Constructional details for building a plug-in-coil tuner efficiently covering all the useful wave-bands from 12 to 20,000 meters.

October 1926
That, in a nut-shell, is the reason why Cunningham Radio Tubes won the complete confidence of radio owners away back in 1915 and why they hold this confidence today.

Radio tubes face a most extraordinary task. They must have rugged strength—a strength that will endure through hour after hour of gruelling service. Yet they must also have accuracy that transcends all normal scientific standards. Cunningham Radio Tubes meet these exacting requirements year after year. By sheer merit, they have won their way into the sockets of America’s finest radio receivers.

New York  Chicago  San Francisco
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RCA-power Radiotrons

Volume
without forcing

THE man who likes plenty of volume for easy listening usually has to drive the last tube of his set beyond its limit to get the music loud enough. And then it is no longer music. The RCA power Radiotrons are specially made to stand the strain in the last audio stage. They can handle plenty of volume without blasts or rattles, and therefore mean finer, clearer tone!

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Quality is a research story

The high quality of performance you get with a genuine RCA Radiotron is due to incessant research. The Radiotron laboratories find ways to make better tubes—they find ways to improve manufacturing processes—and they keep a constant check on the uniformity of the manufactured Radiotron. It pays to look for the RCA mark.

RADIO CORPORATION OF AMERICA
New York Chicago San Francisco

RCA Radiotron

MADE BY THE MAKERS OF THE RADIOLA

SAY YOU SAW IT IN QST—IT IDENTIFIES YOU AND HELPS QST
The most important factors in perfect set performance:

Aero Coils are the perfect supersensitive inductance units! Due to their special patented construction, high frequency resistance is reduced to a minimum. Hence Aero Coils are capable of greater volume, and are sensitive to all the radio frequencies, thereby correcting the real cause of distortion, impossible to correct with other types of coils. But more! No dope is used. So if you are interested in better performance from any set, be sure to build with Aero Coils.

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The Aero Coil Tuned Radio Frequency Kit illustrated above will positively improve the performance of any receiver. Patented Aero Coil Construction eliminates radio frequency losses and brings tremendous improvement to volume, tone and selectivity.

Kit consists of three matched units. The antenna coupler has variable primary. Uses .00035 condenser. 8 page color circuit layout and instruction sheet for building the supersensitive 5 tube Aero-Dyne receiver packed with each kit. Extra copies, 75c each.

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Completely interchangeable. Adapted by experts and amateurs. Range 15 to 130 meters. Includes three coils and base mounting, covering U. S. bands 20, 40 and 80 meters. You can increase the range of this short wave tuner by securing coils No. 4 and 5. Combined range of 25 to 150 meters. Both interchangeable coils fit same base supplied with short wave kit and use the same condensers. Coil No. 4 price $4.00; Coil No. 5 price $4.60.

Aero Interchangeable Coils No. 4 and 5

Increase range of your short wave tuner by securing coil No. 4 and coil No. 5, combined range 125 to 550 meters. Both interchangeable coils fit the same Aero base supplied with the short wave kit, and use the same condensers.

Coil No. 4 — Range 125 to 250 meters — $4.00
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You can get any or all of these coils from your nearest dealer. See him TODAY.

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**Active stations in Maryland are requested to report to SCM Layton of Wilmington, Del. until an SCM is elected for the Section.**
Meets All Amateur Requirements

The CR-18 was designed especially for the amateur. The rapidly growing demand for this low-wave receiver is proof positive that it is fully satisfying his needs.

The efficiency of the CR-18 is the result of eight Grebe features plus Grebe construction.

An Antenna Coupling Coil provides variable electro-magnetic coupling between antenna and grid circuit. Permits of harmonic tuning to increase signal strength, gives greater selectivity and reduces interference and induction noises.

Losses are reduced to a minimum.

Plug-in Coils allow rapid change from one frequency band to another.

Grebe S-L-F Condensers insure ease of tuning and maximum signal strength.

Beat Frequency Control permits tuning to a fraction of a kilocycle.

Plate Circuit design gives smooth control of regeneration without affecting wavelength calibration and tuning.

Cushion Sockets eliminate microphonic noises.

The six Self Supporting Air Dielectric Coils are very rugged, which insures long life.

Write for Booklet Q and charts.

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The American Radio Relay League, Inc., is a non-commercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is non-commercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its Board.

"Of, by and for the amateur", it numbers within its ranks practically every worth-while amateur in the world and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite. Correspondence should be addressed to the Secretary.

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Address General Correspondence to Executive Headquarters, Hartford, Conn.
EDITORIALS

Winter

 COMES the Fall”, as the movie title-writers would put it. Once again our vacations are over, the harvest moon is here, and there’s a zip in the air o’ mornings that announces the arrival of the super-DX season of the northern hemisphere. (Imagine writing this kind of stuff in middle August, as we must do to meet our October number. The bromidity today—excuse us, the humidity—is perfectly terrible, and the static was fierce last night. But that’s all right—by the time these lines reach your eye, O Gentle Reader, there will be a harvest moon and a zip in the air, and we’ll all be feeling the lure of DX again. Then, if not now, we’ll know full well that the poets aren’t talking to us when they sorrow over the melancholy days of autumn.)

We wish we were good at gazing into this other kind of crystal by which one can read the future. We’d like to be able to imagine what variety of wonders the coming winter season holds in store for us. We’ve never dared to guess high enough, tho so we decline this time. But we do know that already, counting far removed colonies as separate “countries”, there are about sixty different countries on the air, with many more coming, so there is going to be plenty of world-wide DX fishing this winter and lots of sport. And with the various exploring expeditions in out-of-the-way places depending on amateur communication for their contact, there is going to be plenty of interest to keep everybody on their toes.

We offer a few tips. (1) The lower portion of our “40-meter band” is unnecessarily crowded. Why should everybody aim at the lower fringe of that band? Foreign DX men tell us that QSO’s would be much better and easier if more fellows would move up into the top half of that band. Try it. (2) Don’t overlook the possibilities of 20 meters. All too few are trying it. Many of those who do, complain to us that there aren’t enough stations there to keep things interesting. But their DX results are exceptionally fine, which shows that many of us are passing a good bet. (3) By all means stay within your authorized wave-bands. When you get over the fence you’re in somebody else’s pasture and gumming up all the traffic.

Please keep Headquarters posted on new countries worked and on the QRA of new stations that have their first QSO with you, so that we may have the addresses for QSL purposes.

And now to work Atlantis, Mars, Patagonia and Zanzibar!

A Job for the Clubs

 WE HAVE commented many times on the fact that there is a large body of radio experimenters who would like to know more about our own brand of amateur radio. We have said that these people possess the necessary ability—that any BCL who can build his own neutrodyne or superheterodyne and make it work can build his own short-wave transmitter and tuner and make them work if only he has a little help. But learning the code is the real stumbling block. We know that it is not so hard; but when one stands on the outside looking in it appears very hard and it takes considerable courage to make the plunge. That is the real difficulty: making the plunge. After one is in, as we all know from experience, progress is rapid and sure. It looks, then, as if one of the most important things we could do to help the big group of fine prospective amateurs in the offering is to lend a hand in this matter of learning the code. To this end we’d like to suggest that it would be a very splendid thing if our numerous clubs thruout the country would start free code classes.

An example of what can be done in that direction is occurring here in Hartford where one of the newspapers is running a free code class under the direction of a capable amateur. A class of 120 BCLs is meeting twice a week. Their average age is 35 years
and most of them are capable of becoming fine amateurs. They have the maturity of viewpoint that comes with years, and they have a greater measure of financial independence than the average amateur of the past has had. They ought to be encouraged for the good of the art. Altho some of them are just learning the code out of curiosity, eighty percent of them say that they intend to own amateur stations soon. Of course not all of the eighty percent will, but nonetheless a very worthwhile addition to amateur ranks is certain to result. And are they progressing? By the end of the third lesson, when they had learned half of the letters of the alphabet, most of the class was copying simple words made up of letters in the half of the alphabet they knew, at the rate of eight words a minute!

This isn't the first free code class ever held, many of our clubs have managed them in the past—but its success and the appreciation shown for it are typical. And here's the point: the need for this kind of service is greater than ever before, and early autumn will be the ideal time for starting it, so that the graduates may have a full winter's season of opportunity before them. We know nothing so valuable that our affiliated clubs might do right now to help Amateur Radio. We commend the idea to the officers of all these clubs. How about it, Clubs?

**Our Handbook**

At last we have the honor of announcing "The Radio Amateur's Handbook", the A.R.R.L. handbook we have been dreaming about for several years. It has been a long time coming, for it has been produced by the staff at Headquarters and it had to be worked on along with our other duties in days already crowded. A strenuous effort has been made to present it for the opening of the winter DX season, and here it is.

The book has been written by Mr. F. E. Handy, A.R.R.L. Communications Manager, eminently qualified for the job not only because of his sound engineering knowledge but perhaps more particularly because this business of actually operating amateur stations is the subject with which his department deals daily and he knows it inside out. The Handbook has been designed to be of equal interest to the beginning amateur, the average amateur, and the past master at the game. For the beginner it starts at the beginning and tells what amateur radio is, what the League is, why it is and how it works, how to become a transmitting amateur, how to operate, and how to build a station. For the amateur already arrived it is both a manual on amateur practice and a textbook on amateur construction and operation, describing the building of transmitting and receiving apparatus and their numerous accessories with enough "theory" to understand the "why" of everything in the amateur station.

We are justifiably proud of our Handbook. We believe it will be of the greatest value to everyone with even the remotest interest in the fascinating hobby of amateur radio. Further particulars will be found in the advertising section of this issue.

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**The Fieldman's Trip**

Arthur A. HEBERT, the League's treasurer, is a man of many titles and duties. Among his titles is that of "Fieldman", the League's traveling contact representative with the membership. The Executive Committee has just authorized another trip around the country by Mr. Hebert. In the latter part of September he will leave Hartford on a 12,000-mile trip, not returning to his desk here until early December. First he goes all the way across Canada to Vancouver, down the West Coast, then thru the southwestern, central and southern states, and home again.

During this ten-weeks' trip Mr. Hebert will meet many thousands of our members, at conventions, ham-fests, little local gatherings, individual visits. Meetings are being arranged along his itinerary by the local Communications officials, and your local official will know if he is coming to your town. He wants to meet as many of you as possible, to tell you the story of the League, to answer your questions. Save up your troubles, too, and tell them to him; if there are any that he can't unravel on the spot he will bring them back to the Executive Committee. We have found these contact trips between Headquarters and the membership one of the most helpful things imaginable in keeping A.R.R.L. the smooth-running organization it is, and we hope this trip will be equally successful. Don't miss meeting "Hebie".

K. B. W.
ALTHOUGH the tendency nowadays to use shorter and shorter wavelengths in all radio communication is a very marked one, it is far from true that the majority of stations is operating on wavelengths below 200 meters. There are more stations in regular operation above 200 meters (and out of the broadcasting band, too) than there ever were. No amateur station can be said to be really complete unless its receiving equipment is designed to take in all wavelengths in which radio communication is going on. Old-Timer, as well as beginner will find that there is a lot of fun awaiting him from listening to telegraph work on wavelengths of 600 meters and up.

It has been necessary, in the past, to use at least three, and sometimes four, complete receivers to cover the wavelengths between 15 and 19,000 meters. Such an array of receiving apparatus is disappointing. In addition to requiring the expenditure of a considerable amount of money, the receivers must be spread out all over the operating table where it is inconvenient to tune them, and each receiver requires its detector and amplifier, or a common amplifier which can be cut in on individual detector circuits. The latter layout begins to get complicated and very inconvenient.

With all this in mind, the job of building a single all-wave receiver by means of which all of the useful radio frequencies could be covered, was undertaken. Obviously, in covering such an enormous range it is going to be necessary to change inductances rather often. We have our plug-in short wave systems, and for work on wavelengths above 1,000 meters, honeycomb coils minus their mud bases are far from hopeless. The plug-in arrangement is as good as any, and certainly a lot more convenient than any method I know of. If the “plugs” and “jacks” are mounted with good spacing between them and on material other than that of the street-paving variety the losses incurred in such a system should be inconsequential.

It is also quite obvious that the same tuning condenser in the secondary circuit is going to be hopelessly out of proportion at opposite ends of the wavelength spectrum. A 125-µfd. tuning condenser is o.k. for the 20-, 40- and 80-meter bands, and even up to 600 meters, but at 4,000 meters this condenser becomes a good vernier device and at 15,000 meters it is even too small to use as a beat note control! Conversely a 625-µfd. tuning condenser is o.k. down to and even through the broadcasting band but at 20, 40 and 60 meters it is out of the question.

There are several methods by means of which the condenser problem can be solved satisfactorily. Probably the easiest consists in the use of a tandem condenser, one section of which has the necessary short wave capacity, and the other section, when combined with the first, has the required long wave capacity. The point of transition from short wave to long wave capacity is not a very definite one. From the standpoint of ease of tuning and covering the bands quickly it probably lies somewhere in the vicinity of 700 or 800 meters. Given a tandem condenser with short-and long-wave capacity it merely becomes necessary to provide a simple loss-less switching arrangement to cut in the required capacity, and that problem has been solved.

The Circuit

There is nothing unusual about the circuit. It is the familiar series condenser regeneration control affair first shown in this country by Weagant in his so-called "X"
circuit. Two stages of audio frequency amplification are used, one stage being in use all of the time for the shorter waves and an additional stage when long wave reception over DX ranges is desired. The additional stage is not required in short wave work but the second stage is a great help when receiving 600 meters and long waves on a small antenna. If the antenna is a long single wire, a single stage will give all the headset volume one wants. A 1,500-foot long the 1,500-mfd. condenser is required. A smaller condenser will necessitate a correspondingly increased number of primary coils on the long waves. Condenser C1 is a 1-mfd., "blocking" condenser not needed in this receiver but shown in case radio amplification is to be added ahead of the detector. The secondary S is tuned by means of the tandem condenser, one section of which has a maximum capacity of 125 mfd, and the other section a capacity of 500 mfd. The C2 (125 mufd.) section is connected permanently across the secondary, C3 being cut in parallel on the higher waves by means of switch X.

Regeneration is controlled by means of condenser C5, having a maximum capacity of 500 µfd. A capacity of this size is perfectly O.K. throughout all wavebands. In the amateur bands the use of a 500-mufd. regeneration condenser is a distinct advantage since it requires a small tickler having few turns, causing less detuning of the secondary circuit.

A word of caution regarding the choke coil is not amiss. If a resistance is used in place of the choke, it will be necessary to change it as the wavelength of the receiver jumps from the ham bands into the medium and long waves. If, on the other hand, a choke coil of the proper size is used, the regeneration control will be smooth in the ham bands and in the broadcast range. Somewhere in the neighborhood of 600 meters the choke does not come into the ar-
gument at all, the impedance of the primary of the amplifying transformer serving the purpose admirably. All we need to worry about, then, is the short wave action of the choke. The secondary of an old intermediate frequency amplifying transformer, stripped of some of its turns, works out entirely satisfactorily for use on all wave-lengths.

The grid condenser C4 is a compromise between low capacity for short waves and higher capacity for longer ones. It has a capacity of 150 μfd. For spark reception on 600 meters this capacity is about the minimum, the signal strength dropping off if a smaller capacity is used. For C. W. reception, however, the grid condenser with a 50-μfd. capacity seems to give as good signal strength on the long waves as a 250-μfd. condenser does. The grid leak should have a resistance between 5 and 10 megoths, depending upon the type of tube and detector plate voltage.

The Receiver Layout

It was the writer's original intention to build the receiver in a completely shielded cabinet, mounting the coils inside. A little thought, though, brought the conclusion that the receiver itself would have to be quite large to accommodate the coils and give plenty of clearance, and also the idea of having to open the lid of the cabinet, stand up and plug in coils and then close the lid when going from one wave band to another did not seem particularly appealing. Consequently the coils were arranged to plug in to jacks mounted on a strip which projects through the top of the cabinet. Yes, a direct steal from the excellent Grebe CR 18 short wave receiver. With the coils mounted outside of the cabinet there is nothing to be gained by shielding the cabinet. Probably shielding would help very little on the longer waves, anyway. It is a good idea, though, to use a metal (aluminum) panel. All chances of disturbing body capacity effects are eliminated forever. The aluminum is much easier to work than bakelite or hard rubber and with the finish shown in the photographs the appearance of the complete receiver is greatly enhanced.

In Fig. 2 is shown a front view of the receiver. From left to right the dials control primary series condenser (C), secondary tuning condenser (C2-C3) and regeneration control condenser C5. The small knob between the first two dials is attached to the rheostat, R, which is a 6-ohm General Radio type 301. The knob between the last

![FIG. 4 TOP VIEW. NOTE TERMINAL STRIP FOR PLUG-IN COILS](image-url)
finish any size metal up to a piece almost as large as a Ford at very modest prices.

The dials shown in Fig. 2 are National variable ratio type, the center dial being one of their latest models provided with a lamp for illuminating the scale. A variable ratio dial is very handy since the same control of rotation is not desirable on all wavelengths.

In Fig. 3 appears a rear view of the receiver. It will be noted that the plug-in strip for the coils is supported by two bakelite rods which, in this case, are \( \frac{3}{4} \) inch in diameter. The exact length of these rods will depend upon the thickness of your baseboard and height of your panel. With the manner the grid jack is spaced from the filament circuit jack a little further than the spacing between the others. One and three quarters inch from the grid terminal one of the antenna coil jacks is mounted. An inch to the left is the “ground” jack, connected to the stator plates of the antenna series condenser, and an inch further along (the last jack at the left) is another antenna terminal, the two antenna jacks being connected to each other. If the antenna coils are mounted “off center”, in their supporting strips, four combinations of antenna coupling can be obtained.

Two degrees of coupling are secured when the antenna coil is plugged into the 1st and 2nd jacks and the 2nd and 3rd jacks, and two additional couplings are secured when the coil is turned around and inserted in a reverse direction. No antenna binding post is provided in the cabinet. The antenna lead-in terminates on one of the G-R plugs and is plugged into the unused antenna jack on the coil terminal strip.

The Capacity Change Switch

Between the two condensers at the right of Fig. 4 you can make out the outlines of the switch used to cut in the 500-mufd. section of the middle condenser. At the outset let it be said that if this switch is to introduce any losses whatsoever by all means these losses should occur on the long wave side, where they can be added to the already great losses inherent in the larger receiving coils. If the switch introduces any loss or requires any additional wiring or dead-ends on the short wave side, the short wave part of the receiver may be spoiled.

Through the panel a hole large enough to accommodate a bushing from an old switch is drilled. (See. Figs. 4 and 5.) This bushing should have a hole a quarter of an inch in diameter, and should be fitted with a lock nut. Through the bushing hole a length of quarter-inch bakelite rod is passed. The panel end of this rod carries a small G-R rheostat type knob. Back of the panel and against the bushing a collar with set screw (also from a G-R rheostat) is attached. Between the collar and the bushing a spring washer is placed, the collar pressing tightly against the washer. The proper tension and “feel” to the switch is secured by the proper position of the washer. At the other end of the bakelite rod another bushing (from still another rheostat) is placed. To this bushing a piece of brass strip a quarter of an inch wide is soldered. The strip should be long enough, and should be so placed on the rod, to come within a quarter of an inch of one of the supporting screws on the 125-mufd. section of the tuning condenser. Under the bolts of this screw a short right angle piece of spring material is placed. This spring hav
a piece of silver soldered to it. Another hunk of silver is soldered to the "arm" of the switch at that point at which contact is made with the first piece of silver. Comment is lacking from whence the silver came. By bending the switch arm back and forth a few times it will be possible to find the position in which the switch contacts rub in good electrical contact when the arm is turned. Note that when the switch is open the only thing that has been added to the short wave side of the receiver is a piece of brass angle a quarter of an inch long. A flexible lead is connected to the switch arm and one of the supporting screws on the 500-mfd. section. Repeated tests have failed to show any audible losses in the switch on the long wave side.

The Coils

Short wave plug-in coils for all wavelengths from 15 to 550 meters are available from a number of radio manufacturers. These coils are of such excellent construction and so reasonably priced it hardly pays to try to make them yourself. If you want to build your own, however, the Hammarlund three inch coils wound with No. 18 S.C.C. wire, 10 turns to the inch can be cut up into primaries and secondaries of the proper size. For reference, secondary and tickler turns are given in the table below. The above Hammarlund coil we have arbitrarily called No. 1. Also we have called their 3-inch coils wound with No. 24 S.C.C. wire (43 turns to the inch) No. 2.

All of the coils are mounted with secondaries and tickler in the same strip. The primaries are mounted on separate strips. The construction of the coil mountings can be seen from a glance at Fig. 6. The base on which the plugs are mounted is of quarter-inch bakelite, ¾ inch wide and 4½ inches long. The spacers supporting the two narrow clamping strips are Cardwell condenser mounting pillars, being known as their part No. 4741. The short wave coils are clamped between two pieces of 3/16 inch bakelite ¾ inch wide and 4½ inches long. The long wave coils (honeycombs) are supported in the same manner except that separate top strips are used on each coil to take care of the different thicknesses of the coils.

In all cases the correct primary coil will depend upon the size of your antenna and the size of the primary series condenser. The above primary coils can be used with

<table>
<thead>
<tr>
<th>Table of Coils</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Unit No.</th>
<th>Ptl. Turns</th>
<th>Sec.</th>
<th>Tickler</th>
<th>Tuning Capacity</th>
<th>Range in Meters</th>
<th>Type of Coils</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>37</td>
<td>4</td>
<td>3</td>
<td>125 µfd.</td>
<td>15 - 32</td>
<td>Hammarlund No. 2</td>
</tr>
<tr>
<td>2</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>&quot;</td>
<td>31 - 85</td>
<td>&quot;</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
<td>17</td>
<td>18</td>
<td>&quot;</td>
<td>50 - 105</td>
<td>&quot;</td>
</tr>
<tr>
<td>4</td>
<td>15 - 25</td>
<td>45</td>
<td>19</td>
<td>625 µfd.</td>
<td>100 - 200</td>
<td>Hammarlund No. 2</td>
</tr>
<tr>
<td>5</td>
<td>150 - 500</td>
<td>150</td>
<td>75</td>
<td>125 µfd.</td>
<td>550 - 600</td>
<td>Honeycombs</td>
</tr>
<tr>
<td>6</td>
<td>400 - 600</td>
<td>400</td>
<td>200</td>
<td>625 µfd.</td>
<td>900 - 1,000</td>
<td>&quot;</td>
</tr>
<tr>
<td>7</td>
<td>750 - 1,000</td>
<td>1,000</td>
<td>400</td>
<td>&quot;</td>
<td>1,500 - 4,500</td>
<td>Honeycombs</td>
</tr>
<tr>
<td></td>
<td>1,000 - 1,500</td>
<td>1,500</td>
<td>600</td>
<td>&quot;</td>
<td>8,000 - 18,000</td>
<td></td>
</tr>
</tbody>
</table>

FIG. 6 SOME OF THE PLUG-IN COILS DESCRIBED IN TEXT

October, 1926
FIG 7 THE CARDWELL 200-D DUAL CONDENSER

condenser, or the smaller of the two coils and the total 625-μfd. tuning capacity.

In Fig. 6 some of the coils listed in the above table are shown. At A, the Grebe-Hammarlund 40-meter secondary and tickler appears (Unit No. 2 in the table). At B is the Aero Products 80-meter coil, available in plug-in style for all waves from 15 to 550 meters with a 125-μfd. tuning condenser. As the terminals on the Aero coils are too close to allow the same spacing to be used with honeycombs, the set mounting strip is laid out for the honeycombs, and the short wave coils (if not home-made) are fitted to the mounting strip by means of an adapter such as that shown at D. This adapter is for the Aero coils. The adapter is plugged into the receiver and the coils in the adapter. At C appears the Hammarlund type of coil for 590-1600-meter reception (No. 7 in the table). The tickler for this coil fits inside of the filament end of the secondary. This coil is head and heels above the corresponding honeycomb arrangement shown at H of Fig. 6. At E is the 7-turn short wave primary coil; F shows a 150-turn honeycomb primary mounting and G is a 600-turn coil of the same type. The three groups at the bottom (H, I and J) are honeycomb secondaries and ticklers for all waves between 590 and 14,000 meters (Units Nos. 7, 8 and 9 in the table). The largest secondary-tickler is missing from the photo.

Operating the Receiver

The short-wave side of the receiver is operated in a manner similar to any other short wave receiver except that when time is taken to tune the primary to the received wave or a harmonic thereof the signal strength is greatly increased. The 1,500-μfd. primary condenser will allow you to use harmonic tuning in the primary circuit no matter what size antenna you are using. On broadcast waves and especially at 600 meters and up, the set is tuned in the following manner; first the correct primary and secondary coils (from the table) are plugged in and the secondary is tuned by varying both secondary and tickler condensers until the desired signal has been picked up. Then, leaving the secondary alone, the primary and tickler condensers are varied until the primary is in resonance with the secondary. A slight readjustment of secondary tuning may then be necessary, especially if the original secondary tuning was done with the primary circuit way off tune. For 600-meter work the Hammarlund coils plus a honeycomb primary make the best spark receiver the writer has ever monkeyed with.

Who's Who

Unless you have kept track of communication in bands other than the ham ones for the past few years you may miss out on a lot of things because you are not listening in the proper place. The broadcast band is pretty well known. Ship calling, answering, SOS work and messages relating to traffic handling occur on 600 meters. Actual traffic between smaller ships and land occurs on 660, 731 and 874 meters. The radio compass wave is still 800 meters. On 952 meters the government has a wave where a number of naval vessels and naval land stations can be heard batting them off hour after hour. Radio beacons (those things making bunches of dashes and never signing) are found on 1,000 meters. Then come the intermediate waves where high power land stations work high power ships. These waves are around 1052, and 1578 to 2499 meters. In this band will be found the high power tube stations WCC, WSH, WAX, KPH and so on, working the large liners. Another band from 2409 to 3156 finds only government stations, among them being the ever faithful NAA on time ticks, weather, hydrographic information and press. NAA's time still comes off at 10 P.M. (E.S.T.) followed by an hour of weather and press starting around 11 P.M. NSS sends time at the same time as NAA and follows this immediately (usually) with press. Lately NKF has been sending time ticks with the rest on 74 meters also, which is understood that this is an experimental time service and may be discontinued. At around 11:15 P.M. WSA sends press on 650 meters, spark, and WSH on about 2400 C. W., both stations being keyed from the same source. On 2200 meters WCC sends press at 9 A.M., 5 P.M. and at 12:18 A.M. WRQ starts his press on 15505 meters.

These are only a very very few of the hun-
dreds of stations operating regularly on waves between 600 and 18,000 meters. After you have listened in on these waves for a little while you will find there is a great kick to be had from jumping from one station to another. The 600-meter kick alone is worth the candle!

Central Division Convention
(Ohio State)

Can anyone imagine a big amusement park being thrown open to radio amateurs and every form of amusements free of charge to all members of the A.R.R.L. — the "Open Sesame" being the League emblem stamped in red on the back of one's right hand. This is no dream fellows, but it came to pass at the 5th Annual Ohio State Convention at Cleveland, on August 20-21, when Mr. Harvey Humphrey, 8 APY, owner and manager of Euclid Beach Park, literally turned the place over to the "gang" all Saturday.

Bright and early Friday morning, delegates from all over the state began to arrive and by two o'clock the register showed an attendance of 125 including a number from adjoining states. 5 AQM from Little Rock, Ark. came from the farthest point until just before the banquet when Alberto Lopez of Caracas, Venezuela, made an appearance.

Just as had been announced, this was a convention in which AMUSEMENT was the foreword and the convention committee certainly kept its word, and with the exception of the traffic meeting conducted by Storck, 8 BYN, the new Section Communications Manager, and the open technical meeting with Thatcher, 8 ZE, and Crosley of 8XE in charge, there was nothing but fraternalism existing.

Fred Schnell, former T. M., Director Darr and Hebert, A.R.R.L. Treasurer, had the dream of their childhood days come true when they were able to spend a whole day on the merry-go-rounds, toboggans, etc., "free-for-nothing." From the way the rest of the fellows took advantage of everything it must have been the ambition of everybody.

There were athletic events of all sorts, and Tom Cunningham showed himself a real Sports Manager. Of greatest interest was the ball-game between the visitors and the Cleveland boys with Cleveland winning 1 to 0 and making the most hits.

The banquet was held at the Park and 8 APY's chef certainly knows how to cook a dinner for a hungry lot of brass-pounders. The speakers of the evening were Fred Schnell of the C. F. Burgess Laboratories who gave an interesting illustrated lecture of his NRRL trip; A. A. Hebert, of Headquarters, spoke about Headquarters' Staff and its daily routine; E. E. Horine of the National Carbon Co. spoke in a humorous vein and showed that he is quite a "bug". After the events of the evening everybody returned to the Hotel Winton where a midnight supper was served; the distribution of prizes made, and an initiation into the R.O.W.H. staged.

Great credit is due the Cleveland Wireless Association, the Cleveland Radio Amateur Ass'n, J. P. Turner and N. H. Gimmy, Chairman, for the success of the convention. And last but not least to 8APY for so unselfishly extending the hospitality of his park.

It is impossible to give the names of manufacturers and dealers who contributed so many valuable prizes but we wish to publicly thank them for their cooperation.

In the words of the "young squirt" it was THE best convention ever.

YOUNGSTOWN was chosen for next year's convention.

— A. A. H.

Strays

A complete list of call letters of all Canadian hams can be obtained for twenty-five cents from Department of Marine and Fisheries, Ottawa, Canada.
The Length of the Hertz Antenna
By G. Wm. Lang

HOW long should a 40-meter Hertzian antenna be? Methods of coupling to linear antennas have been described, as have their effects in polarized transmission and reception, also their manner of working at \( \frac{1}{2} \) wave, full wave and otherwise—but what about the length of these antennas? The

<table>
<thead>
<tr>
<th>ANT NO</th>
<th>WIRE LENGTH</th>
<th>TIP TO TIP</th>
<th>FUNDAMENTAL</th>
<th>K BY WHICH ( \lambda ) IS MULTIPLIED TO GET WIRE LENGTH</th>
<th>SHAPE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet</td>
<td>Meters</td>
<td>Meters</td>
<td>Feet</td>
<td>Meters</td>
</tr>
<tr>
<td>1</td>
<td>30</td>
<td>9.1</td>
<td>2.1</td>
<td>1.409</td>
<td>.4275</td>
</tr>
<tr>
<td>2</td>
<td>31</td>
<td>9.4</td>
<td>2.2</td>
<td>1.408</td>
<td>.4275</td>
</tr>
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<td>44</td>
<td>12.5</td>
<td>2.8</td>
<td>1.57</td>
<td>.4460</td>
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<tr>
<td>4</td>
<td>56</td>
<td>17.1</td>
<td>3.9</td>
<td>1.418</td>
<td>.4300</td>
</tr>
<tr>
<td>5</td>
<td>61</td>
<td>18.6</td>
<td>4.3</td>
<td>1.405</td>
<td>.4320</td>
</tr>
<tr>
<td>6</td>
<td>76</td>
<td>23.1</td>
<td>5.1</td>
<td>1.47</td>
<td>.4480</td>
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<tr>
<td>7</td>
<td>57</td>
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<td>4.0</td>
<td>1.435</td>
<td>.4390</td>
</tr>
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<td>55</td>
<td>16.7</td>
<td>3.7</td>
<td>1.465</td>
<td>.4450</td>
</tr>
</tbody>
</table>

TABLE SHOWING MEASUREMENTS MADE AND CONSTANTS FOR EACH ANTENNA

The writer has found amateurs putting them up purely by guesswork and then resorting to series condensers and coils to get the antenna into resonance with the transmitter. In such cases the antenna is not being worked at the fundamental (and at this time we are inclined to think of that as being the most favorable operating condition).

At 1KA the writer tested various Hertz antennas. He also tested the Hertz antennas at 1CK and 1KF. Some were vertical, some were horizontal, and still others had vertical and horizontal sections but all were Hertzian antennas. From these experiments some interesting results were obtained, the most important of which was the formula for determining the length of the Hertzian antenna for a given wavelength.

The antennas were first measured from tip to tip—end of c.p. to end of antenna. The fundamental wavelength was then found with the aid of an oscillator and wavemeter. We find that for horizontal antennas the wire length in feet is 1.46 times the fundamental wavelength in meters and for vertical antennas the wire length in feet is 1.40 times the wavelength in meters. Thus if we wish to operate at 40 meters with a horizontal antenna we multiply 40 by 1.46 and get 58.5 feet as the length of the necessary system.

Antenna No. 3 was not used in getting an average for the horizontal group. The reason is that this was a wire laid on the floor. Right beneath this floor were five water pipes in active service. I think this justifies omitting it from the group.

These constants have been applied to numerous antennas and an error of less than 5% resulted. Try it and let QST know of the result.

The table also shows tests on antennas of other forms and the constants for those are seen to fall between the H and V types, showing that the constant varies with the angle between the wires and ground.

2. For those of us who own meter sticks and don't want to think in two sorts of units the constants become .44 for horizontal antennas and .43 for vertical antennas. It seems a great pity that we must tolerate this double standard in radio. Tech. Ed.

3. Some other variable seems involved also. Westman and Clayton on p. 46 of QST for May, 1926 gave results for best antenna systems in which the constant was almost exactly 1.5 (.456 for the metric system). This was for the usual form of antenna in which the c.p. is horizontal and underneath a horizontal antenna, both extending in the same direction from the station. Tech. Ed.

At the June meeting of the Institute of Radio Engineers held in New York City, Dr. Greenleaf W. Pickard was awarded the 1926 Institute Medal of Honor for his contributions to the radio art, and particularly as recognition in the pioneering work done by Dr. Pickard in the field of crystal detectors, coil antennas, wave propagation and atmospheric disturbances. Our heartiest congrats to a man whom there is no more deserving of such honor.

Bartholomew of pR4SA was in the H. Q. office recently after a tour of these United States and a trip to Vancouver, B. C.

Additions to the number of crystal-controlled stations are as follows: 1CK, 4TR, 9CDT, 2DS, 2BRB and 2MU.
Cheap Measuring Instruments

By Walter T. Lang*

The amateur experimenter often has a need for electrical measuring instruments of various ranges, yet does not have available the means to purchase them. The following discussion shows how any experimenter may use for a number of purposes, not requiring an exceptional degree of accuracy, a simple pocket volt-ammeter, costing in the neighborhood of a dollar. A "Sterling" instrument was used by the writer. These meters have both ammeter and voltmeter scales. The voltmeter portion of the instrument only, in conjunction with auxiliary apparatus, is used for the purposes outlined.

Voltmeters

To increase the range of the voltmeter from 0-10v to 0-80v is a simple matter, requiring only the use of a series resistance, Fig. 1. For this purpose a 50-watt Edison Gem* carbon lamp gave satisfactory results, allowing a deflection of 6.5 on a source of 50 volts.

The value for the resistance of a 50-watt Edison Gem was personally obtained by the writer, and has been checked with different specimens. It should be remembered that the Gem lamp, although having a carbon filament, has an increase of resistance with an increase of temperature. A suggestion to get constant resistance, as yet untried by the writer is to use a 25-watt grey carbon, and a 25-watt Gem in shunt, the rising characteristic of one being depended on to compensate the dropping of the other.

The best way to calibrate the instrument is to borrow a good meter of approximately the range desired and take the reading of the pocket meter with resistance connected against the reading of the borrowed meter at the various voltages obtainable with a variable "B" battery.

![Fig. 2 Remember this is only a sample curve. It will not fit your meter](QST17-October_1926_page_17.png)

If it is not possible to borrow such an instrument a very rough calibration may be made as follows. Purchase a new B battery and have the voltage across the various taps tested with a good voltmeter. Record all these readings. The home-connected meter should be calibrated across these same taps as soon after as possible, and should be left connected only as long as it is necessary for an accurate reading as the device consumes considerable current, and may cause a drop in battery voltage if left on too long.

In either of the above two cases it is advisable to plot a curve as (due to the fact that change in temperature of the lamp filament causes a change in resistance) the factor of proportionality is not absolutely constant. The curve will droop slightly at the higher readings being shaped somewhat as Fig. 2A.

For rough work, a straight line can be drawn, approximating the curve quite closely, then for rough work we can use a multiplying constant gotten as follows. On line B (Fig. 2) note the value on the lower (horizontal) scale which corresponds to 10 volts in left (vertical) scale. In the example shown in Fig. 2, the value is 80 volts. From this we know that (for rough

---

* Roebling Dormitory, Rensselaer Polytechnic Institute, Troy, N. Y.
work only) we can always find the true voltage by multiplying the pocket meter's reading by 80/10, in other words by 8. Of course the figure is not always 8, it is just as likely to be 8-1/2 or 9-1/2—but it can be found in this way.

**Finding the Meter Resistance**

For the other methods of using the instrument it is necessary to find its resistance. The equation by which this may be done most easily is an application of Ohm's law to the current flowing through the meter and resistance. The process is as follows. The current through the meter (Fig. 3) is

\[ E = \frac{I}{R} \]

Where \( E \) is the voltage read on the meter scale and \( R \) is the resistance of the meter. Of course we do not know the meter resistance as yet but fortunately it can be found from the fact that:

<table>
<thead>
<tr>
<th>Read Volts</th>
<th>True Volts—Read Volts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter R.</td>
<td>E Read Volts</td>
</tr>
<tr>
<td>R Meter R.</td>
<td>Lamp R.</td>
</tr>
</tbody>
</table>

True volts are taken from the curve. A convenient way is to choose a point such that the difference between true and read volts is 50. The resistance of the specified lamp at this voltage is very close to 215 ohms. Then:

Meter R. = \( \frac{215}{50} \) (Reading of meter) = 4.3 (Reading of meter)

The above reading is simply the read volts when difference between true and read volts is 50, and may be easily found on the curve. All of this difficulty may be avoided if a known resistance of 200 ohms is used instead of the lamp. The resistance need not be exactly 200 ohms but it must be known. Do not trust the label on a cartridge resistance or other cheap resistance—have the thing measured by someone who can get a test set or Wheatstone Bridge.

**Milliammeter**

The meter may be used also as a milliammeter in connection with circuits having a comparatively high external resistance, such as the plate circuit of a vacuum tube. A single receiving tube will not give a readable deflection but with three or more tubes, or a sending tube, the readings may be made with fair accuracy, though they are not high. Simply connect in series with the B battery at the minus side as shown in Fig. 4A so as to include detector tube current which may be taken off at a different positive point from that supplied the amplifiers. The same scheme can be applied to transmitters as shown in Fig. 4B. The condenser C may be used if desired to keep the meter from excessive swinging. The equation is:

\[ \text{Milliamps} = \frac{\text{Reading in volts} \times 1000}{\text{Resistance of meter}} \]

**Low Reading Ammeter**

The experimenter often wants to measure current of a value less than one ampere, in a circuit whose resistance is not such as to make negligible that of the meter. Such B battery. The voltmeter part of the instrument is used with a shunt resistance, as the ammeter will not be readable on currents of such a small value. Take the resistance coils of two rheostats (new or old) rated at 4 ohms each, or thereabouts. Find the resistance of each as follows: First connect as in Fig. 5A and read the current. Then connect as shown in Fig. 5B and read the voltage across coil 1. Finally connect as in 5C and read the voltage across coil 2.

