp in the fog himself. There was no more sleep after that. I walks up an' down among the rocks till daylight, doin' some of the hardest thinkin' I ever done in my life.

"'When you was a kid, did you ever fly a kite?' I asks the Head-Cracker, who is sittin' on a rock, wrapped in his blanket.

"'Murderin' snakes! Are you gittin' cuckoo, too!' he gasps, starin' at me. 'What we got to do with kites?'

"'A lot, maybe,' I tells him. "It's just about our last chance of getting away from this bone-pile alive.

"We tears a batten off the gas-boat, an' with our jack-knives makes a kite frame. Sir Ambrosius contributes a silk undershirt—pretty dirty now—for a coverin', an' we rips up Greasy Bill's extra pair of pants for a tail. I had about 200 feet of seven-strand aerial-wire, which I puts the gang to untwistin'. I splices the single

(Continued on Next Page)

strands end to end, makin' a total length of about 1400 feet. I figures that if I can get the kite to lift this, I might have a chance of breakin' in on K-O-X-N at Pirate Cove, about forty miles away, who works a midnight schedule on 1600 meters with N-P-R.

"'But ain't your batt'ries dead?' questions the Head-Cracker, when I explains the idea.

"'Yes—but ain't there a set of Edison batteries in the gas-boat for ignition?' I returns.

"We makes the kite, an' when we tries her out, she flies without any trouble. I gets the Edison cells out of the boat an' hooks 'em up to the spark-coil. About eleven o'clock that night we sends up the kite, an' pays out the bronze wire, which we had wound around a stick. When the wire is all out, the Head-Cracker hangs onto it with a piece of rope and a insulator. I hooks the end of the wire down onto the spark-gap, an' adjusts the coil. She didn't give a very long spark on that aerial, though it was bright an' fat. It didn't look bad—but K-O-X-N was forty miles.

"I begins hammerin' out the distress signals along with the same words I'd sent before; while the Head-Cracker stays alongside me, handlin' the kite. The wind is gettin' fresher all the time, an' the way that kite lunges an' jerks once in a while makes me suck my breath. But the little bronze wire holds her until about two in the mornin', when a gusty squall snaps it at last an' carries the kite off into the sea.

"As daylight comes, the wind suddenly flies round to the northwest; an' like a crack of a whip, a freezin' gale comes swoopin' over Skull Island. In a few minutes the storm whips up a wild, white-crested chop, an' the icy wind rips off the tops of the waves, whirlin' up a white misty spray that covers the whole ocean.

"'She's gonna be a blizzard!' predicts the Head-Cracker in a low voice, studyin' the dull gray clouds flyin' overhead. 'If we don't get away from here today we'll be froze t' death 'fore dark.'

"'This is—aw—terrible!' declares Sir Ambrosius, scratchin' his dirty week-old stubble. 'If we could only manage a bawth—'

"Just then a gusty blast, bringin' a flurry of hard, dry snow, comes swirlin' over the island, an' both our tents turns into aeroplanes an' disappears. We all crouches around among the boulders, tryin' to find a little shelter, till in about half-an-hour the squall passes on, leavin' us pretty blue an' stiff;—an' then hardly a quarter of a mile off the island, pitchin' wildly in the white-capped seas, we discovers—a boat!

"'Hurray!' yells Tin-Pan, jumpin' up an' huggin' Greasy Bill, who happens to be nearest to him. 'We're saved! We're saved!

"'It's th' "*Empress*"' says the Head-Cracker, studyin' the hull and top-work. 'She's a gas-boat belongin' to th' Pacific American Fisheries over at Port Moller.

"'I never knew the "*Empress*" was such a pretty boat!' blubbers Tin-Pan, who is still tryin' to kiss Greasy Bill. 'Why, she's downright be-e-u-u-tiful!'

"The big tug bucks up to the mouth of the cove, an' sends a dory in to the beach for us.

THE operator over at Pirate Cove picked up your distress call last night,' says the skipper of the "*Empress*," when we were all in the warm gallery, hard alongside a pot of fresh steamin' coffee

(Continued on Page 116)

an' a pile of red-hot chow. 'He wirelessed the news over to the Port Moller operator, and we started right away.'

"A few minutes later I hears one of the Aleute hands of the tug pow-wowin' with old Muckashouk.

"*'Wirelessuck tung-ugh-tuck chi* Pirate Cove *Wirelessuck*—Pirate Cove *Wirelessuck chuckalooden chi* Port Moller *Wirelessuck. Adockoo whee-joolen gasolinuck 'Empress' tyloonuck. Wirelessuck asisth-tuck!'*

"Gulpin' down a horse-bite of canned mule, old Muckashouk starts to answer —an' then discovers that I'm watchin' him.

"'Humbug!' he growls."

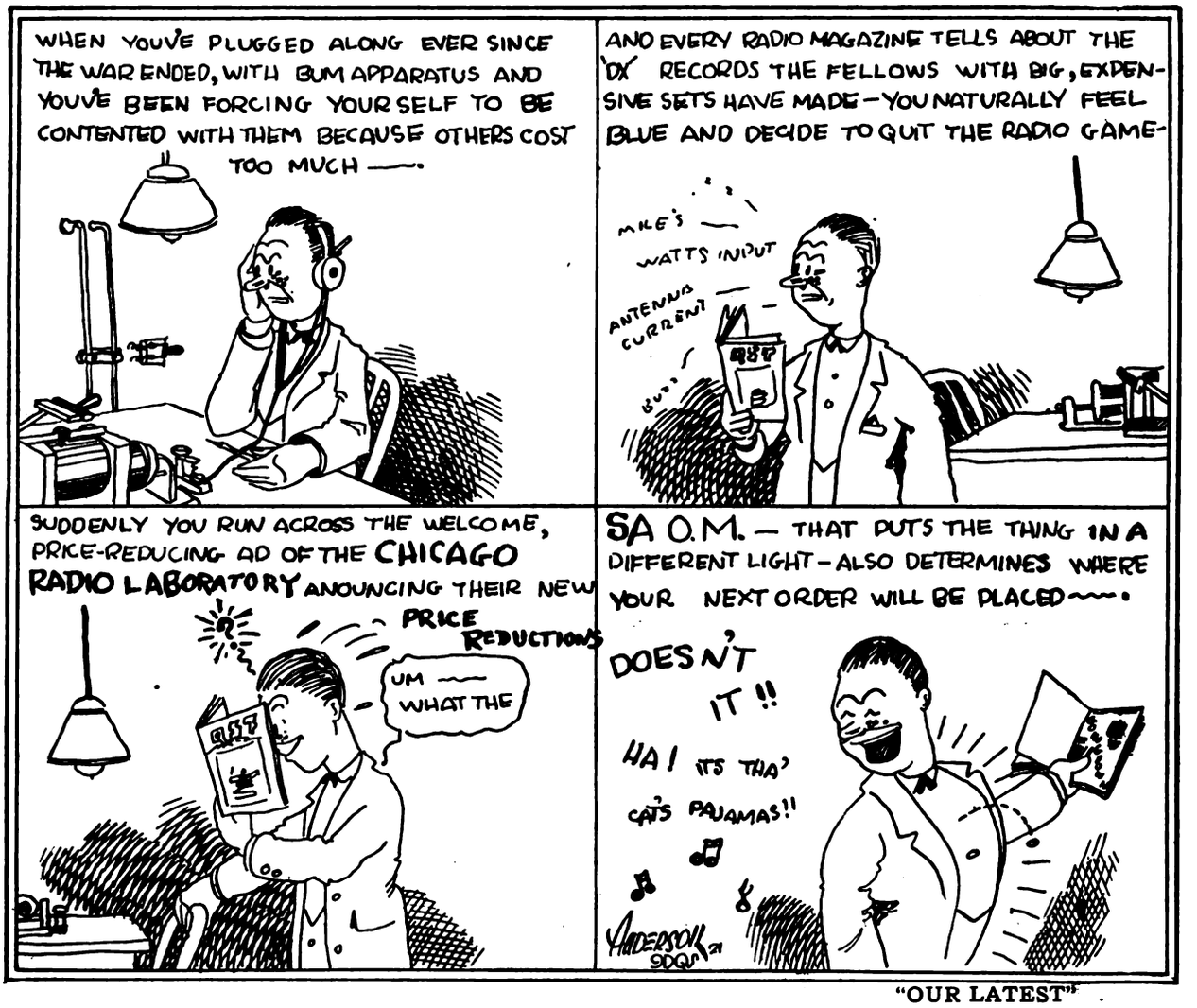
RADIO NOVICE PENALIZED

Because he deemed the 200-meter wave length allowed amateur wireless operators too congested, John Imsand, 40 Goethe street, Daly City, Calif., sent out radio messages on 240 meters, where things were not quite so crowded. But government radio inspectors who happened to be listening in on 240 meters heard Imsand sending out pleasantries through the air and now his wireless station at his home has been ordered closed.

U. R. T. A. ELECTS NEW OFFICERS

AT the second annual convention of the National United Radio Telegraphers' Association, held in New York City August 15 to 18, the following officers were elected for the ensuing term: National president, Claude C. Levin; national first vice-president, H. L. LeCompte; national second vice president, R. H. Murphy; national third vice-president, J. C. Mitchell; national secretary-treasurer, Alfred De Silva, and eight members from the various districts to comprise the executive board.

Don't Feel Blue—Let the Tubes on your C. W. Set do that!



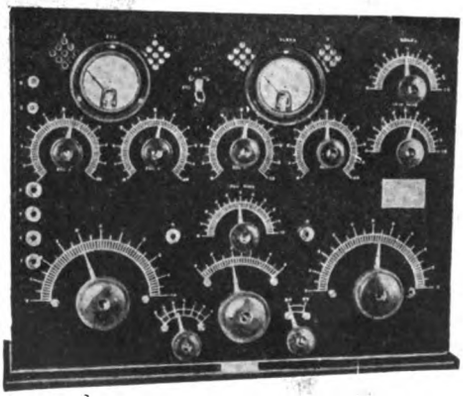
"OUR LATEST"

"Z-NITH" RADIO APPARATUS

Has Been Reduced in Price Approximately 15 Per Cent on Each Instrument.

These prices represent our contribution toward the reduction of the "High Cost of Radio."

Instrument	Old Price	New Price
Z-Nith Regenerator	$ 65.00	$ 55.00
Amplifigon AGN-1	75.00	64.00
Amplifigon AGN-2	105.00	89.25
Amplifigon AGN-3	135.00	115.00
Hyrad Disc	12.00	10.50
Hyrad Non.-Syn. Gap	65.00	49.00
Hyrad Syn. Gap	125.00	105.00
Jeweler's Time Rec.	75.00	69.50
Multiceiver MC-3	265.00	236.00
Altaceiver CW-3	300.00	254.00
C. R. L. Regenerette	12.75	12.75
One-Step Amp. AM-1	33.50	28.50
Two-Step Amp. AM-2	65.00	55.00
Detector AD	20.00	17.00
Detector ADP	30.00	25.00



Z-NITH MULTICEIVER MC-3

The most complete, efficient and flexible receiver ever designed. Described in detail in our Catalog F-21. Write for it.

CHICAGO RADIO LABORATORY

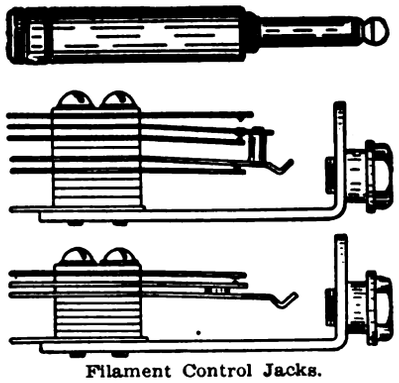
Office and Factory, 6433 Ravenswood Ave. Testing Station 9ZN—5525 Sheridan Road
CHICAGO, ILLINOIS

FILAMENT CONTROL JACKS

(Continued from Page 101)

The function of the filament control jack is to obviate the necessity for filament current switches for detector and amplifier tubes. It also eliminates switches between amplifiers and between amplifier and detector, a saving in filament current which is wasted under customary operating conditions by leaving bulbs burning while not in use. Pushing in the phone plug connects the receivers to the circuit at the detector or desired stage of amplification and lights the bulbs, all in one operation.

If Fig. 1, it is desired to use detector simply push receiver plug in jack M and first bulb will light. If first stage of amplification is desired place plug in jack N, when both detector and first step amplifier bulbs will light and the station will operate with one step amplifier. Similarly for added stages of amplification.

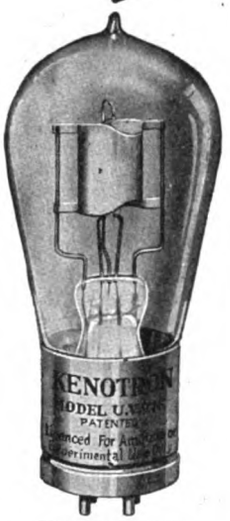


Filament Control Jacks.

The three points on the left (assuming the jack to be in a vertical position with the connections on the bottom.) are

(Continued on Page 120)

KENOTRON RECTIFICATION FOR C.W. TUBE TRANSMISSION



KENOTRON
UV—216
20-Watt Output
PRICE $7.50

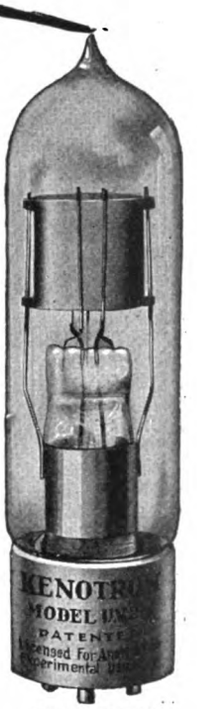
THE least expensive and the most satisfactory method of obtaining a direct-current source for plate-excitation is the use of A. C. with Rectifier Valves.

Two types are available for use with Radiotrons.

Kenotron Model UV—216 is especially designed to operate with Radiotron UV—202, the 5-watt-transmitting tube. Filament requires 7.5 volts at 2.35 amperes. The A. C. input is 550 volts. The output of this rectifier tube is 20-watts at 350 volts D. C.

Kenotron Model UV—217 is designed to operate with Radiotron UV—203, the 50-watt tube. The Filament requires 10 volts at 6.5 amperes. The A. C. input is 1250 volts. The output of this rectifier tube is 150-watts at 1000 volts D. C.

Our Standard Porcelain Socket, Model UR—542 at $1.00 will fit Kenotron UV—216, while a larger socket of the same type, Model UT—541, price $2.50, is required for Kenotron UV—217.



KENOTRON
UV—217
150-Watt Output
PRICE $26.50

The Radio Corporation's tubes are covered by patents dated November 7th, 1905, January 15th, 1907, and February 18th, 1908, as well as by other patents issued and pending. Tubes licensed for amateur and experimental work only. Any other use will constitute an infringement.

Send 25 cents for the new C. W. Transmission Book and Catalogue of Radio Apparatus.

Radio Corporation of America
WORLD WIDE WIRELESS

Sales Division, Commercial Department, Suite 1804
233 Broadway, New York City

FILAMENT CONTROL JACKS

(Continued on Page 118)

used for the filament. The negative pole of the "A" battery on the three stage amplifier is connected to the four jacks at the farthest point on the left. When the plug is out this point is disconnected. The second point from the left in all jacks, except the last, is connected to the rheostat. The third point from the left merely serves to carry the positive connection along to the next bulb.

When the plug is inserted for use of the detector the "A" battery circuit is closed, the phones are placed in the plate circuit and the connection to the amplifying transformer broken. When the plug is removed from jack M the plate circuit is made to include the primary of the amplifying transformer the bulb circuit is broken and the positive pole connection is carried on the successive tubes.

When the plug is inserted in jack N the bulb circuit is closed, lighting both the detector and amplifier bulbs; the primary of the amplifying transformer for the next stage is disconnected and the receiver connections made in its place. This process continues throughout the stages of amplification until the last, when of course there is no occasion to put the phones in the place of the primary of the next amplifying transformer. Hence two points of the jack are removed and in this case the low voltage circuit is closed and phones placed in the plate circuit when the plug is inserted.

6ZR IS MANAGER OF MEYBERG STORE IN LOS ANGELES

Hall Berringer, formerly 6ZR of Burlingame, Cal., has been appointed manager of the new Leo J. Meyberg store in Los Angeles. He will shortly be back on the air with his TNT spark.

Classified Advertisements

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

RADIO CABINETS—Mahogany or oak finished or unfinished, to your design. Send rough sketch for quotation. Prompt service Formica cut to size. Radio supplies, parts, etc. Pacific Radio Exchange, 439 Call Bldg., San Francisco, Calif.

ONE KW TRANSMITTER complete for sale; also several head sets, etc. TRUMBULL, 365 McGraw, Seattle.

WE HAVE—Firco apparatus, Baldys, Sacoclads, etc. Chi-Rad variometers knockdown $4, set up $5. Get our little set. Variometer, wavemeter, receiver, and only $9 with Crystal detector, $10. Always in use. Murdock's type 56s. Write! Port Arthur Radio Laboratory, 2048 Fifth St., Port Arthur, Texas.

FOLLOWING FOR SALE: Complete station. 600-foot aerial, pole, 1-4 KW transmitter. Receiver and Brandes Transatlantics. Also 6-volt, 40-amp Exide Battery, Blitzen 43-plate variable; 2 old type Audiotrons. $60.00 cash. (Buyer pays express or extra charges). G. R. Mackin, 88 Peralta Ave., San Francisco, Cal.

STOP! LOOK! AND ACT! V. T.'s. With each Radiotron UV200 V. T. detector or A-P Moorhead V. T. detector or Radiotron U. V. 201 V. T. Amp. or A-P Moorhead V. T. amp., we will supply free of charge your choice of either a Murdock V.T. socket, improved contact type, or a Remler Bakelite smooth running rheostat, latest type. Radiotron UV200, $5. Radiotron Amp. V.T. UV 201, $6.50; Moorhead A-P detector $5.00; Moorhead A-P. Amp. V. T., $6.50; Remler Bakelite rheostat, latest type, $1; Murdock V.T. socket, $1. We absolutely guarantee the foregoing apparatus. Only new and high grade equipment carried in stock. All orders are filled within twelve hours and shipped postpaid and insured, thereby saving time and money. Remember us. The Kehler Radio Laboratories, Dept. P, Abilene, Kansas.

DUBILIER CONDENSER. Practically new. 14,000 volts. .007 mfd. $22.00. L. E. Martin, 100 Olive Ave., Fresno, Cal.

SHORT WAVE REGENERATIVE SET. Has two Radio Shop Variometer, Wireless Shop Var.-Condenser, oak cabinet, dark finish; heavy Bakelite panel, Remler dials; special circuit. All tuning done on variable condenser. Highly efficient. Fully guaranteed. $25.00. Box 100, Pacific Radio News, 151 Minna St., San Francisco, Cal.

FOR THE LOVE OF MIKE, read this list of bargains in used radio apparatus that we have for sale this month:

One Short Wave Regenerative Receiver, used only two months. In first class condition. Worth $50, sell for $25. Postage on 11 pounds extra.

One Murdock Variable Condenser. Regular price $5. Sell for $3. Postage 25c extra.

One Murdock Oscillation Transformer. Regular price $5. Sell for $3. Postage 25c.

One A.C. Ammeter, zero to 5 scale. Regular price $8. Sell for $4. Postage 25c, including insurance.

One 1-stage Amplifier, complete with bakelite panel, tube socket, amplifying transformer, binding posts, rheostats and wiring. Ready for use. Shop worn only slightly. Sell for $10. Postage 25c.

One Audion Control Panel. Bakelite panel, 8 binding posts, Murdock VT socket, Remler Grid Condenser, Remler Rheostat. Regular price $10. Sell for $6.50, prepaid.

Besides this list of slightly used apparatus we have several two and three-stage amplifiers. A dandy two-step and detector for $35, in beautiful oak cabinet, bakelite panel, complete in every detail, without tubes or batteries. One Honeycomb receiver with set of six coils. Good for Pacific Coast radio telephone concerts. This receiver has two variable condensers, oak cabinet, bakelite panel, series-parallel condenser switch, all binding posts and wiring. Sell to first person who sends $40 money order.

One C. R. 1 Grebe set complete with V. T. tube and Edison "A" battery. $70.

Get on our mailing list at once to receive regular monthly circular of second hand supplies. Everything guaranteed to be in first class operating condition. No junk. Western Wireless Works, Used Apparatus Department, 5534 Edgerly St., Oakland, Calif.

FRENCH INTERNATIONAL RADIO NET

The French government is working out a plan of world-wide wireless communication so as to be independent of all foreign-owned communication systems. From the home station at St. Assize, near Paris, it will be possible to reach all outlying French possessions, including Madagascar, Cochin China, and French Guiana. The largest direct distance will be 10,000 kilometers, from Paris to Saigon, 9,000 kilos from Paris to Madagascar 6,000 kilos from Paris to Brazzaville in West Africa. It is expected that automatic transmission and reception will allow a speed of 300 words per minute. The press rate will probably be one cent per word.

RADIO FUNERAL SERVICE

"Can you oblige me with a copy of the burial service?" This remarkable message was received by the wireless operator on the Cunard liner Carmania from a freight steamer 200 miles away, while the liner was about 300 miles west of Fastnet bound for Liverpool.

The message was despatched from the Canadian Trapper, in which a fireman had died on the voyage from Montreal to London. The wireless operator in the Carmania, which proceeded on her way at full speed, tapped out the service, word by word, in group messages of 150 words.

By Popular Request

During the past few months we have received such a large number of requests from our readers to again give free premiums with subscriptions that we have decided to hold a new subscription drive. The apparatus given free to those who subscribe or secure subscriptions makes this new campaign an unusually attractive one. Many new premiums will be awarded. You can't go wrong on this offer as there are no strings attached to it.

Here Are Our New Propositions:

Offer "A"

Your choice of any Vacuum Tube on the market, not exceeding $6.50 in retail price, will be sent to you absolutely free of charge if you send us FOUR subscriptions to "RADIO." 25c must be added for mailing charges.

Offer "B"

The well known McGuire Radio Lab. Variometer (Cesco Type) or the McGuire Variocoupler will be given free with three subscriptions to "RADIO." These instruments have enjoyed a wide and popular sale. 25c must be added for mailing charges. YOU SAVE $5.50 ON THIS OFFER.

Offer "C"

A dandy Audion Control Panel of Bakelite. Has V. T. Socket, Rheostat and Grid Leak. 8 Binding Posts. Given free with five subscriptions to "RADIO." 25c must be added for mailing charges.

Offer "D"

5 Watt Power Tubes. Any standard make. One of these tubes given free with five subscriptions to "RADIO." These tubes are guaranteed to be absolutely new and standard in every respect. Mailing charges 25c.

Offer "E"

The new Parkin Dial-Rheostat, priced at $1.75, sent to you free if you secure two subscriptions to "RADIO." This device is illustrated in our advertising columns. 12c must be added for mailing charges.

Offer "F"

Any one of the following popular radio books sent to you free if you secure two subscriptions to "RADIO": ARC Radio Manual ($2.50), Elements of Radio Teleg. ($2.50), Consolidated Call Book ($1.50) These books sent postpaid.

Offer "G"

Polished Bakelite V. T. Socket ($1.50) given free with one subscription to "RADIO." Mailing charges 12 cents.

Offer "H"

Bakelite and Mica Grid Condenser given free with one subscription to "RADIO." Standard size for any tube. Mailing charges 10c.

This Offer Will Be Withdrawn Shortly.

Hustle up those Subscriptions and get some Dandy Radio Apparatus FREE!

Start Right Now!

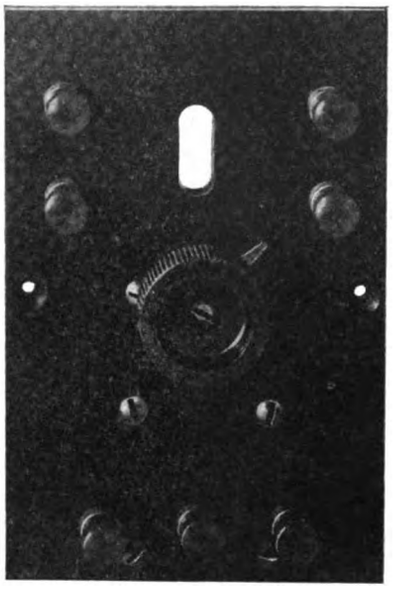
DON'T WAIT 'TILL TOMORROW. YOUR FRIENDS MAY BEAT YOU TO IT.

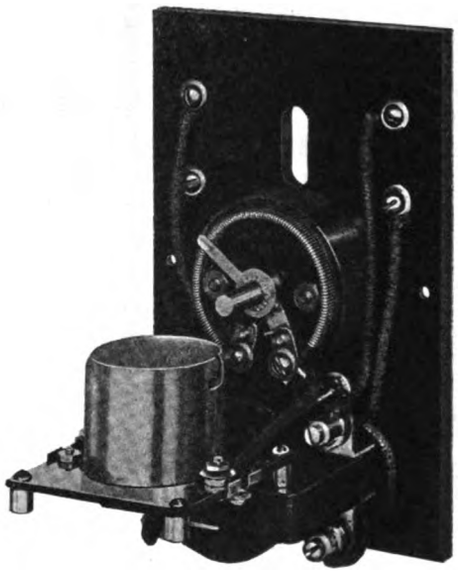
PACIFIC RADIO PUB. CO., 151 MINNA ST., SAN FRANCISCO.

Send me AT ONCE the apparatus described in offer.....
I enclose the remittance of $..... for the subscriptions and .....cents for mailing charges. You will enter the following subscribers to "RADIO" (formerly Pacific Radio News") for a full year each.

Name ..... **Address** .....
Name ..... **Address** .....
Name ..... **Address** .....
Name ..... **Address** .....

BLISS
Unit Amplifiers and Panels





The most pleasing feature of this Amplifier is its compactness. All the instruments are mounted on the panel, and when mounted in a cabinet the panel is very easily removed, making all parts easily accessible at all times. The Transformers are General Radio make and are designed for the U. V. 202 Radiotron. Tube Sockets are standard, four-prong type. Panel is of well finished XX Bakelite and may be mounted on a base or in a cabinet with other units. Supplied without tubes or batteries. Wiring diagrams accompany each amplifier. AN IDEAL AMPLIFIER.

No. W-609 One stage Amplifier.....$15.00

No. W-610 One stage Amplifier Panel..... 2.25

No. W-611 Tube Socket Mounted on back of Transformer 6.25

No. W-612 Paragon Rheostat with Bliss Moulded Bakelite Knob .....$ 2.00

No. W-613 Insulated Binding Posts..... .12

No. W-614 Complete set of Parts for W-609 Amplifier without wire and connections and not assembled..... 11.34

No. 301 BLISS Improved Switch, as illustration, Edgewise contact type with a genuine molded Bakelite Knob. 1 3-8 in. in diameter with a radius of 1 3-8 inches. Nickel plated lever.....$ .60

No. P-501 BLISS Moulded Bakelite Knob. 1 3-8 inches in diameter. POSTAGE PREPAID ..... .30

R. W. BLISS COMPANY

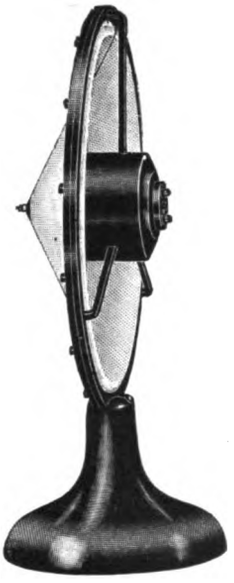
(Department P.)

42 Davis Street **Wollaston, Mass.**

CONTINENTAL NEWS

OCTOBER, 1921

PUBLISHED EVERY MONTH IN PACIFIC RADIO NEWS BY CONTINENTAL RADIO AND ELECTRIC CORPORATION



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Electric Sound Converter
More Than a Loud Speaker!

Designed for both reception and wireless telephone transmission in place of a microphone transmitter.

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ALL AMATEURS: Send for FREE descriptive leaflets about Paragon and Phonetron, the improved type of loud speaker. Creco Catalogue, 25 cents.

Do You Still Own a Quarter?

If so, and if you haven't already sent for the Creco Catalogue, that's the best way to invest it. 112 pages for a quarter, chock full of illustrations, descriptions, prices and all the radio apparatus you ever neard of. Also codes, abbreviations, tables, etc., that you will use daily. Be a sport. Risk a quarter on the best radio buy ever offered you! Anyway, you get credit for quarter on your first $5.00 order, so you really get the catalogue for nothing. Your copy is all ready to be mailed. Slip your name and your quarter into an envelope now!

PARAGON
Scores Again

The hearty endorsement of Paragon R. A. Ten by leading amateurs speaks for itself. Last month we printed 2ZL8's enthusiastic letter. This month we have selected this similar statement from 2ZM as representing the opinions of hundreds of amateurs who have been astonished and delighted with the results they have secured.

"Wish to acknowledge receipt of my Paragon in good shape.

At the same time, I wish to say that I have gotten some surprising results, having read a number of DX stations that were never heard before, with my other receivers, even in the winter time.

I can truthfully say that the Paragon gives better results for all around amateur work than any receiver I have ever used, and will highly recommend it to my fellow amateurs.

(Signed) L. Spangenberg,
Radio 2ZM.

Ask your Radio Dealer

to show you a Paragon R.A. Ten regenerative receiver. If he hasn't one in stock, he will gladly get one if you ask him for it. The seals have now been broken to show you the splendid inside construction. Examine a Paragon carefully—convince yourself that these leading amateurs have not overstated one particle in their complete approval of Paragon results,—and that Paragon is well worth its $85.00 price.

CRECO AMPLIFYING TRANSFORMER

High in quality— Low in Price: **$3.25**

In keeping with the usual Creco policy of distributing only apparatus of recognized quality, we offer an instrument of utmost mechanical and electrical efficiency, complete, ready for mounting, at an unprecedented low price. The Creco transformer was perfected with special reference to the needs of present day VTs. Important features are:

Unequalled audibility and amplification.

No holes in core, eliminating magnetic leakage.

All castings eliminated, etc., etc.

Such a simple, but efficient instrument should interest you at any price. But at the price of only $3.25 (far lower than any other transformer) you will have to place your order quickly. Send for your Creco Transformers at once,—we cannot guarantee to keep the production up to the demand.

Honolulu comes to Continental

(read this letter)

Today I am sending you a radio again for some wireless supplies.

You are getting me delivery in fifteen days from the day I cable you, and that is some service to the center of the Pacific.

(Signed) CYRIL O. SMITH.
Permanent address, The Royal School, Honolulu, U. S. A.

Our Service Covers the World

Order by mail from New York's leading Radio Store

It's a lucky thing for a good many radio stores, that amateurs are willing to blame the mails when they have to wait for their goods. You can order from Continental with the assurance that you won't have to wait. You can bank on it that your order will start toward you the day we get it. Everything listed in our catalogue is right here in stock—no delays. And there isn't much worth having, in radio, that **isn't** listed in the CRECO catalogue. It's not out of place to say that the Continental mail order stock includes **worth while** apparatus for every part of your station. No matter what wireless equipment you need, you can be sure that Continental has it, or will get it for you quicker than you could get it yourself.

Send your next order to Continental. No matter how large or small, it will be filled promptly, courteously, carefully. Please make all remittances by bank draft or Post Office Money Order, to avoid any possible delay.

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RADIO AND ELECTRIC CORP.

EXCLUSIVE WHOLESALE DISTRIBUTORS FOR PHONETRON AND PARAGON R. A. TEN

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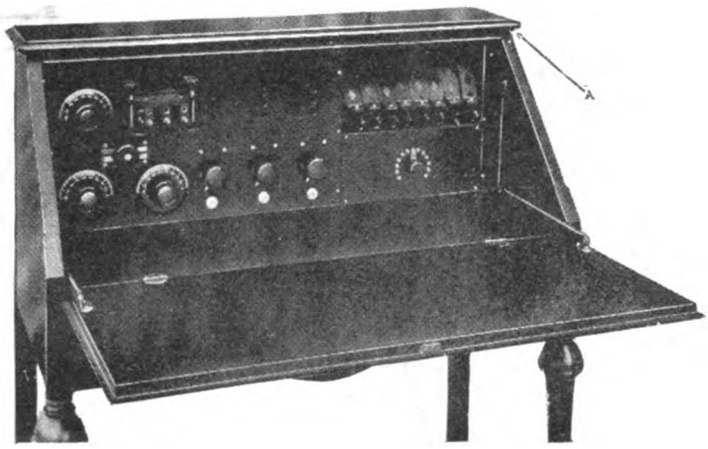
SPECIAL SETS TO YOUR OWN SPECIFICATIONS



The beautiful walnut desk set illustrated is but a sample of our complete, low-priced "made-to-order" manufacturing service. What can we make for you?

If you can't buy **exactly** what you want ready-made, don't buy ready-made at all. Let us make **precisely** what you want, build it **just** the way you want it, and adapt it to fit your purpose **exactly,**—anything from the smallest part to the most complicated and elaborate set. The cost is low. What can we make for you **right now?** Let us submit a figure—that will cost you nothing, anyway, and we may have some valuable suggestions to offer.

Let our service department help you, too. Tell us your troubles. Even though you have purchased your apparatus elsewhere, this service is always at your disposal. Try it—**now.**

Of course, we also have a splendid stock of standard radio equipment and supplies, good apparatus at low prices, and deliveries—Bing! just like that.

We are Western Agents for the Radio Corporation of America and have Dealers Rights for New Discounts

FORMICA PANELS.

Our price for Formica Panels is 2¼c per square inch. All panels are cut accurately and the edges beveled. Polishing is done for 75c per square foot, and all panels are drilled for $1 if center punched.

We have a complete stock of nickel plated machine and wood screws, round, oval, and flat, at 2c each. Sizes carried in stock, 4-36, 6-32, 8-32, and 10-32.

FOR DEALERS ONLY

Due to the increased demand it is getting harder every day to get Radiotron apparatus deliveries on time, and these deliveries will be slower and slower as the season advances.

The Fall rush will undoubtedly find your stock short in this popular line. Guarantee yourself against the loss of profitable sales by stocking a full line of Radiotron apparatus AT ONCE.

AMATEURS

Write for circulars on Radiotron apparatus, and IF YOUR DEALER CANNOT SUPPLY YOU, WRITE TO US DIRECT.

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Pen Brand Products

RADIO EQUIPMENT

Designers - - - Contractors

175 Steuart Street

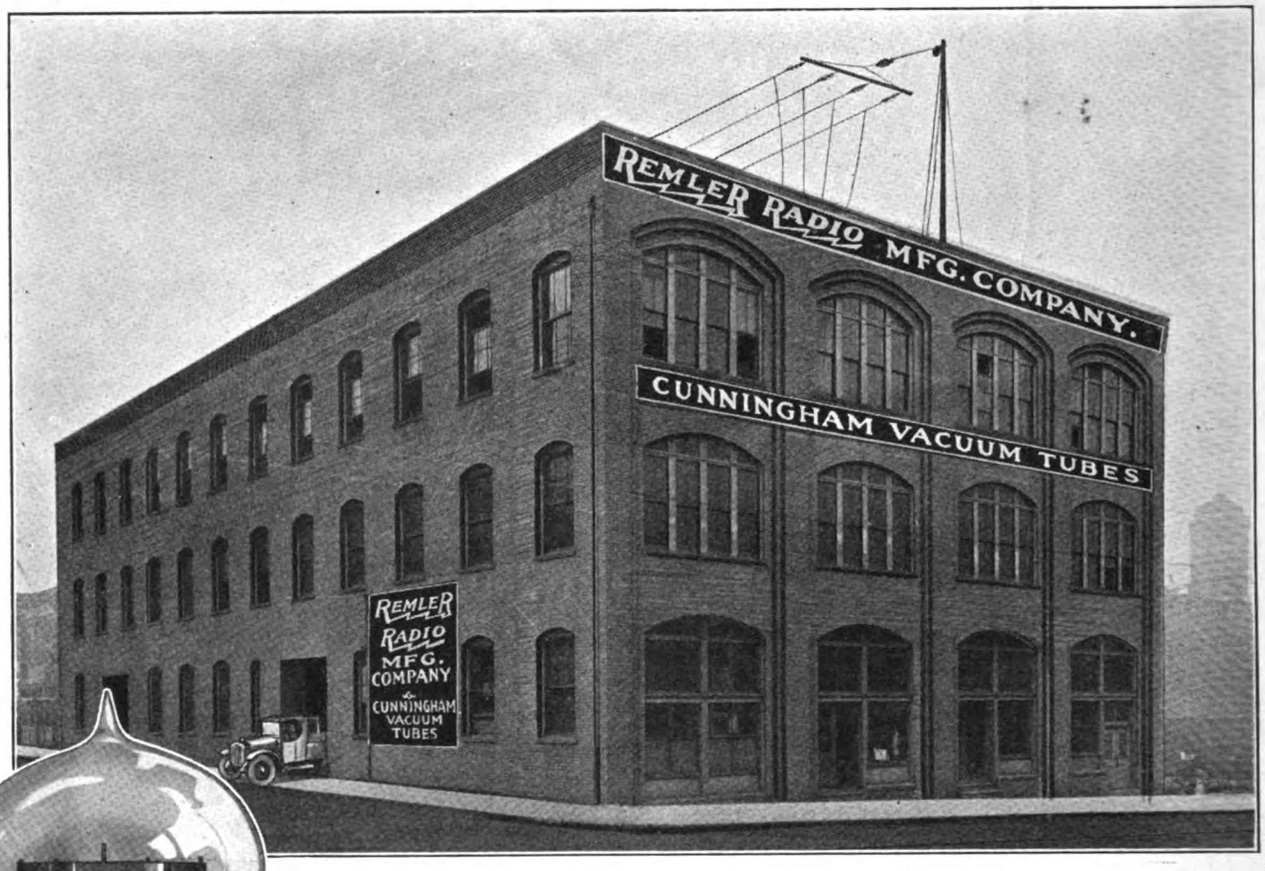
SAN FRANCISCO, CAL.

RADIO

FORMERLY PACIFIC RADIO NEWS

NOVEMBER, 1921 SAN FRANCISCO 20 CENTS

Miss Ruth Phipps, San Francisco Soprano, singing over the De Forest Radiophone at the California Theatre.



Cunningham
C-300
Gas Content
Detector

$5.00

Announcing the New Home of

CUNNINGHAM VACUUM TUBES AND REMLER RADIO APPARATUS

THE strict adherence to quality in the manufacture of Cunningham Tubes and Remler apparatus has been largely responsible for the nationally recognized merit and increased sales of our product which has necessitated the enlargement of our plant facilities. With our Chicago office functioning as a central and Eastern distributing center under the direction of Herbert H. Frost and our enlarged San Francisco home office and plant we are now in a position to render a more highly perfected service to our valued clientele.

If you have not received our new 32 page catalogue of Remler Apparatus and Cunningham Tubes send your name and address today for free copy.

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General Manager

REMLER RADIO MFG. COMPANY
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San Francisco, Calif.

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REMLER APPARATUS RADIATES QUALITY
CUNNINGHAM TUBES MEET EVERY AMATEUR REQUIREMENT

IT'S ONLY A STEP FOR YOU NOW TO A FINE WIRELESS POSITION

SURELY you have noticed how wireless is spreading over the world like wildfire! Every day you learn of some new field that is utilizing it—some new firm organized to push it forward. Big opportunities are open—and every day get more numerous and attractive. But do you realize that YOU can easily qualify for the wonderful opportunities that are opening? Amateurs—do you know that you can quickly build upon your present knowledge of Wireless—and be ready any time you wish for a fine Wireless position, either on land or on sea? You are in a fine position to cash in big on this growing field. Right at home you can easily build upon your present knowledge and quickly qualify. Through our special method of home-study instruction a short period of your spare time can be turned into preparation for a worthwhile future in the fastest-growing field in America today—Wireless. You have the whole foundation, all ready to build upon. Our new, easy method of instruction makes the rest pure fun—but fun that pays big.

The coupon below will bring you an interesting free booklet—telling about the splendid opportunities open, and how you can share them. Mail coupon for booklet today!

Both on sea and on land a fine future awaits the man who is qualified in wireless. No matter whether you wish to visit every nook and corner of the world or whether you prefer a land station, wireless awaits you.

New Method Makes It Easy to Qualify

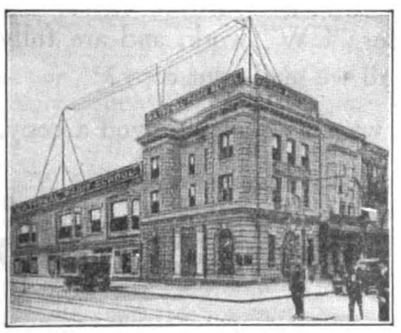
WITHOUT obligation to yourself we would like to tell you more fully about the future wireless offers you. We would like to tell you about our Institute, which is officially recognized by the United States Department of Commerce and whose name heads the list of the schools recommended by the United States Shipping Board. The National Radio Institute was the original and is today the oldest and largest school in America teaching wireless by mail—having over 7000 students in all parts of the world. The government allows our graduates five to ten points credit when taking First Grade Government License examinations. We have graduates all over who have quickly qualified through our special new method.

This is the famous Natrometer

This method not only includes a comprehensive course of instruction written exclusively for us by some of America's greatest wireless experts (members of our own staff) but also includes—as part of the course—a wonderful new invention patented and controlled by us. This device, called the Natrometer, is pictured here. It teaches you in half the usual time how to send and receive, with speed and accuracy. This Natrometer (which can be purchased separately) is superior to any other device of its kind. Without aerial or any outside device it sends you any one of 600 different messages at a speed which you can vary from 3 to 100 words per minute. It is portable; also very attractive in appearance. It is noiseless; and it sends in a natural manner, not like a mechanical device. You get the messages thru its 'phones at whatever speed you wish. And this is **only one** of the features which our new method brings you. Others are listed below. Read them and you will realize why our students quickly qualify and why they step into the fine wireless positions that are waiting!

11 Points That Make This School the Best

1. **Wonderful Natrometer Given with Course.**
2. **New, Easy Method of Copyrighted Theory Instruction.**



Besides being the largest school teaching Wireless by mail, The National Radio Institute has large residence schools in Washington and Baltimore.

3. **Our Diploma Given Government Credit and Recognition.**
4. **Our Location in Washington — Passing New Official Radio Developments on to You.**
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9. **Free Post - Graduate Course, if You Wish, in Our Washington or Baltimore Residence School.**
10. **Membership in the National Radio Relay League.**
11. **Low Tuition Cost and Easy Terms of Payment.**

Mail coupon today for our free illustrated booklet, "Wireless, the Opportunity of Today." Without cost or obligation, we want to tell you more about this field, its big opportunities both on land and on sea, and just how our new method quickly qualifies you. No agent will call upon you. We just want to send you the facts. Mail coupon at once!

NATIONAL RADIO INSTITUTE, Dept. 2911, Washington, D. C.

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Send me your free booklet, "Wireless, the Opportunity of Today." Tell me about the opportunities open in wireless, about your Institute, and your offer.

Name..... Age.....
(Please Write Plainly)

Address .....

City ..... State.....

.... I am interested in a Sea position.

.... I am interested in a Land position.

Say Radio to the Advertiser, it will help you.

—MOVING—

The great demand for "Wireless Shop" products has been growing so fast that we couldn't begin to take care of it in our present location, so we have built a completely new plant and salesroom, plenty large enough to put in new machinery and help, and give you SERVICE.

We wish to announce that on or about October the tenth, we will move to our new building, located at 1262 West Second St., Los Angeles, and then watch our dust.

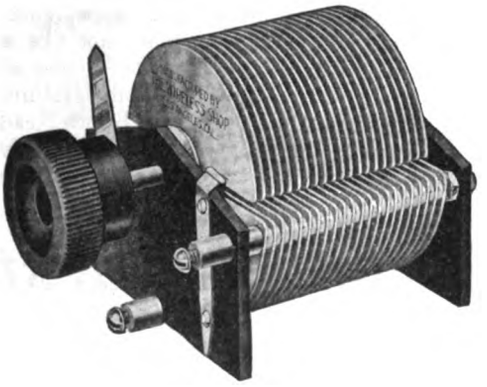
A special department will be maintained to take care of those little jobs you have always wanted in a hurry (but could never get). If you have a rush job, just try "THE WIRELESS SHOP."

A lot of new machine tools are already on the way to take care of the growing demand for "WIRELESS SHOP VARIABLE CONDENSERS," and plenty of help will be on hand to run these machines and assemble finished parts. Lack of space is all that has been holding us back in the past, so now watch the condensers fly.

Quality—as Usual, will ALWAYS Remain Paramount with

THE WIRELESS SHOP
A.J. EDGCOMB

"Consider the QUALITY Before You Buy"



Our "SERIES 'T' " Variable condenser is a high grade, quality product throughout, designed for those who want the best. Fitted with knob and pointer and mounting screws, and packed in individual cartons.

PRICES

No. 20	2	plate,	Vernier Condenser				$2.00
No. 70	7	plate,	approximately	.0001	m. f.	maximum capacity	2.35
No. 130	13	plate,	"	.0002	m. f.	" "	2.75
No. 170	17	plate,	"	.0003	m. f.	" "	3.15
No. 230	23	plate,	"	.0005	m. f.	" "	3.60
No. 310	31	plate,	"	.0007	m. f.	" "	4.30
No. 430	43	plate,	"	.001	m. f.	" "	5.25
No. 630	63	plate,	"	.0015	m. f.	" "	7.50

Include postage for one pound to your postal zone, and insurance.

Our Series "L" and "CW" are larger models, built for receiving and for "CW" work, and are fully described in our Bulletin No. 1, which will be mailed for the asking. Where shall we mail your copy?

Our new, complete catalogue will be ready for mailing shortly, and if you want us to reserve you a copy, get your name on our mailing list at once.

Here's to Better Instruments, Better Service and Better Radio

THE WIRELESS SHOP

1262 West Second Street,

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Vol. III, No. 4 NOVEMBER, 1921 *Per Copy 20 Cents*

Radiotorial Comment

RUMOR hath it that the congressional re-organization committee has recommended that the control of radio communication be transferred from the Department of Commerce to the Post Office Department. To make such a change just as the officials now in charge really have solved the perplexing problems arising from conflicting interests of governmental, commercial, and amateur operators, would seem to be the height of folly. While we are heartily in favor of the spirit actuating the re-organization committee in its efforts to put more efficiency into Federal bureaus, we suggest to the members of the committee that to first sound out the sentiment of the radio fraternity before recommending any drastic changes in existing arrangements would be more likely to insure the eventual adoption of whatever recommendation they may make. Meanwhile, on the theory that a watt of prevention is worth a kilowatt of cure, protests are in order. To head off the matter in committee hearing will be easier than on the floor of Congress.

THOUSANDS of operators throughout the country will learn with regret that E. T. Chamberlain, the greatly beloved and respected Commissioner of Navigation of the Department of Commerce at Washington, is leaving this work to become head of the Bureau of Foreign and Domestic Commerce. This regret, however, is mingled with pleasure at the announcement that D. B. Carson will become the new Commissioner of Navigation. From his past record we have every reason to believe that Commissioner Carson will exercise the same sympathetic understanding of the needs of the amateur as did his predecessor. In leaving this branch of the service Mr. Chamberlain carries with him the best wishes of the entire radio industry.

GREAT publicity has been given the radio telephone in the West during the past month on account of the wonderful concert given by the stars of the Scotti Grand Opera Company, the radio sermon of Dr. Van Winkle of the First Christian Church of Oakland, and the radio music furnished by Steindorff's 60-piece band. This service, as furnished through the enterprise of the radio men, is helping to popularize radio more than would any other agency. Many men of mature years are buying receiving sets and soon can be counted upon as influential radio fans. To improve the music, to prevent duplication of effort and to avoid interference why could not the newly formed Pacific Radio Trade Association establish central transmitting stations at strategic points and undertake co-operatively and thereby more effectively what is now left to individual firms?

SINCE the days of Robin Hood, down through the age of pirates and smugglers, and now in this time of bootleggers and Roy Gardners, the romance of excitement and adventure ever has been attached to playing the game of lawlessness. While our interest and our sympathy naturally goes out to those in trouble, law-breakers too often have been the heroes of literature. Small wonder it is then that there is insidiously created a desire to emulate these ancient deeds of valor, and to break those laws by which we are restrained.

You cannot blame the boy who thinks it big to break the law when he has been fed up on these stories and taught to admire the law breakers. On every hand, also, he hears his elders boast of their prowess in evading the speed cop and the prohibition sleuth. In the shelter of the home he himself has been judged by a lenient standard and held to a small degree of responsibility.

So when he gets his license he does not realize the seriousness of the rules that limit his wave length and his sending power. When he finds the 200-meter field too crowded he goes up a few notches, and when his feeble spark or tube is QRM'd by some big commercial station he throws in another ampere of radiation. But by so doing he plays havoc with legitimate business and government messages. The radio inspector steps in and shuts down his station and he learns, for the first time, that laws are not made merely to be broken.

However unpopular or unequitable a law may be, still it is a law, a rule of conduct for the protection of society, a means for providing the greatest good for the greatest number. If it is wrong, it will soon be repealed. But while it remains a law it should be obeyed.

Personally, RADIO believes that this limitation of wave length is hampering ambitious young men and is throttling legitimate development of radio communication. We believe that the amateur should be allowed to work up to 350 meters and that other stations should be raised accordingly, and we are doing our part to bring this about. But meanwhile we must obey orders.

You, as a radio amateur, can do your part by showing through your obedience of the present law your fitness to receive the privileges of a less restrictive law.

The New Federal Arc Station at Palo Alto

By H. R. Pratt

THE Federal Telegraph Company, a California corporation and organized in San Francisco, has for years been known to all interested in the radio field as the first to employ modern radio equipment, using undamped waves for commercial long distance telegraph communications. For a number of years prior to the war this company, through progressive steps, developed in its research and engineering departments, the first practical continuous wave radio transmitter known to the engineering world, and built and placed in operation a chain of radio stations using the equipment which had been developed, embracing the western coast of the United States and the Hawaiian Islands.

The United States Navy Department, observing this important development, took occasion to investigate the system, which it found so well adapted for miiltary communications that a contract was arranged for the Federal Company to install a complete set of its transmitting equipment in the Arlington(Va.) Radio Station, which at that time had just been completed and was the most powerful radio station in existence. The arc transmitter which was supplied on this contract gave such superior performance that additional contracts were immediately consummated by the Navy Department for a number of high power radio stations. During and following the period of the world war, the Federal Company equipped additional high power radio stations for the Navy Department, which have resulted in a chain of stations extending throughout all American possessions. All of this equipment was designed in California by Federal engineers and manufactured at the company's factory at Palo Alto.

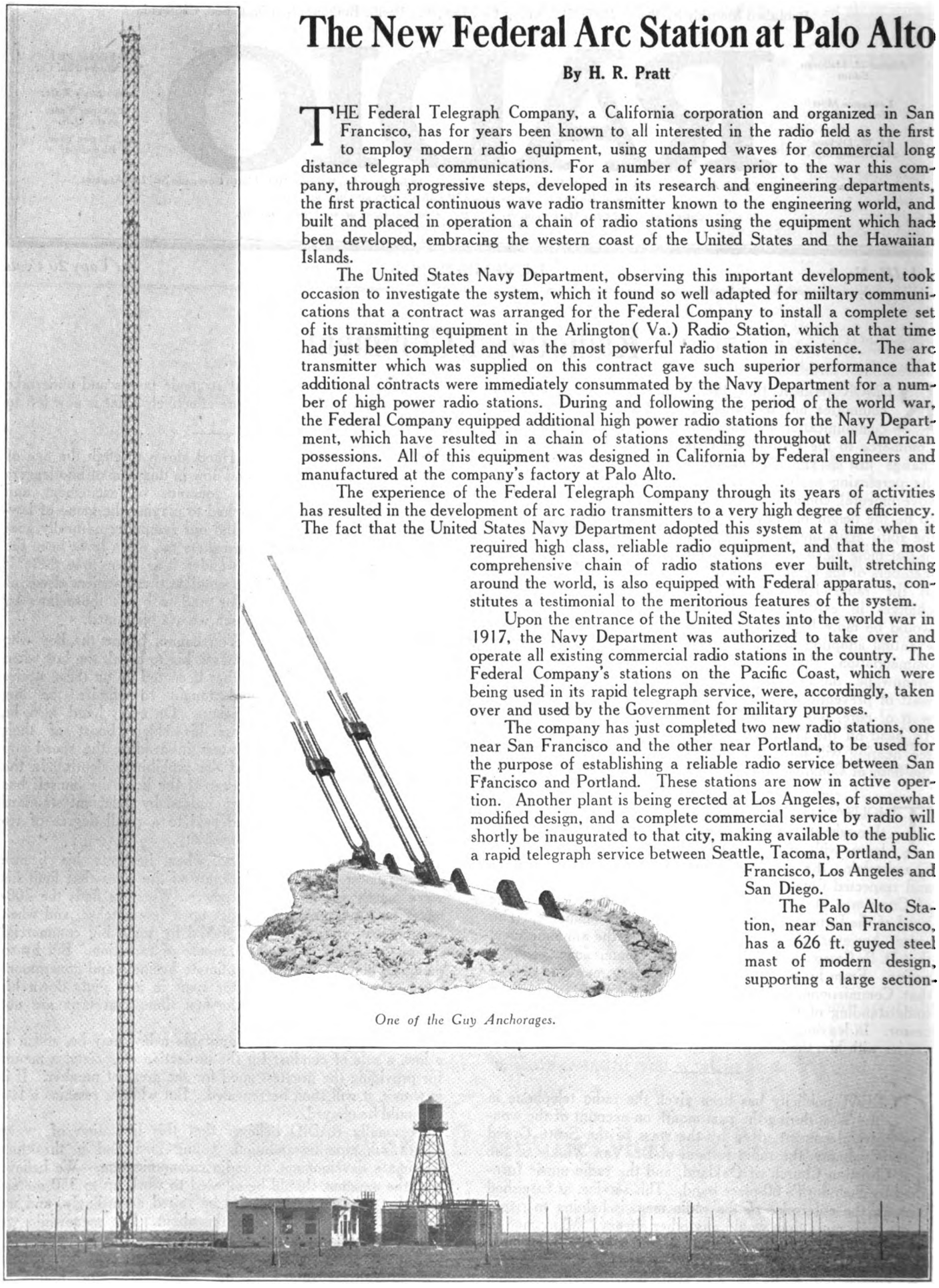
The experience of the Federal Telegraph Company through its years of activities has resulted in the development of arc radio transmitters to a very high degree of efficiency. The fact that the United States Navy Department adopted this system at a time when it required high class, reliable radio equipment, and that the most comprehensive chain of radio stations ever built, stretching around the world, is also equipped with Federal apparatus, constitutes a testimonial to the meritorious features of the system.

One of the Guy Anchorages.

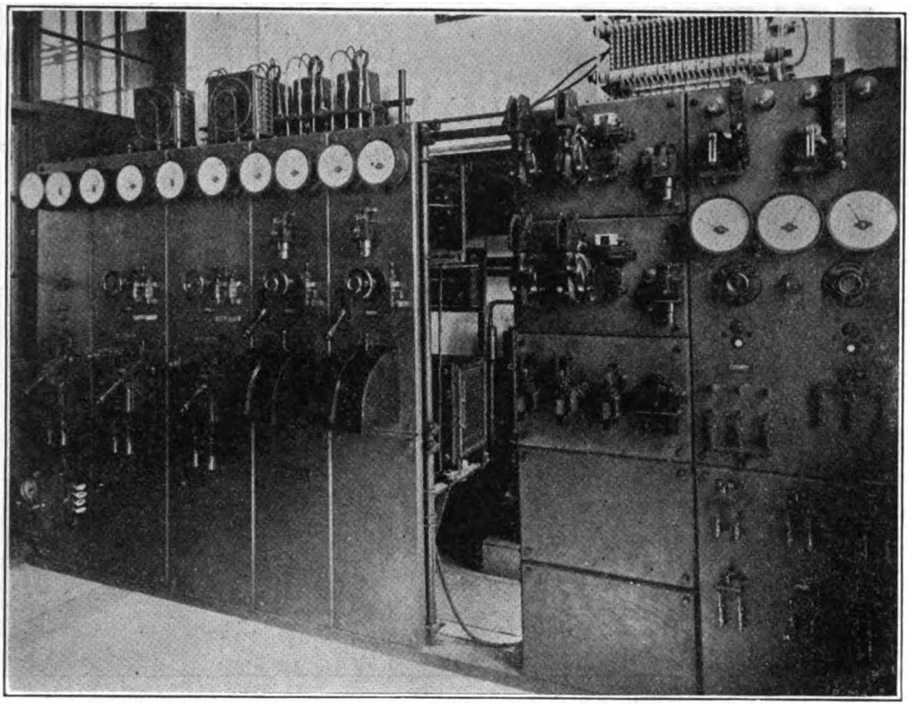
Upon the entrance of the United States into the world war in 1917, the Navy Department was authorized to take over and operate all existing commercial radio stations in the country. The Federal Company's stations on the Pacific Coast, which were being used in its rapid telegraph service, were, accordingly, taken over and used by the Government for military purposes.

The company has just completed two new radio stations, one near San Francisco and the other near Portland, to be used for the purpose of establishing a reliable radio service between San Francisco and Portland. These stations are now in active operation. Another plant is being erected at Los Angeles, of somewhat modified design, and a complete commercial service by radio will shortly be inaugurated to that city, making available to the public a rapid telegraph service between Seattle, Tacoma, Portland, San Francisco, Los Angeles and San Diego.

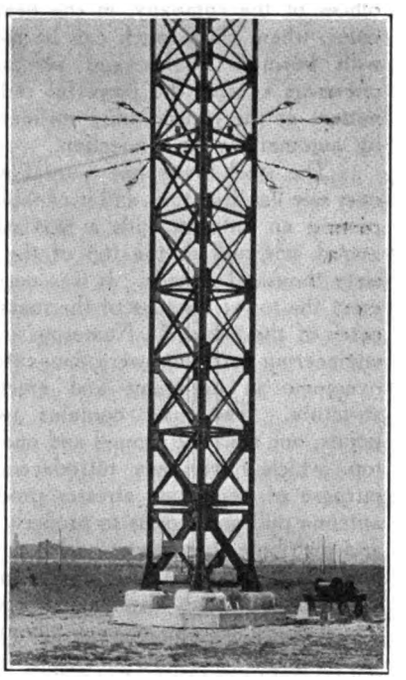
The Palo Alto Station, near San Francisco, has a 626 ft. guyed steel mast of modern design, supporting a large section-



The New Palo Alto Station of the Federal Telegraph Co., Showing 625 ft. Mast, Power House, Cooling Tower, Outdoor Condensers and Counterpoise Ground System.

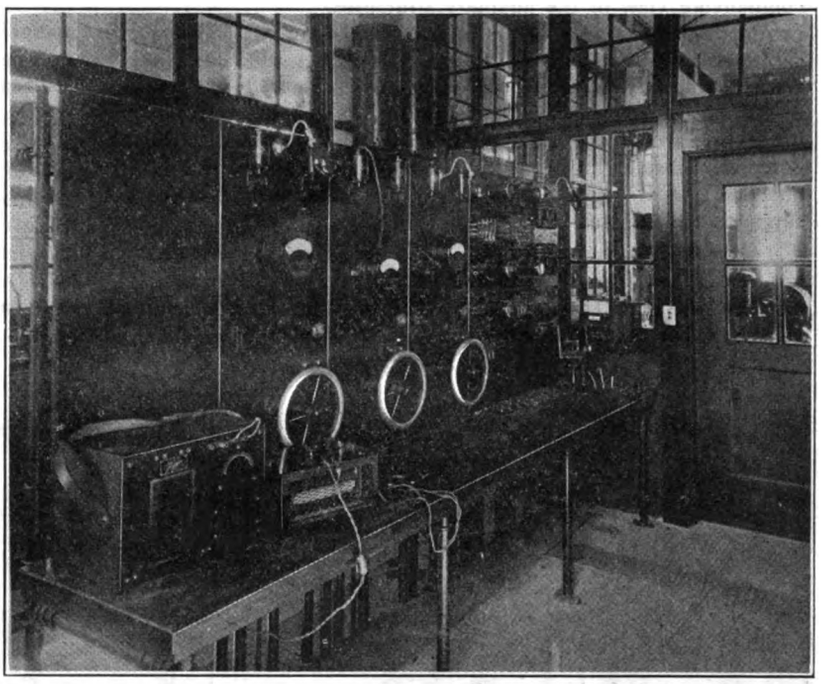


Main Power Switchboard.

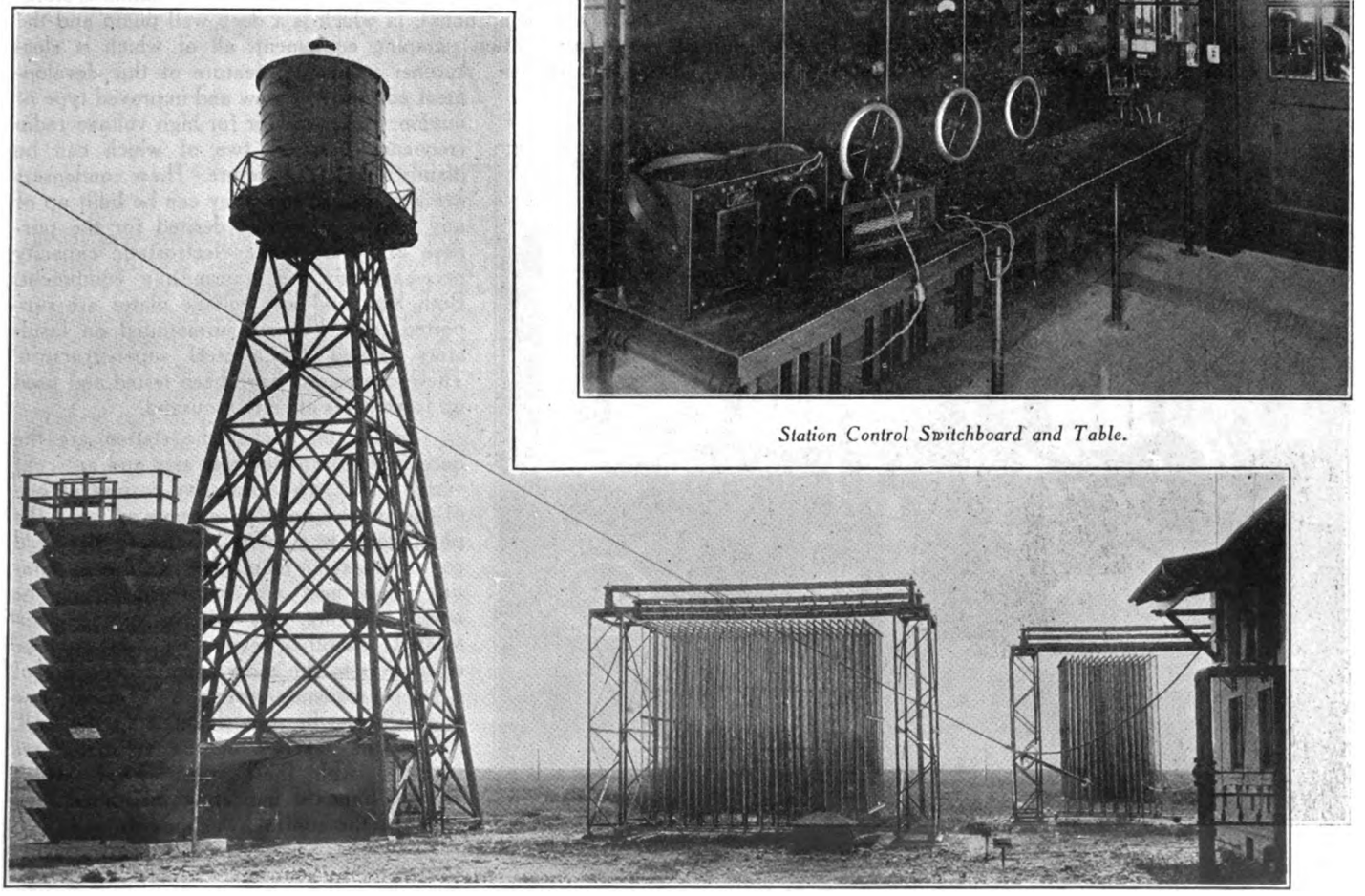


Base of 626 ft. Steel Mast, Showing Counterpoise Ground System.

alized umbrella antenna system. This covers an area of over 150 acres. Many new recent developments in the radio art have been taken advantage of in the building of these stations. Among these is the use of high speed and automatic equipment with multiplex communication channels. All receiving and transmitting operators are in the main



Station Control Switchboard and Table.



