QST
Devoted Exclusively to Amateur Radio
Published by The American Radio Relay League
SEPTEMBER, 1925
25c
Mr. E. P. McDonald, Jr.,
332 S. Michigan Avenue,
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My dear Gene:

I have had so much success and
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In the Orange
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In that white and
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with its glistening
ice, driving blizzards
and endless, relent-
less cold, Cunning-
ham Radio Tubes
deliver the same ef-
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service that makes
them valued so high-
ly in the shelter of
the American home.

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THE AMERICAN RADIO RELAY LEAGUE

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 prerequisites. Correspondence should be addressed to the Secretary.

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EDITORIALS

Election Time

Every year the members of the American Radio Relay League elect seven directors to their governing Board for a term of two years. Thus there are fourteen elected members on the Board, at least half of whom have always had at least a year's acquaintance with League business.

The membership depends upon this Board to manage its affairs, to select its officers, to determine League policies in all important matters. At the meetings of the Board of Directors, each director speaks for his territory and it is the duty of the director to know what the amateurs "back home" want. The Board is the most important part of League government, the actual governing power established by the members and through which the members express themselves in the decisions of League action. It is therefore of supreme importance that able representatives, men of vision and judgement and of experience in administration, be selected. In this issue of QST a notice appears, soliciting nominations for director from the territories in which an election will be held this November. It is the privilege and the duty of every member to think seriously on this subject and express himself, that our A.R.R.L. government may continue to be representative of the membership.

Fish About a Bit

The coming of cooler weather is certain to see an increase in the amount of international DX working, which continues to be one of the most fascinating sides of amateur radio work. It is important for the American amateur to remember that amateurs of foreign countries will not often be found operating within bands assigned by the U.S. government for amateur operation—they are wise enough to know they would have no chance of being heard through our local smother. Yet many American amateurs interested in international DX continue to listen only within the bands in which they are equipped to transmit, and a great horde of foreign signals continue to go unanswered. The place to look for foreign DX is out of the U.S. bands! Most of it is just below and just above our so-called 40 and 30-meter bands. In particular there is a beehive of activity between 32 and 37 meters, good fellows calling their heads off for A.R.R.L. Tune about a bit, you chaps, and give these fellows a shout. There are many new countries getting on the air now, and it's going to be a great winter.

—Kenneth Bryant Warner.

We Ask—

This issue of QST marks the passing of Summer, with its QRN, vacation-QRM and other obstacles to the uninterrupted enjoyment of radio. Perhaps it is just as well, for September and cool Fall weather find us all rested and rarin' to go.

The radio industry has had more than its share of troubles these past six months. From various causes there has been a great slump in nearly all branches. While hardships have resulted, as for instance the drop in advertising in the radio publications, yet in a larger sense it has been a good thing for the industry as a whole as well as for the consumer. This summer has seen the elimination of many "gyps", two-by-four concerns putting out medium-to-punk apparatus and sets. And the reputable firms whose finances and stability have enabled them to stand the gaff have taken time to replan their merchandising and production policies for more efficient operation.

The situation now, at the beginning of the season, is that the industry has been purged of much undesirable apparatus and many such firms. In general those remaining are geared up to a higher standard of service and reliability of products. Their field of prospects is widened through the decrease of competing concerns.

What does all this mean to you, the consumer? It means that you can buy with more confidence than before, secure in the knowledge that what you buy will be well-made and properly sold. It means that you can bring your set or station up-to-date more quickly and perhaps more cheaply than in the past.

So go to it, O.M. Now is the time to get on the air. And in doing so remember to patronize QST's advertisers, mention QST when writing to manufacturers or buying over the counter, and boost QST-advertised products to others. Thus you will not only be getting reliable apparatus for yourself but you will increase its distribution to your friends, and thereby become not only a potent factor for the advancement of the industry but a valued and valuable booster for QST as an advertising medium. Without advertising, no QST; without QST no A.R.R.L.!

—Edwin Adams.
Reviewing the Receiver

By Wm. H. Adams*

An investigator of radio who does not sometimes dream and imagine wonderful circuits quite beyond his power of accomplishment is rather deeply in the rut; and commercial designers of apparatus particularly have a tendency to follow the beaten path.

I have been dreaming. I have been trying to imagine myself a radio wave rambling through various radio circuits, and my imagination leads to some conclusions which I will state as briefly as I can.

The point of all radio reception is first to receive a signal without interference and then to amplify it to taste.

Amplifying a non-selective signal really makes confusion worse confounded, and about two-thirds of the reception obtained nowadays consists of amplified interference.

How Shall We Do It?

No radio circuit of high resistance can tune sharply. This is only vaguely understood, only half-believed. Let me repeat and emphasize "No radio circuit that is of high resistance can tune sharply."

What is meant by high resistance? Not only the copper circuit; indeed, the copper circuit in itself is not supremely important. Metals of lower conductivity sometimes may work acceptably, though copper is best, next to silver.

What is meant is the unappreciated resistances that clog most circuits.

The Antenna

Why put all the responsibility on the set? Consider the antenna circuit. Realize that it always inclines toward high resistance and that this resistance is undesirable.

Anything (whether conductor or insulator) that comes near the antenna will increase the resistance of the antenna and broaden its tuning. This is true of the outside house wall, of the inside plastered wall, of the trees in the yard, of metal roofs and wire nearby, of anything that comes close to the antenna.

Keep the wire distant from the inside and outside walls.

Make twice as good a connection as ever before to the antenna circuit. Solder it. Run it as straight to the set as may be, and if humanly possible carry the antenna wire itself straight to the binding post of the set without any joints whatever. Now go over the ground and make it twice as good as it is now. Even if it takes time one cannot get too little resistance, and every imperfection in the ground circuit gives a two fold imperfection in selectivity. Note please that these resistance reductions do not greatly increase the signal, but instead they sharpen the tuning.

Coupling

The antenna circuit, even at its best, inclines toward high resistance. If it is coupled closely to the secondary circuit this high antenna resistance will also be "coupled into" the secondary circuit, thereby broadening the tuning. Use the loosest possible coupling. Do not be afraid because the signal is weaker. The point, as has been said, is first to receive a signal uninterfered with by other signals and then to amplify it. Under these conditions successful amplification is possible.