Since the resistance of the ammeter is negligible,

\[
\text{Resistance of coil No. } 1 = \frac{\text{Voltage (as in 5 B)}}{\text{Current (as in 5 A)}}
\]

also

\[
\text{Resistance of coil No. } 2 = \frac{\text{Voltage (as in 5 C)}}{\text{Current (as in 5 A)}}
\]

Now connect the two coils in series as shown in Fig. 6B. Now the resultant re-
sistance will be the sum of their separate resistances. A convenient way of connecting the two resistances is shown below in Fig. 6A. Note that the contact arms are removed, and the free ends of the coils connected to the post to which these arms were formerly attached. For use the coils are connected in series with the circuit, and the voltmeter placed across their extreme terminals. The value of the current in amperes may be found as follows:

\[ \text{Current} = \frac{E}{R + \frac{1}{R_1} + \frac{1}{R_2}} \]

This isn't nearly as bad as it looks. We have already found everything but the voltmeter reading and can therefore multiply all the other things together once for all and say that:

\[ K = \frac{1}{R + \frac{1}{R_1} + \frac{1}{R_2}} \]

If one gets tired of multiplying by K it is easy enough to connect the rig up permanently and make a new scale for the meter.

Conclusions

While the above do not exhaust the possibilities of the little instrument, they will furnish the amateur with some food for thought, possibly, as well as saving him a bit of money.

The preceding discussion is not only thoroughly practical, but, with certain assumptions as to negligibility, is mathematically correct. The reader is advised to take readings carefully, with line of sight normal to face of instrument, to treat the instrument with great care, and not to depend on the readings being in any case accurate to more than two figures.

Grid Condenser and Leak Mounting

A VERY handy little device has just been placed on the market by the International Resistance Company of Philadelphia. It is the so-called Durham Resistor Mounting, a combined grid condenser and grid leak mounting. The insulation is of high quality bakelite, whose resistance is said to be exceptionally great. The mounting is arranged to sit vertically on the receiver baseboard, so that connections to the grid circuit and especially the tube socket, will be as short as possible, leaving the other end of the circuit up in the air toward the secondary coil. The condenser clips are spaced to take the type 600 Micadons or any other grid condenser of similar size, and the grid leak clips will fit all standard leaks. Two holes in the baseboard are provided for attaching the mounting to the baseboard. The mountings are also available in double units for use as grid and plate blocking units with resistors in a resistance coupled amplifier.

—J. M. C.

Another Amateur Wins The “Popular Radio” Medal

September Popular Radio announces the award of the “Popular Radio Medal for Conspicuous Service” to another amateur, C. B. Harrison, 9DOZ, of Belleville, Ill., for meritorious service at the time of the Southern Illinois tornado in March 1925. It was Harrison’s work to which we referred in our editorial in August QST, work unknown to us until that time.

When a cyclone destroyed Murphysboro, Ill., Harrison was called upon by the railroad and county medical authorities to broadcast a call for doctors and nurses to meet a special relief train which was being made up. He was at the time under three months’ suspension for some minor infraction of regulation, but seized the bull by the horns and did the job. The relief train was jammed to capacity with voluntary workers! J. Andrew White writes another epic tale of amateur accomplishment in his account in P. R.
Constructing and Erecting a Steel Mast

By Perry O. Briggs

For those who have plenty of back yard room, and a good sized bank account, yet do not want to risk their necks balancing on the top of ninety-foot "two by four", here is a mast which can be erected in one piece by one man and will stand the elements indefinitely.

Tall masts are not so numerous as they were, but any scheme that will work for an 80-foot mast is certainly good enough for a 50-foot mast. Three masts have been erected at 1BGF; all of which were successfully raised without any buckling. One of these masts consisted of six sections of galvanized roof drain pipe. Everything was arranged on the ground and the actual raising was accomplished in less than five minutes. However, the mast described in this article is 7\(^a\) feet tall and is made up of four 22-foot sections of steel water pipe. Section 1 measures 3 inches inside diameter; section 2, 2\(\frac{1}{8}\) inches; section 3, 14 inches; section 4, one inch. Reducing couplings are not used. The sections are telescoped into each other about three feet and are secured by four 1\(\frac{1}{2}\) inch bolts. Four three-inch collars with galvanized iron rings welded to them are bolted to the top of each section to receive the \(\frac{1}{4}\) inch guy wires.

The first thing to be done is to provide a suitable foundation and guy anchors. For the foundation, a hole 18 inches square and two feet deep was filled with a mixture of concrete consisting of cement, sand and stone. A varnish can slightly over three inches in diameter was embedded to the rim of the can in the exact center of the concrete, and just before the cement "set" the can was removed thus making a socket for the foot of the mast. The guy anchors are 4\(^a\) by 4\(^a\) by 6\" long set in the ground at an angle of 60 degrees with cross pieces nailed on below the ground level to hold the anchors firmly in place. There are four guy anchors, each placed thirty feet from the base of the mast. The mast and guy wires were laid out as per diagram. A "hoisting joist" (E in the illustration) was secured to the base of the mast as shown in the small sketch. All the guys which were to go to the No. 1 guy anchor were secured to the upper end of this hoisting joist. A compound tackle was run from that point to the No. 1 guy anchor. Of course it is absolutely necessary to have the length of E equal to the distance between the mast foundation and the No. 1 guy anchor. It is also necessary to use four (not three) guy anchors so that the No. 2 and No. 4 guy wires will hold the mast straight as it goes up and the No. 3 guy wires will stop it when it gets there. It is simple to find the correct lengths of these wires, either by calculation or by a drawing to scale.

Be sure to remember that you are interested in the finished length and that allowance must be made for each joint. All of this takes much less time than the usual step-by-step method of hoisting and adjusting. We found it convenient to make the length of E equal to \(\frac{3}{4}\) the height of the mast and to set the anchors this far out.

When everything is arranged make sure that all bolts are tight, especially the clamps that hold the hoisting guys. The first mast erected at 1BGF had a nasty fall on account of the eyebolt in the upright pulling out. After the dust had cleared away and our eyes had returned to their normal size we made sure that everything was tight and ship-shape before the second attempt. Everything being set for the crucial moment, grasp the "fall" of the four to one tackle blocks; pull gently, thus taking up the
slack. Now pull a little harder. This first hard pull will test all the guy connections of the hoisting guy wires. Gradually the hoisting joist will move earthward and the mast will rise heavenward. When the mast has reached an angle of about forty-five degrees our troubles and worries are over. The strain on the hoisting apparatus becomes less and less and shortly you have the four by four hoisting joist in your hands and by pressing it to the ground your mast is erected. Stake down the hoisting joist and remove the tackle and stay poles. Take off the hoisting guys from the joist one at a time and fasten them to the No. 1 anchor guy; remove the four by four hoisting joist and allow the mast to drop into its socket in the cement foundation. Then with the aid of a level straighten and tighten up the first section and its set of guy wires. In like manner true up the remaining sections and guy wires.

Just before hoisting our mast we applied a second coat of white paint and mast was erected without marring the paint and without danger to life or property.

Northwestern Division Convention
Tacoma, Wash.
October 8th and 9th

All members of the League and amateurs are cordially invited to attend the convention. It will be held under the auspices of the Tacoma Radio Club. This will be the first Northwestern Division Convention and a very good program has been prepared. Headquarters is sending A. A. Hebert, Treasurer and Fieldman, and he will have a good message for the delegates.

Director Karl W. Weingarten, 3219 No. 24th St., Tacoma, Wash., will appreciate hearing from all those who contemplate being present.

ELECTION NOTICE
To All A.R.R.L. Members Residing in the Central, Hudson, New England, Northwestern (including Alaska), Roanoke, Rocky Mountain and West Gulf Divisions:

1. You are hereby notified that an election for an A.R.R.L. Director, for the term 1927-1928, is about to be held in each of the above Divisions, in accordance with the Constitution. Your attention is invited to Sec. 1 of Article IV of the Constitution, providing for the government of A.R.R.L. affairs by a Board of Directors; Sec. 2 of Article IV, defining their eligibility; and By-Laws 14, 15, 16, 17 and 18, providing for their nomination and election.

2. The election will take place during the month of November, 1926 on ballots which will be mailed from Headquarters in the first week of that month. The ballots for each Division will list the names of all eligible candidates nominated for the position by A.R.R.L. members residing in that Division.

3. Nominating petitions are hereby solicited. Ten or more A.R.R.L. members living in any Division have the privilege of nominating any member of the League in their Division as a candidate for Director. The following form for nomination is suggested:

   Executive Committee,
   A.R.R.L. Headquarters,
   Hartford, Conn.
   Gentlemen:
   We, the undersigned members of the
   A.R.R.L. residing in the ..............
   Division, hereby nominate ..............
   of .............., as a candidate for
   Director from this Division for 1927-1928.

   (Signatures)

The signers must be League members in good standing. The nominee must be a League member in good standing and must be without commercial radio connections. His complete name and address should be given. All such petitions must be filed at the headquarters office of the League in Hartford, Conn., by noon of the first day of November, 1926. There is no limit on the number of petitions that may be filed, but no member shall append his signature to more than one such petition.

4. Present Directors from these Divisions are as follows: Central, Mr. Clyde E. Darr, Detroit; Hudson, Dr. Lawrence J. Dunn, Brooklyn; New England, Dr. Elliott A. White, Hanover, N. H.; Northwestern, Mr. Karl W. Weingarten, Tacoma; Roanoke, Mr. W. Treadway Gravely, Danville, Va.; Rocky Mountain, Mr. Paul M. Segal, Denver; West Gulf, Mr Frank M. Corlett, Dallas.

5. This is your opportunity to put the man of your choice in office as the representative of your Division. Members are urged to take the initiative and file nominating petitions immediately.

   For the Board of Directors:
   K. B. WARNER, Secretary.
   Hartford, Conn., 2 August, 1926.

Strays'

8ABX uses ordinary glass test tubes as forms for R.F. chokes. A rubber stopper in the open end of the test tube serves as a mounting to hold the chokes on the panel or baseboard.
Aurora and Its Effect Upon Radio Signals

By W. M. Sutton*

We have seen it repeated so many times that the Aurora Borealis has no effect whatever upon radio reception, that one is reluctant to make any statement to the contrary unless he is prepared to receive the brunt of many criticisms. And yet, we find everybody in general throughout Canada and the United States is complaining of the very poor radio reception during the past winter. Even the British transmitting amateurs were wondering what had become of the American and Canadian amateur transmitters the past winter, claiming they had much better contact last summer. Perhaps the following observations will help explain the reason for such bad DX conditions.

The writer is in a position to keep a very close check upon the Aurora, being able to tell whether it is present, night or day; as he is a repeater operator on a trans-continental telegraph wire. Almost all other statements were made by observers, who could only use the spectacular display in the Northern sky as a sign for the Aurora. In the daytime or at night, when it is cloudy, such observations cannot be kept, and therefore one could hardly call them conclusive.

Instead of starting at the beginning of my observations, I will begin at the other end and go back, because it was in this way that I became more and more convinced that the Aurora has a decided and detrimental effect upon radio signals of certain frequencies.

On the night of March 10th at 11:45 PM I was listening to stations in Toronto on the new Canadian wave of 52.5 meters. Signals were exceptionally strong; 9AL, 9BJ, 3FC, 3V (these are Canadian stations) all had an audibility of R-10, and u2XAC (Schenectady, N. Y.) on 52 meters was so strong that the signals blocked the detector tube. WIZ (RCA test station) was even stronger and all signals in the 40-meter band were very good. At 12:20 AM all Toronto stations had faded almost completely out, and were just readable with concentration. 3V was heard talking to 9AL, and asking him what had happened to the signals, apparently suspecting his receiver. At 12:45 AM, 2XAC with all their power was only R-4, and WIZ had dropped in strength to R-5. Only two or three amateur stations on the 40-meter band were coming in and those were just readable. The night was cloudy and the majority of amateurs would be at a loss as to the reason for such a sudden decrease in signal strength.

The Aurora came on very strong at 11:55 PM this night, and it took exactly 25 minutes before it deadened signals on these two bands.

A permanent schedule has been kept with Toronto station 3FC since January, and several such occasions as described above have been observed. It appears that if the Aurora is very strong the 52 meter signals die off suddenly; but, if it is just moderately strong and continues, it takes an hour or more before signals are unreadable; and then again, if it is only weak, signals are weak too, and increase in strength as the Aurora lifts. This is on 52 meters. The skipped distance is not so noticeable on this wave as on the 40-meter band, and therefore the different intensities of Aurora affect the latter wave band somewhat differently.

On January 25th and 26th there was not a signal heard here on either 52.5 meters or the 40-meter band, and it will be remembered it was at this time that the Aurora tied up all telegraph communication in Canada and the northern part of the United States. On January the 27th, signals were coming in very weak on the 40-meter band, but I was unable to connect with anybody from this station. January 28th signals had returned to normal strength on both these bands.

Most of the above refers to observations connected on the new Canadian wave of 52.5 meters, so a few remarks about its effect on the 40-meter band would not be out of place. It appears that, when the Aurora is either strong or weak in the daytime 40-meter signals will not come through at all, but at night, moderate Aurora has the effect of seemingly bringing the Heaviside layer down, and stations at a moderate distance, (which should be skipping overhead at this time of the night) come in with exceptional audibility, and DX stations cannot be heard. Weak Aurora makes a slight change in the skipped distance as compared with a normal night, while a really strong Aurora deadens signals entirely on this band.

In March 1923 the Canadian amateurs made their first attempt at a Trans-Continental Relay which turned out very unsuccessfully due to what we called very poor weather conditions; but I can remember that a day or so before the tests the Aurora came on very strong and kept up for two or three days. The night it set in signals did not decrease in strength at all and it was not until the next night that any effect was noticed which would make one believe that Aurora has no effect on radio. This

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*Canadian 3NJ, Victoria Hotel, Fort William, Ontario, Canada.
was on 225 meters. The same has been observed on the present broadcast band, which accounts for most BCL's saying that they have had wonderful reception when the aurora has been plainly seen in the sky and the next night, when it has disappeared, the signals have lost their volume, and they fail to see the reason.

Perhaps some of you will ask if the Aurora has been on continually throughout the winter. It has not, but it has been so frequent that the ether has not had a chance to straighten up, so to speak, and therefore the poor reception on broadcast waves. On the other hand, we, amateurs, on the short waves are not affected so badly, because when the Aurora lifts, our signals come back almost immediately. The winter of 1923-24 was very good for both broadcast and amateur signals, because the Aurora appeared during the fall and spring, but none was noticed during the winter months. 1924-25 was not as good because we had several disturbances of Aurora throughout the winter, and this winter has been very poor owing to the repeated and strong Aurora. Last fall there was very little, which accounts for the wonderful DX most of our amateur stations accomplished. This is the worst year for Aurora I have experienced in six years. Observation. Last fall one of the scientists predicted great disturbances of Aurora would be experienced for the next 18 months due to a sun spot maximum and his predictions are beginning to look like facts.

**Conclusion**

Strong Aurora kills signals from 35 meters up to 500, although the effect is only immediate on signals up to approximately 60 meters. As one goes up higher in wavelength, the time lag is increased. The delay between the start of the Aurora and the disappearance or weakening of signals may be as long as 24 hours in the upper broadcast band. The signals also take much longer to come back to normality.

Moderate Aurora makes quite a change on the skipped distance of 40-meter signals, and prevents real DX. As we go ten meters higher the signals gradually fade out. In the broadcast band distant signals are coming in, but fading is very pronounced, and no medium distant stations come through.

Slight Aurora changes the skipped distance just slightly on the 40-meter band, and causes fading on medium distance broadcast stations, but distant stations are fairly steady. The fifty meter signals will push through but are much weaker. Intermediate Aurora, coming for a few hours and lifting for a day, and then coming back again, will cause a continued blanket on broadcast signals, but the short waves will break through whenever the Aurora has lifted.

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**A Straight Frequency Line Condenser**

EMBODYING several very unusual features, the condenser shown in the illustration has recently been made available. It is of the straight frequency line type, but differs from the majority of the condensers of this type in that its external dimensions are comparable to those of the usual straight capacity line type of condenser.

The smallness is obtained through the use of exceedingly small plates—exceedingly small when compared to most of the others—and the requisite capacity is secured by the use of a number of these plates. The supporting frame holding the rotor plates is a "U" shaped piece of heavy metal, the other end of the "U" carrying the insulation which is of high grade rubber. Both rotor and stator plates are of brass and are soldered in place. Pig-tail connections are provided to supplement the cone bearing contacts. The required minimum capacity is obtained by a permanently connected fixed condenser composed of two quarter moon shaped plates attached to rotor and stator portions of the circuit. The condenser is made in several "broadcast" capacities and is supplied for short wave use in several different maximum capacities. For short wave work the "minimum capacity" shield is omitted. This very nice job is the product of the Sanborn Electric Co. of Canton, Mass.

—J. M. C.
Wavelength-Frequency Conversion Chart

The Wavelength-Frequency chart shown here is due to Captain Tom Rivers, well known to A.R.R.L. men thru his work in connection with the Army-Amyhete Network, and who is now attending a course in Communication Engineering at Yale University. The operation of the chart is as simple as can be imagined, find the number which stands for the wave length you want in Kilocycles, the number opposite is the corresponding frequency in Kilocycles. The same numbers can be used for frequency-wavelength conversion just start with one and the other is opposite.
"Ham"

By C. E. Tamm*

D

O the code hounds of radio, who seem universally to have adopted the nickname of "Hams", really know what this term stands for?

To be called a "Ham" on a land line is the premiere insult, and even though realizing his short-comings, the poorer the operator, the more he resents being called a "ham."

True, the term can be applied to some of the "CQ" demons, but it seems a shame to apply it to all transmitting amateurs, especially after listening to some of the "copper plate" stuff that may be picked up nightly.

Long before Marconi and De Forest had produced anything that would transmit characters without the aid of wires there were "hams."

To the railroads goes the honor for producing the real dyed-in-the-wool "ham.">

Time was, years ago, when to be a telegraph operator on the railroad was the pet ambition of at least one youngster in every small town. A full-fledged operator was of considerable importance in his community and not a little sought after by many of the comely young ladies of the village.

The magnanimous railroads created positions for "helpers. A helper's duties were multiple; sweep out the depot, carry the mail to and from the post office, help the train crews load freight and baggage, flunky around the warehouse, take care of the pumping engine at the water tank and do any and all other jobs that no one else would do. After all this was done the helper could practice telegraphy. This privilege being his principal remuneration for his 12-hour day of labor.

Night times, while the regular operator curled up on a table and slept, the helpers had full possession of the idle wires, which in the day time were used for messages and car reports.

Midnight, dead silence except for the snores of the operator. Off in the distance a dog, suffering from insomnia gives vent to his feelings. Then there begins a confused clicking of a telegraph sounder, giving forth halting characters. As the arm of the sender, stiffened from a day's labor in the warehouse, limbers up gradually, there is formed an office call, repeated many times, eventually to be answered by the helper at the office being called.

Invariably the conversation would start:

"H o w i s m y g i r l ?", spelled out very slowly and haltingly. Then a tedious exchange of the bits of gossip of interest to no one but the two future train dispatchers.

After many months of this the helper would go into division headquarters, take his examination and (if acceptable), would be assigned to a regular position as telegraph operator.

Then he became, in the parlance of the commercial and railroad operators in the relay office, any number of dashed and blanked kinds of a "HAM!") Probably some really old timer, long since grown old in the service, may be able to tell with certainty just how the term first originated. By the comparatively late comers in the game, it is generally conceded that the term "Ham" was applied to the plodding student because his Morse characters sounded a great deal as if they were being formed by a huge ham instead of a hand, on the sending key.

Another term used in land line telegraph is "Lifting the 'Lid.' " "Lid" being another term applied to a young operator who "breaks" on every other word and whose sending is so full of "combinations" that even old timers are at a loss at times to decipher just what the "lid" or "ham" is trying to say.

As I listen to the hum and whine of the vari-toned CW's, I am inclined to the belief that all the original "hams" with their "H o w i s m y g i r l ?" have forsaken the land lines for radio with its "C U A G N O M." But even at that the term "ham" is a label to many of the senders on the ether.

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Who says the amateurs are not running broadcasting stations? From WTIC, The Travelers Insurance Company's station at Hartford, we find the following lineup of hams: Chief Engineer Randall 1ANQ; Chief Op. Taylor, 1IAT; Operator Mix 1TS; Op. Herriott, 1AOI; and Operator Tucker ex 1ADP. All of the operating force at WTIC who were old enough to enlist were in the Government Radio Service in some form or other during the World War. And this is just one broadcasting station from some five hundred.

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2CXL, 2API and 1AOA have a new abbreviation. "XW? Are you rushing the young ladies"? "XY R1 to R9—Yes I am rushing the young ladies at present (in proportion to the R's)"—hi!

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*1211 State St. Milwaukee Wisconsin.
Experimenters' Section Report

For organization details the reader is again referred to page 38 of our July issue. We lack space to print this information each month. If you have not the July issue please ask us for details but please enclose a self-addressed envelope.

The July-August 5-Meter Tests

The 5-meter test series have just run out as this is being written. This is the 30th of August and "copy" cannot be turned in after tomorrow so there is no point in waiting for reports. Requests for reports are being sent out to all who are known to have taken part in the tests and others are hereby asked to give all details of their experiences.

It is not anticipated that there will be a great deal to report for experience has shown that the weakest spot in the present tests lies in the very great uncertainty as to the operation and wavelength-range of the receiving equipment. At several stations this has been checked up and after careful work a tuner has been built that gives very much better results.

The Need for 5-Meter Wavemeters

The biggest difficulty is in knowing that one is really listening on the same wavelength at which the other fellow is sending. With one exception ALL of the successful transmissions have been made after a wavemeter was carried over the route and the receiving set calibrated with the same wavemeter used at the sending end. Some additional tests will be made after a batch of wavemeters have been made up and distributed.

More of this later.

Concerning 5-Meter Receivers

The difficulty with most of the receivers seems to be in the absolute inability of their builders to appreciate how small a change of capacity will cause the tuning to whiz across the desired signal. The condensers used are almost always too large and the construction is almost always such as to permit vibration and hand capacity to spoil the action.

Illustrative of the workable kind of receivers is the one here shown which was made by Norvell Douglas of 9EHT at Lawrence, Kansas. The tuner uses the Armstrong tuned-grid, tuned-plate circuit shown in Fig. 2B on page 35 of the July issue, except that it was found desirable to bypass the R. F. around the audio amplifier with the aid of a micadon condenser (shown between the tuning condensers) and to make sure that the R. F. used the bypass by putting the Lorenz-coil in series with the audio transformer primary as an R. F. choke. The distributed capacity of the audio transformer will permit oscillation in the original circuit but the stability is better with the bypass and choke. Note that the choke is suspended clear of the baseboard. This was found necessary but the vibration had to be damped by guying the coil with threads, one of which can be seen in the original photo, tho possibly not in the magazine reproduction. The tuning condensers are Hammarlund "vernier" condensers driven by bakelite shafts to prevent hand capacity effects. Here is an important point. These bakelite shafts were originally 5 inches long but the "whip" made it impossible to find a signal. The trouble was located by testing on a local oscillator and shortening the shaft. This tuner is a big step in the right direction but the uncertainty as to the sending stations compelled the use of an excessive wavelength range, i.e. from 4.0 to 7.0 meters. Does that sound small? Well it is enormous!! It covers 18,360 cycles or much more than can be found between 20 meters and 20,000 meters. What chance would one have of tuning in even NKF with a tuner that rushed from 20 to 20,000 meters with a single turn of the tuning knob? How much less chance is there of finding a faint signal which is unsteady as most of our 5-meter stuff is? Even when one knows just where the signal is to tune in the most careful manipulation is necessary.

The tuner with which further work will need to be done will have very much smaller condenser capacity. Budlong suggests a fixed plate with a short piece of curved wire to act as the movable plate, the wire being mounted on the tuning shaft.

A New Record

The real problem is to find out what 5-meter waves do in the ether, but that does not keep one from feeling elated over DX work when it happens. It seems certain now that 2AUZ has been heard on
schedule at Hammond, Indiana, also that several 3rd district stations have been heard on Long Island. Check tests are being planned and details will be given later. If these are freaks we have three such. In view of the extremely poor conditions under which they have occurred they hardly seem like freaks.

The Outlines

All the problem outlines but two have been sent out. These two are being held for a few days but will have been sent out before this magazine reaches the members. The outline on antennas for poor locations appears to be the favorite as most of the men enrolled seem to regard theirs as a poor location.

Books

Several requests for books on alternating current theory arrive each week. These have been answered by postcard. Naturally there is room for opinion on such things but the writer is inclined to feel kindly toward D. C. and J. P. Jackson’s freshly revised “Alternating Currents and Alternating Current Machinery” (McMillan) for $6.00; or the more condensed, “Elements of Alternating Currents and Alternating Current Apparatus,” by J. L. Beaver, published by Longmans, Greene and Co. at $4.00. Both of these books will be reviewed in QST.

R. F. Chokes

Any work available on the voltage-distribution and natural wave of R. F. chokes in oscillating tube circuits will be very much appreciated so that it may be tied in with work done by Mr. E. G. Watts of Miami, Fla., and Mr. C. H. Starr of St. Catharines, Ontario, both of whom have been mentioned in this connection. Their work has developed some peculiar effects that are not well understood and might possibly be explained by other work along the same line.

Short-Wave R. F. Amplifiers

With improved understanding of R. F. amplifier action in the 200-600-meter region we begin to feel more hopeful of the future of R. F. amplifiers in the sub-200 region. An outline has been written on this subject and it has been thought wise to confine it mainly to a discussion of the methods used to determine the goodness of the results. This outline will need revision and anything at all on the subject will be helpful—references, designs, experiments and theories.

A New Illuminated Dial

The dial shown in the photograph is the latest version of the excellent National variable ratio vernier dial. Illumination is provided in a very novel manner. The lamp (shown at the left) is attached to the rear of the panel, and projects through a hole in the panel into a “cupped out” place directly behind the trade mark on the front of the housing. Rays from the lamp project downward in the space between the dial and the housing and complete illumination of the dial results. The lamp is held in place by screws which are attached to two moulded-in inserted machines screws, set in the rear of the bakelite housing. An additional machine screw is moulded in the housing behind the control knob. These screws hold the dial very firmly in place against the panel. The lamp operates directly from the 6-volt A battery. At the right of the photograph is a coupling unit designed to accommodate the National Condenser for use with the variable ratio dial.

—J. M. C.

Strays

Every A.R.R.L. member should subscribe to the Radio Service Bulletin, the monthly news sheet published by the Government. It costs twenty-five cents a year and is secured from Superintendent of Documents, Government Printing Office, Washington, D. C. In addition to containing all the latest dope on Naval, Commercial, Army, Experimental Amateur and Special licenses and call letters the Bulletin announces forthcoming papers of the BuStan, has a complete tabulation of all radio papers and articles appearing in all radio magazines, contains a list of Standard Frequency Stations and much other information of value to you all.
Hints On the Design of Small Power Transformers

By Allen H. Babcock

All transformer design goes back to the fundamental formula for induced E.M.F.;

$$E = \frac{4.44 f n \Phi}{100,000,000}$$

where $E =$ the volts for which the transformer is to be designed

$f =$ frequency of the supply circuit in cycles per second

$\Phi =$ total flux

$n =$ turns of wire

Also $\Phi =$ area of core (measured at right angles to the direction of the flux) multiplied by the unit flux, i.e., the number of magnetic lines per unit of area. This is denoted usually by $B$.

By substitution and transposition we have

$$n = \frac{100,000,000 E}{4.44 f B A}$$

Where $A =$ cross sectional area of the core, measured at right angles to the direction of the flux as stated above.

Usually we know $E$ and $f$, $B$, we may assume for ordinary iron $= 50,000$ lines per square inch for all ordinary frequencies of power supply, say 25 to 60 cycles; and we have left two quantities, $B$ and $A$, that vary inversely. Their product must be kept constant so that if we increase either one we must decrease the other in the same ratio.

Expressed in other words, we may use a small iron core and have many turns of copper wire, or we may have a smaller number of turns of wire with a larger core.

For ordinary frequencies of power circuits, say from 25 up to 60 cycles, it matters little, as far as the iron losses are concerned, whether the core is large or small; but when we come to the higher frequencies, 300 to 700 or 800 cycles, the situation is very different, for one of the iron losses varies as the square of the frequency and directly as the flux, while the other varies as the square of the flux and directly as the frequency.

The iron losses are worth considering for two reasons: they have a lot to do with the cost of running the transformer, and they heat the core which in turn heats the copper windings in addition to the heat developed by the ohmic resistance of the copper.

It is easy to see, now, that transformer design is largely a matter of cut and try, not something for which a hard and fast formula can be developed. This is why the usual handbooks fail to be of much help to the beginner who has a transformer to design.

My plan is to assume a core for which the iron can be obtained in standard sizes, then with the quantities that are known and by assuming values for the unknowns somewhere within reason, substitute in the fundamental equation, solve for the complete transformer, and see how it comes out. Then juggle the various quantities around until (in the case of high frequencies) the iron losses are not too much larger than the copper losses, and when the volts of any coil divided by the turns of that coil come out about one or one and a quarter, I call it done.

As a guide for a beginning: for low frequencies assume $B = 50,000$ and $A$ about 10 sq. in.; for high frequencies assume $B = 25,000$ and $A$ about 2 or 2 ½ sq. in, and you will not be far out of the way for small transformers, say up to 1 K. W. and for maximum voltages up to 5 or 6 thousand.

The hand-and textbooks will guide any one who wishes to compute his iron losses; the copper losses are simply the usual PR.

Factory engineers who design transformers every day have many useful short cuts learned by experience. College professors who teach these things will find my methods crude and lacking in refinement. Both should remember, if they feel disposed to criticise what I have written, that the ham who needs a small power transformer is concerned with neither short cuts nor refinements but must cut his coat according to his cloth.
Neon Tubes and the Radio Transmitter

By C. A. Briggs

ONE of the glow tubes now sold for radio use or the common kind sold for testing spark plugs, forms a handy part of a radio transmitter. Fastened at one end to the helix it glows whenever the circuit is oscillating, whatever the wavelength. The free end of the tube must extend in a proper direction readily found by trial. This arrangement is particularly convenient where experiments or adjustments are made. It is unnecessary to hunt around with a wavemeter or receiving set to learn whether the transmitter or oscillating driver, is oscillating.

These tubes, as mentioned in other articles, are also convenient indicators for wavemeters and are coming into use for this purpose. They are sufficiently sensitive. Sharp settings can be made, either by using a loose coupling *just sufficient* to operate the tube at resonance, or at closer couplings when the point of maximum brilliance is really used. The tube will not be harmed where a flash-light bulb will be burned out.\(^1\) There is no inertia in the action of the tube; they will give a good flash to catch the eye when the dial is turned rapidly thru the point of resonance under conditions a flash-light bulb would fail utterly to show anything.\(^2\)

The tube is placed across the wavemeter circuit, that is, in parallel with the condenser. In a wavemeter using a very small capacity, this will upset the calibration and therefore the tube should be connected before calibration. After that attempt to avoid needless overloads because the use of a new tube will call for re-calibration unless it is very much like the first one. It is generally necessary to make some changes in the flash tubes as purchased. To perfect the connection with the ends of the tube, see the diagram. The original connections may be used if they give good sensitivity but usually there is too much machinery about the tube and some of it must be taken off. Work carefully, remembering that it is very easy to tear off the little wire sealed into the end of the tube.

The work of adjusting and changing a transmitter is wonderfully expedited by two tubes, one connected to the helix to show when the circuit is oscillating, and the other across a wavemeter to indicate resonance.

These tubes can now be bought quite cheaply. They contain rarefied amounts of argon, helium or some sensitive gas. Some tubes are more sensitive than others.

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A.R.R.L. Information Service Rules

Please help us by observing the following rules:

1. Keep a copy of your questions and diagrams and mention that you did so.
2. Number the questions and make a paragraph of each one.
3. Make diagrams on separate sheets and fasten them to the letter.
4. Print your name and address (not merely your radio call) on your letter. Don't depend on the return address on the envelope as this is destroyed when the letter is opened.
5. Don't ask for a comparison of the various manufacturers' products.
6. Before writing, search your files of QST—the answer probably is there.
7. Address all questions to Information Service, American Radio Relay League, Inc., 1711 Park Street, Hartford, Conn.
8. It is not essential to enclose an envelope as long as you supply postage and PRINT CLEARLY your name and address on your letter.
A Radio Picture Demonstration

At the last show of the Northwest Radio Trade Association, (which is not in Seattle but in the Twin Cities) there was staged an interesting demonstration of radio picture transmission. The following account is quoted partly from letters of D. C. Wallace, president of the association (likewise of 9ZT) and partly from a report by James P. Barton and John K. Hilliard who operated the equipment.

The Northwest Radio Trade Association requested that the apparatus and materials be assembled. The machines were purchased from Mr. C. Francis Jenkins of Washington, D. C., and after the show were given to the men who operated the equipment. Since the equipment purchased from the Jenkins Laboratories consisted only of the actual transmitting and receiving units, the auxiliary apparatus was gleaned from every conceivable source in the Twin Cities. Very fine sensitive relays were borrowed from the Telephone department of the University of Minnesota. Various kinds of receiving equipment were used. At one time a superhetrodyne was used so that the reception show held in the St. Paul Auditorium and demonstrated during the entire week.

"An illustrated lecture was given in the afternoon and evening on the equipment, explaining its operation."

"The Argus Leader of Sioux Falls, South Dakota, engaged us to take the equipment to Sioux Falls to a radio show held there October 16 and 17. The apparatus was packed up, sent down and worked more successfully than at the St. Paul Show, as we had a chance to work on it and remove some of the features which bothered us at St. Paul.

"The two machines were placed close to each other so that the audience could easily see both machines in operation at the same time. At first they were placed across the Auditorium and this was found impractical since the people wanted to see both the transmitter and receiver in operation at the same time.

"The set-up consisted of two units; one a transmitter, and one a receiver. Each unit was constructed with a Jenkins Midget Model picture machine as the core.

"The transmitter consisted of a Hartley oscillator using two UX-210 power tubes fed by storage A and B Batteries. The Jenkins Conductive ink was used in all of the transmissions. (This is a graphite ink which is a fair conductor. Pictures are drawn, or written done on ordinary paper with this ink. The paper is then wrapped around the transmitting cylinder so that the picture will revolve under the two contacts of the sending relay shown in figure one.)"

TECH. ED.) When a line passes under the contact the ink closes the operating circuit of the high speed telegraph relay which cuts a 250-muf. condenser across part of the transmitting inductance, thereby compensating the wave. (See figure 1)

"The original wavelength was 185 meters but we found at demonstrations and in tests

THE APPARATUS SET UP AT THE NORTHWEST RADIO SHOW IN THE ST. PAUL (MINNESOTA) AUDITORIUM

The other set was at the far end of the auditorium 600 feet away. From left to right the men in the picture are: Prof. C. M. Jansky, Jr., Director Dakota Division A.R.R.L.; R. E. Earle, Radio Inspector 9th District; R. K. Hilliard, operator at 9XI, also operator of the Jenkins transmitter; D. C. Wallace; President, Northwest Radio Trade Association; J. T. Barton, operator at 9XI and operator of the Jenkins receiver; R. R. Skiffen, operator 9YAS, former district superintendent Minnesota District No. 2, now manager WCAL; R. N. McCord, President, Twin City Radio Club and chief operator A.R.R.L. booth at show. The apparatus was worked under the call of 9ZT by special permission from Supervisor of Radio, E. A. Beane.
that body capacity would effect the frequency. We shifted the wavelength to 580 meters as the back wave and 565 as the working wave. The purpose for using a compensated wave was that there is practically no lag between the time the relay closes the L. C. circuit and the shift of the wavelength. The action is electronic and therefore no lag in comparison with a relay lag, which we found to be the only real one.

"As the two units were only 20 feet apart, a single-turn 4-foot loop was used for the radiating system. Storage batteries were used as we could get plenty of them from the dealers who were displaying at the booths. Otherwise we used an M. G. set for plate supply.

"The receiving unit consisted of a detector and three audio stages using 201-A's for detector and first step, UX-112 for second, and a UX-210 for the last step. The coupling transformers were G. R. 6/1, although a 2/1 in the last two stages would be better, using a higher plate voltage. The circuit is a straight "Weagant X" with a short-circuited primary coil to broaden tuning. The accompanying circuit diagrams give all the values of voltage, apparatus, etc. The various values of plate and bias voltage were obtained from the static characteristic curves of the tubes.

"In the plate circuit of the last audio tube was placed a milliammeter and a relay similar to the one in the transmitter. The grid of the UX-210 tube was biased sufficiently to bring the plate current to zero with no impressed signal on the grid. The normal variation of plate current was 0 to 50 mils but 0-20 would operate the relay in fine shape. The relay closed a local circuit operating the stylus recorder which impressed upon the carbon paper, drawing lines.

"In this amplifier we found that a beat note of about 1500 cycles gave the greatest amplification or change in plate current. This method, by the way, is a very good one for determining the amplification curve of the AF transformer with regards to frequency, the Ip deflection in the last tube being the criterion. The reason for biasing the last tube so that Ip was 0 was that the greatest change in Ip could be obtained at that place on the curve with the least change in grid potential. This seems to be characteristic of power tubes, much more so than in lower Ep tubes.

"It was also found absolutely necessary to place a one µf condenser across the terminals of the receiving relay to by-pass the beat note frequency which, without the condenser would cause the relay to clutter and reproduce as a miniature loud speaker.

"We have had very little time to work on these machines but we have a large number of ideas for improvement on the two units. We shall continue to work with these units from time to time with a view to a permanent set-up."

Quoting from Wallace's letter; "You may also be interested in the Twin City Radio Club booth at the N.W.R. T.A. Show. Over several hundred messages were started by Twin City stations. A small transmitter was right at the booth and many of the messages were cleared from the booth itself with no interference to radio reception in the room. A wavelength of 40 meters with 1000 volts of Eveready "B" battery on a pair of UX-210 tubes was used."

—R. S. K.

Strays

At last we've discovered who started this business of "moving Headquarters west". It must have been the Chicago Tribune for that eminent daily is willing to tackle even the moving of our national capital to the middle west. The following editorial appeared in their columns this past summer:

WHY WASHINGTON?

The President and Mrs. Coolidge have gone into the Adirondacks and for the summer the President's office and home will be in a camp on Lake Osgood. That proves that Washington is not the place for the national capital. Part of the year it is too hot for work and although it might be a good thing for the legislative branch of government to have it so, the advantage is lost because Congress skips out about the time the pavements begin to steam.