Auxiliary Structures Surrounding Power House, Including Outdoor High Voltage Condensers and Water System.

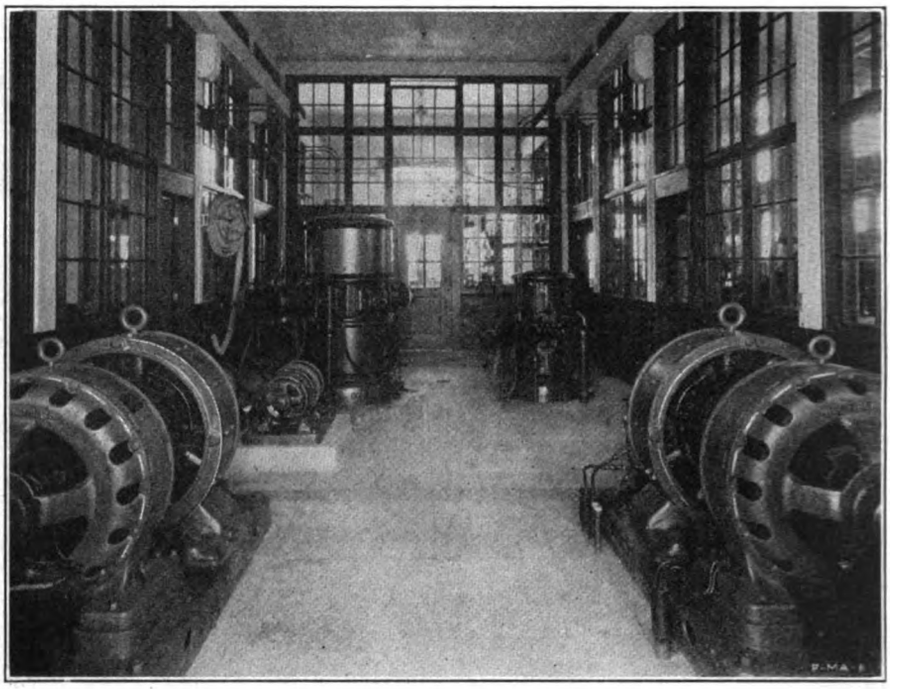
offices of the company, in the heart of the cities, where close touch can be maintained with business houses and offices. These operators control the powerful radio transmitters at the transmittiing stations directly by automatic wire connection.

The steel tower has a total weight of over one hundred tons and is capable of supporting an antenna with a maximum horizontal side pull at the top of the mast of sixty thousand pounds. It was necessary to erect the tower because of the marshy character of the sub-soil. Numerous interesting engineering problems were encountered and overcome in designing and erecting this structure. The mast contains two pivot points, one near the ground and one near the top, which have been introduced for the purpose of permitting stresses produced by antenna pull and storms to properly equalize and distribute themselves, and it is this feature which enables this structure to support an antenna of such massive construction.

The greater part of each guy anchorage is under the surface of the ground. All of these are also supported on pile foundations in the case of the Palo Alto Station.

Prominent in the foreground of the accompanying view of the auxiliary structures surrounding the power house is one of the antenna lead-in cables and one of the high potential insulators used for this construction is visible where the connection in made to the side of the power house. There are several of these conductors distributed around the building, all of which are carried to the equipment inside through special antenna entrance windows, on each side of which are mounted large pillar insulators for supporting the cables.

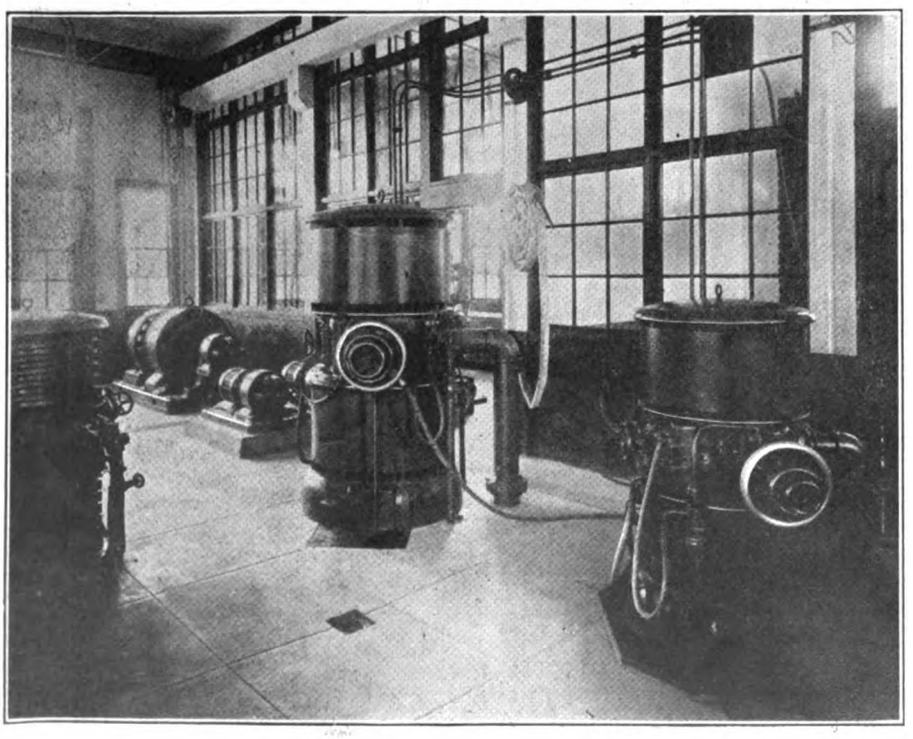
Attached to the side of the power house can be seen the gas seal exhaust pipes from the various arc converter units installed within. These gas seals are provided with special valves so that the arc chambers may be readily cleaned automatically through a blower system. The blower used is mounted in a small, ventilated housing, which can be seen in the center of the picture.



Main Power Machinery and Arc Room.

In designing these stations it was decided to utilize a water circulating system for cooling the arcs and for the purpose of economizing in water, cooling towers of proper capacity to secure the desired heat dissipation were provided. One of these can be seen alongside of the water tank and tower in the picture. At the base of the tank tower is a combined storeroom and pump house, in which is a deep well pump and the necessary station pumping equipment, all of which is electrically driven. Another interesting feature of this development consists of a new and improved type of outdoor air condenser for high voltage radio frequency currents, two of which can be plainly seen in the picture. These condensers are arranged so that they can be built up of any number of plates desired for the purpose of securing the electrostatic capacity necessary for the transmitting equipment. Both high and low voltage plates are supported from I-beams surmounted on insulators carried by a steel super-structure. These condensers have been tested and used up to voltages of sixty thousand.

In the interior of the station are the necessary motor-generator sets and arc converter units. The protective casings of one of the smaller units were removed when the photograph was taken, disclosing the field coil construction employed with this apparatus. This field coil construction can be noted as being very massive and well insulated. Another feature which should be of interest to the radio engineer consists of a radio frequency current transformer, one of which can be seen mounted on the wall. All of the stations of the company are equipped with these transformers, which operate standard indicating instruments located on the control switchboards.



Main Power Machinery and Arc Room.

(Continued on Page 136)

The How and Why of Radio Tuning

By B. F. McNamee

ONE of the most wonderful things about radio to the mind of the layman is the fact that many different pairs of stations can transmit and receive messages in the same locality and at the same time without interfering with each other—of course, providing that they are using different wavelengths. To understand the method by which this is accomplished is to understand the principle of tuning. And the object of this article is to explain in simple words the tuning idea, as well as some of the instruments used for this purpose.

First let us see how a transmitting station sends out a message on any particular wavelength. The aerial at the transmitting station consists of a number of wires suspended from insulated supports and having a wire connecting it with the sending apparatus. This sending apparatus consists of an arrangement for charging and discharging the aerial with electricity almost any number of times per second, as desired. Each time that this charging takes place, energy is radiated from the aerial in the form of an electro-magnetic wave.

If the charging and discharging of the aerial take place very rapidly, or, in other words, if waves are sent out from the aerial very frequently, the first wave will have traveled only a short distance when the second wave is sent out. But if the waves are not sent out so frequently, one wave will have gone a distance of perhaps several thousand meters before a second wave follows it. Now the distance between the crests of two adjacent waves is called the wavelength. This is simply saying that a short wavelength is the result of a very high frequency current in the aerial, and that a currency of lower frequency in the aerial would cause a longer wavelength.

The speed at which these electric waves travel is the same as the speed of light—186,000 miles per second. Expressed in the metric system, this speed is 300,000,000 meters per second. Suppose a transmitting station should send out just one wave every second. The first wave would have traveled 300,000,000 meters before the second wave started. As these waves travel on, they will, of course, remain the same distance apart. So in this case the wavelength would be 300,000,000 meters. If the transmitting station should send out ten waves per second, each wave would have traveled only one-tenth of a second before the next wave was sent out. In one-tenth of a second a wave would travel one-tenth of 300,000,000 meters, or 30,000,000 meters, which would be the wavelength.

We see, therefore, that to find the wavelength corresponding to any particular frequency, it is simply necessary to divide 300,000,000 by the frequency. For example, a frequency of 1,500,000 wave per second corresponds to a wavelength of 200 meters; a frequency of 300,000 waves per second corresponds to a wavelength of 1000 meters.

In order to see how waves of various lengths will affect a receiving set it will be necessary to consider **free oscillations.** We know that a clock pendulum will swing back and forth in a certain length of time if allowed to swing **freely,** and that this length of time will always be found the same, provided that the length of the pendulum and the force of gravity are kept the same. We all know that to shorten a pendulum is to cause it to oscillate faster, and that to lengthen it is to cause it to oscillate more slowly. In fact, any object which tends to vibrate or oscillate when moved from a position of rest will always taken a constant length of time for each swing.

Now we are ready for the important case where we have two pendulums or other vibrating bodies having the **same number of free oscillations per minute,** or, in other words, **tuned to each other.** Let us take the oft-repeated experiment shown in Fig. 2. A and B are two pendulums consisting of weights attached to strings of equal lengths. C is another similar pendulum, but either longer or shorter than the first two. All three pendulums are suspended from a string stretched between two supports. Pendulum A is brought to one side and allowed to swing **freely.** There will be little or no effect on pendulum C, but pendulum B will commence swinging, very slightly at first, but gradually increasing in strength. This is a simple demonstration of tuning. Pendulum A transmitted a series of feeble impulses along the string supporting the pendulums. None of these feeble impulses was in itself sufficient to start the other pendulums swinging to any noticeable extent, and for this reason pendulum C does not swing. But in the case of pendulum B these feeble impulses were supplied at exactly the right time, so that each impulse added its effect to that of the preceding ones.

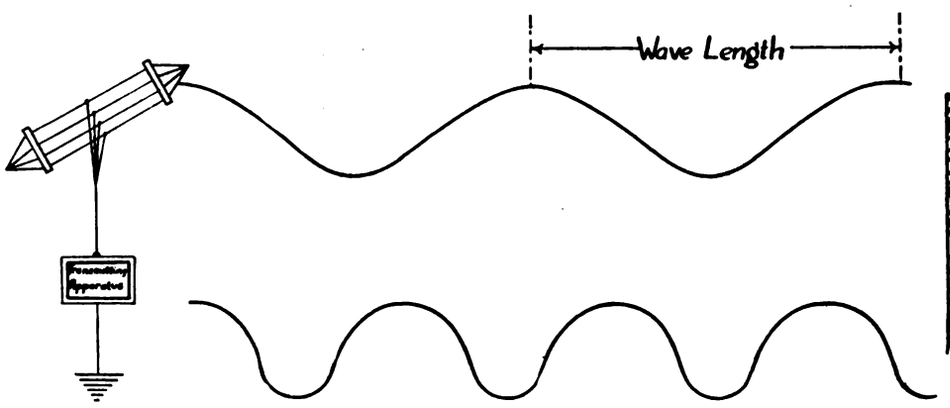


Fig 1. Variation of Radiated Wire Length with Frequency of Vibration.

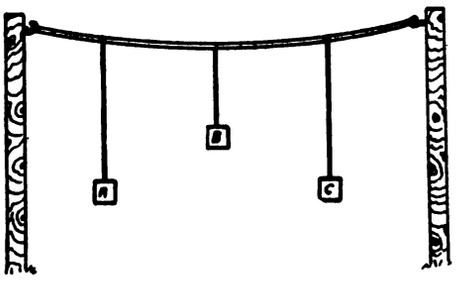


Fig. 2. Pendulum Demonstration of Tuning.

The same effect may be studied in a great many ways without setting up any special apparatus. Stand beside a rocking-chair and give it a series of slight pushes with the finger, in such a direction as to start it rocking. If the pushes are carefully timed to correspond with the free oscillations of the chair, it will, in a short time, rock as far as desired, but such a series of slight pushes will accomplish little if not so timed.

The simplest receiving set generally has a tuned circuit consisting of an aerial, a coil and an earth connection. If we give the aerial an electric charge it will discharge through the coil to ground, but the action will not stop at complete discharge any more than a pendulum will come to rest at the end of the

first half swing. There will be a current flowing back and forth through the coil, gradually decreasing in strength until it dies out completely. This is a **freely oscillating current,** and the number of oscillations per second will depend on the size of the aerial and of the coil.

Suppose that we wish to hear a station that is sending on a wavelength of 1000 meters. This means that waves from this station are striking the receiving aerial at the rate of 300,000 waves per second. Now if the coil and aerial are of such a size that the number of **free oscillations** per second in this circuit will be 300,000, this receiving circuit is tuned to the transmitting station in question. There is a feeble current started oscillating between the receiving aerial and earth by the first wave, and each succeeding wave adds to this current, because, as in the case of pendulums A and B, mentioned above, each impulse is correctly timed.

Now suppose that we wish to listen to a station that is sending on a wavelength of 200 meters. This means that waves are reaching the receiving aerial at the rate of 1,500,000 waves per second. In order to tune our receiving circuit so that it will freely oscillate at the rate of 1,500,000 times per second, it will be necessary to use a smaller coil, or to use only part of the turns. This corresponds in the pendulum experiment to saying that if pendulum A were shortened so as to swing a greater number of times per minute, it would be necessary to shorten pendulum B to keep the two in tune.

Besides **free oscillations** we have to deal sometimes with **forced oscillations.** If, in the rocking-chair experiment given above, the chair would freely rock back and forth ten times per minute, we could easily **force** it to rock back and forth three times per minute or twenty times per minute or almost any number of times per minute by taking hold of it and applying force. This corresponds in radio to having a receiving outfit in the immediate vicinity of a powerful transmitting station. The waves from the transmitting station in this case strike the receiving aerial with such strength that they may force an oscillating current of sufficient strength to cause interference even when the receiving circuit is tuned to some very different wavelength. This interference can be to some extent overcome by using very loose inductive coupling, to be described in a later article.

When a slight adjustment of the receiving tuner is sufficient to bring in or shut out a particular signal, the tuning is said to be **sharp.** On the other hand, if the signal remains strong over quite a range of adjustments on the receiving tuner, the tuning is said to be **broad.** In the case of some transmitting stations, especially spark stations, this broad tuning is caused by the radiation of the energy on a whole series or band of wavelengths instead of on one single wavelength. For example, a station that is supposed to be sending on a wavelength of 200 meters may be sending out more energy on 200 meters than on any other wavelength, but it may be transmitting some energy on many other wavelengths ranging from, say, 180 meters to 220 meters, and, of course, can be tuned in on these wavelengths.

Broad tuning is not always the fault of the transmitting station. It may result from forced oscillations, as mentioned above, or it may be the result of a poorly designed aerial and receiving tuner.

THE NEW FEDERAL ARC STATION AT PALO ALTO

(Continued from Page 134)

At the control switchboard and operating table of the station, located in a separate room, are the terminals of the incoming control lines, telegraph instruments and keys, high speed signaling relays, and the arc control switchboard panels themselves. One operator can run all of the transmitters at this station from this one position, where all controls are concentrated.

The main power switchboard of the station has panels for each motor and generator in the plant. The main motors are 2,200 volt and of the synchronous type. Power is brought into the station through a three-phase underground cable, which terminates behind the switchboard.

The construction of these stations and the resumption at this time of radio commercial telegraph service on the Pacific Coast by the Federal Telegraph Company have been made possible through the recent organization of its affairs by its president, Mr. R. P. Schwerin.

HOW TO HEAR THE RADIO MUSIC IN THE AIR

There is radio music in the air, every night, everywhere. Anybody can hear it at home on a receiving set, which any boy can put up in an hour. One of these sets costs less than a phonograph. With it can be heard grand opera, orchestras, phonograph music, market reports, press summary, sermons and speeches. All that is needed is a hundred-foot clear span of copper wire, a couple of batteries and a cabinet set that can be bought from a radio dealer in every town.

First string an aerial between two chimneys, houses or poles about a hundred feet apart and twenty feet or more high. Use a porcelain insulator at either end, where attached, drop the wire down and bring it into a room through a window or a hole in the wall, and hitch it on to one of the set's terminals. All that is needed for an aerial are two insulators and a hundred feet of hard-drawn No. 14 copper wire. Attach a piece of the same kind of wire to the other set terminal and hook tightly on to a buried water pipe for a ground.

A six volt storage battery—an old automobile battery will do—is needed to furnish current to light the filaments in the vacuum tubes, which are the important parts of the receiving set. A 45 volt dry battery furnishes the current for the vacuum tube plates.

The elaborateness of the set depends upon the price paid, varying from $25 to $300, but every set contains three inductance coils, or variometers, and two condensers, which must be adjusted so that the receiving set is in tune with the sending set, as described in detail by Mr. B. F. McNamee in the preceding article.

A vacuum tube is used to detect the high frequency electric vibrations sent out from the transmitting set and received on the aerial. This tube acts like a one-way valve or rectifier and feeds the current to the telephone receiver just as in the ordinary wire telephone. This will bring in the sound loud enough to be heard by a telephone head-set and by itself constitutes a cheap receiving outfit.

But in order to be heard by every one in the room it is better to get a telephone receiver equipped with a horn and add two more vacuum tubes and transformers which amplify or make the signals louder. Still louder results can be attained with the further addition of any one of several loud-speaking telephones.

Most of the battery sets come in a cabinet in which are mounted the inductance coils, condensers, vacuum tubes, transformers and battery connections. The front of the set contains various dials which control the tuning and the amount of current from the batteries. The use of these dials will be explained in future articles or may be learned from any radio man in half an hour.

Such a set also detects wireless telegraph messages which anyone with a knowledge of the Continental code can read. No license of any kind is necessary to operate it and the music and news are free for all.

No better investment can be made as a means for making a home more attractive to the entire family. Radio brings fathers and sons together on a common basis of mutual interest. The women can easily tune in during the afternoon and have a constant source of entertainment for their guests. Any phonograph selection will be played on request to the operator in charge of the sending station. No home is complete without radio.

Cutthroat Competition in General Public Business

A Samuel Jones Story—By Volney G. Mathison

IT all had its beginnin' one cold afternoon when I was sittin' in my shack enjoyin' the ruddy warmth of the big coal-heater close abeam as I looked out of my big bay window an' watched the gusty flurries of hard, dry snow that swirled among the opposite cliffs an' foretold the approach of Alaskan winter.

Sick an' tired of readin' magazines an' doin' nothin', I was chewin' the rag with K-O-X-N on the little half-inch spark-coil that I use for short-distance monkeying around.

"Say, I'm gonna tell you somethin', Hell-Fire," I says on my key to my hard-boiled colleague over at Pirate Cove; "I've been thinkin' it over, an' I've come to the conclusion that the company I'm workin' for ain't got no sense—"

"Tell me somethin' new, S. J.," breaks in Hell-Fire, on his similar spark-coil; "I found out when I built these two stations that neither one of these codfishin' outfits got any brains worth braggin' about.

"There you are on Unga Island an' here I am on Popoff Island, less'n twelve miles apart, an' each with a wireless station powerful enough to reach the three hundred an' some miles to N-P-Q an' N-P-R. There's sure no sense in these two big stations bein' here together. If these fishin' concerns wasn't so much like a coupl' a scrappin' tomcats, they'd 've agreed to both use this big set here at Pirate Cove, an' only have a little spark-coil outfit over there at Unga—"

"Or both use th' big set here at Unga an' put th' spark-coil rig over at your joint—this station was here first, anyway," I comes back.

"Q-R-T! Q-R-T! Q-R-T! K-O-X-N and K-V-I, Q-R-T!" squeals a loud, mushy 500 cycle quenched spark, which I recognizes as belongin' to an old salmon-steamer lyin' over at the Squaw Harbor fish-cannery, about five miles away: "Say, lissen, can't you darned ginks struggle through a single day without startin' that same confounded never-endin' argument—it's gettin' staler'n five-year-old codfish! I'm tryin' to copy a little press from N-P-R—Bk will you!"

"Hey, you stinkin' ol' fish-barge, whadda'ya mean bawlin' ME out like that—don't ya know who I am?" howls Hell-Fire from his side of the creek. "If ya want press, copy it on arc like I do—or go without! If ya ever open up on me again at five miles with that blasted old busted-steam-whistle spark 'a yours, I'll come over there to th' fish-morgue an' ram your stutterin' ether-wreckin' key down your throat—an' I hope you got what I said, because if you haven't I'll start up the diesel-engine on my big set an' throw enough kilowatts at you to knock your rusty ear-drums inside out! Hear me!"

A dead silence on the air follows this; so I figures the mutt on the fish-scow must'a heard.

"As I was sayin' a while ago, I think this codfish crowd is nuts," I resumes on the key as I look out of my window thoughtful-like at the heavy ocean swell boilin' among the rocks forty feet below: "Here they've got all kinds of good dough tied up in an engine an' generators an' a lott'a apparatus, as well as th' shack and an aerial over a hundred an' thirty feet high an' four-hundred long—an' what do they get out of it? About half-an-hour's run every day, sometimes less, handlin' th' company's private fish business an' a few stragglin' messages from th' insane an' moonshine-struck inhabitants of this here island. Outside of company business, during the last 10 days I ain't had but two messages—one goin' out from Soap Komedal's Pool Hall an' one comin' in fer Loo Hung's Hash House. Two messages in ten days! Think of it!"

The Great Northern Fisheries of San Francisco were in receipt of the following telegram:

"Send twelve audion bulbs; terrific explosion occurred last night. In addition, ship complete set of meters for power house, one armature, new left-side engine flywheel and sixty feet belting. Nosey Olsen hanging around when explosion occurred. Notify Swedish-American Life Insurance Co."

"Ya ain't got nothin' on me," responds Hell-Fire, sendin' sorrowful-like, "I ain't had a blamed thing go out fer three weeks, an' only one collect night-letter come in, which was fer th' Corned-Beef Kanaka, th' cook, an' he's broke—so I had to cancel it."

"Th' trouble with this station is that it's licensed wrong," I declares; "it's got a limited commercial license, which allows me to work on with N-P-R an' no other stations except N-P-Q, if N-P-R happens to be broke down. What I should have is a general public license to work with any an' all stations, ship or land. Besides, all th' Alaska wagons that go by, there's dozens an' dozens of shippin'-board steamers an' oil tankers makin' th' Great Circle from the States to the Orient; an' every night I sit an' listen to 'em gettin' th' brass-pounder's cramps from callin' the navy stations, with business to send. Th' gobs are too busy sendin' government deadheads an' makin' home-brew to bother with th' ships, an' if I had a P-G license I could gather up all that ship-business every night an' relay it to N-P-R on eighteen-hundred meters on my regular daily schedule.

"This station would get the six cents a word coast tariff; an' s'posin' I got only twenty-five messages a night averagin' about fifteen words, that'd be somethin' over twenty-five dollars' profit fer th' company—an' I'd have somethin' else to do besides sittin' around here burnin' up all th' coal in sight an' readin' 'Stormy Stories.'"

"Say, I'm sure glad you told me all that!" buzzes Hell-Fire, "I never thought of it before. I'm goin' to rush a letter out on that salmon-packer tonight to th' home-office explainin' th' whole lay-out to 'em an' tellin' 'em to get me a P-G license right away. I'm much obliged to ya fer th' idea."

"Much obliged, my eye!" I hammers back. "I was talkin' about MY station—not yours! We're only ten miles apart, an' that's too darned close to both be P-G stations. We'd be jammin' each other worse'n a coupl'a chatterin' old hens at a ladies' sewin' club—an', anyway, you've got plenty to do runnin' that jackass moonshine still 'a yours, without foolin' with ship's business!"

That night I gets my letter off to the home office.

What happened afterward I've got all nicely written down here in full detail, but th' ornery plug that calls himself th' author of this stuff says it's too profane to print; so here's where I go off watch an' leave him to finish it to suit himself.

(Notice to readers: After a lot of correspondence between myself and the Secretary of the Navy, I have obtained permission to publish the following messages from the files of N-P-R, the naval

radio station at Dutch Harbor that handles the outgoing and incoming business for K-V-I and K-O-X-N. Peace now prevails along the Alaskan peninsula, but fearing that the reading of this account of what happened up there last fall may stir up afresh the animosities of some of the hair-trigger citizens of Unga and Pirate Cove, the Secretary of the Navy has requested that no copies of the magazine in which these messages are printed shall be sent to the Shumagin Islands. Readers that fail to observe this request do so on their own responsibility.—V. G. M.)

Day Letter, San Francisco, Calif.
Radio, K-V-I, Unga, Alaska, via N-P-R:

Referring to your letter about radio station, we have obtained a general public license for K-V-I. Begin at once. Alaska Codfish Company.

Rush Telegram, San Francisco, Calif.
Radio, K-O-X-N, Pirate Cove, Alaska:

Great idea about ship business. We already got general public license for K-O-X-N. Grab everything in sight. Great Northern Fisheries.

Night Letter, Pirate Cove, Alaska.
Great Northern Fisheries, San Francisco:

Send best 600 meter regenerative receiver you can buy, also four-step amplifier. No business yet, but hear a ship coming from Japan and will probably get big string tomorrow night. Rush a good make hot-wire ammeter reading to seventy-five amperes. Radio K-O-X-N.

Day Letter, Unga, Alaska.
Alaskan Codfish Company, San Francisco:

Pirate Cove also got P-G license and jamming me with ten kilowatts every time I try to work anybody. Send one Hellkum Special Automatic Break-in-Key, forty gallons dynamo oil, six dozen spark plugs. No business yet, but will get a string tomorrow night. Rush ten thousand message blanks. Radio K-V-I.

Day Letter, Pirate Cove, Alaska.
Great Northern Fisheries, San Francisco:

Send by first boat an assistant operator. We must stand twenty-four hour watch to keep up with competitor at Unga. Getting only two hours sleep daily. Eleven Tr's last night, no paid business yet, but plenty soon coming. Ship two complete transformer secondaries, also new cylinderhead for diesel engine. Radio K-O-X-N.

Day Letter, Unga, Alaska.
Alaskan Codfish Company, San Francisco:

Enemy station hogged string last night from the ship I was waiting for last three days, but only Tr's, no paid stuff. Send another operator first possible boat; haven't slept since got P-G license. Ship twelve condenser sections, one gross of hundred ampere fuses, new hot-wire ammeter. Also engine crankshaft. Mail a copy of the United States Radio Laws and Regulations direct to the Pirate Cove outfit. Radio K-V-I.

Day Leter, San Francisco, Calif.
Radio, Unga, Alaska:

Can't get any operator; they have all been reading about Unga in some wireless magazine and absolutely refuse to ship. Do best you can and don't let Pirate Cove crowd get ahead of us under any circumstances. Alaskan Codfish Company.

Day Letter, San Francisco, Calif.
Radio, Pirate Cove, Alaska:

Offered three hundred dollars per month for operator, but all positively refused to ship; said have been reading about you somewhere and think you are crazy. We hired a crimp to shanghai an operator, put him aboard schooner "Beulah" sailing yesterday, but when he learned ship's destination, jumped overboard. Keep up your great work; don't let Unga outfit get away with anything, no matter what you have to do. We are depending upon you. Regards. Great Northern Fisheries.

Telegram, Unga, Alaska.
Alaskan Codfish Company, San Francisco:

Hurrah; made great scoop last night, established communication over distance of 1500 miles with R-N-R, Russian Bolshevik wireless station in Gulf of Anadyr, Siberia. He will give us 300 words of paid code correspondence every night for Russian government's American bureau at Washington, D. C. Ship ten sets of sixty ampere key contacts, also 15,000 gallons gasoline. Radio K-V-I.

Rush Telegram, Pirate Cove, Alaska.
Great Alaskan Fisheries, San Francisco:

Ship one hundred pounds dynamite. Radio K-O-X-N.

Day Letter, Unga, Alaska.
Alaskan Codfish Company, San Francisco:

Have good reason to believe that Pirate Cove lunatic is planning to blow up K-V-I. Tin-Pan Smith and the Head Cracker have been hired at ten dollars a day each to guard station and wireless masts. Getting 250 to 350 words of business from R-N-R regularly every night. No other traffic. If can buy reasonable, send a machine gun. Radio K-V-I.

Telegram, Pirate Cove, Alaska.
Great Northern Fisheries, San Francisco:

Better charter an oil tanker quick; have been compelled to tie up all fishing boats account fuel supply exhausted. Radio station has burnt up all crude oil, gasoline, distillate and coal oil on the island; now burning moonshine costing forty dollars a gallon. Rudolph Krugscaller, Supt.

Telegram, Unga, Alaska.
Alaskan Codfish Company, San Francisco:

Ship a machine gun at any price. Fishermen of both companies have taken up issue and are fighting daily out on fishing grounds. Enemy crowd's big schooner "Pirate King" attacked our dory fleet yesterday; sank four dories. Dago Mike, while under capsized boat, got fish hook in his nose and has gone crazy. Shotgun Sykes took command of our "Alasco Tiger" and went after enemy schooner, drove him on rocks in Man-Eater's Cove; now chasing crew all over the mountains on mainland. Ship 100 feet number 0000 copper wire for better ground connection; also twelve 300,000 volt aerial insulators. Radio K-V-I.

Day Letter, Pirate Cove, Alaska.
Great Northern Fisheries, San Francisco:

Terrific explosion occurred last night, caused by over-strength engine fuel. Send twelve audion bulbs, filaments of all but one broken by shock. In addition, ship complete set of meters for power-house panel-board, one main alternator armature, one exciting-generator armature, sixty feet belting, engine cooling water tank, new left-side engine flywheel, also enough lumber to close hole torn in side of power-house. Nosey Olsen was hanging around power-house at time explosion occurred. Notify Swedish-American Life Insurance Company. Radio K-O-X-N.

Another Day Letter, Pirate Cove, Alaska.
Great Northern Fisheries, San Francisco:

Forty-five Tr's, eight weather reports last night, one paid message eight words; our profit, forty-eight cents. Ship complete new receiving set, amplifiers, pair of phones, one gallon liniment for electrical burns and an aerial switch having at least twenty-four inches separation between switch jaws on sending and receiving sides. The Corned-Beef Kanaka was sniped by one of Unga outfit spying around here in a dory last night; recognized dory as Gumboot Hansen's, and we'll get him. Buy all 30-30 Winchester and 45 Colt ammunition in San Francisco. Radio K-O-X-N.

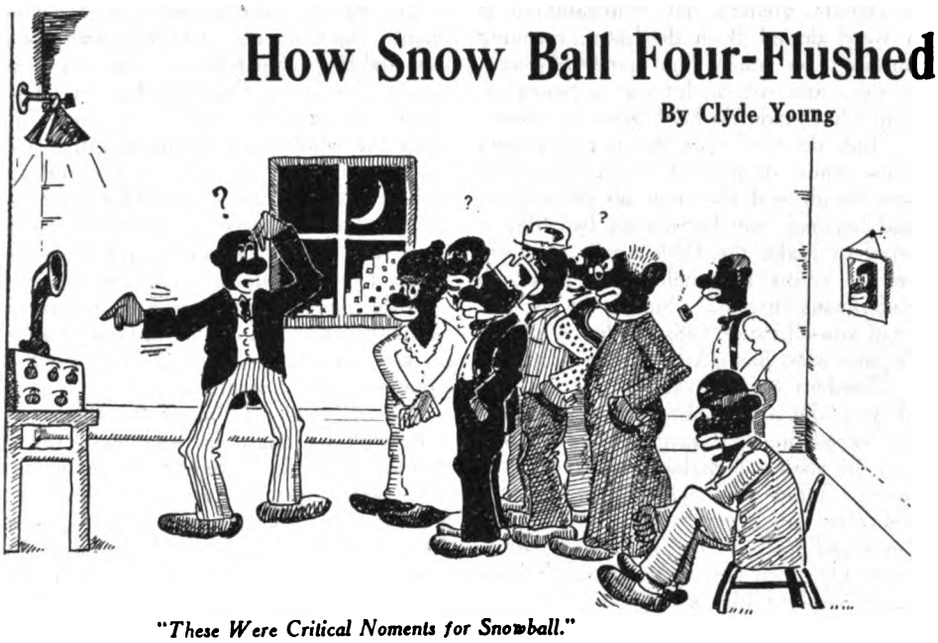
Day Letter, Unga, Alaska.
Alaskan Codfish Company, San Francisco:

All fishing has stopped. We are digging trenches around wireless station; expect attack from Pirate Cove outfit any minute. They put nitroglycerin in gasoline tank of Gumboot Hansen's dory last night; Gumboot and the boat went up in smoke this morning; tore fish wharf to pieces; haven't seen anything of Gumboot since, but dory rudder and piece of engine came down through roof of Soapy Komedal's Pool Hall this afternoon. Ship new pool table for Komedal, also four plain, standard-size tombstones. See if can buy second-hand cannon from army department. Radio K-V-I.

(Continued on Page 174)

How Snow Ball Four-Flushed and Lost

By Clyde Young



"These Were Critical Noments for Snowball."

J. HEATH

LAZARUS Jones Washington Smith arose early. Of course, this had nothing in common with the habits of Lazrus, his arising time as a rule being somewhat later—mostly somewhat. But he was in great spirits. That explains it. He reached for the telephone.

"Gahfield 'tre foah seben," he yawned.

"Hello. Am dat yo' all Winnie?"

"U-huh. Dat's me."

That voice. Oh, that voice. It made Laz's heart pound like a triphammer doing double duty. So soft and melodious. Synchronous note.

"Do you reelize who dis am?" he purred.

"U-huh."

"Could yo' pos'bly ascertain a date wid me on Fawty-fust Av'nu dis eb-nin'?"

"Ah dunno, Laz."

"Aw Win, don' yo' like me since dat Niggah Snowball been hangin' roun'?"

"Well, ah don' feel well, Laz. Ah been cryin'."

"Cryin'?"

"U-huh."

Laz thought fast. That is as fast as the limitations of his educational possessions would allow. Thoughts rushed through his brain with fearful rapidity. But all thoughts hinged on one point—Snowball—his hated rival. He must act. He already felt that something was amiss. That something his clouded vision told him was Snowball. In order to gain time he spoke again.

Winnie!"

"U-huh." That "u-huh" sounded like music to Laz. She heard a society lady use it.

"Wheah am dat lazy niggah, Snowball?"

"Lazy?"

"Zacly. Meaning' ebry-thing in the sense of de word."

"If yo' refuh to Mistah White, he am in Bummin'ham."

"Great horn toads an' 'lil apples. Where'd he get de price ob transportemtashun?"

"From me, Laz. Yo see ah been thinkin'. (Something quite out of the ordinary for her.) Ah been thinkin' I should do something foah de noble upheaval ob dis grate race of ouahs. Ahse gone into reasuch ob science. Ahse gonna pick music from de aiah. Ahse gonna talk through space."

Laz listened intently. He even concentrated, which, of course, was something extraordinary for him. But when a man's in love with a girl like Winnie Jazzbo, he is very apt to do most anything surprising. Turning over her conversation in his mind as she progressed, he came to the conclusion the heat must be having its effect.

"Yoah am gonna talk thru space, Winnie?"

"U-huh."

"Yessuh, jes' say, Hello heah and yo' all heah me here. Fac' is, Laz, we give one big demonstrashun an' wiahluss ball heah at mah house Sat'd'y ev'nin' to which yo' all am cahjulie invahted."

"Miss Winnie ain' you feelin' well?" (Laz had drawn conclusions.) "Does yo' mean t' tell me yoh all can speak foh miles an' miles 'out no wiahs. 'Out no fone like dis one whot I now dissipate?"

"Ah sho' do."

"Well, ahse 'cept dat invahtation. Ise be on han'."

ENTER one, namely, James Snowball White, expositer extraordinary, lately of the White-Jazzbo laboratories, who has entered into terminology and practical research as aforementioned. He was in the outskirts of Birmingham with five hundred dollars of Miss Jazzbo's currency lookin for antenna's and other information. One would wonder why he did not deal directly with persons handling radio apparatus. Snowball had other intention, however, and was casting his optics in various directions, with his head lifted upward to the housetops. His eyes lighted as he espied a beautiful antenna. His instinct told him there must be a good outfit on the lee end of such a display of aerial alaberacy. Snowball had long since come to the conclusion he was not going to spend five hundred dollars on radio. True, he loved Winnie, but five hundred dollars was five hundred dollars. He must get the receiving set, of course. Get it he would. Snowball long since was noted for obstinacy.

Walking up to the front door of the residence which supported the object of his search he was confronted by an obstacle—a bull dog. But Snowball was speedy and before his Ingersol had moved a hair he had cleared the fence.

A lady came to his rescue, as she was drawn to the front of the house by the angry growls of the canine and the soothing words of Snowball in trying to calm the brute. (From the outside of the fence.)

"Lady, dat sho' am a fine dawg. But jes' now he am wrong. I am heah representing a learned community ob us folks wot wish to purchase some radio equiptmunt. Yoh hab' de same on dese heah premises and I thot maybe yoh' all could informashun me regawdin' de pos'ble purchase ob de outfit. May I talk to de man wot operates dat fine antennum?"

"Why, yes; come right in."

"Yes, mam; but ef it's all de same to yoh, lady, would you mine lettin' me see dat nice dawgie on de safe end ob a chain?"

After the dog had been disposed of Snowball was taken to the wireless house and introduced to the owner. A young man of high standing—5BM.

SNOWBALL was in great spirits. The time for the big demonstration and ball had arrived. It was Saturday evening. In the race to win the most coveted hand of Winnie Jazzbo, Snowball had the inside track with a thirty second start on the gun. Lazrus was so far behind he could never overtake him. As a matter of fact, Snowball figured Lazrus was balking at the post and would scratch (meaning out of the race). As Snowball expressed it, "Oh, boy; de prettiest dame in de wurld, wid a bankroll dat spells luxury. My point am seben an' my dice am loaded. May she neber know de truth."

The guests had all assembled and were

more or less nervous. The instruments were set up in one corner, decorated with black chiffon. Snowball wore white gloves and took on, more than the ordinary ham, the aspects of an undertaker.

Parson Ejilah Goosewing had promised to make the introductory address. He arose slowly, the difficulty being that lumbago had at one time made a vicious attack upon him. He adjusted his glasses, coughed, stroked his breast and made a quick gesture as of a man that had not yet learned to swim trying to keep his head above water.

"Ladies and gennelmen," began the minister. "Likewise, brederen and sistern. Permit me to exhibit de excrutiatin' pleasuh ob offerering foh you-al's sureme delectation and joy, uh ebenin' wid dat mos' renowndest scientis' ob the modern age ob the black race—dat is to say, ob de cullud or Affikin race.

"Dis gennulmun what I am a-introducin' is the greatest expositoh what ever expose. In fac', he am of such a renowned and exceedin' ebangelical expositionahy ability day he am been awahded de title ob 'expositoh extraordinary.' Dat means, brederen and sistern, dat he can and does and will expose such a expositionest exposition day you all won't be able to achieve no mental grasp on more'n half of it. Dis heah thing what he gwine expose am de wiahless tellefoam.

"Now, lookahere, bredern and sistern, if you'all am acquainted wid day wonderful and goashamighty grand book, de 'Fore Horse is the Eucalyptus,' den you all knows what is meant by dese terms. Foah, in the Eucalyptus, which am the in-between portions of the Bible, it am writ day in days to come, which now, already, is came, common men and women shall talk here and hear there. An' dat, brederen and sistern, am what is gwine happen right here dis evenin'."

"Us is here, and over dere is somebuddy. And dat somebuddy am gwine talk an' we am gwine hear and de prophesyin' in the big book am gwine be made full of fullfilment like a raisin is wid kick.

"Dis heah expositor what am gwine expose de hidden treasuhs of the natchul, materiul and spirichul worlds, am gwine tie us, you and me which am here in dis room, right up close wid somewhere else. We don't know where at is we goin' listen from, but we is gwine listen away fum heah. And, fuddermore and in addishun hereto, dey ain' goin' be no wires in between. An' dat, brederen and sistern, is de real completion an fulfillment ob de prophesy. De good book say, 'Dem who is heah shall be heard fum hereafter," heahafter bein' a Greek word fum de ancient Sands-kē-rit, meanin' today, which comes fum somewhere else.

"An' lissen, bredern and sistern, heah come the miraclest paht ob dis heah miracle. Hit was a broder ob ouah own race, one ob de Senagambians—I stops to explain, bredern, dat 'Senegambian' is a word deried from de Latin, meaning hit ain't no sin if he gambles'—well, bredern and sistern, hit was a Senegambian what made dis heah great discovery.

"Foh de first' time de way has been made plain; de man ob science has done join hands wid the man ob de church, and between and betwux de two, dey is goin' to make the Bible come true wid copper wiahs and hellfire in fohm ob electricious currents, which is not de kine what you-all makes into bootleg wine, but de kine what has a kick jus' de same.

"Bredern an' sistern, look on de face ob your delivereh! Look at him! Don't be feared, he ain't gwine bite—but, oh, boy, he suah can make yaoh mouf come open! When you nigguhs gets done lissenin' to him bring the far fum de distance and make de near sit down approximatiously, right nex' doah, you all's faces goin' be long like a fishpole and youh eyes gwine stick out like de seven legs ob de mystical jellyfish—yes, I know. I done been dere.

"An' in clunclusion, bredern and sistern, lissen and take heed. In dese heah days dey is too much a-happenin' for a nigguh not to be treadin' de right path. You'all better get right down on youah knees right here—"

At this Snowball reminded the minister hoarsely that introductions was introductions, but "dey ain' nobody come heah foh to heah you-all sermonize, Brudder Goosewing," and the eminent colored divine changed the trend of his appeal to: "Get right down on your knees right heah and greet the man what gwine delivuh de cullud race from his heah state ob intellectual subjection and lead dem one an' all into de promised land ob free gin an fried chicken."

AS Snowball arose, the congregation responded with ethereal, oscillatory applause. A thunderous ovation ensued. Snowball stepped forward, bowing rapturously and at the same time depicting various degrees of the latest African jazz steps.

Lazrus sat in one corner in the utmost entanglements of despair. His chin had dropped considerable while his eyes were like those of a "dope" fiend who had'nt had a "shot" in the arm for days. He was looking for an opening to break this strangle hold that Snowball had fastened so securely upon his accomplishments. He wanted to get away and think. Of course, the vastness of the thing had fastened its fangs deep in the respect of Lazrus, but this was nothing. He could spend a night with a ghost with his thoughts centered on the winning of Winnie. While in these thoughts Snowball was talking:

"People, I will now do all—and more. If yo' will jes' precipitate you' undivided attention and ascertain a mos' conspicuous silence I will now pufohm."

He reached over to switch on the filament. No filament. A frown came upon his highly polished brow. No one was quicker to notice this than Lazrus. Oh, if something only could go wrong! If only the whole scheme would fail! He dare not think of it. But what a tremendous stroke of luck it would be for him.

Snowball was now working frantically over the set. Sweat was oozing from his pores like the Mississippi in flood stage. A little river was running down the table which he was leaning over in his endeavor to get a filament. He had forgotten the combination or something.

He well realized that if the thing did not work he might as well leave town. These were critical moments for Snowball. The most essential phase of the entire situation was the affection of Winnie and her personal regard for his knowledge. To fall down on a mere thing as of a hook-up to battery would be disastrous. He must stall.

"Folks dis wiahluss study ob high frequency am elaborate. De fundahmentahl princahplus are known only to a selected few. Myself bein' one ob dem few. De fust fundahmental am to secuah occilayshums. Dem occulayshums when obtained cause a constant flow of—or—of—Oh, yes, of lava to de condenser wich explodes wid combustshums ob various enfectants to a degree ob dangerous encirclings ob de ground exema."

Here he paused to observe the effect upon his audience. The audience was awestruck with such a flow of vocabulary and trying hard to follow him. Snowball had scored a three-base hit. Still the set was dead.

Winnie Jazzbo was beginning to smell a rat. She wondered if Snowball had thrown away her five hundred dollars with which she had entrusted him for such a good purpose. Had he bought a pile of junk?

Snowball jammed in a plug and, behold—she oscillated. He began slowly and with reverent precision to turn the knobs. The audience gasped and breathed hard as they drew closer, leaning forward with eyes aglow in expectancy. Slowly a voice was being tuned in.

"Hello, 5CR; hello, 5CR; this is 5BM calling at 5YI. Yes, my set was stolen. A colored person came to visit me yesterday and I had to leave the shack on an errand. When I returned he was gone and so was my set—"

Snowball waited for no more. He whirled and tried to stammer something. But Winnie was on him with a wicked looking razor. Lazrus—Lazrus, who had almost given up hope—came to life with a snap and rushed at Snowball with a whoop that could be heard for miles. Pandemonium reigned.

Snowball took the nearest window. He landed safely and went—in no special direction—but he just went.

The Continuous Wave Club of California

Conducted by Lawrence Mott, Associate Editor

EXCELLENT RESULTS FROM 6ALE

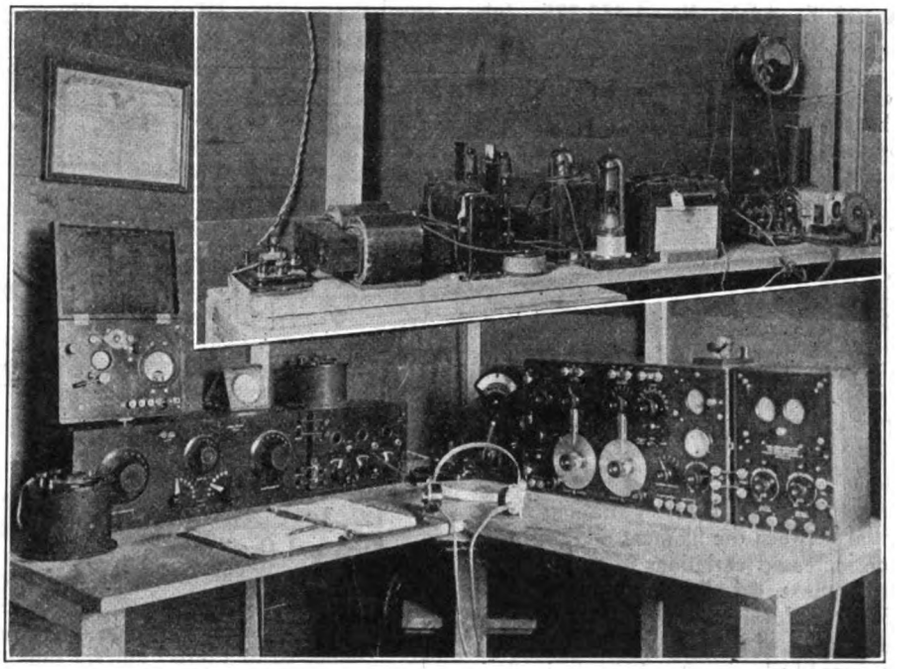
No better argument is needed for widespread adoption of CW than the excellent results obtained by 6ALE at Reedley, Calif. He is advised by 7ZT, ex 7DA, at Portland, Ore., and by 7ZM at Moscow, Idaho, that his signals are the loudest from the Sixth district and by 7ZJ that he is exceeded only by 6ZX. Furthermore, he is being copied consistently by 9AHC, Ellendale, North Dakota, who also says that he is hearing 2FP in New York.

This sending set, which is shown in the upper part of the picture, is owned and operated by W. W. Lindsay, Jr., P. O. Box 643, Reedley, Calif. He will be glad to hear from others as regards his audibility and modulation.

For transmitting, two 50 watt Radiotrons are used with 1500 volts 60 cycle a. c. on the plates. The well-known self-rectification circuit is employed. Filaments are also run on a. c. Voltage is maintained at the correct value by a series resistance in the primary of the step down transformer. The radiation varies with the line voltage from 2½ to 3 amps.

An examination of the picture will give a good idea of the apparatus employed. From left to right appears the relay in primary of power circuit, high voltage plate transformer, filament heating transformer with by-passing condensers of .0024 cap. across the windings; radio frequency chokes are just below this. Next are the plate condensers of .0017 cap. with the two 50 watt tubes on either side, the grid condenser of similar cap. with its leak of 2000 ohms, and behind this the antennae inductance, which has a total number of turns of No. 16 D.C.C. copper wire, amounting to 39, 12 in the grid circuit and 27 in the plate side, with the filament from the center. Inside of this the antennae coil proper slides, in order to vary the coupling. This consists of 6 turns of No. 6 copper wire, which is self-supporting. At the right is the magnetic relay change-over antennae switch, and a tone wheel with its controlling resistance above it. The tone wheel has been tried with A.C. on the plates, and a very good tone has been obtained, although the signals are not as loud as the straight a. c. C. W. Above the wheel may be seen the antennae ammeter with lead running to the entrance bushing. Keys on the operating table control the relays and switches.

For receiving, a Grebe CR3 is used for all amateur work on 200 meters, while the Wireless Specialty Co.'s IP501 is used for all waves above 300, as the Grebe set does not work very well above this wave.



Radio 6ALE, Upper View Showing Transmitting and lower View Sending Equipment.

Radiotrons and Cunninghams are used for detection, while the amplifiers use Western Electric type of tube. The Magnavox (not in picture) is used where extra loud signals are wanted, especially for music. Music from San Francisco (6XAC) has been reported as being heard one-half mile from the set. A third step of power amplification is used to obtain these results. It consists of a U.V. 712 transformer connected in the usual manner with a 5 watt transmitting tube, with 200 volts on the plate.

The wave meter above the receiver is used to keep a check on the transmitting wave and also for measurements of antennae constants. The antenna consists of two 4-wire cages on 2 ft. crosses, spaced 60 ft. high and 50 ft. long. It has a natural period of above 180 meters and a capacity of .00054 mfds. It requires an inductance of 8½ micro-henries to raise the wave to 210 meters, or only 6 turns of No. 6 copper, about 3¼-in. diameter.

The ground is a buried counterpoise, consisting of 6 wires lengthwise, 80 ft. long, and 3 wires crosswise, 50 ft. wide, with the station in the center. Grounding switches, etc., are provided.

6ALE was formerly 2ARD in New York City, where he did considerable QSS testing. He is planning to put in two 250 watt tubes and is raising his poles to 80 ft. He is figuring on trying out a d. c. generator with tone wheel modulation so as to compare with his present a. c. plate supply.

Mr. Lindsay has measured the actual power in-put of his set with a standard Weston portable direct reading wattmeter, finding that both 50 watt tubes running with 10 volts on the filament draw 200 watts on the primary side of the filament transformer, while the plates under the same conditions take 350 watts, or a total of 550. But as tube sets are usually rated the plate wattage is the only one to consider. For instance, in a spark set the current necessary to run the rotary gap is hardly added to the transformer input. This would tend to show the superior over-all efficiency of the tube set as compared to spark.

His co-worker, Mr. C. H. Weatherill, with a set of similar type with 5 watt tubes succeeded in raising 7ZT, 7OZ, 6AGF, and many other local stations, the power input being 50 watts.

Condensers are of .0017 mfds.

Inductance, 3½ in. diam., 12 turns on grid, 27 on plate.

Antennae inductance, 6 turns of No. 6 inside of other coil. Slide for coupling variation.

Condensers across filament windings are of .0024 mfds. and are essential.

Dubilier protective device is used.

Milliameter is 0-500.

Radiation meter, 0-5.

Radio frequency chokes, No. 250 honey-comb coils.

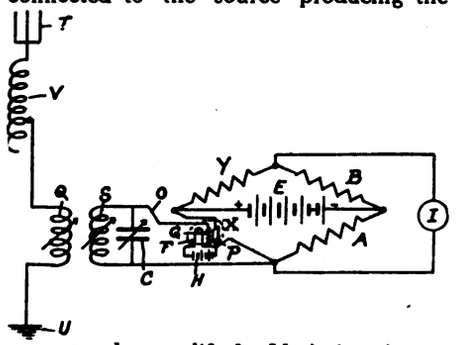
(Continued on Page 170)

Digest of Recent Radio Patents

Prepared by White, Prost & Evans, Patent Attorneys, San Francisco, who have been particularly active in the radio field for many years, and from whom may be obtained further information regarding any of the patents listed below.

Samuel E. Adair, No. 1,383,275, July 5, 1921—Amplifier.

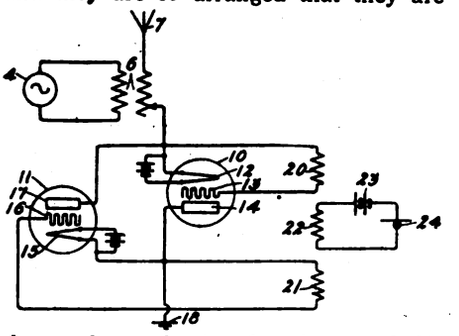
The plate circuit of a tri-electrode device is connected into one arm of a Wheatstone bridge. The grid circuit is connected to the source producing the



current to be amplified. Variations in potential between the filament and grid produce increased variations in the potential across the usual diagonal points of the bridge. "Howling" is eliminated, due to the absence of inductance or capacity in the amplified circuit. "Paralyzing" is eliminated, since there is no grid condenser. The character of the current to be amplified is not limited to oscillatory or pulsatory.

Raymond A. Heising, No. 1,383,807, July 5, 1921—Power Modulation for Radio Transmission.

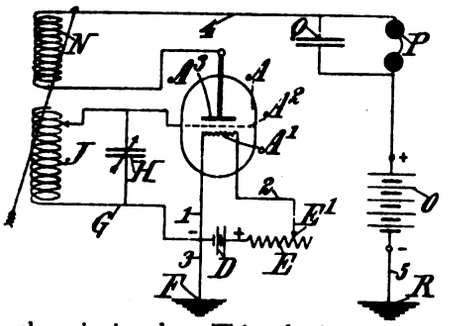
A pair of thermionic vacuum devices are located directly in the antenna circuit, and they are so arranged that they are



alternately conducting for alternate half-waves of the transmission current. Modulation is secured by simultaneously varying the effective resistances of the devices, as by a telephone transmitter inductively coupled to the grid circuits of both devices.

Athelstan A. Hall, No. 1,384,523, July 12, 1921—Wireless Signaling Apparatus.

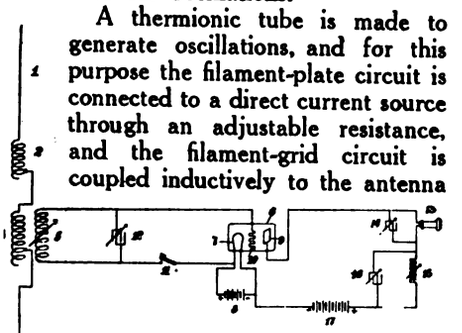
This is a receiving or transmitting system without an aerial. Two earth connections are used, the portions of the earth situated between the two earth connections constituting the radiation element of the system. For receiving, a telephone receiver (P) or the like may be placed directly in this earth circuit and also in the filament-plate circuit of



a thermionic tube. This tube is made between the two circuits of the tube.

Roy A. Weagant, No. 1,384,108, July 12, 1921—Means for Generating Electrical Oscillations.

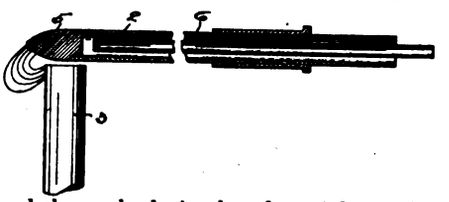
A thermionic tube is made to generate oscillations, and for this purpose the filament-plate circuit is connected to a direct current source through an adjustable resistance, and the filament-grid circuit is coupled inductively to the antenna



circuit. Transmission of signals may be by a key in the filament-grid circuit. The main feature is the inclusion of the adjustable resistance 15 in the filament-plate energizing circuit, by means of which the best effect for the generation of the oscillations may be produced.

Harold F. Elliott, No. 1,385,121, July 19, 1921—Arc Radio Oscillation Generator.

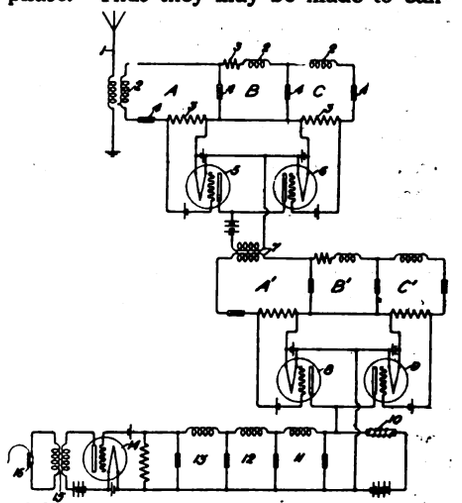
This invention relates to a Poulsen arc generator. The arc is made to follow a desired path by properly shaping the tip of the anode, so that it is bullet-shaped,



and the cathode is placed at right angles to the anode, slightly behind the tip. The arc sheet is thus made narrow and the tendency for the arc to jump to the pole tips is eliminated.

John Mills, No. 1,385,090, July 19, 1921—Radio Receiving System.

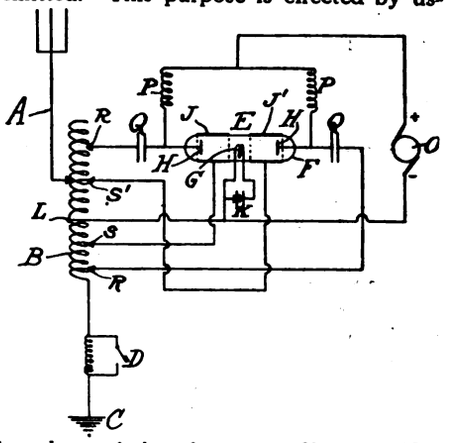
This system is for neutralizing the effect of impulsive disturbances, such as static, in a receiving circuit. The principle of operation is based upon the fact that impulsive excitation of a closed system, such as A, B, and C, result in free oscillations in each of these closed circuits which are practically undamped, and the oscillations in A and C are of the same magnitude and reversed in phase. Thus they may be made to can-



cel by opposing the oscillations of tubes I and 6. The useful signal is, however, not substantially diminished and is transmitted into the transformer 7. Another portion of the disturbances may be neutralized by the use of circuits A, B, C and so on.

Clair L. Farrand, No. 1,385,818, July 26, 1921—Radio Transmitter.

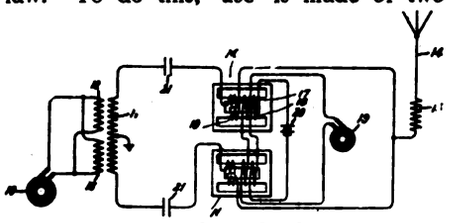
This system aims to use the filament emission in an oscillating tube more efficiently so that the useful value approaches more nearly the value actually emitted. This purpose is effected by us-



ing the emission from one filament (G) to influence a plurality of cold plates (H), so connected to the transmitting circuit that while one of the plates (H) uses the maximum value of current, the other uses the minimum.

Ernest F. W. Alexander, No. 1,386,830, August 9, 1921—Method of and Apparatus for Producing and Distributing Electric Current Waves of Radio Frequency.

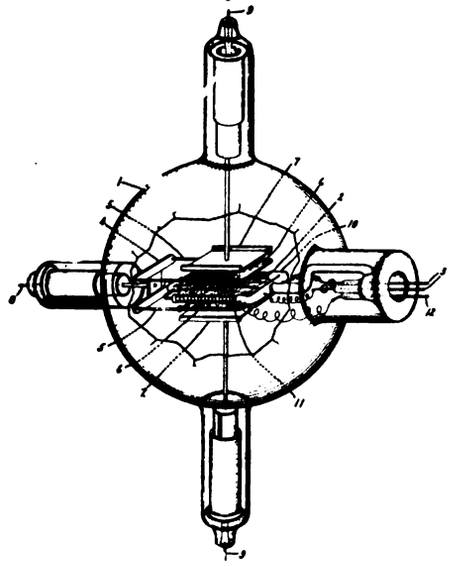
A scheme is described for sending a wave of varying amplitude; more particularly for causing the amplitudes of a radio frequency current to follow a sine law. To do this, use is made of two



parallel paths for the radio frequency current, one including the magnetic controller M and the other the controller N. These are so excited magnetically by the battery 20 and generator 19 that the impedances in the paths M and N vary periodically between zero and a maximum, the arrangement being such that when impedance of path M is a maximum, that of N is a minimum. This periodic variation is at the same frequency as that of the fundamental.

Albert W. Hull, No. 1,385,873, July 26, 1921—Electron Discharge Device.

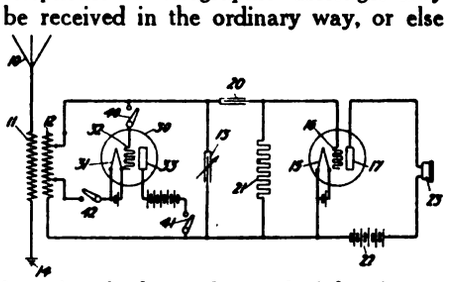
This patent describes a thermionic vacuum tube so constructed that it has a negative resistance characteristic, which can be varied by a discharge controlling member, 11. If the potential difference between the heated cathode (2) and the plate (7) is made great enough, the emission of secondary electrons from this



plate, due to bombardment of the primary electrons, increases faster than the primary emission as the potential difference is increased. This reduces the current flow between the anode (4) and electrode (7) as the potential difference is increased. By varying the potential of the controlling member (11), the relative current values are varied. A device of this sort is much more sensitive than the ordinary tube for the reception or transmission of signals.

Ralph V. L. Hartley, No. 1,387,262, August 9, 1921—Receiving Apparatus for Wave Signaling.