The Tuner

The general principles of good tuner design are the same for all types of tuners. However, the "loose coupler with a tickler" is a simple and well-known type, therefore it will be used as an example.

A receiving circuit cannot have too low resistance.

Begin by using large-diameter coils of large wire, keeping them at least 2" from

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* Eastern Finishing Works, Kenyon, R. L.
any other parts of the set, avoiding all metals and dielectrics in their fields. For the secondary coil especially use no wire smaller than No. 16 or 18, and avoid windings that have high distributed capacity.  

Put the secondary tuning condenser (which should be the best on the market) straight across the secondary coil, the rotary plates being connected to the filament end of the coil. Make the coil wire itself continue to the rotor terminal of the condenser and thence to the filament. Make the other end of the coil wire continue to the condenser stator terminal and then to the combined grid-leak-and-condenser which should be mounted on the detector tube socket.

Do not introduce any switch or loose contact whatever.

So far this is merely a "straight audion circuit" (Fig. 1) without any regeneration control and with a good fixt-tune antenna circuit loosely coupled to a secondary circuit of extremely low resistance. However, the selectivity will be amazing.

Adding Regeneration

Now for regeneration, for we assume that no one will be satisfied without some attempt at this form of radio-frequency amplification.  

A low loss variometer in the plate circuit can be used. Most of the so-called low loss variometers are not truly described, because they contain considerable quantities of dielectric, have considerable distributed capacity, poor contacts and so forth. Some variometers of the lattice coil type are much better, but even these have a certain amount of dielectric and metal in the field.

The writer does not like variometer plate circuit tuning, believing that a properly designed tickler coil for regeneration is more satisfactory and more flexible.

Suppose that something just a little different be tried. All the secondary inductance is not needed in a single coil, and it is possible to gain some definite advantages by dividing it into two coils connected in series. The antenna circuit is loosely coupled to one of these coils, and to the other is coupled a suitable tickler coil in the plate circuit.

Most of the difficulty with the conventional three coil tickler circuit comes from the varying reaction of the tickler through the secondary and to the primary which makes it necessary to retune the other two adjustments when any one of the three is altered. Therefore, in the present tuner, the two secondary coils are installed at right angles to each other and well apart so that variations of tickler coupling will not react inductively through to the first coil and antenna circuit. Now what have we? A simple, well-known circuit built along logical and theoretically accurate lines in such a manner as to eliminate all possible losses and to obtain the greatest selectivity and sharpness of tuning without especial regard to signal strength. It has excellent control over antenna coupling and regeneration with the least possible interaction between these controls and the secondary tuning control. If theory counts for anything, such a combination may well force many of the much touted ingenious and complex circuits now so popular to look to their laurels; moreover, such a circuit is an applicant for admission to the Golden Rule class, as its very loose and non-resonant antenna coupling, and the possibility of ample regeneration without oscillation (permitted by the low resistance secondary circuit), minimizes radiation.

Construction

In order that these ideas might be tested and full advantage be taken of all selectivity possible, some experimental tuners were built. In the final one the primary coupling was used when one changes the terrible 3 coil Meissner sending set to the real 4-coil Meissner circuit.

1 See the article by R. R. Batcher in the present issue of QST.

2 The Technical Editor especially likes this statement. Regeneration is certainly the thing that makes the detector "go out and hunt them". But that isn't all-regeneration is also the thing that makes radio frequency amplifiers work. I have seen very few sets that actually had non-regenerative r.f. stages and they weren't worth the powder to blow them up.
coil is made of a small number of turns of large wire mounted at $45^\circ$, on a fibre shaft turning inside the first secondary coil, held fixed at an angle of $45^\circ$ to the base and two inches distant from it, while the plate tickler coil is similarly mounted on a shaft at $45^\circ$ and the second portion of the secondary coil is mounted like the first but at right angles to same, the first coil, for instance, tipping toward the front and the second one toward the rear. This brings them on the same longitudinal axis, but at $90^\circ$ to each other and, hence, not coupled; and this arrangement of the coils permits the rheostat, condenser and tube to be located between with the shortest possible wiring.

It was necessary to use a very small amount of white lacquer made of celluloid or gun cotton dissolved in amyl acetate to exclude moisture, thinned with at least an equal amount of solvent and as light a coat as possible was put on. Paraffine, silicate of soda, shellac, varnish or paint of any kind absolutely should not be used on coils or base. No avoidable metal or screws were used. Soldered joints were used except in battery leads. No frictional contacts were employed, and great effort was made to get absolutely perfect circuits, but the effort was very well worth while.

The signals are of unexpected volume and very good tonal quality and the tuning is sharp.

**Reviewing**

Now let us set all this down as briefly as possible, telling all of the things that have been done in making our simple tuner as good as possible.

1. The avoidance of all metal and nearly all dielectric in the fields of the coupling coils and throughout the set.
2. The very loose coupling to the untuned antenna circuit.
3. The large wire used, winding to reduce distributed capacity and radio frequency resistance to the minimum.
4. The directness of the wiring and the avoidance of all switch connections or loose contacts or unsoldered joints.
5. The separation of the antenna coupling control from the regeneration control by means of the split secondary circuit.
6. The extremely loose coupling variations permissible by use of $180^\circ$ variable coupling arrangement.
7. The large range of regeneration control and the very low resistance of the plate circuit.
8. The use of an extremely low loss condenser to tune the secondary circuit.
9. Micrometer filament control.
10. Insulation of all wire contacts from wooden supporting members.

11. The almost complete avoidance of radiation due first to the extremely loose antenna coupling, and second, to the extremely low resistance of secondary and plate circuits which makes it necessary to force regeneration and makes possible satisfactory operation below the oscillation point of the tube.

Isn't this worth trying out before wandering off into the maze of neutrodynes, heterodynes, acemedynes, superdynes and other "pseudodynes"? Let's get back to basic principles in a simple circuit that is really of low resistance. After that will be a good time to start building more complex sets on the same "low loss" principles.

There is nothing about the theory or mechanics of the circuit that cannot be applied to tuned radio frequency amplification. Perhaps later I will have a further word about this.

The use of a "Low Loss Tuner" was manufactured in the QST office therefore we feel entitled to have something to say about the way it is used. Just now we wish to know who started the idea that a "low loss tuner" must be a loose-coupler-without-tickler. There isn't the least excuse for that idea—QST has shown low-loss neutrodynes, low-loss superheterodynes, etc. "Low loss" isn't a circuit—it is a quality that appears when the designer understands radio design.