Hamilton may have been justified in the deal he made with Virginia, trading the Potomac capital site for support for his assumption of state debts, but all the equities of that bargain have been dissolved. Virginia spent four years worrying the government in that location and before that the British found it convenient of access.

There are any number of fine capital sites in the interior of the country far enough from the Hudson river to be protected from both alien and eastern influences. Our preference is and has been the east coast of Lake Michigan at. or in the neighborhood of Grand Haven.

It looks like something can always be said against any location. It gets pretty hot in Hartford in summer, too, and we've thot longingly of headquarters in Etah, with the Bowdoin distributing QST. But each winter we incline to the fancy that Havana would be a pretty nice place. Why can't A.R.R.L. have its headquarters on wheels?
Reducing Power for Local Work

By Rufus P. Turner

The fourteenth U. S. radio regulation reads: "All stations shall use the minimum amount of energy necessary to carry out any communication desired." The same words, (or words to that effect) constitute regulation five printed on amateur station licenses, yet—how many of us abide by this law? How often I hear hams in my city pounding away with an input of fifty and a hundred watts merely to chew the rag with another station which is only a few blocks distant. This kind of operation invites complaints and creates a great deal of QRM. We all agree that the amateur should obey regulation fourteen, but when we suggest reducing power, the average amateur will argue that the only practical methods are: the operation of separate transmitters (which involves expense); the use of high-power and low-power tubes in the same set (which requires separate plate supplies) and the taking-out and putting-in of tubes in the same circuit (which involves time). The average amateur who desires to change would rather have some arrangement by which the high-power and low-power tubes may be included in the wiring of the same transmitter with only one control with which to change from one power to another.

After much experimentation, I ran across a suitable system and am describing it in this article. The only control is a S.P.D.T. switch. The change is accomplished by shifting the filament current from one tube to another. The smaller socket accommodates a five-watt and the larger socket a fifty-watt. A 5,000- to 10,000-ohm resistor is connected between the plates of the two tubes for the purpose of reducing the 1,000-volt plate supply to live hundred volts for the low-power tube. It may be necessary to use several resistors in parallel so that the required current may pass. The writer used two RCA 5,000-ohm transmitting grid leaks.

Standard Frequency Schedules

The O.W.L.S. Committee is glad to announce the resumption of its Standard Frequency service, starting with 1XM on October 15th. The schedules from 1XM are by courtesy of the Communications Division of the Massachusetts Institute of Technology and the M.I.T. Radio Society. Sunday afternoon schedules in the 15 megacycle (20-meter) band have been added in answer to a large number of requests. We hope, by the middle of winter, to have three O.W.L.S.-S.F., one on each coast and one in the Mississippi valley. In answer to requests from a number of foreign users, tentative schedules for a month in advance are also given.

1 Megacycle: 1000 Kilocycles = 1,000,000 cycles.

The schedules here given are approved by the Bureau of Standards and the A.R.R.L. O.W.L.S. Committee as well as by the cooperating stations. The frequency values are based upon the standards of the Bureau of Standards, and have also been checked by the Communications Laboratory of the Massachusetts Institute of Technology.

**Friday Evening Schedules**

(FM, Eastern Standard Time)

(Frequencies in Megacycles)

(Approox. wavelength in parentheses)

<table>
<thead>
<tr>
<th>Time</th>
<th>Schedule</th>
<th>Schedule</th>
<th>Time</th>
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<tbody>
<tr>
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<td>No. B</td>
<td>Time</td>
<td>Schedule</td>
<td></td>
</tr>
<tr>
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<td>No. D</td>
<td>No. E</td>
<td>No. F</td>
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<td>8:53 (35.3)</td>
<td>4:48</td>
<td>15.00 (16.7)</td>
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**Monday Evening Schedules**

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<tr>
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<td>15.00 (15.0)</td>
</tr>
<tr>
<td>12:00</td>
<td>15.00 (15.0)</td>
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</table>

**Dates**

October 15, No. A, 1XM

October 29, No. B, 1XM

November 12, No. A, 1XM

November 26, No. B, 1XM

**Division of time of each transmission**

3 minutes— QST QST QST u 1XM 1XM 1XM

3 minutes— 5 second dashes broken by "1XM" every half minute

1 minute— announcement of frequency in megacycles (8.75 megacycles is sent as "2s7MC")

1 minute— announcement of next frequency in megacycles

* 8LF, 427 Franklin St., N. W., Washington, D. C.
Short Wave Tuner Kits

WITH so many good receivers available in knock-down form, no one should have any hesitancy in constructing a short wave receiver. In addition to being cheaper in the self-

assembly form, there is a lot of satisfaction to be had in assembling and wiring your own set. And if it is your first short wave tuner (even though you have done nothing more than closely follow blue printed dia-
grams) the feeling of having accomplished something is a happy one.

In Fig. 1 appears a photo of the assembled tuner, parts of which are available from J. Gross & Company of New York City. The circuit used is the fixed-tune primary, condenser-tuned secondary and throttle condenser regeneration control. The condensers are the double-spaced Hammerslund. The coils are also made from Hammerslund inductances, being of the 3-inch diameter, No. 16 wire wound ten turns to the inch. The coils are mounted on bakelite strips fitted with General Radio plugs, which in turn fit a corresponding terminal strip equipped with G-R jacks. Sufficient coils are provided to cover all of the ham bands. One antenna coil is used throughout the complete range of the receiver. This is also of the Hammerslund type, mounted on a swinging arm so that the coupling can be readily adjusted. The tuner incorporates a detector and one stage of Thordarson of General Radio audio frequency amplification. The sockets are of the spring cushioned type to eliminate microphonic disturbances. An Amperite filament control is used on the amplifier tube, a variable resistance being used with the detector. The dials are the well-known Marco type with a 11-to-1 vernier ratio. The receiver is supplied in knock-down form with everything required.

FIG. 1 REAR VIEW OF THE GROSS RECEIVER ASSEMBLED AND FRONT VIEW OF THE GROSS RECEIVER

FIG. 2. PARTS OF THE REL TUNER

The REL short wave kit, shown in Figs. 2 and 3, is supplied by the Radio Engineering Laboratories, also of New York City. In this receiver Lorenz type coils are used in primary, secondary and tickler. The coils are wound to a diameter of 2¾ inches, the wire being triple covered annunciator type. Coils to cover all of the amateur bands are included. As the primary-secondary coupling is fixed, several separate primary coils are provided so that dead spots in the antenna circuit (due to resonance of harmonic resonance) can be avoided. Everything that is not mounted
on the panel is attached to the long narrow bakelite strip shown in Fig. 2. The body of the sockets is made of the strip itself. The tuner is supplied with a beautifully engraved bakelite panel, the engraving taking care of secondary and regenerator condenser scales and rheostat positions. A single rheostat controls both amplifier and detector tubes, the amplifier being a single stage one. The condensers are of the REL type, being made with very large plates having an unusually large spacing between them. The set is supplied with an unshielded panel and rubber friction verniers mounted on extension projecting well away from the panel. The receiver comes to you in the form shown in Fig. 2, and when completed looks (externally) like the photo in Fig. 3. It is supplied complete with cabinet, panel and all parts and wiring, spaghetti and screws.

Although not a complete kit in that tube sockets, rheostat, panel cabinet and so on are not supplied with the parts, the new Silver-Marshall set of short wave parts shown in Fig. 4 deserves mention. The coils are of their latest type, being wound on moulded bakelite forms, the forms having ribs in which notches are moulded. The wire in the inductances is No. 26 enamel, being spaced by a distance about equal to that of the wire itself. The coils are plug-in, fitting the ring socket which carries all of the terminals. The circuit intended for use with the parts is a condenser-tuned secondary one, the regeneration being controlled by a throttle condenser. A small low maximum capacity variable condenser (shown in the center of the photograph) is used as the series antenna condenser in place of the antenna coil. The main condensers have a maximum capacity of 140 μfd. and with the coils supplied, cover all of the amateur bands. —J. M. C.

**Plug-In Chokes**

If your transmitter is to cover a very wide band of waves it will be necessary to use some form of interchangeable radio frequency choke coils. Home-made plug-in chokes have been previously described in QST. Commercially manufactured chokes are now available. The chokes shown in the illustration are made by the Allen D. Cardell Mfg. Corp'n. Three types are available. One for 20, 40 and 80 meters, one for 150 meters to 200 meters and the other a "universal" for receiving sets. The coils are wound on hard rubber tubing and are supplied with plugs and jacks.

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**Strays**

On page 46 of the September issue, in the article “Radiotron Model UX-210”, we made an error in setting the formulae. The second and third paragraphs on that page should read as follows:

The straight line finally obtained is the optimum load characteristic and its slope is the reciprocal of the load resistance. This line gives the maximum and minimum plate voltage and plate current and the output power is calculated from the following equations:

\[ P = \frac{1}{8} \left( E_{\text{max}} - E_{\text{min}} \right) \left( I_{\text{max}} - I_{\text{min}} \right) \]

The load resistance is, of course,

\[ \frac{E_{\text{max}} - E_{\text{min}}}{I_{\text{max}} - I_{\text{min}}} \]

and knowing these two quantities the A.C. plate current can easily be determined or it can be directly calculated from the plate current swing as shown on the curves.

To clarify the use of this method an example is given below for the 350 volt case.

Given \( E_b = 350 \) volts

\[ I = 1.5 \text{ m.a.} \]
A Portable Transceiver

By Frank A. Gunther

IN THE old days portable sets were in fashion only in the summertime; nobody cared to sit out in a field with a portable station during the winter. However, nowadays there are some of us who have actually come into the habit of hibernating to Canada in the summer and Florida in the winter; therefore have need for a transmitter-receiver. Looking further ahead, when one comes home happy and broke, the set should be able to continue operating in the home—for the owner will not be able to buy another for a while.

This set fits these conditions, besides coming in handy to the person that is unable to get away from business for a vacation, for it fits into a desk and the like very nicely.

Before proceeding, please get accustomed to the fact that this set works (the combination) quite as well as if they had been built for a fixed amateur station, also that the set looks in place when used as such.

Radio sets should be built first and then the cabinets should be put around them. For the sake of contrariness this one was made the opposite way—the cabinet and then the set to fit. This cabinet is a lady's hat box.

The box is ply-wood, draped with leather and provided with a stout carrying handle. The inside dimensions are: length 18¾"; height 16"; depth 10½". Next the general layout was made and it was decided to use a wooden frame carrying three panels of 3/16" bakelite. The frame is of ½" x 1¼" whitewood and is described well enough by the drawings.

The three panels are as follows:— (see photo)

Meter panel (top) 18¾" x 4½"

Inductance shelf (carrying jacks for plug-in coils) 17¾" x 8½"

Control panel (lower) 18¾" x 6½"

The three panels are rubbed down with oil and No. 000 steel wool. The sub panel or shelf is notched (1½" x 1¼") to permit the vertical post of the wooden frame to pass thru. The apparatus on the shelf is as follows: at the rear three Benjamin UX type sockets are mounted with their centers spaced 3½" and the middle one almost exactly half way on the panel and 2½" from the rear edge. These holes are large enough to pass the body of the socket with clearance as the base of the socket is below the shelf. The instructions for mounting in this way will be found in the socket carton.

At the extreme right of the shelf six 3¼" holes are drilled to receive the jacks which hold the REL receiving coils, primary, secondary and tickler. Any coil can be exchanged independently of the others and with a set of 7 the entire amateur range above 12 meters can be covered.

The primary transmitting inductance is mounted in a fixed position at the left end of the shelf with the plate lead running to the right-hand end since that end is nearest the antenna coil. In front of the primary, 4 holes are drilled to permit flexible leads to go from the helix clips down into the set. The secondary or antenna coil is mounted by screwing a lengthwise bakelite strip of 3/16" bakelite to the secondary inductance. This strip is ½" wide and thru it pass a pair of 6-32 machine screws which in turn go thru a slot in the shelf and are each equipped with a spring washer and soldered-on nut to provide a little friction. The panel slot in this case was 3/16" wide and 7½" long, the length obviously depends on the adjustment that is wanted.

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*3ALS. Radio Engineering Laboratories, Thames Street, New York City.
and also on the spacing of the two screws.
The apparatus on the meter panel is self-evident, but may be listed as follows from right to left, 0-10 D.C. filament voltmeter, ground post, 0-500 D.C. plate voltmeter, 4-pole double-throw Federal anti-capacity switch, 0-1 antenna R.F. meter, antenna post, 0-100 D.C. plate milliammeter.

switc, 0-1 antenna R.F. meter, antenna right to left, 0-10 D.C. filament voltmeter, evident, but may be listed as follows from right to left, 0-10 D.C. filament voltmeter, ground post, 0-500 D.C. plate voltmeter, 4-pole double-throw Federal anti-capacity switch, 0-1 antenna R.F. meter, antenna post, 0-100 D.C. plate milliammeter.

was used, but anything will serve that does not overheat—and stays in adjustment.

It is important to have the receiving grid condenser of small capacity as a large condenser makes it harder to get good tube operation at the short waves. In this set, the condenser has a capacity of 100 µfd's, and the leak has a resistance of 7-10 ohms.

All filaments are worked from the same 7.5-volt batteries, the receiving tube filaments (3-volt UX199 tubes) being protected by a semi-fixed 30-ohm rheostat in series with a regular 12-ohm rheostat. The extra rheostat is mounted in the rear of the set, where the 500-voltmeter's "multiplier" resistance is also located.

Six flexible rubber-covered leads are taped together and run to the "power-house" box containing the 7.5-volt A battery as well as the 90- and 450-volt B batteries for the receiver and transmitter respectively. Since the set will almost certainly be for automobile use it is worth while to think of operating the filaments from the 6-volt car battery and possibly to supply the transmitter plate from a 6/350-volt dynamotor.

The complete job is still to be wired up. Flexible rubber-covered wire is best as it does not break or short-circuit. The set is now ready to put into its case and as both sending and receiving circuits are familiar and time-tried everything should operate well at once, provided the antenna is of proper length. A single-wire 31-foot antenna and a similar counterpoise can be operated at their fundamental of about 40 meters or the primary may be tuned to 20 meters and the antenna system operated at its second harmonic. The lower

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1—If the plate voltage does not exceed 350 the output of a UX210 is almost as good with 6 volts on the filament. The automobile battery provides this very nicely. The receiving filaments are safer when run in series—and the proper bias for the audio stage is then available. Tech. Ed.

(Concluded on Page 50)
This very neat layout is the low power crystal-controlled station of John S. Arnold of Alexandria, Virginia. Were it not for the indicating meters on the panels, it would be impossible to pick out the receiver from the transmitter, from a glance at the photograph.

The crystal oscillator is in the center. The panel of the oscillator (as well as the panels of the other parts) is of lacquered brass. The oscillator tube is a UX210 controlled by a crystal ground for either 76.4 meters (3929.9 kcs) or 42.8 meters (7015 kcs). Plate supply for the crystal oscillator and the power amplifier comes from "S" tubes and a step-up transformer, the normal plate voltage being 550. The supply is filtered by means of the home-made filter system under the operating table. A 45-volt C battery is used in the grid circuit of the crystal tube to obtain the proper grid bias for the oscillator.

The cabinet at the left houses two UX210's with their associated apparatus, comprising the power amplifier and frequency doubler. The plate voltage is 550, normally, supplied by the same power unit as the oscillator. The C-battery voltage on the power amplifier varies with the frequency in use at any particular moment. With two crystals and the frequency doubler, 3AAI can QSY to four different wavelengths, viz., approximately 21, 38, 42 and 76 meters (14280, 7890, 7130 and 3945 kcs, respectively).

Filaments of all tubes are supplied with current from a home-made filament transformer. The plate transformer is also homemade.

The antenna at 3AAI is a 3-wire flat-top 40 feet long and 65 feet high. The counterpoise is a single wire 40 feet long and 25 feet high. The station is located right in the midst of the business section, which considerably hampers Arnold's style. The counterpoise is strung right between two brick buildings!

The receiver is mounted on a separate table across the room from the transmitter, when not being photographed. The transmitter is "remotely controlled!" The receiver consists of a set of Aero Products plug-in coils and one stage of audio frequency amplification, mounted in a cabinet similar to the transmitting cabinets. A separate one-wire receiving antenna allows for break-in operation on all
wavelengths except that of the transmitter. Notwithstanding the comparatively low power, 3AAI works 6's almost anytime at night, has worked g2SZ, m8A and other foreigners. For the past sixteen months Arnold has not missed over three or four nights at the set. Most of the work is done on the 38-meter wave. Truly an efficient little station arranged for maximum efficiency in traffic handling.

5AKN, Dallas, Texas

The station shown in the illustration also goes under the name of 5XBH, but is probably best known under the 5AKN call. It was constructed by J. H. Robinson of 522 Cumberland Street, who is also owner and operator.

The transmitter changes circuits pretty often, as do lots of our amateur layouts designed mostly for experimental work. This particular transmitter lends itself to circuit changes particularly readily because the various parts of the circuit can be "gotten at" with ease.

The layout shown uses a UX210 tube as a master oscillator and a lone 50-watt as a power amplifier. Plate supply comes from a 1,500-volt Esco motor generator hid under the floor under the transmitter. A resistance in the positive lead from the M. G. furnishes the necessary drop for operating the UX210 power amplifier.

To the right are the wavemeters. Three are provided. One is a small interchangeable coil meter used for "clicking" the receiver to measure the wavelength of the received signal. Behind the small meter is another one which uses a neon tube resonance indicator. This meter is used primarily for tuning the transmitter somewhere within the 80-meter band. The larger meter uses a thermocouple and galvanometer for resonance indication. It is also equipped with removable coils. 5AKN is an O. W. L. S. hence the variety of meters.

To the extreme right, between the receiver and desk-stand telephone is the control box. Switches are provided for performing a number of operations on the transmitter and receiver. A switch at the top of the panel grounds the separate receiving antenna while transmitting. Below this are small double-pole double-throw switches which cut-on and-off the receiving tube, A and B supplies, the filament of the transmitting tube and the 110-volt line to the motor-generator. All switching controls are concentrated on this small panel where everything can be controlled easily without having to scramble all over the operating table to find a lost switch!

Although 5AKN's stationery does not admit it, we are inclined to believe that he works at the local Telephone Company. Note the moulded telephone receiver shells used to support the transmitting inductances, and the one on the wall right above the transmitter. hi!
IAAE, Pittsfield, Mass.

This is a father-and-son station, owned and operated by Warren S. and Charles M. Campbell. The station is located at 31 Boylston Street, and has been in consistent operation ever since its erection soon after the World War. The start was made with a 202 and Quaker Oats Inductance, using a direct coupled Hartley supplied with 450 volts, A.C. After going through the usual numerous periods of changes and refinements the station takes the form shown in the photograph.

The set employs a 50-watt, low impedance tube in the tuned-grid tuned-plate circuit described in the March QST in the 6HM Station Description. After numerous attempts to correct a slight waver in an otherwise pure D.C. note (due to variations in line voltage) this circuit was found to correct the trouble, thanks to the complete dope furnished by Colonel Foster.

The plate supply is 1200 volts at the tube terminals, supplied by a 750 watt R.C.A. transformer and a 56 jar rectifier with lead and aluminum strips in 20 Mule Team Borax solution. The filter consists of a 100-henry choke and a 15-ufd. condenser. The inductances are of ½ inch copper tubing, the turns being spaced a quarter of an inch. The tuning condensers are 43 plate Nationals that have been cut down to 23 plates and double spaced. The R.F. chokes in both plus and minus high voltage leads are untuned and consist of 100 turns of No. 30 D.S.C. magnet wire on 2 inch tubing. The center-tap arrangement consists of two Xmas tree lamps in series across the filament terminals. Each lamp is shunted by a 6,000-ufd. Micadon receiving condenser. All “hot” parts of the circuit are supported by General Radio stand-off insulators.

Since the efficiency of the circuit depends on the interaction of two coils spaced about 25 inches apart, the inductances were placed 12 inches above the baseboard so that their fields would clear the rest of the apparatus. The coils are fastened to the brass pedestals with unions such as are used in automobile gas lines. This gives extreme rigidity required for high frequency operation and makes quick wave-band changes possible. Nine turns are used in both plate and grid coils for the 7500 KC band and three turns are used for the 15,000 KC band.

The antenna is a single No. 12 enameled wire in an inverted “L”. The flat-top is 45 feet long and 65 feet high and the lead-in is 45 feet long to the set which is located on the second floor. The counterpoise is also a single No. 12 wire 40 feet long and 8 feet above the ground.

IAAE is in both the Army and Navy nets. The station turns in a good bag of traffic each month and the DX includes about everything workable on the face of the globe. The greatest pride, however, is taken in that crystal-like D.C. note which shows what can be accomplished with ordinary apparatus when a little horse-sense is combined with theory.

Two very excellent booklets have just been prepared on audio frequency amplification. One, called “Audio Amplification” published by the Samson Electric Company of Canton, Mass., contains a world of theoretical and practical data on the problems entering into the design of the audio frequency amplifying system, suggests many practical applications of a number of theoretical considerations, discussing fully the relative merits of the various types of amplification systems as well as “B” battery eliminators and reproducers. The other booklet is published by Silver-Marshall, Inc. of Chicago. This booklet is called “The Secret of Quality”. The booklet starts off by stating the number of problems which enter into the audio frequency amplification system and progressively takes the reader through the theoretical solutions and the practical application of these theories. In this booklet, also, the various types of audio frequency systems are explained, their merits compared and the result of a tremendous amount of laboratory work on the audio frequency amplification is brought to light. “A”, “B” and “C” eliminators are discussed, and full descriptions of several popular broadcast receivers are given. The broadcast fan cannot well get along without both booklets which cost twenty-five and ten cents each, respectively.
5ww, W. W. Adams, Box 214, Center, Texas

1 Oct 26

Calls Heard

u-1APL, 32 Lowell Street, Springfield, Mass.

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October, 1926

Pacific Division Convention

EVERYTHING is all set for the Pacific Division A.R.R. Convention to be held at San Jose, California, October 15, 16 and 17, 1926. While a few details have not been settled at the time this is being written, these will be settled definitely by the time this is in print.

No accommodations have been provided for four hundred to be in attendance and by all indications the attendance will run over the mark. This is an A.R.R. Convention and will be run as such.

San Jose is fortunately well situated as a center of amateur activities on the Pacific Coast, there being a total of over a thousand licensed amateur stations within a radius of one hundred and fifty miles. Then too, having a large tourist hotel such as the Hotel Vendome, where the convention will be held, with all the facilities for handling such gatherings, helps to add to the inevitable success of the coming convention. In fact, the Santa Clara County Radio Association, under whose auspices the convention will be held, feel that they were especially fortunate in securing this hotel. Especially so, in view of the fact that they are securing accommodations at a rate less than half the price paid by other large conventions and gatherings at the same hotel in the past.

Some of the names on the program of speakers are nationally-known radio authorities, among them being: A. A. Hebert, A.R.R.L. Treasurer, of Hartford, Conn., Mr. Kolster of the Federal Telegraph Co., Lieut.-Col. Robert Loghry, Signal Engineer, Ninth Signal Corps Area, U.S.A., and in charge of the radio intelligence service in France during the war; Gerald Best, Technical Editor of Radio; D. B. McGown, Radio Inspector of the Sixth District; A. H. Babcock, Director Pacific Division A.R.R.L.; Col. Dillon, Radio Supervisor Sixth District; Mr. Butler, engineer of the E. T. Cunningham Co.

Another means of making this convention attractive to the hams, is the fact that the reservation fee has been placed at the low figure of $3.50 which covers all convention activities, the "big feed" and entitles the holder to the reduced hotel rates. The rates of the hotel for the delegates may be secured for as low as $1.50 per night. — E. A. W.
CARRYING on from last month's I.A.R.U. News Department we are adding hereto three additional countries to the list of foreign DX data.

<table>
<thead>
<tr>
<th>Country</th>
<th>Assigned</th>
<th>Band</th>
<th>Best DX</th>
<th>Traffic Handling</th>
<th>U.S.A. allowed</th>
<th>Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>So. Africa</td>
<td>0-200</td>
<td>30-42</td>
<td>2500 to 0700</td>
<td>Only</td>
<td>0700-0900</td>
<td></td>
</tr>
<tr>
<td>Brazil</td>
<td>36-38</td>
<td></td>
<td>2500-0000</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Zealand</td>
<td>78-76</td>
<td>30-37</td>
<td>0330 to 1440</td>
<td></td>
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</tr>
</tbody>
</table>

The best U. S. waveband for QSO with any of the above countries is the 80-called 10-meter band.

France

"The French Section of the I.A.R.U. elected its officers last month. They are as follows: Honorary President, Lefebvre, f8GL; Presidents, Leon Deloy, f8AB and P. Louis, f8BF; Vice-Presidents Levassor, f8JN and Le Blanc, f8DE; Secretaries, Martin f8DI, Mezger f8GO and Andureau, f8CA. Mr. Levassor who presided over the meeting, mentioned the pleasure it gave all amateurs to have Mr. Louis and Mr. Deloy accept presidencies. The new officers of the R. E. F. composed a message of friendship to all French members and foreign groups. The R. E. F. includes all amateurs interested in the transmission and reception on short waves. Its official paper is the "Journal des 8", known all over the world. Its aim is to help promote amateur work and it requests everyone to assist it by joining and working with the R. E. F. In spite of its being a holiday time, there are still many hams at the key. The receiving is still good in spite of the season, and static is rare, generally speaking, U.S. stations are extremely consistent in the morning from 2 to 6 G. M. T. The signals of the powerful station f8JN are heard very QSA by f8GGG in Shanghai, China. The French settlement in Shanghai also boasts of the stations f8AG, f8EM and f8ZW. All of these stations transmit from 10 to 6 G. M. T. on wavelengths between 30 and 35 meters. f8JN has also been QSO the U. S. ships NISS and NUNX. Richard Jamas (f8QQ) the well-known amateur in Saigon, Indo China, has just been given the official call f81B (Note—radiogram received at A.R.R.L. headquarters from exf8QQ) says that the Government of French Indo China has adopted the intermediate "IC" for all amateurs in that country—J. M. C.) OCBV is the call of the French Military Station in Beyrouth, Syria. The QRH is 58 meters."

—J. Rey, f8YOR

Holland

"Although the Dutchers are still troubled by the Government, they do not QRT, but continue to do good work. During the great Radio Exhibition in the Kurhaus at Scheveninger, an I. A. R. U. meeting attended by more than 70 hams was held. It was decided to hold Saturday Night Prayer Meetings on 90 meters. oCO is preparing for the coming 5-meter tests. oWC tries to keep his daily schedule with u2CVJ and has been in touch with South Africa. oEP and oPM continue to work good DX. oPX keeps his tubes hot by relaying messages for Honolulu and Hong Kong. oWB after working the U. S. and the Antipodes and blowing many 50 watters is rebuilding now. STB returned to his first love, 1000 meters. PCTT, PB2, oWF, oUC, oP3, oRT, oAM, oAX, oNL2, oGA and oKV work Europe and occasionally some DX. oQX, after being confiscated, hopes to be on the air again soon after having paid his license fee. PB3, PB7, PC2 and oKO seem to be able to work every station heard. oKH was the first "N" to hook KEGK. Our Section continues to grow rapidly although only a few of us are licensed."—C. de Beaufort, Traffic Department, Dutch Section, I.A.R.U.
Ireland

"It does not seem to be known generally that Ireland consists of two countries, namely: Northern Ireland, and the Irish Free State. The Northern Ireland hams are under the control of the British Post Office, and use the intermediate "G", while the Irish Free State, or Southern Ireland, gang are under the control of the Irish Free State Government and use the intermediate "GW". Southern Ireland calls commence with the number followed by one letter, i.e., 11B, 12B etc., while Northern Ireland calls are issued in the same manner as British amateur calls. In Northern Ireland plenty of good work has been done. gi2ST has been QSO about 44 countries and all six continents since October last and has put good phone signals across to Brazil, U. S. and Canada. He has also worked ANDIR, Java, being the second British station to do so, gw5NJ continues to QSO Australia, New Zealand and South Africa, and lately has worked Argentina. Phone sigs have been put across to Australia, Canada and Brazil.

gi6MU is at present on a voyage from Ireland to Canada and back, and contact was maintained easily all the way across the Atlantic each night with 5NJ and 6YW. 6YW uses an input of 6 watts and is one of the best low power G's. He holds a record by raising and working Porto Rico on 2 watts, and on this power he has also been QSO U. S. and Canada regularly. This is hard to heat. In Southern Ireland, no station at present uses more than 10 watts input but excellent work has been done. 11B and 18B have both worked the U. S. more than once and 19B has worked all Europe on 3 to 5 watts. Other excellent low power work has also been done, there is not space enough to give details. Reports for Irish Amateurs whose QRA's are unknown may be sent in the meantime c/o W. R. Burne, 34 Dame Street, Dublin, Ireland."—F. R. Netil, 6NJ.

South Africa

By the time these lines are in print and in your hands, the Rand Daily Mail Springbok contest will be in full force. Look up the last issue of QST and in the I.A.R.U News Section you will find dull details governing the contest. The "U's" are urged to cooperate fully with the South African boys. The Springbok is a trophy worth having, and the contest is going to be a good one. Don't forget the QSL cards.

"Conditions in South Africa are improving as the winter draws near. "U" stations are coming through with good strength. QRM from the States is very bad, at times it being impossible to separate some stations. A good deal of experimental work is being carried out by our boys. We do not have large numbers, but where we lose out in number we more than make up in the energetic manner in which all of the South African amateurs tackle various problems. oA4V, oA3B, oA6X and oA3K of Johannesburg are always on the air. oA4Z, oA6W and oA4L are also consistent workers and between them have done a great deal of DX work. World-wide reports of long distance daylight work are starting to come in. It is easily possible to keep communication day and night at all times throughout South Africa in the 30-to 40-meter band. oA3E of Durban has been doing good work with the U. S. A., QSOing the Sixth District in daylight. I hope that the New Zealanders and Australians will please take note that the "O's" are anxious to establish communication with these countries. New Zealand is about our only "dead" country now. A good time for QSO with the Z's from South African stations would be 0600 G. M. T. The S. A. R. R. L. is now on a good sound footing and on good terms with the Government. The country has been divided up into 14 Districts, each having its Divisional Headquarters. Raymond Coombs of Johannesburg was the founder of the League and is the Organizing General Hon. Secretary. Conditions in South Africa for reception are very favorable, although at times QRN abounds. We do not suffer from QRN, though, nearly as much as our South American friends. For the information of the U. S. amateurs in particular, South Africa, contrary to many ideas is not such a wild and savage country as many are led to believe. We are a progressive country, quite modern, and it is hoped that the band of American tourists who have just been through the country will arrive back in the States saying, "we were agreeably surprised."

—R. Oxenham, oA4L

Arabia

A new station in what is probably a new country was sparked recently when Jackson of 1CMP worked tjCRJ whose QRA was given as J. Rockall, Amman, Transjordan, Arabia. The QRH of CRJ was 36.8 meters and the note a pure D. C. one. Shortly after this QSO Borden of 1CMX was QSO CRJ who repeated the QRA as above. Later 1ALR was QSO CRJ, also.

Russia

1CMP and 1CMX both worked AZUT recently. This station is located in Estonia, near Petrograd, Russia and is the experimental layout of a prominent engineer in Russia. The QRH at the time of QSO was about 32.5 meters. His input, we understand, is around 50 watts.

Borneo

Two new stations in Borneo have been QSO'd by a number of "U's". They are
Belgian Congo

A new one, station bcf2, Robert, TSF, Kinshasa, Belgian Congo, Africa has been QSO’d by several British amateurs. u3JW reports hearing him working g2TO and g2NM; u2AVB reports hearing him work g2TO, and g2VJ has worked him several times. g2VJ also reports working 1CW in Tripoli.

Java

Ashley Dixon of u7IT worked PK7 in Samarang, Java, who sends the following account of amateur activities in Java: "There are practically no hams out here but we have lots of atmospheres. BCL's hear Japanese and Australian stations, and Manila comes in F. B. every night. There are eight hundred or a thousand B. C. L.'s but only 3 or 4 hams who have installed transmitters. Receiving as well as transmitting is strictly prohibited by law. Most hams have calls like mine, PK and a number. There are now PK0, PK1, PK7 and PK8. All QSL cards can be sent to me (forwarded via A.R.R.L. Headquarters). PKO (tszero) transmits regularly from 1140 to 1340 G. M. T. every Tuesday and Thursday on 22 meters. PK7 has increased his input to ten watts and has been QSO the U. S. every night afterwards. He uses two Phillips 201-A tubes for transmission, with a plate voltage of 300 obtained from B batteries. The circuit is a Meissner. PK1 is now on the air in the 40-meter band with a '5 to 10-watt input."—PK7.

TIT is only one of a number of U. S. hams to work the PK fellows.

West Africa

Well, boys, here is something else to shoot at. Edwin Cozzens who is on the Presbyterian Board of Foreign Missions at Ebolowa, Cameroon, West Africa recently visited his relatives in California and has just recently sailed again for West Africa with both short wave transmitter and receiver along. The station will be put in operation shortly after his arrival in West Africa. Unnecessary by the Government he will use a call PM with the intermediate fo—fts foPM. He will anchor somewhere near 33 meters and is VERY anxious to establish as many contacts as possible, particularly with U. S. gang. If the French Government assigns him a call he will use foPM followed by the call. The transmitter is a 50 wattter operating from a 1,500-volt dynamotor. The transmitter and receiver were assembled by some of the Sixth District fellows and was given a thorough test before Cozzens sailed. Remember the call, foPM, keep an ear open for him and give him a QSR whenever possible.

Chile

We are reproducing herewith a photograph of station ch2LD, the well-known outfit belonging to Luis Desmaras of Santiago de Chile. The tubes are UX210's, there being two of them. Plate voltage at 300 is obtained from the city lighting mains. The circuit is a coupled Hartley affair. ch2LD’s DX is world wide.

Dutch West Indies

2LE and 2APV have worked PJD who uses a “de” as an intermediate. PJD gives his QRA as St. Martin Island, Dutch Indies, an island due East of Porto Rico.

Indo China

68QQ, Richard Jamas of Saigon, French Indo-China sends us a radiogram saying that the Government has decided that intermediate for Indo-China will be “IC”, and that 68QQ’s new call is IC1B.

Italy

"Although it is only a short time that Italian amateurs have been operating transmitters, considering the results that they obtain every day we think that Italy is now one of the countries showing the greatest activity and most interest in amateur radio. This is due largely to the wide scope of activities of the A. D. R. I., the Italian Experimenters’ Association founded in November 1924 by several Milanese amateurs. At the outset the activities of this Association were devoted to the problem of obtaining official recognition from the Government, as up to that time all Italian amateurs were obliged to work secretly. The first Italian Transmitters’ Connection was organized in November of 1924 and with the contest the first licenses for amateur transmitters, and a number of fine prizes, were obtained from the Government. The results of the
contest were highly satisfactory; more than twenty Italian stations were received in America on the 80-meter band, and with 50-watts input to their transmitters. Before then no Italian stations had reached across. Since then the number of A. D. R. I. members has increased so greatly and proportionately that one can notice the remarkable progress amateur radio has taken in this country. The American hams who participated in the Paris Congress held in April of 1925 will remember the great number of Italian amateurs who were present. The interest and part they played in the formation of the I. A. R. U. is also a matter of radio history.

"At that time they were already representing the only European association with the same aims and organization as the A.R.R.L., and already had their official organ called, "Bollettino Mensile Della A. D. R. I."

The Government recognized the importance of the association and caused it to give the official call signs to transmitting stations. Lately a committee composed of Government authorities and amateurs studied proposed regulations which will govern the operation of amateur stations. The A. D. R. I. is well known by amateurs and foreign associations for the important relay and QSL service that it gives. We are sure that these lines, appearing in the official organ of the greatest radio association of the world, will make the Italian experimenters and their Association better known."—F. Pugliese, Gen'l. Sec'y., A.D.R.I.

Spain

"The number of licensed transmitting stations in Spain has passed the 40 mark. During the past two months, however, work has been almost at a standstill due to the terrible heat. Only three or four stations have been in operation consistently. EAR20 and EAR1 have no trouble in working all countries of Europe and EAR1 has been QSO the U. S. during the past two weeks. He has also worked zzAC and zzAE. The majority of the fellows are QRT, though, and no new activities will be initiated before Fall. The EAR Association has proposed the granting of station licenses and call letters to receiving stations. The proposal has been well received by the amateurs, and should do much toward helping the progress of amateur radio. The EAR association has been responsible for the formation of a number of Morse Code instruction classes in various cities in Spain. The bulletin "EAR" is the official organ of the Spanish Section of the I. A. R. U. It is owned and directed by Miguel Moya. The bulletin does much to bring the amateurs of Spain (and of the whole world) into closer contact with each other. A Transmitting Contest is to be organized for 1926-1927. The EAR Association is fostering the contest whose object will be to establish with Spanish amateurs, and later America, the Philippines, Cuba and Porto Rico. The contest will start on October 1st and will be conducted as follows: Merits of individual stations will be judged on (1) two-way communications with the greatest number of countries, and (2) the greatest number of individual two-way communications. Power to be used will be that which is officially authorized. The wavelengths to be used will be those established at the first International Amateur Congress, including the experimental band. The EAR Association will publish the results of the contest as the contest progresses. Those amateurs who are interested in the contest should write the "Association E. A., Seccion Espanola de la I. A. R. U., Maj. Lequerica 4, Madrid, Spain."—Miguel Moya

9BHS suggests the scheme shown here for cutting down the QRM from a vibrating M. G. set or a synchronous rectifier:

ONE OF THESE PLACED AT EACH CORNER OF M.G. OR SYNC.

Captain Rex Durrant, late GH1 of Mosul, is now located at the Radio School, Royal Air Force, Flowerdown, Winchester, Hants, England. The station call is GFA and is in regular operation on 43 meters. Captain Durrant will be glad to receive QSL cards at the above address.

8BSS lives on a chicken (poultry) farm. They raise a new kind of chicken. By violet ray treatment they make the young chicks grow so fast they can produce full grown fowl in five minutes. If broilers are desired 8BSS has to run for the hatchet and work fast to keep the chickens from dying of old age.
What Do You Mean, “Short Waves?”

Oakland, Calif

Editor, QST:

Perhaps it has occurred to the brotherhood that the term “short waves” doesn’t really mean what it says. Take the BCL who slaps in a small coil and manages to pick up the 180-meter stuff—why he is “short wave.” Then there is the bird who grabs a pile of apparatus and with great difficulty manages to work at 40 meters—he’s “short wave”.

Yes, its all short wave, but some of us who have done some work at 5 meters, and understand what to call the thing—we have to say “short wave” too. Its tough. Let’s classify the stuff. We are the only ones to do it.

We all agree that 200 to 600 meters should be called the Broadcast Spectrum. Then there isn’t anything particularly funny about the waves from 80 to 200, let’s call this region the “Conlite Region”. Below this, daynight DX shows up very noticeably; perhaps we can call it the “Prolight Region”, the lower limit of which is not sharply defined. Perhaps this region would be between 10 and 60 meters. Below 10 meters we could talk about “short waves and below 1-meter we might talk of “low waves”.