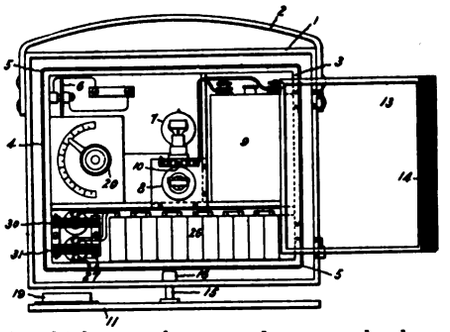
A system is described so arranged that telephonic or telegraphic messages may be received in the ordinary way, or else



by using the heterodyne principle. An ordinary thermionic detector, 15-16-17, in connection with the receiver 23 recognizes signals received by the tuned circuit 12-13. When switches 40, 41 and 42 are closed, the tube 30 is rendered active to generate oscillations of slightly different frequency so as to give beats recognizable by receiver 23.

Reginald C. Clinker, No. 1,386,840, August 9, 1921 — Radiosignaling System.

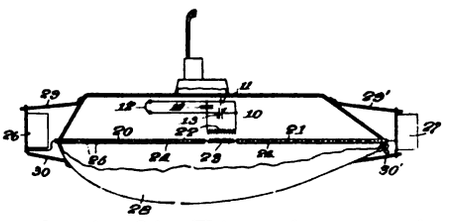
A compact portable receiving set, which does not use an elevated conductor, but instead a coil 3, mounted on the frame



4, which may be turned to get the best effect on pivot 15. In the frame 4 is mounted the tuning condenser and detector. The coil 14 is adjustable for variable coupling with coil 3, and is included in the plate circuit of the detector.

James H. Rogers, No. 1,387,736, August 16, 1921—Radiosignaling System.

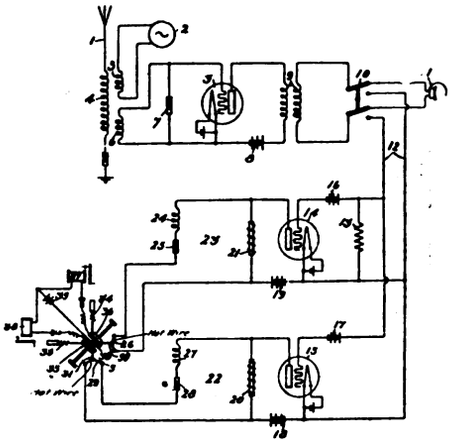
Instead of the usual elevated conductor for the antenna, a horizontal conductor is used, enclosed in a metallic sheathe such



as the pipe 24. This conductor may be used on vessels, such as submarines, both for receiving or transmitting. The antenna coupling is effected by transformer 22-23.

Albert W. Hull, No. 1,387,984, August 16, 1921—Negative Resistance.

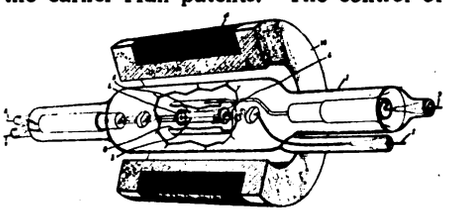
A thermionic device is described, in which the emission of electrons is made so great that the plate or third electrode receiving these electrons emits secondary electrons, which reduces the current flow.



The device thus acts as a negative resistance. Its use to amplify small variations of potential, which is applied between the cathode and the plate, is described.

Albert W. Hull, No. 1,387,985, August 16, 1921—Electron Discharge Device.

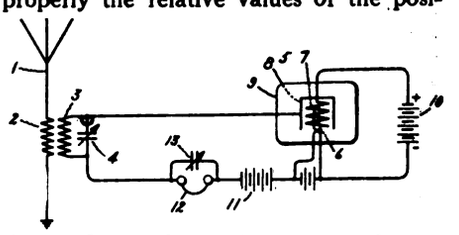
A negative resistance tube is described, having similar characteristics to those in the earlier Hull patents. The control of



the reception of electrons by the plate or third electrode is in this instance effected by the production of a magnetic field coaxial with the tube, which field may be produced by the current to be amplified.

Albert W. Hull, No. 1,387,986, August 16, 1921—Wireless Receiving System.

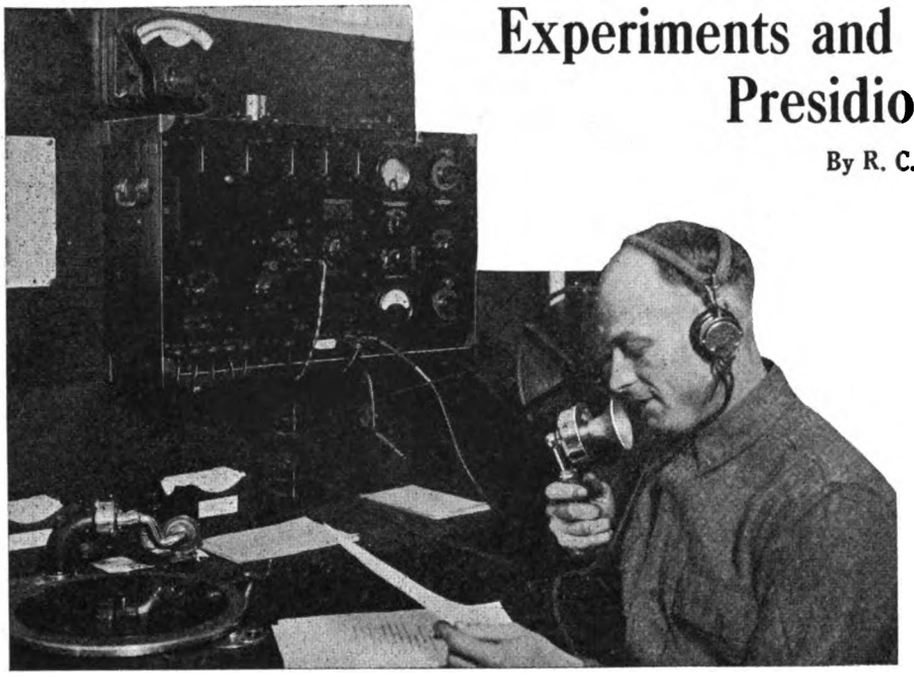
A thermionic tube having negative resistance characteristics constructed as described in the previous Hull patents, is used to reduce the damping (due to the resistance) in a receiving circuit to practically zero. This is effected by choosing properly the relative values of the posi-



tive and negative resistances in the receiver circuit. For receiving continuous wave signals, the negative resistance device can be adjusted so as to produce a slightly different frequency from that which is to be detected, so that the beats may become audible.

Experiments and Equipment at the Presidio Station

By R. C. Tavers



"Hello! 6XW calling"—Sergeant R. C. Tavers, the man with the million dollar voice."

The experimental work of the Signal Corps School, Presidio of San Francisco, Cal., was commenced about August 1, 1920, with the idea in view of determining the maximum efficiency of some of the signal corps equipment, especially so of the type 67-A telephone transmitter. To this end a considerable amount of work was done in selecting an antenna system, nearly every known type of antenna being tried with varying results. It was finally determined that the principal factor for the proper antenna was the ohmic resistance; the type of antenna having very little to do with the overall efficiency.

The first antenna was of the "V" type, 30 feet off the ground, and two-wire counterpoise, laying directly on the ground. This antenna had a resistance of about 40 ohms, and with it we were able to cover from 10 to 20 miles. This antenna was improved until it developed into a flat-top fan of 4 wires 65 feet high and 12 counterpoise wires raised about 3 feet off the ground. The resistance of this antenna was about 15 ohms, and under exceptional conditions we were able to carry about 900 miles. The present antenna is the "T" type, 4 wires 80 feet high with 16 counterpoise wires elevated 3 feet and the resistance is 10.2 ohms. The "T" type 10.2 ohm antenna carried as far and as well during the poor transmitting season as the 15-ohm fan antenna did during the better transmitting season.

During all these tests the same set and power was used, but the radiation varied slightly, naturally, with the increase and decrease of antenna resistance. With the old "V" type antenna we radiated about .4 ampere, while with the present one our radiation is about .8 normal. One of the principal factors noticeable in the present installation is the enormous variation of antenna current with modulation of the voice. On a normal radiation of .8 ampere we are now varying the antenna current .2 ampere upward, or to 1 ampere. This would indicate that an excellent percentage of modulation was being obtained. This condition does not ordinarily prevail in the case of a high resistance antenna, say in the neighborhood of 25 ohms. The mere fact that high radiation is being obtained is not conclusive proof that the set will work a great distance when voice modulation is used. During our experiments we have had this fact brought home to us several times very vividly. In one instance we were radiating 2.5 amperes into the antenna with a new arrangement, and with the old set we were obtaining .6 ampere. The .6 ampere radiation was much louder than at 2.5 and both were very clear and distinct. This would indicate that while we were supplying an excellent carrier wave of 2.5 amperes, by our modulation arrangement we were only able to vary or modulate a very small percentage of this with the consequence of a weak voice signal.

As before stated, one of the reasons for opening up this experimental station was to experiment on signal corps apparatus. Another reason was to afford a means of educating the new amateurs just coming into the game and at the same time advocate the C.W. transmission for the amateur with a view of lessening interference. Considerable has been accomplished up to the present in both undertakings. In a recent test made by the school it was shown that there are 320 that are actually interested in the educational matter and concerts transmitted by this station. And from this same test report it was shown that an audience of about 5000 people listen to the radiophone concerts. This is very encouraging in that about 60 per cent of these people know very little about radio except how to tune their set, but are very much interested and are glad of an opportunity to learn while enjoying music or other fun. To fill this want and to help in their learning we have established a department at the school for the amateur to answer their questions and help them in their problems both by mail and over the air during our regular concerts. All that we require is that in case they desire an answer by mail that an addressed and stamped envelope be enclosed with their questions.

With regard to C.W. transmission for the amateur, this method of radio communication is bound to supersede the old spark method, if for no other reason than the fact that the number of transmitting stations are increasing all out of proportion to the number that can satisfactorily transmit on a given range of wave lengths and about all we hear each evening is "break" and QRM. The average spark set is interfering from 50 to 150 and sometimes 300 meters. That is to say, while he is tuned to 200 meters, he can be heard very loudly from 25 to 100 meters each side of his tuned point. This is not so with C.W. It will be found to be exceptionally sharp, tuning within five meters and sometimes less, of the hump, thereby increasing the number of stations that can satisfactorily transmit on the same approximate wave length. There are a number of other arguments for C.W., but this one in itself would be sufficient reason for its adoption. In our operation we expect to acquaint the amateur with C.W. characteristics, give him the practice of tuning it, show him that it will work, that it is not so complicated as they would have us believe, and in general to encourage the new amateur to consider C.W. for his transmitting installation. To this end we have been rewarded with the results of about 25 C.W. stations who are now operating within a radius of 50 miles around San Francisco. By no means do we take the credit for these achievements. We are only one little cog in a gigantic wheel that has been grinding for C.W. for the past year and a half, and many truly wonderful circuits and material have been placed within easy access of the amateur to smooth out the humps of his C.W. problems, and the men who are re-

(Continued on Page 160)

6ZAF Furnishes Astronomical Time by Radio

For the first time radio has successfully furnished the official time for an important astronomical expendition. But in the words of Director W. W. Campbell of the Lick Observatory and head of the party that went into the desert wilds of Lower California to select observing stations for the eclipse of the sun, September 10, 1923, "it will not be the last time." An interesting story is involved in the part played by radio in this expedition and by 6ZAF, who in public life is A. H. Babcock, electrical engineer for the Southern Pacific Railroad and an enthusiastic radio fan.

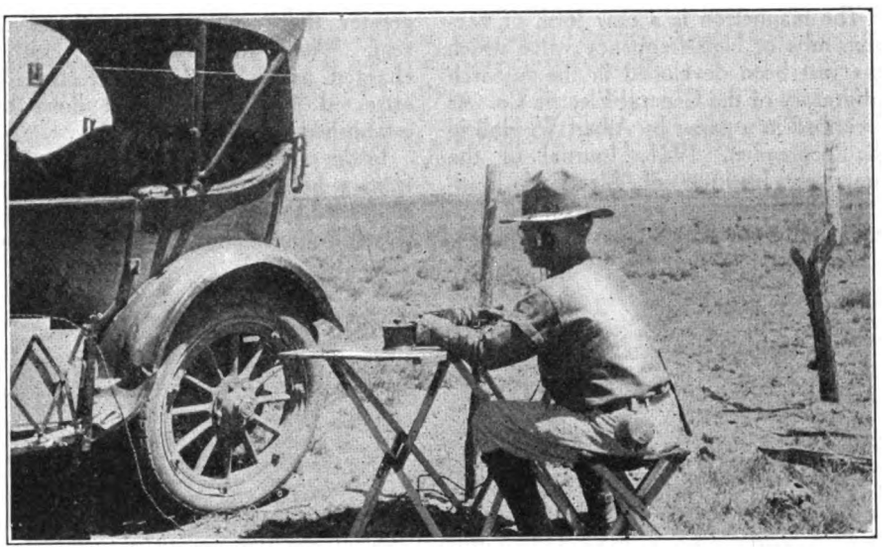
Late in the morning of the day on which this scientific expedition was to leave San Francisco, Director Campbell telephoned to Mr. Babcock that the chronometer on which they were to depend in making their observations of latitude and longitude had been broken and could not be replaced at the last minute. Whereupon 6ZAF said that if he could get together a receiving set and one of those devices that have made the dollar famous no chronometer would be needed. The time signals from San Diego would be more accurate than any single chronometer and could easily be picked up 200 miles away.

Director Campbell was sceptical, but carried away by the boldness of the plan and the necessities of the occasion, doubtfully consented to try the experiment. Through the courtesy of the Colin B. Kennedy Co. and Leo J. Meyberg, Mr. Babcock was able to assemble a simple, portable set.

So the first week in September saw this set as an important element of the equipment loaded into the automobile that carried the party from San Diego into the desolation of the desert hills and canyons to the south of the boundary between California and Mexico. The path of the eclipse will cross this inaccessible region whose clear atmosphere and lack of moisture is the astronomer's delight. The set was the joke of the party during the trip.

But, arriving at the scene of action, Mr. Babcock quickly strung 150 feet of aerial from a tree to a fence post, made a counterpoise, hooked up to the automobile battery, and at noon on the seventh of September, picked up the time signals and established their position.

Director Campbell vows that never again will he be without a radio set and any day we expect to hear that Lick Observatory is so equipped. At such time we hope to publish an illustrated description of the station and two years from now to chronicle the part played in the observation of the eclipse when Einstein's theory will again be tested.



6ZAF Picking Up Radio Time Signals in Lower California.

SCOTTI GRAND OPERA BY RADIO

Giving pleasure to an audience of over 5000 people in seven states was the unique experience of five brilliant stars of the Scotti Grand Opera Company on September 29 at San Francisco. As most of our Western readers enjoyed this opportunity to listen in on this great concert treat broadcasted by the Leo J. Meyberg Company from the Fairmont Hotel, they will be interested in knowing some of the details of transmission and reception.

—Photo J. M. Eaton, The Bulletin. . . . .

Queena Mario, Joseph Hislop, Myrtle Schaaf and Mario Laurenti, Singing the Quartette from "Rigoletto."

The entertainment was made possible through the co-operation of the San Francisco Bulletin and Earl C. Ennis of the editorial staff, with Sheldon N. Petersen, manager of the Meyberg Company, who carried out the experiments necessary to overcome distortion and bring in the musical accompaniment so as to blend with the voices of the singers. The soloists sang directly into the phone and the quartet directed their voices upward into a horn suspended over their heads.

Mario Laurenti sang the "Toreador's Song" from "Carmen," while the quartet from "Rigoletto" was sung by Queena Mario, Myrtle Schaaf, Joseph Hislop and Greek Evans.

The largest single audience reported was at Santa Rosa, Calif., where 700 persons listened to the music as given by the Press-Democrat's receiving set, in charge of Armand Saare, using a three-step amplifier and Magnavox. Sebastian Ruth of Olympia, Wash., reported good reception for an appreciative audience, as did also the base hospital at Palo Alto, when 30 patients listened in and likewise the State hospital at Agnews. Among hundreds of letters received were those from 7XD, Bozeman, Montana, 7XD, Billings, Mont., 7QL, Ranier, Ore., H. Romander, Smith River, 7TH, Walla Walla, Wash., and 6ARE, Auburn, Calif.

S. F. RADIO CLUB ELECTS NEW OFFICERS

Newly elected officers of the San Francisco Radio Club, Inc., include the following: President, H. W. Dickow; vice-president, C. Thompson; secretary, S. Fass; treasurer, C. Shomaker; Sergeant-at-arms, R. Burgess; Chief operator, C. Lane. The new officers were installed on Oct. 13 by Arthur H. Halloran, editor of "RADIO." The affair was one that no member of the club will ever forget. A stag party, radio raffle, refreshments, special radio telephone concert from the Fairmont Hotel station, lectures by Major J. F. Dillon, U. S. Radio Inspector; A. H. Halloran and T. Lambert of the Radio Shop, San Jose, were on the program of the evening. Mr. Lambert demonstrated his new universal long and short wave receiving equipment. A membership drive of the evening added a number of new candidates to the ever increasing roll of the club.

The Magnetron—a New Synchronous Detector

The magnetron is a new form of vacuum tube or high frequency valve which has just been developed in the research laboratory of the General Electric Co. As described in a paper by Albert W. Hull in the September, 1921, Journal of the American Institute of Electrical Engineers, this youngest member of the electric tube family differs from the kenetron,

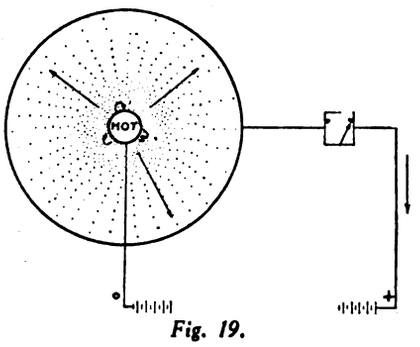


Fig. 19.

the pliotron or audion, and the dynotron chiefly in the method of controlling the flow of current between metal electrodes in vacuum. In its application as a synchronous detector in continuous wave telegraphy in the transoceanic receiving station of Radio Corporation, the magnetron acts as a simple high-frequency valve opened and closed at approximately signal frequency by a locally generated magnetic field, letting through first the positive peaks of the signal and then the negative, giving an audible tone. It is also being

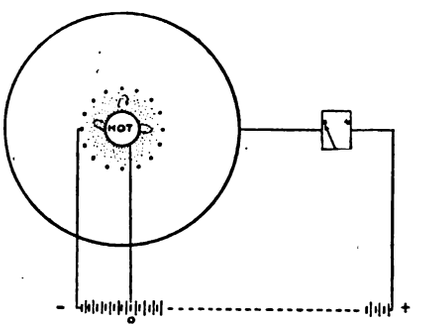


Fig. 20.

adapted to use as an amplifier and as a generator of high-frequency alternating current, a 25 kw. output already being possible.

So as to understand the principle of operation, first consider the kenetron rectifier, wherein the control of current from one metal electrode in vacuum to another is controlled by the temperature of the electrodes. The minute electrons, like little cannon balls, jump out of the hot filament, fly across the vacuum and plunge into the anode. The hotter the filament the greater the number of electrons emitted, and consequently the greater the resulting unidirectional current. When the anode is positively charged, as on Fig. 19, the electrons are attracted to it and current flows thus established.

In the pliotron the current that can flow from a hot filament to a cold anode is controlled by a grid which acts as an electrostatic screen, shielding the hot filament

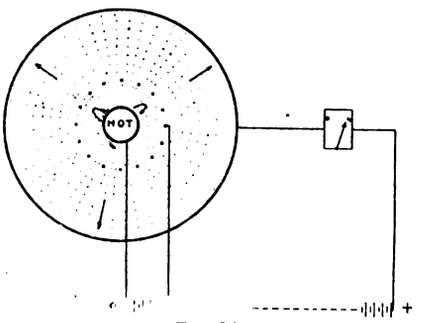


Fig. 21.

from the positively charged cold anode. This grid is indicated by the circular series of dots in Figs. 20 and 21. In Fig. 20 the grid is at a negative potential with respect to the filament and repels the electrons so that they pile up around the filament and prevent any current flow. The valve is closed. In Fig. 21 the grid is positively charged and pulls the emitted electrons away fast enough to give a large current. The valve is closed. Obviously, with an alternating current the valve is

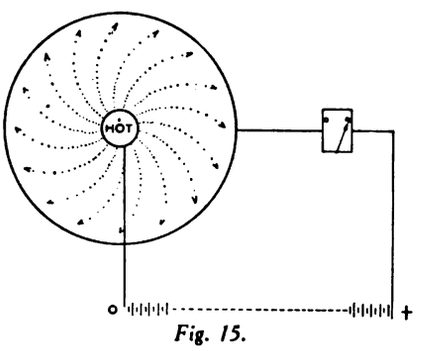


Fig. 15.

open for only one direction and the current is rectified.

In the magnetron, instead of depending upon the heat of the filament and the difference of potential, as in the kenotron, or a positively charged grid as in the pliotron, control of current flow is maintained by magnetic field, as shown in Fig. 4. The cathode is a straight tungsten filament, the anode a circular filament and the magnetic field is created by a solenoidal coil wound directly on the glass tube.

Referring to Fig. 4, a battery (B1) heats the filament to incandescence, and another battery (B2) impresses a constant voltage between cathode and anode, the anode being positive. This is a simple kenetron arrangement. A solenoid (S), supplied by a battery (B3), superimposes a magnetic field parallel to the axis of the tube. If this field is weaker

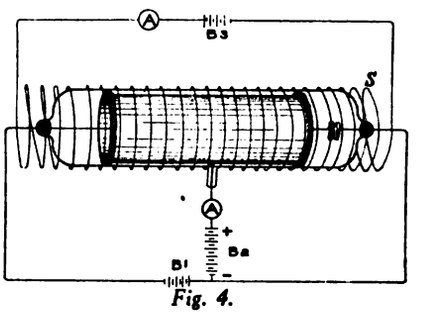


Fig. 4.

than a certain critical valve, the full current will flow; if stronger, no current will flow, the magnetic field thus acting as a valve.

This action is indicated in Figs. 15 and 16, from which it will be noted that the superimposed magnetic field causes the electrons to take a spiral instead of a radial path. Fig. 15 shows the condition when the field is weak and the "valve" open, and Fig. 16 when the field is strong and the "valve" open. Similar effects are produced for tubes containing grids.

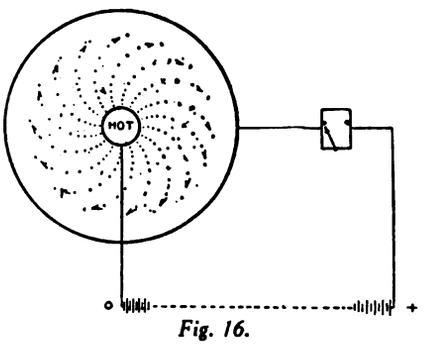


Fig. 16.

In the opinion of Mr. Hull, from whose article these facts have been condensed, the application of the vacuum tube in general and the magnetron in particular to radio will be small as compared to its application to electric power engineering. As a lightning and surge arrester it will protect a d. c. machine or line. "One may predict that one year will see these tubes in use as kenetron rectifiers for series arc lighting. Five years will see them in substations replacing synchronous converters. In ten years they will be on electric locomotives, either as rectifiers, allowing the use of d. c. motors, or as variable frequency alternators, taking their power from a high-tension d. c. trolley line. Twenty years will see d. c. transmission lines, fed through transformers and kenotrons, at any convenient points, by alternations of any frequency, and tapped by the same tubes acting as magnetron alternators."

With the Radio Inspector

This department is conducted by the Radio Inspector of the Sixth District. Questions are answered free of charge. Your name will not be published. Initial your letter only.

***Send your Questions to* RADIO INSPECTOR'S DEPARTMENT, "RADIO"**

Question: Is it unlawful to put an aerial across the street or put it on a telephone or electric light pole? M. B., Hollywood, Calif.

Answer: This is a matter depending on the local laws and regulations. However, usually the power and telephone companies do not allow any wires fastened to their poles, except those of affiliated companies.

Question: If my station is licensed for spark work, would it be necessary to have the license altered so that I may put in a C.W. set? H. C., San Diego, Calif.

Answer: Notify Radio Inspector's Office of such change. No change needed in the license.

Question: Would it be violating my oath of secrecy to make public through press or otherwise the government weather bulletins and official press? PKC., Santa Paula, Calif.

Answer: If the matter is sent out with the prefix "QST to all stations" it may be published. Official press is understood to be directed to naval vessels only, and should not be published.

Question: In what way does an "impact" transmitter differ from the ordinary spark transmitter? What are its advantages? Is there any difference between "impact excitation" transmitters and "impact" transmitters? Where can I get a wiring diagram of either of these transmitters? A. H., San Francisco, Calif.

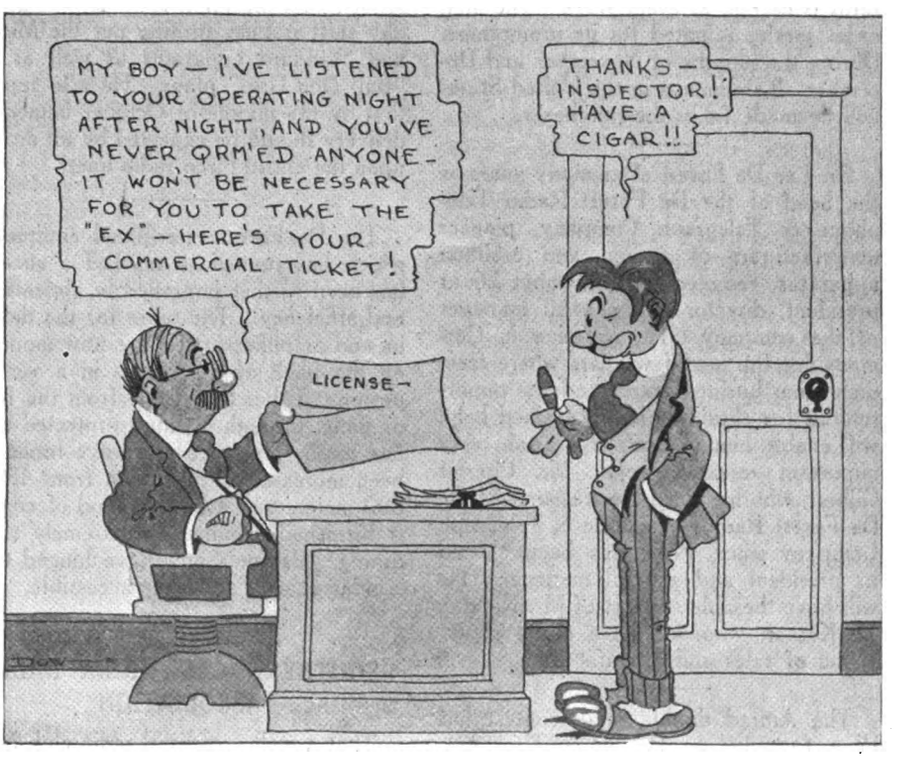
Answer: Not sufficient space to cover these questions here. Refer you to Stone, "Elements of Radiography," and to the proceedings of the trial between Kilbourne & Clarke and the Marconi Co., and to the Proceedings of the Institute of Radio Engineers.

Question: Is it against the law to use the heterodyne system of reception, which causes oscillations to be sent out of the aerial and possibly interfere with other stations, without a station license? Satoshi Uchida, San Francisco.

Answer: If the radiation which results from the operation of the station will interfere with the reception of signals or radiograms from beyond the jurisdiction of the state or territory in which the station is located, such station will be operating in violation of the law. (See Act of Aug. 13, 1912, Sec. 2.)

Seventh District Amateur Stations

7SA	B. C. Barnes	336 E. 9th St., Eugene, Ore.
7SB	L. E. Bracht	1804 Batchelor St., Miles City, Mont.
7SC	W. A. Cnemrich	503 Melrose Ave., Seattle, Wash.
7SD	H. L. Fritz	707 N. 65th St., Seattle, Wash.
7SE	T. L. Richardson	USOHS, Hospital 59, Tacoma, Wash.
7SF	E. E. Griggs	1518 First St., Aberdeen, Wash.
7SG	Don Harris	1711 Simpson St., Aberdeen, Wash.
7SH	A. J. Homchick	904 First Street, Aberdeen, Wash.
7SI	Hal Garrot	4320 Meridian Ave., Seattle, Wash.
7SJ	R. P. Heatlie	324 F Street, Aberdeen, Wash.
7SK	C. C. Howard	218 E. 63rd St. N., Portland, Ore.
7SL	L. C. McManmey	1309 Hood St., Aberdeen, Wash.
7SM	C. T. Hanes	906 19th Ave. N., Seattle, Wash.
7SN	R. G. Wascher	760 Twelfth Ave., Seaside, Ore.
7SO	W. L. Duncan	142 Eleventh St., Corvallis, Ore.
7SP	M. W. Rice	497 E. 28th St., Portland, Ore.
7SQ	R. F. Parslow	522 S. Main Street, Roseburg, Ore.
7SR	R. S. Bean	579 E. Ninth St., Eugene, Ore.
7SS	W. F. Turnbow	704 W. Fourth St., Aberdeen, Wash.
7ST	M. C. Knight	3645 35th St. W., Seattle, Wash.
7SU	J. A. Kindle	230 Sam St., Monroe, Wash.
7SV	D. G. Harvie	205 Montgomery St., Albany, Ore.
7SW	C. M. Landaker	R. F. D. 4, Box 17A, Salem, Ore.
7SX	C. L. Hyer	815 Thurston St., Albany, Ore.
7SY	G. M. de Broekert	345 Mill St., Eugene, Ore.
7SZ	F. M. Curtin	530 Thomas St., Hillyard, Wash.
7TA	R. K. Leonard	421 N. Belmont St.
7TB	V. R. Kem	1509 W. Main St., Cottage Grove, Ore.
7TC	G. C. Perry	3712 Woodlawn Ave., Seattle, Wash.
7TD	G. M. Leasia	1116 Heron St., Aberdeen, Wash.
7TE	G. C. Henny	Bay Ocean, Ore.
7TF	J. K. Trescott	504 N. 31st St., Billings, Mont.
7TG	M. E. Tait	394 Guild St., Portland, Ore.
7TH	A. W. Emigh	335 Grove St., Walla Walla, Wash.
7TI	H. T. Hayden	Monroe & Cosgrove Sts., Townsend, Wash.
7TJ	C. A. Lockwood	2117 S. 12th St., Salem, Ore.
7TK	R. W. Mudgett	Powell, Wyo.
7TL	H. J. E. Young	1163 E. 17th St. N., Portland, Ore.
7TM	A. H. Peterson	2304 N. 39th St., Seattle, Wash.
7TN	J. B. Darragh Jr.	2560 Fifth Ave. W., Seattle, Wash.
7TO	Arvid Herner	1119 E. Harrison St., Portland, Ore.
7TP	J. C. Campbell	Camp Lewis, Wash.
7TQ	H. H. Howell	R. 2, Box 15, Medford, Ore.
7TR	W. D. Thomson	Wilbur, Wash.
7TS	John Pollak	811 Washington St., Albany, Ore.



Things That Never Happened!

Monthly Broadcast of Radio News

Tresco, of Davenport, Iowa, wants to know whether the dealers and amateurs wish him to run another C.W. relay on Washington's birthday.

Leo J. Meyberg Company have moved their Los Angeles store to new and larger quarters, at 950 South Flower street.

Colin B. Kennedy Company state that concerts from their radiophone at Los Altos, Calif., have been heard at Brule, Nebraska.

The De Forest Radio Telephone & Telegraph Company is planning to re-establish their broadcasting station in New York City for the benefit of amateurs within a radius of 400 miles. Feeling that there is a demand for radio telephone news and music in that territory, three nightly concerts of one hour each, to be preceded by a general news program, is being planned. The wave length, time, etc., will be announced later.

The Ship Owners' Radio Service, Inc., is operating chain stores to render radio service to the amateur in exactly the same way as to the U. S. Shipping Board, the U. S. Navy, and many steamship companies, putting Citizen Radio on an equal basis with Commercial Radio. Sorsing is the only company maintaining a chain of stores throughout the United States and in Honolulu and London. A complete stock of every important line of apparatus is carried at every store. The mail order service is noted for its promptness. During the months of November and December all shipments in the United States will be made f.o.b. the purchaser.

Dr. Lee De Forest after many years as the head of the De Forest Radio Telephone & Telegraph Company, pioneer manufacturers of audion and oscillion apparatus, resigned on September 26 as president, director and general manager of the company. He will live in Germany for the next few years where freedom from business cares and the opportunities for obtaining highly trained help, will enable him to complete certain very important research work. Mr. Charles Gilbert, who has been the treasurer of the De Forest Radio Telephone & Telegraph Company since 1915, has been elected its president and general manager. He will have the able support of Mr. Randall M. Keator, who will have direct supervision of sales and manufacture.

The Amrad double prize contest has been extended to December 31, 1921, according to announcement by the American Radio & Research Corporation. Three prizes are offered in the first contest for the best name selected for the new basket-weave, wavy wound, Amrad variometer. Three prizes are also offered for the best name given for the new mahogany finished Amrad regenerative tuners, and detector two-stage amplifiers. Contestants are requested to see the new apparatus at their nearest dealer. They may also obtain descriptive literature regarding the new equipment from their dealer, or request Bulletins O and L from the company direct. Contest blanks may be obtained upon application to the contest department, care the company, at Medford Hillside, Mass.

John Firth & Co., Inc., reports that they are now in a position to make immediate delivery of the Vocaloud. They have been held up by an altogether unexpected and uncalled for mistake on the part of the cabinet makers, who were making the mahogany cabinets in which the instrument is mounted. It seems that an order for several hundred cabinets was placed, and, when long overdue delivery was finally made, it was found that the cabinets were not made in accordance with the specifications furnished. It was, therefore, necessary to place a duplicate order at once, and it is this order which John Firth & Co., Inc., reports is now being delivered and will permit of continuous prompt deliveries of the Vocaloud. Mr. J. Fosner, the production manager, reports that the night shift as well as the day shift is busy turning out the Midget and Standard apparatus as well as the "Bull Dog Grip" plugs. He also reports that by the middle of October immediate delivery should be expected by all dealers upon the entire Firco radio line.

The De Forest Inter-panel equipment, which has proved so marked a success, has been further improved in appearance and efficiency. The tubes for the detector and amplifier panels are now mounted on the back of the panels in a vertical position. Tubes are visible from the front of panel through opening protected by a fine mesh screen. Short wave tuner has been increased in maximum from 450 to 600 meters and a new method of control is furnished, eliminating extremely sharp tuning. Cabinets now have hinged tops, making rear of set easily accessible.

SOUTHERN CALIFORNIA RADIO ASSOCIATION

That a well organized radio club is the best booster the radio amateurs of any district can use to increase their number is well illustrated in the attendance of the meetings of the Southern California Radio Association. Instead of closing down for the summer months, as is usually the case with most radio clubs, the Southern California Radio Association continued its regular meetings on the second and fourth Monday of each month throughout the entire summer. The attendance at these meetings was never less than 100 and most of the time nearer 150. Better still, fully 30 per cent of this attendance has been non-members and thus becomes one of the best sources for new members of the association.

Beside the regular business of the club, there is always an interesting talk or lecture, either by a member of the club or some outside lecturer. The club has in view a series of interesting and instructive lectures along radio and allied lines, and it is remarkable to see the interest shown and the attention given to the lecturer, many lectures lasting through the entire evening. The club has given a number of raffles in the past year and held a most successful "hard times auction," in which each member brought up some of his apparatus (no longer in use at his own station), and the same was auctioned off to the highest bidder. The sales of old apparatus that night amounted to in excess of $150.

The Southern California Radio Association at its own expense sent a representative to the first annual A. R. R. L. convention in Chicago. Mr. V. M. Bitz, radio 6JD, represented the club, and we expect to have the pleasure of a very interesting evening listening to his story of the convention.

The club also has its lecturer whom it loans out to other societies. This lecturer, Mr. Edward T. Lowe Jr., assisted by the writer, recently gave a lecture before the biological branch of the Los Angeles Academy of Sciences with a demonstration of wireless telephony. The club considers its position enviable in that it has the complete co-operation of all the radio dealers in Los Angeles, the same facilitating its operation in many ways.

The Radio Club has done much to increase the general public interest in radio in Southern California, and this in connection with the increased use of the amateur wireless telephone and wireless concerts has been instrumental in interesting many men of mature age who, not caring to learn the code, enjoyed listening in for the concerts, and as a direct result, the club has on its membership roll a large number of the representative business men of Los Angeles.

LEX B. BENJAMIN.

CUTTING AND WASHINGTON RADIO STATION

Cutting and Washington Radio Corporation, 6 and 8 West 48th Street, New York City, N. Y., is operating a shore station at Easthampton, Long Island—call letters "WSA"—about 100 miles from New York City. The station handles general public correspondence to and from ships at sea and is equipped with special designed apparatus for both long and short range communication on wave lengths of 600 to 1900 meters. One of the characteristics of the specially designed transmitting equipment is the distinct tone of the spark which enables ship operators to pick WSA's signals out of a jam of signals from other stations and which also has excellent carrying qualities.

The antenna is a "T" type cage with cage "lead-in"—the antenna being supported by two steel towers each 165 feet high, topped off with 10-foot spars. A counterpoise grounding system is used which has proven very effective.

Calculations by all of the known methods indicate that the radiated power is conservatively three kilowatts, which experience has shown to be quite sufficient for long daylight ranges. It might be of interest to point out the fact that a power radiation of three kilowatts on the average ship would require from 50 to 55 amperes antenna current with an "L" type antenna about 75 feet high above deck and 225 feet long.

Some examples of the ranges covered by WSA are as follows: Signals were copied at night by the S. S. Black Arrow while a few hundred miles off the coast of Spain on her last voyage. Traffic was exchanged with the S. S. Essequibo over 1000 miles south of New York at night—signals from WSA being reported very QSA at the time and very easy to copy through QRM. WSA is consistently heard by ships in Bermuda Harbor in daylight. The S. S. Lapland communicates with WSA regularly from 500 to 800 miles in daylight. The S. S. Aeolus communicates with WSA approximately 2000 miles at night. These are not examples of "freak" work, but of every day communication since on "freaks" WSA has been copied in the Pacific Ocean, in Buenos Aires Harbor, in the English Channel, and at other exceptionally long distances.

To facilitate the rapid handling of traffic there are direct private wires to New York City. An office maintained in the Hotel Commodore, New York City, is also connected with WSA by direct private wire and delivers messages to steamship owners by telephone—all such deliveries being followed with confirmations by messenger. A crew of expert operators was also selected for ability in accurate and rapid handling of traffic.

In co-operation with the Hotel Commodore press is sent nightly at 12:15 a. m. 75th meridian time on 1900 meters free of charge to all ships at sea. The transmitter at WSA is remotely controlled from the Hotel Commodore office for this purpose.

BREMERTON, WASHINGTON

The Kitsap County Radio Association was formed in February, this year, with an initial membership of about 25. Considering that the joint towns of Bremerton and Charleston have a total population of only about 20,000, we consider this a good showing, and have increased our membership to 35, with new members coming in right along.

Until recently we maintained quarters in Union High School here, but are now forced to find other club rooms, due to lack of space to accommodate us during the school year. We are desirous of finding suitable quarters to house not only our members, but a complete station, most of the apparatus for which we now have, consisting of ½ kw. rotary transmitter and De Forest unit panel receiver and amplifier.

Reorganization of the association has just recently been completed, with a view to broadening our work this coming season. We have a code practice table and instruction for half to one hour is given each meeting. As the majority of our members are new in the radio game, code practice is needed. We have only two licensed amateurs at present, but many more on the verge of blooming forth with a ticket. Great care is used that no one without license, uses any manner of transmitter in violation of the law. Several transmitters are almost ready to break forth, but are silent until licenses are obtained. At present, no satisfactory transformer station is established here for traffic purposes. Nothing but a spark coil, but several sparks and tubes coming up.

Personally, I have a 500-cycle Telefunken transmitter nearing completion, and a 15-watt tube-telephone-telegraph set, with which I hope to handle DX traffic.

Receiving conditions locally are poor and have always been, experiments having been made for several years by the local navy station (NPC) to better conditions, with the final conclusion that it is atmospheric or natural causes. However, short-wave stuff as far as Los Gatos, Calif., is heard pretty well here on detector and no amplifier.

Kitsap County Radio Ass'n.
By Howard S. Pyle, Vice President.

DEVELOPMENT OF RADIO TELEPHONE AND C.W. IN SOUTHERN CALIFORNIA

The usual crowd, gathered in Wesrad's store the other day, began swapping reminiscences, and it was amusing to reflect on the rapid development of the radio telephone and C.W. during the past year. Such tremendous strides have been made that contemplating the future—yea, even the near future, is a thing of only the wildest conjecture.

A little more than a year ago, Western radio burst forth on the ether with the first vacuum tube telephone transmitter in this locality. The effect was startling, although the phonograph concerts were much worse than the worst concerts you hear nowadays. On one particularly good night, a conversation was carried on with 6NY, in Whittier, about 20 miles distant. This was stimulating and experiments were "carried on" with renewed vigor. The transmitter, at that time, employed four De Forest tubes, little better than amplifiers, and using the De Forest system of grid modulation. The four tubes were all used as oscillators and the radiation meter ambled up to one-half an amp on state occasions. Those were the happy days!

Then Arno Kluge began juggling the intricate parts of a telephone transmitter and tests were carried on over the intervening blocks with beautiful regularity. Very shortly after Lex B. Benjamin, 6MK, and president of the Southern California Radio Association; and C. E. Blalack, 6JE, entered the C.W. field and from then on new radiofones appeared at frequent intervals.

At the present writing there are about 20 telephone transmitting stations operating in Los Angeles. Some of these stations are concert sets operated by the various dealers on scheduled evenings and the foremost transmitter is Wesrad's 50-watt set, which entertains all the surrounding countryside on Tuesday and Friday evenings.

It is interesting to compare the present 6XD transmitter with the original described above. The circuit has recently been changed and improvements are made almost every week. A great deal of experimentation is necessary to bring this size of transmitter to the point of perfection which it is desired to obtain. The present circuit is a great improvement over previous circuits used and in a coming issue the complete diagrams and data will be shown in these columns.

The Western Radio Electric Company has been foremost in their activities in introducing radiofone and C.W., as it has been their policy to remain abreast of radio advancement for the benefit of the trade. The Oakland store of this company will carry the same policy of sales and service into the San Francisco bay district.

Static Statistics from Everywhere

By Squawk McGuff

I find in a recent editorial from Spokane that they are hearing concerts from San Francisco, and that Spokane, whom we do not hear much about, is there, nevertheless. It is easy to understand the infectious enthusiasm of those people in Spokane when we get the proper "kick" in hearing concerts only a few miles. They hear them over 1000 miles. A sport that includes hearing things 1000 miles away offers the sort of thrill that cannot be disregarded. For some time radio telephones have carried music 1000 miles, and more over water, but inland transmission is much more difficult, as we all know, and to have heard the San Francisco concert was a noble treat for the Spokane enthusiasts.

The persistence of science constantly increases the effective radius of wireless communication. It is only about twenty years since wireless transmission over a few yards was considered something akin to a miracle. Today the range is 10,000 miles and the limit is not yet reached. .

Marconi himself suggested the possibility of interplanetary communication. He has heard wireless signals that he does not think can have emanated from any source on the earth. They can be caught only by apparatus tuned to wave length five times greater than any wave our scientists know about. In 1924 Mars will be closer to the earth. Let's all wind a houseful of loose couplers for that wave length.

LOS ANGELES

The fellows are now getting together their resources for the winter campaign and there is much visiting, inquiring into ways and means and various other maneuvers conducive to general activity. There is also very much use of mild (?) language when the oil runs out of the condenser. These are happy times in the life of the amateur.

Some fellows brag about hearing ten feet from the cans, but that's nothing. The ash man can hear a block from his'n, and he doesn't have amplification, either.

Seems like these wireless telephones that are sending messages out over the air for the boys to pick up by radio are rather disturbing. As they listen they recognize the high pitched voice as belonging to "wimmins" and now they are all talking of installing a set with high tone. It's getting so now that if a fellow wants to be admitted to the sacred sanctum of a long distance listening-in station he must take a girl along with him to call out in an upper "C" tone "it's me!" when the chain will drop, the bolt slide and the key turn to reveal——. Now let's see, was that 6MH or who was it?

6JD took a trip one day
To the Con of the A R R L.
He made a speech and then returned,
And is now feeling pretty well.

That sounds pretty reasonable, let's try another!

In Whittier, the 6AHA (Ah, ha!)
Where the tunes are trained to a nice tra la,
Lives a gay young swain on pleasure bent,
And many is the message he has sent.

FEATURES IN THE DECEMBER ISSUE OF "RADIO."

A. J. CHAMPREUX, engineer Pacific Telephone & Telegraph Co., will tell all about the Catalina Island Radio Installation, including details of connections between the radio and the ordinary two-wire telephone circuit, duplex radio telephoning with simultaneous telegraphy and automatic radio signalling system.

JENNINGS B. DOW, U. S. S. California, will start the first installment of a remarkable "C. W. Manual."

B. F. McNAMEE will continue the how and why of radio tuning with an article on "Tuning Apparatus."

PROF. A. K. ASTER, University of California, contributes a helpful technical article on radio frequency amplification by means of the "Armstrong Super Hetrodyne."

Special Christmas fiction, verse and humor in addition to all regular departments.

TACOMA

On of the last four days of September Tacoma had a great electrical display. The committee in charge of this exhibition offered the Radio Club of Tacoma free space if they would bring down their home made apparatus and show the public what they are doing. The Radio Club built their booth and conducted a most successful demonstration.

Horrors! "Fat" Weingarten, our Chicago conventioner, lost five pounds while East. He says now he will answer to the name only of Skinny. He must have had some time there, though.

Our club janitor is now passing out highly embossed cards, reading "my game is wireless" as his motto, and informing the members that he has gone into the designing and construction work. Don't rush, fellows!

Yes, it's really so. Our esteemed professor of C.W. fame has entered the University of Washington. Remember, Otto, don't get into any of the arguments with the professors over there, as you used to argue at club here—although we know you could back them off the map! Good luck, Otto. It sure is lonesome over here without you and your keen wit.

PORTLAND

Portland has been meeting opposition to the new tariff schedule put into effect last month, when it was agreed to give it a two weeks' trial before further discussion as to its merits. This was done, but on account of the lack of co-operation of outside stations due to lack of knowledge of the new schedule, it was almost impossible for the schedule to receive a fair trial in such a short time. As it was soon discovered that it would almost be impossible to refuse tariff going through Portland after the traffic schedule it was decided to temporarily abolish the clause as published in the last P.R.N. stating, "however no traffic will be handled. In the event an LD station says 'QRJ1,' it is up to you to tell him 'QSU tomorrow night at schedule for traffic.'" It is requested that all other centers, having traffic for or through Portland, make schedules to correspond in such a way as to make connections with Portland at the right time.

("Tacoma will not be affected by this request, being a suburb of Portland."—7ZT.)

7JW, who made a tour of the South during the summer and inspected many of the leading stations, seems to have gained some ideas as to station construction, which he is going to try out. Since his return he has sold most of the old apparatus, and from the latest report has just finished constructing a new home made transformer for his new station. If everything goes as expected there will be a large demand for lightning protectors for receiving sets located locally.

During September Portland was honored by the visit of two of California's best, namely 6DP and 6PR. One evening of their visit was spent in a "Hamfest" at the 7XF station, where most of the "gang" had collected. It was here that the two "dippies" of the coast met. The conversation, or "Hamfest" between 6DP and 7DP that followed was too lengthy for print.

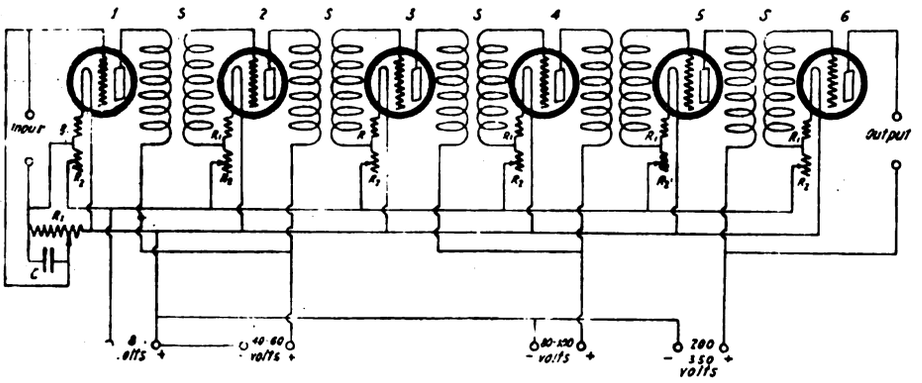
The southern stations are not the only ones that are enjoying a good radio con-

(Continued on Page 164)

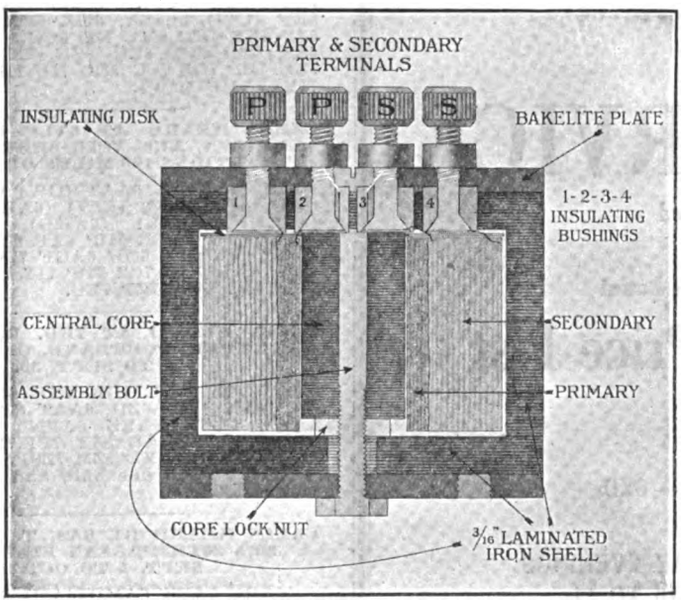
New Apparatus and Supplies from the Radio Manufacturers

SIX STAGE AMPLIFICATION

With the new Firco Midget apparatus described in these columns last month it is possible to connect several units so as to get as high as six stages of amplification. The accompanying diagram shows the circuit employed. Ordinary amplifying tubes are used for the first two circuits, but harder tubes are better for stages 3 and 4, with a plate voltage of from 80 to 100 volts. If still higher amplification is desired stages 5 and 6 may be added, using 5-watt power tubes and a plate voltage of from 200 to 350 volts. The same filament battery is used for all tubes with an individual filament rheostat for each.



Hook-up for 6-stage Amplification.



Cross Section of Saco Clad Transformer.

The elimination of howling or squealing is accomplished by the use of the Saco Clad transformer, cross-sectional view of which is shown herewith.

It will be noticed that the primary and secondary windings are wound around a laminated core of silicion steel and totally encased within a laminated wall of the same material. This laminated shield, as it might properly be termed, serves the double purpose of providing a most efficient path for the magnetic flux.

The six-stage amplifier is actually nothing more than three two-stage amplifiers, coupled one after the other by short bus bars. In the same manner, a four-stage amplifier can be built by coupling together two of the Type 37A amplifiers.

NEW RADIO CATALOGS

Catalog No. 21 from the Marshall-Gerken Co., Toledo, Ohio, is devoted to the Mageco System of Radio Telephony and Telegraphy. It contains illustrated descriptions and prices of both transmitting and receiving sets, as well as of all essential assembly parts.

E. T. Cunningham (Audiotron since 1915) and Remler Radio Manufacturing Co. have moved their offices to 248 First street, San Francisco, where larger quarters and greater manufacturing facilities will give either better "Cunningham Service" than ever. A fine new catalogue of tubes, dials, rheostats, sockets, potentiometers, switches, vario-couplers, variometers and all apparatus parts for receiving sets as well as complete detector and amplifier panels, has just been issued and will be sent on application.

"Radio Apparatus for Amateur and Experimental Use" is the title of a new catalog text which may be obtained from the Radio Corporation of America for 25 cents. It is especially concerned with equipment for continuous wave transmission and receptions, and furnishes the radio amateur with the data necessary for its efficient operation. The publication is in two sections, an instructional and a catalog. The instructional section deals with radiotron transmission, the details of a scientifically constructed station, transmitting tube circuits, their practical use, and general information to the amateur. The catalog section covers radiotron transmission tubes, kenetron rectifier tubes, transmitter accessories, radiatron receiver tubes, receiver accessories, antenna material and accessories. The Radio Corporation has taken the initiative in gathering this valuable information and it is thought that it will go a long ways towards popularizing continuous wave transmission.

Crossley Manufacturing Co., Cincinnati, Ohio, have issued several interesting circulars descriptive of their lines. Among these is a simple variable condenser operated by a cam so as to open and shut like a book, thus giving a uniform variation from .00006 to 0008 mfds. Another is a four prong V-T porcelain socket designed to prevent short circuit through careless insertion of tube, and adapted for side or base mounting.

The Chelsea Radio Company has recently developed an audio frequency amplifying transformer whose electrical characteristics are unusually well proportioned for the best operation with the new high impedence vacuum tubes. The characteristics given below were derived from an 800 cycle Vreland oscillator and the 1,000 cycle data computed for general comparison purposes.

	1000 cycles ohms.	800 cycles ohms.
Primary, Secnd'y open.....	36,175	29,000
Primary, Secnd'y shorted....	1,875	1,500
Secnd'y, Primary open.....	1,875,000	1500,000
Secnd'y, Primary shorted....	55,000	44,000

The notable feature of this device is the high value of secondary impedance with the primary shorted. The core is of the shell type which greatly reduces stray fields, and the coil is of square section and results in an unusually high space factor. The connections have been so arranged as to eliminate all capacity effects between the primary and secondary windings.

CALLS HEARD

CALLS HEARD BY 7MQ, CORNELIUS, OREGON, JULY 20TH TO SEPT. 10TH—ONE TUBE ONLY.

Spark—6AE 6AR 6AID 6AAW 6AQU 6AAT 6AVB 6ACR 6AWH 6AEW 6ANW 6AFJ 6APE 6ABX 6AMR 6AMW 6AGF 6BK 6CH 6CO 6CV 6DP 6EA 6EB 6FH 6FR 6GF 6GR 6GN 6HC 6IC 6KA 6OC 6OH 6PJ 6TH 6TV 6VX 6WX 6WZ 6ZA 6ZK 6ZU 6ZX 6AVT 6ABX 6LV 6II 6IS 6KK 7AD 7AY 7BA 7BC 7BN 7BK 7BP 7CC 7CN 7CW 7DP 7ED 7EO 7FR 1GA 7GD 7GN 7IN 7IU 7IW 7IY 7KB 7KG 7KJ 7KN 7LW 7LS 7NA 7NN 7OZ 7QQ 7WZ 7XD 7YG 7YS 7ZJ 7ZK 7ZL 7ZN 7ZT 7ZW. 5BR (Canadian).
C W—6AWT 6ASJ 6AAT 6AWV 6AUL 6ALE 6ALU 6XAC 6XG 6XW 7HW SMS 7NY 7QE 7RV 7XF 6AGC 7VW.

HEARD BY 6AUN FOR SEPT. 5-20, 1921.

6AE 6EA 6ER 6FK 6FR 6GI 6GE 6GR 6IB 6IC 6KA 6LC 6MH 6MN 6OH 6PO 6OK 6TV 6VM 6ZA 6ZU 6LX 6AAK 6AAT 6ACR 6ACY 6ADL 6AGF 6AID 6AIL 6ALE (CW) 6AOZ 6AQU 6ASR 6AVB 6AWI 6AWH 7BK 7BP 7BW 7CC 7GI 7IU 7KM 7KJ 7KW 7MZ 7OZ 7XO 7XF (CW) 7ZJ 7ZM 7ZJ 7ZT.

HEARD BY 6AVM, 2318 K STREET, SACRAMENTO, CALIF., ON ONE TUBE, FROM SEPT. 18 TO 28.

5ZA 6AGF (6ANJ-fone) 6ACY (6AFN) 6AWV (CW) 6AEI 6AJH 6AVY (CW) buzzer, 6ALE (CW) 6ALU 6ATQ 6ADL 6AEZ 6ATH 6AVD 6AWT (CW) 6AVR 6CP 6DP 6EF (CW) buzzer, 6EX 6FK 6GI (6IM) 6JY 6KS 6KC 6MH NK 6OC 6OD 6OM 6PJ 6SK 6TU 6VX 6ZB 6ZN 7XD 7BK 7ZT 7ZM 7BP 7OZ 7CC 7ED 7IU 7MO 7MY 7KJ 7IW 9AMB (CW).

CALLS HEARD AT 6ALP BY HILLIS BROWN, AUG. 7 TO SEPT. 7—ALL STATIONS 100 MILES OR OVER.

6PJ 6ZX 6AE 6AAT (CW) 6XAC (CW) fone 6AID (6KC) (6TV) (6ARW) (6AJH) (6AED) (6AKL) (6AKD) 6ZE (6ZB) (6FK) 6OT 6ACR 6DP 6AR 6VX 6TV 6AC 6ANP 6CC 6GF 6OH 6AGF 7IW 7ED 7DA 7HW 7XD 7ZM 7OZ 7PP 7IY 7ZJ 7BJ 7BQ 7HK 7LY 7GA 7ZT 7EO.

CALLS HEARD AT 7RO, R. G. HEITKEMPER, PORTLAND, ORE., AUG. 20 TO SEPT. 30.

6CV 6EA 6ER 6GK 6GR 6IC 6KI 6OH 6PR 6SK 6VX 6ZU 6AAT 6ABM 6ABW 6ABX 6ACR 6AEZ 6AFN 6AGF 6AID 6APE 6AWH 7AD 7AY 7FI 7HF 7IN 7IU 7JF 7KM 7NL 7XD 7ZM 7ZS. All the above were heard on one bulb and a three-coil tickler system.

CALLS HEARD BY 6AS, T. B. BROWN, 3675 20TH ST., SAN FRANCISCO, SEPT. 1 TO OCT. 1.

(6AR) 6AEZ 6AMB 6AID 6ADL 6ALU 6ALE (CW) (6AWV (CW) (6CV) 6EA 6EB 6EN 6FK (6GF) 6GI 6HY 6IC (6IS) 6JD (6MH) 6OD 6SK 6TF 6ZB 6ZN 6ZU 7BP 7BR 7ED 7FI 7GA 7IU 7KB 7KJ 7OZ 7ZM 7ZS (7ZT) 7XD.

CALLS HEARD AT 6AFO, SAN FRANCISCO

6DP (6EB) 6EN 6FK 6GF 6GP 6GR 6IC 6IS 6KA 6KC 6LC 6MH 6MN 6MZ 6OH 6PJ 6SK 6TU 6TV 6VX 6WI 6ZB 6ZN 6ZX 6XAD 6ABG 6ADL 6AEI 6AGF 6AJH 6ALE 6ALV 6AML 6AGU 6AVE 7BK 7IN 7KP 7KJ 7OZ 7ZT (7ZJ).

CALLS HEARD AND WORKED BY 6EB FROM APRIL 1 TO SEPT. 23.

6AAH 6AAT 6AAU 6ABH 6ABM 6ACR 6ACQ (6ADA) 6AEI (6AFO) 6AGC (6AIN) 6AJH 6ALE-ICW (6AMW) 6ANO 6APE (6APH) 6ATQ 6XAD-ICW 6ZAE. (6AS) (6BK) 6BU 6BW (6FX) 6IM, 6KC 6KK 6PG-CW (6PJ) (6PO) 6TS 6VX (6WZ) 6ZB-CW (6ZU) (6ZX) (6ZZ). (7DA) 7IN 7IW (7ZJ) 7ZT and 7ZM.

CALLS HEARD BY 7OZ, GARRETT LEWIS, EUGENE, ORE., AUG. 19 TO SEPT. 20

5BR 6AE 6AL 6AN (6AS) 6AW 6AY 6EB 6EN 6EP 6EX (6FH) 6FT (6GF) (6GR) 6HC 6HP (6IC) (6IS) 6JE (CW) 6KA 6KE 6KM 6KP 6KY 6LC 6MH 6MN (6MK) (6OC) (6OH) 6OT 6PC (6PJ) 6PO 6PP 6PR 6PW 6TU (6TV) 6VC 6VK (6VX) (YWH) (6WZ) 6WO 6XW (CW) 6XG (CW) 6XAC (CW) (6ZN) 6ZU (CW) 6ZY 6ZAC 6ZAE 6AAT (CW) 6AAW 6ABG 6ABG (CW) (6ABH) (6ABM) 6ABU (6ABW) 6AEX (6ACR) (6ADL) (6AEW) 6AEZ 6AFA 6AFO 6AFN (6AGF) 6AGN (6AID) 6AIW 6AJH 6AKL 6ALA (6ALE-CW) (6AMW) 6ANK 6ANP 6APE (6AQU) (6ASJ-CW) 6ATQ 6ATV (6AVB) 6AVV 6AWH 6AWI 6AWS (6AWV-CW) 7AD 7AD-CW 7AY (7BA) 7BC 7BG 7BH (7BK) 7BP 7CB (7CC) 7CE(CW) (7ED) 7EO 7FI 7FQ (1GA) 7GI 7HW-CW 7ID 7IN (7IU) 7IY 7JJ 7KB (7KJ) (7KM) 7LS 7LY 7MW (7NL) (7NW) 7QQ 7RB 7XD 7XF-CW and fone 7YA 7ZB (7ZJ) 7ZM 7ZN 7ZO 7ZS (ZT) 9MH 6AK.

The above stations were worked with a ½ KW. set during ten nights, which were not consecutive.

The old rotary 7OZ is discarded and will be replaced with the CW and a new Quenched gap outfit.

7MF of Eugene has discharded CW and has the old spark set of 7OZ.

There has been a lot of qrm. from a 500 watt CW set in Eugene at the aviation field (EF1). This set freezes the tubes and puts 1d on the blink till all their traffic is off. The field will be moved about the first week in October and DX will start.

This is all from Eugene this month. Will send you some more next month.

CALLS HEARD BY 6AWT, SAN FRANCISCO, FROM SEPT. 1 TO 22

6AE fone (6EA-WK) 6EN 6ER 6FK 6FR 6GI 6GF 6GP (6GR-WK) 6IB (6IC-WK) 6KA 6KC 6KP 6MH 6MN 6OH 6OK (6PO-WK) 6SK 6TU 6TV 6VH 6VM 6ZU 6ACR 6ACY 6ADL 6AID 6AJG 6ALE-CW 6AOZ 6AQU 6ASR 6AVB 6AWI 6AWH 7BK 7BP 7CC 7FI 7GA 7IU 7KM 7KJ 7KW 7MZ 7NL 7OZ 7XD 7XF-CW 7ZJ 7ZM 7ZS (7ZT-WK).

CALLS HEARD BY 7MF, EUGENE, ORE.

6AE 6AK 6AR 6CH 6EX 6FH (6GF) 6IG 6KA 6KM 6KX 6MF 6OC 6PR 6TV 6XAD (CW and music) 6VX (QSA) 6WZ 6ZX 6ZU 6AEZ 6ABR 6AWV (CW) 6AVY (CW) 7EX 7FI 7HC 7HW (CW) 7IU 7KJ 7KM 7LW 7MA 7NL 7PA 7QQ (ex-ZZ) 7SP 7XF (music) 7XD 7ZM 7ZS YA 9IB. Any one hearing 7MF's CW please qsl.