7QD reports ANE whose QRA we would like to know.
**Practical Lecher Wires**

By Eugene C. Woodruff*

LECHER wires are permanently set up at 8CMP with the accessory devices for tuning the wires and locating the voltage nodes at any time. One can make a wavelength determination with the wires almost as quickly and conveniently as with a wavemeter, certainly more accurately. Preliminary experiments with neon tube indicators and thermogalvanometers worked just as was stated in the October, 1925, and May, 1925, numbers of *QST*, but the operation was slow and fussy if satisfactory accuracy was attempted. After some struggle, the apparatus described herewith was developed, eliminating the unsatisfactory features of the other indicators.

Referring to Figure 1: Two parallel wires 23 feet long and spread eight inches apart are hung between pyrex insulators about six feet six inches from the floor of the cabin. Under one end of the wires is a shelf on which is mounted the indicating apparatus as shown. With this arrangement, a UV-199 receiving tube, the plate circuit of which includes a five milliampe meter. The grid is connected to one of the Lecher wires through a fixed condenser having a capacity of 200 micro-microfarads, the other wire being connected to the tube filament. The grid leak connects grid and filament directly. This device not only indicates with precision when the wires are in tune with the transmitter, but also shows when the bridge is at a voltage node on the wire. The short-circuiting bridge, S.B., is made to travel along the wires by an endless rope looping from wall to wall through pulleys. The operation of making a measurement is as follows:

With bridge unhooked, couple the transmitter to the Lecher wires and tune with either the transmitter, or the wires, (or both) until the milliammeter in the indicator plate circuit shows a minimum. This tuning is very sharp as the plate current of the indicator shows a large, abrupt, change as the circuits come into tune. If one man is working alone he observes the milliammeter through field glasses while tuning the transmitter. The bridge is now placed on the wires and the operator, standing near the indicator, shifts the bridge by means of the rope until the milliammeter again shows the same abrupt drop in reading. When this condition obtains the bridge is at a voltage node. Two or more voltage nodes are located in this manner, a chalk mark being made on the floor underneath each node, using a plumb bob. The distance between the chalk marks is one-half wavelength.

It was found best in general to adjust the Lecher wires roughly to seven times the wavelength desired and depend on the transmitter for the fine adjustment.

The natural period of the Lecher wires was determined by coupling a calibrated receiver to the input end of the wires with the indicator in place but with batteries disconnected. With receiver oscillating one hears the familiar click as wires and receiver are brought into resonance. The coupling should be as loose as possible, of course, or the calibration of the wires will be in error by a large percentage. This testing served to determine the dimensions of the wires and their accessories so the wavelength range would include waves seven times the length of those for which the transmitter was intended.

It is especially convenient to have an adjustable grid leak on the transmitter as the response of the Lecher wires and the indicator can be made much more definite and precise by adjusting the leak to the best value. This value is readily found by observing the behavior of the indicator during test. In adjusting the wires to different wavelengths it is important to keep any loading with coils and condensers symmetrical. UV-199 tubes served very well in the indicator when the transmitter used five-watters or 201-A tubes. If larger

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By Eugene C. Woodruff*

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transmitting tubes are used it may be necessary to use larger tubes in the indicator. In any case select a tube for the indicator that has a rather large plate current, say one mil or more, when supplied with the rated filament and plate voltages. A tube that had become perfectly useless in a receiver, refusing to oscillate, was found to work better than a "good tube" in this connection. The bridge instead of being a continuous conductor across the pair of wires may to advantage include a small condenser. Indications seem to be a little sharper when such a condenser is used. Under certain conditions it is not necessary to tune the Lecher wires at all. If the first response is to a wavelength at the lower end of the transmitter condenser scale and the wires are tuned for that, then one may find that for all longer waves one can leave the wires at this tuning merely setting the transmitter condenser to the desired series of values and proceeding with the location of the nodes. In the illustration herewith given this procedure was followed. In this case it was found that with the transmitter coupling coil L (Fig. 1) directly connected to the wires with no condensers or inductances, the response was sharp and decided for a reading of seven on the transmitter condenser scale. The plate current of the indicator changed from 1.2 mils to 0.8 mils and back for a movement of the condenser dial of one scale division. For scale readings larger than ten the plate current of the indicator began to fall off again gradually as the transmitter was tuned, reaching a rather low value at one hundred. Data for the table in Figure 2 were then obtained and the calibration curve of the transmitter plotted as shown in Figure 3.

As an interesting check on this measurement the following was done. A wavemeter having a wavelength range from about 100 to 220 meters was checked several times against the standard waves transmitted by the Bureau of Standards station WWV. A receiver was assembled having a range from about 30 to 50 meters and calibrated using the above wavemeter. With the transmitter condenser set at seven, resonance was obtained in the receiver at 43.9, 40, 36.3, and 32.4 meters. The transmitted wave was the 11th, 10th, 9th, and 8th harmonic of these respectively, giving the wavelength of the transmitter 3.9, 4.0, 4.03, and 4.05 meters. The average value is 3.995 meters. The wavelength found by direct use of the Lecher wires was 4 meters. Considering the roundabout methods this agreement is remarkable.

8KS says that an ordinary dimming socket which has several adjustments makes a good primary rheostat for controlling the filament transformer. You have only to avoid pulling the dimmer to the high side as the final jump eliminates the resistant entirely. The dimmer socket is shunted by a 100-watt lamp which carries most of the load and has a fuse plug in itself, to close the circuit.

g2O has tied with mBX and Argentina. He reports that Australian signals seldom if ever come through in the morning whereas the N.Z. stations are most generally heard then.
 Locating "Power Leaks" by Radio

We have talked a great deal about the ways of locating power leaks that cause radio interference. We are about to go into the subject again because it is very important to dealer, transmitter, receiver and electric distribution man alike. This does not mean that we are trying to blame all radio noises onto power leaks. That would be just as silly as the old (meaning a year since) habit of blaming all noises onto amateur sending sets.

The power leak is not always guilty. One large generating company has found that of 125 complaints 29 started right in the house of the man complaining, 20 took care of themselves before they could be reached and only 33 of the entire 125 proved to be honest-to-goodness "power leaks" that the company was responsible for and could therefore do something about.