Don’t laugh; the idea is we need a classification of some sort. It is suggested that the term “Low Waves” be given some job as the above to get rid of it for a while; its ambiguous. Let’s adopt something, even though it is temporary.

Yes, we do need a classification. What have you? —A. Binneweg, Jr., 6BX

A. C. Hum

No. Charlotte, N. C.

Editor, QST:

We have recently been confronted with a problem which though relatively small, was nevertheless considerably annoying and it is likely that the readers of QST will benefit by a brief account of our trouble.

As soon as our new short wave receiver was installed in the shack, we noticed a very pronounced A.C. hum which marred reception and at first we were unable to locate the source of the trouble. After the following changes were made the hum was absolutely eliminated.

The house is wired throughout with black and white covered wire, the white wire being grounded and the black wire being “hot”. We had installed a double pole single-throw switch as a main cut-out and also had a snap switch as a main cut-out and ating switch. This latter one was wired-in in the white (grounded) wire, and gave all the trouble. As soon as the leads were changed over, putting the snap switch in the black wire lead, all trace of hum disappeared until the main cut-out was opened, when it reappeared. We have since found that the State code of wiring does not permit the white wire being broken by a switch, therefore a double-pole single-throw switch if used as a main switch, should have a jumper around the grounded side. Without a jumper a switch of this kind is dangerous in a line. —G. C. Brown

Cheap Logs

Oberlin College, Oberlin, Ohio.

Editor, QST:

A very convenient and inexpensive log book, which adapts itself beautifully to the type of work most stations are doing, can be bought at any book or stationery store. It is bound in heavy canvass, corners leathered, and contains about one hundred and fifty pages of high grade paper, 8 by 12 inches in size. The pages are ruled horizontally and vertically, the latter being of special interest. This book, all prepared for use goes under the name of a double-entry ledger and costs about eighty cents.

E. W. Thatcher, 8ZE

QSLs Via Department of Commerce

Office of Radio Inspector,
Customhouse,
San Francisco, Calif.

Editor, QST:

Amateurs throughout the country are sending cards to the office of the Supervisor of the Sixth Radio District, requesting that they be forwarded to the various amateurs, and neglecting to enclose postage to cover the same. As there is no fund available for such postage, and as they cannot be
forwarded under the official penalty stamp, there is no way in which they can be handled. If the regular postcards are enclosed, or the postage included, we shall be very glad to accommodate them. Otherwise no action can be taken.

—J. F. Dillon, Supervisor of Radio

Hi!

650 California Avenue, Venice, California

Editor, QST:

We quote verbatim a little gem from the “Voice of the People”, the column of The Los Angeles Daily News—a column where all fanatics of any sort may ride their hobbies in the public eye.—“Los Angeles: The radio broadcasting situation in Los Angeles is a peculiar thing. If you don’t believe it, just move within a stone’s throw of one of the big stations and then try to tune that nearest station out on a Sunday morning. It will be a great day when this business is regulated by Uncle Sam....Interference.”

Realizing the devotion of your excellent periodical to the public weal, we should welcome a movement sponsored by you, for the introduction of a law regulating static, power leaks and wave propagation. Such a movement, we are sure, would be greeted with shouts by the radio fraternity.

—C. S. Gleason, 6CJQ

QSLL

597 North James Street, Hazelton, Penna.

Editor, QST:

If the subject will bear more discussion in QST may I have a few words? I would like to have some one point out to me what earthly good a QSL card is anyway. At one time they carried some information. A few usually supplied all that was required to draw conclusions—a carload complicated matters.

Today the cry is “artistic” and original design. The original idea (as I see it) has been lost. Even so, what is the necessity of a written confirmation of something everyone tells you the minute you QSO? Where do fellows rate the slurs, etc., on their cards, intended to force the recipient into answering or being a bum in the eyes of the world? How many cards have you seen that carried QSC? Nil here. Small matter as compared to how QSA a wabbley QSB is in China.

My idea is this: if the QSLL hounds would spend some more time improving their fists and ears, not to mention general operating practices, Ham Land would be a better place to live in. Since we cannot convert all, the second best bet, if you are bent on papering the last room in the house with cards, is to have double cards printed and stamped. One card carries the information you desire to give and the other carries questions as to what you desire to know, with spaces to be filled in. Whatever stand you take please put SBQ down on your Black List as not QSLing, and send your cards to me. For a QSR or test—P.B. OK QRV GA.

—Herb Walzen, SBQ.

Central New York Convention (Atlantic Division)

ALTHOUGH this annual convention was only a one-day affair this third annual event held in Utica on August 29th at the Hotel Utica under the auspices of the Mohawk Valley Brass Pounders proved one of the best held so far.

The arriving hams were greeted loudly by J. Alton Fitch, BBCW on a Bosch horn, which made every one feel at home, and immediately tin whistles were in evidence.

After visiting six of the best stations, and by the way all of them were designed for efficiency, the gang returned to the hotel for a quick lunch preparatory for the afternoon session which started with a moving picture of, “The Wizardry of Wireless” through the kindness of the Radio Corporation. Later, another film from the Western Electric Co., called, “The Audion” showing what takes place in a vacuum tube, was shown. Both pictures were enjoyed by everyone.

The General Electric Company again showed its co-operation by sending, Mr. J. M. Kendall, one of its Radio Engineers who gave very interesting information on R. F. feed lines. And Doc. White (New England Div. Director) was present with his pocketful of tricks which, if used by the fellows, would put the manufacturers out of business.

The evening session consisted of a mighty good dinner supervised by G. H. Pickett who introduced A. A. Hebert, A. R. R. L. Treasurer, as principal speaker.

Timely remarks were also made by Chas. H. Schrader, President of the M. V. B. P. and Dr. Elliott White, Miss Mildred Jordon, entertainer of station WIBX, contributed to the pleasure of the evening by rendering a number of very good selections.

Dean Wallace, proved himself a good chairman for the convention and we are all thankful to him for making it possible for the League members to again get together this year.

The Rochester fellows showed up in such large numbers that they obtained the convention for next year, and we are promised great things. Do your planning now fellows!

—A. A. H.
A Portable Transceiver
(Continued from Page 37)
edge of the same bands can be reached a
bit more conveniently if the antenna and c.p. are shortened somewhat.
The set alone weighs under 30 pounds.
The writer took it to Hartford and back to
New York on an especially hot and sultry
day with no more difficulty than if carrying
an ordinary suitcase. The tubes were in
place and on return everything was found
to be in good condition altho once during
the trip the carrier ran violently into a con-
crete wall while looking—but that isn't
radio.

Amateurs All Over the World
prefer
The ADVANCE
“Sync” RECTIFIER
1. The ADVANCE Sync Rectifier actually does
what any other rectifier claims to do.
2. Can be easily and quickly filtered.
3. Meets all requirements for heaviest duty.
4. Speedy starting because of Advance Bakelite
wheel.
5. Requires no attention—always ready.
Its prevailing use in international transmitting
is evidence that, although lower in price, the
advance Sync Rectifier is superior in quality.
Revolving disk is moulded bakelite six inches in
diameter. Nickel plated brush holders with adjust-
able gauge copper brushes. Convenient control
handle. Disk, aluminum brush arm support and
brush holders perfectly insulated.
Price complete with West-
inghouse 1/2 H. P. Syn-
chronous Motor .... $40
Rectifying wheel with
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and mounting ring to fit
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The resistor units you need for
VARION
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Not affected by moisture, continuous service or over-
load. Wire wound, vitreous enamelled (gloss like) the
permanently reliable re-
sistor. Non-inductive; zero
temperature co-efficient. Com-
 pact; easy to use; hard to
break.
All sizes you need; separate units; or
handy kits of units, totalling 21,750 ohms
in various resistance. Recommended for
all approved A. C. and D. C. eliminators.
84 years manufacturing of resistance as
specialists.

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Again we lead!
HUDSON short wave RECEIVER
PROVED BY THE AMATEURS TO BE THE BEST
THING FOR THEIR POCKETBOOKS—WAIT FOR
COMPLETE LIST OF MERCHANDISE THAT
CAN BE BOUGHT ON DEFERRED PAYMENTS—
Hudson Radio Company
2118 - 61st ST. BROOKLYN, N. Y.
SAY YOU SAW IT IN Q S T—IT IDENTIFIES YOU AND HELPS Q S T

50
The Yaxley Automatic Power Control is undoubtedly one of the greatest advances in radio convenience, satisfaction and economy ever offered to you.

The Control is for the set using a trickle charger and B eliminator or either. The Control automatically cuts off your trickle charger, cutting in the A battery and B eliminator when the switch or filament control of your set is turned on. When your set is turned off the B eliminator and A battery are cut off, cutting in the trickle charger again. Easily wired in series with the A battery (either polarity). Does not disturb the wiring of your set at all.

The Automatic Power Control is the result of 25 years experience in the design and manufacture of relays. Voltage drop is negligible. Self-cleaning, silver wiping contacts. Handsome enameled metal case, with Bakelite base.

No. 444 Automatic Power Control, Series type, for use with sets for tubes having a resistance equal to or greater than 6 U. V. — 199 tubes. . . Each $6.00
No. 445 Automatic Power Control, Multiple type — for use with sets having tubes with a resistance lower than that equal to 6 U. V. — 199 tubes. Each $5.00

At your jobber or dealer. If he cannot supply you, send his name with your order to

Yaxley Manufacturing Co.
Dept. S, 9 South Clinton Street
Chicago, Ill.
Pure Tone—Great Volume

The result of the EQUAMATIC SYSTEM from five tubes is a clean, clear, pure and powerful signal—equal in volume to the usual six and seven tube sets—sharpness and selectivity equal to the superheterodyne—sensitivity equal to a regenerative circuit—and a purity of tone equal to a crystal detector.

How It Works

In the EQUAMATIC SYSTEM, the primary coils are attached to the shafts of the condensers—and are adjustable in their relation to both the condenser shafts and the secondary coils. The primaries are also entirely separated from the secondaries. The secondaries are adjustable to any angle in relation to the primaries and also as to their degree of coupling with the primaries. The primaries are automatically, constantly and continuously varied—at a definite, ever-changing rate of variation—with the turning of the condenser dials. This positive, automatic action provides the absolutely exact amount of coupling—at every wave length setting—necessary to deliver to the secondary coils exactly the amount of energy required to cause the tubes to constantly operate at their highest efficiency.

The Reason For It

In order to keep radio tubes constantly operating at their highest efficiency—just under the oscillation point—it is absolutely necessary to continuously maintain an equal transfer of energy between primary and secondary coils. In order to maintain this equal transfer of energy, every wave length setting must have a different and exact coupling between primaries and secondaries. To secure perfect reception, every successively longer wave length requires a greater transfer of energy—therefore a corresponding greater degree of coupling—than the preceding shorter wave length. The problem has been to provide this exact and constantly varying coupling by some simple mechanical means. The EQUAMATIC SYSTEM solves this problem—does it positively, simply and automatically, and does not resort to any lesser methods whatever. On account of the extremely high efficiency of this system the reception from a home built five tube KARAS EQUAMATIC receiving set is as nearly perfect as radio reception can be with present day knowledge.

Easy to Build

A manual of complete diagrams and instructions for building this five tube KARAS EQUAMATIC receiver in complete detail is included with each set of KARAS EQUAMATIC coils. (This manual will be sent separately upon receipt of 10c to anyone interested). The placing of every part and every wire connection is clearly explained. Even though you may never before have built a set you can proceed without hesitation, confident of successfully constructing an efficient a receiving set as can be made. To build this powerful, sweet-toned, long range receiver, you will need the KARAS parts listed on the accompanying coupon.

Karas Micrometric Dial

Because of the sharp tuning qualities of this set and the greater number of stations brought within range, Karas Micrometric Vernier Dials are essential to satisfactory operation. In these dials there is no backlash and none can ever develop. A light touch on the vernier knob and the dial moves instantly in either direction. Even tuning this powerful set is done with the larger knob, hairline work with the smaller. The vernier ratio is 63 to 1. In the 180 degree type, used on the KARAS EQUAMATIC, there are 200 divisions precisely placed, and marked with gold inlay. Overall diameter is 4 1/8" and the knobs are usually large to give complete freedom from finger cramping when tuning for several hours at a stretch.
Five Tube Receiver Sensation

Solves All Tuned R. F. Difficulties

The EQUAMATIC RECEIVER develops greater SELECTIVITY without distortion or loss of the higher musical notes and their harmonics. All of the radio frequency circuits of this receiver are in PERFECT BALANCE at all wave lengths and once adjusted, the EQUAMATIC RECEIVER cannot howl or disturb nearby sets. The life of both “A” and “B” batteries is greatly lengthened because maximum efficiency can be obtained at lower filament voltages. This also lengthens the life of the tubes. The first tuning dial can be easily synchronized with the other two.

Karas Orthometric Condenser
The sharpness of tuning of KARAS EQUAMATIC receiver is due in large part to the efficiency of the Karas Orthometric condensers used. The radio experts, editors and experienced fans choose these condensers for ANY type of set they may be building. The shape of the plates gives straight frequency line tuning and the 100 broadcast wave channels are equally spaced one division apart over a 100-division dial. Losses are extremely low because of brass tuning plates and end plates, soldered connections, pig-tail and placing of the hard rubber support strips.

Karas Equismatic Coils
The other factor in sharp tuning is the EQUAMATIC coils. Designed according to the very latest known FACTS for efficient handling of radio frequency currents, they pass an EQUAL and MAXIMUM amount of energy from primary to secondary at ALL wave lengths. The fields around secondaries are small and compact, and show little tendency for interaction. The adjustments possible in the coil mounting permit one to readily find a point of zero coupling between these secondaries. The primaries are sturdily built and mounted, and KARAS EQUAMATIC coils will not change characteristics from ordinary handling or temperature and humidity changes.

Karas Harmonic Transformer
Harmonic Transformer was the original high quality audio frequency transformer passing all audible notes and harmonics nearly equally; it has been unsurpassed by any subsequent development at ANY price. The wonderful reproduction and powerful volume of the EQUAMATIC RECEIVER is due largely to the use of two of these transformers. With Karas Harmonics there is no muffling of sound—no fuzz on the edges of words—no thin, squeaky, distorted tones. Instead, every tone is clean-cut, separated and distinct from every other tone. Natural!

This even amplification of ALL audible frequencies is the result of scientific design. Larger coils containing many thousands of turns of wire give an unusually high inductance. Karas coil construction results in a low distributed capacity insuring full amplification of high audio frequency harmonics and overtunes. Complete shielding prevents interaction and two of these units can be placed close together without distortion.

The output of EQUAMATIC RECEIVER is a smooth flow from the loud speaker of rich, round, full, mellow tones such as you have never before heard from any radio—a surprising volume of real music to which it is a delightful pleasure to listen.

Order Through Dealer or Direct on This Coupon
The Karas apparatus essential to the construction of the five tube EQUAMATIC RECEIVER is carried by nearly every good radio parts dealer in most cities. Secure the parts from your dealer. If he is out of them, order direct from us using this coupon. Send no money.

\[\text{Licensed Under King Patents Pending}\]

Karas Electric Company,
1077 Association Bldg., Chicago, Illinois.

Please send me 3 Equismatic Coils ($12), 3 Special Orthometric Condensers with extended shaft ($21), 3 Micrometer Dial ($10.50), 2 Harmonic Transformers ($14), 2 Karas Retard Coils ($2.00) and 3 Special Brackets ($0.70). I will pay the postman $0.25 plus postage upon delivery. It is understood that I have the privilege of returning any of this apparatus for full refund any time within 30 days if it does not prove entirely satisfactory.

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If you send cash with order we’ll ship this apparatus postpaid.

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Add protection to the Set You Build
A Sterling PANEL METER

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Sterling PANEL METERS are made for all purposes and capacities.

Ammeters, voltimeters, voltmeter, combination voltmeters and milliammeters.

With or without push-buttons.

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GROSLEY

Add protection to the Set You Build a GROSLEY PANEL METER

No. 1647 Panel Voltmeter

Panels Voltmeter

with push-button

built in.

A combination for measuring "A" Battery and "B" Battery voltages. 0-75 volts and 0-100 volts with scale division of 1/4 volts and 5 volts respectively.

Price $5.00

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especially designed to measure voltages across tube fillaments when operated on alternating current. Invaluable for mounting in equipment used by transmitting amateurs. Scale: 0-15 volts 1/3 volt div.

Price $6.00

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REAL BARGAINS: NEW AND PERFECT:

- VP-1656 Filament Transformers, 75 watt, 5 7/8 with meter, $1.95; VP-1658, Filament Transformers, 150 watt, 10 by 10 with meter, $3.00; TV-172 Audio Amplifier Transformers, 1 watt, $1.50; UC-2210 low power Transmitting Condenser, $1.75; UC-1004 Antenna Coupling Condenser, 10,000uf, $10.00; genuine Hooper-Cabel No. 4 Headphones, 2200 points, $2.50; genuine Callow Type 125-B Variable Condenser, 1000uf, $2.00; Nimat 0.48 Transmitting Box, $2.25; Jewel 0-15 AC 7.5 Voltmeters, $6.50; Jewel 9-100, 0-200 or 0-300 milliammeters, $1.00. Send for Catalog, 7701 ft 900-1912 Grid Condenser, 5000uf, $2.95; 0-15 AC Voltage Meter, $2.50; Mica Condensers 100uf, 0.6 volt, $2.50; Bell-Moore Variable Grid Leaks, 5ce; Arnold 2796 Lighting Switches mounted on 5 inch porcelain posts, $1.50; Dry-Pan Balanced Volume Control, or 15 plates may be used. Bell-Moore $1.00; E.F. Battery Changers, 710v, 60 etc. Charles 4 amp. rate, $3.00; UC-1759 Variable Air Condenser, 1000uf, $1.00; PR-509 Filament Rheostat, 3 amp, 20 ohms max, 50iv; ARMAD Circuit Breaker Adjustable ground, 10 amas, $1.00; General Radio Power Amplifier, 25watt, $6.50; Stow Magnetic Socket Wrench, 3 in. set, 50c; Missouri Vanscooquiscope with dial, 50c; Hooper-Cabel 5 point Filament Control Sets, 25c; Roll-Smith Radiometer, 6-5, $1.00; Vibroco Impressed Japanized, $15.50; Vibroco, Nickelized, $17.00; Western Electric A20-WW Microphone, $1.00; R.F. Short Wave Tuner, $3.00; Acme Choke, 1 henry 100 Mills, $1.00; Binding Posts per Doz., 50c; Dry-Pan 43 Plate Condensers, 25c; Bell-Moore Resistors, 25c; Fixed Crystals, 25c; Walpert Filament Lock Switches, 25c; Platen Start-of-Transistors, 3 inch, 25c; Marcon Series-Parallel Switches, back mount, 25c; Church Automatic Templates, 35c; RCA Duplex Phone Plugs, 25c; Marcon DPFT Back Mount, 25c; V. E. Connectors 21 - R, 2-11, 2-19, 2-13, 2-23, 2-25, 25c, all C. O. D. Orders. All items under 4 pounds Postpaid.

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NEW GENERAL RADIO
Apparatus for Amateurs

Type 358
Amateur Wavemeter

This instrument is particularly designed for amateur use in checking wavelengths. Consists of a coil mounting directly on the binding posts of a shielded condenser of 125 MMF capacity. A small lamp serves as a resonance indicator.

The 358 wavemeter is supplied with 4 coils, a calibration chart and wooden carrying case.

The coil ranges are as follows:
- Coil A: 14 to 28
- Coil B: 26 to 56
- Coil C: 54 to 114
- Coil D: 105 to 224

Wavemeter complete ....Price $22.00

Type 334-T and V
Transmitting Condensers

The types 334-T and V condensers are similar in appearance and assembly to all other Type 334 condensers except that they have double spacing for use in short wave transmitting on voltages up to 2000. They have metal end plates with shielded rotor. Plates of the rotor and stator groups are soldered to insure perfect electrical contact. The type 334 transmitting condensers are supplied with counter weights only.

Type 334-T Capacity 100 M.M.F. Price $4.25
Type 334-V Capacity 50 M.M.F. " 3.75

Quartz Plates for Amateurs

Plates are available in the 150-170 meter band, giving second harmonics in the 80 meter and fourth harmonics in the 40 meter band. The only licensed plates available to amateurs.

Price $15.00

GENERAL RADIO CO.
Cambridge, Mass.
HALCO Mail Order Service places at the disposal of the Radio Amateur a comprehensive and prompt source of supply for modern Radio Transmitting Equipment. HALCO Service is directed by amateurs, and those buying from it are dealing with an organization that thoroughly understands their problems and needs. Whether you live right in Boston or 3000 miles away, Halco will save you time and money.

TOBE TRANSMITTING CONDENSERS

The TOBE Transmitting Condensers are made with the same care and scrupulous attention to detail as the TOBE Bi-Pass, filter and high-voltage power pack type condensers. Each transmitting condenser is tested and labeled with date of test and initials of tester. Capacities are guaranteed within 5% of ratings.

1,000-volt condensers are fitted with heavy brass binding posts. 2,000-volt condensers have heavy brass binding posts with petticoat insulators. Each condenser is cased in a heavy silver finished metal case.

The ideal condenser for transmitting plate-supply use. Packed singly.

**Capacity**

<table>
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We sell the TOBE Vacuum "Tipon" Leaks and the TOBE Vacuum Resistors—capable of carrying 5 watts continuously and recommended for transmitting grid leaks.

DE FOREST TRANSMITTING AND RECTIFYING TUBES

We are agents for the De Forest Transmitting and Rectifying Tubes.

- **H Tubes** ........................................... $18.00
- **The new 160 milliamps—2,000-volts H. R. Transformer** .................... $16.00
- **The C-D Rectifying Tube—200-milliamps at 500 volts** ..................... $8.50

NEW DE FOREST D-9 TRANSMITTING TUBE

Maximum output—15 watts, maximum plate voltage 550, filament voltage 75, filament current 1.6 amperes. **Price $9.00**

ACME APPARATUS FOR CRYSTAL CONTROL SETS

- Acme 200-watt power transformers .............................................. $16.00
- Acme 1.6 Henry—115 milliamps. Chokes $10 each
- Acme L-1 Inductances ........................................................................ $8

Send for special folder on Acme Transmitting apparatus.

THE HALCO SHORT-WAVE SET

We have developed a new short-wave receiver of particular efficiency and neatness of design and will gladly send descriptive literature to anyone interested.

**SAY YOU SAW IT IN Q S T — IT IDENTIFIES YOU AND HELPS Q S T**

HALCO MAIL ORDER SERVICE
132 Hanover Street
Boston, Mass.

**Operate your radio set from the light socket with the new Balkite Combination**

**ASK YOUR RADIO DEALER**

**QUALITY DONGAN PRODUCTS**

**Important Announcement**

For the New Raytheon A B C' Power Unit for the 13A Tube

**USE DONGAN**

Transformer No. 2561

Choke . . No. 1591

Be sure to get information on Dongan B-Power Parts for various types of filament and non-filament type tubes.

**Type H**

Super Audio Transformer

The audio curve of this remarkable transformer is uniform; even lower frequencies can pass without distortion. Not only will your set get exceptional volume but a new clarity of tone.

**LIST $4.50**

See your dealer or send us order direct for Dongan Electric Manufacturing Co.

2000-5000 Franklin St., Detroit, Mich.

TRADERS OF MERIT FOR FIFTEEN YEARS
We give it to you after 3 years development

Try the No. 130

REL Short Wave Receiving Kit

It's a worthy companion to the other well-known REL products. Every part has been expressly selected and the entire design made from the actual experience of hundreds of "Hams."

SOME FEATURES

- Seven REL small size plug-in coils.
- Coils are rugged and moistureproof.
- Special low capacity double spaced variable condensers.
- Non-metallic friction vernier controls eliminate grinding noises.
- Four inch rubber extension handles on both controls positively eliminate body capacity.
- Large visible scales engraved directly on panel.
- Very easily assembled and wired.
- Front panel completely assembled with condensers and vernier controls.

It's a short wave sensation built by the pioneer short wave experts

KIT PRICE $36.00
Ask your dealer or write us

TRANSMITTING INDUCTANCES

Flatwise Wound on Glass

Every Arctic or Tropical expedition now in action is equipped with the REL inductances. They are the inductances which every efficient short wave station will eventually use.
- Type "L" — 40-80 and 150 meters
- Type "S" — 20 meters and lower
- Single units, with 3 clips Price $5.50
- Double units, with 2 glass rods (as illustrated) Price $11.00

We manufacture a complete line of short wave equipment such as plug-in coils, RF choke coils, transmitting kits, etc.

SPECIAL THREE AND FOUR COIL MEISSNER INDUCTANCES BUILT FOR BROADCASTING STATIONS. WRITE US YOUR REQUIREMENTS.

Radio Engineering Laboratories
27 Thames Street
New York, N. Y.

WAVEMETER

With Neon Tube Indicator

Wavelength range 17 to 550 meters. Individually calibrated with 1% accuracy. Plain and simple reading curve chart.

- Type "A" — Price $22.00

Radio Engineering Laboratories
27 Thames Street
New York, N. Y.
Two New
FROST-RADIO
UNITS for SET BUILDERS

ACTUAL SIZE

FROST-RADIO Type 890 Series
Super Variable Resistance

For fine control of volume, tone, regeneration, grid bias, etc. They are far superior to wire wound types
and have many new exclusive advantages. The spring roller contact arm gives any degree of resistance
smoothly and noiselessly without wear. After a 46,000 turn test in our laboratory this unit showed no
noticeable variation in resistance. Element has large
current carrying capacity and will not over-heat.
Entirely enclosed in dust-proof nickel plated case.
Arranged for single hole mounting and equipped
with bakelite pointer knob. Type 890 (2 terminals) is
supplied in 50,000, 100,000, 200,000 and 500,000 ohm
sizes; Type 990 (3 terminals) in 400, 2000, 5000,
100,000, 200,000 and 500,000 ohms. Both types, $1.25
each at your dealer’s.

FROST-RADIO Type 700 Metal
Frame Rheostats

A simple, rugged rheostat that gives smooth and
accurate control of both output (volume) and filament
voltage. It will take 25% to 50% overloads without
over-heating. The contact arm glides over the wind-
ings without wear yet always with positive contact.
FROST-RADIO Rheostats are supplied in resistances
of 25%, 33, 4, 5, 6, 7, 10, 20, 30, 50 and 75 ohms.
Equipped with pointer knob and arranged for single
hole mounting. Price 50c.

FROST-RADIO
HERBERT H. FROST, Inc.
160 North La Salle St.
New York

CHICAGO
Los Angeles

KITS-SETS
-PARTS

Complete Transmitter Installations 5 to 1000 Watts
Full Line of Transmitting Parts at Reduced Prices

Unsurpassed DX
with the ARSCO RS-100

10-110 Meters
1 Stage A. F.

A precision instrument
designed and built for
maximum efficiency on
the short waves.

Price including mahogany
$38.00

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ARSCO
77 CORTLANDT ST.
New York

Amateur Radio Specialty Co.

SEND for CATALOG

SAY YOU SAW IT IN Q S T - I T IDENTIFIES YOU AND HELPS Q S T
Throughout the world, wherever electricity is used, this distinctive mark stands for dependability in

**Magnet Wire and Windings**

This trade mark on a spool of wire, on a coil in a Radio unit or any electrical apparatus, is a guarantee to the purchaser or user that there is no better made.

Back of this mark is the world's largest manufacturer of magnet wire and windings with ample resources to support the guarantee of satisfaction which goes with every Dudlo product.

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NEWARK, N. J.

Western Office: 274 Brannan St.
SAN FRANCISCO, CALIFORNIA

Chicago Office
160 North La Salle Street
CHICAGO, ILL.
NEVER BEFORE!
A Cargo of MAGNAVOX Radio

MAGNAVOX POWER REPRODUCERS Designed for those who desire the very utmost quality in the reproduction of programs, 100% CONTROL of Volume and Tone, and the assurance of a VOLUME CONTROL immense volume or soft tone can be had at will. Battery current consumed is negligible. Finished in crystalized enamel.

MAGNAVOX POWER REPRODUCER No. 1, List Price $50.00, OUR PRICE $11.75.

MAGNAVOX POWER REPRODUCER No. 2, List Price $50.00, OUR PRICE $16.75.

MAGNAVOX AUDIO FREQUENCY POWER AMPLIFIERS Brings that station just beyond reach of your ears in so sound as you desire, can be used with any type power tube.

Model AC10: 1-stage in heavy crystalized enamelled metal. List Price $35.50. OUR PRICE $28.75.

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MAGNAVOX COMBINATION SETS (Amplifying Reproducers) Reproducers combined with 110 power amplifer compactly mounted in crystalized enamelled case; will cover the widest range of operating conditions, whether a small room or large concert hall.

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Model A2R: combination reproducer and 2-stage amplifier; list $65.00. OUR PRICE $18.75.

RADIO SURPLUS CORPORATION 250 Washington Street Boston, Mass.

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Talks with NewZealand
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Mr. Huddy uses

C.C. TUBES
—a type for every radio need.
Write for complete data sheet.
The Randolph catalog is the radio market place of the world—a masterpiece of merchandising that sells our house, the largest exclusive radio mail order house in the world.

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Over 2,000 Items—from the most beautiful, fully equipped console model radio set, down to the smallest part or tool for the set builder—bits, parts and supplies of every conceivable type and style. All beautifully illustrated and interestingly described. And please to make this possible, we have included radio data that makes it an invaluable text book for every lover of today's most fascinating and most wonderful achievements.
ALREADY
The Standard of the Critical Amateur

TECO SHORT WAVE RECEIVER

A receiver designed by amateurs and constructed of the highest quality products such as Cardwell Condensers, RCA Audio Transformer V Yorkers Dials and the famous TECO plug-in coils. Extreme care in construction and the quality of the parts insure efficient operation of the receiver of the entire tuning range of 10 to 200 meters (1800 to 30,000 kilocycles) specially priced at $27.50.

TECO SHORT WAVE TRANSMITTER

Built to TECO standard with the best of parts. Has all the necessary high voltage filters and chokes. A milliammeter and a hot wire meter are mounted on the front of the panel. Two sockets in parallel give operator complete control of the output. Tuning condensers are high voltage Cardwells. Specially priced at $49.50.

TECO CRYSTAL-CONTROLLED TRANSMITTER

A precision transmitter, the last word in the amateur world. Comes complete with Piezo quartz crystal calibrated to your specifications. A pilot lamp on the front of the panel tells you when you are right on the mark. There is also a radiation meter on the panel. This transmitter is a counter part of the one used by the Byrd Expedition. Specially priced at $87.50.

TECO FAMOUS PLUG-IN COILS

These coils are spaced wound using 16 gauge wire on a “Protector” form, a non-inflammable, non-conductive composition mounted on grained bakelite using TECO plugs. These coils can be used in any short wave receiver and are designed for use with short wave condensers having capacity of 150 m. mfd. and 250 m. mfd. for antenna and oscillation respectively. For a complete set of five coils with mounting strip and antenna coil $12.00. Separate coils for 10, 20, 40, 80 or 200 meters $2.50.

TRANSMITTING EQUIPMENT CO.
19 Stewart St. Boston, Mass.

AGAIN WE ANTICIPATE YOUR WANTS

The New “WINDHAM” Universal Condenser

Independent Removable 1/4” shaft of desired length passes through a Hollow Spindle permitting clock or counter clock-wise rotation with all the other Windham features so well known to the trade. Single or double spaced 3 to 23 plates panel or test board mounting. Send for Catalog

THE GOYER COMPANY, Willimantic, Ct.

The Greatest Quality Buy Today

The Hawley rechargeable “B” storage battery completely assembled and ready to run including electrolyte, 22% volt, $2.00; 45 volts, $5.65; 67% volts $7.65; 90 volts $10.00; 112% volts $12.50; 185 volts $14.75; 157% volts $16.90; 180 volts $19.00; 200½ volts $21.00.

Knock-down kits at still greater savings. All assembled batteries and kits contain the now recognized famous “Sur-Loc” connectors. Does not close up 15 to 30% of the elements as cramped on connectors do. With its patent pending grip it cannot come loose from the expansion and contraction of the positive element which others are subject to. All told this means—quieter, cleaner reception—greater length of life per charge and economy in charging. Don’t be satisfied with antiquated construction.

Complete ready to run “B” storage battery charger, $2.75. This may be connected directly to battery. Also may be used as a trickle “A” battery charger. Complete sample cell 30c prepaid.

All goods sold on understanding that they give satisfaction, and can be returned in 30 days for complete refund. Further guaranteed two years. Order direct—send no money—simply pay expressman cost on delivery. Or write for my free literature—it’s free— it will tell you what to expect and contains some mighty interesting matter.

B. HAWLEY SMITH
31 Washington Ave. Danbury, Conn.
ALUMINUM Radio Shields

The latest sensation in radio and used by Cockaday in his new LC-27.

See our demonstration of the shields at work at the New York and Chicago Shows.

Use the Coupon to Get Your Copy of "ALUMINUM RADIO SHIELDS"

A complete treatise of unusual interest on the vital importance of proper shielding by Cockaday, Free, and the Research Engineers of the Aluminum Company of America.

Their unique "shielding" value is largely due to the conductivity of the virgin aluminum used (highest mass conductivity known), their accurate and predetermined thickness, and their scientific design and precision manufacture.

Developed by L. M. Cockaday and the Aluminum Company of America to eliminate distortion due to feed-back, interference between units, and loss of energy due to absorption. Fully effective. Universally adaptable.

Put them in your new set—your ingenuity will find effective applications—note the surprising results—look for them in the latest standard manufacturers' models.

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PITTSBURGH, PA.

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Pittsburgh, Pa.

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Address: .............................................................

City .................................................................

What Circuit do you now use? ...........................................

What one will you build next? ...........................................

SAY YOU SAW IT IN QST—IT IDENTIFIES YOU AND HELPS QST
ELECTRAD
Say "Royalty" and Be Sure!
New MODEL ELECTRAD
Royalty Variable High Resistances
Recommended and endorsed by leading radio authorities. Note these superior features:
Resistance element not exposed to any mechanical operation.
Metallic arm on wire-wound strip insures positive electrical contact.
Same resistance always obtained at same point.
Resistance value under control in process of manufacture—remains constant in use.
Shaft is turned smoothly over entire range of resistance with less than a single turn of the knob.
Eleven types—a range for every purpose. Type E—$2.00; all other types, $1.50.

SANGAMO
Mica Condensers

in the
Stromberg-Carlson RECEIVER

Radio enthusiasts sat up and listened when the opportunity came to hear the Stromberg-Carlson receiver. That firm's name means quality. Their set won a leading place immediately in a market that seemed overcrowded with good makes. No claims are made of revolutionary ideas in new circuits, but every part is made with scientific precision.

Sangamo Mica Condensers are used in the Stromberg-Carlson because they are permanently accurate. Sangamo condensers are solidly molded in bakelite. All edges are sealed tight; no moisture can creep in to change the capacity. Their accuracy is guaranteed to be within 10 percent and to remain unchanged. Distinctive in appearance, too; completely enclosed in velvety smooth brown bakelite; all corners rounded to prevent chipping; reinforcing ribs for mechanical strength.

Experiment with "world-beater" circuits if you will—but remember that accurate Sangamo Mica Condensers will improve the tone and range of any set. You can fit your set exactly—there are 35 capacities to choose from.

Tried SANGAMO BY-PASS CONDENSERS?
They stand the surges without breaking down.

Sangamo Electric Company
Springfield, Illinois

RADIO DIVISION, 50 Church Street, New York
SALES OFFICES—PRINCIPAL CITIES

SAY YOU SAW IT IN QST—IT IDENTIFIES YOU AND HELPS QST
TROUBLE! is what you WONT have, if you use Cardwells. No QSZ or QTAs—always QSA.

The 191E—.000075, or the 167E—.00015, illustrated below, is F. B. for that Aero-Coil set, or any short wave tuner.

SEND your order today, and ask how we built our short wave tuner.

NOTE
For John Claytons "Universal" Plug-in Receiver—The Type 200-B lists at 8 Bucks.
The type C gives a modified straight wavelength.

<table>
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<tr>
<th>Type &quot;C&quot;</th>
<th>Type &quot;R&quot;</th>
<th>Capacity</th>
<th>Mfd &quot;s</th>
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Transmitting

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*S has two insulated stator—capacity of each.

SEND your order today, and ask how we built our short wave tuner.

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*S has two insulated stator—capacity of each.

The Allen D. Cardwell Manufacturing Corporation
81 Prospect Street
Brooklyn, N. Y.

Condensers

"THE STANDARD OF COMPARISON"
SAY YOU SAW IT IN QST—IT IDENTIFIES YOU AND HELPS QST
TRANSMITTERS

HAVEN'T COMPARATIVELY DESIRABLE FOR CROWDED

COMPACT. ESPECIALLY EFFICIENT COIL FOR MODERN

TESTS TO BE THE MOST

GLE TRANSFORMER, $2.10

INTERFERING PICKUP.

TRANSMITTERS

ATTACHED ARE THE SAME HIGH

IMPROVED TUNED RADIO FREQUENCY

TRANSFORMERS

PROVED THROUGH EXHAUSTIVE COMPARATIVE

TESTS TO BE THE MOST

EFFICIENT COIL FOR MODERN

RADIOS.

2½” DIAMETER

TRANSFORMER

COMPACT, ESPECIALLY DESIRABLE FOR CROWDED

ASSEMBLIES. ELIMINATES INTERFERING "PICKUP."

SET OF THREE, $3.75. SINGLE TRANSFORMER, $2.10

3½” DIAMETER

TRANSFORMER

CAPACITY COUPLING REDUCED TO LOWEST DEGREE.

FOR USE WITH .00035 MFD. CONDENSERS.

SET OF THREE, $6.00. SINGLE TRANSFORMER, $2.25

"LEAKELESS" TRANSFORMERS

UNIFORM HIGH INDUCANCE, LOW

RESISTANCE. THE EXTERNAL FIELD IS SO

SLIGHT THAT IT PERMITS PLACING COILS

TOGETHER WITHOUT APPRECIABLE INTERACTION.

SINGLE TRANSFORMER, $2.25.

BATTERY SWITCH

QUICK, POSITIVE, CLEAN-CUT MAKE AND BREAK.

WHEN IT'S "IN" IT'S "OFF," ELIMINATING DANGER OF WASTEFUL USE OF BATTERY.

30 CENTS EACH.

PRIZES FOR RADIO HOOKUPS

A CONTEST FOR NEW AND ORIGINAL CIRCUITS.

WRITE OUR NEAREST OFFICE FOR FULL DETAILS.

Benjamin Electric Mfg. Co.

120-128 S. Sangamon St.