CALLS HEARD BY 6EA, H. C. Seefred, APRIL 1ST TO SEPT 25TH.

Heard: 5IF 5ZA 6AI 6AS 6BS (CW) 6BW 6CH 6DN 6FH 6FI 6FK 6GO 6JM 6MZ 6PO 6QR 6SR 6TC 6VK 6VL 6WO 6XZ 6ZB (spk. and ICW) 6ZE 6ZH 6ZK 6ZY 6ZZ 6AAK 6AAT (CW) 6AAU 6AAW 6ABH 6ABW 6ABX 6ACR 6ADA 6AFA 6AFN 6AFO 6ALA 6AOY (CW) 6AQW (CW) 6AWT (CW) 6XAD (ICW) 7FI 7GA 7HN 7IW 7NL 7XD 7YA 7ZM and 9ZN.

Worked: 6AE 6AK 6AR 6CP 6DP 6EX 6GF 6GR 6HC 6IC 6KC 6KM 6OC 6OH 6OW 6PJ 6PR 6SK 6TU 6TV 6VX 6WZ 6ZU 6ZX 6ABM 6AGF 6AID 6AJH 6AKL 6ALE (ICW) 6AMW 6ANK 6APH 6AVB 6AWH 7BP 7DA and 7ZT.

CALLS HEARD BY 6ACM, A. AND L. NEWMAN, 1700 SONOMA AVE., BERKELEY, CAL., FROM SEPT. 1 TO SEPT. 30.

6AK 6AR 6CV 6DA 6DP 6EA 6ED 6EN 6ER 6FH 6FK 6FT 6GC 6GF 6GP 6GT 6HY 6IC 6ID 6IS 6IZ 6JY 6KA 6KC 6KP 6KS 6KX 6LC 6MH 6OD 6OH 6PJ 6PR 6QR 6RS 6RZ 6SK 6TF, 6WI 6ZB 6ZN 6ZU 6AAT (CW) 6ABM 6ABS 6ACR 6ACY 6ADL 6AEI 6AEZ 6AFN 6AGF 6AGP 6AIB 6AIO 6AJH 6AKE 6AKI 6ALL 6ALN 6ALP 6ALU 6ANP 6APE 6APO 6AQU 6ATQ 6AVD 6AVR 6AVV 6AWH 6AWY 6AZD 6AZL 6BAP NK YA 7BK 7BP 7CN 7CU 1ED 7FI 7GA 7GO 7IM 7IN 7IS 7IU 7KD 7KJ 7KM 7MY 7NL 1NU 7OK 7OZ 7RA 7XC 7XD 7YA 7ZJ 7ZM 7ZR 7ZT 6GR.

Daylight reception: 6AK 6IC 6FH 6GC 6GP 6KP 6PJ 6AAT 6ACR 6AZD 6AZL 6BAP. Any one hearing 6ACM please QSL.

CALLS HEARD AT 6ASJ, OAKLAND, CAL., FROM MAY 12 TO OCT. 2.

6AE (skp. and CW) 6AP 6CR 6DD 6DP 6EA 6EB 6EN 6ER 6FK 6GI 6IC 6ID 6IS 6IY (CW) 6JE 6KP 6KS 6LA 6LX 6MB 6MH 6MX 6OD 6OH 6OM 6PR 6TH (6TV) 6VX 6WU 6ZB 6ZU 6AAT (CW) 6ABG

6ADL 6AGC 6AGF 6AGU 6AIR 6ALA (6ALE-CW) 6ALU (CW) 6AMW 7BK 7BP 7CC 7DA 7DJ 7ED 7FC 7IN 7IU 7KJ 7KM 7MF 7NN (7OZ) 7ZJ 7ZM 7ZT 9HM. As I am working nights, the above calls were heard between 12 M. and 2 A. M. Any one hearing my ICW or Voice please QSL, Chas. L. Elvin, 929 Sixtieth Street, Oakland, Cal.

CALLS HEARD BY 7ZT (EX-7DA), PORTLAND, ORE., IN SEPTEMBER.

(5BR-Canadian) 6AE 6AK 6AR (6AS) (6AV) 6BW (6CH) (6CP) (6CV) 6CW (6DP) (6EA) 6EB (6EN-CW) (6ER) (6EX) (6FH) 6FX (6GF) 6GI (6GR) 6GX 6HY (6IC) 6II (6IS) 6JE (6KA) (6KM) 6KP 6LC (6MH) (6OC) (6OH) 6PJ (6PR) (6QR) (6QT) (6SK) (6TU) (6TV) (6VK) (6VX) 6WR (6WZ) 6ZB (6ZU) (6ZX) (6AAT-CW) 6AAU 6AAW 6ABM 6ABW 6ABX 6ACR (6ADL) 6AEI (6AEW) (6AEZ) 6AFN (6AGF) (6AID) 6AJH (6ALE-CW) (6AMW) (6AMZ) 6ANK (6APE) 6ATH 6ATO (6ATV) (6AVB) (6AWH) (6AWT-CW) (6AWV-CW) (6AWY-CW) 6AZU 6ZAD-CW ("NK") "YA" (7AD) (7AY) 7BA (7BC) (7BK) 7CC (7CE-CW) 7CN (7FI) (7IN) (7IU) (7IY) 7JF (7KJ) (7KM) 7LS (7MP) (7NL) (7OZ) (7TJ) (7XD) (7ZM) (7ZS).

Krebs, Oklahoma, Sept. 29, 1921.

Editor, Pacific Radio News, San Francisco, Calif.

I have looked in your magazine and several others, but without success, so I am writing to you personally to ask if there is any such "bird" as 6WV.

If there is, please inform him for me that I heard his signals here on night of Sept. 28, about 10:55 to 11:05 P. M. (here). He was easily readable on one tube and he was calling 9ZC-5ZA and also CQ.

At the time I was using only one tube, three Duo-Lateral Coils and only "one" Variable Condenser, it being shunted across the secondary coil.

Yours sincerely,
THEO. R. HAMILTON,
Radio 5KZ.

CALLS HEARD AND WORKED ON A ONE-WIRE AERIAL ABOUT 80 FEET LONG, BY 6AAK, SANTA BARBARA, CALIF.

(6AE), 6AK, 6DP, 6FK, 6FY, 6HC, 61C, 6KA, 6KC, 6LC, (6MH), (6MZ), 6OH, (6PJ), (6PO), 6SK, (6TV), (6VX), (6ZX), 6XZ, (6ZB), 6ZN, 6ZU, (6ZX), 6AAT, cw. and phone, 6ABO, 6ABM, 6ABW, 6ACR, (6AFM), (6AGF), 6AIC, (6AID), 6AIP in daylight, (6AHJ, in daylight p. m.), (6ALE, cw), 6AMW, 6AQU in daylight, a. m., 6AUL, phone and cw, (6XAD, cw), (6ZAD, cw).

San Diego can be heard and worked in daylight. My radiation is 2 amperes on full power. Above calls heard and worked during August.

6KS ON ONE TUBE:

(5ZA), (6AE), (6AI), (6AH), (6AK), (6AR), 6BO, 6BU, 6BW, (6BX), (6CH), (6CP), (6DP), (6EX), (6FH), (6GF), (6HC), (6HH), (6IC), (6IM), (6JT), (6KC), (6KM), 6LU, (6MZ), (6OC), (6OH), (6OW), (6PR), (6QR), (6QS), (6SK), 6SL, (6TF), (6TH), (6TV), (6VX), (6WZ), (6XZ), 6ZB, (6ZN), (6ZU), (6ZX), (6ZZ), (6AAK), (6AAH), (6AAW), (6ACM), (6ADA), 6AEY, 6AEW, (6AFW), 6AGA, (6AGF), (6AID), 6AIN, (6AIW), 6ALA, (6ANK), (6APH), (6ARS), (6XAD), (6ZAA), 7DA, 7IN, 7YA, 7ID, 7ZJ, 7IW.

CALLS HEARD BY 7SG, DON HARRIS, 1711 SIMPSON AVE., ABERDEEN, WASH., SEPT. 6 TO OCT. 1.

Canadian—5BR 6AK 6AX 6CC 6CD 6CH 6CP 6CV 6DP 6DT 6EX 6GF 6GP 6GR 6GX 6HX 6IB 6IC 6KS 6LC 6LR 6OD 6OH 6OW 6PJ 6PP 6PR 6QR 6RH 6RX 6SU 6TC 6TU 6TV 6VM 6VX 6WO 6WZ 6ZE 6ZK 6ZU 6AAH 6AAU 6AAW 6ABM 6ABO 6ABR 6ABT 6ABW 6ABX 6ACA 6ACE 6ACR 6AEI 6AEW 6AEZ 6AFN 6AGF 6AHX 6AID 6ALU 6ANG 6APE 6ARC 6ARK 7BC 7BK 7BP 7CA 7CC 7CF 7CS 7ED 7FI 7GA 7ID 7IU 7IW 7IY 7JF 7KB 7GK 7KM 7LW 7MF 7MO 7OZ 7XD 7ZG 7ZJ 7ZM 7ZN 7ZP 7ZS 7ZT.

CALLS HEARD BY 6LV, WILLIAM BAKER, SAN MATEO, CALIF.

6CX 6DP 6EA 6EB 6ED 6EN 6ER 6GC 6GF 6HK 6IC 6IS 6JC 6JD 6KA 6KC 6KP 6LC 6LX 6MH 6MV ..OH 6OM 6PJ 6PP 6PR 6QR 6SK 6AAK 6ABW 6ACU 6AEI 6AGF 6AIB 6AIW 6AJE 6ALM 6ANK 6ANJ 6ANO 6ZA 6ZN 6ZH (phones and C. W.) 6XAC 6XAJ 6ASJ 6ALE 6AWY 6AUL 6AWT 6AAT 6XG 6XC 6ZE 6XW 7ZM 7BK 7BY 7AD 7ZB 7ZJ 7ZT 7XD 7OZ 7IN 7IW 7IN 7BW 7ED 7YA 7YS.

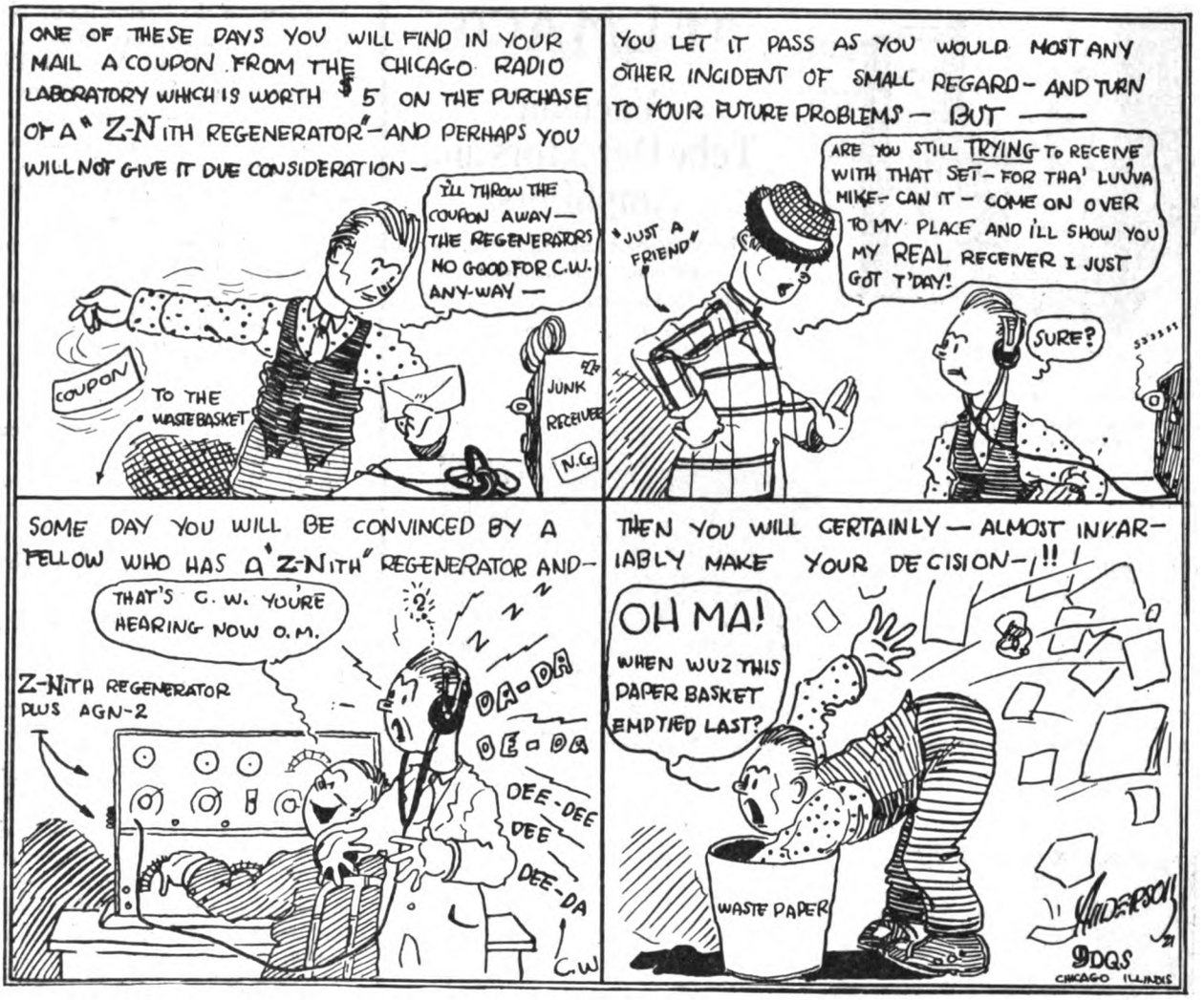
C. W. NEWSLETS

(Concluded from Page 171)

New members of the C. W. Club of California include 7RV, W. Morton, 6523 45th avenue, S. E., Portland, Ore., whose schedule is 11:10 p. m. Tuesday, Thursday and Saturday; 6AQT, M. Graham, 6784 Hollywood boulevard, Hollywood, Calif., wave length 202 meters, schedule 11:10 p. m. Monday, Wednesday and Friday, and 6ZAF, Allen H. Babcock, 2227 Piedmont avenue, Berkeley, Calif., wave length 375 meters, schedule not yet assigned.

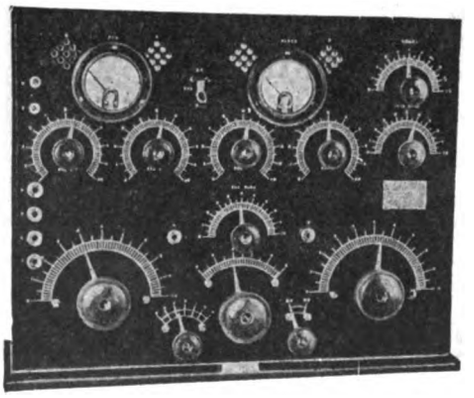
Plans are in mind to enlarge the C. W. Club of California to the C. W. Club of America, due to requests from district C. W. workers, the increasing range of C. W. work and the greater scope of Radio. What think you Eastern men of the idea? Definite announcement will be made in an early issue.

Radio 6XN asks that his wave length be listed at 240.



QRX Fellows—Here's Your Chance to Save Five Dollars on a Real C. W. Receiver

BEST *for* SPARK



Z-Nith Regenerator

BEST *for* C. W.

To be useful in a modern radio station, a receiver must be equally satisfactory for the reception of spark and C. W. signals. A set designed to respond to either alone does not meet the needs of an up-to-date DX traffic station.

The **new, improved** Z-Nith Regenerator, with a range of 180-1000 meters, 180 coupling, variometers with balanced inductance and many other exclusive features, will enable you to handle traffic with spark, C. W. and radiofone stations at will.

In order to boom fall business, we are sending, without charge, a coupon, good for $5.00 on the purchase of one of these wonderful new Regenerators to every person on our mailing list. If we don't have your name, and you want to take advantage of this unprecedented offer—

Write Us Now!

Chicago Radio Laboratory

6433 Ravenswood Avenue, Chicago, Illinois

Say Radio to the Advertiser, it will help you.

LETTERS TO THE EDITOR

Dear Sir: Will you kindly state in the next issue of the Pacific Radio News that 6GR is now located at: 6GR—.

EDW. ANDERSON,
1420 26th St., Sacramento, Calif.

Dear Editor: I would appreciate it very much to have my change of address placed in your magazine: "6AQU has moved his station from 117 West 45th St., Los Angeles, to 1937 Haste St., Berkeley." Have been reading the P. R. N. for a long time and it keeps getting better and better. Best magazine yet.

Very truly,
H. BECKER.

Dear Sirs: In looking over your Sixth District Amateur Stations I find you have 6ATN, M. E. Stuart, which should read M. E. Smart. Kindly rectify the error.

MERLE EDISON SMART,
Motor Route A, Fallon, Nevada.

Dear Sir: I note in your October issue of Pacific Radio News there is an article written by Mr. Schuwendt describing the construction of a small C. W. Radio set, wherein he writes, "from which can be seen that the circuit used is the familiar Colpitts with grid method of modulation."

While the writer does not claim very great results, when this method of modulation is used, he most certainly objects to have the entire credit go to someone who did not first produce the circuit as drawn by Mr. Schuwendt on page 87.

If Mr. Schuwendt will carefully analize Mr. Colpitt's circuit and then compare it with Logwood's circuit, he will note a similarity in grid modulation, but will not see much resemblance in the rest of the two circuits.

In the first place, Mr. Colpitt's circuit is an inductive feed back arrangement, while the Logwood circuit is a capacity coupled. In Mr. Colpitt's circuit he makes use of a C battery in the grid circuit, while in the Logwood circuit the grid leak is in series with the secondary of the

modulation transformer. Further inspection of the two circuits the H. F. oscillations are fed to the antenna through an oscillation transformer in the Colpitt circuit, while it is connected directly to the antenna in the Logwood circuit.

It was the idea of the writer to produce a circuit that did away with the well known four tuned circuit and be free from patent interference. To do this meant a single open radiating circuit, and the simplicity of the circuit devised by the writer is drawn out by Mr. Heising in the I. R. E. Proc., August, 1921. On pages 319 and 320 there is drawn the two circuits which are subject matter in this letter.

In a short time another patent will be issued to the writer which will show the filament earth connection erroneously left out in the patent already issued, which makes this circuit possible to oscillate efficiently. Very respectfully,

C. V. LOGWOOD,
Radio Engineer for the City of Chicago.

CUTTHROAT COMPETITION IN GENERAL PUBLIC BUSINESS

(Concluded from Page 174)

Special Extra Rush, San Francisco, Calif.
Radio, Unga, Alaska:

During first two months of general public operation you handled 18,113 words of Bolshevik code correspondence. In accepting messages from a foreign radio station we become responsible for all forwarding charges that arise after we pass the traffic through our station. On this code the forwarding charges from Unga to Washington, D. C., totals thirty-six cents a word, to which we added our own six-cent tariff, and sent a bill for $7607.46 to the Russian government. They wrote us a letter thanking us for handling their messages and enclosed a remittance of 14,916 rubles, which we have just sold as old paper for nine cents. Conferring with Great Alaskan Fisheries, we find our deficit account public operation of K-V-I will be about $8100.00 greater than theirs. They probably have a much more intelligent operator than we, at any rate we are convinced we got enough of this public business stuff.

Your station has been returned to a limited commercial license. Do not accept any outside business from anybody under any circumstances or you will be immediately discharged. Alaskan Codfish Company.

Night Letter, Unga, Alaska.
Alaskan Codfish Company, San Francisco:

Ship immediately one thousand pounds each prunes and raisins, two tons each best quality barley and rye. Present stock completely exhausted account preparations for great peace celebration of Unga and Pirate Cove settlements. Also ship one hundred latest magazines for radio operator. Ed Hooley, Supt.

THE PRESIDIO STATION
(Continued from Page 144)

sponsible for these improvements are well known to the radio fraternity.

In conclusion I might give a description of our set and antenna system. The antenna system is composed of a "T" type antenna 80 feet long, 4 wires spaced 3 feet apart; both ends open and insulated from the spreader. This is by no means ideal and we expect to make some slight changes in the near future. The lead-in is 65 feet long and is rat-tailed down to the lead-in insulator. The counterpoise system is composed of 16 wires spaced 1 foot apart, placed directly under the antenna and raised 3 feet off the ground, and is well insulated from ground. The set used is a plain two-tube transmitter, using one as an oscillator in a Colpitt circuit and the other as a modulator in the Heising circuit, the tubes being the Western Electric VT-2. The two transmitting tube filaments draw 3 amperes and operates on a plate current of 90 to 110 milliampers, and the normal radiation is .8 ampere. The power supply of the set is a 28-watt dynamotor, Westinghouse make, the motor side of which is run by a 12-volt storage battery, this same storage battery operates the send-receive relay, the microphone and lights the filaments of both transmitting and receiving tubes. The generator side of the dynamotor furnishes the plate potential, about 350 to 450 volts.

PACIFIC RADIO TRADE ASSOCIATION

Organization of the Pacific Radio Trade Association has been accomplished at San Francisco and Los Angeles, with A. H. Halloran as president, Ellery B. Stone as vice president, representing Northern California and Nevada; A. J. Edgecomb as vice president representing Southern California and Arizona; Max

SPECIAL OFFER
SEIBT PHONES

Unequalled opportunity. Special purchase cut price to unheard-of figure. We pass the savings on to you. World famous Seibt Phones—the invention of Dr. Seibt, builder of Seibt Precision Instruments—were $12.75,

$7.75

Equipped with Firco No. 34B, round type, "Bull - Dog - Grip" Plug, for only

$9.25

Nearest Firco dealer can supply you.

Wouldn't You Like to Own this Station?

TUNER, detector and 6-step amplifier for $115.00! Real quality at a new low price level—so arranged that you can invest a little at a time and yet get results right from the start.

That's what you get in Firco Midget Sets. You can start with just the Firco Tuner (150 to 1000 meters) for $15.00 and the Firco Detector for $11.00. You'll get results at once, better than you ever expected. Then you can add a little at a time till you get a powerful station like the one shown here.

Or, hook Firco Midget Audion Sets on to your present receiving apparatus. But **to preserve neat appearance and insure smooth operation, use Firco Audion Sets thruout. Then you're sure of results, because they're made to work together.**

Read the price list below. *Go to your radio dealer* and let the sets speak of their quality for themselves. Then resolve to put every cent you invest in radio from now on into Firco apparatus—where you get the most for your money.

Note: Six steps of amplification are made entirely practical, without howling or squealing, by the use of Firco Saco-Clad transformers. Saco-Clad 100% shielded amplifying transformers are also sold separately, in individual cartons, for $5.00.

Hook a Vocaloud onto any amplifying combination of Firco Sets, or other apparatus, and get your signals QSA all over your house. **No batteries, no adjustments, no extras. Station type (shown above) in solid mahogany cabinets, $30.00.**

Pick up the weak signals with Seibt or Brown phones, also sold by Firco dealers under the Firco trademark. At the new low prices, Brown super-sensitive, imported Phones are an unheard-of bargain.

John Firth & Company, Inc., 18 Broadway, New York

FIRCO RADIO

FIRCO MIDGET RADIO SETS

Tuner, 35A....	$15.00
Detector, 36A..	11.00
Detector and One-step Amplifier, 37A..	24.00
Detector and Two-step Amplifier, 38A	40.00
One-step Amplifier, 39A..	18.00
Two-Step Amplifier. 40A..	30.00

BROWN PHONES

Type A, Adjustable; was $22.00, now..	$18.00
Type D, for Radio work; was $20.00, now	16.00

FIRCO RADIO

MIDGET RECEIVING SETS

"Pioneers–since 1901"

Say Radio to the Advertiser, it will help you.

Loewenthal as secretary treasurer; Hall Berringer as secretary at Los Angeles, and E. T. Cunningham, Colin B. Kennedy and A. F. Pendleton as directors. Enthusiastic and well attended meetings have been held at both Los Angeles and San Francisco, constitution and by-laws adopted and committees appointed.

The District I committees are as follows:

Program Committee

D. E. Lyon, chairman; E. Portal, J. F. Dillon, L. Ets-Hoskin, C. B. Nelson.

Membership Committee

H. C. Hopkins, chairman; H. W. Dickow, S. Warner, C. Hassler, Tom Lambert, San Jose.

Public Policy Committee

Louis Levy, chairman; S. N. Peterson, O. H. Chamberlin, A. F. Pendleton, E. T. Cunningham.

Merchandising Committee

Leo J. Meyberg, chairman; H. J. Rathbun, J. K. Fairchild, L. H. Waldron, N. R. Kuhn.

Educational Committee

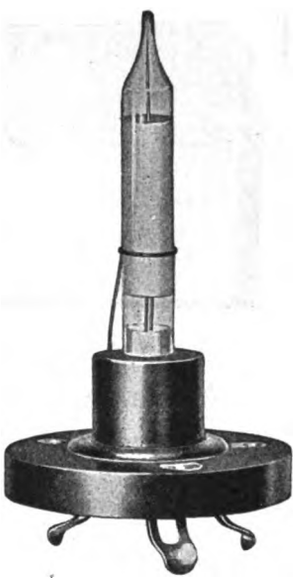
O. H. Miller, chairman; H. C. Hopkins, J. L. Swindelle, B. F. MacNamee, N. A. Bowers.

CONNECTICUT RADIO

The New Electron Tube

Detector and Self Amplifier

(Fully protected by patents in the principal countries throughout the world)



This Tube, the Sensation of the Chicago Radio Show, is new in principle and in operation. Hence it offers these notable advantages:

No B Batteries
No Tickler
No Grid Leaks
No Filament Adjustment
High Selectivity
Extreme Sensitiveness
(Equal to one stage of amplification)
Much Longer Life
Uniformity of Tubes
(All equally good)

It represents the result of over four years' exhaustive research, the study of nearly 2000 tubes, with complete records of the characteristics of each one. It has had thorough tests in our own research laboratories, and months of continuous operating use.

Only after gaining this full knowledge of its characteristics, its remarkable possibilities, and its practical usefulness, are we ready to offer it to radio workers as a forward step in a great field.

Made up in the complete CONNECTICUT Detector Set at $35.00; Detector Unit alone, $12.00; Tubes (for replacement), $3.50.

We shall be glad to furnish you with further information on request. Or ask your dealer to show you the set.

CONNECTICUT TELEPHONE & ELECTRIC COMPANY
Meriden Connecticut

80 Britannia Street

Say Radio to the Advertiser, it will help you.

STATIC STATISTICS

(Continued from Page 150)

cert every night. The Northwestern Radio Manufacturing Company (7XF) is giving us the latest jazz every night from 8 to 8:30 p. m. The records are furnished by the Remic Song Shop of this city, which makes it possible for the latest to be available at all times.

As 7ZB had just returned from a trip to Tacoma and Seattle you no doubt will understand that he was all filled up on theory and had to inform 7ZT and 7ED of some of his findings and conclusions arrived at through 15 minutes of scientific study and consultation with 7BK.

THE NEW YORK ELECTRICAL SHOW AND THE PART PLAYED BY RADIO

At the New York Electrical Show, from September 28 to October 8, the Radio Corporation of America was one of the most important exhibitors, with exhibits of transoceanic radio communication, marine radio communication and radio sales. One of the features of the exhibit was a 100-watt, C.W. and radio telephone, self-rectifying set, employing Kenotron rectifier tubes and the new magnetic modulator placed on an operating table in such a manner that every piece of apparatus was clearly shown and connected by colored wires. A 10-20 watt C.W. and phone set, using D.C. on plate, was also in operating order on this table with the same unique manner of showing connections. Another important exhibit was the Radiotron and Kenotron exhibit, where every tube in the Radiotron and Kenotron family was shown. Other important apparatus was a Klineschmidt automatic tape perforator and tape recorder as used by the Radio Corporation in its high power transoceanic services when radiograms from Europe and other countries are inscribed on tape in a correct and accurate manner.

PLAN TO CONTROL WORLD'S WIRELESS

An international wireless company for the control and development of the greater part of the world's radio facilities has been organized at Paris by representatives of the wireless interests of Great Britain, France, Germany and the United States. The American delegation was headed by Owen D. Young, vice-president of the General Electric Company, and included Edward J. Nally and J. W. Elwood, president and secretary, respectively, of the Radio Corporation of America, and a large staff of experts. The Westinghouse interests also were represented. British interests were represented by Godfred Isaacs of the British Marconi Company; those of France by E. Tiradeau of the French Wireless Company, and those of Germany by C. Shapiro of the Telefunken Company. Radio facilities of the four countries will be pooled, but each country under the plan will retain control over its respective territory. It is thus hoped to eliminate great waste occasioned in the past by duplication of equipment by the different organizations, and at the same time to place at the disposal of the international company unlimited funds for an extensive program of development and research.

This conference followed the international radio congress, which recently ended two months' work in Paris and which recommended to all the governments represented greater use of wireless and closer co-operation between the big powers.

NEW PACIFIC COAST TRAFFIC MANAGER TO BE APPOINTED

The American Radio Relay League has requested Pacific Coast members to suggest names from whom to select a successor to A. E. Bessey as Pacific Coast district traffic manager. Pressure of other work has compelled Mr. Bessey to resign this position, but he continues as a director of the League. As the League notice did not reach Western members until Oct. 10th, action was to be taken on Oct. 15th. A request for delay was wired to Hartford, Conn., so that agreement might be reached locally before recommendations were made. Several excellent men are available—men of mature years, executive ability and a sympathetic understanding of the perplexing problems involved. The several radio clubs have their names under consideration and the indications are that the right man will accept this duty. The Pacific district has been divided so that hereafter Sebastian Ruth will care for the Northwest and Mr. Bessey's successor will look after California, Nevada and Arizona.

BOY SCOUTS ENTERTAIN BY RADIO

On Oct. 3 the Boy Scouts of Oakland, Calif., entertained Oakland and hundreds of amateur radio operators in widely separated places with a wireless concert from the Fairmont Hotel, San Francisco. The receiving mechanism was operated by Boy Scouts, while the transmission was handled by the Leo J. Meyberg station on the roof of the Fairmont. Paul Steindorff took his entire sixty-piece orchestra to the Fairmont Hotel especially for the occasion, and his program was one of the most important radio demonstrations ever attempted in the west. Two songs were given by Miss Elfrida Steindorff and speeches in favor of the Boy Scout drive were delivered by Mayor James Rolph of San Francisco and Abe Leach, head of the committee which has the drive for funds in charge.

MINISTER PREACHES BY WIRELESS

An innovation in church services was introduced, Oct. 2, by Rev. H. A. Van Winkle, pastor of the First Christian Church of Oakland, Calif., who preached from the Hotel Oakland by wireless, not only to the members of his own congregation, but to thousands of others scattered for miles around on land and sea. Rev. Van Winkle sat in the hotel at a wireless telephone and preached his sermon into the receiver. Through the medium of the magnavox and wireless, thousands of listeners in different places heard his talk on "The More Efficient Way." The usual church music was also given over the radiophone by the choir. The Hotel Oakland Station is operated by P. D. Allen of the Western Radio School.

C. W. CLUB OF CALIFORNIA

(Continued from Page 141)

Mr. Lawrence Mott,
Catalina, Calif., Avalon.

Dear Sir: As I sit here and listen to the very excellent music being rendered by the new set of L. J. Meyberg, while reading your page in "Radio" devoted to California C.W. Club, it occured to me that you were doing an interesting and good work. (Pardon jazz in writing, but the durn phonograph is reproducing "Sweet Mama") so I decided just on the spurr of the moment, to offer my little bit for your use if suited, together with proof of the DX records.

The set of which I shall give diagram was built by myself early in the phone game here in Los Angeles, in fact the only other regular phone set working was one operated by 6XN.

You will note from both cards that voice was put through, though not very successfully insofar as communication was concerned, the C.W. being used for that purpose. But voice was understood.

The radiated amperage when working 7ZT was .5 and when working 5ZA was .4. The set was at that time at Olive (when working 5ZA only), 30 miles east of Los Angeles, and 6ER was signing off hence the card was addressed to him. Had to use series condenser, 43-plate Murdock, in order to reduce down to 200 M.

Am now using a more advanced set

and can supply information if you care to have some for future use.

Apologizing again for the jazzy nature of this letter, due to the music that continues to haunt me, I am,

Yours for C.W. predominance,
6JE.
Chas. E. Blalack.

A sense of justice compells me to add that in both these instances, 7ZJ and 5ZA I was qsp'd by spark friends.

Sept. 17, 1921.

Mr. Lawrence Mott,
Avalon,
California.

Dear Sir: I wish to be enrolled as a member of the progressive C.W. Club of California. My C.W. set consists of two 50-watt tubes. At the present time through the lack of proper high voltage I am only radiating 1½ amperes on C.W. and 1 ampere on voice.

I would like to be placed on your C.W. schedule as soon as possible. It will only be two or three weeks until I will have the proper high voltage. At the present time my wave length is 210 meters. This is the lowest I can get, as I have only one complete turn in the antenna and one in the ground circuit. Sincerely yours,

PAUL D. LANGRICK,
(Radio 6ATB).
510 North Lake Street.

NEW C.W. CLUB MEMBERS

7RV—W. Morton, 6523 Forty-fifth avenue S. E., Portland, Ore. Schedule: 11:10 P. M., Tuesday, Thursday and Saturday.

6AQT—M. Graham, 6784 Hollywood boulevard, Hollywood, Calif. Schedule: 11:10 P. M., Monday, Wednesday and Friday.

JURY RECOMMENDS RADIO COMPASS

Responsibility for the wreck of the steamer Alaska off Blunt's Reef recently has been placed on Capt. Harry Hobey by a coroner's jury which returned its verdict after several weeks of taking testimony in the cases of two persons drowned. Captain Hobey went down with his ship. Other officers were exonerated.

Blame for the wreck was placed on Captain Hobey because of his failure to check his position by radio compass bearings, failure to take soundings and failure to observe proper precautions at hearing fog warnings. The coroner's jury recommended that more general use be made of radio compass bearings, furnished by the U. S. Radio Service, and that owners of passenger-carrying vessels be required to equip their ships with a listening device for the detection of submarine sound signals from submarine bells.

THE HAM'S SOLILOQUY

Obey or not obey, that is the question:
Whether 'tis better in the end to suffer
The laws and rulings of the radio inspector
Or to take up arms against the troubles of the air
And by opposing end them; to quit, to send
No more, and by quitting to say we end
The QRM and the thousand natural shocks
Our flesh is heir to? 'Tis a consummation
Devoutly to be wished. To quit, to stop,
To stop, perchance to miss, aye there's the rub,
For while we stop what concerts come
When we have taken off that tikkler coil
Must give us pause. There's the respect
That makes pleasure of so long hours.
For who would bear the whips and scorns of dad,
The scant pocketbook, the spark-set's vexations,
The pang of a discharged cell, the code's mix-up,
The tubes' burning out, and the scoffs
That patient merit of the unworthy takes,
If 'twere not for the fun and fascination
Of being a radio bug? Who would these burdens bear,
To curse and swear at interference,
But that the chance of hearing something after dark
From that undiscovered country of the air from whose bourne
Every message comes, puzzles the will
And makes us rather bear the ills we have
Than pass up the sport of radio.

—A. H. H., with apologies to Shakespeare.

GENERAL PUBLIC BUSINESS

(Continued from Page 138)

Telegram, Unga, Alaska.
Alaskan Codfish Company, San Francisco:

Outposts report entire Pirate Cove gang preparing embark in dories and power boats, heavily armed. We are well trenched in; allies arriving daily from outside islands; will help us defend Unga against enemy. Ship complete new transformer primary, rotary-gap motor, exciting generator armature, three fire extinguishers and one dozen Hellkum Never-Fail, Kick-back Preventers. Superintendent Hooley wants three bundles first quality grave-digger's shovels. Radio K-V-I.

A Red (Government), U. S. N., Dutch Harbor, Alaska.
Commander Thirteenth Naval District, Bremerton, Wash.:

Information at hand indicates that it may soon be advisable to send a number of gunboats up to the Shumagin Islands. Full details being forwarded in a report which you will receive by next mail schooner leaving here some time next summer. Naval Radio, Dutch Harbor.

Rush Telegram, Unga, Alaska.
Alaskan Codfish Company, San Francisco:

Pirate Cove gang are coming. Radio K-V-I.

Rush Telegram, San Francisco, Calif.
Radio, Pirate Cove, Alaska.

Having checked up Superintendent Krugscaller's latest reports and examined our bills in this office, we find that general public operation of Pirate Cove radio station for two months has cost as follows:

Apparatus and repairs shipped	$3152.21
Telegrams about radio	98.76
Extra engine fuel	2640.00
Total	$5890.97

Against this we have a tariff on three paid messages received, totalling 26 words at six cents a word, amounting to $1.56, and leaving a deficit of $5889.41. This does not include boats and dories smashed by fighting fishermen. Public service operation of K-O-X-N is hereby suspended. You are now returned to a limited commercial license. Great Alaskan Fisheries.

Day Letter, Unga, Alaska.
Alaskan Codfish Company, San Francisco:

No fight. Enemy abandoned plans for attack, following receipt of advice that Pirate Cove P-G license has been cancelled. I have driven competitor out of the field by superior operating ability and feel that I am entitled to a substantial increase in my salary. Russian code messages running about 500 words a day at present. Please advice at once about salary. Radio K-V-I.

John Mills, No. 1,385,091, July 19, 1921 —Signaling.

A receiving system arranged to minimize the possibility of the production of false signals due to static, etc. The detector tube 3 transmits the signal to two circuits, 22 and 23, the latter being tuned to the audio frequency of the signal. By balancing the energy dissipated in these two systems, this energy being integrated for a period longer than that of the oscillation in circuit 23, it is possible to neutralize the disturbing influences. The energies are transformed into heat in the wires 26 and 29, which jointly control a contact 32 between two stationary contacts. Static disturbances have equal effects on wires 26 and 29 and the contact 32 simply moves parallel to the faces of the stationary contact while no signal is sent. Due to the use of integrated energy, irregularities in the instantaneous values of the disturbances have no bad effect.

POLITICAL SPEECHES BY RADIO

Now comes a suggestion from Chester Rowell, member of the California Railroad Commission, that by means of radio a candidate can sit at home and address gatherings of the entire electorate assembled in public squares, public halls or private homes equipped with magnavoxes and radio receiving sets. Ah, but where would the minatory finger of Sam Shortridge be, or the clenched hands of Hiram? Under this plan Theodore Roosevelt never could have shown his teeth or Bryan his seersucker suit. But the suggestion opens the mind to what the future has in store.

Classified Advertisements

Advertisements in this section are three cents per word net. Remittances, in form of currency, money order or stamps, must accompany order.

RADIO CABINETS — Mahogany or oak finished or unfinished, to your design. Send rough sketch for quotation. Prompt service. Formica cut to size. Radio supplies, parts, etc. Pacific Radio Exchange, 439 Call Bld., San Francisco, Calif.

STOP! LOOK! AND ACT! V. T.'s. With each Radiotron UV200 V. T. detector or A-P Moorhead V. T. detector or Radiotron U. V. 201 V. T. Amp. or A-P Moorhead V. T. amp., we will supply free of charge your choice of either a Murdock V. T. socket, improved contact type, or a Remler Bakelite smooth running rheostat, latest type. Radiotron UV200, $5. Radiotrun Amp. V.T. UV 201, $6.50; Moorhead A-P detector, $5.00; Moorhead A-P Amp. V. T., $6.50; Remler Bakelite rheostat, latest type, $1.00; Murdock V. T. socket, $1.00. We absolutely guarantee the foregoing apparatus. Only new and high-grade equipment carried in stock. All orders are filled within twelve hours and shipped postpaid and insured, thereby saving time and money. Remember us. The Kehler Radio Laboratories, Dept P, Abilene, Kansas.

MURDOCK ROTARY GAP, complete, $6.00. Harold Thiel, 27 Elgin Park, San Francisco, Cal.

COMPLETE I K.W. transmitting set of radio 6AEI for sale, $65.00. A bargain. Harvey Blackmun, Winton, Cal.

THE BEST Christmas gift that you can send your radio friend is a subscription to "RADIO." We will send him a beautiful Christmas card, telling him of your generous gift. Let us have the order now. Shop early and avoid the rush. Pacific Radio Pub. Co., Inc., 465 Pacific Bldg., San Francisco, Cal.

STUNG AGAIN—He thought he could get away with it, but it N. D.-O. M., cheap apparatus never did and never will give satisfaction. He tried others, but finally turned to us. Why? Because we make nothing but first-class apparatus, using standard makes of instruments, and yet our prices are low. Now he's satisfied. Try us and see why. "There's a reason." Yours truly, Montebello Radio Shop, Montebello, Calif.

ONE ESCO 550 Volt ¼ Amp. Motor Generator, 110 Volts A. C. Never used. $75.00. Perfect condition. Cost $85.00. 1 Jewell 0-500 Volt Meter, $10.00; cost $15.00. Reason for selling: going out of the radio game. C. MAASS, 250 21st Ave., San Francisco.

FIELD WIRELESS

Firefly and cricket
Have set up their wireless
In the fields, and tireless
They flash and click-click it.

What are they saying?
The long day is over;
The dew's on the clover:
It's time to stop playing.

There's more. They are spelling
Which way the wind's blowing.
How fast thing are growing,
How good they are smelling.

Oh! I wish I could utter
Half that they're sending
And receiving, blending
Their spark and their sputter.

Sometimes you feel creepy
To think they are talking
With things that go walking
When people grow sleepy.
—B. A. Botkin, in N. Y. Evening Post.

President R. P. Schwerin of the Federal Telegraph Company has concluded a contract with the Chinese government by which that government is to issue bonds, which apparently are to be turned over to the company, with which to construct five radio stations of great power at various Chinese ports.

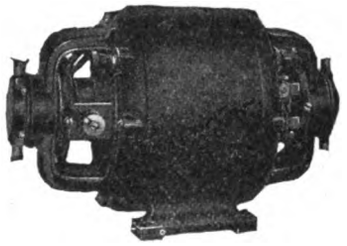
WESTINGHOUSE BROADCASTING STATION

The Westinghouse Electric & Manufacturing Company announces that it has opened a radio telephone broadcasting station at its plant in Newark, N. J., and, with the cooperation of the Newark Sunday Call, is supplying news and concerts which can be heard by wireless operators within a radius of 200 miles. Every night at 8:05, Eastern Standard time, an entertainment consisting of a digest of the day's news, government reports, and a musical entertainment is given. A special feature of the entertainments is a children's hour every Friday night at 7 o'clock, when songs and stories for the youngsters will be radiophoned.

During the world series baseball games every ball, strike and other play was reported as soon as made from this station, so that thousands were able to enjoy the games. Similar service will be provided for the major football games and other important events. The Westinghouse Newark station operates on a wave length of 360 meters and its call letters are WJZ. It should be easily heard as far south as Baltimore and as far north as Albany, while under favorable conditions the messages should be audible in practically the entire area east of the Mississippi river, and as far east as the Bermuda islands.

Guaranteed De Forest Parts for C. W. Apparatus Below Cost

Inductances for transmitters up to 50 watt capacity. 50 turns of wire wound on threaded formica tube. 7 or 26 positive taps. Proper spacing between turns for maximum efficiency. $8.50.



Guaranteed ESCO dynamotors, 110 volt D. C. to 500 volts D. C., 100 watts. Ball bearing type; one unit. This is the best possible outfit for C. W. plate supply. Smooth running. Noiseless in operation. Large overload factor of safety. Reduced to $65.00.

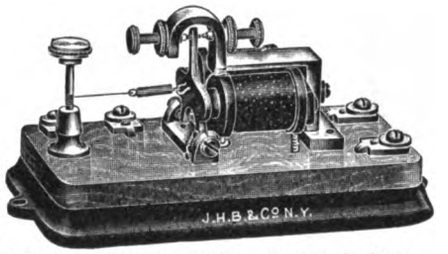
Ward Leonard vitrohm resistance units for filament current adjustment and other uses. The best obtainable. Absolutely constant resistances—
5 ohms with ferrules, 7¾"x⅝", 90c; 60 ohms, no ferrules, 2"x⅝", 65c; 90 ohms with ferrules, 2"x⅝", 75c; 5000 ohms, graphite sectors, 2½"x⅜"x¼", for adjustable grid leak resistance, 55c.

Panel type microphone on japanned arm ready for mounting. Low resistance. No. 262W. $4.00.

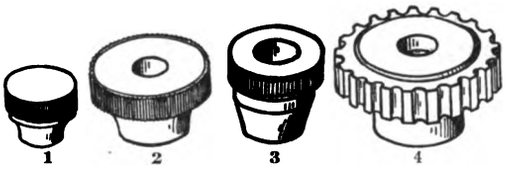
Federal telephone jacks with polished nickle plates, No. 1423W, 90c.

Guaranteed Standard makes of head telephones below cost—

Murdock No. 55	—3000 ohms	$4.50
Federal No. 53W	—2200 ohms	7.00
Federal No. 52W	—3000 ohms	9.50
Red Head	—3000 ohms	7.50



Bunnell relay operating on 6 volt battery. Ideal for electroc-magnetic transfer switch. $3.98.



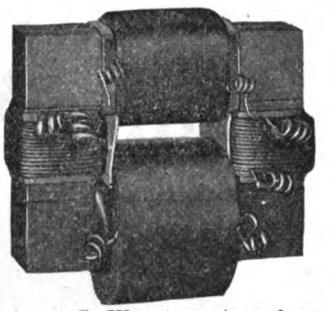
Knobs for switches, rheostats, variometers or condensers—
No. 1, ¾" top diameter, 6c; No. 2, 1¼" top diameter, 8c; No. 3, 15/16" top diameter, 10c; No. 4, 1½" top diameter, 15c.

DE FOREST DUO-LATERAL COILS
At lower cost than imitations

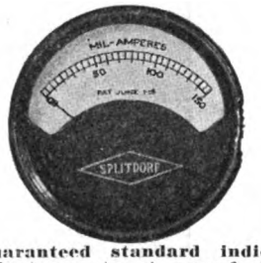
NOTE REDUCED PRICES

The mounting bands have been perfected so they are absolutely impervious to moisture; lower distributed capacity, lower high frequency resistance, and better made in all respects than any other coils of this type now on the market.

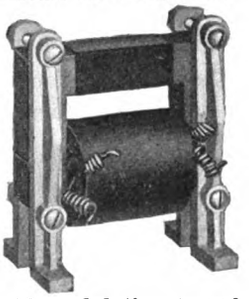
DL—25	$1.40	DL—300	$1.75
DL—35	1.40	DL—400	1.80
DL—50	1.50	DL—500	2.00
DL—75	1.50	DL—600	2.15
DL—100	1.55	DL—750	2.35
DL—150	1.60	DL—1000	2.60
DL—200	1.65	DL—1250	3.00
DL—250	1.70	DL—1500	3.50



Acme C. W. power transformers. Unmounted. For 60 cycle, 110 volt supply, 3 secondary windings. 6, 12 and 1000 volts, with center tap on high voltage. Designed to furnish 500 volt D. C. when using standard rectifier tubes. Works efficiently with all makes of tubes. $12.50.



Guaranteed standard indicating instruments at manufacturer's cost—
Hot Wire Ammeters — General Radio—scale 0-7, $7.00; Hot Wire Ammeters—General Radio—scale 0-2, $7.00; High Frequency Ammeters—Roller Smith—scale 0-5, $22.50; Filament Ammeters—Roller Smith — scale 1.5-0-1.5, $8.00; W. Filament Ammeters—Weston—scale 6.0-0-1.5, $9.00; D. C. Ammeters — Splitdorf — scale 0-2, $5.75; D. C. Ammeters—Splitdorf—Scale 0-3, $5.75; D. C. Ammeters — Splitdorf — scale 0-5, $5.75; Hot Wire Ammeters—General Radio—scale 0-10, $7.00; D. C. Milliamters—Splitdorf—scale 0-150, $5.75; D. C. Milliamters—General Radio—scale 0-250, $7.00; Filament Ammeters--Amer. Everready—scale 1.5-0-1.5, $3.80.



Acme A3 modulation transformers on mounting brackets. Exceptionally efficient input transformer for Radio telephone work. $5.00.

Perfectly insulated control buttons. D. P. D. T.; push locking type, for battery circuits, transfer switches, etc. $1.50.

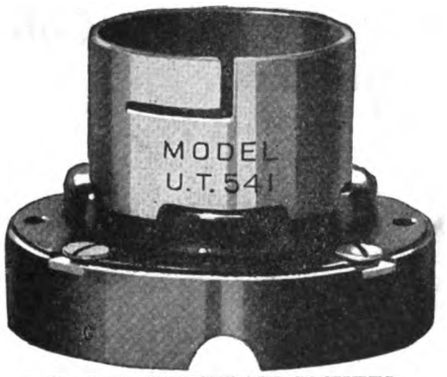
De Forest Radio Telephone & Telegraph Company

1391 Sedgwick Avenue, New York, N. Y.

Inventors and Manufacturers of High Grade Radio Apparatus

Say Radio to the Advertiser, it will help you.

Continental NOVEMBER Specials



R. C. A. PORCELAIN SOCKETS

These sockets have been specially designed to meet the need for a reasonably priced socket which at the same time would be a perfect insulator. Procelain as used in these sockets has been found to be a perfect insulation.

MODEL UR 542.....$1.00
(Designed for Radiotrons UV-200, UV-201, UV-202, Kenotrons UV-216.)
MODEL UT 541.....$2.50
(Designed for Radiotrons UV-203, Kenotrons UV-217.)

R. C. A. TONE FREQUENCY INTERVALVE AMPLIFYING TRANSFORMER

For maximum amplification be sure to use this rigid perfect intervale transformer specially designed for use with RADIOTRONS. Among other features that distinguish this transformer is the especially high ratio secondary to primary turns—9 to 1.

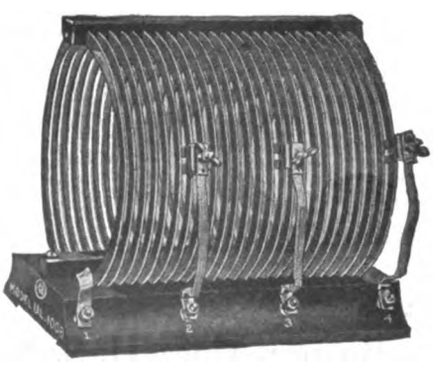
MODEL UV 712.....$7.00

* * * * *

R. C. A. OSCILLATION TRANSFORMER

This transformer was developed primarily for use with RADIOTRONS transmission. The clips supplied for tapping on the transformer are of the same design as those used on the Radio Corporations' commercial transmitters and overcome difficulties which have been experienced in the past with such connections.

MODEL US 1008.....$11.00



All the Way from Honolulu

they send to Continental for radio supplies. Read this letter, recently received:

"Today I am sending you a radio again for some wireless supplies. You are getting me delivery in fifteen days from the day I cable you, which is some service to the center of the Pacific."

(*Signed*) Cyril O. Smith.
Permanent address: The Royal School, Honolulu.

From Honolulu to New York and back in fifteen days! That means we shipped the order the day we got it. It means we had the goods right on hand, ready to be shipped at once. And we must have shipped it well, or Mr. Smith wouldn't keep on sending to us for all the radio supplies.

Are *you* getting that kind of attention to *your* mail orders? Try Continental the next time you need radio supplies. Our service covers the world. No matter where you live, you can count on the same courtesy by mail that you would receive in the store itself. No excuses—we make good!

There are still a few copies left of the Cresco 112-page catalogue. Send a quarter for your copy, which will be credited to your first $5.00 order. In the meantime, look over this list of specials, and order direct from the ad. Please help us to avoid any delay whatever, by making remittance by P. O. Money Order or bank draft.

CONTINENTAL RADIO AND ELECTRIC CORP.

EXCLUSIVE WHOLESALE DISTRIBUTORS FOR PARAGON RECEIVERS, PHONETRON LOUD SPEAKERS, AND CRESCO TRANSFORMERS.

J. DiBlasi, *Sec.* J. Stanley, *Treas*
Dept. G10
6 Warren Street, New York

DUBILIER UNIVERSAL CONDENSER
Provided in all the used capacities.
Price $2.00

FEDERAL MICROPHONE DESK SETS

A neat appearing, efficient instrument at an exceptionally reasonable price.

No. 261-W. Price..$6.50

R. C. A. FILAMENT RHEOSTATS.

Body is composed of insulating material containing a large percentage of asbestos, making this rheostat fireproof. Special features reduce tube noiseless.

MODEL PR 535.....$3.00
(Designed for use for Radiotrons UV-200, UV-201, UV-202, Kenotrons UV-216.)
MODEL PT 537.....
(Designed for Radiotrons UV-203, UV-204, Kenotrons UV-217.)

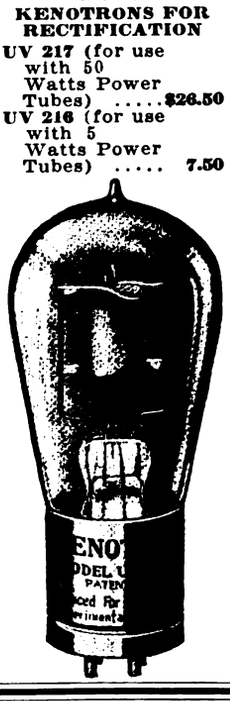
R. C. A. CONDENSERS FOR C. W. TRANSMITTING SETS

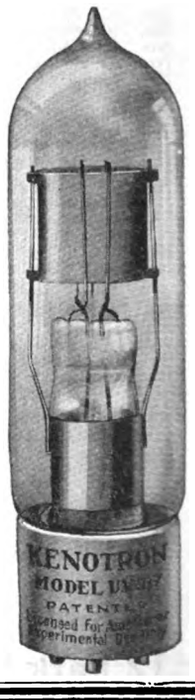
"Faradon" type condensers, highly efficient for Radiotron transmitting circuits.

Model UC-1014—Capacity .002 mfd. Voltage, 3,000. Price.....$2.00
Model US-1015—Capacity, 003, .004, .0005 mfd. Voltage 7,500. Price. 5.40
Model UC-1803—Capacity, .000025 mfd. Voltage, 10,000 volts. Price. 5.00
Model UC-1806—Capacity, .002 mfd. Voltage, 6,000. Price..... 7.00

KENOTRONS FOR RECTIFICATION

UV 217 (for use with 50 Watts Power Tubes) **$26.50**
UV 216 (for use with 5 Watts Power Tubes) **7.50**

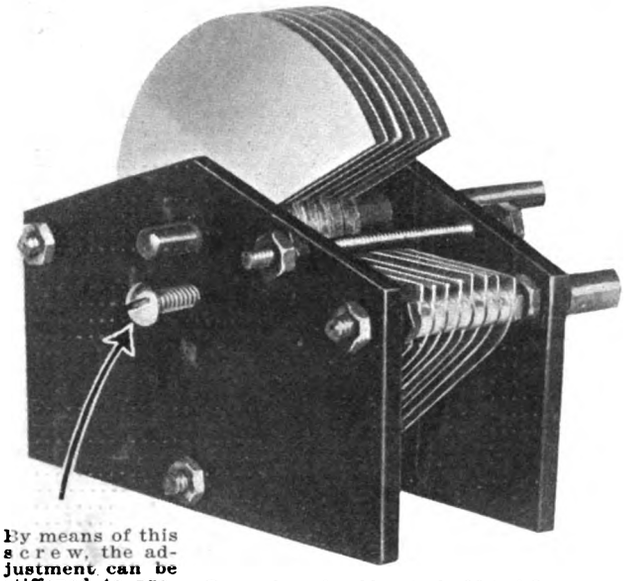




SERVICE

Buy your apparatus where you get the service that should go with every piece of equipment you purchase. Buy your apparatus from The Radio Telephone Shop, which has equipment and machinery complete to give every purchaser, no matter where he may live, a full measure of personal service during the entire life of each piece of apparatus he buys.

THE NEW "PEN BRAND" VARIABLE CONDENSER



By means of this screw, the adjustment can be stiffened to prevent the variable plates from slipping after the desired wave length has been secured.

Postpaid to any address in the United States.
Dealers write for proposition.

An Improved Type

This is the new Radio Telephone Shop Series X Variable Condenser, manufactured with a special screw by means of which the adjustment may be tightened to prevent the variable plates slipping after the proper wave length has been secured. Connections can be made either by soldering or with nuts. The plates are die stamped from No. 22 Gauge hard-rolled aluminum, and the entire condenser is of typical "Pen Brand" quality and rugged construction throughout, particular attention being paid in the manufacture to making it sturdy and accurate, so as to give perfect service over a long period of time. Radio Telephone Shop service goes with every one sold, and each one is fully guaranteed. Sizes for every purpose.

Price: 2 plate, $2.00; 23 plate, $3.60; 43 plate, $5.25. With Pen Brand condensite dial 75c extra

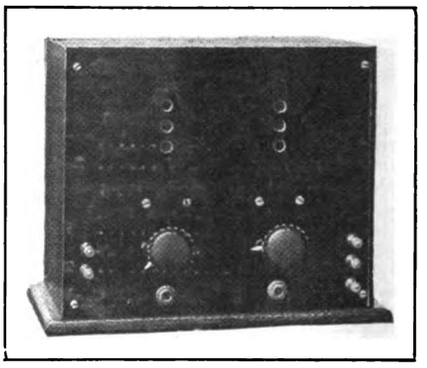
Apparatus made to your order

WE MAKE

DIES

The Radio Telephone Shop has recently installed special machinery and complete equipment to make manufacturing dies and handle die stamping work. Manufacturers will save time and money by procuring their dies here. Inventors—we can manufacture your apparatus. Write us for full particulars.

The special two-step amplifier illustrated at the right is a sample of some of the beautiful equipment the Radio Telephone Shop is manufacturing to the buyer's own specifications. If you want a set for some particular use, let us make it to order for you. If you can't buy what you want ready-made, have it made. Don't be satisfied with substitutes. We are completely equipped to make apparatus to order, from the smallest part to the most magnificent and most complete set. Tell us what you have in mind and let us submit a figure.



Of course we also have a complete line of standard equipment, and with every piece of equipment we sell goes the positive Radio Telephone Shop guarantee and the helpful Radio Telephone Shop service during the entire life of the apparatus. If you are not already one of our enthusiastic patrons, get wise. Try us. Get everything you are entitled to at the lowest price, and get it quick. Your regular needs, your special needs, and all your needs will be faithfully filled by—

THE RADIO TELEPHONE SHOP

RADIO EQUIPMENT

Dealers — Designers — Manufacturers

175 Steuart Street, San Francisco, Calif.

A. F. PENDLETON,
Manager

DECEMBER 1921. TWENTY CENTS

RADIO

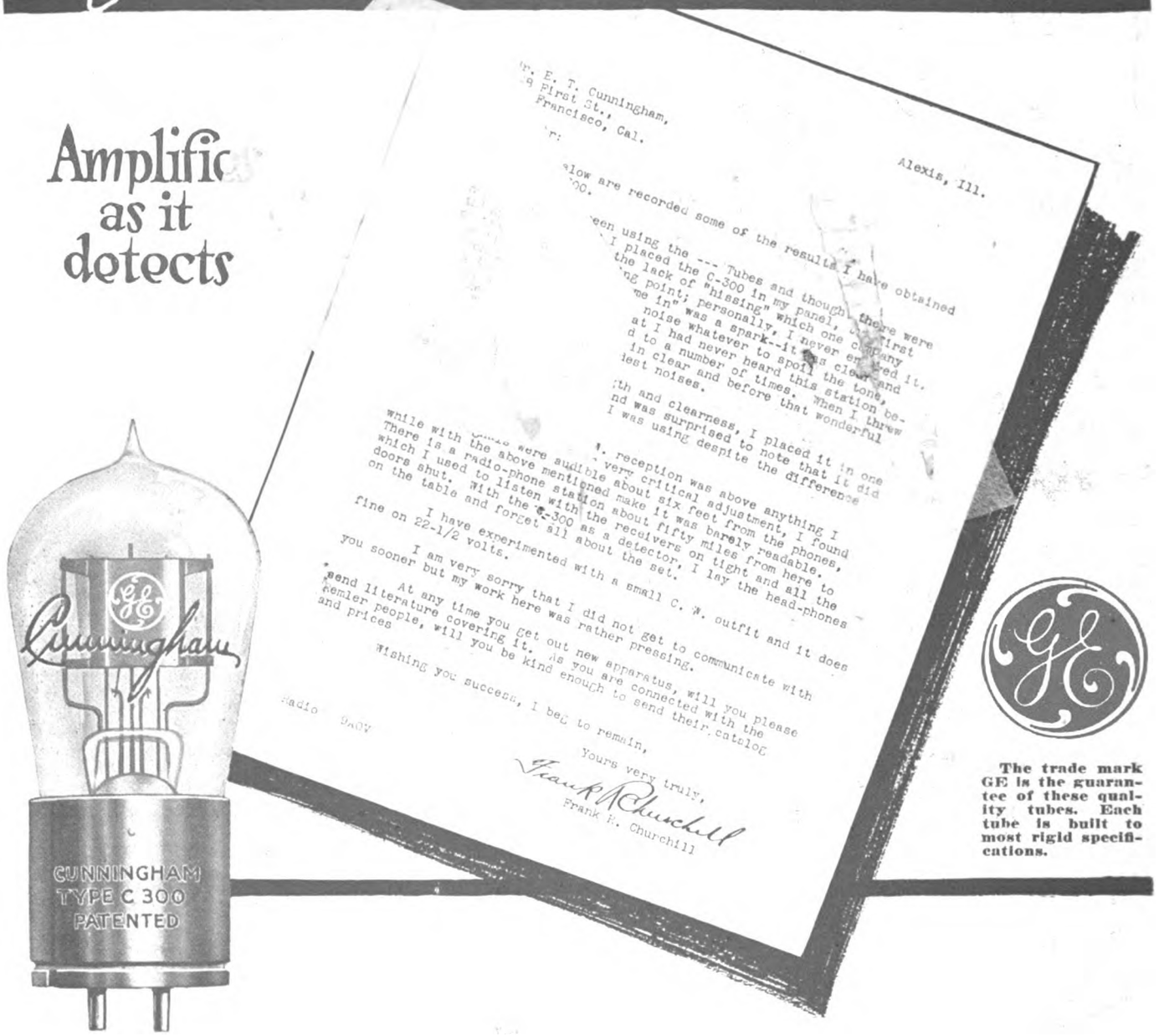
Formerly Pacific Radio News

REMLER APPARATUS FOR A RADIO CHRISTMAS

RADIO CHRISTMAS NUMBER

Cunningham Tubes Speak for themselves

Amplific as it detects



Cunningham C-300 Gas Content Detector

$5.00

The trade mark GE is the guarantee of these quality tubes. Each tube is built to most rigid specifications.

E. T. Cunningham

Trading as

AUDIOTRON MFG. COMPANY

248 First Street
San Francisco, Calif.

154 West Lake Street
Chicago, Illinois

REMLER APPARATUS RADIATES QUALITY
CUNNINGHAM TUBES MEET EVERY AMATEUR REQUIREMENT

RADIO

Established 1917 as Pacific Radio News

Volume III *for* DECEMBER, 1921 *Number 5*

CONTENTS *for* DECEMBER, 1921

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H. W. DICKOW, *Advertising Manager.*
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1003 North Coronado St., Los Angeles.

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Preceding Date of Issue

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Entered as second-class matter at the Post Office at San Francisco, Calif., under the Act of March 3, 1879.