The noises that started in the complainants' homes were mainly inside the sets themselves — poor battery connections, defective tubes, loose contacts, damaged audio transformers, etc. In addition to this there was the usual crop of noises from household appliances — "violet ray" machines, washing machine and vacuum cleaner motors, electric fans, bad sockets, etc. This sort of thing should not be blamed on the light company and it is a good idea to begin hunting the "line leak" by pulling the cutoff switch in your own home to see if there isn't something wrong right at home.

If it isn't in the house it still may not be a line leak — 9 of the 125 complaints above were traced to other things — street cars, telegraph lines, etc.

The Real Line Leaks

If you are sure that the racket-factory isn't in the home, are pretty sure that it isn't the "plop-plop-plop" of passing trolley cars, then maybe it really is a power-line trouble. Now the Generating and Distributing company gets into the picture. An indignant customer calls and says that the power company is manufacturing a fiendish noise and must stop it at once. He does not know where the noise is, how many miles from him it may be located, not even in which direction the thing is from him. He knows only one thing — it MUST STOP AT ONCE.

The Trouble Shooter

Then it's up to the radio trouble shooter. He cranks the Ford, puts the radio receiver aboard and goes to the neighborhood where the most noise reports have been arising. Then he goes up one street and down the next, listening for the place where the
noise is loudest. If the power doesn’t go off and the leak keeps on leaking he will find it 9 times out of ten. Then he reports to the repair crew and moves on to the next complaint. The repair crew gets out and fixes the break.

It is fast work—but even this does not suit the radio men who did the complaining. They can’t understand why it wasn’t all done in .30 minutes by the Ansonia clock—why couldn’t the company drop all the thousand details of a business reaching almost every person in town, drop all these things and come running to fix one defective joint that wasn’t interrupting service, wasn’t endangering anyone—but was simply disturbing the amusement of a few dozen people. It is ridiculous—yet that’s what the generating company is up against. In spite of this wholly unfair public attitude the companies are almost without exception doing everything that can be thought of, are employing men solely to run down these things and—are making money thereby.

That’s the pleasant part, it pays to make friends of the public (even when that is inclined to snap at the company) and it pays to run down little leaks by radio before they become bad enough to attract attention to themselves in other ways.

The Trouble Man’s Tools

So much for the background; now for the way the thing is done. In the splendid report issued on “Radio Interference” by the National Electric Light Association all manner of sets are shown as used by different power companies. There is everything from a mahogany cased superheterodyne to a plain little set with a detector and a single stage of audio amplification. There are sets with loops and sets with antennas, but mainly the loop seems to be the favorite. This isn’t because the loop is used for compass work—most of the trouble shooters seem to agree that the loop is useless as a compass, serving only to give the senseless results indicated in Fig. 1. Occasionally though the compass will work and then it does save time. Meanwhile it is compact and always the same if it was decently built.

There seems to be a fairly general agreement that too sensitive a set is worse than useless, therefore the tendency is toward simple sets with few tubes. Good representative sets of this sort are shown in our photographs.

The Things That Are Found

Every one will at first think of arcing grounds, bad joints and swinging contacts between two wires or a wire and ground. These things are found occasionally. The radio trouble shooter is more likely to find less visible things: loose transformer fuses, defective transformes: bushings, a loose transformer-case grounding wire, a defect inside a pole transformer or manhole transformer—or a vibrating charger or a fan
motor right in the room from which the complaint came.

The high-tension line is usually very well behaved; certainly up to the time when the insulators are beginning to "age" badly. There are notable exceptions to this, perhaps the worst being the famous New York - Westchester and Boston electric line (which gets as far as Westchester) which makes life miserable for a goodly part of the Bronx on rainy evenings. There may be other lines that create fully as much "rookus" but they don't do it in such thickly populated neighborhoods.

When a bad defect does develop on a high-tension line the effects are usually very severe and extensive as the R. F. energy created by the arcing discharge travels along the line and is radiated off as it goes, especially when it comes to an insulator or any other irregularity in the line. Mr. Owen Millar of Reward, California, reports one case that was found 125 miles from the point at which interference was first heard.

Mainly though the noises start in the lines of moderate voltage, those below 2400 volts. These lines are more complex. It is harder to maintain them carefully and minor difficulties can develop unobserved. When anything does develop it is heard at once for such lines are invariably surrounded by radio receivers.

The Household Appliance

Although it has been said in several ways, one more repetition will be attempted—look first at the electric devices right in the home. A "violet ray" machine will raise Cain for half a mile around and should never be used in the evening. An electric fan with brushes makes a merry mess of the ether for a few yards around and its big brother the vacuum cleaner is rather worse.

A defective socket will raise incredible noises while the lamp in it seems to be burning all right.

The well-known warming pad with its chattering thermostat frequently keeps up its noise for weeks before detected.

The battery charger and defective plug on the flatiron out in the kitchen also escape un-noted.

Therefore again—start by pulling the main switch for the house. If the noise does not stop then call in someone who can read radio telegraphy. If he assures you that it isn't a radio station then it's time to call the light company, remembering that they are human and deserve pleasant treatment, also that there is no industry which more prides itself in doing the utmost to improve its work in every way.

Acknowledgment

Much of the material for this article has been contributed by Mr. J. A. Mitchell of the Hartford Electric Light Co. We are also indebted to Messrs R. H. Wohlford (American Gas and Electric Co., New York) and F. C. Manson of the Indiana and Michigan Electric Co. as well as Mr. R. W. Shoemaker, Electrical Department, Turlock Irrigation District, Turlock, California. In particular there should be mentioned the courtesy of Mr. R. W. Lovell of the National Electric Light Association from whom we received the report of the Radio Interference Committee. This report is so excellent and so complete that any reader of QST will find it very greatly worth the 60¢ asked for a copy. The address is 29 West 39th Street, New York City.

A 360° Vernier Dial

For use with the Quam, Remler and other condensers requiring a dial graduated in a complete circle, the National Company have brought out their popular Velvet Vernier dial with 200 divisions occupying 360 degrees of the dial. The vernier movement is similar to the regular 180 degree Velvet Vernier control. In addition to use on the above mentioned condensers, this new dial should find use in a variety of radio appliances which require a vernier operating throughout one complete revolution. The dial is 4 inches in diameter and the knob is large enough to comfortably grip and hold.