New York: Chicago San Francisco

247 W. 17th St. 444-8 Bryant St.

Manufactured in Canada by the Benjamin Electric

Mfg. Co., of Canada, Ltd., Toronto, Ontario

IF YOUR DEALER CANNOT FURNISH YOU WITH BENJAMIN

RADIO PRODUCTS, SEND AMOUNT DIRECT TO US WITH THIS CARD AND WE WILL SEE THAT YOU ARE PROMPTLY SUPPLIED.

ELITE DRILLED 4-IN-1 TUNER PARTS

12 JACK STANDS, WITH DOWEL ROD "LEGS" 4" HIGH, DRILLED FOR GENERAL RADIO JACKS OR UNDRILLED; 3 GRID COIL PLUG-IN HOLDERS WITH 2½" HIGH DOWEL SUPPORTS, DRILLED FOR G. R. PLUG-IN SPRING TIPS, OR UNDRILLED; 3 PLATE COIL HOLDERS, DRILLED OR UNDRILLED; ANTENNA AND TICKLER HINGED COIL HOLDERS, DRILLED FOR PLUG-IN TIPS, OR UNDRILLED. ALL PLUG-IN STRIPS, DRILLED OR UNDRILLED. ALL HARD WOOD BOILED IN PARAFFIN. 34 PIECES IN ALL. GIVES CHANCE FOR WIDE RANGE OF QUICK CHANGE EXPERIMENTATION.

ASSEMBLED AND DRILLED SET $7.00

ASSEMBLED, BUT UNDRILLED SET $6.00

50% DISCOUNT TO TRANSMITTING A.R.R.L. MEMBERS, IF STATION CALL LETTERS ACCOMPANY ORDER.

SEND POSTAL MONEY ORDER, OR PERSONAL CHECK TO

ELITE PATTERN WORKS

996 Maple St. Detroit, Mich.

COMPLETE $25.00

WITH TUBE

George Electric Company

"B POWER UNIT"

DELIVERS THE POWER VOLTAGE AT ALL TIMES WITHOUT A Trace OF HUM. MOUNTED CONVEXLY TO REST AS LONG AS THE RADIO SET.

A FULL WAVE RECTIFIER CIRCUIT IS USED, NO FLAME TO BURN OUT. VARIABLE RESISTANCES CONTROL DELIVERY AND AMPLIFIER VOLTAGES. BUT TOLL TAP FOR POWER TUBES, PLenty OF CURRENT FOR ANY SET ON THE MARKET.

LOWER PRICE HIGHER QUALITY

POSITIVE GUARANTEE

SOLD DIRECT TO THE FACTORY TO YOU, OR THROUGH OUR AUTHORIZED REPRESENTATIVES. WRITE FOR COMPLETE INFORMATION. SHIPPED PREPAID ON RECEIPT OF $25.00, OR C.O.D. FOR $35.00 PLUS POSTAGE.

GEORGE ELECTRIC COMPANY,

756 CARLETON AVE., ST. PAUL, MINN.

AGENTS AND DEALERS WANTED!!!

WRITE FOR ATTRACTION AGENCY PROMOTION.
New!

All-American Audio Transformer

This latest development meets the new demands for compact wiring and longer life—
Binding Posts are conveniently located for straight or sub-panel wiring—
The coil is vacuum impregnated—
After assembly the shell is filled with special compound and the complete unit hermetically sealed. A transformer that sets a new standard.

Tone Quality Is the Keynote

No standards of quality can be higher than those we set for our own products; no inspection is more rigid; no tests more severe.
Each of these All-American Transformers plays its part in determining the quality of radio reception. Each is designed and made with the same care that goes into the finest receiving sets.
These products have helped to create All-American leadership.

New 1927 Radio Key Book
Everybody who enjoys radio should read it—an interesting 48-page analysis of radio in terms anybody can understand; with complete constructional details of the leading types of circuits. Send 10c in coin or stamps for your copy.

All-American Radio Corporation
4223 Belmont Avenue • CHICAGO
Are You Building A B-Eliminator?

If so, follow the example of leading radio engineers and use the Bradleyohm-E and Bradleyunit-A for your voltage control.

Bradleyohm-E is a new and enlarged Bradleyohm designed expressly for B-Eliminator service. The extra long columns of scientifically-treated graphite discs insure perfect voltage control, even after long usage.

Bradleyunit-A is a solid molded resistor that is heat-treated and accurately calibrated. It can be soldered without affecting its calibration. Ask your dealer for Bradleyohm-E and Bradleyunit-A for your B-Eliminator.

Visible Truth!

All tubes look alike more or less—they are easily disqualified in handling.
You are told "this" is better or "that" is better—perhaps it is true—perhaps not.

Supertrons are different.
You see a re-enforced interior construction.
You see the most expensive and best material.

—it is Isolantite
You see definitive quality.
You are told SUPERTRON is the best—it's truth—it's Visible Truth. Guaranteed by Serial Number.

Supertron Mfg. Co., Inc.
Hoboken, New Jersey
Branch Office—30 North Dearborn St., Chicago
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What Size Grid and Plate Blocking Condensers?

You have always used .002 mfd. for blocking condensers but who knows that it is the best size for short waves? The builders of KUH believe .000095 mfd. better for their tuned grid in plate circuit. Our UC 1015 condenser gives eleven different capacities between .0002 mfd. and .001 mfd. so you can select the best size for your set.

Why not try them?
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Brand new enameled porcelain G. E. Gridleaks in 5000 ohm and 10,000 ohm sizes for all tubes. Size 1" x 6".

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Formica panels for well known kits Veri Chromed in gold on high gloss Formica are sold by leading dealers and jobbers; Bremer Tully Counter-phase; Browning Drake National; General Radio Four Tube Universal; LC 26 Cockaday; Victoreen Superheterodyne; Best's Superheterodyne; Madison Moore Superheterodyne; Camfield Duoformer; Aerodyne 5 Tube; St. James 8 Tube; Karas Equamatic, front and sub-panel; Infradyne, 7x30 and 7x23.

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SNAP!

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Merely plug into the loud speaker jack and push phone plug into sleeve provided. For sets without jacks, attach to binding posts—simple, easy, quick. Try one on your set today. Sold with money-back guarantee.

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Move Your Loudspeaker To Any Room!

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PYREX* Insulators help your transmitting set reach out to greater distances. The use of PYREX Insulators in short wave transmitters and receivers eliminates leakage and odd losses. The country's greatest power stations, The Byrd Polar Expedition, the Navy, the Coast Guard and Air Mail Service, all have depended on PYREX Insulators for greatest efficiency.

Select your equipment from the following list of PYREX Insulators

<table>
<thead>
<tr>
<th>Insulator</th>
<th>Height</th>
<th>Diameter</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>Low Power Transmitting</td>
<td>1&quot;</td>
<td>0.5&quot;</td>
<td>0.50</td>
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<tr>
<td>Medium Power Transmitting</td>
<td>1.25&quot;</td>
<td>0.75&quot;</td>
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<tr>
<td>High Power Broadcasting</td>
<td>1.25&quot;</td>
<td>0.75&quot;</td>
<td>0.75</td>
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Industrial and Equipment Division
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—a tinned, copper bus bar wire with non-inflammable "spaghetti" covering, for hook-ups. 5 colors; 30-inch lengths.

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**B BATTERY ELIMINATOR**

Do away with troublesome, expensive, bulky batteries, with acid, stained carpets, a dead radio just when you want it most. Install the KINGSTON B battery Eliminator and forget your battery troubles forever. Trim, handsomely finished in black and nickel, and guaranteed not only to remove the battery nuisance, but to deliver clearer tone and increased volume. Three different voltages obtainable at same time, each tap adjustable over a wide range, making any desired voltage from 5 to 150 possible and harmonizing perfectly with your own set. The Raytheon tube is used as a rectifier.

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**635 Short Wave Kit**

The type 635 Short Wave Receiver Kit contains the carefully designed and matched essentials for a real short wave set. Its range is 18 to 150 meters. The kit contains a set of four plug-in coils, one coil socket, one coupling condenser and two 140 m.t. condensers. These parts are all carefully designed for operation together.

With the four coils supplied, the amateur bands fall well to the center of the tuning scale. "Dead spots" at which the receiver will not oscillate are totally eliminated. The antenna condenser allows coupling adjustment to suit individual conditions.

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**ATTENTION OWNERS OF AMATEUR STATIONS**

Now is the time to change your transmitter over to crystal control. For 40 or 80 meter work, we recommend either an 40 or 80 meter crystal. No need of using higher wave-length tubes to work on the lower bands. Here are oscillating crystals in the form amateurs hands as follows:

- 150-200 meter band
- 75-150 meter band
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The above prices are for a crystal to receive anywhere in its respective bands. Frequency stated accurate to 1 part in 100,000.

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When Glenn H. Browning and Francis H. Drake designed a radio frequency transformer which for the first time gave satisfactory amplification at the broadcast frequencies, they earned the world-wide good will of the amateur fraternity.

Recognized as the radio leader of his community, the amateur's recommendation carries tremendous weight in the selection of his neighbor's receiver.

This recommendation is the radio dealer's leading asset in promoting the sale of Browning-Drake Receivers.

Browning-Drake produces only one model, built complete at its Brighton laboratories. Fairly priced, and handled only by the highest grade jobbers, the Browning-Drake Receiver has never been cut, and no dealer has ever lost money on Browning-Drake.

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An electrical means of determining the condition of your storage-battery cells. Made with a resistance for placing a substantial load in excess of that ordinarily called for by Radio tube filaments, on each 2-volt cell. The meter although calibrated in volts is provided with a simple scale readable at a glance showing when the battery is in fully charged or poor condition or needs immediate recharging.

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Tests automotive batteries too.

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After severe laboratory tests, seeking the ultimate in musical performance, these receiving set manufacturers have all chosen Thordarson amplifying transformers as the finest to be had.

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SUPER AMPLIFYING TRANSFORMERS
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Transformer Specialists Since 1895
WORLD'S OLDEST AND LARGEST EXCLUSIVE TRANSFORMER MAKERS
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TRANSMITTING VARIABLE CONDENSERS

.0001 Mfd., 23 plate, 3/16 inch spacing .......... $12.50
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Prices include Type A Velvet-Vernier Dials.

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The special phosphor bronze solder tab and spring members are all in one piece. This unique spring design insures positive non-microphonic cushion effect.

Unique push-contact seats the tube-prongs properly and effects reliable, positive, contact.

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The UTMOST in 5-Tube Efficiency

Rare Tone Quality and Extreme Stability feature this new 5-tube instrument. Heavy copper cans completely encase each coil, preventing any possibility of local pick-up on the coils themselves, and permitting total neutralization of each radio frequency stage—with consequent freedom from distortion.

An emergency vernier adjustment—which permits a compensating movement of the third condenser—supplements the two regular tuning controls and makes possible the elimination of interference caused by two stations of but slightly different wave lengths.

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For audio amplification apparatus, either internal amplification with UX-112 tubes or UX-171 tubes may be chosen, or where auditorium volume is desired, external amplification with a super-power amplifier can be used.

5-TUBE RECEIVER PRICES

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
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<th>East of Rockies</th>
<th>Also made in table model</th>
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<tr>
<td>No. 502</td>
<td>Receiver, Art Console, American Walnut, 5-tube, coils shielded, dual control, equipped with voltmeter, space for all operating equipment</td>
<td>$325</td>
<td>$190.00</td>
<td>$192.50</td>
<td>$255.00</td>
</tr>
<tr>
<td>No. 501</td>
<td>Receiver, Treasure Chest, Solid Mahogany, 5-tube, coils shielded, dual control, equipped with voltmeter</td>
<td>$350</td>
<td>$192.50</td>
<td>$192.50</td>
<td>$350.00</td>
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No. 5-A Cone Speaker, Tip-Top Table type. Violin wood soundboard finished in Mahogany, Pedestal solid Mahogany. Price $95.00, Licensed under Lektophone patents, 1271527 and 1271529. Other patents pending.
The AmerTran DeLuxe

in two types for $10 each

1st and 2nd stages

Standing out prominently among recent developments toward better reproduction, the AmerTran DeLuxe sets an entirely new standard of audio amplification.

Here is an audio transformer which reproduces the deep boom of the bass drum, the roll of the pipe organ and the lowest tones of the bass viol with startling realism, at no sacrifice of the highest sounds within the audible range. Used in connection with the new cone speakers and new tubes these transformers amplify uniformly over the entire audible range. The approach to absolute perfection is so close that the human ear is unable to note further improvement.

The AmerTran DeLuxe is made in two types—first and second stages and should be used by the pair!

The AmerTran Power Transformer and the AmerChoke are the result of over twenty-five years' experience in transformer building. They are among the finest units available for the construction of a power supply of the better type. The Power Transformer has filament supply windings for the rectifying tube and furnishes sufficient plate current, after rectification, for the operation of the set.

Write today for interesting free booklet "Improving the Audio Amplifier" and other data on the subject of better radio.

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EAGLE RADIO COMPANY
16 Boyden Place  Newark, N. J.

The New Tube Transmitting Condensers

The ideal Condenser for Transmitting Plate-Supply Use

<table>
<thead>
<tr>
<th>Mfd.</th>
<th>1000 volts</th>
<th>2000 Volts</th>
</tr>
</thead>
<tbody>
<tr>
<td>.5</td>
<td>2.50</td>
<td>5.00</td>
</tr>
<tr>
<td>2</td>
<td>2.00</td>
<td>4.00</td>
</tr>
<tr>
<td>1</td>
<td>1.50</td>
<td>3.00</td>
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<tr>
<td>2</td>
<td>1.00</td>
<td>2.00</td>
</tr>
</tbody>
</table>

The 1000-volt condensers are fitted with heavy brass binding posts; the 2000-volt condensers have heavy brass binding posts with petticoat insulators.

Each condenser is tested and the capacities guaranteed within 5% of ratings.

The 2 mfd. 1000-volt condensers are especially adapted for and used in the AmerTran Power Packs, Sent Prepaid Upon Receipt of Price.


Parts and supplies for Edison element storage "B" batteries in stock for immediate delivery. Perfect elements. Electrically welded on and cap connectors. Type "A", 5c per pair. Type 3-6, 1000 M. A. 8c. Type 5-8 3000 M. A. 5c 1 1/2" flat bottom jar, 25c. Typo 3-G, 1500 M. A. 75c. No. 20 pure nickel wire, 10c per ft. No. 18. 15c. Separators, 4d per doz. Potassium hydroxide and Lithium for making 5 lbs. Edison solution. 85c. 100 volt battery in steel case, complete in every detail, $15.50. 140 volt, $17.00. Send for complete list.

J. ZIED, 904 N. 5th St., PHILA., PA.
STOP that howl!

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

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

You can get it for every size tube!

Just ask your dealer, or write.

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

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

SHORT WAVE COILS

COMPLETE SET—5 Coils and 2-Coil Mount—$5.00
Antenna Coil and attachment $1.00 additional
From your Ham Dealer—or direct
Other Good Short Wave Parts. Send for List
SEATTLE RADIO LABORATORY
3335 33d Avenue, South Seattle, Wash.

AEROVOX
Built Better
RAYTHEON CONDENSER BLOCKS

AEROVOX products are used by over 200 of America's Radio Manufacturers. AEROVOX Condensers are approved by M.I.T. and Yale Universities.

AEROVOX WIRELESS CORP.
493-491-489 Broadway, New York
Branch Offices:
No. Lewis, New York Wireless Sales
Cleveland, Rule & Co.
Chicago, B. M. & Co.
Birmingham, A. W. & Co.
St. Louis, W. M. & Co.
Seattle, K. A. & Co.

Say you SAW IT IN QST—IT IDENTIFIES YOU AND HELPS QST
THE SUPER SYNC

The Synchronous Rectifier That Can Be Filtered

The Super Sync is now in use in several foreign countries and giving the same excellent results as those in this country. Several amateur stations after installing the Super have communicated with foreign stations that they were unable to reach before. A letter in our files from Clair Foster of 6 HM claims that after installing the Super he was able to carry on reliable consistent communication with O-A3E, thus proving the reliability of the Super.

P A T. PENDING

PRICE $75.00 F. O. B. ST. LOUIS

MARLO ELECTRIC CO., 5241 Botanical Ave., St. Louis, Mo.

GENUINE

Kenotron Rectifying Tubes
Model UV-216

These Tubes are the GENUINE R.C.A. Kenotron Rectifying tubes. Filament voltage 7½ volts and will safely stand A.C. input of 750 volts. Four of these tubes will run a 60 wattter.

These Rectifying tubes will pass plenty of current and voltage for your TRANSMITTER and also are very efficient for use in "H" ELIMINATORS.

STANDARD BASE. EVERY TUBE BRAND NEW AND PACKED IN ORIGINAL CARTONS.

List price $7.50 ea.—Extra Special $1.85 ea.

AMERICAN SALES CO., 21 Warren Street, N. Y. C.

Save 20 to 50%
ORDER NOW!

Try Us for prompt and careful attention, immediate delivery and courteous service.

LOWEST PRICES for DRILLED, ENGRAVED or DECORATED PANELS or SUB PANELS for the popular standard circuits, for short wave receivers or transmitters; or specially cut, drilled and engraved TO YOUR OWN SPECIFICATION.

GORTLANDT PANEL ENGRAVING CO.
79 GORTLANDT STREET, NEW YORK

Bradleyleak

THE PERFECT GRID LEAK

Provides a noiseless range of grid leak resistance from ½ to 10 megohms. Assures most effective grid leak resistance value for all tubes. Small grid condenser (0.00025) is separate. Metal parts nickel plated. One hole mounting.

Allen-Bradley Co.
Electric Controlling Apparatus
277 Greenfield Ave., Milwaukee, Wis
ABSOLUTELY! MISTER AMATEUR
WE HAVE THE MOST ASTONISHING VALUES

CARDWELL CONDENSERS
King-Cardwell 41 plate
Evenly spaced for transmitting. 95c.
King-Cardwell 11 plate
For short wave receivers. 95c.
King-Cardwell Transmitting
Factory rebuilt for 3000 Volts. $2.98.
Cardwell Dual Condenser
Uses in 13-15 pt. $1.95.

R I N G - C A R D W E L L 4 1 p l a t e
Easily doubled spared for transmission. 95c.
K IN G - C A R D W E L L 1 1 p l a t e
For short wave receivers. 95c.
K IN G - C A R D W E L L T r a n s m i t t i n g
Factory rebuilt for 1100 volt cycle time without "draging." LIST PRICE $7.00
OUR PRICE $5.00

TUBES
Rectifying tubes will stand 500 volts
and pass 60 mils.
Half wave type 95c.
Full wave type $1.25.

RADIO CORPORATION
G E N U I N E 2 0 1
An excellent tube for the short wave transmitter. 95c.

RCA UC-1803 FARADON
CONDENSER
Capacity .000025 Mfd. 10,000
volt breakdown
List $5.00
SPECIALLY PRICED AT
95c

RCA AUDIO TRANSFORMER UY712
Highly recommended by Kruse for short wave audio amplification.
This sealed audio transformer was made
in amplifer a 1000 cycle time without "draging." LIST PRICE $7.00
OUR PRICE $5.00

RCA OSCILLATION TRANSFORMER, UL 1008
Can be easily converted for short wave transmission by cutting out a turn. Works perfect for a Hartley circuit.
LIST PRICE $11.00
Our Price $7.50

RCA POWER TRANSFORMER
UP1016
Has plate, filament, and rectifying tube windings. Plate sold 3000 volts with input for 1500 volts, filament
and rectifying tube windings 10.5 volts with input of 5.25 volts. For home power tube a resistor in the primary
uses common control of output.
List Price, $5.50
Our Price $3.00

RCA TF TRANSMITTER, 20 WATT
This transmitter designed for CW or voice and it can be easily
converted for operation on 40 or 80 meters. Housed in a beautiful
abinet with meter on panel.
SPECIAL $75.00
250 WASHINGTON STREET
BOSTON, MASSACHUSETTS

The New Hammarlund "MIDLINE"
Condenser Will Improve Your Radio

It gives greater separation of low-wave stations
than the old "SLC" type and greater separation
on the high waves than the more recent "SLF" type.

In addition to the many famous features in previous
Hammarlund models, the "MIDLINE" has
ball and cone bearings and a full-floating rotor
shaft. This shaft may be removed and a longer
shaft inserted for use in any scheme of multiple
condenser operation.

Made in all standard capacities—single, dual,
and triple. Also for short-wave work.

Sold by the better dealers.

HAMMARLUND MANUFACTURING CO.
424-438 W. 33rd Street, New York

For Better Radio

SAY YOU SAW IT IN QST—IT IDENTIFIES YOU AND HELPS QST
Scientific precision of a high order enters into the manufacture of the Durham Metallized Resistor, developed by two leading university professors. Noiseless and guaranteed to maintain, under all conditions, the resistance marked on its label.

500 ohms to 10,000 ohms ..................................................... $1.00
Above 10,000 ohms to .25 meg................. 75
.25 meg. to 10 meg..................................................... 50

RESISTOR MOUNTING
Made of moulded insulation of exceptionally high resistance. Best quality tension-spring, bronze contacts. Only upright mounting made.

Single Mounting....................... 60c
For Condenser.............................. 66c

CARTER
"HI-OHM" Volume Control and Filament Switch

<table>
<thead>
<tr>
<th>Resistance</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>500,000 ohms</td>
<td>$2.50</td>
</tr>
<tr>
<td>300,000</td>
<td></td>
</tr>
<tr>
<td>200,000</td>
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<td>50,000</td>
<td></td>
</tr>
<tr>
<td>10,000</td>
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</tr>
</tbody>
</table>

$2.50 Complete with arrow pointed knob.

Simplifies the operation of the set and eliminates the battery switch. As soon as the knob is turned from "Off" position, the filament switch is closed and remains closed until the "HI-OHM" is turned off.

Have you seen the new all-metal frame "Midget" Rheostat combined with Filament Switch— all resistances $1.00.

Any dealer can supply
In Canada—Carter Radio Co., Limited, Toronto

Sacrifice Sale of Amplifiers

Large stock of metal "flower-type" horns, excellent amplifiers or loudspeakers, priced below cost for quick disposal. For particulars and prices write

SALVAGE DIVISION
VICTOR TALKING MACHINE COMPANY
Camden, N. J.

Airplane flame proof Blinker Key (Q-1100, at $4.00, SE 1924, A, S. W. Rev. Receiv. 1 tube, 50-1000 meters, $10.00, TUBES. (4) 896. (7) 1-4, 47. Spark 22.8, 200, 300, 1200, 1400, 2000, 3000.) Send $1.50 in 4th Terminal. $1.50 on 76-2500 Meter Water Meter, Type 2500-B-R. Complete. 3 sets, prices, one of stationary, $10.00. Just a sample of our bargains. Get our new and latest reduced price list for a 2¢ stamp. We bought $10,000.00 worth of United States Government Radio Transmitting and Receiving Sets and Parts. Mail orders sent all over the world.


"Radio" with Volume and Distance


Try "COLYTT" Grid-Leak tonight.

MONEY BACK GUARANTEE. Sent postpaid with full directions for $1.00.

THE COLYTT LABORATORIES
565 West Washington Street, CHICAGO, ILL.
The advantage of a Weston Voltmeter for positive set control is well known. Here is a new combination—two instruments in one—a Pin-Jack Voltmeter and a High Range Stand. Simply plug the Pin-Jack Voltmeter into the filament Pin-Jacks on the panel and you measure tube filament voltage—remove it and plug it into the High Range Stand and you can measure battery voltages up to 160 volts! \[1\]

The results—tube economy, longer battery life, better all-around set operation. \[2\] The new Weston Pin-Jack Voltmeter and High Range Stand is a typical Weston product designed especially for the Radio Expert and Enthusiast.

For complete information write for Bulletin “0”.

WESTON ELECTRICAL INSTRUMENT CORPORATION
158 Weston Avenue, Newark, N. J.

STANDARD THE WORLD OVER

WESTON
Pioneers since 1888

---

No Change in Wiring
~ with the adapted
Mogul 5VCX Power
tube

An Adapted Mogul 5 VCX power tube—so easy to apply as an ordinary tube—that almost doubles the signal carrying capacity of the ordinary tube. This greater capacity eliminates overheating and distortion and it can be applied to any set without change in wiring.

With an Adapted Mogul 5 VCX power tube in your set you will immediately note an unusual improvement—a general increase in volume, a roundness of tone and clear-cut reproduction in music and dialogue that is unobtainable when ordinary tubes are used.

ONE USER SAYS—
"Let me congratulate you on the splendid performance of Adapted Mogul 5 VCX Power Amplifier Tube. I found that there was almost noticeable amplification and clarity. The tube actually gives considerable increase in volume when used without additional plate voltage or grid bias. But when 305 volts is applied to the plate the volume is virtually doubled."

PUT ONE ON YOUR SET TONIGHT!

The Van Horne Co., Inc.
91 Center St.
Franklin, Ohio

---

MICA TRANSMITTING CONDENSERS
.002 MFD. 6000 VOLTS
Manufactured by Connecticut Telephone & Electric Co.
Used As Grid, Radio Frequency By-Pass and Plate Blocking Condenser

EXTRA SPECIAL PRICE $2.00 Each

AMERICAN SALES CO. 21 Warren St. N. Y. C.

SAY YOU SAW IT IN QST—IT IDENTIFIES YOU AND HELPS QST
To Our Readers Who Are Not A. R. R. L. Members

Wouldn't you like to become a member of the American Radio Relay League? We need you in this big organization of radio amateurs, the only amateur association that does things. From your reading of QST you have gained a knowledge of the nature of the League and what it does, and you have read its purposes as set forth on page 6 of every issue. We would like to have you become a full-fledged member and add your strength to ours in the things we are undertaking for Amateur Radio, and incidentally you will have the membership edition of QST delivered at your door each month. A convenient application form is printed below—clip it out and mail it today.

American Radio Relay League,
Hartford, Conn., U. S. A.

Being genuinely interested in Amateur Radio, I hereby apply for membership in the American Radio Relay League, and enclose $2.50 ($3 in foreign countries) in payment of one year's dues. This entitles me to receive QST for the same period. Please begin my subscription with the ....................... issue. Mail my Certificate of Membership and send QST to the following name and address.

........................................
........................................
........................................

Station call, if any ........................
Grade Operator's license, if any ........................
Radio Clubs of which a member ........................

Do you know a friend who is also interested in Amateur Radio, whose name you might give us so we may write him about the League? ........................

........................................

Thanks!

SAY YOU SAW IT IN QST—IT IDENTIFIES YOU AND HELPS QST
Only Samson Chokes can Stop all Distortion

Howling, "motor boating" and other distortion can be instantly stopped by Samson Chokes which have the patented helical winding. This makes them keep R.F. and A.F. currents where they belong at all frequencies particularly those frequencies where other types of chokes act as condensers and let these currents by. Samson Chokes have no pronounced resonance points.

Use the R.F. Chokes in grid circuits of first amplifier tubes, in B plus leads of R.F. tubes, in reflex circuits, and in place of resistance leak in resistance coupled amplifiers. Use the Audio Frequency Choke in the B plus leads to detector and amplifier tubes. By their use in such circuits B batteries will last much longer and "B" eliminators give much better quality of reproduction.

Conditions for Tone Quality
Covered in New Booklet.


Manufacturers
Since 1882

SAMSON ELECTRIC CO. Member
Sales offices in Thirty Leading Cities.

A. F. Choke

CANTON

Learn to Send the Easy Way
With The Improved Martin

VIBROPLEX

For Continental, Morse or Navy Codes

Japanned Base, $17
Nickel-Plated, 19

Adjustable
To Any Desired Speed

Over 100,000 operators use the Improved Vibroplex because it is EASIER, QUICKER and MORE ACCURATE than the old key.

It transmits with amazing ease, CLEAR, CLEAN-CUT signals at any desired speed. Saves the arm, prevents cramps, and enables any operator to send with the skill of an expert.

Special Radio Model
Equipped with Large Specially Constructed $25
Contact Points. Requires no relay
Every amateur needs this bug. Easy to learn. Sent on receipt of price. Money order or registered mail.

Liberal allowance on your old (Martin) Bug. Order Now!

THE VIBROPLEX CO., Inc.
825 Broadway,
New York

Say You Saw It in Q S T—It Identifies You and Helps Q S T
GROSS WAVEMETER

A high grade precision instrument at 1/3 the usual market price. Built into compact carrying case of genuine solid oak, leather handle on top with removable cover. Coils extremely low loss making a very low resistance wavemeter either the flash lamp or galvanometer type will easily respond to an oscillator using 50 volts or less on the plate of the tube. Coils fit into holder in the cover, Calibration better than 1% guaranteed. Checked against Piezo oscillator using a minimum of 10 points for each curve, no imaginary curves drawn from 3 or 4 points. Separate curve furnished with each coil.

Type 1—L—with flash lamp indicator for 20, 40, 80 meter bands.

Type 2—L—with flash lamp indicator for 20, 40, 80 and 200 meter bands

Type 1—G—with galvanometer indicator for 20, 40, 80 meter bands

Type 2—G—with galvanometer indicator for 20, 40, 80 and 200 meter bands

J. GROSS & CO.

30 Park Place

New York City

Everything For the Ham

Nicholson Electric Co., 1407 First North Street
SYRACUSE, N. Y.
Service

In addition to their relay work the amateurs of the world are contributing substantially to the development of the radio industry. Wherever we find them in a radio factory, jobbing establishment or dealer store, we know that they are spreading a story of more intelligent operation and care of radio sets. Service is the hobby of most amateurs.

Let us send you a copy of our No. 700 circular describing the Jewell Radio Service Test Set.

Jewell Electrical Instrument Co.
1650 Walnut Street
CHICAGO

26 Years Making Good Instruments

Heavy-Duty
RADIO OHM
for Simple
Control of
B-Battery
Eliminator

A Centralab Heavy-Duty Radiohm ensures efficiency. Built resistance included with a single turn or knob, allowing panel marking for proper setting to provide various voltages. Tested and approved by Raytheon Laboratories. Resistance remains permanent as a single carbon particle or disc. Insulation withstands 1500 volts. The smooth, noiseless operation greatly improves any set.

$2 At your dealer's, or mailed direct. $2
CENTRAL RADIO LABORATORIES
20 Keefe Ave. Milwaukee, Wis

Centralab

AIRGAP SOCKET

THE NEW
Low Capacity
U X
UNIVERSAL
Price 60c

AIRGAPS will help rid any set of those squawks, howls and fiery noises due to socket capacity; they keep the grids negative, stabilizing the circuit, causing tube to go into oscillations more smoothly and not "spill over" until maximum results are attained.

THEY HELP PREVENT closed circuit, absorption of current, intercoupling of circuits, feedback and undesirable capacity; they make any circuit more stable and sharpen tuning, resulting in purer and clearer tones with more volume on local and distant stations.

Sent Direct If Your Dealer Cannot Supply You. POSTPAID 60c EACH
AIRGAP PRODUCTS CO., MFR
13 Campbell Street, Newark, New Jersey

SAY YOU SAW IT IN QST—IT IDENTIFIES YOU AND HELPS QST
J. W. COLEMAN, JR.

COLEMAN & DAVIS
CONTRACTORS AND BUILDERS
PHONES: 5133-8302-Y
211 NORTH BROADWAY
LEXINGTON, KY.

Electric Specialty Co.,
Stamford, Conn. U.S.A.

Gentlemen:

Some time ago I purchased from you an ESCO motor-generator set, 1000 volt 200 watt, 2 unit machine mounted on one base, and am writing you a few lines to let you know how much I think of your Generators.

The generator not only gives its rated voltage, but goes 100 volts better, putting out 1100 volts, and will stand a considerable overload for a good while. Am using it in connection with a fifty watt tube, and every night for the past two months, during the hottest part of the summer, have been working three or four Australians and New Zealanders.

When it comes to dx ESCO sure is the berries. The information on filters that you gave me several months ago was highly acceptable, and no doubt accounts for some of my good dx this summer.

My signals have been heard and worked in every part of the globe in the last two months of summer and I credit it all to the keen note the ESCO generator puts out. My filter system is what you suggested, namely, 30 henry choke, and 6 mfd condensers.

Thanking you for past favors, I remain

Yours very truly,

July 26, 1928

The "Gold" Bug for the "Gang"!

ONLY $12.50

with cord and plug.

Carrying Case, $3.50 extra.

Here it is, the key that's being used all over the world, just the thing for the "gang." Simple in operation and easy to adjust. Made, guaranteed and sold on a money-back basis by an organization with over 40 years of experience in manufacturing transmitting apparatus.

You'll also be interested in a line of Jewell, Dubilier, Thordarson, Hammarlund and other nationally known equipment.

J. H. BUNNELL & COMPANY, INC.
Headquarters for Transmitting Apparatus Since 1878
32 Park Place, New York Phone: Whitehall 5970

FAMOUS "BH" TRANSFORMERS
BH VIVAPHONIC

For quality of amplification, use the only Low-Loss, Shield Structure Audio transformer made. (Patented) Write for Catalogue Illustrating Audio and Transmitting Transformers, BENJAMIN HUGHES ELECTRIC CO. 298 Laguichefiers St., W. Montreal, Canada Transformer Builders Since 1910

POWER TRANSFORMERS
MODEL U. P. 1016
750 WATTS

List $35.50 ea. SPECIAL PRICE $11.50 ea.

AMERICAN SALES CO. 21 Warren St., N. Y. C.
HAM-ADS

NOTICE

Effective with the July issue of QST the policy of the "Ham Ad" department was changed to the point where it was originally intended that this department should be. It will be centered strictly as a service to the members of the American Radio Relay League, and advertisements will be accepted under the following conditions:

(1) "Ham Ad" advertising will be accepted only from members of the American Radio Relay League.

(2) The signature of the advertisement must be the name of the individual member or his officially assigned call.

(3) Only one advertisement from an individual can be accepted for any issue of QST, and the advertisement must be mailed in not more than one envelope.

(4) Advertising shall be of a nature of interest to radio amateurs or experimenters in their pursuit of the art.

(5) No display of any character will be accepted, nor any cosmopolitan arrangement, such as car or part capital letters, as those which tend to make one advertisement resemble another.

(6) The "Ham Ad" rate is 75c per word. Remittance for full amount must accompany copy.

(7) Closing date: the 25th of second month preceding publication date.

THE life blood of your set—plate power. Powerful, permanent, infinitely superior to dry cells, lead-acid B.B. eliminators. Trouble-free, rugged, abuse proof, that's an Edison Steel-Alkali Storage, B-Battery. Upset electrically when nickel plates are inserted absolute quiet. Lithium-Potassium solution (that's no lie). Complete, knock-down kits, parts, chargers. Glass tubes, shockproof, frost resistant, neither water, fire, nor heat can destroy them. No, 12 solid copper enameled permanently perfect aerial wire 75c 100 ft. Make easy money with 10-volt service station charger. Details, full price list.

Frank Murphy, Radio XMI, 4387 Rockwood Road, Cleveland, Ohio.

25% to 35% discount to amateurs on receiving parts. No extras. Over two pounds data, circuits catalog—25c prepaid. Also exchange with receiving sets you want for new parts you have! Weekly data bulletin—$2.50 per year, trial 20 weeks—$1.00. Fred Luther Kline, Kent, Ohio.

JEWELL meters 25% discount. We specialize on parts and carry a complete line of transmitting and receiving apparatus in addition to regular broadcast equipment. We carry in stock products of the best nationally known manufacturers, such as Acme, National, General Radio, Thorndarson, Raytheon, Philco, Nathaniel Baldwin, Radio Engineering, Curtis-Gritli, Thoth, Dubois, Allen Bradley, Tube Deutsenschaft, Kellogg, Centralia, Yaxley, Acme Wire Company, Crescent Radio Company, M. M. Fleron, Aero Products, Inc. Tell us what you want. We allow dis-counts to A.R.R.L. members and dealers only. Give your call letters. Roy C. Stage, Wholesale Radio, Montgomery and Burt Sts., Syracuse, N. Y.

WANTED—a December 1922 QST. H. Wood, 1054 Elm, Warren, Ohio.

QSL cards, Gerald Julian, 124 Park Road, West Hartford, Connecticut. "Not always lowest in prices—highest in quality."

MATEURS. Big discounts on short-wave apparatus. Western Electric "AF" Short-Wave Sets (limited supply) $27.00. Aero model kits $10.75. For lowest prices write JAP, 643-5 West 171st Street, New York City.

8FN's CHEMICALS sure are F. R. for charging B Batteries and B Units and for high voltage rectifiers where aluminum and lead are used. No box, 50c per box. Wm. Throm, 8FN, 2255 Vine St., Cincinnati, Ohio.

AMATEUR radio equipment built to a quality standard, not a price. E.R.E. equipment is built of the finest material and is guaranteed to give satisfaction. We desire in any equipment. Our line is transmitters, receivers, master oscillator units, wavemeters, etc. Our new Marine type equipment for use on going yachts or cruisers. Special equipment to order. Thos. Ksall, 1209 Grandview Avenue, Warren, Ohio. Radio SDHN.

SAY YOU SAW IT IN QST—IT IDENTIFIES YOU AND HAMS! Write for our catalog of complete line of transmitting and receiving equipment. Ron L. Wollard, Newark, Ohio.

GE acrophane dynamotor. Dubller filter, 12 DC-400 DC $64. TASK.


WESTERN Electric 7-A power amplifier with horn and related exciter. Excellent condition $175.00. Ed. C. Reiser, 315 Beechwood Ave., Trenton, N. J.

UV202 for sale. Been used one month. $5.00. Charles Stevens, Stafford Springs, Conn. IBMG.

WANTED—Several broken or burnt out WE-VT 4 fifty watters. D. M. Ashby, Gibson City, Illinois.

OMNIGRAF wanted—state type, number, condition and price. J. A. VY.

DODGE Radio Shortcut fixes signals in mind to stick. Kills Hesitation; "Speeds Up" to 25 per quickly—easily. Appendix to Shortcut sends rapid progress more certain. Key Work by SDRI-KUF cultivates legible transmission. Bad "fist" prevented or corrected—Take advice from KUF. Key Work and Appendix $1.50. But if purchased Shortcut only and now copy less than 25 per second notice will be One Dollar—seec daily mail; non COD—Money Order only. Dodge Radio Shortcut with Appendix and Key Work $3.50 U. S. and Canada—Elsewhere $4.00 exp. Terms as above. C. K. Dodge, Mamaroneck, New York.

49c TRANSMITTING rheostats for 5-7.5 watt tubes. 3 for $1.25. New VT2 tubes $1.50. Joseph Neubauer, 1220 Pine Street, Philadelphia, Pennsylvania.

QSL cards printed on Government post cards. Two colors, 100, $2.15. 200 for $4.00. Full amount must accompany manuscript, including postage. Samuel Singer, 157 Thadford Ave., Brookly, N. Y. 2AIQ.

Curtin-Griffith "Juri-Go" or Ross 5-watt DX Bixes $3.15 voiced with free booklet. Mueller 150-watt input tubes $15.00 socket free. Federal Buzzers $2.75. Potter 2000-volt 1-MFD filter condensers $2.50; 2000-volt 1-MFD filter condensers $3.25. Also condensers to bona-fide dealers—give references.) New "Ham-lit" with latest transmitting circuits, parts, etc., by Price Griffith, 1109 Eighth Avenue, Fort Worth, Texas.