Forecast of Contributions for January Issue

C. W. enthusiasts will welcome the announcement *that* ENSIGN JENNINGS B. DOW, U. S. S. California, is writing a complete "C. W. Manual," the first chapter of which will appear in these columns next month. The first article will deal with the Vacuum Tube Transmitter Circuit. Succeeding installments will treat of the inherent advantages and disadvantages of C. W. circuits to date, design and construction of five-watt, ten-watt and fifty-watt radio phones for receiving and transmitting, design and construction of a ten-watt and a 250-watt power amplifier, electrolytic and thermionic rectifiers, smoothing out systems, and valuable advice to the experimenter and constructor. This series will also be printed in book form prior to its completion as a serial in RADIO.

A beautifully illustrated account of radio as a preventive of forest-fires may inspire some of our readers with the ambition to operate one of the U. S. Forest Service radio stations next summer, an opportunity for combining pleasure and profit in an ideal radio vacation. The suggestion is pertinent that you urge your Congressman to do his part in securing a continuance of the airplane forest patrol.

The praiseworthy ambition of every amateur to build his own set may be intelligently and efficiently accomplished by following the explicit directions in a series of forthcoming articles by D. B. MCGOWN, assistant radio inspector sixth district. The first article to appear in December will illustrate and describe the construction of a good single coil receiver that will tune up to 2500 or 3000 meters, so as to get everything up to the short wave arcs. Succeeding articles will give directions for home construction of various types of receiving and sending equipment.

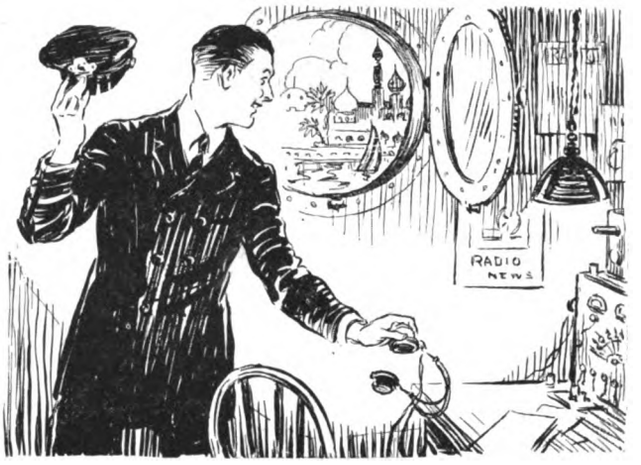
Much favorable comment has been received regarding the articles on how and why of radio apparatus by B. F. MCNAMEE. The first, published in November Radio, gave a simple account of the theory of radio tuning, and the current issue contains an account of the apparatus and manipulation necessary for good tuning, which will be concluded in December.

'Tis with pleasure that our readers are advised that G. M. BEST of the engineering department of the Pacific Telephone & Telegraph Co., will continue the Radio Question Box, which starts in this issue. Mr. Best is an experienced radio engineer whose answers to any questions that may be propounded can be depended upon for clarity and accuracy. Send your queries to him—care of RADIO.

It's Only a Step for You Now to a Fine Wireless Position

SURELY you have noticed how wireless is spreading over the world like wildfire! Every day you learn of some new field that is utilizing it—some new firm organized to push it forward. Big opportunities are open— and every day get more numerous and attractive. But do you realize that YOU can easily qualify for the wonderful opportunities that are opening? Amateurs—do you know that you can quickly build up your present knowledge of Wireless—and be ready any time you wish for a fine wireless position, either on land or on sea? You are in a fine position to cash in big on this growing field. Right at home you can easily build up your present knowledge and quickly qualify. Through our wonderful Four-Step Home-Study Method a short period of your spare time can be turned into preparation for a worth while future in the fastest growing field in America today—Wireless. You have the whole foundation already to build upon. Our new easy method of instruction makes the rest pure fun, but fun that pays big.

The coupon below will bring you an interesting free booklet—telling about the splendid opportunities open and how you can share them. Mail coupon for booklet today!

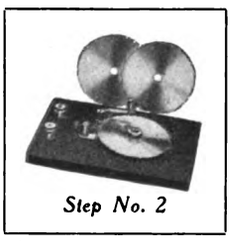


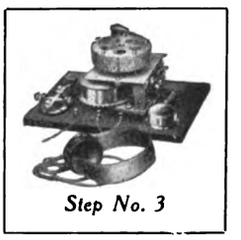
Amazing New Method Makes It Easy to Qualify

From our years of experience in training men for Wireless we have developed the wonderful new Four-Step Method. This method not only includes the comprehensive course of instruction written exclusively for us by some of America's greatest Wireless experts, (members of our own staff), but also includes as part of the course four remarkable inventions. Right in your own home with this amazing system we take you quickly and easily through the four short steps between you and one of the splendid wireless positions waiting for you. These four wonderful inventions make learning like a fascinating game, you learn by actually doing—and you progress so rapidly that many of our students have qualified for fine positions in a few months.

FOUR WONDERFUL INVENTIONS FURNISHED WITH OUR COURSE


Step No. 1


Step No. 2


Step No. 3


Step No. 4

Step No. 1—The Learner's Transmitter—makes learning the code a delightful pastime. With this splendid instrument you get through the fundamentals of wireless almost before you realize it.

Step. No. 2—The Learner's Receiver—does away completely with the old trouble of having to have a second person send messages to the student. With the Learner's Receiver the student masters what many consider the most difficult part of wireless in almost no time.

Step No. 3—The Wonderful Natrometer—perhaps the most important invention ever made for wireless instructional purposes. This amazing machine is designed especially to build up receiving speed. Six hundred different combinations of messages can be sent at speeds varying from five to one hundred words a minute smoothly, noiselessly and without the slightest bit of "choppiness" by this wonderful machine.

Step No. 4—The Special Westinghouse Receiving Set—completes your training into a high-paid wireless expert. This is a real receiving instrument and will enable you to "listen in" on the world. This splendid device gives you the practical experience of actually taking messages" out of the air."

Our special short-cut course is built around the use of these four wonderful inventions. No matter whether you know a thing about electricity at the present time, this wonderful Four-Step Method will qualify you quickly and easily for the splendid opportunities open for you in Wireless. No wonder our students learn so rapidly—hundreds of them are making good in all parts of the world today. You owe it to yourself not to let this really once-in-a-lifetime-chance slip by. With the experience you have already had as an amateur you should qualify in a very short time through this new easy way to learn.

Big Opportunities in Wireless

Radio provides you with a valuable training and gives you a trade that will last you a lifetime. As a radio operator you save big money right from the start. It is nothing uncommon for radio men to save $1,000 the first year they work—and why not? All expenses are paid in addition to salary, and he has plenty of time to prepare for the higher-up positions, (Radio-Engineer, etc.) paying $6,000 to $10,000 a year. Think of it! Are you going to let this great opportunity slip by?

Send for This FREE *Book*

11 Points That Make This School the Best

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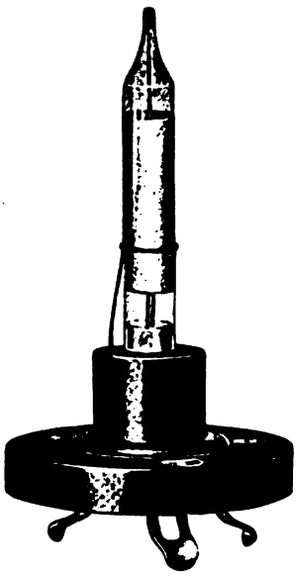
CONNECTICUT RADIO

The New Electron Tube

Detector and Self Amplifier

(Fully protected by patents in the principal countries throughout the world)



This Tube, the Sensation of the Chicago Radio Show, is new in principle and in operation. Hence it offers these notable advantages:

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No Grid Leaks
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High Selectivity
Extreme Sensitiveness
(Equal to one stage of amplification)

Much Longer Life
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(All equally good)

It represents the result of over four years' exhaustive research, the study of nearly 2000 tubes, with complete records of the characteristics of each one. It has had thorough tests in our own research laboratories, and months of continuous operating use.

Only after gaining this full knowledge of its characteristics, its remarkable possibilities, and its practical usefulness, are we ready to offer it to radio workers as a forward step in a great field.

Made up in the complete CONNECTICUT Detector Set at $35.00; Detector Unit alone, $12.00; Tubes (for replacement), $3.50.

We shall be glad to furnish you with further information on request. Or ask your dealer to show you the set.

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Say Radio to the Advertiser, it will help you.

Arthur H. Halloran
Editor

Lawrence Mott
Associate Editor

H. W. Dickow
Advertising Mgr.

RADIO

Vol. III, No. 5 DECEMBER, 1921 *Per Copy 20 Cents*

Radiotorial Comment

THE usual formula of this festive season is: "A VERY MERRY CHRISTMAS!" It looks stereotyped, and it is, we admit, strenuously overworked each year, but beneath the printed words lies all the depth of human friendship and fellowship that we possess—and that we extend to you right gladly and with fulsome cheer.

We think of you, not merely as subscribers, contributors and advertisers, but rather as co-workers, whose vast store-houses of energy are being expended along the lines of progress.

Progress! Magic term! And because of American youth and manhood, their devotion to it, this great nation of ours lights the way for the world.

It is a wonderful thing to be an American!

Have you ever given that a thought?

From the point of view of the ages of nations, we are 145 years young! But in that time we have reached—and passed—the rest.

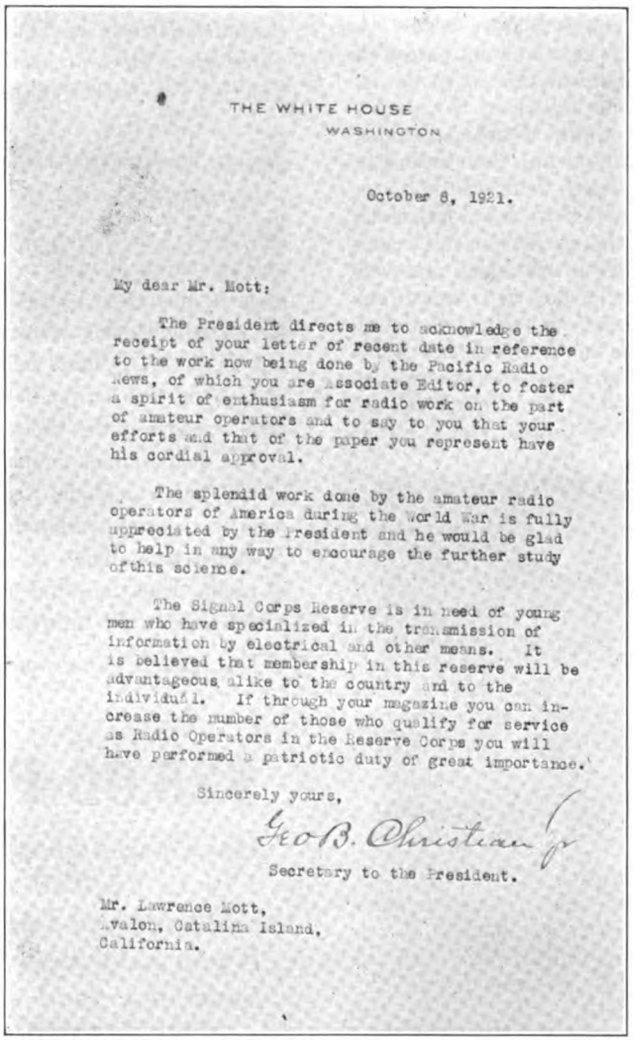
We do not write these lines in a spirit of egotism. Rather are they set down as a spur, that we—and by "we" I have reference to the vast body of American amateur radio operators—may not forget the little tale of the tortoise and the hare!

ON THIS page is a message from President Harding to the amateur radio enthusiasts, that we are indeed honored by having been given the great privilege of publishing.

We would ask that the amateur fraternity read the conveyed words of the President—carefully:

"The splendid work done by the amateur radio operators during the World War is fully appreciated by the President, and he would be glad to help in any way to encourage the further study of this science."

Portentuous words—these!



THE WHITE HOUSE
WASHINGTON

October 8, 1921.

My dear Mr. Mott:

The President directs me to acknowledge the receipt of your letter of recent date in reference to the work now being done by the Pacific Radio News, of which you are Associate Editor, to foster a spirit of enthusiasm for radio work on the part of amateur operators and to say to you that your efforts and that of the paper you represent have his cordial approval.

The splendid work done by the amateur radio operators of America during the World War is fully appreciated by the President and he would be glad to help in any way to encourage the further study of this science.

The Signal Corps Reserve is in need of young men who have specialized in the transmission of information by electrical and other means. It is believed that membership in this reserve will be advantageous alike to the country and to the individual. If through your magazine you can increase the number of those who qualify for service as Radio Operators in the Reserve Corps you will have performed a patriotic duty of great importance.

Sincerely yours,

Geo B. Christian Jr

Secretary to the President.

Mr. Lawrence Mott,
Avalon, Catalina Island,
California.

The splendid promise of a splendid man to encourage amateur radio efforts.

The body aggregate of amateurs would be stupid indeed, were they not to take heed and forge ahead.

President Harding did not reach unto the position of the nation's Chief Executive at a sudden bound. His years of public life, and more especially his years of experience in the U. S. Senate, have given him a passingly shrewd cognizance of the affairs of the world, that are, alas, in a sadly tangled condition, and he knows, full well, the telling value of Preparedness.

God wot, we have had enough of wars—we, a world of human beings that flatter ourselves that it is "civilized!" But the fact remains that the milk of human kindness, as between nations, is not overflowing to any marked degree. The fact remains that overwhelming strength in every branch of every service in the nation's defense and offence, is—par excellence—the only road that leads to Peace. The immortal Roosevelt summed the situation neatly when he said: "Be so thunderin' strong that no one will want to start anything!"

The amateur radio operators of the U. S. hold it in the palms of their hands to be of inestimable service to the President, in his capacity of Commander-in-Chief of the Army and Navy, as members of the Signal Corps Reserve.

Says the President:

"The Signal Corps Reserve is in need of young men who have specialized in the transmission of information by electrical and other means. It is believed that membership in this reserve will be advantageous alike to the country and to the individual."

This is President Harding's message. Could anything be more clear?

We think not.

And we ask that when it is possible to register at the proper places—to be later announced in these pages—for enrollment with the Signal Corps Reserve, that every amateur operator, of eligible age, and with sufficient knowledge, step forward one pace.

We further ask that those whose knowledge is a bit backward, bestir themselves and "make good."

We ask that the American amateur radio operators of the Pacific Coast work hard, seriously, continuously, during the coming year. We ask that the traffic managers of the ARRL be rendered every assistance in order that the Pacific Coast records for traffic successfully handled may prove that the operators out here are not a heedless lot of youth, but rather that they are men, of serious intent. We ask forbearance, one toward another; a little less jamming of the night airs with useless chatter. We ask that the Federal laws be obeyed.

And finally we ask that which we again extend to you—Friendship, Good Fellowship, Loyalty.

We ask these things, that his faith in amateur radio, the praise that the President has so generously bestowed upon it, and his recognition of its great potential value, may not be all in vain.

LAWRENCE MOTT.

WITH thanks do the publishers of Radio publicly acknowledge the receipt of congratulatory letters too numerous to be individually answered in person if every ounce of effort and every minute of time is to be devoted to making RADIO the best in America. We deeply appreciate these many expressions of approval and encouragement and can only say that we will do our best to justify them in the future by trying to make each issue a little better than its predecessor. To help us in this work we ask each reader to write us what he likes and what he dislikes in December RADIO what features he would like to see added and what departments dropped. And especially do we request our readers to send in radio questions so that our technical adviser, Mr. Gerald Best, may be enabled to make a success of his Question Box. Without questions no answers can qualify.

TOO much credit can not be given the generous and spontaneous action of the members of the Bay Counties Radio Club of Oakland, California, in agreeing to stay off the air while the radio concerts are being broadcasted nightly. This graceful recognition of the privilege of others to listen in to the musical treats that are now available to thousands shows that a radio fan can be a gentleman notwithstanding his eager desire to perfect his "fist" and teach his "ear." As a result many more people will put in receiving sets and the day hastened when no home will be complete without its radio.

BELATED, but none the less hearty welcome is herein given to Citizen Radio, the new name that now dignifies the amateur operator. But while such nominal recognition is due this praiseworthy effort to find for radio its place in the sun, we should not thereby forget the wonderful associations that cluster round the name "amateur." Literally and originally "a lover," amateur implies not the novice nor the inexperienced, but rather the doing well of those things which we like to do. And greatly is it to be desired as radio outgrows its swaddling clothes and assumes the responsibilities of maturity, that still may its devotees continue to play the game for the pure love of it. May the Citizen never forget to play the lover!

WE READ in the early records of the West that the Argonauts, finding a country without law and order, governed themselves by certain customs that now live and are enforced as the law of western water. So likewise have the pioneers in radio, finding the existing laws to be inadequate, mutually agreed upon certain rules of the air as traffic regulations. But the laws of the air, unlike those of water, have not yet been codified. The art is too young. Experience is showing that these tacitly accepted early customs are still inadequate to cope with the radio outlaw and to protect the majority.

So RADIO hereby extends an invitation to all of the radio clubs west of the Rockies to send representatives to a great meeting to be held at San Francisco on January 1, 1922, in order to devise some more effective means of regulating the traffic. Then and there will be given the opportunity to draft a "Pacific Plan,"—Pacific not alone territorially, but also because of its peaceful significance.

The suggestion is ours, but the action is yours, Oh Citizen Radiory of the West! Lay aside petty differences, forget past quarrels and get together in solemn council so as to bring out of the present chaos of the ether an order that may be respected and obeyed.

Your hosts will be the radio clubs of the San Francisco Bay district. Already have they anticipated this notice and prepared great pipes of peace and foaming beakers of balm. The San Francisco Radio Club has reserved a convention hall, plans a radio ball, and is arranging a radio show. New Year's Eve in San Francisco! Oh boy! Oh joy!

Let Vancouver, Seattle, Tacoma, Portland, Spokane, Butte, Salt Lake City, Reno, San Diego, Los Angeles, and all intervening centers of radio activity select of their best to represent them at this great peace conference. Let each club, through its accredited delegate, present its carefully formulated ideas. Let these various ideas be tested in the fiery furnace of discussion. And then let the best of them be welded into a complete ideal to govern the radio operator during the year to come.

The deliberations might well be guided by the general rules of the American Radio Relay League, which can be adapted to meet the special conditions peculiar to the West. They can be amended annually so as to keep pace with the rapid growth of radio. Thus, and thus only can be established that harmony so essential to the future advancement of radio.

The value of these words rests in their personal application.

$25.00 Prize Contest

Have you a receiving set that tunes from 175 to 25,000 meters and regenerates, oscillates and detects over its entire range? If you have such a set, tell us all about it. Send in a good sketch of the circuit, the entire constructional details and enter the race for a prize of $25.00 in gold for the best manuscript submitted. The contest closes on December fifteenth.

The Catalina-Long Beach Radio Telephone Link

An engineer's account of how radio telephone conversation from ordinary Bell telephones is maintained to and from Avalon.

Radio Station at Pebbly Beach, Catalina Island.

BY MEANS of a 30-mile radio link between the coast of Southern California and Catalina Island, it is possible for a telephone subscriber anywhere on the lines of the Bell telephone system to call any subscriber on the island by telephone. Now that a year's operation has demonstrated the success of this combined wire and wireless service, it seems desirable to give some of the details whereby this remarkable event has been achieved. For a full account the reader is referred to a paper by L. M. Clement, F. M. Ryan and D. K. Martin, which will appear in the Proceedings of the Institute of Radio Engineers. The following material has been rewritten from an advance copy of this paper:

Communication is accomplished by means of a 23-mile wire circuit from the Los Angeles exchange to Long Beach, a 31.5-mile radio link from Long Beach to Pebbly Beach on Catalina Island, and 1.2-mile wire circuit from Pebbly Beach to Avalon, the principal settlement on the island. This circuit is pictorially shown in Fig. 1. The radio circuit is operated in duplex, it being possible to send and receive at the same time from each station. Furthermore radio telegraph messages are sent while telephone conversations are being carried on without mutual interference.

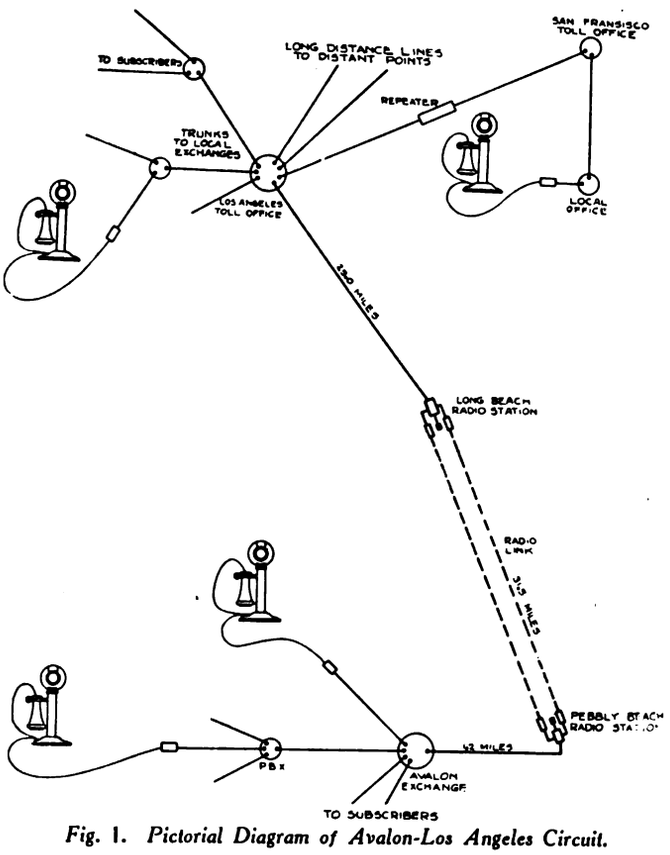
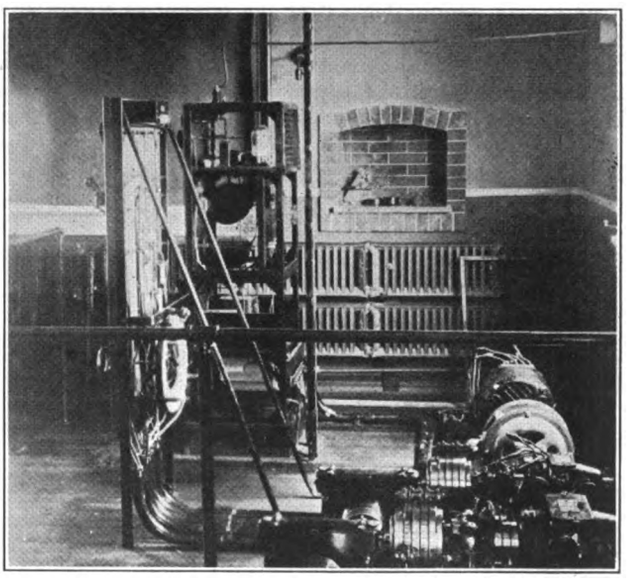


Fig. 1. Pictorial Diagram of Avalon-Los Angeles Circuit.

There were two methods available for establishing telephone service to the island, either by submarine cable or by radio; and, inasmuch as the time element and first cost were determining factors, the radio telephone was selected by the engineers of the American Telephone & Telegraph Co. as the best solution of the problem. Although the decision to employ radio was reached late in May, 1920, the system was in regular operation by the following July, this rapid installation being made possible through the co-operation of the manufacturing department of the Western Electric Company and the engineering and construction department of the Pacific Telephone & Telegraph Company.

The two principle requirements of the radio equipment were duplex operation and efficient connection to the ordinary two-wire telephone circuits. The first requirement was met by making use of the principle of selectivity, i.e., different wave lengths are used for transmission in opposite directions. After a careful survey and study of the interference from nearby radio stations a wave length of 470 meters was selected for the Long Beach radio transmitter and 400 meters for the Pebbly Beach radio transmitter.



Rear View of Transmitter Power Panel, and Motor Generator at Long Beach.

The problem of combining a sending and receiving channel into a single duplex channel had already presented itself in ordinary telephone repeater practice; and the same method of combining the two channels into a single channel was adopted

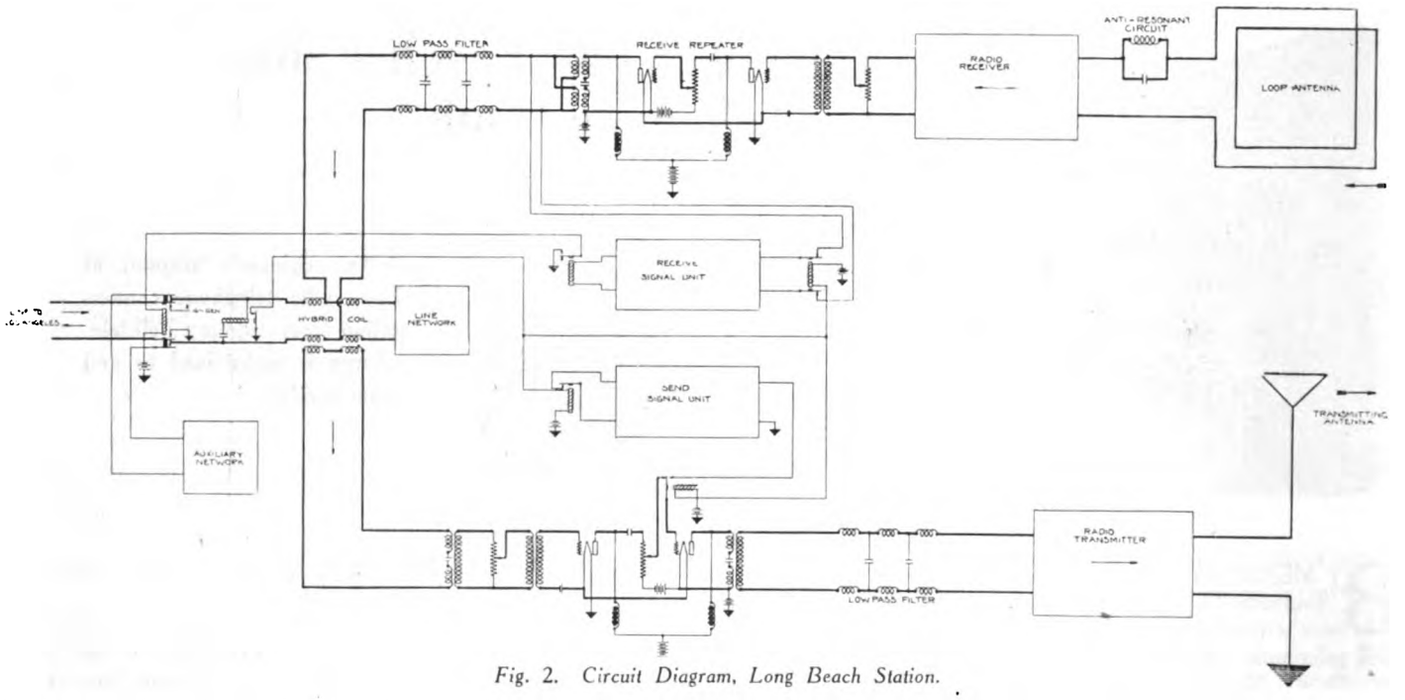


Fig. 2. Circuit Diagram, Long Beach Station.

in this case by using a three-winding transformer or hybrid coil, as it is called. This met the second requirement of efficient connection between the radio link and the wire lines.

Fig. 2 shows how the radio circuit is linked with the wire circuit. The heavy lines in this figure show the speech circuit, and the light lines the signaling system. For simplicity only the principal connections are shown.

Speech currents received from the Los Angeles line pass through the cordless switchboard to the hybrid coil and to the network inducing similar currents in the input winding connected to the send repeater. This repeater amplifies these speech currents and delivers them to a low-pass filter which freely passes the principal speech frequencies of from 200 to 2000 cycles, but greatly attenuates currents of frequencies higher than 2200 cycles. Experiments have shown that only the band of frequencies from 200 to 2000 cycles need be transmitted to deliver commercial quality and readily understandable speech, and therefore the use of this filter does not impair to any appreciable extent the quality of transmission. The filter serves two purposes: it prevents interfering currents of frequencies above the necessary speech range from entering the radio transmitter, and it makes the balancing of the line with a suitable network somewhat easier in that the balance must be effective only for frequencies below 2200 cycles. The output currents from the filter are delivered to the radio transmitter where they are further amplified and employed to modulate the radio frequency carrier current there generated.

The cordless switchboard provides convenient means for testing and monitoring on the circuit and for connecting quickly with another wire line in case of trouble in the wire portion of the circuit.

Referring to Fig. 3, the speech current is applied to the speech amplifier tube, E, through the input transformer T_1. The output of this amplifier is impressed on the grid circuits of the two parallel modulator tubes through the transformer T_2. The action of these modulator tubes is that of an amplifier and their output voltage is impressed on the plate circuits of the two oscillator tubes by means of the reactance L_2, which is common to the modulator and oscillator plate circuits. This modulation of the oscillator plate potential results in speech frequency variation of the amplitude of the antenna current.

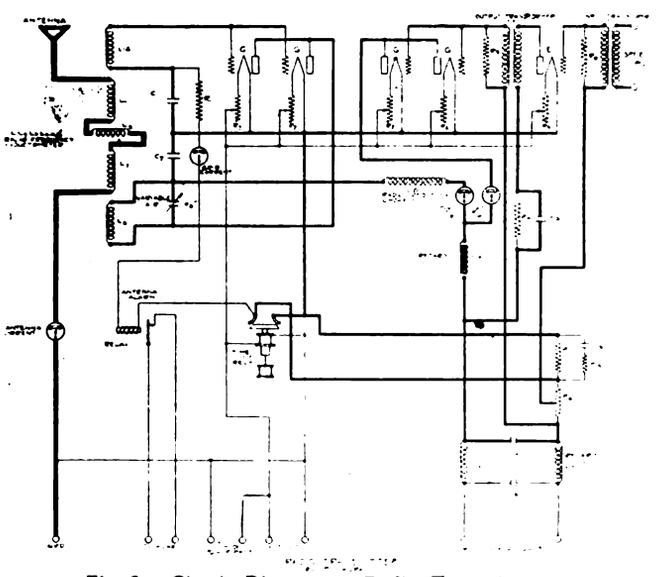
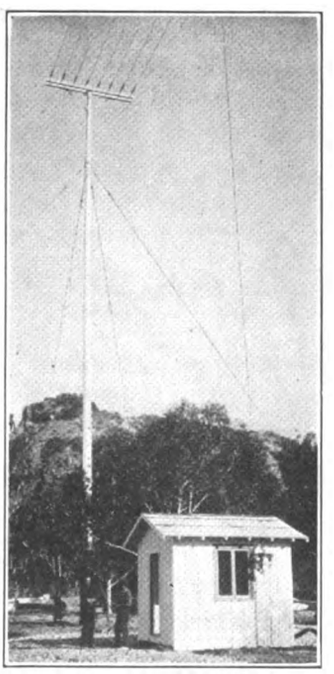
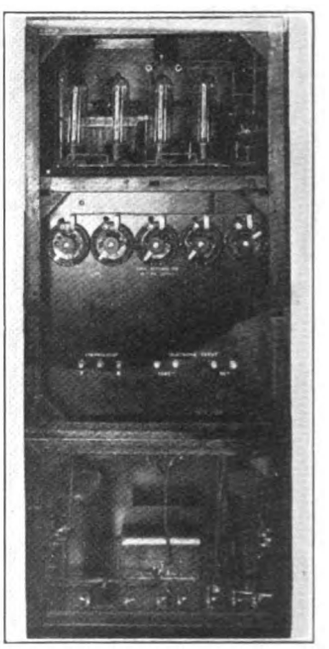


Fig. 3. Circuit Diagram of Radio Transmitter.



Antenna and Transmitter House.



Rear View of Radio Transmitter.

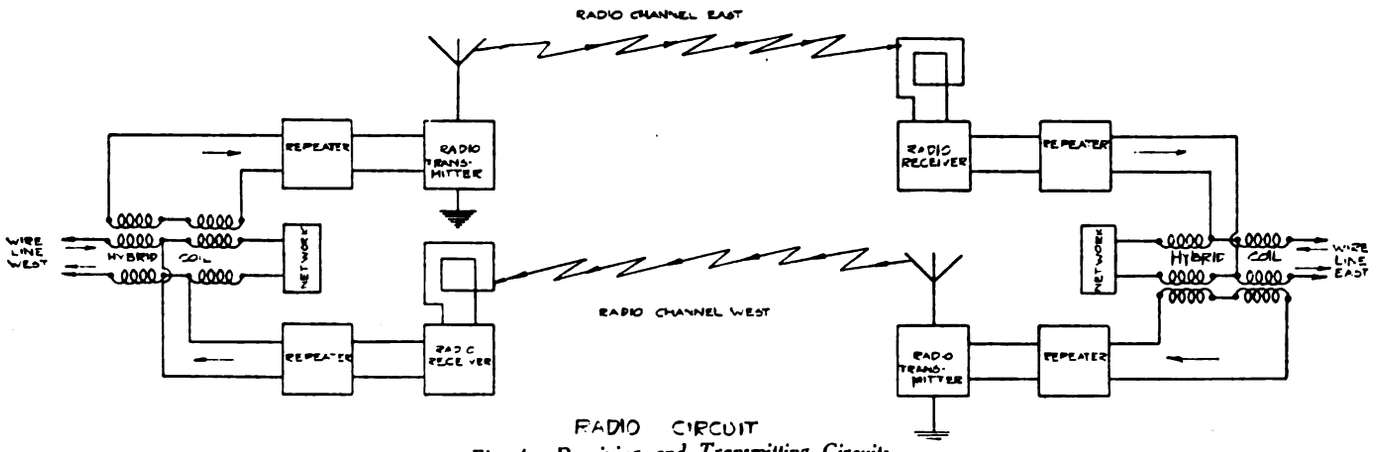
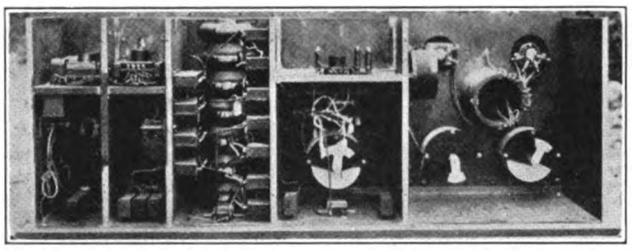


Fig. 4. Receiving and Transmitting Circuits.

Direct current supply from a.c. mains is obtained from a motor generator set consisting of an induction motor which drives two ECK generators, one 12-volt and the other 1000-volt. The low voltage supply heats the tube filaments and the high voltage furnishes the currents.

As may be noted from Fig. 3 the 1000-volt circuit includes



Rear View of Receiving Set.

a filter made up of the series retard coils L_3 and the shunt condensers C_4, which smooth out any commutator ripple or other machine noises and protect the generator from the radio frequency potentials.

Negative grid potential for the speech amplifier E is maintained from the drop in potential in the upper part of the resistance R_4 and for the modulator tube from the entire drop in this resistance, which carries the space current of all tubes in the transmitter set.

The 12-volt filament circuit controls the time limit relay which controls the auxiliary negative grid potential resulting from the drop of potential in R_{10}. This negative potential is large enough to stop oscillations and to minimize space currents. The filaments thus reduce to normal temperature before the auxiliary grid potential is removed, which prevents excessive space currents while the filament is heating. The oscillator grid circuit stops flowing whenever the oscillations cease in the antenna circuit, releasing a relay which actuates an alarm at the switchboard.

A loop antenna is used for receiving, it being of the solenoidal type 6 feet square with five turns.

In order to prevent, as far as possible, currents of the transmitting frequencies entering the receiver, an anti-resonant circuit adjusted to have a maximum impedance at the transmitting carrier frequency is included in the loop circuit and forms an effective filter.

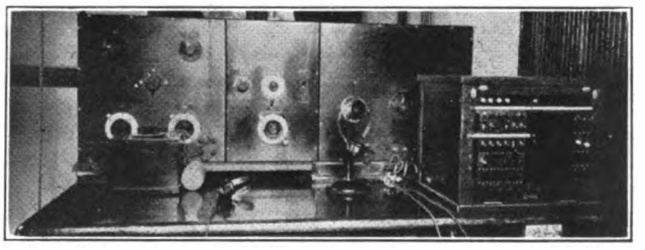
Fig. 4 clearly shows the entire receiving circuit as associated with the radio transmitter, and also shows the signalling circuit, the diagram in itself being self explanatory. The heavy lines in the drawing show the speech circuit and the light lines the signalling system. Current for the operation of the receiving apparatus is supplied by storage batteries and by dry batteries as in the usual amateur set.

One of the most novel features of the installation is the fact that the subscriber is called in the usual manner by the switchboard operator after the operator has been "rung" by means of a signal which not only passes over the radio link but is automatically relayed at the junction with the wire circuit. The operator at the sending station merely throws the usual ringing key and a light appears or a buzzer sounds at the receiving toll board.

As shown in Fig. 4 this is accomplished through a series of relays actuated by the usual 16-cycle ringing current from the line wire, these relays being connected to the sending or receiving tubes.

The transmitting aerial at Pebbly Beach and Long Beach are each supported by 90 foot poles 107 feet apart, firmly set on concrete and I-beam footing so as to get the full effective height of the masts. The antennae are of the T type and consist of eight wires spaced 2 feet apart and supported by double cross arms bolted to the pole and reinforced by a channel iron truss, making for great rigidity and minimizing any change of frequency due to the swinging of the wires. This construction is clearly shown in the accompanying illustration. The antenna wire is 7-strand No. 18 silicion bronze. All joints are made with copper sleeves. A lead-in of 1/4 inch copper sash-cord is connected to the antenna wires at their center. Each wire is fastened to a long eye-bolt passing through both cross arms and secured with lock nuts, thus allowing the tension of each individual wire to be regulated without affecting the tension of the other wires. Four porcelain strain insulators in series insulate each wire from the cross arms.

Grounding at Pebbly Beach is accomplished by wires run radially from the transmitter for a distance of 250 feet and buried in the ground to a depth of 8 inches. All surrounding conduits and water pipes are thoroughly connected with each



Front View of Receiving Set.

other, copper strips are buried in moist earth and thus is secured an effective low resistance net work.

At Long Beach, besides the office ground, copper strips are buried at the bottom of a 34-foot well which was filled up with junk copper, coke and earth; in addition all surrounding pipe and metal were thoroughly grounded.

It is of interest to note that not a single conversation has been interrupted by static, although the line has been "noisy" during electrical storms. The station radiates a pure sharp wave and any interference with nearby stations is easily eliminated by anti-resonant circuits.

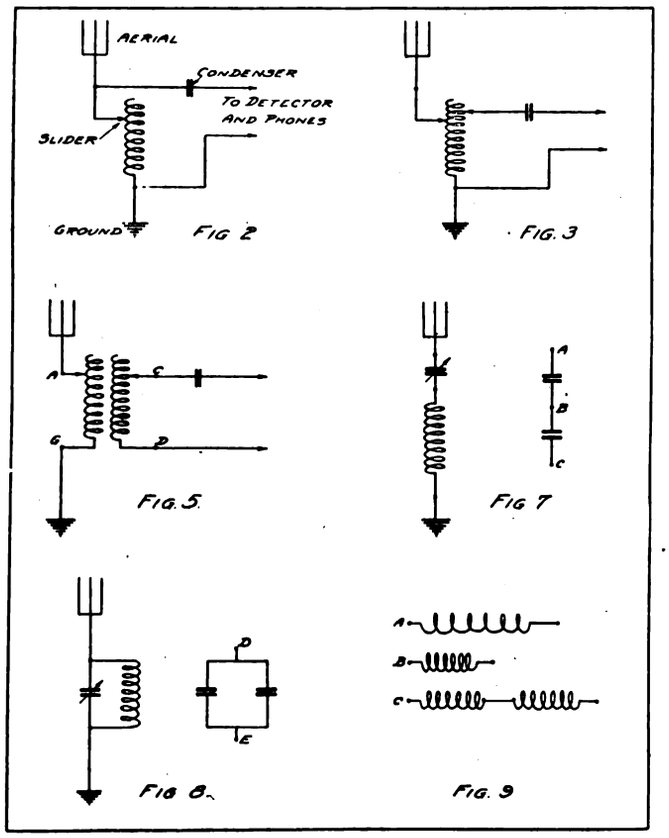
The Handling of Tuning Apparatus

By B. F. McNamee.

AN OLD style tuning coil consists of a single layer of copper wire wound on a tube made of some insulating material. The turns do not touch each other, being separated by insulation or by being wound in a groove. A slider makes contact with the wire, so that one can use any desired number of turns. By using the connections shown in Figs. 2 or 3, such a coil may be used for tuning to transmitting stations on various wave lengths by simply adjusting the position of the slider.

In studying the action of tuning apparatus we are repeatedly confronted with the terms "inductance" and "capacity." A short explanation is therefore in order.

Whenever an electric current flows there is magnetism set up in the space surrounding the conductor. To demonstrate this one has but to observe the deflection of the needle of a compass when brought under a trolley wire. The property which an electric circuit has of storing energy in the form of magnetism is called the inductance of the circuit. While a straight wire of given length has a certain amount of inductance, the same length of wire wound into a coil has many times that amount of inductance.



Before a lightning discharge takes place there must be a storing of energy in the cloud in the form of static electricity.

The property which the cloud has of storing electrostatic energy is called its capacity. This capacity of the cloud is greater because of its nearness to the earth than it would be if far removed from all conducting bodies. The cloud and the earth taken together with the non-conducting air between them form what is termed a condenser. A condenser consists of two conductors separated by an insulator, and usually takes the form of two metal plates separated by some insulating substance, such as glass or air. When a condenser is constructed of two sets of metal plates, in which one set is movable with respect to the other, we have the ordinary form of variable condenser, as shown in Fig. 6. The capacity of such a condenser can be changed by simply turning the knob, which controls the movable plates.

Just as the frequency of a pendulum may be changed by changing its length, the frequency (or wave length) of an electric circuit is changed by varying its inductance or its capacity. In the circuit shown in Fig. 2 the main inductance is the coil, and the main capacity is the aerial. It is easily seen that the aerial and ground form the two plates of a condenser with the air between them as the insulator. As it is difficult to vary the capacity in this circut, the tuning is done by running the slider along the coil, thus varying the inductance.

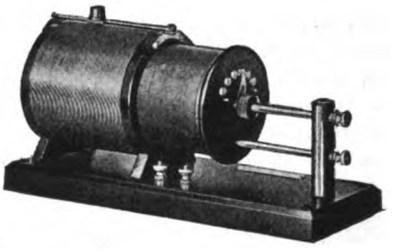


Fig. 4. Loose Coupler.

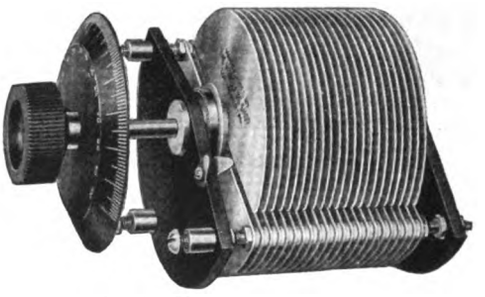


Fig 6. Variable Condenser.

Fig. 3 shows the two-slide tuning coil which permits the detector circuit to be tuned as well as the aerial circuit. This circuit will give louder signals than that of Fig. 2, because the tuned detector circuit will supply more energy to the detector.

Fig. 4 shows the ordinary type of loose coupler, the circuit of which is shown in Fig. 5. The two coils are generally arranged telescope fashion, with one of them free to move with respect to the other. One of the coils form the main inductance in the antenna circuit, and is known as the primary, while the other, known as the secondary, is the main inductance in the detector circuit. The action is the same as in an ordinary transformer. The magnetic effect of the current in one coil sets up a corresponding current in the other if the latter is tuned to the wave length in question. We therefore have two distinct circuits which must be both tuned to the incoming signal before it will be picked up, except in cases where we are very close to an extremely powerful station. While the loose coupler involves more adjustment than the tuning coil, it provides for much greater freedom from interference. A variable condenser is usually connected between points C and D to assist in tuning the secondary circuit.

It is a common and serious mistake to think of the two circuits of a loose coupler as entirely independent of each other when it comes to tuning. The presence of each circuit changes the amount of inductance in the coil of the other circuit, and the closer the two coils are placed, the greater is this effect. Consequently if we tune in a signal with the coils

For Consideration by the Secretary of the Navy

By Lawrence Mott, Associate Editor.

LET it not be thought that in this article I venture to criticize the Navy Department—as such, indeed, is far removed from my intent—which is to call the attention of the Honorable Secretary of the Navy to certain—facts. And this for the reason that it is seldom that the Man at the Top knows o'erly much anent "doings" many rungs lower down on the Official Ladder!

I reproduce part of a communication received by me from one of the foremost amateur operators in Southern California, a man of mature age and dignified profession, whose hobby is research and experimental work in radio effort. Only in the fact that he does not transmit messages for financial considerations is he different from Class A-1 Commercial Operators—and I make so bold as to state that he has forgot more about radio than the average commercial operator knows—today!

Hence his letter is very much worth while considering!

" . . . . *Something should be done about these arcs. It seems unjust that the Naval Stations should be permitted to use a transmitter that upsets all traffic within 100 miles. Their own engineers have counted over 60 harmonics. The foolish part of it is that it not only upsets all commercial and amateur stations within the above distance, but the Navy spark station, itself, has the greatest difficulty in reading, sometimes faring much worse than the amateur stations.*

"There must be some politics, somewhere, or else much gross negligence and inefficiency! It is too bad that some of the real engineers, interested in the location of some of the government radio stations, have not been listened to—at Washington. This arc station, here at San Diego, has no natural ground! It was placed where it is because of a fancied protection, yet its visibility is relatively just as great where it is, as had it been put in False Bay—where a really efficient ground system could easily have been obtained. The arc is the most discouraging single element here, completely wiping out as it does, decent reception most of the time. . . . ."

All this is a sheer waste of men's time, of the Government's apparata, etc. And it could all be efficiently remedied, were investigations—and their resultant changes—made.

I am informed that these conditions exist, to a large extent, wherever a Naval Station is situate.

WHY? Ah! there's the rub o' it!

Radio communication is rapidly becoming one of the chiefest arteries of the nation's means of communication. Should a state of war exist, it would be the artery. Why not—while the Dove of Peace—poor, harassed bird!—seeks a hit-or-miss roosting place on American soil, and timidly utters a plaintive coo-coo—why not look into the matter of faultily-builded Naval Stations, and correct mistakes? Mistakes that—although doubtless made in good faith—might prove to be very expensive—especially on the Pacific Coast.

No one censures an honest mistake. But they are fools, indeed, that seek to "hush up" mistakes—and trust to "getting by" with them.

RADIO holds no "special license" to censure, to criticize or to publish articles that are derogatory to the dignity and prestige of the Government of the United States. Or that reflect adversely on any Department in the Government. The Editors take a very great deal of pride in trying to further certain plans of the War Department—for more efficient radio among civilians.

BUT the Editors also feel that it were a mistake—in the wrong direction—not to call the attention of the Honorable Secretary of the Navy to certain, inexcusable weaknesses in the nation's most sensitive and critical arm of defense: its means of radio communication on the Pacific Coast.

"loosely coupled" and then separate the coils somewhat ,the signal will become weak or disappear, because it is now de-

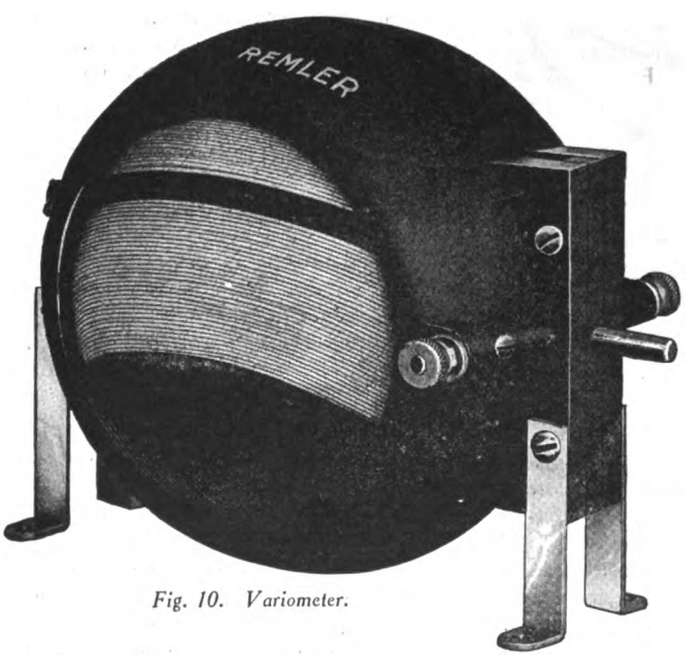


Fig. 10. Variometer.

tuned, due to the changed inductances. This does not mean that the coils must be returned to their former close position, but rather that the signal should be tuned in again, with the coils somewhat separated, by means of the sliders or variable condensers. It will generally be found that the signals can be made as loud with loose as with close coupling, and at the same time the possibility of interference is greatly reduced.

When condensers are connected in series as in Fig. 7, the total capacity is reduced. Thus the capacity between points A and C is less than that between either A and B, or B and C. Fig. 7 also shows a variable condenser connected in series in the antenna circuit, thus cutting down the total capacity. This circuit will therefore tune to a shorter wave length than otherwise.

When capacities are connected in parallel as in Fig. 8, the total capacity is equal to their sum. Thus the wave length to which the antenna circuit in Fig. 8 will tune is increased because the capacity of the variable condenser is added to the capacity of the aerial.

Fig. 9 illustrates the principle of the variometer. A represents a coil with widely separated turns. B represents the same coil with the turns brought nearer to each other. In the case of B the magnetic action of the current in each turn has much more effect on the other turns than in case A, and the inductance of B is therefore greater than A. C represents two coils wound in the same direction. If they are brought nearer each other, the total inductance is increased. If one coil is turned completely around so that its magnetic field opposes the other, the total inductance will be decreased by bringing them close together. In the variometer shown in Fig. 10 one coil is mounted on a shaft and may be revolved. The inductance is greatest when the current goes through both coils in the same direction, and least when it goes around the two coils in opposite directions. By means of a variometer we can have any amount of inductance between these two values.

(To be continued in January RADIO.)

Promoting the Sale of Radio Equipment

By Ellery W. Stone.

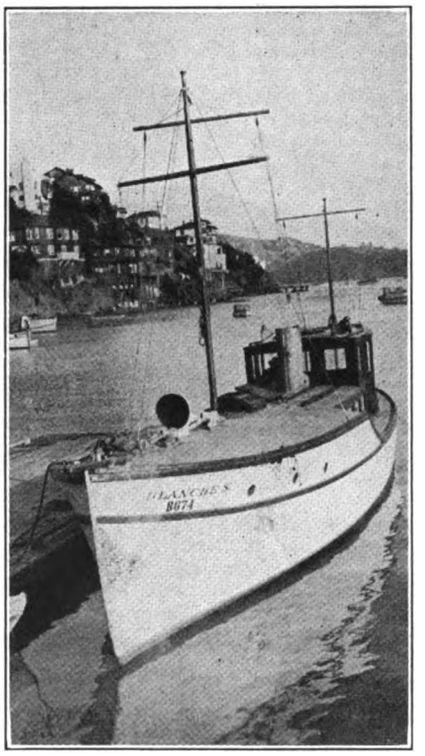
This is an article which every amateur can read with profit. It is taken from an address given before the San Francisco Electrical Development League, many of whose members are prospective radio dealers. It illustrates the work that is being done to make it possible for every amateur to examine his equipment before purchase in his own home town. It also opens up the way for commercial advancement in the radio field on the part of ambitious young men.—The Editor.

In the early days of radio, the bulk of the so-called amateur radio business was handled by the mail order method. But as the volume of business increased and as new inventions and developments were made, the number of manufacturers increased steadily and the form of distribution naturally changed. Radio equipment is not a staple article, the purchaser wants to see and handle his prospective purchase rather than to buy them from printed descriptions in catalogs, so that the logical contact with the purchaser is through the retailer.

According to "Electrical Merchandising," the market in this country consists of some 700,000 boys, men, and some women, ranging in age from 16 to 60, the average age being 21. Until the last year or two, the radio market consisted largely of the boy who bought radio parts and in many cases, only raw materials, with which he built his own equipment. That was before the advent of the radio telephone, when to be able to transmit and receive radio messages, it was necessary to learn the telegraphic code. As a rule, it was only the boy who had the time, the ambition, and—I must admit—the ability to become proficient in the code. And because he was only a boy with a youngster's naturally limited purchasing power, although as I have intimated before, this was sometimes unnaturally augmented, he was restricted to the purchase of parts only and he was able to build a set which he could not afford to buy ready made because he had an abundance of time which cost him nothing. Besides, he was not limited to eight hours daily production.

But with the advent of the radio telephone, the adult has become interested in the radio art, because it is no longer necessary to learn the telegraph code in order to gain employment from this pastime. Anyone now can enjoy concerts by radio in his home, no government license is required for receiving sets, and so far as technical knowledge is concerned, it is no more difficult—and probably easier—to operate a radio telephone than to drive an automobile. The equipment necessary to receive music and news items by radio is neither cumbersome nor elaborate and the cost is no more than that of a phonograph. It may be installed anywhere in one's home and there is no unsightly mast to be erected, as in the old days. A single bare copper wire strung from the roof to a house, tree or other support, say two hundred feet away, is all that is required.

The electrical dealer gets so many calls for radio equipment that he has to put in a radio department. He hires a bright radio amateur for work after three p. m. and all day on Saturdays. Such an amateur knows what you need to carry in stock, he belongs to one or more radio clubs, his friends will buy from your store, and you will learn the radio business from him. But don't think you will be able to supplant him. Because when the time comes when you know as much about the radio business as he does, your radio department will have developed to the stage when you will need all of your radio salesman's time and you will be looking for additional help from him.



Motor Boat Cruiser "Blanche S" equipped with Radio Receiving Set. Dr. Martin E. Simon, Flood Building, San Francisco, is the Owner.

What is the cost of the apparatus purchased by the amateur? The average boy starts off with a supply of parts and small equipment which will total from $5 to $15, and as his interest and his requirements increase, he buys more and better apparatus to add to or replace what he started with. The older amateur or the adult prefers to buy a set complete and his initial outlay will average at least $50. By the time both types of amateurs get through with this thing, only fortunately for us they never do get through with it, they will have stations worth hundreds and even thousands of dollars.

"Electrical Merchandising" very conservatively estimates the purchasing power of the radio amateurs who "tinkers" and experiments at about $25 per year. The radio customer who has the means and inclination to purchase complete sets ready made of course does not buy new apparatus often. But he does buy supplies for renewal, and as he increases the range of his set, and this invariably happens, he spends more for new equipment than the "tinkering" amateur spends in a number of years.

There are some 6,500,000 farms in the United States with at least one boy per farm who can learn to operate a radio receiving set. The Department of Agriculture has commenced the erection of eight radio telephone stations at the various agricultural centers of the country to broadcast by telephone crop reports, crop and produce prices, weather and stock reports. There are several receiving sets on the market designed especially for farm installation. The radio manufacturers are advertising in the farm journals and these journals are running editorials and articles on the subject. You jobbers have your salesmen out in farming territory. A radio line will be a profitable one for them to handle.

In addition to the boy amateur, the power company and industrial concern, and the farmer, there is the man who installs a radio receiver in his home for the reception of concerts, stock reports, baseball scores and other news items. I know of a man of means across the bay who has a radio receiver in his living room and his daughter, who doesn't know an ampere from a volt, operates the set and receives radio music in their home every evening. There are many such installations in private homes locally, pur-

(Continued on Page 246)

The Armstrong Super-Heterodyne

By A. K. Aster.

The rapidly increasing number of amateur stations makes it necessary to have an extremely selective receiving set in order to do any long distance work or to listen to any radio-phone undisturbed. To meet this demand the Armstrong super-heterodyne is the only system which permits almost unlimited radio-frequency amplification and allows you to get that faint fellow several districts away. Remember, that two or three steps audio-frequency amplification is about the limit, that a detector works much better on strong signals than on weak ones, and that the way to get strong signals into the detector is to use radio-frequency amplification.

Fig. I shows the wiring diagram of such a system adapted for use on short-wave-lengths. Its operation consists in heterodyning the 200 meter incoming signals to some long wave-length, say 3500 meters, then amplifying them at radio-frequency, then detecting them, and finally amplifying them at audio-frequency to any desired audibility. The reason for hetrodyning the incoming signals to some long wave-length is because this gives added strength and because radio-frequency amplifiers work better at long wave-lengths than at short ones. All this sounds far worse than it really is.

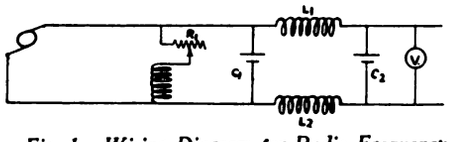


Fig. 1. Wiring Diagram for Radio Frequency Amplifier.

At this point let me dispel any fear which may lurk in the mind of the reader regarding the difficulty of handling this system. It is very easy to adjust, having no more settings than the ordinary feedback receiving set. In place of having to set the size and coupling of the tickler coil you have the coil and condenser of the local oscillator to set.

First tune the primary and secondary to the wave-length of the sending station and then adjust the local oscillator till the signals come in loud and clear. It will be noted that only the first step of the radio frequency amplifier is tuned, the other steps being resistance coupled. This is far simpler than the ordinary radio frequency amplifier because, once set, it does not need any further adjusting. It may be found necessary to keep the first step slightly detuned to prevent howling, otherwise this system is absolutely howlproof, a decided advantage over the feedback system. Those who have never used a properly designed set of this kind have no idea of its possibilities. It is the only system for real relay and loop work. Contrary to current opinion this entire system can be successfully operated from a single "B" battery without difficulty.

The oscillator, tuner, radio-frequency amplifier and detector, and audio-frequency amplifier must be mounted in separately shielded boxes or in separately shielded compartments of a single box. I cannot overemphasize the fact that the system must be properly shielded to get satisfactory results.

If separate boxes are used, they may be lined with tin foil, including the inside of the front. Such boxes should be provided with a false front three or four inches back of the actual front. All tap-switches, etc., should be mounted on this panel and all controls, including condensers and rheostats, must be connected to the actual front by means of rubber or bakelite rods.

If a single box is used it likewise should be provided with a false front for controls, but it should be lined with thin sheet copper as, due to the proximity of the various parts, the resistance of the tinfoil would be too high for sufficient shielding. All joints of the box, except the top, should be soldered and the connecting wires from one compartment to another should be led through as small a hole as practical. No matter what sort of boxes are used, the tubes must be mounted inside of the boxes and shielded by mounting copper tubes around them. These copper tubes should continue through to the front of the box and there be capped by screening so as to permit ventilation and observation of the filament color.

The "B" battery for a system like this should be at least 100 volts and since at least four or six tubes would be used the upkeep cost, if flashlight cells were used, would be high. The solution is either a set of small storage batteries or a motor-generator set. A set of small glass jar storage batteries can be purchased for about the cost of three sets of standard 108 volt "B" batteries. Probably the most economical scheme in the long run is a motor-generator set. The writer built such a set from good second-hand machines for about the cost of a standard 108 volt "B" battery. The generator can be made of any good 110 volt d. c. shunt wound motor having at least 36 bars on the commutator and having a well, electrically balanced armature. All armature coils must have the same number of turns, otherwise it is practically impossible to smooth out the commutator ripples. The motor to be used as a generator should be rated at 1100 r. p. m. because such a motor when driven at 1750 r. p. m. will develop about 110 volts, which makes it possible to directly connect it to a standard 1750 r. p. m.

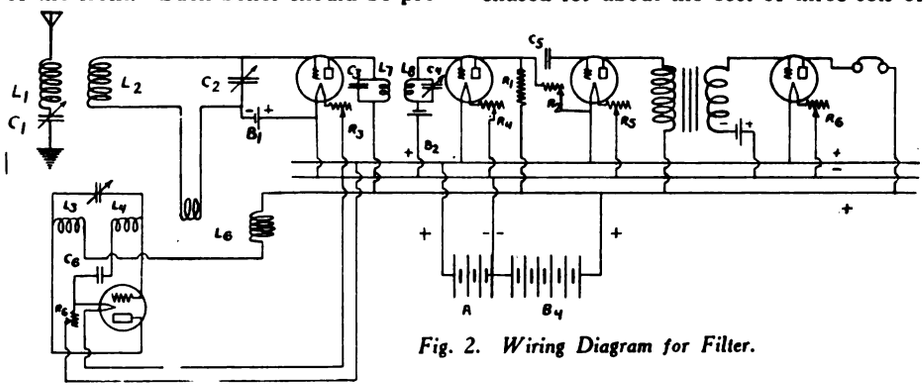


Fig. 2. Wiring Diagram for Filter.

*L*₁ 25 *or* 30 *turn HCC.*
*L*₂ 35 *or* 50 *turn HCC.*
*L*₃ 30 *turns No. 24 DCCC on 3-inch tube, tap at 8, 12, 16, 24 and 30th turn.*
*L*₄ *Same as L*₃.
*L*₅ 10 *turns No. 24 DDC on 3-inch tube.*
*L*₆ 200 *turns No. 24 DCCC on 3-inch tube, winding space 1½ in.*
*L*₇ 150 *turns No. 34 DSCC-pancake I. D. 2½ in.-⅛th in. thick.*
*L*₈ *Same as L7 Coupling between L7 and L8 ¼th in.*
*C*₁ 0.0015 *variable (See Note 1).*
*C*₂ 0.001 *mfds. variable.*
*C*₃ 0.00025 *mfds. mica condenser.*
*C*₄ 0.0003 *mfds. variable.*
*C*₅ 0.00025 *mfds. mica condenser.*
*C*₆ 1 *mfd. paper condenser.*
*C*₇ 0.0005 *mfds. variable.*
*R*₁ ½ *megohm.*
*R*₂ 2 *megohm.*
*R*₃ *Standard filament rheostat.*
*R*₄ *Ditto.*
*R*₅ *Ditto.*
*R*₆ *Ditto.*
*B*₁ 1 *to 6 cells flashlight battery .*
*B*₂ *Same as B1.*
*B*₃ *Same as B1.*
*B*₄ 110-*volt battery or motor-generator set.*
A 6-*volt storage battery.*
T Audio-frequency amplifying transformer.
Note 1 Condenser C1 should be provided with a switch so that it may be put either in series or in parallel with L1.
Note 2 The circuits C3L7 and C4L8 at M must be adjusted for resonance.

motor. The driving motor, if a. c., should be of the enclosed type so as to have as little external field as possible in order to keep the a. c. hum out of the plate circuit of the tubes. Mounting the motor-generator set on a non-magnetic base will also help matters. If the plate voltage generator is some distance from the set the leads should be made of lead covered wire or run in conduit. The sheathing should be well grounded in either case in order to cut out power line induction.