Strays

When SDDU was reconstructing his antenna and counterpoise a neighbor remarked, "I see you have two aerials, one for the high waves and one for the low waves!"
Designing the Secondary Coil
A Simple Chart for Measuring Inductance and Wavelength
By G. H. Burchill*

Laboratory accuracy is not required when we figure in advance the physical dimensions and wire sizes of a coil which is to be used as the secondary of a receiving tuner. We usually have enough leeway between theoretical design and practical construction to make it perfectly feasible to use a calculating chart to determine the constants of our secondary coil. By means of the chart shown, the inductance of a coil whose length (actual linear space occupied by the wire itself) and diameter is known can be determined almost instantaneously. The wavelength at which the coil will be resonant with any of five capacities in parallel to the coil can also be found with the size of wire used. Opposite this point, on the lower left hand scale, read the inductance of the coil. The wavelength to which the coil will tune with any value of parallel capacity is found by following the horizontal line through this point to the right to intersect the curve corresponding to the given capacity, the corresponding wavelength being read directly below this intersection on the bottom scale.

How to Use the Chart
To determine the inductance of a coil and the wavelength for which it is suitable it is necessary to know the length and diameter of the winding and the size of wire. Locate the intersection on the upper left-hand scale and follow the horizontal line through it to meet the curve which corresponds to the diameter of the coil. From this point run vertically downward to meet the line marked with the size of wire used. Opposite this point, on the lower left hand scale, read the inductance of the coil. The wavelength to which the coil will tune with any value of parallel capacity is found by following the horizontal line through this point to the right to intersect the curve corresponding to the given capacity, the corresponding wavelength being read directly below this intersection on the bottom scale.

The dotted line illustrates the use of the chart to find the characteristics of a coil 3.4 inches long, 3 inches in diameter and wound with No. 22 D.C.C. wire. The inductance read on the lower left hand scale is .46 millihenries and the wavelength with a .0001 µfd-shunt condenser is about 406 meters as determined by the lower right hand set of curves.

The minimum capacity of a receiver using a 11 plate condenser is about .000025 µfd. (25 µfd.) and this curve on the chart may be used to determine the lowest wave which

can be reached with any of the coils. It is well, however, to operate with a little more capacity than this in shunt and the .00005 μfd. curve should therefore be used to find the minimum working wavelength. Similarly, the .00025 μfd. curve gives the highest wavelength that can be reached (with the average 11 plate condenser) and the horizontal distance between these two curves may be taken as the working range of the coil under consideration. The range of the coil mentioned above is from 200 meters to something over 600 meters.

To design a coil for a certain wavelength range proceed as follows: locate the lowest wavelength required on the wavelength scale, follow the vertical line through it to meet the .0001 μfd. curve and read the inductance opposite on the right hand scale. Check this value of inductance by using the curve corresponding to the maximum value of your condenser to show that the highest wavelength desired can be reached. If it cannot it will be necessary to use a larger condenser or interchangeable coils. When the value of the inductance has been determined follow the horizontal line through it to the curve for the size of wire to be used, upward to a suitable diameter of winding and horizontally to the left to find the length of the winding.

With a little practice it may be found convenient to work from the wavelength to the size of coil required without reading the value of the inductance, this being only an intermediate step which it is possible to omit. For example: Find the length to which a 4 inch coil must be wound with No. 20 D.C.C. in order to tune to 500 meters with a .0001 μfd. condenser in shunt. Locate 500 on the wavelength scale, follow the vertical through it to meet the curve marked .0001, then horizontally to the line marked 20, vertically to the 4 inch diameter line and lastly horizontally to the left to the length required—2.1 inches. Simple, isn’t it?

The Hoosier State Convention
(Central Division)

No one who attended the 2nd Annual Convention of the Hoosier State Amateurs will deny that the reception given the visiting “Hams” was very warm—the temperature average 96 during the two days—and the cordiality of the “native” was of the best.

Under the efficient management of the A.D.M., D. J. Angus, and that of the Chairman, A. S. Burns, the convention opened promptly and the register soon was filled to overflow. The first stop was made at the plant of the Allied Magnet Wire Co., and every one under the guidance of several good guides was given an opportunity to see how magnet wire is made. The next stop was at the Lenore Substation of the Central Indiana Power Co., where our reception was most cordial. At this place every one was given an opportunity to see “Wired Wireless” in operation, and the completeness of the system cannot be appreciated without such a visit and expressions of wonderment and pleasure was heard from all sides. The Broadcasting Station WFBM operated by the same company and in the same building was also visited—for a remote control station it appears to be one of the best.

After a bite to eat the evening meeting was opened with a good address by Prof. A. M. Wilson of the University of Cincinnati, Mr. John H. Miller, Chief Engineer, Jewell Electrical Instrument Co., who has done so much in the developing meters for our use, again showed himself our good friend by coming from Chicago to lecture on the proper uses of meters. A most interesting address was given by Mr. P. D. Scott of the A. T. & T. Co., on “Transmission of Pictures” over telephone lines, and their kindness in distributing actual photographs of such transmission was much appreciated.

Saturday the 11th opened bright and early with Radio Inspector Turner on the job, and quite a number passed the examination successfully for both commercial and amateur tickets.

The afternoon was spent in listening to Treasurer Hebert, from A. R. R. Lo Headquarters, and as usual he told us enough about our League to make us feel proud of being members. Mr. E. T. Flewelling also gave us a good talk on “ Receivers,” being followed by an old amateur in the person of Fred Marco, 9ZA, who is always interesting with his discussions.

The closing event was the banquet, and it was quite a departure from most affairs of the kind in that there were no speakers, thanks be, but interesting, nevertheless, by the time used for such purposes in distributing the prizes won at the different contests. A little skit was sprung at the last moment which made everybody laugh.

Our thanks to the prize donors—we wish we could name them all here but there were too many of them—and to Angus and the Indianapolis Radio Club for their successful efforts.

Look out for next year “gang”. The South Bend fellows will have it.

—A. A. H.
Adding Punch to Your Neutrodyne

By A. L. Budlong

In the original article on the Hazeltine neutrodyne published in the April, 1923, issue of QST, the circuits were shown for the straight neutrodyne amplifier and non-regenerative detector, shown in Fig. 1, and also a neutrodyne with regenerative detector, as shown in Fig. 2.