BEST offer takes new Philco glass-cased storage battery. Blaine Davis, Duquesne, Pennsylvania.

WANTED—Westinghouse detector amplifier, unit type DA. George Woodbury, Union City, Indiana.

FOR sale—my entire equipment. Condensers, meters, transformers, etc. Send for list. Harold Cerny, Belle Plaine, Iowa. 914X.

BALDWIN phones $5. Murdock phones $3, 0-15 Jewell voltmeter $5, 8 volt Thorndarson Transformer $5, Thorndarson Power transformer for 5 watt $3, C802 tubes $1, transmitting grid leak 75c, UC814 tubes $2, 802 tubes $2, 814 tubes $2.15, all for $4,00.

111—Prospect, Cincinnati. F. G. F. D. D.

2CD—Castleton, N. Y., selling out new 50 watt parts chop.

450 WATT Thorndarson transformer. New. 3000 v tapped. $16.00. 9BOS.

WHILE they last, genuine brand new R.C.A. UV202 five watters, $2.45. James Marinel, 725 Oak Street, Youngstown, Ohio.

FOR sale—New Mario super-sync rectifier. Guaranteed perfect condition. $56.00. 9DQU, 1838 N. Edward, Deserit, Illinois.

MUST sell. Going to school. 15 watt 40 meter set with 15 watt 80 meter set $50. Esco 500 watt 40 meter yna-80 pair $10, tubes, meters, chokes. Write for particulars. 2BIF.


FILTER chokes unmounted 20H 25 M.A. $1.00—50 H 50 M.A. $1.50—50H 60 M.A. $2.00. 275V transformer from 110 $5.00. Use two for Raytheon tubes, 420V secondary with midtap and 6V primary chokes. Write for list of other parts. M. Leitch, 52 Park Drive, West Orange, N. J.

HELP SET QST
PURE aluminum and lead rectifier elements, holes drilled, brass screws and nuts, pair 1/16", 1" x 4", 15c, 1 x 6 1/2c, 1 1/2 x 8 1/2c. E. F. Johnson, 10th Avenue. 15c, 1 1/2 x 8 1/2c. $1.00. Lead $1.00 square foot all prepaid. Silicon transformer steel cut to order, 3/16", 19 lbs. 25 cents, 5 lbs. 25 cents per lb. 4 cubic inches to lb. Postage extra, 1/2 cash with order—balance C.O.D. Edgewide wound copper ribbon .350" wide; 3/4" outside diameter turn 1/4", 1/2" inside turn, 3/4" 1/4" turn. prepaid. Geo. Schults, Calumet, Michigan.

FOR SALE—the following at 6FC; Jewell 6-O TC $3.50. Acme inductance, $1.25. Acme 1/2 henry 500 mil double choke, $3.50. UC193, 75c; UC194, $1.00. W.E. 2 mfd. filter condensers, $1.00. E. F. Johnson, 10th Avenue. 75c. UC183 $1.00. Autoformer, $1.25. M. B. Stinson, 1109 Eighth Avenue. For leak, $1.60. Aerovox 1500 volt 1-mf condenser, $1.75. Geof Kincer, 3161 5th Avenue, New York, N.Y. circuits. Many other bargains. Write for list. M. B. Stinson, 27 School St., Boston, Mass.

NEW W. E. fifty writers $25.00. UC194, 3000 volt, .50 mfd. condensers $1.80. Ameripart apparatus, power transformer, 39/2, $.35. De Luxe transformers, $18.50 each, 1042, $3.00, 3600 volt. For $5.00 post paid, 21.56 extra per additional unit. E. F. Johnson, 10th Avenue, Whitewater, Wis. 4CSM.

WAVEMETERS: Rigidly built; Bakelite panels and coils; not in cabinet; good condensers and solid coils bulk the dips; curve charts furnished, read 100th of meters at short waves; accuracy guaranteed within 1/2 of 1%; no floppy leads to change calibration. This is all the dope. One band $5.00 postpaid, $1.50 extra per additional band. Edw. Bromley, Whitewater, Wis. 4CSM.

SELL—=Exco 8/80 volt dynamotor. 9CJH.

READ cm and weep—Thorordon 150 watt 1500 each side and forty, fifteen bucks. Jewell 9-D milliammeter, 0-300, five bucks free radio, 0-700. $7.50. Filament volts 0-15, $5.00. What have you got? OMZ, S. G. Granger, Lefkov, N. Y.

FOR low power, 400 volts 3000 mill. Willard element storage battery, best offer. Acme 200 watt transformer with condensers $1.90. 950.00 watt filament $5.00. 2 UX210's $4.00. 1 UX216 $4.00. Watt good synchronous rectifier or 1500 volt M.G. 8AMT. R. Burrows, 3107 Durbin Place, Cincinnati, Ohio.

GE dynamotor 24 volt input 1500 volt output, at 233 amp. with extended shaft, $185. 50 watt power transformer $50.00. It has 1500 volt center tapped winding. Two 12 volt windings with center taps, $5.00. Two UV217 Kenotrons with sockets, $15.00. Filament transformer 150 watt 32 volt 22 volt secondary with primary rectifier, $5.00. Jewell T.C. ammeter 4.5 in. diameter 0 to 10 amp. $5.00. Henry Barth, 2728 R. Jefferson Ave., St. Louis, Missouri.

QRI?? You will be able to answer accurately if you have a General Radio 388 wavemeter, Range 14 to 221 meters. Will be a real value. $25.00. Built, scientifically accurate wavemeter, and in stock, price $22.00. Send immediately for descriptive leaflet. 5000 ohm grid leaks with center tap, $2.00. Commercial ammeter, 0-250 ampere, $1.50, 5000 ohm. Stropride grid condensers, 1000 volts $2.50. One mf. 1750 volt filter condensers, $2.50. Fifty watt porcelain base sockets, $2.50. Send now and get all. List. It's free for the asking. Harris, 5RM, 104 East 10th St., Fort Worth, Texas.


FOR sale—My complete amateur station 3PTA. Motor generator, 7%2/350 watt crystal control transmitter, receiver, storage A and B batteries. Everything for some real deal. Two transformers 950.00. 100 watt UP102. Name your own price. Will sell all for $700. Check win. Write for list. R. R. Barker, Gladwyne, Penn.

For that winter DX—Thorordon power transformers 800-450 each side $11.00. 1000-1500 each side $18.00; 80-watt filament transformers $6.50. Thorordon 850-volt power-glimmer transformers for 5-watts $8.50. Curtis 450-volt power-wax filament transformers 550 each side $12.50. Edgewide wound copper strip 6-inch size per turn 1/2; 4-inch per turn, $1.25. Aluminum square frame, 0.125 milliamperes 12.5% 0-500 milliamperes $7.50; 0-600 milliamperes $7.50. Power grid $1.60. Aerovox 1500 volt 1-mf filter condensers $1.75. Geo. Kincer, 3161 5th Avenue. Telephone. Jewell 250 watt carb. $1.25. Q-0, 1109 Eighth Avenue, Fort Worth, Texas.

REPRESENTATIVES wanted—Every set owner is a live prospect for our fully guaranteed 180 volt "B" Power Tint, Sells for $25.00. Liberal commissions. George R. Towns, 755 Carlton Avenue, St. Paul, Minnesota.


WHEN it comes to amateur transmitting and receiving apparatus, there's one place you're sure to get dependable goods, quick service, and at prices here, but BALD'S "Hamlator" is the original and still the best Ham Catalog, is waiting for you with all the dope. Send for it today—it's free. Remember we send you catalog and for it. Enclose stamp for list. It. W. Johnson, Waseca, Minn., W.A.D.


NEW brands superior phones $2.75 a pair. Signal variable condensers all sizes 24 each. Send for my bulletin of bargains for the ham. 9MY, Story City, Iowa.

HAMS! Announcing "Cilzvur", a monthly rumble containing only the calls being heard in the ham parts of the world. First issue January. Price only fifteen pennies per copy, $1.50 per year. Published by Hamm. "We do not do this without your help. Won't you endorse it by sending us your lists and subscription?" Published by SFI and BALD'S. It's for your sake. Subscriptions now to 2527 North Bailey Street, Philadelphia, Penn.

AMATEUR radio equipment built to a quality standard, not a price. F.-R.-L. equipment is built of the finest material and is guaranteed. We use your parts, if desired. In every set, we use only standard parts and components. Low battery oscillator units, wavemeters, etc. Our new marine type equipment for use on sea going yachts or cruisers only. For the first time, the Government lists $100 and 210. W. B. C. generators direct connected to 110 V. 72K. New Covertex Universal New Omnipar 3-Olive Type. Binoculars and telescope. What can you do for me?

Charles O. Snyder, Richmond, Indiana.


Q R A SECTION

50c straight, with copy in following address form only: CALL—NAME—ADDRESS.

1AZJ—Jack Bean, 27 Adam Street, Pittsfield, Mass.


1CJH—Roy B. Fuller, 30 Harrison Street, Pawtucket, R. I.

1CNQ—118th Observation Squadron, Air Corps, Connecticut National Guard, Brainard Field, Hartford, Conn.

1CNP—Everett L. Roberts, 5 Summer Street, Orono, Maine.


1ZA—C. E. Jeffrey, Jr., 925 Commonwealth Ave., Newton Center, Massachusetts.

2ABO—William T. Pinney, 68 Simonson Ave., Mariner’s Harbor, Staten Island, N. Y.

2ABP—William Brady, 2521 Woodbine Street, Ridgewood, Brooklyn, N. Y.

2MK—E. F. Rainolds, Central Valley, Orange County, New York.

4PO—C. A. Davis, P. O. Box 688, Winter Haven, Florida.

4HA—Eugene L. Pfeulin, 226 Hyman Ave., Hendersonville, N. C.

4SP—James B. Witt, 832 N. 5th Avenue, Knoxville, Tennessee.

6ACQ—Walter James Robertson, 2015 South California Street, Stockton, California.

6AX—David L. Bigley, 346-54 Street, Oakland, California.


6CNX—Lawrence Johnson, Ephraim, Utah.

6CUA—Dr. J. W. McElwee, Box 338, 1382 Paseo Del Mar, San Pedro, California.

7AAC—M. A. Frye, Heppner, Oregon.


8AZD—Edward C. Bright, 3308 Williams Ave., Detroit, Michigan.

9AQZ—E. L. Aschinger, 1005 S. Bloomington Street, Streator, Illinois.


9BWJ—(Ex 8DOV)—Edwin E. Hare, 550 Brown Street, Paintsville, Kentucky.

9CHD—Ralph E. Skyles, 702 Carson Avenue, La Junta, Colorado.

9CKF—Frank Colough, Box 211, Philip, South Dakota.

c5EH—A. R. Williams, 56 Madison Avenue, Toronto, Ontario, Canada.


The following stations belong to members of the A.R.R.L. Headquarters staff. For them should be addressed care A.R.R.L., Hartford, Conn.: 1MK Headquarters 1QD John M. Clayton 1AL H. P. Westman 1BS R. A. Holmes 1AOA K. S. Kruse 1KQ F. Cheynay Beeckley 1BH F. E. Handy 1OA R. S. Kruse 1BIW K. B. Warner 1SZ C. C. Toddmon

PRICES TALK—Immediate—Reliable—Service. Thordarson combined plate and filament transformers. Ideal for 5 and 750 watt transmitters. Has 500 volt and 10 volt filament with center tap. Special $1.45. Every make of power transformer at low bargain prices. A.U.C-13001 condensers 10,000 volts $1.85. 821-A for Hartley Circuit. Bleeding and grid condensers $.50. RCA UXU 10 condensers, the berries for tube plate and grid transmitters (RFUH circuit) 10,000 volt $1.85. Tuba Deisteren, 3 MFD 1000 volt filter condensers. Special $2.53. Genuine Carnall 23 plate condensers $2.15. 48 plate $1.95. Carwell 21 plate transmitting double spaced condenser only MFD $1.95. Special 3 inch Bush 1.000 volt and milliammeters $0.49. Thermocouple antenna meters 15.35. New General Radio Wavemeter type 285 $19.50. 15 dial latest model monoprop $28.25. Special 5 dial monoprop. combination MFD $21.95, $30.25, $35.00. Avo short wave coil kit $9.75. H.E.L. receiving coil kit $1.15. H.E.L. transmitting inductions, double complete will give a 1 m. wave to your rig. 2 m. wave $1.65. Send for complete list of parts. All apparatus brand new same guaranteed. Deal with a brother ham and save your shekels.

2MA 207 Neptune Ave., Brooklyn, N. Y.

SEE THAT SCREW

A screw driver adjusts an XL in crossed places.

X-L VARIO DENSER

Results in easier tuning, more distance, volume and clarity—greater stability. Indorsed by leading radio authorities.

Model "B" A slight turn obtains correct tube oscillation on x-l tuned radio frequency circuits. Next, adjust. Roberts two inch Browning-tube. McEwen's after Knockout, etc., capacity range 1 u. to 29 micro-microfarads. Price $1.00

with grid aids obtains the proper grid capacity on Tuesday. Filter for 5 watt transmitters. Intermediate frequency tuning in herewave and remove grid bias in all sets. Capacity range 1.4 to 29 micro-microfarads. Price Model 0-1 Model 0-1 add. $0.00 to 1.00 M. F. D.

Model 0-10 $0.00 to 0.005 M. F. D. $1.50

Model 0-10 $0.05 to 0.10 M. F. D. $2.75

X-L Push Post Push it down with your thumb, insert wire, remove pressure and wire is fully held. Released instantly. Also furnished mounted on strips. Price 15c.

X-L RADIO LABORATORIES 2425 N. Lincoln Avenue Chicago, Ill.

Laboratory Product CRES C E N T L A V I T E S R ES FOR DISTORTIONLESS AMPLIFICATION

Dual resistance for DeForest "TH" tube $1.25. Complete of two units mounted on bakelite and connected in parallel. Please specify if your "TH" tube requires 60,000 ohms or 25,000 ohms All available apparatus in stock. Let us show you and reserve your place:

CRESCENT RADIO SUPPLY CO. 1 Liberty St., Jamaica, N. Y.

SAY YOU SAW IT IN Q ST—IT IDENTIFIES YOU AND HELPS Q S T
METRALIGN
SLT STRAIGHT LINE TUNING

condensers opened a new principle of station separation on all wavelengths by engineering design, and as usual created a trend that is being rapidly followed, but only in appearance.

The METRALIGN SLT condenser was first publicly announced in May.

The definite principles on which METRALIGN SLT is based still remain the exclusive design that assures

Station Separation on All WaveLENGTHS
Those condensers claimed as being "just as good" are not good enough. Get the original and genuine.

GET THIS BOOKLET
We have prepared a booklet on METRALIGN SLT which is an education on condensers. Send for a copy today.

GENERAL INSTRUMENT CORP.
477 Broadway, NEW YORK

Makes Any Set A New Set—in 15 Minutes
"They last twice as long as the smaller batteries of equal voltage"

"That's a pretty broad statement, Tom. Won't you have to make it conditional on the number of tubes in the set or the use of the new power tubes?"

"No, sir! Under the same operating conditions—whether you use four, five tubes or more, whether you use a power tube that uses up to 135 volts, the Eveready Heavy-Duty No. 770 or the even longer-lived Eveready Layerbile No. 486 will last twice as long as the smaller sized 45-volt batteries."

"Well, they ought to, they cost more."

"Yes, about a third more—but lasting twice as long as the smaller batteries, they cost much less."

"Your arithmetic is good, Tom, but if that's so, when I bought my set why did the dealer equip it with the smaller Eveready 772? Why didn't he put in the Eveready Heavy-Duty Batteries?"

"He probably thought he was doing you a favor—making your first investment cost you a little less. That little difference looks like a lot to a good many folks who are buying their first set, equipped with tubes, loud speaker, 'A' and 'B' batteries and everything."

Heavy-Duty batteries last twice as long as the smaller batteries of equal voltage. Eveready Heavy-Duty Batteries are the great contribution that the world's foremost electro-chemical laboratory has made in "B" battery economy, dependability and satisfaction, and the satisfactory reception of radio programs. Dry "B" batteries give a noiseless current, pure D.C. (direct current), the kind that is essential if you prize pure tone.

Send for booklet, "Choosing and Using the Right Radio Batteries," which we will be glad to send you upon request. This booklet also tells about the proper battery equipment for use with the new power tubes. There's an Eveready dealer nearby.

Note: A "C" battery gives a quality of reception unobtainable without it and greatly increases the life of your "B" batteries.

Manufactured and guaranteed by
National Carbon Co., Inc.
New York — San Francisco
Canadian National Carbon Co.,
Limited, Toronto Ontario

Tuesday night means Eveready Hour
through stations:
WOR—New York WBAI—Cincinnati
WEAN—Providence WTMJ—Cleveland
WNEW—Boston WTVI—Detroit
WTAG—Worcester WAND—Chicago
WIP—Philadelphia WOR—Davenport
WBN—Buffalo WOCN—Minneapolis
WOCF—Pittsburgh WOCM—St. Paul

SAY YOU SAW IT IN QST—IT IDENTIFIES YOU AND HELPS QST

SAY YOU SAW IT IN QST—IT IDENTIFIES YOU AND HELPS QST
after all...

"OLD FRIENDS ARE BEST"

IN THE years that have flown since Acme pioneered in transmitting (in those days when "amateur" meant amateur) we have tried to keep faith with our staunch old friends of Q. S. T.

Looking back now, we feel old. Almost every name that used to mean something in the manufacture of transmitting apparatus has disappeared—or deserted to the purely receiving field.

Acme, almost alone, still sticks to the ship—still tries to keep faith with its old friends. And yet, while holding and serving its old friends, Acme has kept pace with radio progress.

Today Acme is one year ahead in the two most important ends of radio reception, quality and elimination. For quality, Acme offers the new amplifier in three stages, first resistance coupling, second transformer coupling, and last resistance coupling with impedance leak; as well as three styles of loud speakers that give "reproduction without distortion."

See Acme’s contributions to quality and elimination at any good dealer’s, and send 10c for new Acme booklet, "Power Supply For Radio Sets."

Claude M. Kains
President, Acme Apparatus Company

ACME ~ for amplification
At last! The long-awaited
Radio Amateur's Handbook

with a
GOLD MINE
of radio information
between its covers

A Manual of Amateur Short-Wave Radiotelegraphic Communication,
Written by F. E. Handy, A. R. R. L. Communications Manager, and Published
by The American Radio Relay League

THE HANDBOOK meets and fills the long-felt need. It is at once a manual of approved procedure for the most advanced of "old-timers", a text book on station construction and operation for the average amateur, and the finest introduction to amateur radio for the beginning amateur that has ever been published anywhere. It paints the whole picture of the greatest of modern hobbies, covering everything from so elementary a start as the explanation of what amateur radio is and how to become an amateur, up to the details of construction and operation of the most up-to-date type of amateur transmitter, and the most elusive and complex of traffic-handling procedures. Communications Department questionnaires have shown that the amateur has little idea of how his apparatus works. The Handbook explains it, in "theory" made understandable. Data and complete constructional information on the building of many pieces of apparatus are given.

This handbook is the Guide to Amateur Radio—"Ye Compleat Hamme". There isn't a person in the world of any interest whatever in amateur radio who will not profit by owning this book. We think that every amateur in the world should want a copy. It's the biggest dollar's worth that ever happened.

READ THE HANDBOOK AND INCREASE YOUR RADIATION!

Ready in Late October—Orders Accepted Now
Send in Yours Today—$1 Postpaid Anywhere

AMERICAN RADIO RELAY LEAGUE
1711 PARK STREET
HARTFORD, CONN.
Here's the oldest and newest—

How old is yours?

That black little package of pitch and cardboard is the Granddaddy of all dry "B" batteries—the first of its kind in the world.

A lot of old-timers will remember it, and for the next few months we are going to publish on the back cover of Q.S.T. the call of every "ham" who will send a radiogram, a card or letter telling how many years he has used our batteries. Send yours in today. Address it to Burgess Battery Co., Madison, Wis.

Burgess Batteries are used in these "ham" stations

<table>
<thead>
<tr>
<th>Godley</th>
<th>1XAM</th>
<th>4EH</th>
<th>6CTP</th>
<th>8ZT</th>
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<td>8COR</td>
<td>9CYC</td>
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<td>4DM</td>
<td>6BSC</td>
<td>8ZG</td>
<td>9CFK</td>
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The Month with Expeditions

VOQ

OPERATOR ED MANLEY of the Putnam Arctic Expedition reports that almost all of his traffic this last month was handled from North Upernavik through 6CP, the station of Mr. J. R. Miller at Hammond, Ind. Contact has been next to perfect even when VOQ used the low powered emergency outfit provided with Eveready B batteries for plate supply. Signals from the Schooner Morrissey of the expedition have worked from both the twenty and forty meter wavelength bands.

The thrilling story of the week of trouble when the Morrissey was aground a high tide near Whale Sound has long since been in the newspapers so we will not repeat it here. The efforts of every member of the expedition saved the ship and hope had been practically given up. During the time when the Schooner was on a submerged rock the radio outfit was not used much, as the batteries could not be recharged and it seemed best to conserve the power supply of the main outfit until the very last. It gave a comfortable feeling of security unknown to operators a decade ago to have available the means of communication with friends. It did not become necessary to make use of either the main or emergency sets to call for help, but everything was on hand with which to do so if the party had had to abandon ship 1,000 miles from the nearest settlement where help could be secured.

A radiogram sent A.R.R.L. Headquarters by Manley contains a list of amateurs worked up to August 22. This list is quite able to speak for itself. Practically every part of the country is represented. Manley says that in three trips made from Upernavik to Whale Sound results have been duplicated except for local disturbances. North of Cape York the signals fell off noticeably, VOQ getting out best from Melville Bay.

17D, 1FL, 1AAC, 1PA, 1HJ, 1CMP, 1BQK, 1ACI, 1AAY, 2BNZ, 2CRB, 2AEV, 2N7, 2N9, 2DO, 2VO, 7DO, 7N7, 7K, 7AIQ, 7SEW, 7SAJN, 7SAE, 7BQG, 7DQ, 7DQJ, 7ZT, 9KT, 9C7G, 9BZK, 9C9P, 9CQF, 9BK, 9CBE, KGBB, VYG, DG7x1.

Since August 22 when Miller (6Q) left his station for a month's vacation in the West, the Morrissey has been coming farther south. The usual quantities of traffic and press have been put through 2N7, 1CCZ, 2AGQ, 3AHA, 2AAN, 2TOU and 2C7H. Although 6CP will not be on the air again until the week of September 1st, there is none of the old experienced contact. Dozens of stations are ready standing by and easier to take traffic.

2NZ thought he might stay off the air for at least a couple of months after his strenuous watches with KEGK, but he is back and hard at it again, keeping a daily watch on the hook at VOQ between 10 and 11 p.m. E.S.T. A thousand words of press have been handled in two weeks. Sometimes 2NZ and 1CCZ copy together to make repeats unnecessary. With itself, practically the only traffic on one occasion, Hendricks of 1CCZ took the press on schedule and QSked to Strout on a later schedule. ADS tried to give Manley a lift on some of the traffic on one occasion but his pet power leak started and he was forced to QSK. 2ACQ reports that VOQ is on every night after 9.46 p.m. E.S.T., and that VOQ usually works on 37 meters. 1AAY, 4C4Q, 3M7, 4JS, 5ADY, 9PT, 9CET, 9CKS and 9DCK all report VOQ very good. There is sometimes a "futtery" D.G. note but not often bad QSS. The sign have the wobbly CW characteristic of any small ship when at sea. The operator of 8FJN copied VOQ on a ten foot indoor antenna August 1 when she was at Whale Sound.

WNP

The MacMillan expedition contact has been good, also. 12K and 1AAY still take most of the messages for New England. Most of the Chicago traffic went through these eastern stations up to September 1st. WNP hooked 9CE5 in Chicago. 12K handled over thousand words up to September 7th in 227 official messages. All the messages in his file make a very complete and interesting story of the expedition. 12K's message tally shows 3449 words sent and 9571 received (not to mention the various service messages). 1AAY handled about 182 messages with expeditions, looking schedules with both WNP and KGBB. About 2500 words per week went through 1AAAY. Messages for Maine and Illinois points were forwarded by radio via 1B1IG and 8AAW. This month the Bowdoin and the Sachem Third are on their way south. As we write, it is expected that the Bowdoin will dock at Wiscasset, Maine, about September eleventh. The photograph we show this month is that of 1AAY at the Cambridge, Mass., location. This outfit connected with WNP before being set up at the summer QRA. The expedition contact from 1AAY mentioned this month was all performed from Holyoke, Mass. Gold tells us that although this is probably the last of the work for WNP and KGBB, he is planning to carry on from Cambridge again when he gets back there this fall. He says that the M.E.T. location throws an R7 signal into Brazil. When there isn't much studying to be done, he stands a good chance of connecting with the Roosevelt Memorial Expedition (GMD), whose schedules were given here last month.

9C7G in Chicago handled several messages with WNP and is keeping a schedule for further traffic. 2CYX took a couple of WNP messages and forwarded them by radio, also making a schedule. 1FL took some from WNP through bad QRM but had better luck later in the month, taking ten messages totaling about 700 words from KGBB. He says that KGBB has the same note as WNP but without the wobble to it. 9DNQ agrees not to this. In his report of working KGBB he reports the signals very unsteady. Probably both are right and 9DNQ worked the expedition at SEA. 1CJ, 6BMW, 6CN7, 1BMS, 6BMH,
NAVY DAY TELEGRAPHIC BROADCASTS

NAVY DAY will be officially observed on October 27, just as last year, under the auspices of the Navy League of the United States, with the Navy sponsoring, and the celebration and lending all possible assistance. Many amateurs belong to the Naval Reserve and some of us have enjoyed a pleasant summer cruise, getting fine experience afloat with naval radio equipment. Others have been stationed at land stations for a few weeks, while still others have participated in radio drills from some of the stations located at the Headquarters of a Naval District.

The program has been arranged carefully so that each reader of this QST can have a chance to make up for QST from the names of operators to A.R.R.L. Headquarters. The more messages you will be able to send yourself in WNP put on some radiophone entertainment, and hearing some of the best records by copiers will be a real thrill to many of us.

However, Navy Day broadcasts give us all an opportunity to show interest and pride in our Navy.

Last year the Official Relay Stations received advance notice of Navy Day broadcasts. Many of them entered into Navy Day competition and were placed on the air and the A.R.R.L. the Navy Day Honor Roll printed in December QST. The operators who made the record by copying all or nearly all of the several different broadcasts received a letter of commendation from the Chief of Naval Operations. This year we have the schedules for QST and everyone who reads this announcement is invited to enter in the competition.

The Secretary of the Navy, Commander in Chief of the Battle Fleet, Commander in Chief U. S. Fleet, Commander of U. S. Naval Forces in Europe, Commandant of the Seventh Naval District, Lt.-Comdr. WM. J. Lee U.S.N.R., and Lt.-Comdr. F. H. Schnell, U.S.N.R., operating the two Meier Stations of the Naval Reserve, and Lieutenant-Commander Maxima U.S.N.R., and President of our A.R.R.L., will all have special messages for amateurs that will be released on Navy Day from different stations at different times in accordance with the following schedules:

<table>
<thead>
<tr>
<th>TIME</th>
<th>Station</th>
<th>Call</th>
<th>W.L.(m.)</th>
<th>Freq.(km)</th>
<th>E.S.T(GMT)</th>
<th>Mes</th>
<th>From</th>
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<tr>
<td>Key West, Florida</td>
<td>NAR</td>
<td>9110</td>
<td>9, 10</td>
<td>8:00-9:20 p.m.</td>
<td>1000</td>
<td>Comdr. 9th U. S. Forces, Europe</td>
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<td>Washington, D.C.</td>
<td>NKP</td>
<td>9090</td>
<td>8, 9</td>
<td>8:00-9:20 p.m.</td>
<td>1000</td>
<td>Comdr. 9th U. S. Forces, Europe</td>
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<tr>
<td>Winter Park, Florida</td>
<td>NRRG</td>
<td>9634</td>
<td>9, 10</td>
<td>8:00-9:20 p.m.</td>
<td>1000</td>
<td>Lt.-Comdr. W. J. Schnell, U. S. N. R.</td>
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<tr>
<td>USN Memphis, in European waters</td>
<td>NISS</td>
<td>9770</td>
<td>9, 10</td>
<td>8:00-9:20 p.m.</td>
<td>1000</td>
<td>Comdr. U. S. N. R.</td>
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<tr>
<td>Madison, Wisconsin</td>
<td>NRI</td>
<td>7000</td>
<td>9, 10</td>
<td>8:00-9:20 p.m.</td>
<td>1000</td>
<td>Lt.-Comdr. F. H. Schnell, U. S. N. R.</td>
<td></td>
</tr>
<tr>
<td>Puget Sound, Washington</td>
<td>NPC</td>
<td>8110</td>
<td>9, 10</td>
<td>8:00-9:20 p.m.</td>
<td>1000</td>
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<td></td>
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<tr>
<td>San Francisco, California</td>
<td>NPG</td>
<td>9070</td>
<td>9, 10</td>
<td>8:00-9:20 p.m.</td>
<td>1000</td>
<td>Lt.-Comdr. F. H. Schnell, U.S.N.R.</td>
<td></td>
</tr>
<tr>
<td>Hartford, Conn.</td>
<td>IAW</td>
<td>7002</td>
<td>9, 10</td>
<td>8:00-9:20 p.m.</td>
<td>1000</td>
<td>Lt.-Comdr. F. H. Schnell, U.S.N.R.</td>
<td></td>
</tr>
</tbody>
</table>

Let's show the Navy Department that we are able to do the usual good job of everything we undertake. In about two hours and a half, all the messages will get on the air. How many will you turn in at Harford for the first prize? Be sure to have the proper wavelengths on Navy Day, October 27, copy what you can, and mail it the next morning to A.R.R.L. Headquarters, Attention of the Communications Department. This will show us that you have tuned ears, that your wave-meter is accurate and your tuner sensitive, and it will enter you in the Navy Day competition, giving you a place on the Honor Roll.

QST FOR OCTOBER 1945
Army Notes

2ND CORPS AREA—The organization of Auxiliary Radio Nets is progressing very well, everyone showing an interest and co-operating in every respect. It is always be clear to everyone by now that any amateur can belong to the Naval Reserve as well as to the Army Radio Nets without any obligations required within the structure of service. Amateurs who have hesitated about applying for appointments due to belonging to the Naval Reserve should know there is nothing to prevent their station being part of an Army-Amateur Radio Net at the same time.

2SC keeps daily schedules between six and twelve P.M. to ensure close control of Governors Island. All A-A work so far as possible will be conducted on wavelengths between 75 and 78 meters in this Corps Area.

Following is a list of Stations which have been formed together with the principal and alternate N.C.S. in charge:

Brons, 2GYX (P); 2APV (A); Manhattan, 2EV (P); 2ATX (A); Brooklyn and Staten Island, 2PF (P); 2CLA (A); Long Island, 2AKV (P), 2KG (A); Eastern New York, 2PF (P), 2AGM (A); Western New York, 2JH, 2SAT (A); New Jersey—Newark, 2BAA (P). The N.C.S. are organizing the stations which have been appointed in their respective nets. All amateurs assigned to these nets are now receiving instructions on procedure. Get information from your Net Control Station or send requests for information and applications for appointments to Army Amateur Representative, Mr. David Tailey, 2PP, 2222 Ave. O, Brooklyn, N. Y.

4TH CORPS AREA—A big proposition was put over in a big way by amateurs in the Fourth District of New York. The National Guard of Georgia went on its regular annual encampment at Tybee Island, Georgia, 4RM, 4PC and 4RQ were among them in keeping the camp in communication with Headquarters at Atlanta. At Atlanta, 4SI handled the work very capably, making possible all the messages between the two stations. A 50-watt battery in a Hartley circuit was supplied by a 750-volt dynamotor. Six and twelve-volt storage batteries were used for the rest of the equipment. An arriving camp at 5 A.M., the tent was put up and also the 20-foot guttapercha mast. By 10 A.M., there were reports in from both stations and on listening to the pre-arranged hourly schedule with 4SI, the gang were elated to hear him calling fractally. Answering back brought no report of opening of life's darkest moments. After further unsuccessful attempts the gang held a consultation, deciding that as the rainpipe was a real established machine, the radioplane was jumping over Atlanta due to "skipped-distance" effect. 4RM was left at the tent while the others ate chow and decided to check the ground connection on the transmitten (the high end was about 12 feet off the ground). Right after the noon schedule, came the first successful QSO using this equipment. Cobra cables, a better understanding was strong between two telegraph poles which brought in better reports. Regular schedules were kept with 4SI, only two being missed during the whole period of encampment. Several antennas were tried and some of the schedules were kept on 80 meters where less trouble from fading was experienced.

A total of 542 messages were handled in both directions, the messages being delivered by telephone in Atlanta and answers returned on the next schedule. The 400-watt dynamotor, designed to the Chief of Police caught a man who had stolen a lot of money and taken the train to Atlanta. Two for Fort Screven were also handled, 14 messages being sent and answers returned over the same route when the long wave set was unable to get in touch with Washington, D. C. All supplies were ordered by radio. The business was handled, as it was found that radiograms got replies in between ten and twenty minutes time, while the Western Union took about twice that time to do the job. Everyone concerned is to be congratulated on putting over a real worthwhile achievement.

5TH CORPS AREA—Stgt. Stark of the 38th Signal Company, National Guard, at Camp Knox, Ky., tells us that in putting 90X on the air, employ Coca-Cola bottles which were used as insulators and the set got out to Australia and the Philippines the first night.

9ADK, 9CPQ, 9BCC, 9DUC, 9BCA and 9EAI are all at Camp Knox operating at 9GK regularly.

FR5 is the U.S. Army experimental station located at Fort Meade, Canal Zone, and operated by H. S. Cronkhite. FR5 may be heard right below the 40-meter band and Lieutenant, Dowman, Signal Supply Office, certifies that all cards received will be promptly acknowledged.

6TH CORPS AREA—Most of the stations in the Corps Area Net made a good showing for the month. Each service station was only at its best points where station-owners were away on vacations. At Milwaukee, 9DTS gets the gold star for most consistent service with 4IBG and A-C. 4G-9DQ gets the gold star for consistency with 9ZV right on his heels. Short-wave stations were put in operation during the summer at Camp Green and Camp Shorts. 9DOX and 9AKY, managed to QSO 9AFF with several messages from these points but had a difficult time of it. 8BMM at Detroit tried to keep on schedule but had trouble in getting in touch on the scheduled nights.

The net stations at L'Anse and Lansing, Mich., handled their traffic through 9AW, using 40 meters without any trouble. The official traffic included a number of coded messages. 9AFF wants to be able to report every Net Station on the job by the time of the next report. It is hard to tell when another station will want relief but with everyone who volunteered his station for an Army Amateur Radio Station doing his duty, more messages can be handled through the various Corps Area Nets without the various Net Control Stations or their alternates.

7TH CORPS AREA—The new 9BAY is nearing completion and will be the Net Control Station of the Minnesota Army-Amateur Net. A 100-watt 500-watt outfit is used at 9BAY, and CW and phone set on 80 meters. Four operators on duty five nights a week will roll up the message figures. 9BAY is located at Army Armory building 3, 17th and 14th Streets, N.-S. N. T. M. Cord and Knock of 9BAY, together with the 9BEZ and 9DNOX, did some notable work during the National Guard encampment. (July 25-Aug. 3).

9BAY using 15 watts out and an epenpin antenna was installed in a tent. In a tent, one portable transmitter and receiver was built into a suitcase 16" by 12" which was carried everywhere. Including all batteries, two head-sets, antena, and message blanks. A UV201A tube was used with Ford-coil power, giving a signal of 890 in camp and on one occasion covering 500 miles in daylight.

On several days, the portable was taken out in the field with the company and communicated with camp stations up to five minutes. During these periods messages were put through in next to nothing, flat. The officers in charge were highly enthusiastic at the good and excellent efficiency obtained and the four "ops" received many compliments for the good work in this Corps area.

A Naval Reserve Communication Division similar to that formed in Florida by 4XE is now being organized in the 3rd Naval District. Drills start around Oct. 26th. All Communication Reservists in the states of New York, Vermont, Northern New Jersey and Connecticut are requested to contact the Third Naval District, 1711 Park St., Hartford, Conn., for further details.

In the First Naval District the organization of a Communication Division of the Naval Reserve is taking shape with tactical calls and Naval procedure is soon promised. 1KL, 1ATV, and 1BIG are the charter Maine members and when three more men have been enlisted from Maine on New Hampshire, the drills will start. Write the Maine Section Communications Manager, 13 East Crescent St., Augusta, Maine for details of the works planned.

If you live in Massachusetts get in touch with Mr. John M. Wells, Z2D, Southbridge, Mass. 1BIG and 1ZD are commanding officers in the vicinities. Lt.-Cmdr. Charles M. Kelly, Jr. U. S. N. R. is organizing the entire First Naval District so that regular radio drills will be conducted. It is expected that the state of Rhode island will be taken care of by a separate unit with Headquarters at Providence.
Club Activities

CALIFORNIA—The Southern California A.R.R.L. picnic was partly covered in these columns last month. We forgot to mention the novel fish-finding contest which was a feature of the picnic. It ended in a controversy as to whether frogs were fish which was not decided until 7SI awarded the $5 water to 6CMS. 60C placed 2nd with a $5AP tagged an apple eating contest which was won by 6JT. 6RM got the $500 cycle A.F. Transformer by winning the bun making contest. 6BLY gave two YL’s life memberships in the Los Angeles Radio Club, and after an argument between 6BQR and 6CMQ for the honor of escorting Miss 7SI home the party went home tired but happy.

The Modesto Radio Club will award their Wouff Hong Trophy to the best sixth district station to be chosen at the coming Pacific Division A.R.R.L. Convention.

The Santa Clara County Amateur Radio Association will soon be a new partner of the Federation. Probably a 250 watt will be used—call 6SV. The station will be on the air nightly, an amateur superstation with a corps of trained operators.

The San Francisco Gang got behind the Radio Show at San Francisco and put A.R.R.L. over in great shape. Heinz and Kohlmoos loaned a fine 100 watt transmitter and a receiver and all that was left to do was install all the apparatus in the booth that was obtained courtesy of Mrs. Longeman and Mr. Heinz. 6BAA nearly landed in the jug and had special position ringing him all around the show. However, due to his native hospitality, he succeeded in eliciting the mob and breaking open the sealed doors and boost antenna wire out into the great open spaces. The rest was easy and traffic began to move as the first visitors trickled in. The station was licensed under the call 6CP for the week of the exhibit. A booth was set up in the week and some of the local transmitters assisting 6CP are still hot trying to clear the hook like old times. Code cards were distributed to all visitors at the booth and a bunch of A.R.R.L. supplies were sold, The radio station and all the various signs and photos in the booth made a hit with visitors and let everyone know about the A.R.R.L. and amateur radio in general. Among many prominent visitors was pigpen and kingpin of them all. Don Wallace, 92T-6AM.