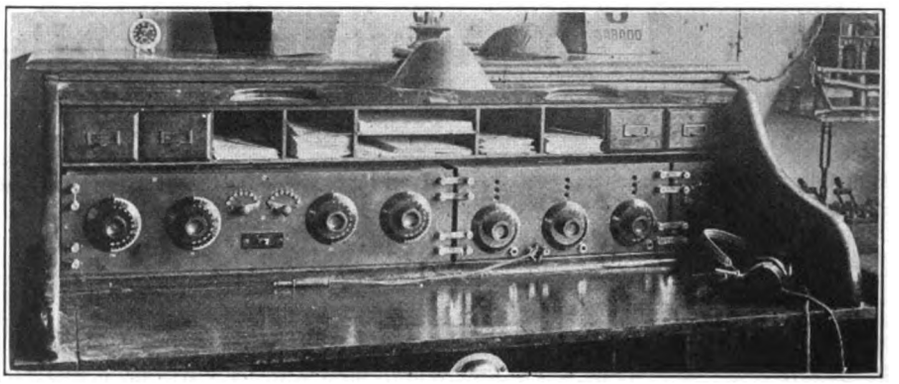
The design of a filter is a case of cut and try for each individual generator. (See Fig. 2 for approximate dimensions and wiring diagram.) The motor-generator set has the advantage over the storage batteries because it needs little attention other than an occasional cleaning and oiling. The commutator of the generator must always be kept thoroughly clean so as to insure sparkless commutation, which is absolutely necessary. The brushes should be of hard carbon and properly fitted.

Another point which must not be lost sight of is that operating five or six tubes puts a heavy drain on the "A" battery and if this is not large enough it will not hold its voltage steady for any length of time, which means continual adjustment of the filament rheostat and unsatisfactory operation. The battery should be large enough to deliver at least six amps. for 10 or 12 hours.

To those who are not accustomed to operating a number of tubes in parallel let me give a word of caution which may save the filaments of a few tubes. When shutting off one or more tubes of a bank of tubes operating in parallel always shut off the entire bank first, then cut out the desired tubes, set all filament rheostats for minimum current and you are ready to turn on your tubes again. If you cut out a tube while the others are burning the rise in current is liable to burn out the entire remaining bank of tubes. Another thing to remember is that the filament circuit must be connected up with heavy wire, as a very small resistance produces a very large voltage drop on low voltage circuits. This is especially important if the batteries are some distance from the set.

For those who are interested in loop work this is the ideal system, for thereby radio-frequency amplification can be used under advantageous circumstances, that is, at long wave-lengths. With a fair sized loop and five or six stages of radio-frequency amplification one should be able to pick up amateur stations at surprising distances. It should be remembered that a loop is very free from static and interference can be eliminated by adjusting for direction as well as for wave-length.

To doubters all I can say is "the proof of the pudding is in the eating."



New Radio Shop Receiving Set in Use.

THE SOUTHERN CALIFORNIA RADIO ASSOCIATION DINNER-DANCE BY "6XAD"

Decidedly it was a success! Thanks to the "wim and wigor" of President Lex Benjamin (6MK) the "party" given at Panlais' in Los Angeles, on the evening of November 7, was very much in the nature of a thumping—success!

Broadcasted daily by the Western Radio Electric Co., and the southern branch of the Leo J. Myberg Co., so well heralded had the affair been that at the mustering for food there were more than 80 members present, with a modicum—too much of a modicum!—of the more Deadly Species of the Race! Radio 6XAK had intimated that all the ladies possible were to be brought, and that if one had not a wife—or a sweetheart—to bring some one else! Thus conforming precisely with the spirit of the modern day—C.W., 'neverything! The tables were charmingly decorated with flowers, and favors of various and amusing kinds were en masse.

Interspersed with sallies from Ye Hon. President—and general gayety—the dinner progressed to a satisfying (!) end, and President Benjamin introduced a new member—U. S. Deputy Game Warden Lawrence Mott—associate editor, sometimes known by his alias of "6XAD"! Mr. Mott bored the spark men intensely—and cheered the C.W. men correspondingly—with some pertinent remarks on the reckless disregard of the radio laws by certain spark operators in the Southland, and ventured the prophecy that unless amateur operators, the nation over, behooved themselves and walked with a good deal more circumspection, the amateur fraternity stood to lose the government's interest, and the plainly-evidenced friendship of the present administration.

Mr. Mott then explained, cursorily, the new plan of the Organized Reserves, Signal Corps division, and a great deal of interest was manifested.

Some interesting words were pronounced by a member of the Naval Radio Service, in which he, too, plainly stated that spark men were getting themselves strenuously disliked along the coast by the fleet's officers for causing QRM FAR above 200 meters! Not many amateurs, to be sure, but enough to create ill feeling!

I asked him point blank whether the fleet ever suffered QRM from C.W. operators, and the answer was both a prompt and a satisfying one: "Never, sir!" 'Nuff sed!

Yes, it was a jolly party, and it is hoped that one such can be arranged for each month. Personally, I hope so, as there is seriously lacking in the Southland a cohesive spirit!

GET TOGETHER, SOUTHERN DIT-DAHS!

A NEAT RECEIVING SET

The illustration shows a business-like arrangement for a radio receiving station, belonging to Rev. Clarence E. Woodman of Newman Hall, Berkeley, Calif. The desk part of it, while presenting a somewhat opulent appearance, is really constructed from an ordinary kitchen table, with under-panelling made from some matched floor boards found in the cellar. The roll-top part was bought second hand. After removing the lower row of pigeon holes, the space was just right for the "Radio Shop" set shown in the cut. The small panel, at the extreme right of the set, contains the B battery. In front, under the drawer, are six binding posts for three telephone receivers: A "Murdock," a "Liberty" and a "Baldwin." At the right of the desk are seen three throw-switches: That at the right is a 3-pole single-throw switch, to cut in any one of three aerials. The middle is a D.P.D.T. switch to connect the aerial and ground either with the desk set or with any experimental one; (the latter hooked up to a pair of binding posts shown at the front edge of the table.) The left-hand switch is for the A battery—connected either with the desk set; or with any other, by means of the pair of binding posts corresponding. The "Radio Shop" set his been found highly efficient, and gives thorough satisfaction.

9BD (Canadian) at Vancouver, B. C.

A Northwest Mystery Explained

Due to a change of call number from 5BR to 9BD the experimental radio station of Wm. D. Wood Jr., at the Barron Hotel, Vancouver, B. C., has created much curiosity among Northwestern operators. Mr. Wood has an experimental license from the Canadian government allowing 200 meters for spark and valve set. All owners of Canadian experimental licenses must be holders of first class commercial certificates of proficiency in radiotelegraphy, Canada.

His antenna is a 7-wire "L" on the hotel roof, with cage lead-in from the south end. The aerial points due south. It is supported by two 40-foot poles with 16-foot spreaders in flat top. The total length of wires is about 100 feet and natural, period of aerial about 180 meters. An insulated counterpoise of the same dimensions is exactly under the aerial, and 5 feet above the tin roof of the building. This is used for the phone and C.W. set.

One K.W. type "T" spark transmitter with 20,000-volt secondary at all powers has been used up to the present time, but Mr. Wood has just secured a United Wireless "Coffin" type transformer with a 30,000-volt secondary, which will be used for extreme "DX" at a later date.

The gap is a Benwood super-synchronous, bakelite case. Various numbers of electrodes have been tried on the removable disc with final decision to use eight electrodes, as when the gap has but four electrodes the strain on the condenser is so great that it is likely to puncture if the "Coffin" were used. The only thing that might be improved upon the Benwood "sink" gap is the method of adjusting it to synchronism. If a device for making this adjustment easier and more accurate could be attached, it would be quite an improvement, in Mr. Wood's opinion.

Four Marconi Leyden jars of .003 mf. each are connected in parallel for a condenser, and give a total capacity of .012 mf, which is considerably more than most amateurs are able to get away with and still keep below 200 meters. These jars are only supposed to withstand 15,000 volts, but the fact that they stand up under twice that voltage speaks pretty well for them.

The primary inductance is one and a half turns of 1½ inch brass ribbon mounted in such a manner as to be all useful inductance and not leads. The secondary of the O.T. is 8 turns of 1-inch brass ribbon ,but only 5 turns are in use at present.

Six-inch coupling has been the adjustment for the past month or so, and with adjustment 4.2 H.W. amps are going into the aerial, but to prove that amps. don't mean much in some cases Mr. Wood was reported just as QSA by a "seven" station when he had reduced power and was only putting out 1.3 amps. On the night of Oct. 24, 6KA in Los Angeles said he was QSA and on this occasion the amps going into the aerial was about three and no more, and the coupling at about eight inches separation.

9BD has been in operation for a very short time and therefore has not done much "DX" to speak of, but wherever reported the sigs are usually "QSA OM" whether true or not.

The phone and C.W. transmitter is a 20-watt output set, using four 5-watt tubes and the Heising circuit. At a later date concerts will be sent out for the benefit of local amateurs. There is no other amateur phone station in British Columbia to date, so it will be new to the majority of amateurs to get the music in Vancouver via radio. Data regarding the phone set will be given in detail at a later date as no work of importance has been accomplished with it so far.

The receiver is a Radio Shop regenerative with a home-made detector and two-stage amplifier.

9BD VERSUS 5BR

Time: Oct. 15, 12 to 1 a. m.

Place: The air.

(fade in) 6QR working 9BD (they finish), 9BD coming in very QSA (then finish).

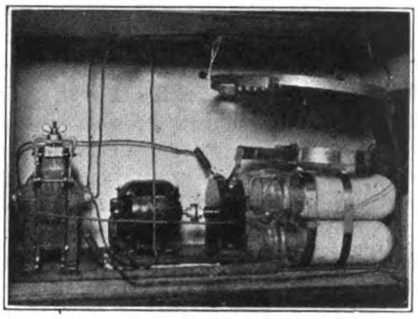
9BD 9BD 9BD 9BD.....
.....9BD 9BD de 6CP 6CP 6CP 6CP (long call dx stuff).

9BD 9BD 9BD 9BD.....
.....9BD 9BD de 7YJ 7YJ 7YJ 7YJ (also slow dx stuff).

9BD 9BD 9BD 9BD.....
.....9BD 9BD de 7BH 7BH 7BH 7BH (7BH puts extra dashes in his nines to make the impression of distance more emphatic). hi. Silence, still no answer from 9BD. 6QR de 6CP sa om who is 9BD anyway. 6CP de 6QR 9BD qra Canadian special station, old 5BR, Vancouver, B. C. (All fade out.)

Moral: If you don't think anyone hears you, just sign off a 9— call.

We'll bet 9BD in Chicago gets a couple of dozen "heard you" cards out of the deal anyway.



9 BD Benwood Gap and Condensers.

LETTERS TO THE EDITOR

Sir—We have read Mr. Carl Soderstorm's letter in the September issue of your publication, and, while we agree to a great many of his statements, there are some things which we would like to discuss in all fairness to the modern radio operator. With regard to the use of audions and other modern apparatus for reception, there are, of course, many advantages and disadvantages.

It is true that the service companies are paid to furnish apparatus, and the operator is perfectly within his rights to rely on this apparatus solely for communication. However, when everyone else is covering all kinds of distances and working circles around the users of crystal detectors, it is only natural to expect the commercial operator to try and improve his range. The navy has used audions and other modern reception apparatus for a number of years and has found it not only as good as the crystal, but far better. All important stations on land have used audions even to the extent of paying royalties for the privilege of so doing.

Can Mr. Soderstorm support his claim that radio communication was conducted

(Continued on Page 248)

Christmas Off the Florida Coast

By "Sparks."

"Wishing you a Merry Christmas and a Happy New Year" was the way the cards read—the cards that our relatives, friends and sweethearts sent us. We received them as we cast off the lines that held our tiny tow boat and her tow, a long, unwieldy, sinister-looking concrete car float—to the dock at the Army Base, Norfolk, Va. As the "let go" whistle, one long and two short, sounded, the clang of the engine room bell floated harshly up to us of the decks and we were off! Out through the narrow Army Base channel we threaded our way, turning into the main ship channel at the black bell buoy and leisurely made our way to sea, out past the capes of "Ole Virginny."

The glass being low, we hugged the beach so that the west wind did not have so much effect on us, the car float sheering from side to side and almost overtaking us at times.

Coastwise men have a habit of running fairly close to each other in order to save as much time as possible but you can bet they gave us a wide berth that night—that sheering contrary mass of steel and rock caused many an old time skipper to don trousers over his pajamas, slip his deck-flattened feet into a pair of "mules" and "hit the deck" on the "cat-hop" at the urgent request of an alarmed second or third officer.

Leeway! Sink my side! We set the usual course down the beach to Cape Hatteras. At 8:10 A. M. the following day this perverse piece of war-amateur built junk that constituted our tow actually parted a 7/8 steel chain and one 5/8 steel chain. We stopped, brought her alongside, and repaired them.

Upon arriving off Cape Hatteras we found our sister ship, S. S. Taconv, also with a concrete carfloat in tow. By the time we rounded "Diamond Shoal" light ship the wind was howling out of the nor'nor'west. A great piling sea was breaking over us. The carfloat was pulling us back and jerking like some living thing that did not want to lead. We were in a tight place there for a while. The seas were breaking under us as they raced over those deadly shoals, the graveyard for many a good ship and gallant crew. The captain stepped down into the engine room and, calling the chief engineer to one side, said quietly, lest the men hear: "Give her all she's got until I give the word, Chief; we're on Diamond Shoals." Well, the Chief certainly shook her up and we pulled slowly into deep water and a loon laughed hysterically out there in the darkness. We pulled, strained and battled all that night—fought the seas, defied the wind and lived.

At 8:30 next morning a second bridle carried away, but the waters were too rough to go alongside so we plugged on and on praying for the one side to hold her. At Cape Lookout light ship we turned for Cape Lookout light where Cape Lookout bends a protecting arm southward.

At the entrance to this partly artificial partly natural harbor, the last link carried away and here she went hell bent for election for the beach. We caught her, brought her alongside, and made her fast for the night.

The following morning we repaired our bridles and proceeded on our way, not knowing whether the Tacony had lived or not. Finally we saw her—she sent us a radio, saying she was going into Charleston for supplies. We did not think it necessary and told her so in our reply.

We went on and on—washed and rolled, rolled and washed, until Hillsbore lighthouse, way down there on the coast of Florida was passed and then—both bridles carried away at 4:10 a. m., darker than the pits of hell, a gale blowing from the north, the Gulf Stream running north at a rate beter than three knots per hour—you can imagine the seas.

We pulled in what was left of our hawser and went back over our trail to look for our lost protege. We found her at 5:40 a. m. When dawn came we went alongside. She sprung our starboard rail, but a line was made fast to one of her bits and we put a strain on it so as to pull her up under the beach to smooth water—the line parted. Another one was made fast, it parted. In order to get away before she would ram us the captain gave the engine room a full speed astern bell. We got away all right, but when we started to come forward the engines would not move—a line was fouled in our propeller!

There we lay absolutely helpless, rolling in the trough of the sea. We sent out a radio call for help, which failed, but, thank God, we were drifting towards land. A seaman was on the carfloat and when we had drifted to ten fathoms of water we let go the anchor, put a lifeboat over the side with the second officer in charge to get the man off the carfloat and return to the ship. As they left, the wind shifted to the east, making the carfloat dead to the windward, and for every stroke of the oars the lifeboat would go back three feet. The second officer, realizing that to make the carfloat and return to the ship was impossible, gave all his attention to landing on the beach. They landed safe and sound,—the last we saw of them until we arrived at Key West.

What was that? A vibration? Are we aground? I ran to the engine room and put my head inside. The engines were turning over. We promptly heaved in the anchor and made for the carfloat before she would go aground. We made her and got the towing cable on her this time, but were aground three times in the effort.

We proceeded on our way, dead tired, dirty, hungry and with the pleasant knowledge that it was watch for watch (four hours on, four hours off) until we reached our destination. This all happened on Christmas day, December 25, 1920.

"Wishing you a Merry Christmas and a Happy New Year" was the way the cards read,—the cards that our relatives, friends and sweethearts sent us. And a loon laughed hysterically out there in the darkness.

HAM CRUDITIES AND ODDITIES

(Or: Why the Ether Is Jammed!) Over-Hears by "6XAD"

(N. B.: When a chap is trying to do serious work—gets msgs through—or listen for l-d calls —it is ALWAYS so pleasant to hear—hour after hour—such as these):

"A cat has nine lives but a frog croaks every night." (1/2 hour's work to get an "r" on that, from San Francisco.)

"Saw Maggie with Fred tonite wheres Bill?" (Ha! SCANDAL!)

"Do u hear me any better now?" (Asked for 'steen-millionth time!)

"Pse listen while I do sum tuning." (Followed by 11 mins of "V's.")

"Harrys got a new Chandler eight." (12 mins of accurate description—paint, body, etc. Radio 6—— ought to be an Agent for the Chandler!)

"Saw Jones abt moving chicken hse and he sed—" (14 mins vastly interesting info. I know all about moving chicken houses—now!)

"Am thnking buying motorbyke what u advise?" (16 mins' advice given. What I know not of motor bykes is not worth knowing!)

"Went to B—'s new soda ftn today his nut sundy fine." (How eeeenormously interesting!)

"Awful grouch on father tonite cant wk long." (Hurrah!)

"Mother sez dont hav tooth pulld ul need it when you are old." (Mother is wise!)

"Going be sick tomorrow wont hav go school." (The OLD stuff!)

"Wish Dillonld come down and listen 2 all these brd spks." (Cheer the wish to the echo.)

And so on—AND so forth, dit-tah without end. AMEN!

A Distress Call at Triangle

(Triangle Island, a mountain peak protruding from the Pacific off the northwest end of Vancouver Island, rises abruptly to a height of 680 feet. The Canadian Government radio station which crowned its summit was closed down in June, 1921, a transfer being made to a less isolated location.)

Triangle Island trembled and the wireless office shook;
The radiotelegraphist glanced up with puzzled look.
The wind came from Queen Charlotte Sound, below there in the gloom,

Beating on the windows with a fearful note of doom;
It blew with sudden fierceness, as only east winds blow,
And lashed the sea to fury six hundred feet below;
The spray dashed up the cliff-sides, and it made a salty rain
That drenched the rock's high plateau and flew to sea again.
This was the most tempestuous night that he had seen or heard;
He though the island trembled (but that was quite absurd)
The wireless house might shiver, and the shock might be profound,
But the building, like its engines, was bolted to the ground;
The roof might shed its shingles, and the windows make a din,
The ice-edged wind was all outside and comfort was within.

Signals from the stations all up and down the coast,
Varying from a drum-beat to the whisper of a ghost—
Some high-pitched and strident, and others merely drones—
Superposed and intertwined, they sounded in his 'phones.
Seattle and Victoria, Prince Rupert, Estevan,
North they came from 'Frisco and south from Ketchikan;
Shrill note from a "K"-boat, slobber from chopped arc;
Many kinds of music from as many kinds of spark.
The "Emperor of Africa" was seven days from land,
And working now with Estevan she sounded close at hand;
The Honolulu station was very faint and thin
(Outside the gale was raging but the fire burned bright within).
A lonely life is radio, if lonely one can be
With all the north Pacific to bear one company,
With ready means of flashing thought with all the speed of light;
For ever and where'er they be,
Ploughing each her furrow free
Ships upon the sombre sea
Are speaking through the night.

Unfaltering the signals came, and out of all he heard
The storm they had to penetrate affected not a word,
For naught can stop electric waves, divert them or delay;
The radiated impulses go heedless on their way.
But no ship called his station (and this he did not mind,
For starting up an engine is labor of a kind);
He merely sat and listened to the voices in the air,
His feet upon the table and reclining in his chair
In indolent position—one might have thought he slept,
But the vigil never ceases where a wireless watch is kept.
For ever-present service, unseen by those they serve,
Wireless men upon the coast,
At their isolated post,
Are least considered of the host
Who work with brain and nerve.

The boisterous night was passing and at last u glimpse of day
Came creeping over Triangle and drove the wind away.
The operator left his 'phones to stretch and breathe a spell,
For with the night the signals were fading out as well;
He took a turn around the room,and then a step outside,
Drinking in the freshest air that sea-girt hills provide.
The sun that pierced a filmy mist persuaded him to stroll;
He walked a dozen yards or so and climbed a little knoll.
Before him stretched a corner of the greatest sea of all;
It boiled and wrought its violence below the rocky wall.
He went a little further and he halted with a start,
He halted with a shudder and a leaping of the heart,
For he stood in a position where he knew the eye could reach
The churning of the breakers on the boulder-studded beach,
And now the beach was buried full twenty fathoms deep.

Straight from the water's level the cliffs rose clear and steep;
The island's base was hidden and the ocean had encroached
On all the hollow places where the height could be approached.
This was no time for standing there, this was no time to think
What seismic disturbance might have caused the isle to sink,
For Lanz Isle and the Haycocks were nowhere to be seen,
The sun had shifted northward from the point where dawn had been—
And then a slight vibration, like the rocking of a boat—
He knew at once these signs must mean: Triangle was afloat!
Its narrow point to windward and its broadest end to lee,
It had slid away before the gale and drifted out to sea.
With sailless masts and rudderless, it wandered where it would;
A grotesque ungainly barge,
Roaming on the sea at large,
With a wireless man in charge
Who was spellbound where he stood.

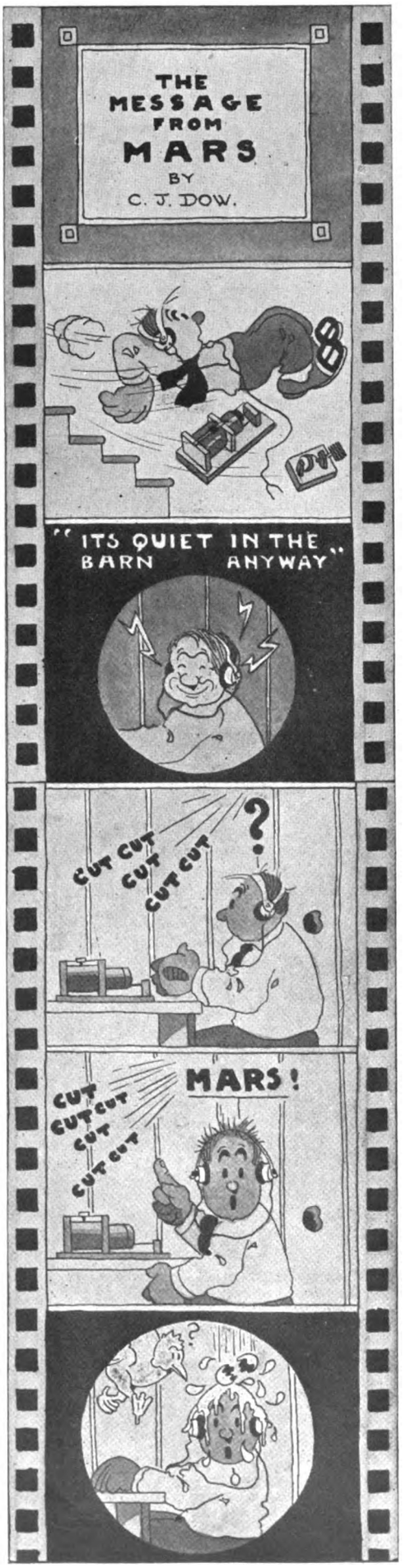
Blunderingly he hastened back, deciding as he went
Not to wake the other fellows till the call for help was sent;
He set the flywheel spinning, and the engine gathered speed,
Then sat to send a message that all the world should heed.
He sent a call out broadcast, and an answer came at length
From Estevan, with signals of but half the normal strength;
He told in hurried phrases of Triangle Island's lapse
From insular solidity to a nautical "perhaps."
Letter followed letter as he jerked the signals free,
Letter followed letter as he pounded on he key,
Sending out to everyone the message of distress:
With a roar and with a crash,
As the disc smoothed out the flash,
By the magic dot and dash
Went forth the S. O. S.

The echo of the final flash had scarcely died away
When the chair slid from the table and the place began to sway
The tuner toppled over and hit the rising floor,
As the operator dodged the stove and scrambled through the door;
Stumbled on the moving steps and struck the tilting ground,
Seeing in that instant that the waves were close around.
The island was submerging, for ended was its sail
(For gone was all the impetus imparted by the gale);
Higher rose the water till it touched his feet at last,
Higher yet and higher as he grasped the central mast;
Unscalable when vertical, he climbed it now with ease—
A yard or two each time it swung to forty-five degrees.
Impressions were chaotic now—he had not far to go—
The chimney lashing through the waves was all that showed below.
Then downward plunged the wireless mast, and downward too, went he,
Down into the clutches of the icy, stifling sea.
The frenzy of complete despair demanded effort yet;
And he fought back with all his might
Till he rose back to the light,
Where all that was in sight
Was cold and very wet.

All nature mocked the human speck that struggled there in vain,
The wave-troughs pulled him down with them, but still he rose again,
The sun beamed bright to ridicule all lingering trace of hope;
. . . . . .
But the "Emperor of Africa" was throwing him a rope.
. . . . . .
. . . . . .

The island seemed to tremble, and the windows made a din;
Outside the gale was raging, but the fire burned within.
The radiotelegraphist, reclining in his chair,
Was languidly attentive to the signals from the air;
The warmth had made him drowsy, and he noted with surprise
The clock had stolen half an hour before his very eyes!
His log required an entry, and here it seemed to be—
For the "Emeperor of Africa" was calling V-A-C.

—Will Burford.



Radio Verse and Reverse

PEACE AND GOOD WILL

By J. F. DILLON

Like the fog that drifts in from the ocean,
An impenetrable curtain of gray,
So the angry passions encompass the mind,
Obscuring the clear light of day.

Gone then is the poise which we boasted,
And all true sense of justice and right,
The abysmal instinct of ages long past,
Has returned like a thief in the night.

Shall this demon of malice and hatred have reign
In a soul consecrated to love,
When charity and tolerance of thought and of deed,
Would dispel all the darkness above?

If the mind close the bars of its portal to hate,
And conjure thoughts of love and of right,
In His infinite wisdom the Master of all,
Will sanction and aid in the fight.

The dear friends we love are precious jewels most rare,
So let us prove to them worthy each day;
How vacant and dreary our lives here would be
Without them to brighten the way.

INDEED IT IS!

By "6XAD"

When at night you're DX sending,
Rythmic dots and dashes blending—
And some spark breaks in—unending—
Ain't it . . . grand?

When you hear that far "2" Station
With such feelings of elation . . .
And a spark roars in . . . damnation!
Ain't it . . . grand?

As he opens up—full power—
Keeps on going—hour by hour—
Just discussing some girl's flower—
Ain't it . . . grand?

When you hear his squawk go flooey—
"Blow his works, migosh! Oh blooey!"
Doesn't that your life re-new-y—
And: AIN'T IT GRAND?

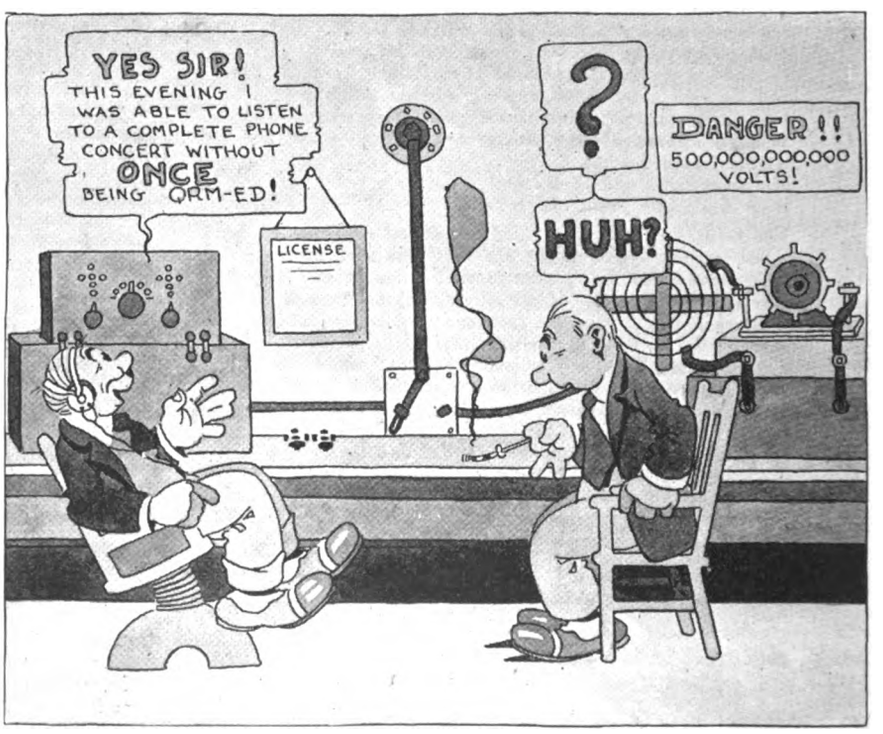
MUSIC IN THE AIR

By P. FENNELL

Are you very fond of music as it's sung—
Do you revel in the touching tenor tongue,
Would your inner soul delight
In a Bach or Wagner night
If you didn't tuck your torso in a suit that's far too tight?
Maybe you profanely holler
When you don your evening collar
That the bore of formal clothing sends your pleasure out of sight.
And perhaps you tell your consort
When the taxi driver calls
That you'd fain attend the concert
In your khaki overalls.

If you're really strong for comfort and for ease
You'll enjoy the lines that follow after these,
For they'll tell you—and it's true—
What your radio will do
When you want to hear some music without getting black and blue
From a fight with starchy linen,
Causing cussing, which is sinnin'
Well, the trick is very easy. It's available to you.
Simply string denuded copper
From your chimney to a tree
And your wireless is ready,
Music, absolutely free.

If for Sunday church you find you're rather late,
Tune your wireless up for services and wait.
You will hear the hymn and prayer
And the choir on the stair;
And in time the morning sermon will inspire via air.
Then you'll hear metallic trickles
As the deacons gather nickels,
But you really can't contribute if you really are not there.
You can share a thousand wonders
Or enjoy these all alone
When your house includes the presence
Of a wireless telephone.



Things That Never Happened!

Codfish for Christmas

By Volney G. Mathison.

OLD JUDGE DRIFFIN, sometimes disrespectfully referred to by Samuel Jones as Dopey, was badly rattled. Beads of sweat were springing out on his face and his hand shook nervously on the key as he asked N-P-R for a third repetition of a message he had been vainly trying to copy for the past half-hour.

Biting his signals off angrily, the gob at N-P-R bounced through the telegram again. The navy man's snappy sending flustered Old Judge more than ever. His fourth copy of the message looked about like this:

"Nrl ck—n—SagFranc—Nog—Jotees Cal Alaskp Codfish Cogtany, Unga, Alaska: Driffin has asced for posuion as radio oanerator w K-V-I whr you legee gxt gmthifin yough judqent he is atsle opelate qke afflavit tothw effertrt and radio fspetrtor pill mrpt him a anrovisulaanerzt if hrot ascanble hold job immfiteainy adtsseand we will send twou a relig on scssoneae ppgasseak sliling in thri days. ..Anspr. A. C. Co."

With a short, terrified gasp, Old Judge clutched at the key and stuttered out still another woeful Q-T-A.

"Hey, holy criminy, whassamatter!" howled the enraged gob at N-P-R. "Who in h——l ever told you you could operate, anyway! You ought'a be in a wireless kindergarten copyin' rat-cat-dog four words an hour off'n a omnigraph! For th' love of mud, get that operator an' lemme get clear before I go bugs an' jump off'n th' bluff into th' Bering Sea!"

"Shucks, that won't do, Dopey," disgustedly declared Samuel Jones, who had been listening in all the time on an extra pair of phones cut into the circuit. "In about a week you'd have that poor gob goin' out an' hangin' hisself on his wireless pole—gimme th' key."

His face red with shame and mortification, Old Judge gave up his chair.

"Sorry, O-M," flashed the clear, smoothly-sent signals from the steady hand of the veteran brasspounder; "I'm pullin' out'a here next month, an' was tryin' Dopey out to see if he could hold down th' job—guess he won't pass muster, though. Slip me that blue."

The gob came back on the air, spluttering angrily.

"Well, all I gotta say is don't you ever spring him on me again if ya don't want me to send you a box of dynamite fer Christmas!" he barked. "Ain't it bad enough to be stuck out here in th' middle of th' ocean on a sliver 'a ice-covered rock along with a gang of home-brewin' lunatics, without sendin' all day to a confounded old codfish who couldn't read three words a week if ya sent him a copy of th' message by mail first! Here's that blue—copy:

Nr 1 ck 58 nl San Francisco, Nov. 15. Jones, care Alaskan Codfish Company, Unga, Alaska: Driffin has asked for position as radio operator at K-V-I when you leave. If in your judgment he is able operate, make affadivit to that effect and radio inspector will grant him a provisional permit. If he not capable hold job, immediately advise and we will send you a relief on schooner 'Anangashak' sailing three days. Answer. A. C. Co."

Samuel Jones gave the navy operator an O. K. and told him to stand by.

"I'm goin' to tell 'em to send up a man," he said bluntly, showing the message to Old Judge.

The look on Old Judge's face was tragic.

"I—I—couldn't I have another chance, Sam," he pleaded . "Knowin' it was a test made me rattled; an' seein' th' message was somethin' about my application for this job made me more flustered than ever——"

"No, you might as well forget about tryin' to run this station," sharply interrupted Samuel Jones. "You ought to've had enough, after th' mess you've made of the schedule this afternoon—I guess I was a fool ever to encourage you in thinkin' you could handle K-V-I. Go an' play with your ham set—you seem to do better with it than you do here."

Drawing a pad of sending-blanks toward him, Samuel Jones wrote out a message.

Old Judge made as if to speak again, but then the spark crashed out with its heavy roar and a telegram was started on its circuitous road to San Francisco. Old Judge easily read the younger man's strong, steady sending. The preamble went by unnoticed, but the concise text cut him to the heart:

Driffin incompetent send man on schooner.

As Samuel Jones sat waiting for an acknowledgement from N-P-R, Old Judge stepped softly to the door and stole out of the station.

Across the tops of the white-crested seas that were sweeping into the bay came a willy-wawing southeasterly squall, which swirled fiercely along the granite cliffs where the wireless shack snuggled, and pelted Old Judge with a blinding flurry of soggy, wet snow that made him sink his head still lower in his mackinaw as he stumbled disheartenedly along the narrow trail which led up through the village.

His failure to get that wireless job was a bitter disappointment to Old Judge. It left him completely in the lurch. As federal commissioner, Old Judge drew no salary. He received a meager fee of eight dollars each time he held court, which since the advent of prohibition and an extremely easy-going marshal, he did not have occasion to do hardly oftener than once a month. He was also the village postmaster; and the revenue he derived from this, along with a few straggling dollars gleaned from performing sundry Siwash weddings and by acting as administrator when some fishermen's row ended with Colts and tombstones, served to keep the wolf from the old fellow's door—but only by a scant margin. Indeed, his mode of living was little better than hand to mouth.

In justice to Samuel Jones, it is necessary to state that he knew nothing whatever about Old Judge's financial affairs, and imagined him wanting to get K-V-I merely from a childish desire to have a larger wireless set with which to amuse himself.

Reaching his dwelling, which stands on a knoll in the middle of the village of Unga, hardly a thousand feet from the wireless station, Old Judge mechanically brushed the snow off his worn mackinaw and twice-half-soled shoes, and went slowly in.

Lying on his table, waiting to be opened were four big packages, all marked in flaming red letters: "Wireless apparatus—don't crush." They had arrived that very morning in a bunch of mail dropped by a passing steamer.

STANDING there disconsolately, contemplating the four packages, Old Judge's thoughts wandered back to the happy period not long past when he had first become a wireless amateur.

His amateur set, which had come to him through his friend Hell-fire, the builder of K-V-I, consisted of a two-inch spark-coil, a small loose-coupler, audion detector, and a few essential auxiliaries. The coil and the audion were operated on a storage battery, which was charged by means of a small power-line strung along the village housetops over to the codfish company's station. Outside his dwelling, two neatly-guyed eighty-foot poles supported his aerial, a good-looking antenna in every respect, though it paled into insignificance below the towering masts of K-V-I only a few hundred feet away.

For several months Old Judge had been supremely content with his little set. He established friendly relations with the operators of the Alaskan steamers that occasionally went by the isolated Shumagin Islands, and with the lapse of time every brasspounder on that run had come to know and look for the old fellow's fuzzy spark-coil note.

But eventually Old Judge became a

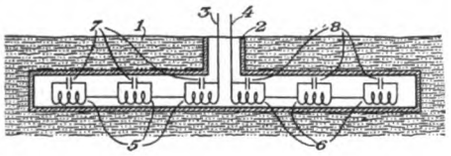
(Continued on Page 222)

Digest of Recent Radio Patents

Prepared by White, Prost & Evans, Patent Attorneys, San Francisco, who have been particularly active in the radio field for many years, and from whom may be obtained further information regarding any of the patents listed below.

Earl C. Hanson, No. 1,388,336—August 23, 1921.—Underground and Submarine Antenna.

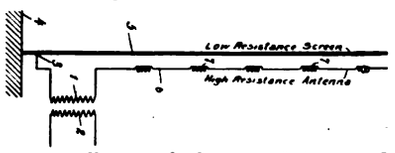
An antenna is described adapted to be placed underground, so arranged as not to be responsive to strays. This is effected by forming the antenna in spirals to



increase its self-induction. Thus strays, being highly damped, find difficulty in passing through, but sustained oscillations can get through. To enhance the effect, sections of the coils may be bridged by condensers which are properly tuned relatively to the shunted coils so as to produce the right effect.

Pupin & Armstrong, No. 1,388,441—August 23, 1921—Multiple Antenna for Electrical Wave Transmission.

A low resistance, low inductance, antenna is inductively coupled loosely to a high resistance, high inductance antenna. The high resistance antenna is the



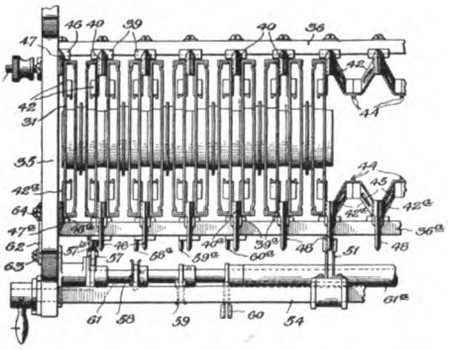
one actually used for receiving and is tuned to the oscillations to be received; the other being used merely to screen impulses of short duration. Such short impulses are dissipated in the low resistance antenna by oscillations which have a very high period, equal to that of the natural period of this antenna. Since the coupling is loose between the two antennas, these oscillations have little effect upon the high resistance antenna.

Colpitts & Arnold, No. 1,388,450—August 23, 1921.—Transmission of Intelligence.

This patent described a scheme for sending high frequency modulated waves of high power. The modulations are produced by an ordinary telephone transmitter 21 which modulates waves of radio frequency of amplitude comparable with that of the modulations. The modulated waves are then amplified and caused to radiate energy from the antenna 43. The low amplitude carrier waves are generated in an oscillating audion tube 3, the input circuit of which is coupled to the transmitter circuit. The output circuit of the oscillating tube is amplified by tube 26, and then by tubes 27, 28 and 29 in multiple. For powerful sending, hundreds of such tubes as 27, 28 and 29, are connected in multiple.

F. Lowenstein, No. 1,388,834—August 23, 1921.—Spark Gap Apparatus.

A quenched spark gap is described, so arranged that any number of individual spark gap units up to a limit may be independently inserted between spring contacts to form an apparatus of any

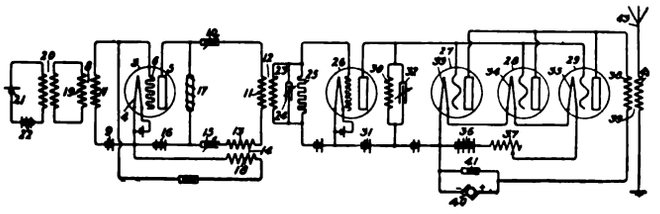


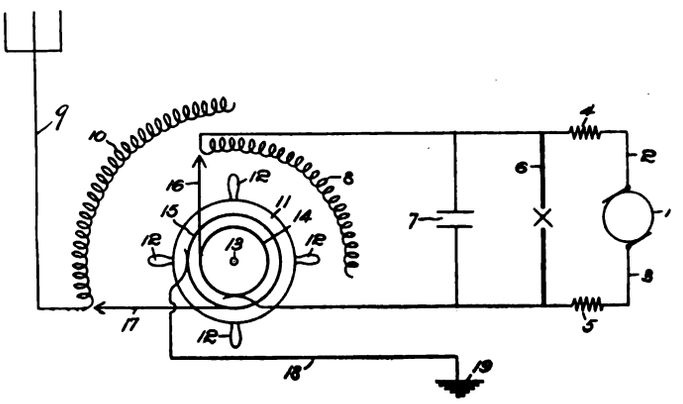
required number of gaps in series. The spring contacts 42 are so arranged that they automatically complete the circuit upon removal of any gap unit, as for repairs. The gap units have chimney-like flanges 31 of metal which serves the double purpose of providing a metallic contact to the springs 42 and of conducting the heat away from the spark gap. Switches are also provided for short circuiting any member of the gaps without necessitating their removal, and at least one of these switches is so arranged that the number of gaps may be varied in steps of one so that accurate adjustment may be obtained.

J. H. Hammond Jr., No. 1,390,288—September 13, 1921.—System for Controlling Moving Bodies By Radio Energy.

A scheme is described by means of which a moving body, such as a torpedo, may be steered by radio. The body carries an antenna system 20, 21, 22, 23, and 24, and has a plurality of receiver circuits 25 and 26. These circuits are tuned to different wave lengths, so that by radiating energy of the proper wave length from a distant point, it is possible to select which one of the two circuits may be rendered active. The device is so arranged that if circuit 25 is active, the body is caused to turn say to the right, while if circuit 26 is active, the body is caused to turn to the left. This result is accomplished by rapidly rotating switches 27 and 28, of which 27 is arranged to connect the circuits 25 and 26 alternately to the input circuit of a detector 35, 36, 39 and switch 28 is arranged simultaneously to connect the output circuit of the detector to relays 42, 43, so that when circuit 25 is connected to the detector, the relay 42 is also connected thereto; and on the contrary, when circuit 26 is connected then relay 43 is also connected. The movement of the switches is so rapid that the scheme is practically the equivalent of two separate detectors, each associated with one of the receiver circuits 25 or 26. Upon transmission of waves which renders say circuit 25 active, the relay 42 is energized, and this causes actuation of an electric valve 52 in the fluid cylinder 49, the piston of which is acted upon by fluid under pressure in tank 55 to move the rudder actuating bar 50.

(Continued on Page 253)





Monthly Broadcast of Radio Newslets

R. R. Beal, chief engineer, Federal Telegraph Company, is in the Orient. Haraden Pratt is acting chief engineer during Mr. Beal's absence.

D. C. Marsh, until recently in charge of the Federal Telegraph Company's Washington, D. C., office and having the title of resident engineer, has been transferred to the Pacific Coast, where he will be attached to the engineering staff of the company in connection with marine and other radio duties.

W. E. Lufkin, formerly sergeant in the signal corps and past president of the San Francisco Radio Club, has been appointed assistant radio inspector for the sixth district. Because of his sympathetic understanding of the radio situation throughout the sixth district Sergeant Lufkin is well equipped for his new duties in which a host of friends join in wishing him all success.

The Federal Telegraph Company exhibited for one week in the rooms of the San Francisco Chamber of Commerce the Kolster radio compass and position finder. This equipment will shortly be installed on shipboard for the purpose of giving practical demonstrations at sea, after the conclusion of which, this development will be placed on the market for sale.

The official opening of the Radio Central station, New York, owned and operated by the Radio Corporation of America, was inaugurated November 5 by the transmission of a message from the President at the White House in Washington and its simultaneous reception at every radio station in the world.

The Olympia Radio Club has elected officers for the ensuing half-year term as follows: Edwin Wilson, 7ZP, president; E. O. Robbins, 7BZ, secretary-treasurer. J. Grant Hinkle was elected an honorary member by acclamation. Regular meetings will be held on the first and third Wednesday evening of each month.

St. John's Radio Club has been organized at Berkeley, Calif., with a charter membership of forty boys. Frank McCullough is president and chief operator. Gilbert Earle, vice president; Charles Clark, secretary-treasurer and John Pedder, sergeant-at-arms. Meetings are held each Friday evening at 2640 College avenue, Berkeley, for code practice and arrangements have been made for monthly addresses on radio matters by a number of prominent radio men.

Complete success attending wireless transmission of handwriting now marks the most advanced step in utilization of radio activity. Messages from General Pershing and Premier Briand, sent from the Belin laboratories in Paris, have been received and recorded in the handwriting of the senders at the United States naval radio station near Bar Harbor, Me. Practical use of the new invention is assured. Credit for its perfection largely is due Professor Edouard Belin, whose scientific research for many years has distinguished him as one of the foremost thinkers of the age.

The point to point radio stations recently completed by the Federal Telegraph Company at Portland and San Francisco were placed in commercial operation September 1. Three full duplex radio channels are now operated between these points. The company's Los Angeles station now under construction will be placed in operation about the first of the year. This station is also for point to point service, and when placed in commercial operation, will communicate with San Francisco, Portland and Seattle, operating three arc transmitters simultaneously.

Complete radiophone reports of the football game wherein the Oregon Agricultural College defeated the University of Washington at Corvallis were given students at Seattle. The Seattle Post-Intelligencer had a special telegraph wire between the football field at Corvallis and its radio broadcasting room at Seattle in charge of R. W. Bell. The Northern Radio and Electric Company installed a receiving set at the university in charge of H. S. Tenny. The telegraph reports from Corvallis were typewritten and then read into the transmitting radiophone by Mr. Bell.

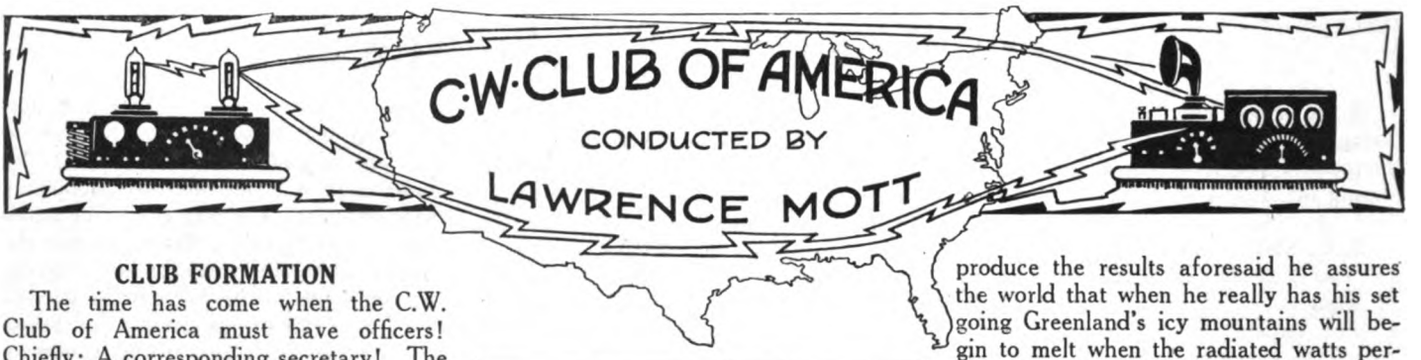
G. E. Robinson, formerly 6AIH and now KOZR, reports hearing the Fairmont Hotel, San Francisco, radiophone, operated by Leo J. Meyberg, 800 miles north of Seattle on board M. S. Culbarra. Two stages of amplification were used. He also clearly heard the Hotel Oakland phone, Oakland, Calif., operated by P. D. Allen, 6XW, operated by Sergeant Travers at the Presidio, and 6XAC, operated by Colin B. Kennedy Co. at Los Altos, Calif. 6XG is the best all 'round, 6XW runs a close second, 6XAC is louder than either, but the modulation is no where near as good. 6XAJ I got good one night.

The amalgamation of all the clubs of the Pacific Northwest is well under way at present, although the name of the organization has not been decided on as yet. It has certainly been a hard job and a slow one, too, since it was first proposed by the Radio Club of Tacoma, at their annual banquet in March, 1920. The constitution is being threshed out among the clubs now. The purpose of the amalgamation is to bring closer together the various clubs and to make better working conditions. The job will be finished in a few weeks now and radio will found with a new, fresh and snappy organization.

The Beach San Francisco radio station operated by the Federal Telegraph Company, call letters "KFS," maintains a continuous watch on 2400 meters CW and 600 meters spark and operates transmitters on both wave-lengths in communicating with ships at sea. This station is operated exclusively for ship to shore communication and is successful in maintaining a regular and reliable service with Federal arc equipped vessels, both Shipping Board and privately owned, up to distances of 5000 miles. Pacific Mail steamers now running between San Francisco and Baltimore are in direct touch with the Beach station from the time they leave San Francisco until they return.

Research work in transmitting wireless telephone impulses without antenna, has been undertaken by Sergeant R. C. Tavers of the United States Signal Corps radio school at the Presidio with the result that music and speech has been transmitted several hundred miles, clearly and audibly, without outside wires. Sergeant Tavers, in his tests, used small squares of copper netting suspended edge-down in his operating room. Using one as an aerial and the other as a capacity ground he was able on Sunday night, October 30, to transmit music to Bakersfield, Sacramento, Eureka and a considerable distance out to sea. The netting was used experimentally and worked beyond expectations.

A new record was received in wireless circles November 4 when 400 members of the California Alpine Club, at their annual outing and camp craft show in Rattlesnake Canyon on the slopes of Mount Tamalpais, danced to wireless concert music played from the Fairmont Hotel, the Presidio and Los Altos, California. The "tapping" of distant hotel orchestra and record music by radio was accomplished by means of a wire thrown into a tree. This, in conjunction with a four-step amplifier unit, enabled the hikers to receive their entertainment high up on the mystery mountain as loudly as though in a ballroom. The concert continued for several hours, each of the named stations contributing a special program for the event.



CLUB FORMATION

The time has come when the C.W. Club of America must have officers! Chiefly: A corresponding secretary! The associate editor of Radio has been enabled, thanks to the kindness of many radio friends, and C.W. enthusiasts, to start the interest in a club direction, and it is moving along nicely, with many applicants for membership, and a growing interest being shown from many quarters.

It is with regret that the associate editor cannot "stay with the job," but a variety of other important matters—chiefly having to do with a typewriter!—do not permit of his giving the time that is necessary to the answering of the hosts of inquiries, etc., that pour in on his defenseless head! He has done his best to "weather the gale" of paper, and to satisfy all inquirers! Think not too harshly of him.

It is therefore suggested that all C.W. men write to the editor—N. B.: NOT the associate editor!—and to him state their candidates for president and secretary. There being no dues involved, a secretary-treasurer is not needed.

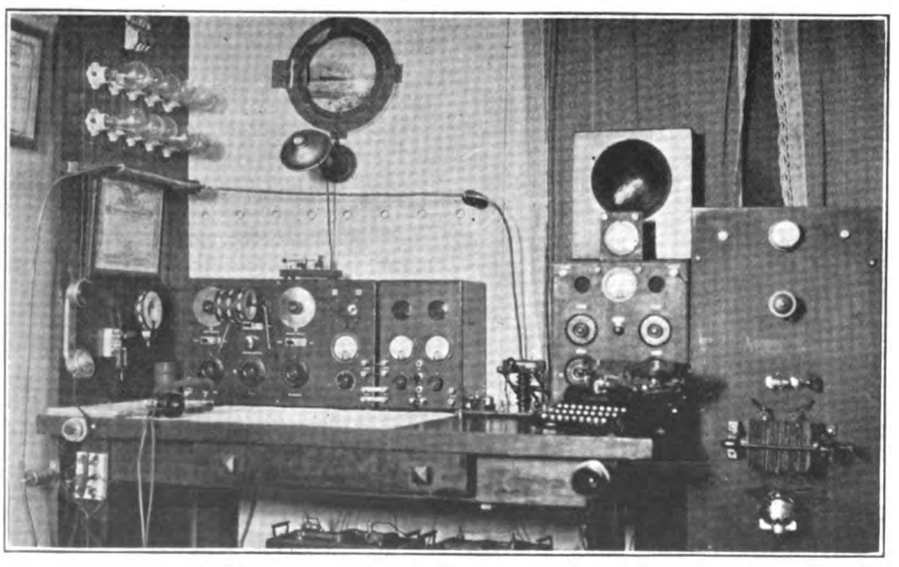
The associate editor stands ready, at any time, to offer such advice as may be asked of him, but he very earnestly begs to be relieved of the responsibilities of the future directing of the C.W. Club of America, as it is growing beyond the time that he can give to it!

R. P. MacKenzie, 1016 Fourth avenue, Los Angeles, Calif., is Radio 6ALV and not 6ADU as previously reported.

The requests to join the C. W. Club of America are so numerous and insistent that I am compelled to arrange a new schedule—that will appear in the January issue. This will divide the week into three sets of nights—two each—and in this way I hope to accommodate all C.W. enthusiasts. It is the only way out of the present dilemma, as by adding more working times to the present schedule, the last men, each night, are working into the next day!

LAWRENCE MOTT.

The Pacific Coast record for C. W. transmission is about to be announced. The C. W. Club of America will award the leather medal with the wooden string to the winner in the near future. The lucky station is 6IZ of San Diego County, which has received cards from 9BP and 9AJA residing at Evanston, and Chicago, Ill., respectively. Both 9BP and 9AJA report C.W. signals from station 6IZ calling 8FQ on October 1, 1921. A representative of RADIO when interviewing 6IZ was assured that these results were as nothing compared with what will follow in the near future. 6IZ has been thinking about getting a C.W. set assembled and if the mere thoughts of getting one produce the results aforesaid he assures the world that when he really has his set going Greenland's icy mountains will begin to melt when the radiated watts percolate. In the meantime 6IZ would like to know the brand of hooch responsible for the keen reception away back there in Illinois. He wants to know if the hookup is degenerative or whether they are using oscillating carborundums.



6AQA at Los Angeles, Calif.

C. D. CLUB NEWSLETS

6ZB having completed the 20-watt panel set, is now busy with C.W. on 200 and 375, and gives regular concerts by phone Sunday and Thursday nights, 7-8 p. m. on 200 meters. The circuit used is a modified Hartley with Heissing modulation. For fone one oscillator and one modulator, are used, each 5 watts, and from one to four tubes in parallel for C. W. A. C. and electrolytic rectifiers are used for plate and filament. The spark set is used when needed for calling.

6AQA AT HOME

No, this set is not on shipboard, as you might suppose from the scenery with its cleverly camouflaged port-hole, but is situated in "The Palms" apartment at 421 West Adams Street, Los Angeles, Calif., where George C. Tichenor nightly hears stations in the seventh, fifth and ninth districts.

The receiver and two-step amplifier are of Mr. Tichenor's own design, but were built to specifications by the Western Radio Electric Co. This set is regenerative from 150 to 25,000 meters,—using a CR-5 circuit up to 600 and honeycomb coils for greater wave lengths. The detector is changed to either circuit by two anti-capacity switches. A "window" in the panel allows for easy access to the tube. As the picture shows, there are meters on each tube.

The key and antenna change-over switch are both mounted on a bakelite base. The main leads are half inch copper tubing, which is efficient, and also helps to give the set a commercial appearance.

The C.W. transmitter is of 10 watts output and allows the use of voice or buzzer modulation or straight C.W. The spark set consists of a home made transformer, Dubelier mica condenser, Wesrad O.T. and an Amrad quenched gap with fan as blower. The set is mounted on a half inch bakelite panel.

DX-CW LISTENING CONTEST

In order to encourage tuning and listening for Continuous Wave signals, the Associate Editor will donate, each month, to the operator who correctly reports having heard him, from the greatest distance, ten dollars' worth of radio apparatus, said apparatus to be purchased from firms whose advertisements appear in the pages of RADIO. There are but two conditions to the attaining of the prize: 1. That the receiving operator give details of his receiving apparatus, and 2, that he quote from the QST that he hears.

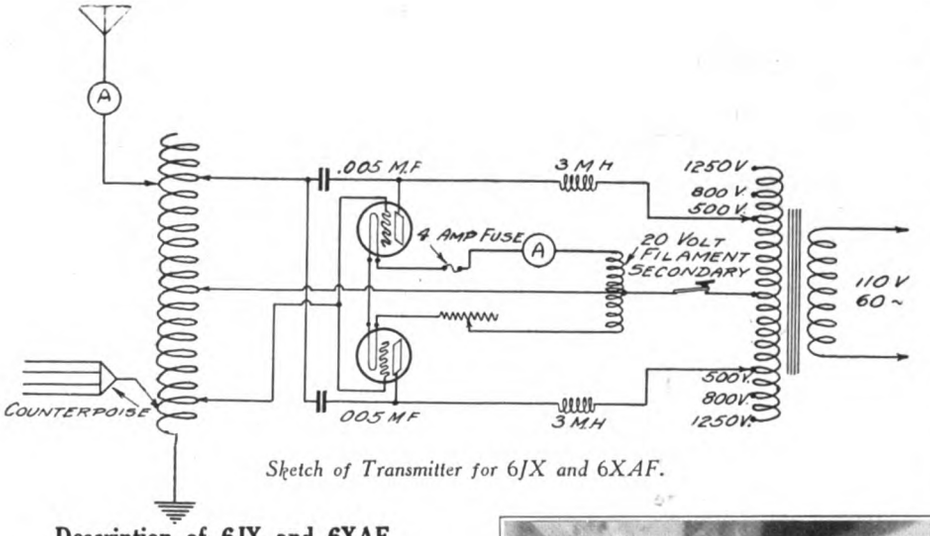
U. S. Deputy Game Warden Lawrence Mott's station is 6XAD, situate at Avalon, Catalina Island, California—thirty miles distant from the mainland, with Los Angeles as the nearest large city.

Mr. Mott will QST each night, beginning December 1, at the following hours, and on these wave lengths:

10 P. M.-10:10 P. M.—375 metres, C.W.
10:10 P. M.-10:20 P. M.—200 metres, I.C.W.
12 M.-12:10 A. M.—375 metres, C.W.
12:10 A. M.-12:20 A. M.—200 metres, I.C.W.

All reports received prior to the 8th of each month will be published in the next-following issue of RADIO, together with a description of the prize winning station. Photographs of contestant's stations will be published, if clear details are shown.

From 12:20 A. M. to 12:30 A. M. Mr. Mott will listen especially for DX signals, and will report these in RADIO.



Sketch of Transmitter for 6JX and 6XAF.

Description of 6JX and 6XAF

Transmitting—Two 50 watt power tubes, with 500, 800 or 1250 volts 60 cycle a. c. on plates. Filaments operated on a. c. also. Hartley oscillating circuit used. Radiation varies from 1.8 amps on 500 volts plate to 4.1 amps on 1250 volts plate.

The details of transmitter are shown in accompanying sketch. Two different antenna inductances, one of 10 turns for 200 meters, and other of 30 turns for 375 and 450 meters, latter used when experimenting. Inductances are all Dubilier 4000 volt. All connections made with 385 strand Litz. All this apparatus will be permanently wired into a panel outfit as soon as a 300 watt Kenotron rectifying set is completed. Will then be able to use set for either telegraph as at present, or for telephone work.

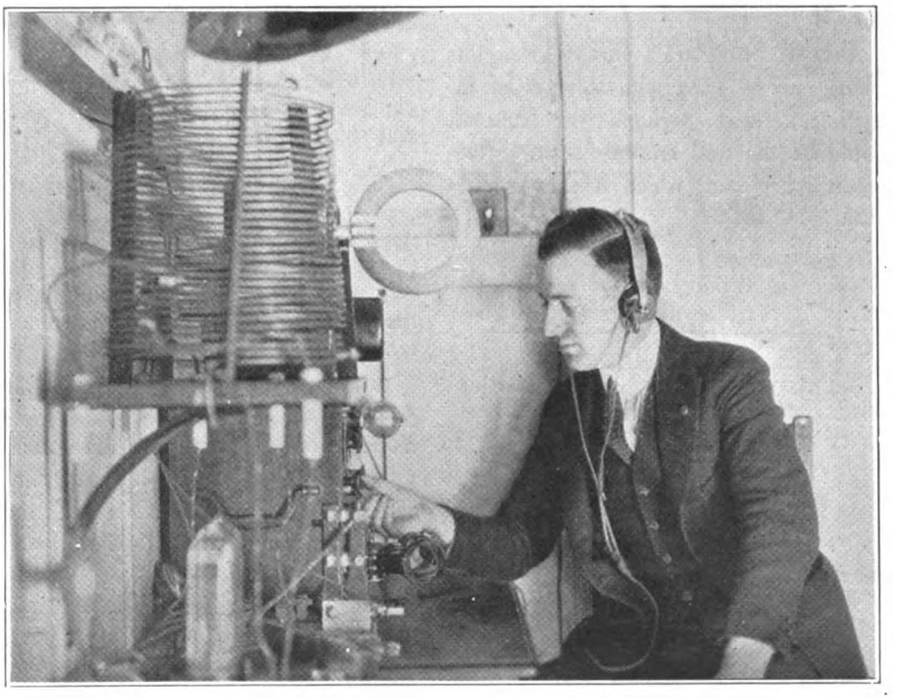
A Kolster Type D. Decremeter is used to keep an accurate check on the wave length.

Receiving—A short wave regenerative receiver, not shown in the illustrations, is occasionally used, but prefer flat wound Litz coil in honeycomb coil mounting, on regular receiving set, on account of flexibility. Receiver consists of detector and three stage amplifier, employing Western Electric tubes throughout, on 130 volts plate, and was entirely constructed by self. Detector uses well known Armstrong circuit, but amplifiers are of special design, to work with a Western Electric loud speaker. The set, which weighs 60 pounds, is considerably heavier than the average amateur amplifier, on account of the large number of choke coils, transformers and condensers necessary to produce distortionless transmission of music through three stages of amplification. Antenna consists of 8 wires of 7-18 phosphor bronze in form of inverted L, the mainmast being 55 feet high. The counterpoise is composed of 12 No. 10 B. & S. insulated wires, 8 feet above the ground and directly below the antenna. The antenna has a natural period of 165 meters and a capacity of .00058 m. f. Power input of a. c. transformer on transmitting set is 5 watts no load, 80 watts with both filaments running, and 410 watts with 1250 volts on plates and set radiating.

About distance worked, have received cards from five states, with reports of signals heard QSA. To date have not done much DX work on account of experimental work in progress, but expect to be on considerably this winter.

NEW MEMBERS C. W. CLUB OF AMERICA

Hugh Compton, 6AUB, 3369 28th street, San Diego, Calif.; Chas. W. Holdiman, 510 South Sixth street, San Jose, Calif.; Paul Socolopsky, 4BY, Loreburn, Sask., Canada.



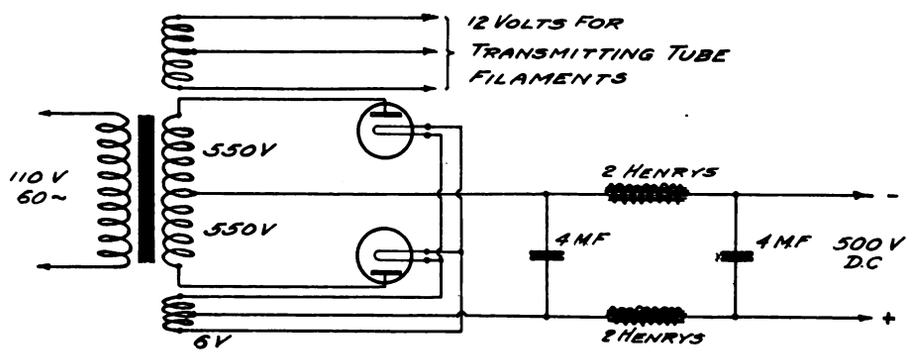
Gerald M. Best, 6JX and 6XAF, Who Answers Queries and Replies on C. W. Practice. *(See Next Page.)*

Queries and Replies on Continuous Wave Practice

This new department of questions and answers on continuous wave practice is conducted by Gerald M. Best, of the Engineering Staff of the Pacific Telephone and Telegraph Company. Because of his electrical studies at Cornell University, his radio service in France during the World War and his specializing work with the telephone company, Mr. Best is peculiarly well qualified to answer any question that may be submitted. Our readers are invited to send in their problems for solution.—The Editor.