Of the two systems, the one in Fig. 2 will give noticeably greater signal strength under most conditions. The reason is this: When we neutralize the R.F. amplifier tubes, the adjustment is made to keep the tubes some distance below the oscillation point. This means that the greatest possible signal strength is not being obtained because greatest sensitivity maintains when the tubes are just on the edge of oscillation. On the other hand, with a regenerative detector, we can pull the system right up to the point of oscillation, thereby getting the most out of the receiver.

The commercial styles of present-day neutrodynes do not use the regenerative detector system. The reason for this is probably that such an addition means another control. However, since practically all of the neutrodynes (there are a few notable exceptions) have three controls, making one more control than the normal person has hands, I don't see why four controls are any worse. It's easier, as a matter of fact, to work on two pairs of dials, shifting both hands, than it is to work on three dials, and go through the agonizing indecision of wondering which two of the three you will work together, and which hand is to be used for the third one later.

Adding the Punch

Method No. 1 is the one shown in Fig. 2,

\[ \text{FIG 2} \]

Neutrodyne with detector regeneration

whereby we break the detector plate circuit and insert a variometer for obtaining regeneration. When you do this, it is advisable to put a .001 microfarad fixed phone condenser across the phones or audio transformer primary, as shown in Fig. 3. Many people will not want to tear their sets apart, or add instruments, so we will resort to a simpler method, shown in Fig. 4. This is a dead cinch. All you do is to take the neutralizing condenser off the second stage of amplification. This allows this stage to operate up to, and even in oscillation, but does not do any harm, since the first neutralized stage prevents radiation.

\[ \text{FIG 4} \]

This method is extremely satisfactory, enabling a noticeable gain in signal strength to be obtained. Not only that, but you have not added any controls, and furthermore, haven't had to tear the set apart or crowd other instruments into the set.
So far as I know, there is only one disadvantage. You can't log the dial settings as you used to. With the method shown in Fig. 2, the settings of the first two dials may be logged, but the third will be off. With the method in Fig. 4, the setting of the first dial may be logged, and perhaps the second, but not the third.

It may be that, after removing the neutralizing condenser of the second stage, as shown in Fig. 4, you will still not be able to get oscillation with the third dial. This means one thing: Your R.F. transformers are not what they should be, and are not giving you full amplification. The trouble is nine times out of ten that the transformer primary has too few turns. Two remedies are possible. One is to rewind the primary ("P" in Fig. 4), putting on 20 or 30 turns of wire; the other is to leave the transformer alone, and add a plate variometer in the detector as shown in Fig. 3. You do not need to put the neutralizing condenser for the second stage back in place, as the fact that the set would not oscillate without it proves that it was just camouflage in the first place.

Misplaced Power
By Malcolm H. Romberg

W

H

EN I became tired of 200 meter stuff some months ago I decided to go down on 80 meters. After reading a lot of QST's I was all ready to begin. After tuning and trying I finally got the tube running somewhat cooler than the sun. Of course I proceeded to call at once. After the sixth or seventh call somebody tapped on the door. I had to drop everything and answer. It was the woman who lived on the third floor. She said that her lights were going up to half brilliancy every once in awhile although the switch was off, and wouldn't I please come up stairs and take a look. I did it, but the lights were acting just as they are supposed to. I told her that she must have been dreaming, but that if they did it again she was to call me. Then I came down and started to call where I had left off. "Tap, tap, tap" at the door again. This time I had her hold the key down, and sure enough I was doing the lighting of the lights for her with my radio transmitter. I secured three small 1,000-micromicrofarad condensers, put them in parallel and connected them across the line. The wavelength of the line went to 452 meters where it did no harm.

Now unfortunately people don't want funny things hanging from the light fixtures to satisfy some nut with a transmitter. Therefore I got some very small condensers and taped them up compactly so that I could put them up under the canopy of the fixture where nobody else could see them. Since then I have bought a couple of dozen small mica condensers of 10,000 micromicrofarads capacity each and have shunted every light fixture in the house. Perhaps some of you may think that all of this performance required a very large antenna current, but it didn't. I have a 5-ampere antenna meter and with the aid of a large magnifying glass I know for certain that it does not move. I have tried a 14-volt Christmas tree light in series with the antenna and it lights fairly brightly, therefore I suspect that there are others who don't have a great deal of power but who do have some trouble. That's why I am writing this to help them.
Making a Synchronous Converter

By W. H. Raring, 8LH

For plate supply, the logical thing to my mind seems to be a small single phase converter. The first cost is relatively small (merely the cost of a two-pole D.C. motor of suitable voltage) and the operation simple. Almost everyone has a small plate transformer or one can be easily built, as the required A.C. voltage is small. Due to competition, fractional horsepower motors have excellent characteristics and are very well built.

They will stand double voltage safely without excessive sparking. Double speed is also safe, and an 1800 R.P.M. motor can with a fair safety margin be kept at 3600.

The change from a D.C. motor to a rotary converter is simple and easy. Slip rings must first be provided. A blown cartridge fuse (with the brass ends filed down to permit of insulating them from the shaft) was used at 8RH with fine operation. It would be better for the ham to use his own judgment on these constructional details. The slip rings should be connected as shown in Fig. 1 to commutator segments as nearly as possible directly opposite each other. An unbalance here will cause a slight change in D.C. voltage and a little sparking. We advise knocking out the wedge on top of the armature coils carefully, placing the lead wire in and pressing the wedge back. Generally there is plenty of space for the wire.

Next examine the machine for a series field winding. If it has one, disconnect the leads and bring them out. Also bring out the armature or brush leads. The shunt field leads may now be brought out and tagged. If the machine under question is shunt wound it will be necessary to provide a series winding. Wind about 6 turns of No. 18 annunciator wire or electric fixture wire over each field coil. Connect the coils so the current will flow in opposite directions in every other coil. Now connect the machine as shown in Fig. 11.

When the switch is thrown to "start" the converter will run as a series motor. Allow the machine to pick up in speed for a few seconds, then throw the switch to "run". A two pole switch could be used, but it is best to short circuit the series winding, as its field will add to the shunt field and vary the power factor a good deal under load. The machine is now running as a synchronous converter and supplying D.C. at the commutator. The voltage at no load is the transformer voltage divided by 0.707.