CONNECTICUT—At a recent meeting of the Twin City Radio Club, S.C.M. Nichols gave an interesting talk on a new feature of the Wards Island. It ended in a suggestion the club members unanimously elected 1BHFM as Route Manager of New Haven County. Plans have been devised for allotting different territories to the club members whereby schedules will be givenstations throughout New England. 1BHFM will appreciate the cooperation of stations who can arrange schedules with the 20 New Haven and West Haven traffic stations. Write him. Letters are now going out to arrange some of the schedules. Operations began in earnest September 1st. Each member has been supplied with a blueprint showing all O.R.S. in Connecticut and when all the schedules are in operation, we hope to reproduce the map here. While call letters represent 40-meter stations and red is used to indicate 80-meter stations on the operated cards are cordially invited to write the Secretary. Communications regarding schedules with a view to making relay work more interesting and effective are also welcomed. Address Mr. R. H. McKendrick, 46 Center St., West Haven, Conn.

ILLINOIS—Mr. Lloyd Gendle, chief up of the Burlington Expeditions, and formerly of Bellevue, D. C., recently addressed the Chicago Amateur Radio Association, giving a very interesting story of his expedition and telling all about his experiences with crystal controlled transmitters. The attendance at summer meetings has averaged about 35. The fellows all had a good time at the last Purdue meeting.

INDIANA—The Indianapolis Radio Club had a picnic on Sugar Creek, 50 miles from Indianapolis and 5 from Louisville attended. The portable transmitter kept the gang in touch with the outside world. All had a big time and will QTA again this fall.

MICHIGAN—A representative bunch from Southern Michigan and Northern Ohio met at Monroe, Mich., (half-way between Detroit and Toledo), in mid-July, enjoying a fine dinner together, having an FB get-together meeting. 8ANE, 8AVX, 8AVB, 8BN, 8BN, 8BD, 8BD, 8BC, 8SB, 8UC, 8CEP, 8COW, 8DOR, 8DOR, 8DOR, 8SWO, 8SCV and 8ADZ were among those present. 9DXZ was visiting 8CEP with whom he has kept a schedule for about six months. It is planned to hold further meetings at frequent intervals.

MAINE—The Queen City Radio Club were recently given a clam bake and general good time by the Bar Harbor Radio Club at a meeting held at the steamship wharf by members of the B.H.R.C. and escorted by auto to 1BG, the club’s radio station. A drive to Buffalo was followed and after an inspection of the Navy Radio Station, 1BG, where a 14 inch aerial was set up and an FB clam stew on the beach. 1BBD was the most appreciated steward, former C.P.O. at NBD during the war, and a worthy host. 1AQL, president of the Q.C.R.C., was awarded the championship for slowing away the stew. A trip around the island ended with an inspection of the compass station at Otter cliffs.

NEW YORK—The Radio Association of Western New York will again, as in the past two years, have a booth at the Radio Show in Buffalo, Oct. 18th to 20th, for full details. Come and bring someone with you, QSL for QST.

TEXAS—The Third Annual Hamfest of the Bexar County Radio Association was, as usual, a huge success. The gang visited Fort Sam Houston, the Bell Telephone Company’s plant in Buffalo, Oct. 16th and October, 9WAB and several amateur stations, including 6HE. Visitors from all over the state were on deck and made the most of the chance of the year to inspect a ham shack. 6HE’s visit was sponsored by Fred and by the Radio Supervisor. The Army-AMateur Prize Contest was discussed by Col. Gibbs, C.S.O., of the 5th Corps Area. The Radio Supervisor’s program was explained by S. C. McSahm, 5GW. A QW contest, a code speed contest and a drawing contest were part of the program. Octobreer movies and movies for the gang. Capts. Stoner and Ellis of the Signal Corps and Mr. L. D. Wall, Army Amateur Representative, were no strangers to Fort Sam Houston. The tables were equipped with benches and food to serve those who find code easier than the spoken word. The radio dealers of Fort Worth and San Antonio generously provided prizes for the contests. The event will be remembered as a pleasant one. San Antonio hospitality is a splendid index to A.R.R.L. fraternalism and friendship.
YOur attention is called to the Fall schedules of the League’s Official Broadcasting Stations. The official stations have agreed to observe the wavelengths and scheduled times of transmission, making it possible for you to select a station, to listen for him at a certain time and on a certain wavelength, and to receive the Official Broadcast. A number of stations send the broadcast so you may “run across” a broadcaster in the course of your ordinary listening. We hope to add more complete list for publication in November QST and to announce a competition at a later date to determine the most consistent broadcaster and to find where and when the broadcast can be copied. As soon as enough additional Official Broadcasting Stations have been appointed by the S.C.M. to make a contest profitable, the details will be announced.

Each week, the latest news of expeditions, schedules of tests that are being run and other important amateur news of the hour are made into a broadcast which is sent to operators of Official Broadcasting Stations weekly. The broadcast has a slighter later than the mailing date so that the material to be sent can be in the hands of each operator at the beginning of the week of release no matter in what part of the country he is located.

If you have a station that gets out well and feel that you can send the broadcast regularly at one of the advertised days, please let the head of the station know by all means apply to your Section Communications Manager (his address is on page 3 of each QST) for appointment as O.B.S. giving him the information above in particular, on the 18-21.4 and 150-200 meter bands more stations are needed in all parts of the country, especially in the seventh radio inspection district.

The operators of the various stations are willingly giving up part of their time to this work and will appreciate it if you will send a card saying that you copied the Official Broadcast from them on schedule.

O.B.S. are requested to send the broadcasts slowly enough so that they can be copied by beginners and with steady, even keying. A number of folks on the West Coast copy 6JX’s broadcast regularly one day a week, and a number of people are thrilled to listen to their favorite broadcasters right along for code practice. We will be pleased to receive any suggestions regarding the convenience of making this service through the Official Broadcasting Stations of still more interest and value to you. Only thus can we improve.

**Wavelength (Local Standard Time)**

<table>
<thead>
<tr>
<th>Call</th>
<th>Days of Transmission</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Mon., Fri.</td>
</tr>
<tr>
<td>1BEP</td>
<td>Sat., Sun.</td>
</tr>
<tr>
<td>1BFCT</td>
<td>Mon.</td>
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<tr>
<td>1BIC++</td>
<td>Wed., Fri.</td>
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<td>1BQD</td>
<td>Daily</td>
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<tr>
<td>1CPJ</td>
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<tr>
<td>1GA</td>
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<tr>
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</tr>
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</tr>
<tr>
<td>6CT</td>
<td>Mon., Wed.</td>
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**Official Broadcasting Stations**

To All A.R.R.L. Members of the Southern Minnesota Section and the Dakota Division

Mr. D. C. Wallace, 9ST-XAX, your newly-elected Section Communications Manager, has been forced to resign due to his changing location to the Pacific Coast where he already is making plans to set up a big "six" station on the air. Not only will 9ST be missed by everyone but Wallace's change in location will be a distinct loss to the Section and to the entire Dakota Division. Your loss is our gain. Nevertheless that loss will be keenly felt.

Nominating petitions are hereby solicited in order that an election for an A.R.R.L. Section Communications Manager for the next two year term of office may be held in the Southern Minnesota Section in accordance with the Constitution. Five or more R.R.L. members living in any section of the United States or in any foreign country may file nominating petitions setting forth the name of the candidate for Section Communications Manager. The nominees and signatures of the petition must be members of the League in good standing. There is no limit to the number of petitions that may be filed but no member shall sign more than one such petition. The proper form for nomination was shown on page 46 of April, 1926 QST. All such nominating petitions must be filed at League Headquarters, Hartford, Conn., by noon of Feb., 23, 1926 for the petition to be valid. Members are urged to take initiative and file nominating petitions immediately for the man of their choice.

F. E. Handly, Communications Manager.
More messages were handled in August than during any other month of the year. By virtue of operating a set eight hours per day, keeping 15 schedules on two wavelength bands, he rose from 7th to 1st by the end of August. The percentage of total messages handled by each Section is shown in the summary of the month's work. By comparing the percentages of the different Sections, the relative effectiveness of each Section is shown on a message-handling and reporting basis. If the percentage shown opposite your name under "M.SGS" is much greater than shown under "M.SGS" it means that some of the following things need to be done:

- Dead ORS need to be cancelled.
- More live stations need to be appointed.
- Message lanes need to be formed covering important points in your territory. More schedules can help.
- Perhaps the ORS need to be given twice the number of messages to handle. More ORS may be needed.
- Perhaps the ORS need to be appointed in such a way that one ORS can handle more messages. If your Route Managers have been appointed they can take steps to improve this situation.
- If the messages are being handled all right after all, it is possible that the reports are not coming in as they should—which means that some letters need to be written. E.C.M. should make up these reports for Headquarters.

One from all the reports received for O.S.T and the other one on the progress of the organization from the report. The Manager sends his S.C.M. on his success in lining up scheduled routes by radio.

The different Sectional Communications Managers are being appointed. Calling YOUR part to keep your Section and Division a leader. Do you stand higher or lower than last month and what are you doing about it? How do you expect to stand next month?

If every station owner who sends these words will see that every message is handled or passed along promptly and report his good work, we will be able to show 100% delivery in the National scheme of things in a short time!

The problem of message RELAYING and DELIVERY must get some serious attention if our general service is to be one of which we are proud. The reports show that messages going over regularly scheduled routes get through in 100% and 100% accuracy. The figures show that there is plenty of traffic to be handled. More individual responsibility regarding prompt and accurate delivery will bring the results we want. PLEASE DO YOUR PART, O.M.

Messages received should always be delivered immediately (a) by telephone, (b) in person, or (c) by mail if no other means of effecting delivery is available.

Never accept messages which cannot be handled or delivered without informing the chief filing the message of the circumstances.

Keep the hook busy by handling traffic on schedule days.

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**TRAFFIC SUMMARY BY SECTIONS**

More messages were handled in August than during any other month of the year. By virtue of operating a set eight hours per day, keeping 15 schedules on two wavelength bands, he rose from 7th to 1st by the end of August. The percentage of total messages handled by each Section is shown in the summary of the month's work. By comparing the percentages of the different Sections, the relative effectiveness of each Section is shown on a message-handling and reporting basis. If the percentage shown opposite your name under "M.SGS" is much greater than shown under "M.SGS" it means that some of the following things need to be done:

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DIVISIONAL REPORTS

ATLANTIC DIVISION

EASTERN PENNA.—SCM, H. M. Wallace, 84Q—The usual gang are on the job. Reports came through in fair shape, but many old ORS's still hold out. New appointments have been made. If you don't have your new one, you don't have any. All old appointments are now QSKed. A very few are on the inactive list. The SCM believes that most deserve an ORS, but reports simply must be had in order to carry on. It is not too late to stage a comeback. Get busy, fellows! ORS's are in and you will be taken care of if you show the proper spirit. No applications have been received for O.S., G.A.T, etc. How come?

The ORS snappers hold the lead with over 70% of the traffic. 40 M struggled through with about 20% and those on both bands had 10%. 32M is the only band you will hear from more company, OM. The SCM and a few of the old timers expect to get back on 200 for a little old stuff—nappy work—rag chewing—CQ—less calling. All those who can pull 20 per down with QSZ, are invited to come along. If you are not an old timer, you will get a new thrill—you anyway?

SCMO gave 8EU a chase this month. 8CD8 leaves us to join the Western N. Y. gang for the winter. Sorry, OM. 8SB7 reeled a gang out, aided by a new reed in the fair shape. Official ORS's received 111 traf.

(Sunday Ball scores? H11) 3AIX jumps out Police 'Flyers.' 3A9D is on the job early mornings. 8AVK moved to Montoursville but kept the same old QSK. 8GZ7 almost made the HPL this month. 3BTV is busy. 3LW continues good DX, but not much traffic. 3AI9 has a new antenna. 4SM is south last month but had a nice time. 3APQ got on 40, but must be making a good job of rebuilding—he is still at it. 3QY blasted his tubes. 3ZS is home again and ready to bust out. 3VP has bad W3, 8BLF keeps going. Bank tube gave 8BLF trouble again. A load of work kept 8BQ off the better part of the month. A new 60 watter kept 8HCL off. A bottle went west for 8BLF. 3ZQ is iterative but leaving for school. A last minute report from 3Z0 carries a nice total—and saved his ORS. H11 Power leaks raised thunder with 8BSZ. 3BVZ is DX'ing but promises traffic next month. That's better, 8Q7 'canned' his YL—again. Mexico of 3BLF keeps sked with another Mexico—3BBVZ. Family affair?

The op of 4W7 says their "vacation" is over. Any time, OM.

IF ANY OTHER SECTION HAS A GREATER NUMBER OF BRASS POUNDERS THAN THIS SEVEN of 'EM TALK UP, DON'T LET 'EM RED US GANG—KEEP MILES AHEAD!!

Traffic: 8EU 273, SCM 267, 3Z0 172, 8BFE 161, 8BSZ 127, 8CW 122, 8CCQ 115. 8SM 92, 8CGZ 90.

3AWT 36, 3AI9 37, 3BLP 32, 8CQZ 17, 3VF 16, 8CD8 76, 3ADE 73, 8DIR 69, 8AVK 60, 8AVJ 50, 3AI9 16, 3AI9 15, 3AI9 13, 8MW 12, 3AI9 12, 3AI9 7, 3BFQ 1, 3BP9 6, 8BHA 5, 3BQF 4, 8BVE 4.

SCMO 32, 3AI9 37, 3BLP 32, 8CQZ 17, 3VF 16, 8CD8 76, 3ADE 73, 8DIR 69, 8AVK 60, 3AVJ 50, 3AI9 16, 3AI9 15, 3AI9 13, 8MW 12, 3AI9 12, 3AI9 7, 3BFQ 1, 3BP9 6, 8BHA 5, 3BQF 4, 8BVE 4.

SCMO 32, 3AI9 37, 3BLP 32, 8CQZ 17, 3VF 16, 8CD8 76, 3ADE 73, 8DIR 69, 8AVK 60, 3AVJ 50, 3AI9 16, 3AI9 15, 3AI9 13, 8MW 12, 3AI9 12, 3AI9 7, 3BFQ 1, 3BP9 6, 8BHA 5, 3BQF 4, 8BVE 4.

3AI9 37, 3BLP 32, 8CQZ 17, 3VF 16, 8CD8 76, 3ADE 73, 8DIR 69, 8AVK 60, 3AVJ 50, 3AI9 16, 3AI9 15, 3AI9 13, 8MW 12, 3AI9 12, 3AI9 7, 3BFQ 1, 3BP9 6, 8BHA 5, 3BQF 4, 8BVE 4.

3AI9 37, 3BLP 32, 8CQZ 17, 3VF 16, 8CD8 76, 3ADE 73, 8DIR 69, 8AVK 60, 3AVJ 50, 3AI9 16, 3AI9 15, 3AI9 13, 8MW 12, 3AI9 12, 3AI9 7, 3BFQ 1, 3BP9 6, 8BHA 5, 3BQF 4, 8BVE 4.
SCNX has been rebuilding and is ready for traffic now. 90HX is now putting a new station on 40. 981K states that SCBM will be going strong as he is a new operator just coming on the circuit. 9DME expects to work higher waves in account of QRM. 9DOS has been rebuilding his receiver. He also put in a Kenotron rectifier. September promises to be a busy month from reports as the gang are sure busy getting their new stations into shape. 9NY started the New York prize district in the USA. 8P8 was in N. Y. C. for a few hours, 2ZL, 2BRB, 2PF and 2UP made his visit worth while.

**SPECIAL NOTICE!** 8UL becomes hero. He saved two lives from drowning on his vacation in Canada.

**Traffic:**

9DHX 697, 8SLP 185, 8BM 96, 8AOB 61, 8QVJ 41, 8CH 48, 8AHH 65, 8AEG 23, 8CVP 17, 8ADG 10, 8ADE 7, 8BGN 7, 8ABG 2, 8SCN 3, 8AKS 2, 8HJ 2.

**Western Penna.—SCM, G. L. Crosseley, EXE—18 cancellations in this Section in effect Sept. 1 for failure to report to the SCM for three consecutive months with four pending. After a little weeding the SCM believes that we will have a 100% Section. The traffic report for the month was very light because of the hot weather and storms causing QRM, but there is outlook for a pick-up in the near future. The SCM has all stations that have made application for ORS previous to this and have heard nothing from them to apply again to him and action will be taken if the records the SCM are not complete for the time previous to his taking office.

8CNE, 8CLV, 8CIX, 8SON, 8DOQ, 8SRH and 8CMH report off the air due to QRM and bad. 8SNO has been off the air due to serious illness of his owner. He is taking care of himself and recovering, OM. 8SHE is off the air because the BCI can read his transmission by flicker system of the lights. HI. 8ACN, 8CNEX, 8Y, 8SIQ and 8GJ have been off the air due to rebuilding. 8XIE is still at the same process of rebuilding. 8CES and 8DHW are now operating with 201A while 8SHE tried a Marconi and went back to the 8BCEY-8TW. While changing his antenna system and hopes to make it better. 8GK has put in a kenotron for plate supply. 8AGQ had a hamfest at his station last month. 8GZ has been experimenting with a Jenkins machine. 8ASD, 8DHN are new stations in the Section this month. 8ALF, 8SGI, 8CFO, 8JW, 8GJ, 8VPE, 8DOY, 8AXD and 8ABM are helping 8SGI and have been doing the best of summer work. 8ABM and 8CWT claim there is plenty of DX but not much traffic. 8CGP is using a crystal receiver. He reports he is having some success using a 201A on 40 and 80 meters. 8ZD has a crystal controlled M. O. in the 8BCEY-8TW and has a schedule with a 12-meter signal controlled on 37.5 meters. 8BSG, 8DOB and 8BYK are on 80 meters on tone. 8BRC and 8SHN are on frequency. 8SRC is on 17 meters and would like a few of the hams to call him on 10. He is using a plug-in transmitter for bands changing. He handled PX on the Florida Hurricane this month. 8SHE's receiver at 8XX were at the fifth Ohio State ARR Convention the weekend of Aug. 20-21. That was some occasion and 8XXS com. a gang of hams (kids 8 yrs. old) turned loose in the amusement park such as Canoe Beach with all the amusements free gratis. Did we have fun. Well guess once—that's all.

**Traffic:**

8SEW 27, 8BBL, 8SKG 5, 8AGO 8, 8SF 87, 8AKD 2, 8CES 3, 8BRE 1.

**Central Division**

**Indiana—SCM, D. J. Angus, SCYQ—9BPE leads the traffic gang, using 208A on 1000 volts. 82 m. 9DFP has just finished building a new station on 80. He is now QSR from New Jersey to West Virginia. 98XQ works army schedules exclusively. 9bkj put in a new station on 20 and 40. 8SCQ is putting in a new station on 90 and 800 volt MG set. 9BFW has just been appointed RM in Dist. 3 and is with us district controller. 9BEZ is putting in new equipment. 8CMJ put up a vertical antenna but hadn't worked anyone since. 9AEW is building a new station in West Virginia. 9BFZ just finished rebuilding and is going fine on 40. 9DML is a new station at South Bend. 9BEU is putting in a new station on 90 and 40 meter set. 9BHP worked 15 stations after a hilarious time at the picnic of the Indianapolis Radio Club.

9DYT worked 9GX at the Army camp. 9QR changed from 40 to 80 meters. 9BRO's best contact is Madison. In the new 20K we got 9B8K in on 2400 watts. 9H9K has remodeled for 40 meters. 9DHJ put in 2100 watts on 40, 80 and 170 meters. 9B9J worked 9CX at Camp Knox. 9CP is off for a month while taking a trip through the west. 9BSK-9DVS-9ZQ gets out all over the world on a 210, 20 meters and 80 watts. 2AW and 9DMD are going strong on 40. 9DUN perking now. 9ES opened up again at Terre Haute. 9AXO is a new station at Terre Haute trying for an Ohio. 9DODD and 9G5C are putting in new antennas. 9LTA is quite busy getting that district in shape. 9CYW just started and is going fine. 9ASF just got going again with a new shack and pole.

**Kentucky—SCM, D. A. Downard, 9ARU—If you fellows want to get your state out of the rut, each of you will have to do your part. SCM expects to report three consecutive months and—bleoooy! 9QAB means to handle plenty of traffic. He is arranging several schedules and keeping them. 9SNT is on regular schedule with 9DGY. Great CR 18 and says it's the best yet for the short waves. 9AZF, one of Kentucky's YL's, is attending U of K at Lexington, with her aunt, and helping with DX. 9ALM reports having an enjoyable time at Miami. 9EI, ex ADM of Kentucky, paid the Louisville gang a visit August 29th. After visiting the hams around the Fall Cities he, 9QX, 9BRK and 9ARU dropped in on 9WU to try to locate the reason for his failure to get on. When they heard that the 9WU receiver was up on the shelf with the transmitter serving the purpose of RF choke—but the transmitter worked. Didn't stay to see what he was going to use for receiving.

**Traffic:**

9MN 11, 9OX 10, 9CMW 4, 9DTT 4, 9HP 2.

**Ohio—SCM, H. C. Storck, 8BYN—8BPL leads the traffic gang, with a score of NOS for Ohio. 8JU, 8UG and 8CEN just returned from Camp Perry. 8BYN is at Camp Knox now. 9SCB is acting Section Manager for a month and he says not to expect much traffic. In the SCM's report 9SCB has been doing some good DX this month. 9SLP is doing well with his crystal control set. Let's all get together next month and bring up the traffic total for Ohio. 8QZ has been away so not much traffic handled.

**Traffic:**

9BPL 180, 9BDM 181, 9AEEU 50, 9SQC 47, 9SCQ 188, 9GNA 81, 8GAN 28, 9ASU 27, 9BKM 24, 9VSW 20, 8SY 19, 9ZJ 13, 9GZ 12, 8HJ 10, 8BNA 8, 8AVX 7, 8ZG 7, 8ADA 7, 8SCQ 7, 8BE 6, 8SDK 6, 8DGQ 3, 8PQ 6, 8DGA 4, 8FX 4, 8FRX 4, 8DEM 3, 8DND 3, 8CMH 2, 8SX 1.

**Wisconsin—SCM, C. N. Crapo, 9VD—9EK took an enormous jump this month, carrying off all honors in the state. 9DKT comes second, having consistent schedules with 9EEX and 9TF, and handling Army and Tourist traffic. 9AZN deserves special praise but we cannot say exactly what his total was as his report is not in. 9DOL, therefore, comes third. 9BTF sends a very interesting report of the doings of the gang in his district. He entertained 9DLQ and ex 9MH this month. 9HWO says he worked HF FXI showing that the summit is still alive and wants schedules at 8 PM Tues., Thurs. and Sat. 9R and Cubas are locals now. 9BJY is using a DX210 on 40 meters. Works the all. 9IN just got back from Yellowston. 9AES says that past operating conditions have been terrible in his section for the past month but improving a bit lately. 98B1 is operating on 80 and 40 and still builds. 9APZ hasn't changed his antenna in two months. 9EGW has been repairing and is now ready for business. 9YD is still a VR and has just put in new equipment. 9BOL, 9AGU-9ARM, 8BEM, 9BVA, 9BKR, 9CIU and 9DKA reported but no traffic handled. 9DSE sent in a QST of 144, 9DLD 48, 9BWK 20, 9EMD 18, 9VD 15, 9CPT 12, 9BEK 11, 8BJY 8, 8BAN 7, 9AEU 4, 9AFZ 4, 9BH 8.

**Michigan—SCM, C. E. Darr, 8ZZ—ZST of Pontiac**
is back and will use 100 watts. A new M. G. will make it perk. 9EAY has been away and is at his set again. He is putting in a new radiating system. 9DIV will be back soon after a prolonged vacation. 9FAX has been doing good work. 9GCE has had a new antenna, and in four months has worked coast to coast and to the gulf. 9DLD also has been doing good work. 9CUE uses raw AC on account of his close-in nature. His new Great Gama 18 pulls in the DX. 9FF says a "sink" is the bunk. ND so he has gone back to chemical rectifier. 9AUB of Grand Rapids is doing nice work on 40 meters. 9BOK is back from an extended vacation and is putting in a great vacation state—the traffic reports show it, too.

Traffic: 9CCM 88, 9CEP 44, 9AUB 14, 9ZZ 10, 9EAY 7, 9FAX 5.

ILLINOIS—SCM, E. K. Schreiber, 9AAW—9PU will be off the air this winter due to the fact that the operator is going to college at the University of Illinois. 9PU and 9AOA will operate a new set there under SCM's management. 9EPE has been keeping 9DWN, FB, OM. 9CSB has rebuilt his transmitter, which now uses 50 watts. A vertical antenna sent to Australia finds 9SCN. 9AFF has installed WE 250 watt and is keeping schedules with all the sixth corps Area Army stations. Traffic from Australia was handled. 9BWL has been active and will be appointed an ORS. 9DZX also has been pounding the key consistently this month. 9XCX is rebuilding. Schedules were kept with 9DWN and 9EPE, but 9DIU is not available for schedules with him. A new Hertz keeps the signs poking on 20, 40, and 80 meters. 9APY has kept schedules with 9SCM, 9EPE, and 9AMQ for Scotts Field and the Chicago Daily News were handled. 9DAF kept schedules with 9AGG, 9SBN, 9DAF, and 9ALK worked a C and Z. 9TXN is away on his vacation for the month of September. 9EPE is building the transmitter for winter traffic. 9BHH insulated the transmitter on plate glass and has added 6 more meters to his DX. 9GGA is happy with his new rig and will be going good by Oct. 1st. 9AXF has been working on a new idea and promises to be on records on short waves this winter. 9DAX will be busy with his 3rd harmonic better than a Hertz antenna. 9AAB will be on the air with 100 watts generator supplied and working on 40 meters with 9DFD. 9DIU will have reports with slack this month. 9AHD reports had power QRMs so is going into partnership with 9ATF using 10 watts from 9DIU. 9AAB is happy with BFX and is a copy. He will probably use 100 watts on 40 meters this fall. 9BDI reports he will have 50 watts by Xmas. 9CXM on short DX this month is "IT". 9DGA reports he finds the 3rd harmonic operation much better than fundamental. He mailed 40 messages to Minnesota which points this month. (That's the matter with the Minnesota gang on the air?) 9BIB holds first place in the state in this month, but is leaving for school at Ames, Iowa.

Traffic: 9HIY 163, 9DHW 76, 9EUG 47, 9BHY 23, 9ADS 20, 9AYE 16, 9EPE 14, 9DUG 12, 9CTR 8, 9DZA 8, 9KV 6, 9EFP 5, 9AR 2, 9CP 1. 9DFD 9.

Addendum: 9DEQ has rebuilt his transmitter using new REL inductances and "Zep" antenna. 9BDF just got on the air and hasn't worked any DX yet. 9DMM worked 9AAW and 9WPN, but 9DEQ is off for alterations. 9EFG reported that 9BFF has gone to Washington to take up commercial operating, and his brother will take over his DX. 9GDF is contemplating rebuilding. 9ADF is now trying Vertical Antenna using self-rectifying set with 2.5 60 watt zva's.

Traffic: 9DEQ 3, 9DMM 4, 9DKK 4, 9EFG 3, 9EDF 2, 9ADF 8.

SOUTH DAKOTA—SCM, J. F. Beck, 9BDW—Stations are general rebuilding in preparation for cooler weather. 9DWN is high traffic man by virtue of his schedules and proper use of his power. He now operates on both 39 and 80 meters. 9DZT broke into Australia in addition to a fine message total. 9CJS has rebuilt his set and has 100 watts on 80 and 160 and 15 watts on 20 and 40 meters. 9DIT has an M. O. set. 9DNS the Y. M. C. A. station at Sioux Falls is active. 9CKF is a new station at Philip and 9CJR at Clark. 9BDT is raising his antenna 80 feet and 9DDT are rebuilding sets. 9BBF is the Official Observer.

Traffic: 9DWN 888, 9D7I 174, 9CJRS 44, 9DR 20, 9BDW 20.

DAKOTA DIVISION

NORTHERN AND SOUTHERN MINNESOTA—SCM, C. L. Barker. 9EGU—Since D. C. Wallis, late SCM for the Southern Section of Minnesota, was killed in the April Earthquake at Long Beach, Calif., the reports from the two sections are as one this month, pending election on a new SCM for the Southern Section. It will not be very long now until the new Route Manager is appointed and, as a starter it might be well to suggest that we all start to arrange schedules—one that we will not be able to change, but they can be open to the public a long time. 9ZT is no more so Don will sign 6AM from now on at 109 W. 3rd St., Long Beach Calif. We certainly are sorry to have him leave us, but wish him the best of luck. 9CKI burned out all his tubes and won't be on until the last part of September. 9COO is again rebuilding, putting in a 60 watt set again, using the REL inductances. 9ASW is changing to the 4 coil Meissner and expects to have much more kick to his sign. 9BHO is waiting for batteries for his plate supply. 9BMD has been too busy to build and forgot the 26th. HI. 9COS is still waiting for an adjustment on his H tube. 9SP has been very busy arranging schedules. 9BSF will be in Washington D. C. to take up a radio course. 9GUM works a large antenna on the 3rd harmonic with excellent results. 9BWR's weather conditions the last month. 9CPUK uses a glass panel mounted 7.5 watt and is working on a new rig, with many watts of power, 9CQG is still sending out DX, but on a severe thumping of the tubes against the knees jarred the filament loose from the grid and the tube is as good as ever. (Some filament in that tube). 9DUV is still suffering from fluctuating line voltage but the power company is putting in voltage regulators, which will fix it out. 9BPF has the lighting struck away and fixed 100 pounds out in the usual fashion. 9BAY has a 100 watt set perking now at the Armory and will soon have a 1000 watt knocking out on 40 meters. 9ELE will set up at a place he managed with a 50 watt c. w. and phone set on 80 meter band. 9ADS works on schedules and finds it much worth while. 9BRY handled a lot of traffic direct from FX-1 and the rectifier steps out fine. 9DBW is another who finds 3rd harmonic operation much better than fundamental. He mailed 40 messages to Minnesota which points this month. (What's the matter with the Minnesota gang on the air?) 9BIB holds first place in the state this month, but is leaving for school at Ames, Iowa.

Traffic: 9HIY 163, 9DHW 76, 9EUG 47, 9BHY 23, 9ADS 20, 9AYE 16, 9EPE 14, 9DUG 12, 9CTR 8, 9DZA 8, 9KV 6, 9EFP 5, 9AR 2, 9CP 1. 9DFD 9.

Addendum: 9DEQ has rebuilt his transmitter using new REL inductances and "Zep" antenna. 9BDF just got on the air and hasn't worked any DX yet. 9DMM worked 9AAW and 9WPN, but 9DEQ is off for alterations. 9EFG reported that 9BFF has gone to Washington to take up commercial operating, and his brother will take over his DX. 9GDF is contemplating rebuilding. 9ADF is now trying Vertical Antenna using self-rectifying set with 2.5 60 watt zva's.

Traffic: 9DEQ 3, 9DMM 4, 9DKK 4, 9EFG 3, 9EDF 2, 9ADF 8.

NORTH DAKOTA—9BIV has raised his wave to 40 watts and he qualities at the little expense of having to better QSB. He is building a seven and one half watt fine set for local use. 9BZB will be on the air again soon. 9CRO is going to do work and to be able to handle some traffic for North Dakota. 9BDR is doing good work again and will be on nearly every night. 9CRD will be on 170 meters all the time. His traffic is large and he has taken the care of the telephone central so not much time for set but managed to keep schedules with his folks while away on their trip. 9DKG has been heard on the coast in day time with 10 watts, 9DAE used his continental antenna system, 8 feet high. 9PN is moving to a new home in town and will be off the air for a few days but expects to be on with a better set then.

Traffic: 9DKQ 2, 9EDF 2.
DELTA DIVISION

LOUISIANA—SCM, C. A. Freitag, 5UK—There has not been very much activity in this section due to poor weather conditions and heavy QRM. I believe, however, that we can look for quite an improvement within a short time, as even within the last few days foreign stations seem to be coming in a little better.

5K reports having a schedule with the Motor Ship City of San Francisco, RXY, each morning at 300 W and a new generator and is using two UX210 tubes with an input of 230 to 250 watts.

5WY states that he has not been able to do much as he is rebuilding his transmitter and receiver. He has a KF4H transmitter of 50 watts power. 5ML also uses the same circuit with CX-216A.

The Skyhook gang has formed the Caddo club and is operating 5WYM.

Traffic: 5UK 12, 5KC 8, 5UK 7.

MISSISSIPPI—SCM, J. W. Gulliett, 3AKP—5QZ has just returned from a Naval Reserve Cruise to Havan with 2DD. He is operating 2AKP regularly from now on. Ben. W. Robins, of 5YD has been pounding brass as a commercial operator and has just returned from a trip to South America. 5AGM will be off the air until next summer as Boy Scout camp has closed for this season. 5ALZ-SZAB are on a trip to North Carolina. The SCM has three applications for ORS for future traffic handers.

We hope to have a much better report next month as most of the amateurs in this section are rebuilding their receivers and transmitters for the cold weather that is to be soon.

Traffic: 5APK 29, 5API 27, 5AQU 5, 5AGM 1.

TENNESSEE—SCM, L. K. Rush, 4KM—Come on, you ORS, and send in those reports each month. We want to know the truth instead of especially the Eastern portion of the State. 4HL uses a W5260 and is leaving for a visit to USCBM. He has applied for ORS. 4PA has handled traffic for 5K5 and is running a station through the summer 1EO goes to Armours Institute and will have a 9 call while in Chicago. 4CU is rebuilding and will know how he did it soon. He has been up 40 meters and is heard on 40 meters. 4KM is slowly but surely getting on the air again. Several of the gang from Memphis came over for a few days.

Traffic: 4PA 12, 4HL 11, 4KM 10.

EASTERN NEW YORK—SCM, Earle Peacox, 2ADH—Say! Not bad for a start, eh? This Section led the Division last month. You fellows that spend 60 to 70 cents a month writing twenty-word QSLs and working three of them must think you’re having a wonderful time. DX stations are just like women, they’re the same all over. Allentown, Pa., or Melbourne, Pa., or 2 UY is just the same. It’s about time we got wise to this. Come up on 80 meters where you raise them all. Arrange a few schedules and get a few new ones, and we’ll guarantee you a brand new thrill. What say?

2QU, 2BOW, 2ADQ and 2ASE want ORS appointments.

2AAZ, 2CTP, 2APT, 2AKH, 2ANY, 2AML, 2CTH, 2CYM, 2CHY and 2ADH have had their appointments OK’d and new certificates sent. The others, with the exception of 2QB and 2AGM, who have asked to have their ORS suspended due to inactivity, will be explained to do or they’ll be suspended with a capital “C”.

2APT is now working on schedules with 8BLO, 8UE, 5AKH and 1AWE. He hit his daily doze of QRM and looks at the schedule, and asks what happened. 2ADH ran second but was off to rebuild. Made a chemical rectifier and every plate glows! 2CDH needs to be coming in a little louder. The others, hereby acknowledge them anyhow. 2AQG took a 218 word PX mess from VOQ but admits dropping two words here and there. VOQ you must have heard how he did it. Skeda were kept with 2ALI and 2QY.

2AAZ has a daily sked with 2CJ and clicked with WAP to boot. 2AML is nursing a Herts antenna in his station. He says he will be taking his DX as an up-state. He keeps the SCM posted on what’s what. 0OM, OM. He had a sked with 2QU, 2LA is on 180 meters and says the wx is fine up there. Quite a few 2’s on the old band, he says. FB, 2CTH worked n0WC, fLoss, 2GI7, Trafford and heard from

8MA and a’SC on 40 and bh22 on 20, all in daylight. Hw 2 2CYM may QSY back to 200 meters. Who said it was the 30’s? 2AGQ so confident?—cate? To which I answer, “Si, Senor”. By the time you read this, 2CYM will be on with stx control. FB, it’s tough 2DD can’t find more than one key. There’s one time FB would sure boost our traffic total sky high. “DX!” says Bill, “Hi Hi” says me. 2FY is another married ham but seems to want a plenty of time in the contest. He just come back from his vacation, watch Herb roll up a total. 2BW is just back from Plattsburgh and is trying hard to get started again. Got a small wild women from Tarrytown. 2CFW went to all the trouble to put a big bug on 20 meters just to work VOQ on schedule but never a tumble. After building the bug VOQ is using, too. 2CNS, on vacation, couldn’t do without a portable receiver, but oh, how his fingernails itch for a key! 2ALQ pulls the same thing, for at 700 watts, lightning struck his fifty blue. H1 The SCM feels that 2CJE and 2AQH are tempting him with their tale of adventures with the SCM club with old 2CUZ. Wilson is going to Princeton and will have to give up his pre prep call 3WY, but Whittemore is going to open up again for a few months of other blasting and then—well, he’s going to join the Ancient Order of Beneficts, you know. 2OBG has already married but is having a hard time keeping a QTH and the SCM wants to shake hands and stop the trouble.

2BOQ just returned from a trip to Carolina. The SCM has three applications for ORS for future traffic handers.

2RES has asked to have his ORS suspended due to inactivity, will be explained to do or he’ll be suspended with a capital “C”.

2APV is still much alive but nil on traffic just now due to other activities.

2CYX reports DX FR. He has handled traffic with WNP and kept schedules with NTT but is a little slow in sending out reports to NTT, also now OAC. Take a look at his traffic total for this month. 2BBX now uses break-in system. He recently worked 2CYWXL. 2AKX is a new DX. In addition to his other one. 2APV is still batting them out, he is handling Porto Rican traffic regularly, recently worked Tanzania and keeps skeds with 2BNU. 2AKH is a new DX. 2AKH in construction. 2KDR is working his station during his absence. He has worked quite a few foreigners but the poor tube gave up the ghost.

Manhattan—2NZN is building a 204A set so hasn’t been on the air much this month. Some one pulled his antenna out of the pulley and he just got it back. Nice people where he lives. 2ZM is working a few foreigners but says traffic is from NTT. He says he is very hard luck to have to work at night, so he doesn’t do the DX some of the fellows do. 2EY recently took a 12ZM, 18ZL, 21AN. He’s doing well.

He says it came in fine. 2BNL just came back in the smoker from a trip to the Midwest. He saw all the gang there. He is now using 400 V. B. battery ass 2 v. A battery on a UX210. 2BCB is doing the same thing, only using 500 v. 2APJ is using an H tube.

NEW YORK CITY & LONG ISLAND—SCM, H. Mardon, 2CW, Brooklyn—New tower is in, has a new antenna up, 85 feet high. FB. He is pretty busy with the Army net control work. The following stations have been appointed: 2BOS, Alternate 2APV, Brooklyn and Staten Island 2PF, Alt., 2CLA. Manhattan, 2EV, Alt. 2 ABT. Long Island 2AKY, Alt. 2KG. 2OB has a total of 27 foreign countries. He used Asia for a WA1KXL trip. 2AKY has been away most of the summer but is back now and intends to get going. 2BBW blew 2 kenetrons and installed four in their place. He is now on 2700, 1700 and 2100 grid and reports the set perking FB. 2AQW is still tickling out PB as usual. 2APD just got back from vacation and has reported his much-needed vacation. Director Dunn, 2CLA, is also on vacation. Both will be back soon and will start their many activities.