Question: I want to build a C. W. set similar to the one used at 6XB but prefer a circuit using a step-up transformer and a. c. with a third tap for filaments.—D. C. S.

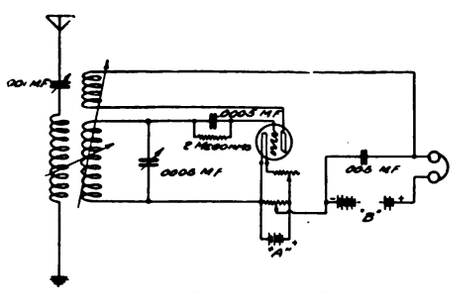
Answer: Since you have the circuit diagram of the transmitter at the Fairmont Hotel, 6XG, it will not be necessary to indicate it here. The circuit shown herewith is for rectifying 60 cycle 110 v. a. c. into 500 volt d. c. and is complete up to the point where connection is made to the transmitting set.



Circuit for Rectifying 60 Cycle 110 V. A. C. Into 500 Volt D. C.

Question: My big problem is how to hook up a set of Turney Spider Web Inductances consisting of two movable coils and a fixed coil, enclosed in a cabinet. —R. H.

Answer: There are a variety of circuits which can be used with this set of inductances, and perhaps the simplest would be the well known Armstrong regenerative circuit, which is shown herewith.

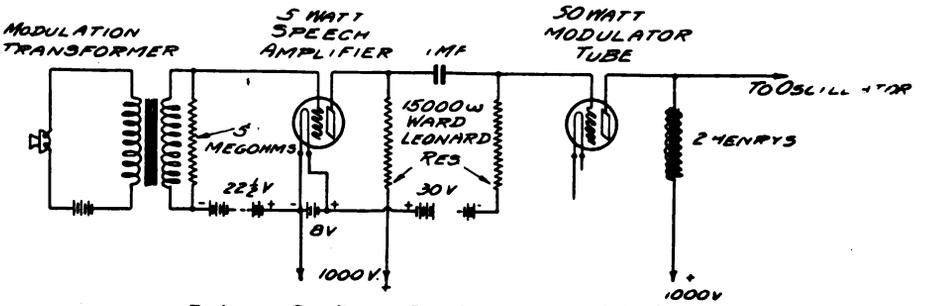


Armstrong Regenerative Circuit.

Use the center coil for the secondary, and the two movable coils for the primary and tickler, respectively. Should the vacuum tube fail to oscillate, try reversing the tickler leads, as you may have the secondary and tickler coils inductively opposed.

Question: I have a honeycomb coil receiving set for long waves. ..Why can I still hear faint signals when I remove the primary inductance from the circuit?—C. W.

Answer: You are probably picking up enough forced oscillations from a nearby high power transmitter to operate your detector tube. However, if you are not near a transmitting station, it may be due to leakage in your condensers, wiring and coil mounting, or to induction between the primary and secondary air condensers.



Resistance Coupling of Speech Amplifier and Modulation.

Question: Please publish the winding data for a transformer to connect a Radiotron 5 watt transmitting tube, used as a speech amplifier, to a Radiotron 50 watt power tube used as a modulator, in a 50 watt radiophone set.—A. H.

Answer: While a transformer that will answer the purpose can be constructed, a much simpler way would be to use a resistance coupling such as is shown in the following sketch.

LONG BEACH RADIO RESEARCH ASSOCIATION

The Long Beach Radio Research Association was organized in June, 1921, and is making real progress toward establishing a big radio station. The club is not a part of or has any connection with any club previously organized under a similar name as this is the only one besides the one in the high school.

The club house is being built now on the Earl Daugherty aviation field and will be used to some extent in connection with airplane communication in the vicinity, as there is a great deal of aviation on the Pacific Coast. Two eucalyptus poles about 70 feet high have been hauled to the grounds and are being placed in position. The station will have a 1 kw. spark set and a phone set of 20 to 50 watts power. It is expected that long distance communication will be a regular occurrence. The set will bark on 375 meters wave length.

A tour of inspection has been planned to include some of the larger stations in the vicinity so that members will have a chance to see what is being done in the commercial and government way. This tour will include the large 30 kw. arc station under construction near Hynes; the radio plants aboard the warships at anchor in the harbor; the compass station in San Pedro, and the one at the Submarine Base.

Full information concerning the club and its activities may be obtained from Robert Portis, 2500 Elm avenue, Long Beach, Calif. The officers of the club are: Robert Portis, president; J. Cutting, and G. Shoeman, secretary; Will Kersting, treasurer, and Ralph Haynes, chairman of publicity.

Static Statistics from Everywhere

By Squawk McGuff

Rah! Rah! Rah!
Biff! Boom! Bah!

SEATTLE.

And now, my friends, I wish to announce that last, but not least, we have heard from the Totem City by the Puget Sound. They are vindictive souls—these Chinook warriors—and they wish it known to the pop-eyed world that they are alive and that when Tacoma and Portland take such cracks at their equipoise they have stirred up a community where the bald-headed eagles roost on the cuckoo clocks and the canary birds sing bass and the jack rabbits spit in the bull dog's eye. In other words, they are so tough that they scratch the enamel on the bath tub.

If you don't believe me, folks, just read the following letter and weep:

October 19, 1921.

Squawk McGuff,
Dear Sir:—

After digesting your page of this month's P. R. N. (future Radio) the Totem Radio Club has decided that Seattle was being left out of publicity really due her, but it is our own fault. We have not been asleep as you might think—as organizing 100 live, energetic members into a compact club is no joke.

But the look on that page of yours was enough to wake a dead fuse or a shot "B" battery. The only thing we saw about Seattle was: Tacoma says to Seattle, "Why all the high power for short distance work?" And in answer to that statement I might say that Seattle has some spark sets. You know it's pretty hard to get below 100 watts on a rotary, and, of course, that explains why Tacoma puts up a kick against Seattle; we ought to work on less wattage.

Seattle boasts over eight radio phones in operation, and quite a few "phones" coming up. One "phone," the P. I. radiophone working on 1.3 amps., issues news bulletins from 9 to 9:30 p. m., along with the latest music. The P. I. phone is operated by the Northern Radio Company of Seattle. Another phone, 7XC, of the Northwestern Radio Company, gives concerts every night from 8 to 8:30, showing that Seattle hasn't been asleep.

The spark sets need not be mentioned, they speak for themselves.

As regards the Club: H. Mason, president; H. L. Jones, vice president; T. J. Bidner, secretary; E. R. Rebman, treasurer; S. G. Hagen, publicity agent.

If any more news is wanted of our Club, please write at the earliest possible moment and let me know when write-ups are to be in, Club news, etc. I am enclosing one of the write-ups in the Seattle Times of Oct. 18, about the Totem Radio Club.

Yours very truly,
Sheldon Hagen, 7ON.

You tellum Seattle. We admire you fellows up there. Let's hear more about you please, and believe me, we will reserve the proper space on this little old page of fun (and otherwise) so that they may know from coast to coast, and then some, that the Totem Radio Club is actually a functioning organization. "73," MERRY XMAS.

LOS ANGELES

After the raise was over,
After the "feed" was done,
Brothers scraped mud off the wet walks,
As though it were excellent fun!

In course of time guy wires rust and become unsafe to those around the pole; therefore, 6EA and 6EB invited friends to assist in lowering the top section of a pole, it being 2x3 in size and 30 feet in length, to replace the rusty wires.

The day arrived, and also considerable rain, at times. 6ABG failed to come and afterwards, sent word by radio that he had a "cold"—and it was rather cold to get out of bed at that time, hi! But Mr. Foxley, chief op. at Edison Power Plant, and radio enthusiast, faithfully prepared to do or die; 6OL, also, as natty as one could wish; and 6KI, the good old stand-by, who helped put that pole up in 1812, was on hand as smiling as ever.

After consultation, they decided to go ahead. 6KI was highest on the pole and removed the bolts; 6EA was next below to receive and steady the pole and it was lowered without mishap for the new guys. It rained some more and when it was raised—say, fellows, you should have seen those on the adobe ground of a side hill, holding the guys—the neighbors thought they were practicing a new kind of sliding dance and were betting which could go furthest without coming down on all fours; but at last, it was over and they went into a warm room and a good, filling "feed," to talk for an hour or so, before separating.

The "Meteor Electric" went the limit for speed on Flower street and then disappeared in the "Pacific Radio," as to name, at 1108 W. Second street, but where it will be more luminous than ever. Already, the "Advance Electric" and "The Wireless Shop," were in the next block west and soon this may be known as Radio street, and when the tunnel is opened, a new crop of millionaires will likely spring up, like mushrooms, in the night. MERRY XMAS.

TACOMA

We notice an alarm clock in 7BA'S station which solves the mystery of why he starts calling DX stations at regular 3-minute intervals, who have not been on for the evening. It's a good thing that 7BA was not at the Chi banquet or Bessy would have been minus a "hot" drink. 7BA uses that stuff to oil his transmitter.

7BL is changing his location.

The Seattle P.-I. fone is very QSA, but someone had ought to donate him some new up-to-date records, also wish that they would give out news of the present day instead of a week old.

Tacoma noticed with much hilarity in the last RADIO the little note of exception Tacoma is given in the Portland traffic laws. We would like to ask our old friend Squawk if he is sure he did not misprint in one little place there. Instead of Tacoma being a "suburb" of Portland (being nearly 200 miles away) we thought maybe it should read, "Tacoma is the 'superb' of Portland."

I was down on a destroyer the other day chewing the fat with some of the ops. We were listening in to the various stations around 975 or 1000 meters when a noise somewhat similar to someone running their finger nails over a table top caused us to jerk off our fones in double quick time. I finally managed to explain to the excited ops that it was nothing wrong with old man either but was simply our old friend 7KM testing out his compressed victrola-record quench gap. I told the fellows all about Otto and his experiments and let me tell you, fellows, that even though we hear of Ott doing what is in our estimation "funny things," he is the boy that can work Portland, San Francisco or any of the eastern stations when we "wise birds" have to give up in despair. We visited Otto later on and managed to get a few snaps of his station. Things may be a little scattered around but there is a complete radio station before you and one of the best LD stations in the northwest.

Some of the brothers-in-swat claim I am getting worse but read the following I received from an anonymous source through the mails. It's a breach of etiquette to print anything that comes unsigned but this bird is so good here it is:

My Dear Squawk McGuff,
You arn't half crazy enuff
So I'm sending in sum stuff,
Hope it doen't make u tuff.

BUCK SEZ:

The Raccoon runs the main line,
The 'Possum pulls the switch,
The Rabbit says, "Q R X, my friends,
My key hand has the itch."

Another long-standing record broken—Peterson dropped: "Rosie."

C. U. AGN NEXT MONTH.

With THE U-S-Radio Inspector

CONDUCTED BY MAJOR J.F. DILLON

A MONTHLY DEPARTMENT OF INFORMATION FOR OUR READERS

INSTRUCTIONS FOR CALLING

A number of cases have come to the attention of this office, in which it was very evident that amateur radio operators are either too lazy, or too careless to study the laws and regulations regarding calling, when using spark transmitters. The law requires that in calling the signal "KA" shall be made, once, the call of the station called three times, the letters "DE", once, followed by the call letters of the station calling three times. Nothing else, no finish, or other signal. In answering, the above procedure is followed, except that the station answering signs only ONCE, and gives the signal "K," meaning "go ahead."

I recently heard one amateur make the KA signal three times, the calls of the station he was calling three times, sign DE once (strange to say) and sign off his own call about five or six times, and then a series of strange noises followed, which sounded like the noises made by a loose wire, and the same foolishness was again repeated. All this for one call. If stations are near together, and there is very little doubt as to the called station's reception, it is permissible to call and sign off once, but a series of actions like those outlined above show either a careless disregard for the law, or an ignorant, green operator at the key—usually both. Brevity is essential in the transmission of radio signals today, in order there be as little interference as possible.

Radio telephone stations are quite at a loss to know how to call by voice, as it is obviously impossible to make the preliminary call signal, and all the conventional characters when calling. Until further and more definite instructions are issued, the following form is suggested for radio telephones. Assume Station 6XXX and 6YYY are to work, and that 6XXX wants to raise 6YYY, the conversation would be about as follows:

Call: "Hello 6YYY, hello 6YYY, hello 6YYY, 6XXX calling, 6XXX calling, 6XXX calling." (Station 6XXX only working.)

Answer: "Hello 6XXX, hello 6XXX, Hello 6XXX, 6YYY answering, all right, go ahead."

Business now to be transacted, each station giving his call letters, and the call letters of the station he is working with at the beginning and end of each transmission, unless working duplex.

The above is only suggested, and is not to be accepted as a hard fast rule, but should be followed generally, until more explicit instructions are issued, covering the full details of radio telephone conversation, which will probably not be available for some time to come.

Respectfully,

D. B. McGOWN,
Assistant Radio Inspector.

R. Squire, 6AWG, 39 Granada street, San Francisco, closed for 30 days, starting October 24, 1921. Squire was warned to get down to 200 by this office in August, and did not do so. Was heard on 245 meters, and was given 30 days to think over whether or not he would obey the law.

CHANGES OF ADDRESS

R. A. Phillips, 6AHO, has moved from Moneta, Calif., to La Habra, Calif.

7XD is at the Billings Polytechnic Institute, Billings, Mont. Its listing in the old call book is erroneous and many cards have been therefore mis-directed. Prof. Glenn E. West is in charge.

R. M. White, 6OL, is now located at 1509 South Brand Boulevard, Glendale, Calif., instead of 717 East Windsor road, as previously reported.

Question: May I transmit with a spark coil providing I do not send outside of state or interfere with government stations?

Answer: No. You must obtain a license to use the spark coil.

New Sixth District Amateur Stations

6AWQ	J. W. Hadley	San Simeon, Calif.	
6AWR	D. G. Hewitt	Box 596, Stanford University, Calif.	
6AWS	H. D. Schmidt	383	Ocean St., Santa Cruz, Calif.
6AWT	B. Melinari	653	Union St., San Francisco, Calif.
6AWU	W. Stonerook	3702	Utah St., San Diego, Calif.
6AWV	C. H. Weatherhill	1509	G St., Reedly, Calif.
6AWW	L. Jones	Manteca, Calif.	
6AWX	E. Sedlacek	267	W. Badello St., Covina, Calif.
6AWY	L. P. Bernett	428	B St., Hayward, Calif.
6AWZ	G. E .Gay	432	Linden Ave., Long Beach, Calif.
6BAA	Geo. W. Womer Jr	5526	Telegraph Ave., Oakland, Calif.
6BAB	R. Lewis	31	Monte Ave., Piedmont, Calif.
6BAC	E. Miller	1645	American Ave., Long Beach, Calif.
6BAD	G. R. Martin	423	N. Curtis St., Alhambra, Calif.
6BAE	G. S. Morris	5132	Lincoln Ave., Los Angeles, Calif.
6BAF	G. L. Powell	375	Malino Ave., Long Beach, Calif.
6BAG	E. L. Ramer	2220	86th Ave., Oakland, Calif.
6BAH	V. E. Semran	940	So. Fair Oaks St., Pasadena, Calif.
6BAI	G. H .Dennis	Box	596, Stanford University, Calif.
6BAJ	H. M. Hines	1045	N. Stevenson Ave., Pasadena, Calif.
6BAK	R. Bunch	610	Pacific Ave., Santa Cruz, Calif.
6BAL	T. Howells	1777	Crystal Ave., Salt Lake City, Utah.
6BAM	F. L. Walker Jr.	Westwood, Calif.	
6BAN	L. Vesper	2035	Alameda Ave., Alameda, Calif.
6BAO	James Kennedy Jr.	266	Carl St., San Francisco, Calif.
6BAP	W. F. Fredrick Jr.	670	Walsworth St., Oakland, Calif.
6BAQ	C. W. Smith	142	Shrader St., San Francisco.
6BAR	C. Anderson	3732	Seneca Ave., Los Angeles, Calif.
6BAS	William L. Burnett	2039	Deakin St., Berkeley, Calif.
6BAT	Salesian Club	666	Filbert St., San Francisco, Calif.
6BAU	C. H. Rockwell	R.R.	C, Box 205, Tulare, Calif.
6BAV	H. M. Hughes	1631	Dale St., San Diego, Calif.
6BAW	Myron Albertson	852	Westchester Place, Los Angeles.
6BAX	F. R. Welch	Hanford, Calif.	
6BAY	F. Grant	234	Union St., Watsonville, Calif.
6BAZ	Mrs. Mary O. Houston	3420	Union St., San Diego, Calif.
6BBA	H. D. Graves	1454	S. Broadway, Chico, Calif.
6BBC	P. Borden	Brea, Calif.	
6BBD	C. L. Worthley	1118A	Barendo St., Los Angeles, Calif.
6BBE	C. K. Burns	1835	Bancroft St., San Diego, Calif.
6BBF	Thos. H. Howells	L. D. S. University, Salt Lake City, Utah.	
6BBG	J. R. Harding	Hartman Bay Enterprise, Butte Co., Calif	
6BBH	E. A. Nielsen	115	So. 21st Ave., Phoenix, Ariz.
6BBI	A. H. Schmith	Main St., Battle Mountain, Nev.	
6BBJ	A. F. Miller	1328	18th St., Santa Monica, Calif.
6BBK	J. Gilleran Jr.	222	W. San Carlos St., San Jose, Calif.
6BBL	R. A. Niaja	479	34th Ave., San Francisco, Calif.
6BBM	M. A. Hawkins	2850	19th Ave., San Francisco.
6BBN	K. Dilks	1326	W. 16th St., Los Angeles, Calif.
6BBO	H. B. Chambers	780	Rialto Ave., Pasadena, Calif.
6BBP	J. C. Hooton	R. F. D. No. 1, Los Gatos, Calif.	
6BBQ	F. Macik	194	S. El Belino Ave., Pasadena, Calif.
6BBR	W. E. Carman	165	Lincoln Way, Auburn, Calif.
6BBS	T. L. Up de Graff	1450	San Pasqual St., Pasadena, Calif.
6BBT	K. Walton	418	Second Ave., San Bernardino, Calif.
6BBU	E. Knorr	134	E. Center St., Covina, Calif.
6BBV	F. Pollard	200	W. Badillo St., Covina, Calif.
6BBW	W. C. Milhouse	429	S. Painter Ave., Whittier, Calif.
6BBX	C. Stewart	Fifth St., San Rafael, Calif.	
6BBY	A. Penrose	210	University Ave., Los Gatos, Calif.
6BBZ	F. Anderson Jr.	466	Campus Ave., San Bernardino, Calif.
6BCA	G. Wilson	3635	11th St., San Jose, Calif.
6BCB	R. H. Speck	Upland, Calif.	
6BCC	S. M. Roycroft	114	N. Isabel St., Glendale, Calif.
6BCD	G. H. Simpson	Box 130, Salida, Calif.	
6BCE	V. M. Ashworth	174	N. 1st St., Provo, Utah.

Questions and Answers

By the Radio Inspector

Question: What are the requirements for passing an examination for a radio phone? G. E., Berkeley, Cal.

Answer: Exactly the same rules and regulations apply to telephone sets as to telegraph, viz.: The application must pass the regular amateur examination, including the ten word code speed test, and written examination, and must make application for station license in the usual manner after the operator's license has been obtained.

Question: I am licensed for a spark set which I have and want to do some C. W. experimenting on the side. If C. W. proves satisfactory I may change to it but do not want my license to be changed for C. W. as I do not know whether I will permanently use it. I intend to keep the spark set. Will my license be subject to cancellation or suspension if I do not have it changed? I do not care to have my license changed every time that I desire to use a spark instead of C. W. J. K., San Jose, Calif.

Answer: You may not operate the CW set without authority, as unless it is designated in your license, or unless you have notified the office and received permission to use it, you would be working without a license. If you notify the office that you are going to make this change, and send the license back for correction, the use of CW will be authorized as well as the spark set now installed. This would allow you to experiment on either CW or spark, under the usual restrictions of an amateur license.

Question: I have a CW set that will not operate on a wave length below 325 meters, although I have tried all sorts of schemes to make it go down to 200. Can I, therefore, get a special license. I wish to use it for general amateur communication. K. M., San Francisco, Cal.

Answer: No. This does not constitute any grounds for a special license of any kind. Your attention is directed to Par. 63 of the Radio Laws and Regulations: ". . . a special license will be granted only if some substantial benefit to the art or to commerce aside from individual amusement seems probable." Furthermore, even if you had the special license, you would not be allowed to use the special wave for general communication among amateurs. Special amateur stations are granted certain wave lengths differing from those assigned to other stations for specific purpose. These stations are only allowed to communicate with other special stations of the same class ON THE SAME WAVE LENGTH. For general amateur communication, you would be required to have and use the 200 meter wave. It seems probable, that if you would cut your antenna in half that you would get down all right.

Question: Please inform me of the number of words per minute that I must copy in order to pass the various grades for commercial examination. B. Y., Los Angeles, Calif.

Answer: All examinations include sending and receiving, as follows:

Commercial Extra First Class—25 American Morse and 30 Continental Morse.

Commercial First Class—1st grade, 25 words per minute.

Commercial First Class—2nd and 3rd grades, 20 words per minute.

Commercial Second Grade—1st grade, 25 words per minute.

Commercial Second Class—2nd grade, 20 words per minute.

Commercial Second Class—3rd grade, 12 words per minute.

Question: I hold an amateur first grade license at present and desire to get a commercial license. The amateur license does not expire for about a year. Is it necessary for me to wait until the present license expires before I can take a commercial examination? How long must a person hold an amateur license before he can take the commercial examination? C. M., Oakland, Cal.

Answer: Not necessary to wait for expiration of the amateur license. Holding of an amateur license has no bearing on the holding or applying for a commercial license, except that no one can hold two licenses at the same time. If you hold a commercial license of any grade or class this will suffice for operation of any amateur station.

Question: I have had 24 months on a commercial SECOND grade license. Can this apply to the 18 months experience required for the commercial first class first grade? This was all on merchant ships. J. L. N., San Pedro, Cal.

Answer: No. The regulations state: "First Grade—A year or more satisfactory commercial service IN THE SECOND GRADE—" and for second grade "Six months or more satisfactory commercial service IN THE THIRD GRADE." You would be eligible for the Second Class First Grade in your case, but not for the First Class, as your service was not on a license of proper grade.

New Sixth District Amateur Stations

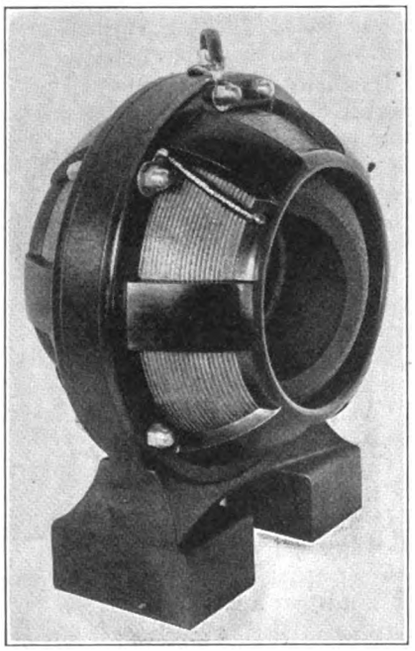
6BCF	John Fishback	20 N. Greenwood St., Pasadena, Calif.
6BCG	Wm. A. Bryan	First Ave., Upland, Calif.
6BCH	Wm. Rosenthal	176 15th Ave., San Francisco, Calif.
6BCI	D. Skilling	2960 Linden Ave., Berkeley, Calif.
6BCJ	E. Salmina	St. Helena, Calif.
6BCK	A. J. Nachbaur	Vallejo, Calif.
6BCL	C. Bluffum	116 20th St., Monterey, Calif.
6BCM	G. R. Harris	Carolina St., Vallejo, Calif.
6BCN	H. Hutchinson	121 W. Center St., Covina, Calif.
6BCO	L. S. Green	Gridley, Calif.
6BCP	E. Atmore	R. F. D., Box 38, Santa Paula, Calif.
6BCQ	E. R. Hog	Mt. Wilson Observatory, Mt. Wilson, Calif.
6BCR	C. Foreman	1714 Alameda Ave., Alameda, Calif.
6BCS	J. Windley	Market St., Manteca, Calif.
6BCT	A. T. Lenoir	1330 E. Pierce St., Phoenix, Ariz.
6BCU	H. Bidwell	San Marcos, Calif.
6BCV	W. J. Robinson	2318 Santa Clara St., Alameda, Calif.
6BCW	F. T. Remer	231 Magnolia St., Modesto, Calif.
6BCX	O. S. Schlenther	2915 Magnolia St., Oakland, Calif.
6BCY	D. Dart	1315 Tamalpias Road, Berkeley, Calif.
6BCZ	H. Hadley	74 Henry St., San Francisco, Calif.
6BDA	H. Frank	1465 McAllister St., San Francisco, Calif.
6BDB	Osmund Stone	1831 Balboa St., San Francisco, Calif.
6BDC	W. W. Schmidt	605 19th Ave., San Francisco, Calif.
6BDD	S. Glassen	2319 Ashby Ave., Berkeley, Calif.
6BDE	W. A. Huber	1603 San Bruno Ave., San Francisco, Calif.
6BDF	E. Hendrickson	2036 7th Ave., Oakland, Calif.
6BDG	W. F. Betts	1533 19th St., Santa Monica, Calif.
6BDH	I. W. Eisenberger	105 N. Fourth St., Alhambra, Calif.
6BDI	D. Wright	Box 125 R. F .D., Glendora, Calif.
6BDJ	A. Clapper	141 E. Center St., Covina, Calif.
6BDK	C. Gutte	1034 Goshen Ave., Visalia, Calif.
6BDL	W. D. Cheney	2723 Benvenue Ave., Berkeley, Calif.
6BDM	J. R. Evans	Riverbank, Calif.
6BDN	G. S. Clark	P. O. Box 383, Bishop, Calif.
6BDO	M. C. Starkey	Taft, Calif.
6BDP	H. M. Williamson	674 6th St., Hollister, Calif.
6BDQ	T. L. Mayes	Coalinga, Calif.
6BDR	W. H. Baird	Fellows, Calif.
6BDS	L. J. Wren	911 13th St., Modesto, Calif.
6BDT	W. S. Shin	1941 Funchal Lane, Honolulu, T. H.
6BDU	Pacific Radio School (R. Tinker)	75 New Montgomery St., San Francisco.
6BDV	B. F. Zinser Jr.	810 W. 48th St., Los Angeles, Calif.
6BDW	D. C. Helsey	232 N. Gower St., Hollywood, Calif.
6BDX	J. De Laney	367 E. 57th St., Los Angeles, Calif.
6BDY	H. Ramer	4547 Cleveland Ave., San Diego, Calif.
6BDZ	A. E. Barnes	1901 Oxley St., So. Pasadena, Calif.
6BEA	W. L. Evans	241 N. Hollenbeck St., Los Angeles, Calif.
6BEB	R. A. Reed	1800 Third St., San Diego, Calif.
6BEC	C. R. Noren	6016 York Blvd., Los Angeles, Calif.
6BED	C. H. Smith	126 Anza St., San Francisco, Calif.
6BEE	C. J. Hansen	3454 Percy St., Los Angeles, Calif.
6BEF	H. D. Hicks	3327 Jefferson Ave., San Diego, Calif.
6BEG	J. P. Weathers	1221 Trenton St., Los Angeles, Calif.
6BEH	B. E. Edwards	515 Sinclair St., Reno, Nev.
6BEI	C. D. Thomas	2801 La Salle Ave., Los Angeles, Calif.
6BEJ	F. McCullough	3161 College Ave., Berkeley, Calif.
6BEK	H. R. Green	1814 So. Vermont St., Los Angeles, Calif.
6BEL	J. P. Blindbury	618 Bushnell St., Alhambra, Calif.
6BEM	K. Kawachi	R. F. D. 1. Box 463B, Gardena, Calif.
6BEN	E. Bradford	Lost Hills, Kern Co., Calif.
6BEO	J. R. Winn	417 Ocean Front St., Venice, Calif.
6BEP	R. Julian	1260 E. 4th St., Long Beach, Calif.
6BEQ	G. H. Rufener	410 W. Santa Barbara Ave., Los Angeles.
6BER	T. Newman	4130 Bachman Place, San Diego, Calif.

New Apparatus and Supplies from the Radio Manufacturers

NOVEL GREBE MOULDED VARIOMETER

Among the many interesting improvements included in the latest types of Grebe radio apparatus is a moulded variometer of novel design.

This variometer consists essentially of five moulded bakelite pieces; a frame, two skeletonized cages for supporting the



New Grebe Variometer.

stator windings, and two half balls which make up the rotor. The cages containing the stator windings are bolted to the frame, while the rotor is assembled on the shafts. It is claimed the design of this unit reduces dielectric losses to insignificance, and that the extreme accuracy and constancy of dimensions gives a more stabilized design than would be possible with any other form of variometer.

A 2 K.W. VACUUM TUBE SET FOR PANAMA

A 2 K.W. radio tube transmitter, now installed and in operation at Almirante, Panama, has recently been completed by the General Electric Company for the Radio Corporation of America. Not only is this transmitter unusually powerful for a tube transmitter, but it was designed and built in record time, being finished, tested, and ready for shipment three months after receipt of the order.

The set consists essentially of equipment designed to supply direct current at 12,000 volts for the plate supply of the radiotron tubes, and for converting this power into radio frequency. Power is supplied to the transmitter at 440 volts, single phase, 60 cycles, and stepped up to high voltage by means of a transformer, the output of which is fed into the rectifying system.

The rectifying system consists of two K.W. Kenetron tubes which supply 12,500 volts d. c. to the plate circuits of the radiotron generators. The ripple in the output of the rectifying system is smoothed out by means of a suitable filter system. The radio frequency power is generated by a system consisting of two 1 K.W. radiotrons with the necessary grid and plate coils, together with an antenna loading coil. Provision is made for controlling the power by a power change switch which alters the voltage on the primary of the plate transformer. The filaments of all tubes, Kenetrons and radiotrons, are operated on a.c. thrcugh transformers which step the supply voltage down to the operating voltages of the filaments.

The set is equipped with a wave changing switch which, by a single operation, changes the transmitted wave to any one of three lengths—600, 1,000 and 3,000 meters. The switch automatically selects predetermined points on the loading, plate and grid coils. Provision is also made for transmitting on interrupted continuous (ICW) as well as on continuous waves (CW). This is accomplished by means of a motor-driven interrupter in the grid circuit of the radiotron tubes, which starts and stops oscillations in the antenna at audio frequency, approximately 1,000 interruptions per second.

The rating of the transmitter is based on the power input of the antenna circuit, instead of on the output of the power equipment as is usual with spark transmitters. The rating of the tube transmitter is the product of the antenna resistance times the antenna current squared, equalling two kilowatts. While it cannot be predicted exactly what the range of this set will be, it is expected that it will equal if not exceed, the range of a 50 K.W spark transmitter. As an example of its initial effectiveness, the set is now carrying on reliable and most satisfactory communication from Almirante, Panama, to New Orleans, La., not only at night but during the daylight period as well.

TRADE NOTES

Somerville Radio Laboratory, Boston, Mass., has issued a new illustrated price list of radio apparatus for the use of the amateur operator.

Atlantic-Pacific Radio Supplies Co., San Francisco, are distributing a revised list of prices on DeForest radio apparatus illustrated and described in Catalogues F, G, S-21 and S-22, which show the new DeForest CW equipment and parts.

Herbert E. Metcalf, publicity manager for the Magnavox Company, is instructor for the radio course offered by the Extension Division of the University of California in the Pacific Building, San Francisco, every Monday night.

H. S. Tenny, formerly chief electrician U. S. navy in the Adriatic service, and frequent contributer to these columns, is now manager Northern Radio & Electric Co., 418 Union street, Seattle, Wash.

Frank A. D. Andrea, New York, has issued an attractive new catalogue of Fada radio instruments and parts, including crystal detectors, vacuum tube detectors, amplifiers, rheostats, switches and transformers.

The Formica Insulation Co. has won the suits brought against it by the Westinghouse Company and the Continental Fiber Co. for alleged infringing patents for making and molding laminated articles.

F. Clifford Estey, president and secretary of the Essex County Radio Association of Radio Clubs in Essex County, affiliated with the American Radio Relay League, has become associated with the Clapp-Eastham Company, Cambridge, Mass., as sales manager. Mr. Estey will direct all sales and advertising work for the C-E line of radio equipment and electrical laboratory apparatus.

Mr. A. E. Evans, formerly of the Western Wireless Works, and Mr. J. L. Sabo, formerly with the Independent Wireless Telegraph Company as radio inspector, have opened a radio supply store at 1972 San Pablo avenue, Oakland, Cal. The new concern will be known as the Evans & Sabo Company. The Western Wireless Works has been absorbed by the newly founded concern. A complete line of all the standard makes of radio equipment will be carried in stock. Manufacturing of radio apparatus will be carried on to a large extent. A new type of 2 K. W. break key, high tension condenser, receiving equipment, etc., will be manufactured.

Radio men of San Francisco and bay cities will be glad to learn that Ben Linden, who was the Radio Inspector in charge of the sixth district during the war period, is now in charge of San Francisco's newest radio store, doing business under the name of Warner & Linden. The store was opened for business on November 1st, at 350 Market street. A complete line of all the standard makes of radio apparatus will be carried in stock. Mr. Warner has conducted a radio store for many months in Oakland, California, under the name of Warner Brothers.

CALLS HEARD

CALLS HEARD BY 6ABJ, E. R. SHARPE, MARTINEZ, CALIF.

(6AK), (6AV), 6BJ, 6BX, 6CH, 6CU, (6CV), 6DN, 6DY, 6FH, 6FI, 6FP, (6GR), (6GX), 6HC, (6IC), 6IG, (6IM), 6LA, 6LR, 6OG, 6ZE, 6ZU, (6ZX), 6AAM, 6ABC, 6ABE, 6ABH, 6ABP, 6ABW, (6ABX), 6ACM, 6AEG, (6AEW), 6AFN, 6AID, 6AJF, (6AGA), 6ALA, 6ALL, 6ALV, 6ALR, (6AMM), (6AMW), 6ARH, 6AWF, 6AVN, 6AVM, 5LA, 7MP, 7XD.

The above stations were heard with one step of amplification. All QSA. Anyone hearing 6ABJ please QSL.

HEARD AT 7XD, BILLINGS POLYTECHNIC INSTITUTE, BILLINGS, MONT. Sept. 1-Oct. 1, 1921

5HK, 5LA, 5ZA, 6ABX, 6AEQ, (6AEZ), 6AFT, (6AIB), 6AIZ, 6ALEC.W., 6APE, (6ATQ), (6AWH), 6AXC.W., (6CV), 6FI, (6GR), 6IC, (6OT), 6WV, 6XG, (6ZU), 6ZM, 6ZS, (7HM), (7HW), (7IM), (7LY), (7OZ), 7UT, (7XQ), 7YA, 7ZE, (7ZG), (7ZJ), 7ZK, (7ZM), 7ZN, (7ZO), 7ZR, (7ZS), (7ZT), 8XAD, 9ABU, (9AEG), 9AEY, 9AFW, 9AGN, 9AMC.W., 9AMBC.W., 9ANF, 9ANK, 9AOU, 9ARZ, 9ASF, 9AYA, (9AYS), 9DLJ, 9DSG, 9DUD, (9EE), (9HM), 9HT, 9HW, 9JN, 9LC, 9LF, 9OE, 9OI, 9PN, 9PS, 9STK, 9XW, (9YAK), 9ZA, 9ZAC, 9ZC, 9ZN, 9ZUG, 9ZYC.W.

CALLS HEARD BY KOZR (FORMER 6AIW OF ROSEVILLE), IN BELLINGHAM, WASH. 9:30 to 11:30 P. M., Oct. 7, 1921

6AK, 6DP, 6EB, 6CH, 6GF, 6IC, 6OC, 6TU, 6GR (very QSA), 6AAT (C.W. QUD), 6GP, 6ALE(C.W. QSA very), 6AEZ, 6VK, 6XAJ (Oakland Hotel Concert), 7BK, 7CC, 7IW, 7MA, 7MP, 7KJ, 7YJ, 7YO, 7XD, 7JS, 7YL, 7ZM (QSS bad), 7YA, 7ZU.

STATIONS COPIED BY 6ASB (D. V. RUSSELL), BREA, CALIF. Sept. 18-Oct. 18, 1921

5ZA, 6AK, 6AL, 6CH, 6CV, 6CY, 6DS, 6FH, 6FK, 6GI, 6GM, 6GP, 6GR, 6GS, 6GT, 6IC, 6IM, 6IV, 6JE, 6KC, 6KS, 6KY, 6MD, 6MS, 6OC, 6OD, 6OG, 6OL, 6PJ, 6PO, 6QR, 6RF, 6SK, 6UP, 6WR, 6ZX, 6XD (phone and music), 6ZB, 6ZR, 6ZU(C.W.), 6ZZ, 6AAG(C.W. and phone), 6ACY, 6AFU, 6AIF, 6AIM, 6ALP, 6ALU, 6ARP, 6AUD, 6AWH, 6XAK(C.W. and phone and music), 7MF, 7IF, 7XD, 7ZD, 7BP. Stations at least 25 miles away.

CALLS HEARD BY 6AME, BOX 218, RIVERBANK, STANISLAUS CO., CALIF.

From Sept. 21-October 21, 1921

Heard on one-tube and honeycombs. All signals at least fairly QSA. Spark stations: 5ZA, 6AB, 6AF, 6AG, 6AN, 6AR, 6AN, 6AX, 6CH, 6CS, 6CV, 6EB, 6ED, 6EG, 6EN, 6ER, 6FC, 6FH, 6FK, 6FS, 6FT, 6GB, 6GI, 6GL, 6GP, 6GT, 6GX, 6HC,, 6HY, 6ID, 6IG, 6IM, 6IN, 6IS, 6JE, 6JC, 6KA, 6KC, 6KH, 6KM, 6KP, 6KS, 6LB, 6LU, 6MF, 6MH, 6MZ, 6NC, 6OD, 6OE, 6OL, 6OY, 6QR, 6RB, 6RD, 6RF, 6RR, 6RT, 6SC, 6SK, 6ST, 6SU, 6SV, 6TF, 6TG, 6UO, 6VY, 6XX, 6ZB, 6ZU, 6ZR, 6ZS, 6ZX, 6ZZ, 6AAH, 6AAT, 6AAN, 6ACY, 6ADL, 6AEZ, 6AGF, 6AGG, 6AGH, 6AGL, 6AIB, 6AID, 6AIO, 6AIP, 6AJE, 6AJH, 6AKL, 6ALU, 6ALP, 6AMI, 6AMN 6APH, 6ARK, 6ARW, 6ATF, 6ATQ, 6AVB, 6AVD, 6AWK, 7AC, 7BJ, 7CK, 7DB, 7DW, 7ED, 7FI, 7GA, 7GR, 7IC, 7IM, 7IN, 7IV, 7IW, 7JU, 7KB, 7KJ, 7KG, 7LT, 7MA, 7MF, 7MP, 7MU, 7NA, 7NR, 7NW, 7OZ, 7QO, 7RM, 7RU, 7RW, 7TJ, 7VO, 7XD, 7XJ, 7XM, 7YJ, 7ZB, 7ZJ, 7ZM, 7ZN, 7ZO, 7ZS, 7ZT, 7ZU.

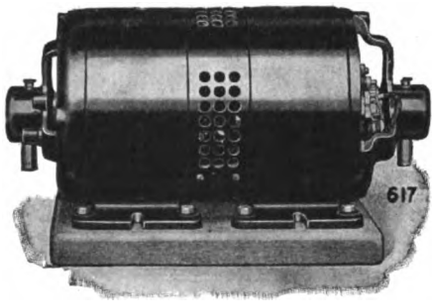
Additional spar stations heard with sun shining: 6AC, 6AK, 6AM, 6FH, 6GC, 6GF, 6GR, 6HF, 6HX, 6IC, 6KW, 6OC, 6TU, 6UF, 6VM, 6AAJ, 6ABX, 6AEI, 6AFN, 6AJD, 6AJU, 6AJW, 6ALW, 6ATF, 6ANB.

C.W. stations: 5ZA, 6AT, 6AV, 6EF, 6EN, 6ME, 6RA, 6WV, 6XR, 6ZA, 6ZN, 6AAT, 6AHC, 6AIO, 6ALE (day), 6ALU, 6AQT, 6ARF, 6ART, 6AWE (day), 6AWC (day), 6AWH, 6AWV, 6XAC, 6XAD, 7XF, 9AMB.

Phone stations: 6AK, 6FI, (day), 6XD, 6XE, 6XG (day), 6XW, 6AWY (day), 6XAC (day), 6XAK, Hotel Oakland. (6?) 7XF and 9 (?)AF. (Reynolds Radio Co., Denver, Colo.)

C. W. *for* Christmas

—Make a Good Start with your Christmas Money—A Few Suggestions



ROBBINS & MEYERS, MOTOR GENERATORS AND GENERATORS FOR C.W.

100 V. A. C. 500 V. D. C.

100 watts output 1750 R.P.M. $74.75. Ship. wt. 95 lbs.
200 watts output 1750 R.P.M. 89.80. Ship. wt. 120 lbs.
200 watts output 3400 R.P.M. 79.00. Ship wt. 95 lbs.

110 V. A. C. 1000 V. D. C. (Double Commutator)

200 watts output 1750 R.P.M. $197.40. Ship. wt. 185 lbs.
200 watts output 3400 R.P.M. 181.40. Ship. wt. 150 lbs.
500 watts output 1750 R.P.M. 271.00. Ship. wt. 275 lbs.
500 watts output 3400 R.P.M. 208.80. Ship. wt. 220 lbs.

Generators Only, Belt Driven, With Pulley—500 Volts

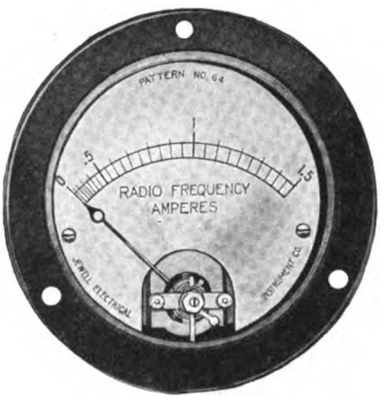
100 watts output 1750 R.P.M. $42.00. Ship. wt. 50 lbs.
200 watts output 1750 R.P.M. 50.60. Ship. wt. 65 lbs.
200 watts output 3400 R.P.M. 44.00. Ship. wt. 50 lbs.

1000 Volts (Double Commutator)

200 watts output 1750 R.P.M. $77.60. Ship. wt. 65 lbs.
200 watts output 3400 R.P.M. 98.20. Ship. wt. 80 lbs.
500 watts output 1750 R.P.M. 145.60. Ship wt. 140 lbs.
500 watts output 3400 R.P.M. 98.20. Ship. wt. 80 lbs.

These generators are positively the last word in efficient design. Workmanship and appearance unsurpassed.

Prices are all F.O.B. San Francisco.



JEWEL ELECTRIC METERS

Pattern 33. 3¼" dia. Flush Type Milliammeters, D.C. for plate current, 0-100, 0-200, 0-250, 0-300, 0-500 mill....$6.50
Ammeters D.C. for filament current and battery charging. 0-1, 0-1½, 0-2, 0-2½, 0-3, 0-4, 0-5, 0-8, 0-10, 0-15, 0-20, 0-30 amps. $6.50

Voltmeters D.C. for transmission and reception. 0-3, 0-7.5, 0-10, 0-15, 0-20, 0-25, 0-30, 0-40, 0-50 volts.$ 6.50

0-150 volts 8.75
0-300 volts 9.75
0-500 volts 14.50
0-1000 volts 21.50
0-1500 volts 27.50

Pattern 25, same case as pattern 33 Thermo Couple, Radiation meters. Radio Frequency Ammeters. 0-1, 0-1½, 0-2, 0-2½, 0-3, 0-5, 0-10 R. F. Amps....$9.05

Pattern 54 3¾" dia. (new type) Flush Mtg. Milliammeters D.C. for plate current. 0-100, 0-200, 0-250, 0-500 milliamps $8.40
Ammeters D.C. for filaments and battery charging. 0-1, 0-1½, 0-2, 0-2½, 0-3, 0-4, 0-5, 0-8, 0-10, 0-15, 0-20, 0-30, amps. $8.40

Voltmeters D.C. for transmission and reception. 0-3, 0-7½, 0-10, 0-15, 0-20, 0-30, 0-40, 0-50, 0-75.....$8.40

0-150 volts 9.60
0-300 volts 12.25
0-500 volts 16.75
0-1000 volts 23.75
0-1500 volts 29.80

Pattern 64, same case as pattern 54 Thermo Couple Radiation meters. 0-1, 0-1½, 0-2, 0-2½, 0-3, 0-4, 0-5 R. F. Amps. $12.40

Pattern 74 same case as patterns 54 and 64 Ammeters A.C. For A.C. Power Supply and Filament Current. 0-1, 0-1½, 0-2, 0-2½, 0-3, 0-5, 0-10, 0-15, 0-20, 0-25, 0-30 Amps. $8.30

Voltmeters A.C. for A.C. Power Supply and Filament Voltage. 0-10, 0-15, 0-20, 0-30, 0-40, 0-50, 0-75 volts $8.30
0-150 volts 9.60
0-300 volts 12.25

NEW WESTINGHOUSE SINGLE PHASE 110-VOLT INDUCTION MOTORS!

A Limited Quantity. These Prices Cannot Be Equalled Anywhere.

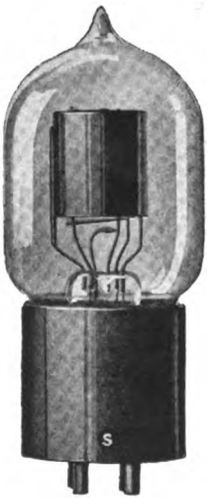
	Reg. Price
1-20 H.P. $13.70. Ship. wt. 16 lbs.	$18.30
1-8 H. P. $17.00. Ship. wt. 20 lbs.	22.70
1-6 H.P. $19.75. Ship. wt. 23 lbs.	24.15
1-4 H.P. $21.50. Ship. wt. 24 lbs.	25.20

Postage or express extra from San Francisco.

VACUUM TUBES

For receiving and transmitting purposes. Complete stock.

Shipped Postpaid Standard Prices



The above prices are subject to additional postage from San Francisco.

All our meters are provided with movements specially insulated from the case—built to our order at the factory of the Jewell Instrument Co.

—All orders filled from stock on any standard equipment

Heintz and Kohlmoos

606 Mission Street **San Francisco, Cal.**

Say Radio to the Advertiser, it will help you.

HEARD BY 6AUN

6AK, 6AR, 6CV, 6CZ, 6DP, 6EA, 6EB, 6EN, 6ER, 6FT, 6GF, 6GI, 6GR, 6GP, 6GX, 6HH, 6HY, 6IC, 6ID, 6IS, 6JC, 6JE, 6JY, 6KA, 6KC, 6KR, 6KS, 6KY, 6MH, 6MK, 6MN, 6PJ, 6PO, 6QI, 6QR, 6SK, 6TI, 6TU, 6TV, 6VR, 6VY, 6ZB, 6ZN, 6ZX, 6ZZ, 6AAT, 6ABX, 6ACR, 6ACY, 6ADL, 6AEI, 6AFN, 6AGM, 6AIB, 6AID, 6AKL, 6ALE, 6ALU, 6ATX, 6ATQ, 6AVB, 6AWH, 6AWS, 6AWV, 6XAC, 6ZAD, 7BK, 7BP, 7ED, 7FI, 7IN, 7IU, 7JW, 7KB, 7KG, 7KJ, 7LU, 7MF, 7NL, 7TO, 7XD, 7XF, 7YA, 7YS, 7ZK, 7ZJ, 7ZM, 7ZT, 7ZU, 5ZA, 9BD(Canadian), 9HM, 9AMB(C.W.).

CALLS HEARD BY B. MOLMOSI 6AWT

5ZA, 6AK, 6AR, (6CV), 6IP, (6EA), (6EB), 6EN, 6ER, 6FH, 6FT, 6GI, (6GR), (6GR-C.W.), 6GF, 6GX, 6HH, 6HY, 6IC, 6ID, 6IF, (6IS), 6JE, 6JC, (6KA), 6KC, 6KR, 6KY, 6MH, 6MN, (6PO), 6QI, 6QR, 6SK, 6TI, 6TU, 6VY, 6VR, 6ZB, 6ZU, 6ZX, 6AAT-C.W., 6ABX, 6ABG-C.W., 6ADL, 6AEI, 6AFN, 6AGM, 6AIB, 6AID, 6AJH, 6AKL, (6ALE-C.W.), 6ALU, 6AVB, 6AWH, 6AWV-C.W., 6XAC-C.W., (6ZAD-C.W.), 7BK, 7BP, 7ED, 7FI, 7IN, 7IU, 7JW, 7KB, 7KG, 7KJ, 7LU, 7MF, 7NL, 7TO, 7XD, 7XF-C.W., 7YA, 7YS, 7ZK, 7ZJ, 7ZM, (7ZT), 7ZU, 9HM, (9BD-Canadian).

6DWT reported QSA on tube by 9BD Canadian.

Anyone hearing 6DWT please QSI B. Molinari, 653 Union Street, San Francisco.

PARTIAL LIST RECEIVED AT 6WI DURING SEPTEMBER
(Anybody Hearing 6WI Please QSL By Mail, Etc.)

5ZA, (6AAT), 6AAW, 6AK, 6ABM, (6AJH), 6ATQ, (6AVB), 6ADA, 6ABU, 6APE, 6ACA, 6ACR, 6AUL, (6ARnk), 6AFN, (6ACF), 6BW, 6CP, 6CV, 6DA, 6FK, 6CF, 6CR, 6IC, (6KC), 6OC, 6OH, (6PJ), 6SK, (6TV), (6VX), 6WZ, 6ZU, (6ZB), 7ZJ, 7ZM, 7ZT.

HEARD AT 6FB, REDONDO, CALIF.
Aug. 29-Oct. 23

5ZA (CW&SPK), 6AK, 6AS, 6CP, 6CV, 6DP, 6EX, 6FH, 6FK, 6GF, 6GR, 6IC, 6IM, 6KC, 6KM, 6OC, 6PJ, 6PR, 6QR, 6QT, 6TU, 6VK, 6WO, 6WG, 6ZB, 6ZU, 6ZX, 6ZZ, 6AAT, 6ABH, 6ABU, 6ABX, 6ACH, 6ACM, 6AFO, 6AGF, 6AJH, 6AMK, 6ARW, 6ATQ, 7BP, 7FI, 7IN, 7IW, 7KB, 7MF, 7MP, 7XD, 7YA, 7YG, 7YS, .7ZT, 7ZU, 9HT, 9IN, NK.

Log report can be given.

STATIONS HEARD AND WORKED AT 7BK, SEATTLE
September 15-October 15

Canadian 5CJ, Canadian special (9BD). 6AK, 6AAT, 6AAU, (6AAW), (6ABH), (6ABU), 6ABW, 6ABX, 6AEZ, 6AFM, 6AFN, 6AFO, 6AGF, (6ALE), 6ANG, 6APH, 6ARK, 6AVB, 6AWV, (6CH), 6CP, 6CV, 6DP, 6EA, 6EB, 6ER, 6EX, 6FH, 6GF, (6GR), 6GX, 6HY, 6IC, 6IM, 6IS, 6KP, 6LU, (6MH), NK", 6OC, (6OH), (6PJ), 6PO, 6QR, 6QT, 6SK, (6TU), (6VK), 6VM, (6VX), 6WZ, 6XAC, 6XG, (6ZU), 6ZX, 7BH, (7BP), 7CC, 7ED, (7FI), 7GA, 7HF, (7IN), 7IO, (7IW), 7JU, (7KJ), 7MF, (7NL), 7TA, (7TJ), 7XD, 7YA, (7YJ), (7ZM), 7ZT.

HEARD BY 5BR, VANCOUVER, B. C.
Sept. 1-Oct. 20, 1921

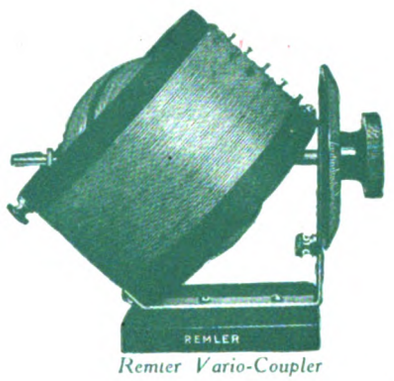
Canadian "5'S" too numerous. 7ZT, 7KM, 7ZS, 7ZB, 7KB, 7ED, 7BP, 7BK, 7IN, 7MF, 6AH, 6EX, 6CH, 6GR, 6ZU, 6ALE, 6XAD-C.W., 6ABX, 6AFN, 6LU, 6AUA, 6IM, 6FH, 7ZJ, 7ZN, 7CC, 7XP, 7XD, 7ZM, 7LY, 7MF, 7MH, 7IW, 7FI, 7YJ, (7IC). 6QR, 6KA, 6KM, 6AWT-C.W., 6IM, 6AGF, 6WZ, 6VX, 6GR, 6FN, 6FH, 6AK, 6LU, 6GX, 6ANG, 6AEZ, 6ZX, 6IK, 7YJ, 7KM, 7BH, 7UJ, 7RA, 7BR, 7GA, 7CW, 7ZU, 7TJ, 7MP, 7LU. Loudest 6 station is 6QR in Reno, Navada. Loudest 7 stations are 7BP, 7ED, 7ZT and 7ZU.

CALLS HEARD AT 7MF, EUGENE ORE.

Canadian 5BA, (5BR), (6AE), 6AK, (6AS), 6AE, 6AR, 6BJ, 6CL, 6CV, 6CY, 6DD, 6DP, 6EA, 6EB, 6EX, 6FH, 6FK, 6GF, 6GI, 6GR, 6IC, 6IM, 6IS, 6KA, 6KM, ER, 6MF, (6OC), 6OH, (6PJ), 6SK, 6TV, 6VK, 6VX, 6WZ, 6ZA, 6ZE, 6ZH, 6ZX, 7AC, (7AY), (7BK), (7BC), (7BJ), 7CN, 7YS, 7ZA, 7ZJ, 7ZM, 7ZN, 7ZO, 7ZTACIN 7ED, 7EX, 7FG, 7GO(C.W.), 7HW(C.W.), 7IN, 7IM, 7JW, 7KB, (7KJ), 7KM, 7LW, 7MO, (7MW), 7NL, (7NW), 7OT, 7SP, 7TO, 7XF(phone, music, C.W.), 7XD (CQ), 7YA, 7YS, 7ZA, 7ZJ, 7ZM, 7ZN, 7ZO, 7ZS, 7ZT, 5ZA(C.W.), 5IF, 6AAT(C.W.), 6ALE (C.W.), 6AQT, 6ARK, (6ABW), 6ABX, 6ABU, 6ABM, 6ABH, 6XAD(C.W.), 6XAC (C.W., phone), 6XG(C.W., music, phone).

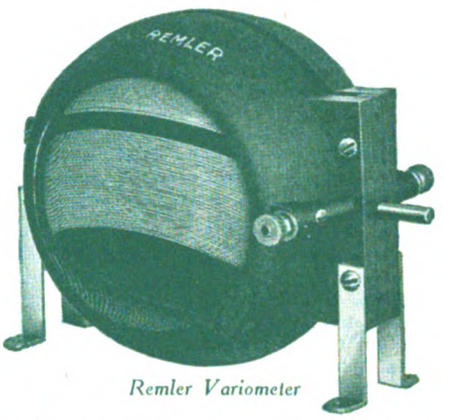
The Season's Greetings!

Xmas Presents and a *New Year* Resolution are in order. *A Radio Gift* is a lasting, pleasing and instructive one. Order Early. Make your *New Year* resolve to buy your Wireless Apparatus where you obtain:



Remler Vario-Coupler

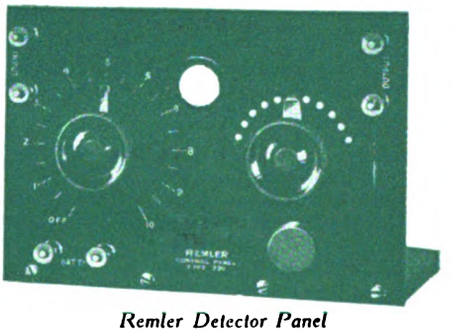
The Brand of Service that gives you what you want when you want it, and at a price that is right.



Remler Variometer

Type 503 .....$5.40
Type 504, with dial..... 6.40
Type 505, panel mtd...12.75

Type 500 .....$6.00
Type 501, with dial..... 7.00
Type 502, panel mtd... 9.75



Remler Detector Panel

Type No. 330. Price.....$8.00

BURGESS B BATTERIES

No. 2156. Navy Type. 22½ volt with 18 volt tap for G.E. tubes. Size 3"x4"x6⅝". Price.....$3.00
No. 5156. Medium Type. 22½ volt, with 9, 13.5, 18 19.5, 21 and 22½ tap. Size 2¾"x2 9/16"x4⅛". Price $2.75
No. 4156. Signal Corps Type BA-2. 22.5 volt. Size 2½"x2"x3⅜" $2.25

GREBE RECEIVERS

CR-3. 150-Meters $65.00
CR-5. 150-3000 Meters, includes detector control.$80.00
CR-8. 150-1000 meters, includes detector control.$80.00
CR-9. 150-3000 meters, includes det. 2-step....$130.00
CR-6A. 150-20,000 meters, includes det. 3-step..$375.00

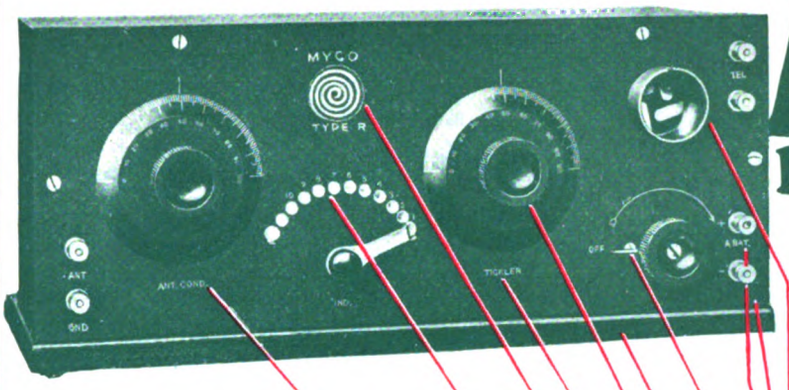
Western Radio Electric Company

550 SOUTH FLOWER ST.
LOS ANGELES, CALIF.

274 TWELFTH ST.
OAKLAND, CALIF.

Distributors for

Remler Apparatus, Burgess Batteries, Grebe Apparatus



MYCO RADIO RECEIVING SET

Licensed Under the Armstrong Patents

150-3000 Meters

Price

$55.00

—it constitutes the most desirable combination known for the reception of phone concerts

- Vacuum Tube Socket: Metal Shell type with positive contact springs.
- Fixed Capacities: Correct proportions for modern tubes.
- Metal Parts: Brass. Exposed parts satin nickel plate.
- Wiring: Approved Busbar of large hard drawn conductor.
- Front Panel: Grained Formica Plate.
- Binding Posts: Nut type; assuring positive connection.
- Reostat: Ruggedly costructed to give correct adjustment of modern vacuum tubes without excessive heating.
- Cabinet: Hard Wood with Artistic Weathered Oak Finish.
- Dials: Bakelite with convenient shaped knob.
- Tickler: Capable of giving regeneration over entire range of wave length.
- Engraving: Gorton: filled in with permanent Brilliant White.
- Inductances: Genuine bank wound with liberal size conductor giving maxium efficiency.
- Variable Condenser: Counter balanced type of ample proportions and trouble proof.

THE MYCO TYPE R RECEIVER is the ultimate result of design and experimentation to develop a receiver that is especially applicable to wavelengths between 150 and 3000 meters; both Spark and C. W., Telegraph and Telephony. It is so designed to tune in such stations in a minimum time and with wonderful ease and positiveness. The Myco Universal Receiver has been designed and built after exhaustive experimentation to meet these requirements and does so to perfection. All unnecessary controls have been eliminated so that the only changes necessary to vary wavelengths are one Variable Condenser and the inductance Switch. Such adjustments are not critical but after the desired station has been heard they can be amplified very greatly by increasing the tickler control. This arrangement means that practically any station within range can be picked up and tuned in to maximum amplitude in a few seconds of time.

This receiver is offered in one model only employing some original ideas in construction. Combined with the receiver in the same cabinet is an efficient vacuum tube control resulting in a set complete ready to connect on to batteries and aerial and ground.

Entire assembly complete on panel which permits of easy removal for inspection of interior. Each receiver shipped in heavy wooden case guaranteed against damage and full instructions inclosed.

For those who desire a greater amplitude of signals than is obtainable with our Universal Receiver alone, we offer a two-stage amplifier unit to be used in conjunction with same.

The unit is exactly the same height and depth as Myco Universal and is intended to set along side. The connection lugs are furnished with the amplifier.

Myco Two-Stage Amplifier f. o. b. San Francisco, $55.00

See your dealer who has information on this set or write for Bulletin 1000A giving detailed instructions of the Myco Type R Receiver and Amplifier.

428 Market Street
San Francisco, Cal.

LEO J. MEYBERG CO.

950 South Flower Street
Los Angeles, Cal.

Operating the Fairmont Hotel Radio Station 6XG San Francisco

Send for Our Concert Schedule

Operating Hamburger's Department Store Radio Station 6XAK Los Angeles

MOVED

—and it was some job

Yes—We are now located in that new factory which we told you about last month. And O Boy, it's some nice place. All the light and air we need and lots of space to put things.

Now—We can soon begin to take care of the ever increasing demand for "*Wireless Shop Variable Condensers*"; the Quality instrument that is made right and stays right. We are not quite settled completely, but we are now running and will be up to full production within a week.

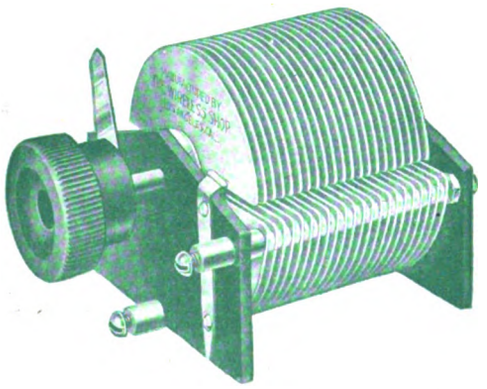
But Remember—We have a lot of orders ahead, and if you want prompt deliveries we cannot urge you too much to place your order at once. We will try hard to keep our shop producing enough condensers to take care of the orders, but the way orders are arriving every day now, it looks as if we would be swamped.