If an A.C. ammeter is obtainable place it in series with the transformer primary, and by placing a rheostat in series with the shunt field the current may be varied until a minimum is reached. This is the point of highest power factor and will be near unity. The rheostat will vary in motors according to the shunt field current, but several lamps can be used in series and parallel arrangement to give best results. We are interested in power factor for two reasons. First, a low power factor will mean a high transformer current and heating. Second: high armature current will mean armature-heating and low voltage (D.C.) output. Some small converters run best with no field current. It should be noted that if we reach minimum armature alternating current input by increasing the shunt field resistance there will be a point where current will again rise.

Do not try to get 1000 volts out of a converter using a 250 volt D.C. motor. If 1000 volts is desired, use a 550 volt D.C. street car ventilating motor. These motors can often be "picked up" cheaply and will stand 1100 volts D.C. output continuously.

Mosul, Turkey, uses the call HH1 which has been mistaken for gHH1 because the English intermediate "g" is used.
Transformers and Reactors in Radio Sets

Part 1.

By R. H. Chadwick

YOU all know the uses of transformers and reactors in transmitting sets. Doubtless most of you know more about the actual use of them than I do, but just to summarize the variety of applications, let us tabulate the units required in an average transmitting set.

**Direct Current Source**

Step up power transformer.

Transformers for lighting rectifier filaments, (if Kenotrons are used).

Filter Reactor.

**Oscillator**

Filament transformer for oscillator tubes.

**Modulator**

Modulation reactor.

Microphone transformer.

Coupling and amplifying transformers.

There are a great many freak applications for transformers and reactors but the above requirements are the usual ones.

**General Theory of Transformers**

The plate transformers and the filament transformers are all commercial-frequency transformers of fairly normal design. About the only unusual features peculiar to radio are: the requirement in the power transformer of low reactance under peculiar half-wave conditions; and the requirement in some of the filament transformers of high insulation on the low voltage winding.

The reason for high insulation on the low voltage winding of a Kenotron filament transformer is evident from a consideration of Fig. 1. The negative side of the circuit is usually at or near ground potential, and the Kenotron filament sec-

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* Transformer Department, Fort Wayne Works, General Electric Co. This paper is abstracted from the original talk prepared by Mr. Chadwick for the Hoosier State A.R.R.L. Convention. The paper was read in Mr. Chadwick's absence by Mr. E. A. Wagner, Managing Engineer of the Transformer Dept.
It is not difficult to calculate regulation. As a beginning we can give the rule that if the resistance drop (the so-called IR drop) in the windings is 1% then the copper loss will also be 1%. A more exact statement is: The resistance drop in the windings, both primary and secondary, is the same percent of the full load voltage as the FR is of the volt-amperes output.

The Windings
The resistance of transformer-windings is usually calculated from elementary principles in which it is considered that the resistance of a piece of wire one foot long with a cross section of one square mil has a resistance of 8.5 ohms. (See Fig. 2). The resistance of the winding is then determined by multiplying the length in feet by 8.5 and dividing by the cross sections of the wire in square mils or 1,000,000 times the cross section in square inches. The length of wire is determined by calculating the average length of one turn from the geometrical proportions of the transformer, multiplying this length by the total number of turns. The copper loss in each winding is then the square of the current in that winding times the resistance. The total copper loss in the transformer is the sum of the copper losses in both windings.

We now have the copper loss, which we need in calculating efficiency. Expressing the copper loss as a percentage of the total volt-amperes output gives us the IR drop in percent of full load voltage, which is the figure we need in calculating regulation.

Exciting Current and Core Loss
Both of these characteristics are functions of the flux density in the core. The exciting current never can be calculated with great accuracy. In designing it is found from curves based on experience, but there is always a wide variation from the average because the core joints are not uniform.

Core loss is determined from curves showing watts-per-pound plotted against flux density.

Flux density is calculated from the primary voltage, number of turns in the primary winding, and the frequency, and from the dimensions of the core in accordance with the following formulas:

$$\phi = \frac{E \times (10^6)}{4.44fN} \quad \text{and} \quad B = \frac{\phi}{A}$$

Where $\phi$ is the total flux flowing in the core, $E$ is the primary voltage, $f$ the frequency, $N$ the number of primary turns,

$B$ the flux density in the core, and $A$ the cross section of the core. These formulas assume sine waves, and the voltage is expressed in R.M.S. value, while the flux and flux density are expressed in peak values. Dimensions are in inches and square inches.

To explain the use of these formulas we will consider for a moment the general theory of the transformer.

Consider a transformer, as in Fig. 3, with the primary coil connected to a line of alternating voltage $E$ and frequency $f$. Now the first tendency when the connection is made is for the primary coil to receive current from the line. This current causes a flux to build up in the core. The building up of the flux induces a voltage in the coils of the transformer in both the primary and the secondary. The condition of balance will be obtained in each coil. The direction of this induced voltage in the primary is such as to oppose the flow of current from the line. The condition of balance will be obtained when the difference between the voltage...
induced in the primary and the line voltage causes just enough current to flow to create the flux which produces the induced voltage, which is called the "counter-E.M.F." In a practical transformer the difference in voltage required to maintain the flux is so small as to be entirely negligible. We therefore consider that the counter-E.M.F. is equal to the line voltage and so the flux is dependent on the line voltage in our formulas, although actually what we mean is it is determined by the counter-E.M.F. generated in the primary.

The formulas given above may be transposed to solve directly for flux.

\[ E = 4.44fN \phi \]  

1 should say that if any amateur radio enthusiast attempts to build himself a transformer he might obtain, but he would be safe if he kept the core flux sufficiently low, that is, value \( B \) in the above formula should not exceed 70,000.

Leakage Reactance

There are various ways of describing leakage reactance in a transformer, but the simplest way is to consider each coil as a separate reactance coil.

In Figure 4 you see certain lines of flux around both coils. These have nothing to do with leakage reactance, because they affect primary and secondary alike, inducing the same number of volts in each turn of both windings. There are, however, as in Fig. 5, certain lines of flux which pass between the coils or through part of one of the coils so that they do not surround all turns of both coils. These are the lines of flux responsible for the so-called leakage reactance. A correct picture of the leakage reactance of the transformer is obtained if you consider the primary coil alone as a separate reactor or choke coil with a magnetic path represented by all the leakage paths which can surround the coil (or a portion of it); and then consider the secondary as a separate choke coil in the same way.