2BPS is still much alive but nil on traffic just now due to other activities. 2CYX reports DX FR. He has handled traffic with WNP and kept schedules with NTT but is a little slow in sending out reports to NTT, also now OAC. Take a look at his traffic total for this month. 2BBX now uses break-in system. He recently worked 2CYWXL. 2AKX is a new DX. In addition to his other one. 2APV is still batting them out, he is handling Porto Rican traffic regularly, recently worked Tanzania and keeps skeds with 2BNU. 2AKH is a new DX. 2AKH in construction. 2KDR is working his station during his absence. He has worked quite a few foreigners but the poor tube gave up the ghost.

Manhattan—2NZN is building a 204A set so hasn’t been on the air much this month. Some one pulled his antenna out of the pulley and he just got it back. Nice people where he lives. 2ZM is working a few foreigners but says traffic is from NTT. He says he is very hard luck to have to work at night, so he doesn’t do the DX some of the fellows do. 2EY recently took a 12ZM, 18ZL, 21AN. He’s doing well.

He says it came in fine. 2BNL just came back in the smoker from a trip to the Midwest. He saw all the gang there. He is now using 400 V. B. battery ass 2 v. A battery on a UX210. 2BCB is doing the same thing, only using 500 v. 2APJ is using an H tube.

QST FOR OCTOBER. 1926
and a new antenna 136 feet above ground. 2AMJ has been very busy lately. He says he had a great time with 4IZ on his recent visit to N.Y. 2ALS is using 2, 210s and a crystal on 80 and a 50 on 40. 2ALL has decided to stay in. 

Queens—2AIZ is rebuilding, putting in a 50. He will be on the air in Sept. 2AYJ has started out but says he wishes he had started long ago. 2AWX back on the air after a hurried trip to Washington. 2AVB is busy taking orders over the air from DX hams for 2IFQ gear. 2AIVQ on N.Y. in stores. 2AVJ is getting along but 1AYJ is doing good work. 2AEJ finally got across the pond, worked 8YOR. 2AEV is very busy with the YLS. H1 2AFP is coming out in October. 

Richmond—2CEP is the star of S. I. this month. 2AKK is back from a fliver trip through Texas and Colorado. He will be on the air steady now. 2AKK is rebuilding in Sept. 2ATQ B is opening in addition to 2ATQ A which is doing increased power and is ready for traffic. 2ABO, 2AHH, 2ARD are new stations in S. I. 2TS and 2SL are on 40 meters. 2AFV has a fifty going on 40 and 200 m. 

The SCM has had many requests regarding new ORS certificates and applications for same. Be prompt and they will all come in due time and if you don't hear from me immediately, don't think I have forgotten. I have so many other things to straighten out I had better dodge it till I get the water to sink once. Your old certificates are still in force until I start to issue new ones, which will not be for about a month. 


NORTHERN NEW JERSEY—SCM, A. G. Wester, 2WR—2AT promises to break forth with greater power. 2/2W is QRV experiments and vacations. 2EYJ expects to send some regulars with an indoor antenna. 2AEF is having trouble having the station licensed. 2DX is busy from 3 to 5 P.M. 2IYJ has orders to still rebuilding for short waves. 2FC is keeping the shore traffic route working. 2GV is busy laying plans for an amateur banquet to be held the next week, to return with a 2AYJ new station opening in Hingham Heights. 2IS has reopened and report very little traffic. 2KEA is rebuilding the receiver for better DX. 2GJ is a live wire and has been in the City and in line for an ORS. 2QD is trying to get the Plainfield amateurs together again. 2AUJ has just completed a new 55' mast. 2AWM is the new station in the City and is in line for an ORS. 2ADU is trying to get the Plainfield amateurs together again. 2ADU has just completed a new 55' mast. 2AWM is the new station in the City and is in line for an ORS. 2ADU is trying to get the Plainfield amateurs together again. 2ADU has just completed a new 55' mast. 

Traffic: 2AT 23, 2GV 13, 2AHR 13, 2ALM 13, 2CP 12, 2AVJ 10, 2CJ 5, 2AUJ 4, 2ADU 4, 2CQZ 4, 2KE 2, 2CW 1, 2ADV 1, 2ARC 1. 

MIDWEST DIVISION 

IOWA—SCM, L. R. Huber, 9DOA—The SCM put in a month's work as a CMTC student and returned to find that 9BKV and 9CZC, as Route Managers had been hitting the ball in fine shape. FR! Iowa will be all there this winter when it comes to the SCM. 

More applications for ORS appointments are solicited. You may not make the grade at first—but you can find your weak spots and shoot again three months later. Several applications have been received to date. 

Q S T FOR OCTOBER, 1926
just returned from a western tour so traffic has been nil. 9DMJ passed along a few mesgs and reports a battle with a super-sink—not of the Taunurenwen kind. 9AA says ND, too hot.

9DAE is located as SCM RM. 9CKS came home from Harvard, built a big antenna, got set to working on harmonic and has been worked several times this month. He reports traffic handled, QRD Can. Govt., Ottawa, also mesgs, for members of the crew to home folks, VYG reporting him R7 to R9. The fly in the pudding is that CRS has to report back to 9CGY, and 9CGY is QRD Northwestern. 9DKG is QRT, has to stay home as father had an operation. 9ARA made BPL, also working all ARB. 9AUNZ is on his 30 meter and wants schedules on 20, 9DCD working W. U. trick and QRT temporarily. 9DVF tells this: No antenna, no counterpoise, moved net on the station, shot rectifier, delivered 3 mesgs and is still a ham.

9BQS reports reopening Sept. 1st. 9CZW is away traveling as we have seen. 9DAE is reporting school in Warrensburgh, address 206 E. Fulton. He is reopening his station there and wants to hear from ORS in regard to route problems. 9BSY put in new front antenna. He says it is FB and wants schedules north and west. 9BUL is wrangling an H tube. Ex-9ERK is reopening his station with loop antenna. He has handled traffic and kept schedules with 5ACE at 7:00. 9AOB is shut down on account of heat and QRN. 9CMR reports same at his station.

9BQS reports all hands QRT for summer. 9BDB ditto. 9DKW is using 50 cycle plate supply as the rectifier went dead. 9BIE reports ND locally. 9CAX is back on 40 handling traffic. 9BND's last three schedules are in and he handled a few messages. 9ELT is going again. 9RRR and 9ACA are too QRT to operate late.

Traffic: 9AAU 104, 9ARA 103, 9BND 75, 9CKS 48, 9BEZ 12, 9IDR 10, 9DJM 10, 9ACX 9, 9BUE 5, 9DVF 3, 9RR 3.

NEW ENGLAND DIVISION

RODE ISLAND—SCM, D. B. Fancher, 1BVE—Providence—1AAD is on again after an illness and is ready for schedules. 1AWE, 1BIE 1AEI and 1AAU are all active and live wire stations getting out well. 1AWE worked Jugo Slavia, FB, OM, IAHE and 1DP say that vacations interfered this month. HI!

Westerveld—1AAP has been appointed an Official Observer and has logged a bunch off wave. Located out, OMs. Things about the same at 1BVR. 1BLW is now a new ORS using a low power set and is getting on gommercial work for the United Fruit Co. so don't try to burn him up. It just can't be done.

Newport—1BQG is a new OBS. The SCM visited him and found a neat station. He also found that he has a peak of a new OW. HI!

Traffic: 1AWE 20, 1BVR 14, 1AAP 12, 1AET 7, 1QY 3, 1AD 4, 1IE 2.

EASTERN MASS.—SCM, R. S. Briggs, 1BVL—1BMS, 1UV, 1BKV, 1ABA and 1QZ join the Brass Founders’ League. FB and many congratulations. 1AGS is on again, with Hi! written on it and expects to handle traffic on 200 meters. 1CRJ has been away but handled some traffic. 1RR built a crystal controlled counteroscillator but it did not work. 1BWM is ham bands. 1IAX visited 20VJ. 1ABA is one of our traffic wonders but he dropped a screwdriver on his set and is 40 meters and receiving. 1OU bought a lot of Junked Army and Navy sets and used the good parts. 1AIR reports OTR working Navy sets. 1AKC built a crystal set going fine until the crystal cracked. 1LJ went away on a USNRF cruise. 1BQG is trying to get this new OBS and at his new QRA. 1NK and 1ADG are putting Revere on the map. 1RF is home again. 1BKV handled a bunch of traffic on 80 meters. 1UE and 1BMS do some snappy traffic work when it gets early on. 1BKV built his set and then was sorry he did. 1INV is on with a 50 watt. 1BAT is still trying to get some rectifier parts. HI! 1IKY is up, also after being on at 1CPD. 1LMM was bothered by bad power leaks. 1ICT is going to operate on 80 meters. 1AMJ is quite solid and expects to handle traffic. 1BQA using the cell 1QZ. 1AIF had to drop schedules due to hot weather. 1AWB visited the gang in Mansfield and Pawtucket. 1AILP is on again after QRM from Ford's and YIA. 1ADM handled a message with WNP that was QSRd from P STBY to Chicago in 1 1-2 hours. 1GA is getting out fine with a very oscillator.

Traffic: 1BMS 804, 1UE 270, 1BKV 114, 1ABA 110, 1QZ 105, 1BZQ 55, 1AYF 33, 1NK 23, 1AGD 21, 1GA 20, 1AWB 20, 1ACI 19, 1BVL 16, 1ADN 12, 1IKY 8, 1IDR 8, 1JL 6, 1IA 5, 1IY 4, 1LM 4, 1AXA 3, 1AGS 2.

MAINE—SCM, F. Best, 1BIG—1AUF handled an impressive total, closely followed by 1ATV and 1BIE. 1BDZ is working 80 meters and has a wonderful DC note and a nice punch. This station has now been in operation for three summers. 1AJS is on 80 and 17 meters and has managed to tie up with NGT, Naval Radio Station, Seattle. Washington on 30 meters. 1BNL is still handling a little traffic in spite of the fact that he only gets home over the week-end. 1AHI has been on intermittently and promises to handle some regular schedules this fall. 1QY is going great guns with a new Heritian antenna. 1ICOM and 1BEE have done a good job of developing into a good pair of traffic handlers. 1BHR has a fifty and is punching great holes in the ether. 1BIG has a transmitter repair work for about 90. 1BDG reports a good total. 1AFT reported through 1BIG via radio.

Traffic: 1BIG 531, 1AU 167, 1ATV 192, 1BZQ 177, 1RAL 38, 1BDZ 27, 1QY 23, 1BNL 9, 1AD 7, 1QY 7, 1ICOM 4, 1AFT 40.

VERMONT—SCM, C. T. Kerr, 1AGJ—1BHP jumps off with the traffic honors. FB, OM! 1BEG is greasing up again and will soon hit them off. 1BIE, a new ORS at 1BIE, has had a busy month. Last month he handled 43 mesgs with his "fiver," leading the state! 1ICM is on a trip south to see the sights. 1AGJ is in a new ORS rebuilding. Where is 1BDX? 1BIG is now QSO Canada. HI! Now, fellows, with the advent of cooler weather, the SCM expects all to get in again and slam out those mesgs as well as report activities to him.

Traffic: 1BPP 23, 1BD 9.

CONNECTICUT, SCM, H. E. Nichols, 1BM—The SCM is looking for a wonderful Fall in the radio work of this Section and has received quite a few applications for ORS appointments which indicates our stations are doing good out there. FB and 1AGS fellows, do all you can to encourage that new amateur in getting started for we must keep the rank filled up. 1BEZ, a new ORS, and 1AOCX head the list for the most traffic handled and are to be congratulated for their zeal during the warm weather. 1FD is still in bed but sent in his cards and hopes to be on the most traffic handled and are to be congratulated for their zeal during the warm weather. 1FD is still in bed but sent in his cards and hopes to be on.

Traffic: 1BAY 36, 1AOX 30, 1ADW 24, 1AOS 16, 1MY 14, 1KD 14, 1BB 13, 1JH 12, 1BCG 6, 1BQH 4, 1BM 4, 1BHM 4, 11V 2, 1BF 1.

NEW HAMPSHIRE—SCM, V. W. Hodge, 1ATJ—Traffic has increased somewhat this month in spite of bad QRN and QRM from vacations. Most of the groups are on 80 meters and a bunch of ORS are to be congratulated for failure to report for two consecutive months. 1AIR reports holding on. 1BVL is still working good and is a prospect for an ORS. 1BIT was QSO WNP and took the mesgs. He also worked 1MTR 35, 1AOX 20 and 1ADW 10 after Oct. 1 and wants schedules. 1AVL also worked WNP and is having great luck on 38 meters. He expects to return to N. U. this fall, a new 40 meter QTH 35. 1AQG.

Traffic: 1AVL 30, 1AOX 30, 1AER 28, 1AQG 20, 1BTO 10, 1CKK 16, 1ATJ 5.

WESTERN MASSACHUSETTS—SCM, A. H. Carr, 1DB—Most of the gang reported. It was surprising the time many of you got in and the fact that there were a few zeros due to hot weather and vacations. Dr. Teemaker of Shrewsbury, a staunch friend of the Worcester County hams, has joined the ranks of
ORS. We all wish him good luck. His call is 1UM.
Our old friend, IAAC is on the air with a 201 and Ford coil until when I suppose he will QSO Mars with a new set. IAAL is setting up a Master Control Car and is on schedule with A2RM daily. 1AOF has been QSO Tasmania. He has 500 watts on CW and tone and some of the rest of us got "broken" somewhere. OM Cushing, 1AAW, says he is still fishing, swimming and surfing. He reached a total of 31 which was pretty good for a cripple. Perhaps it would be well if some of the rest of us got "broken" somewhere. IMAZ and 1IAM had a great time on their visit to Hartford. I believe they visited WTIC and didn't suggest any improvements to the management. Can it be that some of us amateurs are able to HI up 1AJK at 700 watts and says no YLs at present. No kidding!

SKY and 2ATR visited 1AMS during the past month. We would like to welcome more visitors to our section to show them what a live bunch we are and how it can be done. Your SCM quite unintentionally tells you all for a breeding job in his last report. This may be the only way that some of you will hear of it and the SCM wants to take this opportunity to thank you for the splendid innovation in putting the Section at the very top. Visitors are welcome every day at 10B. I hope to get all the new certificates out this month.

Traffic: 1AJM 49, IAMZ 46, 1AQM 81, 1AKZ 21, 1AAL 12, 1BIV 8, 1AMS 6, 1AJK 4, 1AAC 2, 1ALZ 2, 1BVR 2, 1AOF 2, 1PY 1.

**NORTHWESTERN DIVISION**

OREGON—SCM, A. C. Dixon, Jr., T7T—Portland stations led the rest of the state as usual. There are now five Portland stations which are on the air and are handling traffic. They are TAEK, T7T, 7TH, 7AV and 7FW.

7AEK has been keeping schedules with Alaskan T7K for the last three or four months and has handled thousands of words of traffic through c2XA. 7AV makes up with consistency with what he lacks in power. His best DX is J7H. 7T7 is handling traffic and 7TH has a great amount of traffic. 7AKK is back from his honeymoon and promises to send in a creditable report next month. He is one of the old timers.

Traffic: 7THV on for five days and handled several messages. 7AAC is a newcomer in line for an ORS ticket.

Portland and the rest of Oregon for that matter is now in a very favorable situation. The DXs are much louder in the east than any of us. The gang back there must not think that we do not know how to handle them. 7THV and 7FW and T7T are reported in Malay, Borneo, Japan, PI and China as being louder than any of the DXs in the west. They are now a number of times and cleared 1800 words of traffic through c2XA. 7AV may be one of the best DX stations in the West Coast, his reports are consistent and dependable. 7THV and 7AV are two of the best DX stations in the West Coast and is on the air most of the time.

Traffic: 7AVK 46, 7THV 29, T7T 26, 7AV 12, 7FW 11.

IDAHO—SCM, E. S. Norquest, ex-7OB—T7T is still on the East Coast handling commercial brass but will be back to go to school this winter. T7A is back in school again and handled power but will not have a staff of operators till school starts. 7OB and T7Q are no more, as their calls have expired and they are attending school. 7OB worked Washingtons Day DX with the usual amount of DXs.

Traffic: 7ASK 64, 7THV 29, T7T 26, 7AV 12, 7FW 11.

MONTANA—SCM, A. R. Wilson, T7T—7UO and 7DD did some excellent work this month. 7UO joins the BPL. He has a new 80 watt working the whole West. Five rules are giving him severe trouble and they are: 7DD is doing excellent work in spite of his poor location. He has worked A2 and BZ, on 40 meters, using M. O. circuit.

Traffic: 7DD 114, T7T 114, 7AT 17.

PACIFIC DIVISION

SECTION 4, NO. CALIF.—SCM, F. J. Quenstant, 6NX—The new ORS certificates will soon be mailed to all active reporting stations. Active reporting stations are going to lose their ORS if they do not report this month. 6BDW was high traffic this month, nosing out 6AMM by ten messages. 6BLW, 6CTO and 6DLQ were on August 6, 6BDW chassis having 50 O cards in twenty days besides keeping schedule with pilaAU. 6ZAT had his portable working at Boy Scout Camp. 6GKV did some excellent traffic handling and was now 6GKV in Capitola. 6JFD did a portable this month and he will take it on his vacation. 6JMT worked NZ with his portable and 6AMM and 6GKV as well as handling traffic with JITS.

Traffic: 6AMM 24, 6BDW 38, 6BYV 26, 6ZAT 22, 6CDW 21, 6DIK 19, 6DKY 9, 6DKC 9, 6CEI 8, 6CDJ 8, 6ECI 6, 6CJD 4, 6AFF 4, 6BAM 3, 6AMM 3, 6CDW 2, 6DKY 2, 6DKC 2, 6CEI 1, 6CDJ 1.

Sect. 6, NO. Calif.—SCM, St. Clair Adams, 6BAM—6BAM is now assistant op at a new broadcasting station just opened at Eureka. As so few reports reached the Section this month, a move to combine Section 5 and Section 4 is being considered. Please let have all the reports promptly next month, OMs.

SOUTHERN SECTION—SCM, L. E. Smith, 6BR—Our water holes had no amateur activity. Traffic is as heavy as winter time and working the other side of the globe, So. Africa, is a common phenomenon. The first amateur plane was made and was the first of the month, and on Sept. 1 another ARRL banquet was held in Los Angeles. Both affairs were attended by nearly seventy hams, all of whom are extremely proud of the Section. SCM is making this being due, of course, to the real live wire ORS we have.

Activity around San Diego is showing great increase, a bunch of the San Diego hams planning to go to the Pacific Division Convention in airplanes. Conversations were obtained from the ORS this month but many of the reports came thru late. Don't forget, two "misses" and you lose your ORS. All stations report good DX throughout the summer. Some fellows are back QRV with the YLs to take advantage of it. There's only one cure, fellow! T7Q, a non-ORS, takes traffic honors. Yes, he keeps schedules all month and BPL reports. 7ARL reported QSO Spokane hams are installing a 250 at the Inter-State fair, 7AIM got QSO YQ. 7UQ and 7TAU are back. TF7K is installing a master keyer; 7AIM and 7TAU report working DX with DC. 7AG shot his fifty, shook the filament together again and worked A, Z, AU, He and much local DX. Tube trouble got 7CCY to drop out traffic. 7GB is QRV YLs. (Or is it a YL7?) 7E5K and TXE are still vacationing. 7AP0 has schedules with 7EWM, 7BZ and 7EJ says 7EWM has 500 watts. Ex 7OT writes that he will sign 9HASH or something from Chicago. 7TPZ is having tube trouble. 7QP, of Key Klicks, has moved back to WAI for a second childhood. T radiator is one of the new Red Lodge stations. 7AAE is operating a power station at Mystic Lake but will be back with us strong soon. 7NT was away from the set most of the month.

Traffic: 7TFU 114, 7DD 114, 7AT 17.
 écrit pour le 6 AXW suite est 

le trafic 6 AXW leads in traffic and made the gang there.

3. B. S. 6 AXW reports working VYGE while at Prince Edw. Island. 6 CGK says that finances and a YL kept him off. Just how do you mean that, OM? 6 AKW reports that fire is his fifty percent.

4. B. D. 6 DEG is one of our new ORS and is sure a live wire. 6 RH is experimenting with antennas, 6DQ is doing some work with 6JL this month. Keep it up, OM. 6 AM was home but one week but sure did his bit. 6BH now has a 190 running on 5 meters and 6BQQ is working DX. 6 FKY keeps 6CDY busy 7 days a week, but his key is a bit slow. He doesn’t get to see his key often. 6DS is handling mailing matter and dates on schedule. Fine. Work. Schedules make it easy for him to handle. A traffic total. 6 DC has been working Boro and PI. 6 BX continues with his bi-weekly traffic but missed the lead by 6 months. 6BQ uses an Aluminum cone filled with water on top of his antenna and works So. Africa. How much water do you use? 6 BOV wants HU traffic. He works schedules with HU every night.

6. B. F. He leads the entire Section in traffic. Very FB! 6BVO reports a new ham. We need him. 6 TMT. 6RF and 6CDX all report ORS from vacations. 6 CNK and 6OP are all torn up experimenting. 6 CQA seems messages are scarce but sure originated his share. 6CT is a very busy DXer. 6 CLXK is good. 6 FLY works Java on a 7.5 watter. 6 DBQ is now keeping schedules with Japan. 6 AE is looking for schedules. 6 BH is another one to work so. Africa. 6CQG has suffered from YL’s this summer, speaking of radio, HI!

Activity in Dist. No. 3 picked up by maps and boards. So. Africa looks as though it’s a busy place this month. 6 AVO promises that some more of the old timers will soon be back. FB. 6 ASV is working As and 6. 6 BZJ up to his usual hand. A 7.5 watter got 6 BVY into S. A. He worked O. S. and the B. B. is moving to San Diego in a few weeks. 6 BSN reported thru 6 BZJ. He has just moved to Santa Barbara.

6. AQW is trying his best to work J-ITS. He wants to see the big DX in and 6 AGK seems to do so. 6DCK, with his UX210, is doing FB. 6 CIW, a new ham, is setting up nights learning the dots and dashes so that he can work into 6 USC with ease. 6 CKU can’t seem to get out. 6 CJF is trying to get his key to oscillate on 40. He has been up on 80 meters once and doing well. 6 CRZ has been doing pretty good work with 6 UX210.

Arizona—Dan Lamb, 6 ANO, is the new Route Manager here. Summer will soon be over and with it Ariz. static. We hope for some more big traffic totals like we have been getting. He spent his vacation in Texas where he visited many hams. 6 BWH and 6 CBJ are doing fine work with 500. 6 DCO continues to work a foreign station on a 7.5 watter. The picture is very bright. He promises dope on his set in QST soon. 6 BW is having lots of fun trying to drill glass panels. He’s only a dozen or so. FB. 6 TMA will try and make a record. OM. 6 ASA is an old timer with a 54 doing great work. 6 ANO keeps going but is very busy with business. He says that they are looking for a real ham here winter this year. Fine. OM. 6 RJH is in the hospital.

Traffic: 6 BXC 337, 6 BJR 326, 6 BXD 176, 6 BOJ 125, 6 BQQ 142, 6 BYG 123, 6 DSS 80, 6 NP 73, 6 COA 73, 6 DJX 19, 6 CLK 44, 6 CAE 42, 6 AEP 41, 6 AEE 8, 6 BMT 34, 6 BTV 57, 6 BGO 32, 6 BHC 28, 6 ANO 26, 6 BVM 25, 6 SB 26, 6 DZJ 23, 6 DCO 20, 6 CQG 20, 6 CSW 59, 6 MB 18, 6 HH 18, 6 JA 18, 6 MR 15, 6 RJH 12, 6 BHM 11, 6 BKH 11, 6 BUX 5, 6 DCK 4, 6 ASV 4, 6 CDY 2, 6 SW 2.

Nevada—SCM. C. B. Newcombe. 6 NU—Nevada hopes to have at least three hams at the San Jose Convention. SCM. We represent the Section. Nevada’s SCM is looking forward to the first opportunity to see the gang there.

Traffic: 6 IUO 62.

Hawaii—SCM. K. A. Cantin. 6 TQ—Summer weather failed to affect the activities and traffic totals for the past month and local stations made an effort to prove that weather does not affect the 40 meter traffic band. 6 AXW leads in traffic work and made the grade to the Brade Ponnies’ League. Schedules did the trick. 6AHE has established a weekly schedule with pi-1HR. Each of the six operators that stand watch arrange their schedules and this method has greatly improved traffic work. 6 AJL established contact with pi-UCB. John Hay Ely, 6 ATO, was in the neighborhood and stretched his East traffic work by QSOing u-1QZ, Makr’s Isle off New England Coast. 6BDL changed his spot to another one and 6 BDL now works the East coast with ease. Traffic is also handled with the Philippines. 6AFF was on the air again for a month with a sign in his plans say that 6AFF plans to sell out and try to keep away from radio. “Is easier said than done. OM.” 6 NHU has contact with u-NSF and 6BVG ex-KFWH. His 50 watt does the work of a 100 watt bottle. 6 OF using 75 watts MG plate supply keeps in contact with 6 RW and 6 AFS. Traffic was handled with u-1WQ and 2AKR. 6 OF was handled from pi-1BD. New Zealand and Australia also accept traffic from 6 DUC. 6TQ continues to keep in contact and arranged a work schedule with the 6th district. A schedule was kept with u-6JP but the last time both were QSO. 6 JP had to run for water to extinguish a fire in his plate transformer. That was the last heard from 6 JP.

6 CFN dismantled his 50 and 250 watt as he is returning to the mainland. Using a 5 watt until he sells. 6 AEF turned in his ORS appointment. Pressure of business keeps him away from the key. 6 BUS reports reception very poor at his location on the other island. Traffic handled with 6 BRD, 6 SCN and 6CA. 6 ARS builds BCL receivers and ham transmitters. His report indicates that he is kept busy. 6 CST was QSO with S. Africa giving some traffic. Power was estimated as an input of 12 watts AC from 6CQG. Station was established with pi-1DL. Station is now under reconstruction. An H tube is being installed. 6 KQ using 50 watts AC has an A-21 with a plug in. The relief operator at 6 CLJ has been kept QRV. 6 CLJ is due back from the Orient this month.

Traffic: 6 AXW 176, 6 BTO 155, 6 BDY 44, 6 DLU 58, 6 AFS 29, 6NL 27, 6 DCE 25, 6 TQ 22, 6CFN 17, 6 AFE 16, 6 BUS 10, 6 ASR 7, 6 CST 4, 6CLJ 2, 6KQ 2.

Roanoke Division

Western Virginia—SCM. C. S. Hoffman, 6 BSIU—QRN and vacations kept the general traffic totals down again this month. Two old timers showed activity—JW and 82XW— university than usual. 6 AMD worked schedules with VWZ, and worked A. Hu, Z, and BZ. 6 BMX experimented with vertical brass-pipe antenna. 6 BJJ was heard in Australia. 6 SWZ is on 78 kc using 400 watts AC and 200 watts on 5 watter. 6 SP’s QRI is now 40. 6 AWM using a 200 tube worked 713. 6 CDV working 8YD and 8GPL. 6 CKE handled a PR message for Wheeling. 6 BSIU is busy getting ready to issue new ORS certificates. 6 BUB and 6 ADI of Wheeling: 6 BTB of Hinton have applied for ORS. 6 AUL worked 6 BAF and CZ-FQ 5.

Traffic: 6 AMD 65, 6 CEK 32, 6 BSIU 29, 6 SP 19, 6 CDV 16, 6 BM 6, 6 SWZ 6, 6 AUL 60.

Virginia—SCM. J. C. STA advised us that he is moving into North Carolina and his call will be 4AB. 3 MK has had trouble with his receiver recently. The operation on and did very little. 3 BMN has been doing some very low watts input. He works A and Z. He says he expects to rush right on the air in great shape as soon as the weather settles. 3 AOT purchased a 72N ORU’s transmitter and expects to be on 3BYZ. 3 BZY says nothing out of the ordinary to report. 3 CKL has returned from training. 3DUU says it’s too hot for work right now. 3 BGS says other duties interfere with his radio work.

Traffic: 3 STI 3, 3 YQ 2, 3 YQ 1.

North Carolina—SCM. R. S. Morris, JFJ. 4 BY is helping put Montgomery on the map. 4 BT shot his fifty but finds that a UX210 is just as good. 4 NH has ORM 619CQG is on most consistently. 4TS is rebuilding and will have some of the most realistic storage B. MO-PA set, remote control etc. 4 JS handled two messages from VOX. 4FX is working out DX now. 4PR uses two UX210s crystal-controlled on 7.5 meters. 4 HR completely rebuilt. 4HI is a new station at Carolina. 4WE is off the air until school opens Sept. 15th.

Traffic: 4MI 52, 4BY 52, 4NH 19, 4 JS 8, 4NJ 5, 4 JR 4, 4HX 2.

Rocky Mountain Division

Colorado—SCM. C. R. Sedman, 6CAG—Denver: 6 SACW leads the Colorado bunch and at the same time wins the first subscription to QST given by SAK. Congratulations. OM. 6 DRRM runs a pretty close

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second to 9CAW. He has made application for ORS. 9CJY put out some good work in between times. He says ORS is as yet, that his He has a rather important schedule to put through effect soon. 9NE has just returned from California where he spent two months with 9HC. Seeing a single ham! He says he will have more to report about his work soon. 9NM is looking forward to the reports but promises to be a good station. His QRM is 41 meters. 9DLA is another new station that has been cropping up quite a while now but he is going fine with a 7.5 meter. 9C0U will open up as soon as school starts. 9BQO, still another new one that 9NEA is going fine. 9DDE has put in remote control and a Hertz antenna and reports fine results. 9CAA is also using remote control most of the time but is not on the air as much as formerly, as he is working nights now. 9OQ has another new 60 and says he gets a better QSB now. 9BJN is rebuilding for a mercury arc rectifier and hopes to be better when they are finished. On another new station, is a Western Union op and handles lots of traffic here but reports things slow on the air. 9HYF, 9HYT is both out after the army traffic. 9QQG does most of his work in daylight time. 9CDE is working for an Army-Amateur appointment. Good luck to you. OM. He has a schedule with 9EAL every Sunday. 9CFY is back on with AC on the plate. Traffic: 9CAW 396, 9DKM 281, 9CYJ 96, 9CIAA 98, 90M 11, 9BN 10, 9DEO 10, 9WZ 9, 9JE 4, 9CNL 2. UTAH-WYOMING—SCM, Art Johnson, 6ZT—Only four reports were received from our stations this month. Everyone working SCM, was away on vacations, so there was very little activity. BID with only 13 messages handled more than any other station in the Section. 6BUV reports that he is now obtaining excellent results with a Hertz antenna on 73 meters. 6AIK in Ogden has submitted application for an ORS certificate. Traffic: 6KV 18, 6BUV 3. SOUTHEASTERN DIVISION

LOBAMA—SCM., A. D. Trumb, 5AJP—Mobile has a most active ham in the person of Harrison of 6D1AD. Installation of the new Hertz antenna set at WNN as well as the erection of their powerful antenna and counterpoise. 5AX is peeking to beat the band, despite an accident recently which nearly put an end to his life. One often hears 5MI working. 5ARK is a new ham in Birmingham. 5WI has been working most everywhere with his old trusty fifty and 5AQF foot most raising its towing head to spur forth the fiery waves coming from the shack. 5DI has played in hard luck so often that he feels like it's nothing any more. 5AVP is playing right along, shooting his transformer and then blowing another H tube this month, everything is working at normal. 5AJP is working a second set, set using 2 H tubes. 5ADA got himself a new tube so he can use fifty that fifty this winter. 5ATP has been playing around with YLs but is on the air constantly with his fifty, working around the world at his leisure. 5DP has been trying to work on 5 meters. 5AGA is sweating over his Lizzie. 5DFH has been at work at 6YJ during this summer. 5APJ lost a good fifty last month and is working with a 210 now. Traffic: 5DI 28, 5AX 24, 5ADA 21, 5ATP 18, 5WI 17, 5ARK 13, 5AL 12, 5AM 9, 5CM 2.

FLORIDA—SCM., W. F. Croghan, 4GZ—We have ex-1HE-12Z who was accused of being a new-comer. He is in Jacksonville with 4MH as a call. Word comes also with us in 4BPR from Jacksonville. His call is 4KV, and he comes from QST town. Word comes. OM. 4NE is confined to his bed. 4OH has been sick with pneumonia but able to be out now. Most traffic here on the Naval Code. 4NY and 4DD have been appointed ORS. They are hard workers. and moving traffic well. 4MS reports things are moving on Muscovia. 4YL probably are the cause. 4TK reports very little traffic moving now. 3ZJ is pounding the brass again. 4OC says he is doing good. He will go to midnight and Saturdays. 4KL lost an H tube but has another on the way and is putting in crystal-control soon. 4YX is anxious owing to motor-generator set. 4BL is operating on SS Shedd on Lake Michigan. 4KL has been at 4HL by Christmas time. 4YX visited HQ a short time ago when he was in New York on a business trip. Traffic: 4I2Z 99, 4OB 39, 4DD 32, 4HXL 30, 4TEC 20, 432 10, 4VS 6, 4QY 5.

WEST GULF DIVISION

OKLAHOMA—SCM., K. M. Ehret, 5APG—5ADO just completed his best traffic season ever with a newly installed 75 watt with which he works Aussies and N. Z. nearly every morning. The rest of the Cushings here have not been too busy. 5ASK is going away to college but is not going out of his radio for he has built a portable trans missile and receiver using 375 volts on a Raytheon tube with a well-filtered output. He is doing good work with this set and is applying for an ORS. 5ANL just moved into his new shack and is about ready to let loose the hammer. 5ARL is using 350 meters and a little later try 40 with another transmitter. He desires reliable ORS to write him for the right thing. 5ANB is using the 40 and 80 meter ORS. 5VM is trying to work out a traffic route to handle messages locally in the state. He hints that he will get in touch with his appointee as soon as he can. Another job for the preacher?

5SW and 5APG have been contemplating the construction of M. O's with the result 5APG is fairly under way with his. 5SGL is still hungry for greater DX and is having a regular diet of this sort. He keeps some sort of schedule with LW who is enroute to Buer, Texas. 5AYF is in C. W. in stalled in an apartment and is proceeding to erect a station. 5AVV got back from his trip and found that somebody sat on his 75 watt while he was gone. 5ARL is on occasionally. 5AYF has been working his station and will start at State University next month. 5AWQ bids the Oklahoma Gang farewell and looks forward toward Florida. 5BVT has been at WZ. OM. We note also that old post war spark. 5HL has left for California. 5ABO is having a great time writing to all the New Orleans regarding the renewal of his license.

GOOD NEWS, Gang—we just received a letter from Mr. Hebert, Treasurer and Field Man of the A. G. advising that he will be in Oklahoma City on Monday, November 8. What are we going to do plan? Fellows, we have more reports due than we have been receiving. No matter whether you are an ORS or not, loosen up and make Oklahoma the best ARRL state in the country.

Traffic: 5ADO 105, 5APG 15, 5AGN 15, 5ANI 10, 5WS 9, 5ASK 6, 5QV 6, 5ML 1.

SOUTHERN TEXAS—SCM., E. A. Salm, 5YK—This Section is rapidly coming forward. Some new ORS have been added and the old ones have taken new life. Present indications are that we will have a splendid winter season. 5AVF, 5AR, 5AYI and 5ARF of Uvalde, a new ORS reports working CH-2AR. They report some traffic although they say that they *have* to get any before they were one of our ORS stations. E. C. Shaw, 5HE of San Antonio, has come forward as one of our very best stations. But, 5APM has beaten station WZ, A and Z stations. He relayed trans-Pacific test messages and a message from San Antonio to the Philippines almost immediately for an Army officer. 5APM reports poor results due to weather. 5AYL, 5HE, 5CIT has had trouble with fluctuating power supply due to remodeling of their power plant. Edward Wilkins of Miranda City has had some transmitter trouble and is putting in an Esco motor-generator. 5HS is preparing to move and is out of the air for a short time. The Hamfest of the Besar County Radio Assn. was a huge success and the SCM had a very pleasant time there. Congratulations, the affair was pulling in grand style.

Traffic: 5HE 14, 5EW 13, 5MS 12, 5AVI-5ARF 6.

NORTHERN TEXAS—SCM., W. B. Forrest, 5AJT—Reports are somewhat better this month but with the coming of cold weather, they should be very much better for September. W is operating portable 5ATZ at the Coralina Oil Field area where he must muckate with the gang. 5AMG is hollering for traffic. 5EP, Tyler, is now OWLS No. 69 and is prepared to work on 40 and 80 meters also. 5DAP has been in contact with the gang who like to QSR and to QSO. 5ASL continues with the good work, although his Mg was weakened. His is on 20 and 40 meters and the best DX for 60 meters. 5EL-PKT (Java). 5AJJ, Dallas, blew his WE 50 watts but is now using an H tube on 40 meters. 5ASL has been sick the last month and is busy to go again by the middle of September and wishes to take a bundle of schedules after that date. His address is 1600 nor St. Dallas, Tex. 5WV will be at the A. M. again this year. E. C. Shaw,
ONTARIO—SCM, W. T. Sloan, 9BJ—CENTRAL DISTRICT: There has been a little more activity caused by some of the old timers, a few of whom are back from their holidays but several others are away.

9BJ is back in town and had the misfortune to "blow" his generator but after firing a sync for a week or so the display of neighboring BCLs he has decided to use 300 volts DC (7) from his 8 eliminator on a 210. He has a schedule with 9MU on the latter’s return trip to Europe commencing Aug 22 on 43m. Also he is giving the QST a kick up the butt with his forthcoming CQ report. 9BJ is still tickling the ether with 150 watts on a 201A and having quite fair results so far. He is going to try using 240 for two weeks but did a lot of work in the early part of the month and is looking forward to working over 200 stations in the month on a swather with a Hertz. 9AZ is also away for two weeks and has a portable outfit with him which he expects to keep hot at Balsam Lake. 3OK is just back from his holidays and hopes to put a new feeder line on the old Hertz. 3BY is back at it again and also comments on the same change as 3OK due to hard boiled BCLs in the same block.

3EL is experimenting with the new types of feeds for Hertz antennas and hopes to be on with added power soon. 3SV writes from Bermuda to say that it is a Ham’s paradise for some US stations. 292 messages and working over 300 stations in the month on a swather with a Hertz. 9AZ is also away for two weeks and has a portable outfit with him which he expects to keep hot at Balsam Lake. 3OK is just back from his holidays and hopes to put a new feeder line on the old Hertz. 3BY is back at it again and also comments on the same change as 3OK due to hard boiled BCLs in the same block.

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