There Must Be a Reason Why "Wireless Shop" Condensers Are So Much in Demand. We know the reason, but perhaps no one has ever let you in on the secret. "*Quality*"—that's the reason. If you have ever seen one you know, but for those fellows who have never had the opportunity of looking them over, we'll tell you that it's *Quality* that sells "*Wireless Shop Condensers.*" With the fellow who knows, *the Best* is what he wants. If you happen to be one of those who don't know, write us for a copy of Bulletin No. 1, which describes and illustrates the complete line of "*Wireless Shop Condensers.*"

They are made in three types and fourteen sizes—one for every need.

SERIES "T"

Three-inch stationary plate. For receiving circuits. Easy to mount back of your panel. Fitted with knob and pointer.

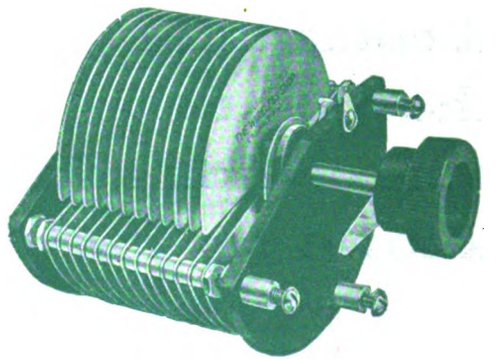


No. 20 2-plate Vernier Condenser.....$2.00
No. 70 7-plate, approximately .0001 m. f. maximum capacity 2.35
No. 130 13-plate, approximately .0002 m. f. maximum capacity 2.75
No. 170 17-plate, approximately .0003 m. f. maximum capacity 3.15
No. 230 23-plate, approximately .0005 m. f. maximum capacity 3.60
No. 310 31-plate, approximately .0007 m. f maximum capacity 4.30
No. 430 43-plate, approximately .001 m. f. maximum capacity 5.25
No. 630 63-plate, approximately .0015 m. f. maximum capacity 7.50

Include postage for one pound to your postal zone, and insurance.

SERIES "CW"

Four inch stationary plate. Wide spacing for "CW" work. Fitted with knob and pointer. Solid Formica End supporting plates.



No. 1500 15-plate, approximately .0004 m. f. maximum capacity $6.00
No. 2500 25-plate, approximately .0006 m. f. maximum capacity 7.50
No. 3500 35-plate, approximately .0008 m. f. maximum capacity..... 9.00

Include postage for two pounds on No. 1500 condenser, and for three pounds on No. 2500 and 3500, and insurance, to your postal zone.

And, Remember, That Quality Will Always Predominate With

THE WIRELESS SHOP
A. J. EDGCOMB

1262 West Second Street **Dept. R** **Los Angeles, Cal.**

Say Radio to the Advertiser, it will help you.

CALLS HEARD BY 7GO, SALEM, ORE.
Sept. 10-Oct. 5—(One Stage)

6AS, 6ABH, 6ABM, 6ABW, 6ACR, 6AEW, 6AEZ, 6AFN, 6AGF, 6AID, 6ALE(C.W.), 6AJH, 6ATQ, 6AWH, 6AWT(C.W.), 6BAF, 6CP, 6EA, 6EX, 6GI, 6GF, 6GR, 6IC, 6ICN, 6IS, 6KA, 6OC, 6TU, 6TV, 6VX, 6WJ, 6WZ, 6XG(C.W.), 6ZAD(C.W.), 6ZB, 6ZM, 6ZR, 6ZU, 7CE, 7BK, 7BP, 7ED, 7FI, 7GA, 7IM, 7IU, 7IY, 7KB, 7KM, 7KJ, 7KW, 7LY, 7MO, (7MW), 7NL, 7TZ, 7XD, 7XF(C.W.), (7YJ), 7ZJ, 7ZM, 7ZS, 7ZT, 9HM, 9AX (Canadian 9AX?)

CALLS HEARD BY 6WR, PASADENA, CALIF.
July 30-Sept. 15

All work was done with a single audiotron tube and variometers.

(6AE), 6AK, /6AR), and "NK," 6CV, 6EP, (6FK), 6GF, 6HC, 6IC, "JS," (6KC), 6KX, 6MK, 6MY, 6OC, 6OH, (6PJ), 6TU, (6TV), 6VK, (6VX), 6WZ, 6ZB, 6ABM, 6ABU, 6ABW(C.W.), 6ABX, 6AEZ, 6AFB, 6AGB, (6AGF), 6AID, (6AJH), 6AKL, (6ALE(C.W.), 6ANG, 6APE, 6ARW, 6ATW, 6AND, 6AUV, 6AWH, (6AWI), 6BAW (C.W.), 7ZT, 7BP.

HEARD AT 6AAK, SANTA BARBARA, CALIF.

CL-fone, 6AH, 6LC, 6ZX, 6AK, 6MH, 6AAT-C.W., 6BW, 6MZ, 6ABW, 6CR, 6OH, 6ABX, 6CV, 6PJ, 6ACR, 6EX, 6SK, 6AGF, 6FK, 6TV, 6AJH, 6GF, 6TU, 6APE, 6GR, 6VK, 6ATV, 6KA, 6VX, 6KC, 6WZ, 6KS, 6ZB, 6LB, 6ZU.

HEARD AT U. S. FOREST PATROL STATION S.B., SANTA BARBARA, CALIF. BY 6AAK

6AH, 6AK, 6BW, 6CR, 6GF, 6KC, 6KS, 6PJ, 6SK, 6TU, 6TV, 6VX, 6ZU, 6ABW, 6AGF, 6AHJ, 6APE, SDLU, (...N78)¼ 6AH, 6AK, 6BW, 6CR.

CALLS HEARD BY RADIO 7QR, C. V. ANNIN, MYRTLE POINT, ORE.
Sept. 27-Oct. 28

On Crystal detector and 3500-meter loose coupler: 6AK, 6BB, 6CV, 6GF, 6GR, 6HY, 6IC, 6IM, 6KA, 6KM, 6PJ, 6QR, 6VX, 6WZ, 6ZU, 6ZX, 6AAU, 6ABX, 6AFN, 6AGF, 6AID, 6APE, 6AVY, 7BH, 7BK, 7BP, 7ED, 7FI, 7GA, 7IN, 7IW, 7IY, 7KJ, 7MF, 7MU, 7MY, 7RF, 7VX, 7YJ, 7ZM, 7ZS, 7ZT, 9AX, 9BD.

HEARD AT WJK, TAFT, CALIF.

5ZA, 6AH, 6AJ, 6AN, 6AAX, 6AAW, 6ADI, 6ADJ, 6ANF, 6AMX, 6AJT, 6AEI, 6ARO, 6AIV, 6ARW, 6ATF, 6ATQ, 6BW, 6CP, 6DA, 6EX, 6FX, 6FY, 6GF, 6GT, 6IF, 6II, 6IV, 6KC, 6KX, 6LY, 6MK, 6PJ, 6SK, 6TU, 6TV, 6VK, 6VM, 6VX, 6XAC, 6XAD, 6ZB, 6ZTD, 6ZU, 7XD, 7YG, 7YA, 7LY, 7ZT, 7ZU, 7ZAF, 9ZA calling 9ZN and 9PS (9:08 p. m., Oct. 10th).

It might be of interest to know that the Bakersfield Californian is operating two five-watt radiophone sets, one at Bakersfield and the other at Taft. We are getting one and a half amperes radiation on 400 meters. Our signals are reported as heard by 7YA at Boise, Idaho, and the West Carmargan, a freighter, while 100 miles out of Honolulu. We have been sending out the baseball reports of the world series play by play as received from the AP and would appreciate a card from anyone having heard these signals.

PHILLIPS THYGESON,, Old 6BU,
Op. at WSK.

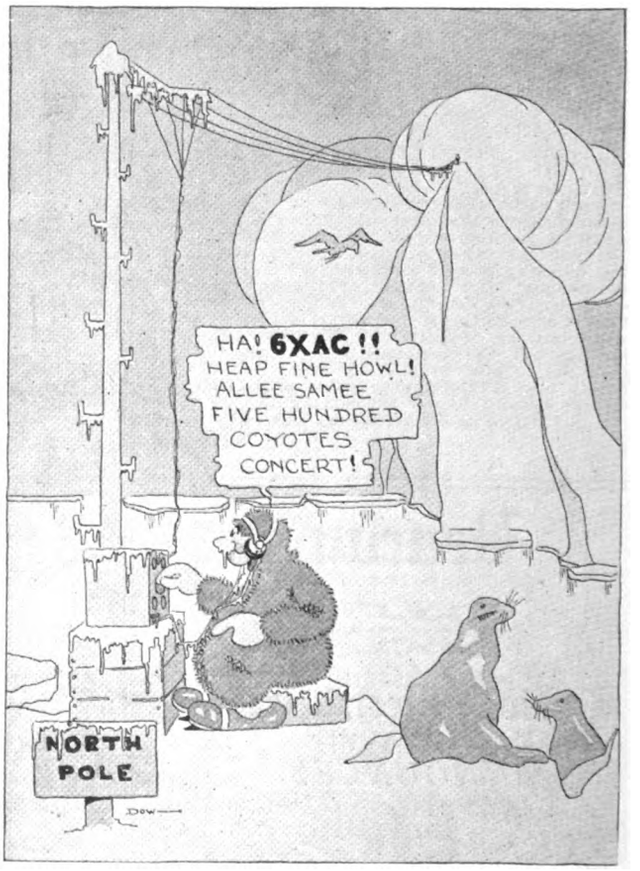
CODFISH FOR CHRISTMAS

(Continued from Page 203)

subscriber to a popular wireless magazine, whose full-page ads of magnificent apparatus quickly brought him to an unhappy realization of the comparative poorness of his own equipment. With almost childish eagerness he would study for hours the beautiful illustrations of imposing long-wave receivers, alluring two-step amplifiers, and all the other splendid apparatus. He swamped himself with a multitude of catalogs and earnestly longed to buy everything in all of them; all the while realizing that he could not afford to buy anything in any of them. It taxed his resources to buy enough coal to keep from freezing to death through the long Alaskan winter with its fierce snow-storms and shrieking northwest blizzards.

So Old Judge had studied the handsome array of apparatus in his catalogs with a sort of despairing worship, until one day Samuel Jones had a falling-out with a certain Siwash belle of Unga, and immediately developing an acute attack of the wanderlust, announced that he was going to pull out for San Francisco. Then it was that there had dawned upon Old Judge's horizon the dazzling possibility of his getting the berth at K-V-I with its free coal and provisions and a

(Continued on Page 224)



Things that never happened here
Are really heard in Lapland clear.

CODFISH FOR CHRISTMAS

(Continued from Page 222)

salary of a hundred and fifty dollars a month.

Losing his head in a whirl of joyful excitement at the mere prospect, Old Judge dispatched an order to a wireless supply house for over three hundred dollars worth of apparatus. He felt that even if he became operator over at K-V-I he would still want his amateur set for amusement and for conversing with the passing ships. He sent a small draft with his order and trusted to a belief that he would be able to draw from the codfish company an advance salary check to meet the C. O. D. bill of more than two hundred and fifty dollars when the apparatus arrived.

AND now, in one short afternoon, his hopes had been wrecked, his dreams shattered. Sadly, Old Judge regarded the newly-arrived packages. They would have to go back now. There was no doubt about that. Well, at any rate, being postmaster gave him the opportunity to unwrap the instruments and look at them, at least, before sending them back.

Without much enthusiasm, Old Judge untied one of the heavy packages, carefully removed the wrappings and brought to view a big, powerful-looking six-inch spark-coil. It was clearly a splendid instrument. Its polished mahogany case shimmered richly and its finely built vibrator with large, accurate contacts bespoke its quality. Old Judge set it on his instrument table and ruefully compared his own little coil, so small and inferior-looking beside the glistening big beauty. What distances he could do with the boys on the ships with this coil! Sixty miles any time, perhaps a hundred. And he had to send it back.

Fumblingly, Old Judge opened the next package. It contained a magnificent regenerative receiver. It was a superior instrument, its flawless panel, perfectly-grained, setting off artistically the glossy black dials, beautifully engraved, turning true and with a velvety smoothness.

But splendid piece of aparatus as was the regenerative receiver, it was outdone by a long-wave tuner with a complete set of honeycomb coils, and by a two-step amplifier that fairly took Old Judge's cabinet work, lustrous black insulation, and heavy rich nickel—a superb instrument.

For a long while Old Judge sat entranced, inhaling the faint odor of fresh insulation and metal that emanated from the tableful of handsome apparatus. How tarnished and dilapidated his own little set looked beside this magnificent equipment.

A passionate desire to keep all these beautiful instruments swept over Old Judge. What stations might he bring in; countless ships, land stations near and far, perhaps sometimes an amateur from the distant outside, certainly dozens of high-power arcs from everywhere. Old Judge had always wanted to tune in the arcs. He had often listened to them over at K-V-I, and had longed for a set that would bring them in.

A damp, chilly draft brought Old Judge back to earth. The fire was out and the room cold and cheerless. Taking his coal-hod, he went out into his little kitchen and scraped up a few scant shovelfuls of siftings from the bottom of his empty coal box. It took six tons of coal to see Old Judge through a winter—and coal cost forty-five dollars a ton down at the codfish company's shed. Besides, there were still costlier provisions to be bought.

Heavy at heart, Old Judge carefully rewrapped all the instruments and took them back into the room which he used as a postoffice. The mail boat was now at Dutch Harbor, to the westward, and upon her return the apparatus would go back with her.

Glancing at his calendar, Old Judge noticed with a shock that the mail boat was scheduled to touch at Unga, eastbound, on Christmas Day. It looked as if it was going to be a cheerless sort of Christmas for Old Judge.

Every year the codfish company sent up a few crates of live turkeys from San Francisco on the winter supply-schooner; and despite their sky-high prices, Old Judge had always managed to have one—but he was not going to have one this year. The postoffice wasn't bringing in much of late; weddings seemed to have gone out of style, shutting off that source of revenue; and the sourdoughs' guns were rusting from lack of use, with the result that even the eight-dollar court fee seldom came any more.

No, clearly, Old Judge would have no turkey this year. The company generously gave free codfish from the tanks to anybody who wanted it; and Old Judge would have to get along with fish. Codfish for Christmas wasn't a very

(Continued on Next Page)

CODFISH FOR CHRISTMAS

(Continued from Preceding Page)

cheerful sort of prospect, but Old Judge felt that he could face it with a smile if only he could keep those magnificent instruments.

Had Samuel Jones known all of these things, he would undoubtedly have put Old Judge in at K-V-I. Old Judge realized this, but old and needy as he was, he had some pride. If he wasn't good enough for the job, he didn't want it given to him as charity.

Three weeks later, a wintry blizzard came shrieking over the Shumigans. Towering green seas boomed and thundered on the ocean-exposed shores of Unga Island, and the bitter northwest wind, sweeping down the sides of the white-clad island mountains, brought swiftly-flying gusts of hard, frozen flakes and crashing cannonades of sleet, until all the world seemed turned to snow and ice.

Provisions and coal were exhausted at the company store and the uneasy village was anxiously awaiting the arrival of the schooner "Anangashak," bringing a full cargo of fuel and food supplies, and the annual shipment of Christmas goods. Since the schooner carried no wireless, the time of her arrival was a matter of conjecture.

For five days the blizzard held on, steadily increasing in fury. Samuel Jones paced restlessly back and forth in his receiving room, or stood before his bay window and gazed out over the storm-swept sea toward the opposite island of Nagai, ten miles distant, whose lofty white peaks were occasionally visible during brief lulls in the blanketing snow-squalls.

Darkness fell. The roaring blizzard shrieked fiercely around the eaves of the wireless house; and the rocky ledge upon which the building stood quivered jarringly under the thundering impact of the towering rollers that hurled themselves against its granite base and enveloped the ice-crusted cliffs with white sheets of flying spray and sea-water which came swishing momentarily on the window-panes of the receiving room.

Standing in the darkness, gazing out into the night, the lone operator suddenly saw a far-distant fiery red serpent shoot skyward and burst into a shower of tiny glowing stars. Again and again a sinuous tongue of flame flashed like a little electric spark before a background of black velvet, until the watcher realized that distress rockets were being fired from over on Nagai Island.

Next morning the storm lulled, giving way to silently falling snowflakes that grew into great drifts around the buildings and sheds and made somber white ghosts of the mountains that girded the harbor round. Taking advantage of the pause in the storm, a power-boat ven-

(Continued on Page 228)

CODFISH FOR CHRISTMAS

(Continued from Page 226)

tured over to Nagai—and returned bringing the crew of the schooner "Anangashak."

Lost in the blizzard, the vessel had struck on Nagai. The crew got ashore, but the ship and all her cargo was a total loss.

Seeking out the skipper of the "Anangashak," Samuel Jones inquired for his relief operator.

"Him vouldn't come," replied the brawny shipmaster. "Seems like him didn't know vere ve vas going ven he comed aboard, but yust ven ve vas pulling out, somebody telled him an' he skijoodled ashore without efen his dunnage. Ay fancy him neffer vent back to der offis, an' them bane tankin' him vas aboard."

The news of the shipwreck spread quickly through the village. Soon a knot of anxious fishermen, all with numerous healthy kiddies to be fed, were gathered in the company store. The superintendent joined them.

"We'll have to get relief from Dutch Harbor or we'll be up against it," he said. "We divided the last sack of flour in the store yesterday. There's no fish on the grounds in this weather, and what little we had in the tanks has already been cleaned out. I went to get Old Judge a piece this morning, but there wasn't a fin left."

SHORTLY afterward, Samuel Jones emerged from the company store with a message for the Alaskan revenue cutter service at Dutch Harbor, explaining the plight of the village and asking for a relief cutter with supplies.

Staggering through the storm, which was again sweeping over the island with renewed fury, Samuel Jones was overtaken by Johnny Topsy, a rosy-cheeked youngster with a passion for wheels and machinery. With his ingenious, merry smile, Johnny had established a right of unquestioned admittance to K-V-I, where he spent much of his time keeping the station's engine looking as if it had just arrived from the factory.

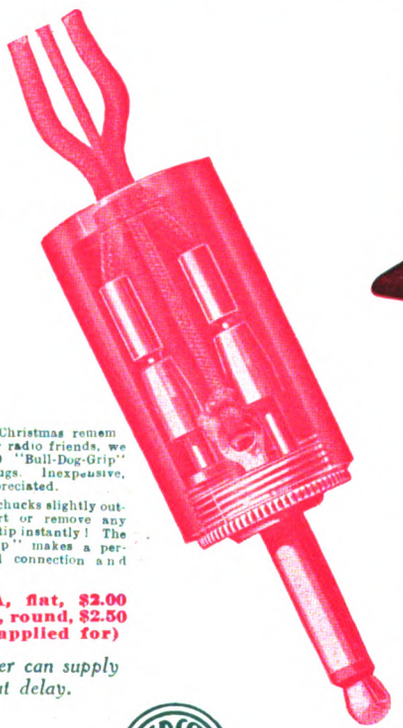
"Stormy Gus come over from Pirate Cove while it wasn't blowin' so hard this mornin'," announced Johnny, as he followed Samuel Jones into the station and began shaking the snow off himself. "He says both 'a Hell-Fire's wireless masts bin blowed off into th' ocean, an' a freeze-up's busted th' cylinder of his diesel-engine. He's all on th' bum, ain't he?"

Samuel Jones did not reply. He was disappointed and angry over that chicken-hearted relief operator who had crawfished and left him facing the prospect of being stuck at Unga indefinitely.

If only Old Judge wasn't such a hopelessly rotten operator—but as Samuel

(Continued on Page 234)

The VŌCALOUD



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CODFISH FOR CHRISTMAS

(Continued from Page 228)

Jones stood watching Johnny industriously oiling-over the engine, he reflected that the acute situation existing in Unga at the moment showed what a risky thing it would be to leave K-V-I in charge of an incompetent man. The only other wireless station in the Shumigans out of commission, gales and blizzards whipping the open sea into a maelstrom where no small vessel could live, and here an isolated village without food or coal in midwinter—where would its people be should the wireless fail? K-V-I must run.

And making K-V-I run was not any too easy. Only a few weeks before, a sending transformer secondary had gone up in smoke, and the last spare winding in the station was now on the transformer. It was not a very sturdy-looking secondary either, and had to be watched. If it were to shoot——

Johnny had the engine going now. Stepping over to the transmitter panel, Samuel Jones reached around behind to switch in a big auxiliary oil-condenser that he used in the closed circuit on the 2400 meter navy wave. The transmitter was controlled by an automatic break-in key mounted on the front of the panel; and as Samuel Jones worked shifting the condenser bus-bars, his elbow came against the armature-lever of the break-in key.

Instantly, the spark crashed in the gap —and Samuel Jones with his hands on bare bus-bars, jerked violently and doubled up like a jack-knife. He fell back upon the swiftly-running belt between the engine and the alternator, rode upon it a few feet, was hurled against an iron bench-vise at the opposite side of the room, and slumped to the floor senseless, a deep gash cut in the side of his head.

The spark had flamed in the gap but a mere instant. In that terrific involuntary jerk when he took the current, Samuel Jones had pitched the condenser connections together in confusion; and now a wreath of pale blue smoke curled up from the transformer secondary.

Badly-frightened Johnny had presence of mind and knowledge enough to pull back the jammed lever of the break-in key. Then he stopped the engine and went for help.

HALF-A-DOZEN fishermen carried Samuel Jones over to Old Judge's house on a mattress. There is no doctor at Unga; and in addition to his many other profitless duties, Old Judge is the village's first-aid.

But when Old Judge essayed to dress the wound in the operator's head, he saw that the injury was something too serious for him; it required the presence of a genuine doctor at once.

Old Judge went over to the station.

(Continued on Page 236)

CODFISH FOR CHRISTMAS

(Continued from Page 234)

Johnny explained as well as he could what had happened.

"An' that ol' black gillhooley with th' yellow doughnut thing on it blowed up again," he concluded, pointing at the burnt-out transformer. "It was th' last doughnut, too—there was some new ones comin' on th' 'Anangashak.'"

Looking at the secondary, fairly burned to charcoal, Old Judge saw that it was manifestly beyond hope. But a message had to be sent out some way—and quickly.

Going into the receiving room, Old Judge's eyes fixed themselves upon the half-inch spark-coil that Samuel Jones used for short-distance work. Old Judge knew there were no ships in the vicinity, and therefore no chance of raising anybody on that little coil, but the sight of it vaguely reminded him of something—he didn't know just what. For a long time he puzzled. Why, of course—the six-inch spark coil over in the postoffice!

Half-an-hour later, Old Judge had the big coil on the desk hooked up in the place of the half-inch instrument. The powerful coil worked splendidly on K-V-I's big aerial and for a time Old Judge called N-P-R hopefully, but with the approach of midnight he finally realized that he was not radiating enough power to possibly raise the naval station almost three hundred miles away.

Taking the coil off the storage-battery upon which he had been operating it, Old Judge connected it through a battery-charging resistance to the 110 volt exciting-generator current. A much heavier spark resulted, but still it was not enough. Old Judge heard N-P-R clearing N-P-Q on the 3 A. M. schedule; and though he called repeatedly he could not attract the navy operator's attention.

Old Judge reduced the resistance in the coil's primary circuit until the vibrator contacts arced heavily and grew so hot that Johnny, stlil faithfully on the job, had to cool the vibrator with a wet rag while Old Judge called again and again. The cold grayish light of a gloomy mid-winter morning found him still at the key, the big coil's contacts now quite burnt up, the vibrator ruined, and sticking hopelessly.

Old Judge spent the forenoon doctoring Samuel Jones. The injured operator was developing a fever; and Old Judge saw that help must come quickly.

With the germ of an idea in his head, that afternoon he went back to the station and studied the burnt-out transformer on the main set. Going into the receiving room, he atacked the big spark-coil with a screw-driver and took off the cover. Procuring a dish-pan, he set it on the stove and laid the coil in it to melt out the wax compound that filled the

(Continued on Page 238)

CODFISH FOR CHRISTMAS

(Continued from Page 236)

case. This done, he set about taking out the secondary, and after being forced to break the coil case to pieces, he at length got the winding out, intact.

With Johnny's help, he dismantled the sending-transformer, removed the burnt secondary, and attempted to put the spark-coil winding on in its place. Finding the transformer core much too large for this, he pulled the leg of the core to pieces and with a pair of snips cut a number of the soft iron laminations into strips narrow enough to enter the spark-coil secondary. After hours of tedious labor reassembling the iron core pieces,

he at last had the transformer back in its mounting with the improvised secondary connected into the set.

Johnny started the engine. After getting the condenser connections straightened out, Old Judge carefully cut the alternator voltage down to the lowest limit and gingerly pushed over the lever of the break-in key on the panel.

A spark, rather small, but smooth and clear, flashed across the teeth of the synchronous-gap; and the hot-wire ammeter climbed up to five amperes. After testing a few minutes, Old Judge felt the secondary winding and found it still cool. He had studied his books enough to understand that the fine wire with which it was wound was liable to melt instantly if too much current were pulled from it. Gradually raising the alternator voltage, he brought the ammeter reading up to seven amperes before the secondary began to feel warm.

Trembling with excitement, Old Judge hastened into the receiving-room and listened in. He heard no signals, but it was still early in the evening and the navy operators would be on the job. Old Judge grasped the key and shakily called N-P-R.

There was no response.

Again he called, and yet another time, followed by a C-Q, but still no answer. A cold fear clutched at Old Judge's heart for a minute; then he discovered that no signals could be brought in anywhere on the tuner. He had seen Samuel Jones have the same trouble and he knew just where to look. Hurrying into the power-room, he examined the break-in key. Industrious Johnny had over-oiled the key-armature; and the lubricant had gummed the contacts on the receiving side.

Quickly cleaning the key, Old Judge returned to the receiving set and got the phones on just in time to hear the familiar spark of N-P-R coming in strong. The sending had an angry snap in it.

"Say, didn't I tell you to keep off that key, you confounded old lummox!" the gob was yelling. "Get out 'a there an' stay out—you spoil th' air!"

Old Judge was nervous and frightened, but he was not to be bluffed this time. With gritty determination, he steadied his shaky wrist.

"Excuse me, N-P-R," he replied. "I know you don't like to work with me, but S-J is hurt. Will you take a message to the revenue service?"

The gob came back on the air and spluttered around apologetically for a moment.

"Awright," he finally returned. "You seem to have improved a little since last time, anyway—guess we can get along."

IT WAS Christmas Day—an Alaskan Christmas Day, cold and quiet, with the big white snowflakes falling thick and fast, piling the smaller

(Continued on Next Page)

CODFISH FOR CHRISTMAS

(Continued from Preceding Page)

drifts into big hills and building the big hills into great white mountains.

Samuel Jones, wearing a bandage around his head, but otherwise quite his usual self, sat in Old Judge's den reading a magazine and soaking in the mellow warmth that pervaded the room. The heater glowed redly, and a big bucketful of coal stood waiting beside it; for the superintendent of the codfish company argued that since hardly any fuel was being used out in the wireless station, Old Judge was entitled to free coal for his house.

Excited juvenile shouts out in the village attracted Samuel Jones' attention; and looking out through a window, he saw two obstreperous young Alaskans on the opposite hill-side fighting frantically for possession of a shiny new coaster-sled, while a dozen or so youthful spectators all clutching big brilliantly-striped sticks of candy in their mittened fists, looked on and yelled at the top of their lungs.

Samuel Jones suddenly turned around and sniffed, expectantly. From the kitchen, where Old Judge was bustling about with a great stir, there emanated a Christmassy odor of turkey and cranberry.

"By jingo, it's a funny thing—somehow I can't feel very sorry over havin' got this gash in my bean," remarked the ex-operator of K-V-I, a little later as he jabbed his fork into a big piece of delicious white meat. "Mebbe I'm a kind of a fatalist; but someway I always figure that everything turns out for the best."

Old Judge gazed fondly at the regenerative receiver, the long-wave tuner and the two-step amplifier, all glittering in magnificent array on the little table in his den; and he felt that perhaps Samuel Jones was right.

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Daylight sparks: 6AK, 6BM, 6CZ, 6CP, 6DG, 6FH, 6GF, 6GR, 6IC, 6JE, 6HN, 6OC, 6PR, 6QR, 6TU, 6AFN, 6ALW, 6ATV, 6AUD, 6AVB, 7CE-CW, 7IN, 7KS, 7MP, 7MO, 7TQ-CW.

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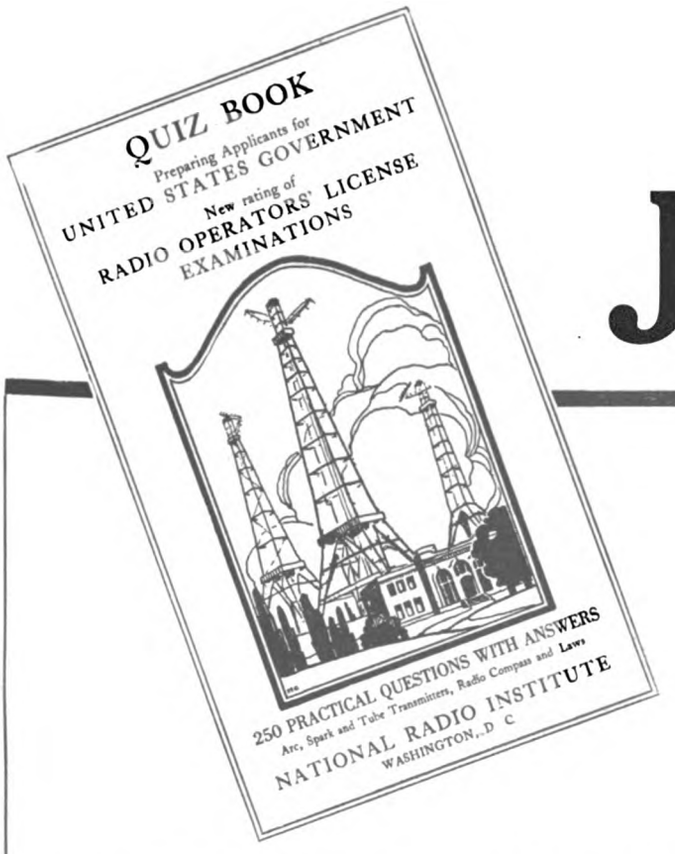

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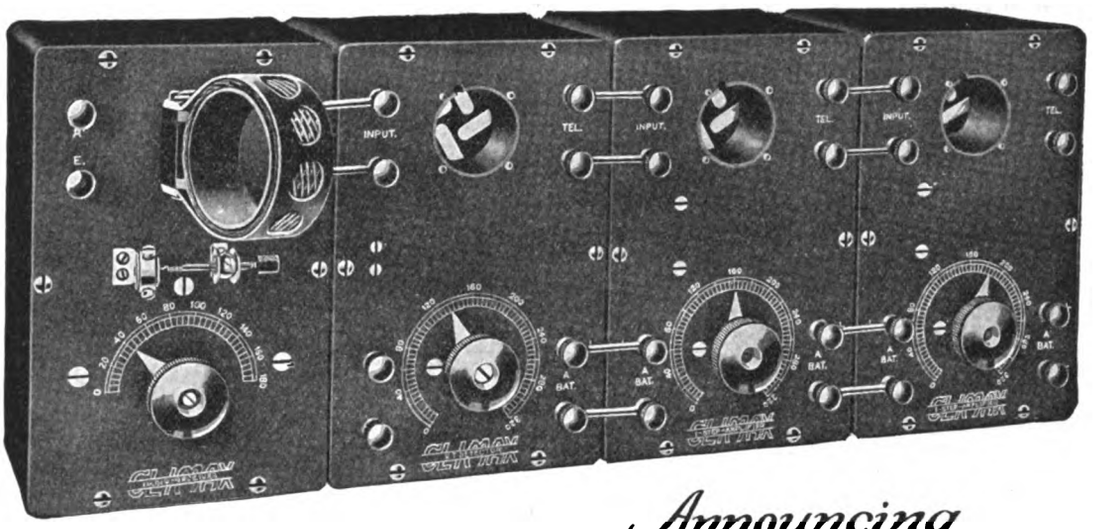

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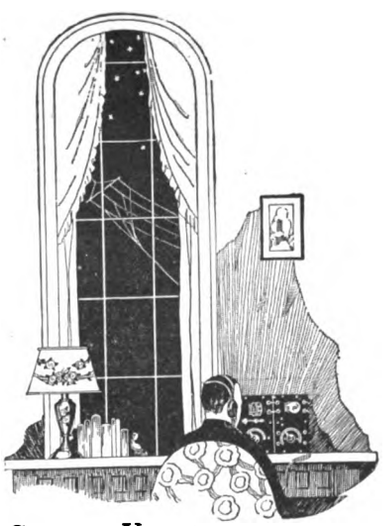

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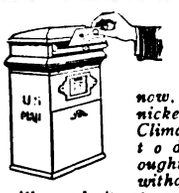

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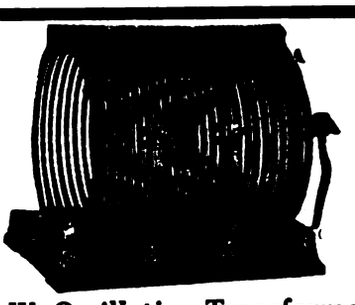
PROMOTING SALE OF RADIO EQUIPMENT

(Continued from Page 196)

chased by people who are willing to spend from $200 to $400 for high class equipment. Receiving sets are installed at the Claremont and Mt. Diablo Country Clubs, and last week when the world series baseball returns were being sent out from our station at the California Theatre—every ball and strike ,just as fast as you saw them posted on the newspaper bulletin boards—the players out on the golf course could hear these returns over a mile from the club house, through the use of a Magnavox similar to the one we have here.

Let me tell you a little more of what the radio jobbers and manufacturers are doing locally to create demand. There are five radio telephone stations in operation within 40 miles of San Francisco, on different time schedules and wave lengths, so that it is possible to receive at least two and often as many as five radio concerts a night in every home. Grand opera concerts were broadcasted by radio twice this year from our California Theatre station and from the Meyberg station at the Fairmont Hotel. These concerts were received over distances upwards of 1000 miles. The returns of the Dempsey-Carpentier fight, Sunday morning symphony concerts, and Sunday sermons by clergymen—you see you may have your choice—have been other special features. Semi-technical talks with demonstrations have been given before all the local business organizations. The public is being sold to radio. All that is needed is to round out distribution, and the electrical trade is the logical medium to accomplish this.

There are between 400 and 500 stores handling radio apparatus in the United States today, but this is not enough. More dealers are needed. Let us see what requirements the radio dealer must meet—a stock investment of from $500 to $1500, which can be turned over rapidly, and, as I have said before, a salesman who knows the line. There are about 12,000 electrical dealers and jobbers with retail departments and 3000 central station companies selling electrical merchandise in this country. This gives a total of 15,000 possible distributors for radio apparatus. This number is not too great because there are 700,000 bona fide amateurs as well as your farmers and private home users to reach. Needless to say, those of you who get in at the start are the ones who will reap the greatest profits. Let your radio department grow up with this business and your profits will grow likewise.



C. W. Oscillation Transformer
$11.00

50-Watt Radiotron
$30.00

C. W. APPARATUS for the Radio Amateur

5-Watt Radiotron
$8.00

Have you received your copy of the new catalog of Amateur Radio Equipment?

750-Watt C. W.
Power Transformer
$38.50

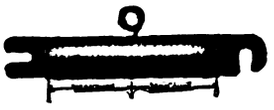
The instructions given in the catalog enable the radio novice to place a Tube Transmitter into practical operation within a few hours after delivery of the equipment. Either telegraph or telephone communication can be obtained by connecting Radio Corporation sets directly to an A. C. power source.

The illustrations shown here cover a few of the Radio Corporation's C. W. accessories now available at your nearest dealer.

The Radio Corporation's C. W. Tube Transmitters consist of scientifically co-ordinated parts, which, when connected together provide a thoroughly reliable C. W. Tube Transmitter. All uncertainty of operation is eliminated.

The demand for R. C. A. Continuous Wave Apparatus is unprecedented.

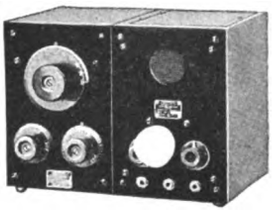
325-Watt C. W.
Power Transformer
$25.00



C. W. Transmitter
Grid Leak
$1.10

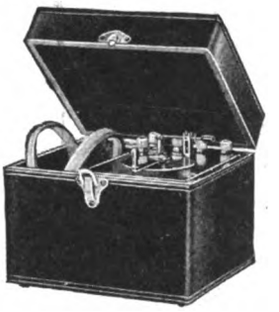
.002 MFD—C. W.
Condenser
$2.00

FOR RECEPTION



Receiver for "DX"
Work
$125.00

The two Receivers illustrated here have met with instant favor in the amateur field. The "Aeriola Junior" is the ideal set for the beginner or the novice. The type RC Receiver is pre-eminently the most suitable set for "DX" stations. Watch our advertisements for future announcements which will be of the utmost importance to radio experimenters.



"Aeriola Jr."
Receiver
$25.00

If you have not already secured your copy of our combined instruction book and catalog, send 25 cents today to

Sales Division, Commercial Department, Suite 1804

Radio Corporation of America

WORLD WIDE WIRELESS

233 Broadway, New York City

Say Radio to the Advertiser, it will help you.

LETTERS TO THE EDITOR

(Continued from Page 199)

more satisfactorily and efficiently ten years ago than it is at present? Can he prove that ships such as the Matson fleet enjoyed the "quick come back" when far out at sea, or the selectivity of tuning, as they do at present, when using the old Type D tuner, crystal and old straight gap of 1910 or 1912? We are not old operators, having been at sea only seven years, but we have operated the misconceptions of the United and Shoemaker Wireless Telegraph Company, and have watched the growth and improvements of radio during the years. Although freak distances were occasionally covered with these old sets, directly coupled, with a decrement unlimited and waves as broad as the Pacific; still we must remember that at this early date there were comparatively few ships equipped with radio on the Pacific, and the coast stations would spend hours and even nights to make a record, as they then had no other traffic to handle.

We admit that there are some so-called operators who make their station an experimental laboratory, who dismantle their apparatus to conform to their own ideas of efficiency (?) and who bring discredit on the entire profession. This type of operator was as prevalent at the initiation of radio as he is at the present day, and is no argument against the profession as a whole. The fault lies with the employer. Is it necessary that they hire one of these incompetents to go out in charge of a ship's radio when there are many capable operators out of work? Perhaps they do everything within their power to get rid of these men, but there will always be a certain percentage of this class, no matter whether they are using their own or ship's apparatus.

We know of no instances where commercial operators have spent $300 to $400 for the privilege of hearing POZ on the Pacific, as Mr. Soderstorm states they do, but we do know of many who have invested $30 or $40 to enable them to get reliable time signals, press broadcasts and hydrographic information on offshore voyages. Many of these had the necessary apparatus at home on their amateur sets. There is no need of dismantling the regular set to set up an audion. About two leads may have to be changed to receive on either audion or crystal, so there is no chance of the "private apparatus" interfering with the operation of the equipment provided. It is the practice on many ships for operators to have entirely separate receivers for long wave. A single lead to the antenna is the only additional connection to the installation, and while the operator receives his press through one ear piece, the other remains connected to the ship receiver and the

(Continued on Page 250)

LETTERS TO THE EDITOR

(Continued from Page 248)

600 meter watch is thereby kept. This is also regular navy practice.

As far as interviewing the skipper about the installation, this is the proper thing to do if it does not comply with the law. But if the skipper has been used to results obtained by operators using audions and you fail to produce the same, his answer when broached regarding purchase of additional equipment is invariably, "It has worked all right before, I don't see why it doesn't do the same now," and no amount of argument can convince him otherwise. Rather than be thought an incompetent operator, most radio men provide their own audions or other efficient equipment.

There is no reason to bore the table or bulkheads full of holes, or litter the shack with a jumble of loose connections, switches or other material, as Mr. Soderstorm states. Any operator who does this is incompetent to operate the set and may wreck some vital part of it, and has no place in radio. An audion or other proven efficient reception apparatus can be installed in cabins to be an asset to the appearance rather than detrimental, and "hay wire" is unnecessary. No, Mr. Soderstorm, we have never seen a chief engineer bring a feed pump aboard a steamer, but we have seen him and his associates bring aboard their own tools and other small portable conveniences not provided by some steamship companies. Moreover, we have noticed that it is a custom for all mates to bring their $60 to $100 sextants, and in a good many cases, glasses, aboard, because they were unprovided in the majority of ships, and which are of vital necessity in navigation. The radio man is establishing no precedent by bringing along a few conveniences for reception, any more than if he happens to bring along a typewriter of his own, as long as he does not bring aboard some integral part of the equipment—as a motor generator or transformer—to supersede the company equipment.

The right operator is not referred to sarcastically by the ship's officers, as Mr. Soderstorm insinuates. He holds his place on his merits as a man, and is respected as such in accordance.

As far as we know there is no law against the use of audions as long as emergency storage batteries are not used for the operation of same. Radio inspectors in ports of the United States have entertained no objection to such use. We cannot see where patent rights have anything to do with Standard Oil or other ships controlled by the Radio Corporation which own and control the rights for the use of audions.

Moreover, the audion receiver or detector affords the certainty of an efficient

(Continued on Page 252)

LETTERS TO THE EDITOR

(Continued from Page 250)

watch, with no chance, as in the case of a crystal, of it going dead each time you send, or of having to fuss around for a good point.

Mr. Soderstorm apparently assumes that all operators who use audions and other equipment of proven value, are fools or worse, or dismantle their sets and imperil the safety of all ships by the installation of unreliable apparatus. He has only to visit a number of ships in charge of competent operators to note that such apparatus is, in the majority of cases, as efficiently and neatly installed as that provided by the company.

Respectfully,

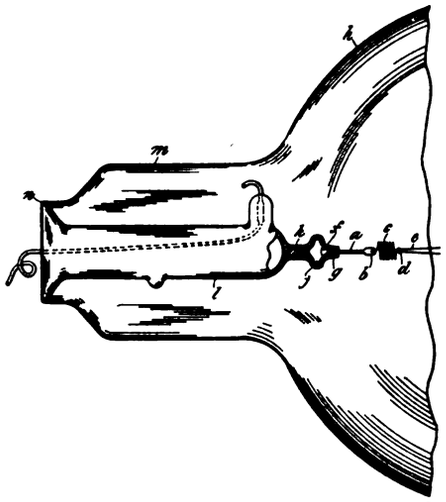
S.S. "Admiral Schley" H. MacGOWAN,
Oct. 9, 1921. At Sea. N. H. ALLEN.

RECENT RADIO PATENTS

(Continued from Page 204)

C. H. Harvey, No. 1,389,351—August 30, 1921.—Means for Supporting Electrodes in Ionic Tubes.

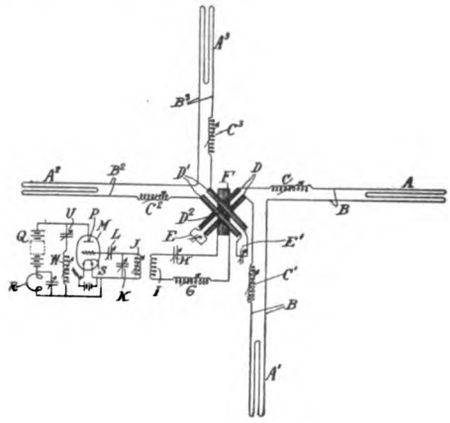
A construction for the support of the heated cathode **e** is described, which has the object of permitting large variations



in temperature without danger of cracking the glass. This is effected by molding the anchor wire **a** loosely in the recess **j** instead of fusing it into the glass as done heretofore. The usual spring **c** is interposed between the anchor **a** and the filament **e**.

R. A. Weagant, No. 1,389,800—September 6, 1921.—Radiosignaling Apparatus.

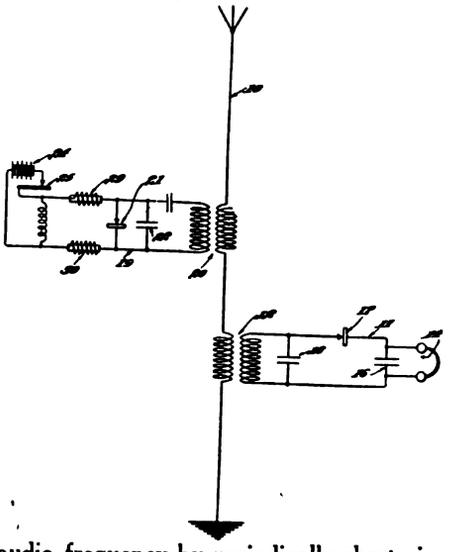
A static eliminating means is described for a receiving station. For this purpose, a number of antennae A, A1, A2, and A3 are arranged angularly with respect to each other, adjacent pairs as A and A1 being connected to coil D in a tuned-closed circuit. Other pairs of antenna



may be connected to coils in a similar manner, as D'. These coils are angularly displaced and are all in inductive relation to a rotatable coil F connected to a conventional receiver circuit. It is stated that by properly positioning the coil F, the effects of static may be neutralized, since the phase of the static is made to differ substantially in the two coils D and D'.

V. Bush, No. 1,389,026—August 30, 1921.—Radio Receiving System.

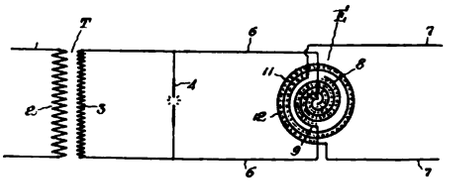
A scheme is described for breaking up the radio frequency oscillations received into groups at audio frequency. This is accomplished by an absorbing circuit coupled to the antenna at 20, so arranged that it is periodically capable of absorbing a large portion of the received energy, so that the amount transmitted to the telephone circuit is insufficient to operate it. The absorbing circuit is rendered alternately active and inactive at



audio frequency by periodically short circuiting the condenser 22 of this circuit by the crystal detector 21. To cause the crystal detector to be alternately conducting and non-conducting, an a.c. voltage of audio frequency generated by the interrupter 24, 25 is applied to it. Since the a.c. current can flow only in one direction through the detector 21, the periods of activity of the absorbing circuit occur at the frequency of the alternating current source which is that within the range of audibility.

L. R. McDonald, No. 1,389,255—August 30, 1921.—High Frequency Electrical Oscillation Apparatus.

An oscillation circuit is described in which a single piece of apparatus E serves both as a transformer and as a condenser. This apparatus is inserted between the source 3, 4 and the work circuit 7, 7, and consists of coiled conductors, 8, 9,

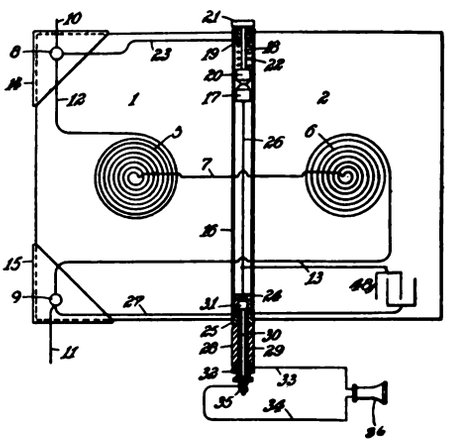


and 11 separated by insulation. The inner conductors 8 and 9 are not in metallic connection, but serve merely as plates of a condenser. The outer conductor 11 serves as the secondary to which this work circuit is connected. The electrostatic lines of force in apparatus E are perpendicular to the electro-magnetic

lines of force, and it is claimed that much better regulation of very high frequencies can be obtained by this apparatus than those hitherto used.

H. St. J. de Aula Donisthorpe, No. 1,388,936—Aug. 30, 1921.—Radio Telegraphic and Telephonic Apparatus.

A pocket receiving set is described, which is adapted to be connected to aerial and earth at 8 and 9. It consists of a pair of hinged members 1 and 2 which may be opened and closed like the leaves



of a book. Each member carries the coil 5 or 6, and by varying the book opening, the receiver set may be tuned to the desired wave length. The hinge accommodates the detector elements 17, 20, as well as the plug for the telephone 36.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912,

Of Radio (formerly Pacific Radio News) published monthly at San Francisco, Calif. for October 1, 1921.

State of California, City and County of San Francisco, ss:

Before me, a notary public in and for the state and county aforesaid, personally appeared A. H. Halloran, who, having been duly sworn according to law, deposes and says that he is the editor of Radio and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, 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, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, Pacific Radio Publishing Co., 465 Pacific Bldg., San Francisco, Calif.

Editor, A. H. Halloran, 465 Pacific Bldg., San Francisco, Calif.

Managing Editor, A. H. Halloran, 151 Minna St., San Francisco, Calif.

Business Manager, H. W. Dickow, 151 Minna St., San Francisco, Calif.

2. That the owners are: Pacific Radio Publishing Co., 151 Minna St., San Francisco, Calif.; H. W. Dickow, 151 Minna St., San Francisco, Calif.; A. H. Halloran, 151 Minna St., San Francisco, Calif.

3. That the known bondholders, mortgagees, and other security holders owning or holding one per cent or more of total amount of bonds, mortgages, or other securities are: None.

A. H. HALLORAN.

Sworn to and subscribed before me this 27th day of September, 1921.

CHAS. EDELMAN.

(My commission expires April 17, 1922.)

Classified Advertisements

Advertisements in this section are three cents per word net. Remittances, in form of currency, money order or stamps, must accompany order.

RADIO CABINETS — Mahogany or oak finished or unfinished, to your design. Send rough sketch for quotation. Prompt service. Formica cut to size. Radio supplies, parts, etc. Pacific Radio Exchange, 439 Call Bld., San Francisco, Calif.

STOP! LOOK! AND ACT! V. T.'s. With each Radiotron UV200 V. T. detector or A-P Moorhead V. T. detector or Radiotron U. V. 201 V. T. Amp. or A-P Moorhead V. T. amp., we will supply free of charge your choice of either a Murdock V. T. socket, improved contact type, or a Remler Bakelite smooth running rheostat, latest type. Radiotron UV200, $5. Radiotrun Amp. V.T. UV 201, $6.50; Moorhead A-P detector, $5.00; Moorhead A-P Amp. V. T., $6.50; Remler Bakelite rheostat, latest type, $1.00; Murdock V. T. socket, $1.00. We absolutely guarantee the foregoing apparatus. Only new and high-grade equipment carried in stock. All orders are filled within twelve hours and shipped postpaid and insured, thereby saving time and money. Remember us. The Kehler Radio Laboratories, Dept P, Abilene, Kansas.

DON'T READ THIS! Detector and two-stage $40; Spider Webs 180-450, $4.50; large 180-1000, $14; Remler Control Panel, $7; Panel Mounting Variable Condenser 43 plate, $4.50; Murdock fones, 3000 ohms, $4.75; Duck's Navy Coupler, $17.50 Everything for $85. All articles P.P. Insured. W. C. AICHILL, 844 Central Ave., Hollister, Calif.

TO THE READERS OF RADIO. Do you know that you can save considerable of your money by buying your audion control panels from us? Our controls are very small and compact. Our Det. and one-step is six by nine inches, front space, and our Det. and two-step six by nine front. Watch this magazine for our future advertisements. DEVORE RADIO SUPPLY CO., Gibson City, Illinois.

NEW AND ORIGINAL—The KLAUS switch lever is all of that. The knob and nickel plated blade are all of the switch that moves, allowing you to solder connection directly to shaft of switch. Absolutely no possibility of switch loosening. Silent and sure. Klaus switch, 60c, 2 for $1.10. As a special offer, our switch with 6 switch points, 65c. PORT ARTHUR RADIO LAB., Port Arthur, Texas.

SHORT WAVE REGENERATIVE SET gets results, $20; DeForest Honeycomb panel, mounting 3 coils, 2 L25, 1 L35, $8; Loose coupler (crackerjack), $5; Tresco C. S. tuner, $8; Krag rifle .30 (U.S.) first class, leather sling, 120 rds. ammunition, $20. Write quick for particulars. JOHN A. KINDLE, Monroe, Wash.

AT LAST—A real vt. socket. Fused, no danger of burning out that expensive tube; take your choice of 5w. tube socket or receiving tube socket, contact over whole surface of prong on tube base, precluding the possibility of noisy connections; super-efficient for CW. The unusual Victor socket, $1. PORT ARTHUR RADIO LAB., Port Arthur, Texas.

BKUMA YRLSBUG. 240 beginners tell how memorize wireless code in half hour to two hours. 28-page booklet and 10 supplementary pages mailed for 10 red stamps. DODGE, Box 220, Mamaroneck, New York.

WE CALIBRATE wavemeters up to 1000m for 35c per point, 3 points $1. PORT ARTHUR RADIO LAB., Port Arthur, Tex.

FOR SALE—Complete sending set. Price cut to less than half. 6APH station. Perfect condition. One .01 dubilier condenser, $20; one 1-8 h.p. induction motor 3600 r.p.m., $15; 1 K.W. Acme transformer, $12; O.T. 1-2 inch copper tubing, $5 (key and switch thrown in); super benwood gap, 16 points (ENCLOSED) $18. Total, $70. (ALL EQUIPMENT ALMOST NEW.) Receiving Set—Detector panel in oak box 10x12, $12; DeForest two-step, $30; 6 coils and honeycomb stand, $4; Baldy fones, type F, $12.50; two condensers, $6. Total, $64.50 (tubes and "B" batteries thrown in.) 6-volt "A" battery and rectifier (Westinghouse), $15. Would like to sell either outfit, or both, complete as would not care to sell separately for the reason that I havent the time to devote to it. First come, first served. RADIO STATION, 318 Valley St., San Francisco.

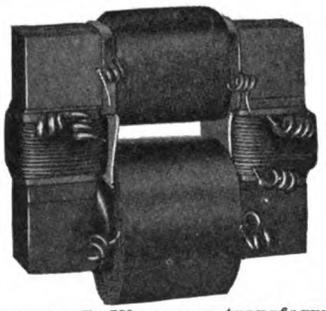
GOOD APPARATUS FOR SALE CHEAP. 1 Jewell 0 to 1 ammeter, $5; 1 Jewell 0 to 10 voltmeter, $5; 1 variable potentiometer, $1; 1 variable (semi) bridging cond., $1; 2 DeForest L-500 honeycomb, $1.10 each; 2 DeForest L-300 honeycomb, $1.00 each; 2 DeForest L-200 honeycomb, $1 each; 1 DeForest L-150 honeycomb, 70c. All coils have plugs attached. Have several other good bargains. Write me. RADIO OPERATOR, 2630 Ridge Road, Berkeley, Calif.

TELEGRAPHY

TELEGRAPHY—(Morse and Wireless) and Railway Accounting taught thoroughly; big salaries; great opportunities. Oldest, largest school. All expenses low—can earn large part. Catalogue free. DODGE'S INSTITUTE, Hass St., Valparaiso, Indiana.

Guaranteed DeForest Parts for C. W. Apparatus Below Cost!

Inductances for transmitters up to 50 watt capacity. 50 turns of wire wound on threaded formica tube. 7 or 26 positive taps. Proper spacing between turns for maximum efficiency. $8.50.



Acme C. W. power transformers. Unmounted. For 60 cycle, 110 volt supply, 3 secondary windings. 6, 12 and 1000 volts, with center tap on high voltage. Designed to furnish 500 volt D. C. when using standard rectifier tubes. Works efficiently with all makes of tubes. $12.50.

Guaranteed ESCO dynamotors, 110 volt D. C. to 500 volts D. C., 100 watts. Ball bearing type; one unit. This is the best possible outfit for C. W. plate supply. Smooth running. Noiseless in operation. Large overload factor of safety. Reduced to $65.00.

SPECIAL BARGAINS

Stromberg Carlson block Condensers, 1 mfd., 4¾" long x 1¾" wide, 1" thick .....@ $1.40 each

Black Sheet XX Bakelite, cut to any size less than 24" x 24". In thickness ⅛-⅛-⅜ @ 10c per cubic inch

Brown Formica Panels ⅜" x 7⅞" x 7⅞" @ $1.25 each

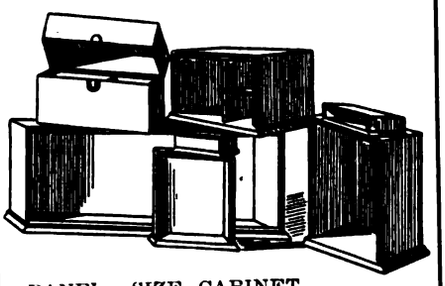
Brown Formica Panels, cut to any size less than 18" x 20", ½", ⅝" or 1" thick @.....9c per cubic inch

Guaranteed Standard makes of head telephones below cost—

Murdock No. 55	—3000 ohms	$4.50
Federal No. 53W	—2200 ohms	7.00
Federal No. 52W	—3000 ohms	9.50
Red Head	—3000 ohms	7.50

De Forest Cabinets

Hand rubbed, waxed early English finish. Quartered oak.



PANEL Width	SIZE Height	CABINET DEPTH	
7½"	7 "	8 "	.....$3.00
9½"	7 "	9 "	..... 3.50
7½"	11⅝"	6½"	..... 3.00
7½"	6 "	2 "	..... 1.25
7½"	7 "	5½"	..... 2.50
18½"	11½"	7 "	..... 4.90
11½"	11½"	6⅜"	..... 4.25
11½"	14 "	6½"	..... 5.25
8¾"	1¾"	4 "	..... 1.50
13½"	7 "	10 "	..... 5.00
9 "	9 "	6¼"	..... 6.75
8 "	9 "	6⅞"	..... 5.25
10½"	9 "	6⅞"	..... 5.00
15 "	9 "	6⅞"	..... 5.75
14 "	9 "	6⅞"	..... 4.00
18½"	9 "	6⅞"	..... 6.25
23 "	9 "	6⅞"	..... 7.50
27½"	9 "	6⅞"	..... 9.00
32 "	9 "	6⅞"	.....10.00
8½"	17½"	18¼"	..... 7.00
9½"	7 "	4¼" with hinged cover..	3.50
11⅞"	8 "	4¼" with hinged cover..	2.00
4½"	4½"	1⅜"	..... .90

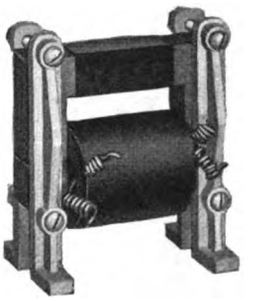
Catalogues describing DeForest apparatus as listed below will be sent upon request:

A Commercial Transmitting and Receiving Equipmen.

E Receiving and Transmitting Equipment for Amateurs.

F Duo-Lateral Honeycomb Coils and Coil Mountings.

G Miscellaneous parts.



Acme A3 modulation transformers on mounting brackets. Exceptionally efficient input transformer for Radio telephone work. $5.00.

Guaranteed standard indicating instruments at manufacturer's cost—

Hot Wire Ammeters — General Radio—scale 0-7, $7.00; Hot Wire Ammeters—General Radio—scale 0-2, $7.00; High Frequency Ammeters—Roller Smith—scale 0-5, $22.50; Filament Ammeters—Roller Smith — scale 1.5-0-1.5, $8.00; W. Filament Ammeters—Weston—scale 6.0-0-1.5, $9.00; D. C. Ammeters — Splitdorf — scale 0-2, $5.75; D. C. Ammeters—Splitdorf—Scale 0-3, $5.75; D. C. Ammeters — Splitdorf — scale 0-5, $5.75; Hot Wire Ammeters—General Radio—scale 0-10, $7.00; D. C. Milliamters—Splitdorf—scale 0-150, $5.75; D. C. Milliamters—General Radio—scale 0-250, $7.00; Filament Ammeters--Amer. Eveready—scale 1.5-0-1.5, $3.80.

Panel type microphone on japanned arm ready for mounting. Low resistance. No. 262W. $4.00.

SPECIAL BARGAINS

Black best grade of hard rubber sheet, cut to any size less than 24" x 48", ⅜" or ½" thick @.....6½c per cubic inch

Tubing for coupling coils or small Helices:

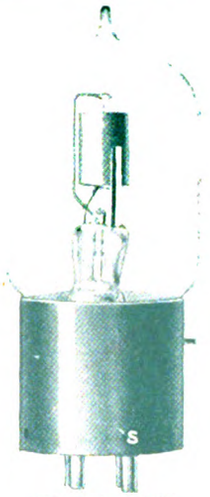
Cellulac—3⅝" O.D. x ⅛" wall .....@ $1.80 per ft.
Bakelite—3⅜" O.D. x 3⅛" I. D.....@ $1.80 per ft.
Bakelite—2⅛" O.D. x ⅛" wall .....@ $1.25 per ft.

De Forest Radio Telephone & Telegraph Company

1391 Sedgwick Avenue, New York, N. Y.

ATLANTIC-PACIFIC RADIO SUPPLY CO., 638 Mission St., San Francisco, Cal., Pacific Coast Distributors.

Use A-P Tubes for Efficiency



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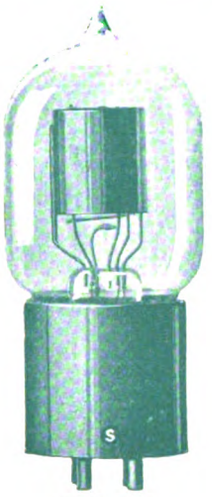

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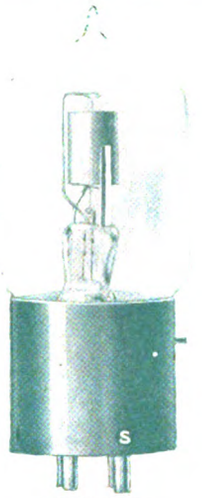

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The above are all three coil mountings. Connection to the movable coils is made through heavy Litz wire, eliminating all trouble from loose connections.
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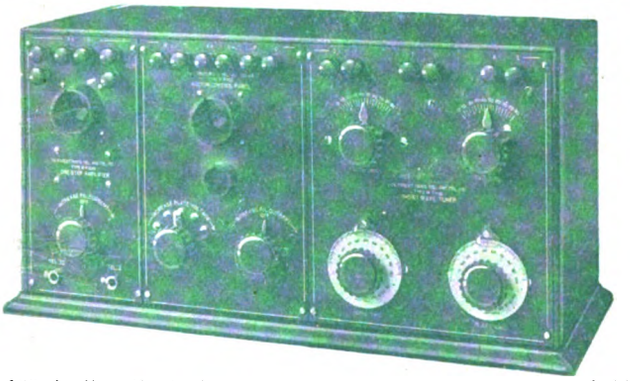

MP-100 Audion Control	$ 14.30
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CONTINENTAL NEWS

DECEMBER 1921

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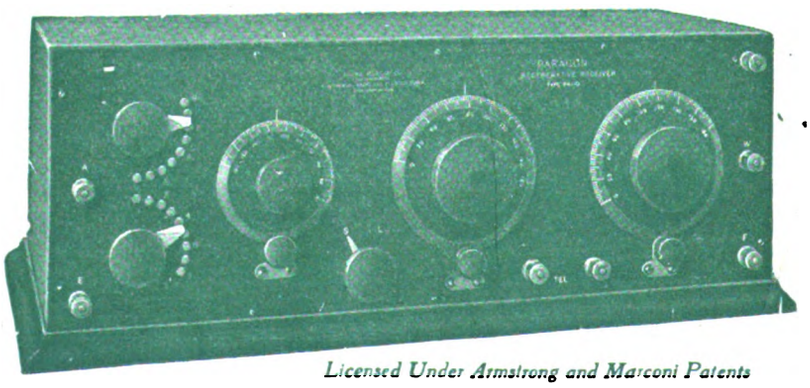

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