Any amateur designing a transformer for his own use will do best not to calculate reactance but to keep in mind the things that will help him minimize the reactance. These things are keeping the paths of the leakage flux long and the cross sections of these leakage paths small; keeping the number of turns in the primary and secondary relatively small.

It is seen from the formulas which I have given that after choosing the flux density we can either put in a big core with a few turns or a small core with many turns. The big core with the few turns results in the lowest reactance and best regulation. There is, of course, a limit to cutting down on the number of turns because beyond a certain point it is bound to result in unnecessarily high cost and prohibitively high core loss and exciting current.

The final design is the result of balancing all of these various factors.
Transformers for Rectifiers

In transformers for full wave rectification (whether for single phase or three phase) the secondary winding is always in two sections, and when one section is delivering current the other is idle. See Fig. 7. It, therefore, always happens if the coils are arranged as shown in Fig. 8 that the portion of the secondary which is active at any instant only covers half of the primary. You can see that by leaving out one-half of this secondary coil you have a bad arrangement as far as resistance is concerned, because there are lots of opportunities for leakage flux to surround certain portions of the primary. The remedy may be either one of the arrangements shown in Fig. 8.

Interference From Electric Heating Pads

When the electric heating pad was invented and first placed on the market, little did anyone believe that some day it would be a source of trouble to people all over the neighborhood! However the fact remains that the ordinary everyday variety of heating pad makes the best little form of radio transmitter there ever was. When you have run out of possible sources of interference when trying to run down that noise which is coming in on your aerial, just quietly slip around to all your friends in your neighborhood and find who has an electric pad in use. Nine times out of ten we will bet that when the pad is turned off the interference ceases.

You have noticed, perhaps, that when an electric light is turned on near your receiver you hear a click in the receiver head-set. This is due to the miniature spark which is formed as the circuit is "made". This click will be much more pronounced if the circuit is broken—that is the light turned off. In an electric heater pad there is a thermal regulating device which automatically breaks the circuit when the temperature of the pad has reached a certain point. Quite obviously this regulating device is necessary. No one wants a pad that is red hot! When the current is cut off the pad, by means of this automatic switching arrangement in the pad, a click is heard in the receiving sets all over the neighborhood. This click is more vicious than the electric light switch click, because the pad carries more current than the light and the spark at the switch contacts on the pad is greater. This would be well and good. We all could put up with an occasional click, but the main trouble is that when the current is cut off by the automatic switch the contacts of the switch will vibrate and the current will be rapidly turned on and cut off and the spark at the contacts will turn into a miniature "arc" such as is visible at the contacts of an ordinary bell buzzer. It is this arc that causes loud continual buzzes in receivers.

Some day all electric pads will be sold with a statement attached which certifies to their non-radio radiating ability. They should radiate heat and not radio waves!

---J. M. C.
A SIMPLE audio frequency oscillator may be of some value to those readers of QST who are members of radio clubs or other organizations in which code practice is given. It may also be used for measurement work.

The tube "squealer" will operate about a dozen phones, or any loud speakers. By adding a stage of audio frequency amplification an extremely loud signal may be generated.

The tube employed should be of the "hard" variety, A 201-A, or any other tube with a high degree of vacuum, functions perfectly in this circuit.

The oscillator described was used for two months on the code practice table at Camp Wallkill, New Paltz, N. Y., and proved to be much better, in every respect, than the best buzzer obtainable. As the campers did not favor the idea of wearing hot phones during the summer months a loud speaker was substituted with very satisfactory results.

The advantages of the oscillator described are evident: the pitch may be adjusted by simply varying the filament current a trifle, and once the desired tone is obtained it will remain constant if the batteries do. The intensity of the signal may be reduced or increased at will by varying the plate voltage, or if a very loud signal is desired it may be attained by adding a stage of audio frequency amplification; the tone is an exact duplicate of a C.W. signal; there are no annoying mechanical "make" and "break" clicks as with a buzzer. The latter feature is especially valuable if the device is used with an omnigraph or other automatic transmitter. Lastly, the tone is very pleasing to the ear and code students find it much easier to increase their receiving speed when this type of oscillator is used.

The device also has interesting applications in many other fields where a buzzer is ordinarily employed.

I trust that the information will be of some service.

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ELECTION NOTICES

To all A.R.R.L. Members Residing in the Atlantic, Dakota, Delta, Midwest, Pacific (including Hawaii) and Southeastern (including Cuba, Porto Rico and the Isle of Pines) Divisions:

1. You are hereby notified that an election for an A.R.R.L. Director, for the term 1926-1927, 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 12, 13, 14 and 15, providing for their nomination and election.

2. The election will take place during the month of November, 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:

(Place and date)

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 .................., as a candidate for Director from this Division for 1926-1927.

(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, 1925. 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: Atlantic, Dr. Geo. L. Bidwell, Washington; Dakota, Prof. C. M. Jansky, Jr., Minneapolis; Delta, Benj. F. Painter, Chattanooga; Midwest, L. Boyd Laizure, Kansas City; Pacific, Allen H. Babcock, San Francisco; Southeastern, Harry F. Dobbs, Atlanta.

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:
K. B. WARNER, Secretary.
Hartford, Conn., 25 July, 1925.

To All A.R.R.L. Members Residing in the Dominion of Canada, Newfoundland, and Labrador:

1. You are hereby notified that an election for an A.R.R.L. Canadian General Manager for the term 1926-1927 is about to be held, in accordance with the Constitution. Your attention is invited to By-Law 26, defining the policy of the League in Canada: Sec. 1 of Article IV of the Constitution, providing for the government of A.R.R.L. affairs by a Board of Directors, of which the Canadian General Manager is a member; Sec. 2 of Article IV, defining the eligibility of Directors; By-Laws 23 and 24, specifying the duties and authority of the Canadian General Manager; and By-Laws 20, 21 and 22, providing for his nomination and election.

2. The election will take place during the month of November, on ballots which will be mailed from Headquarters in the first week of that month. The ballot will list the names of all eligible candidates nominated for the position by League members residing in Canada, Newfoundland and Labrador.

3. Nominating petitions are hereby solicited. Ten or more A.R.R.L. members living in the Dominion of Canada, Newfoundland or Labrador, have the privilege of nominating any Canadian member of the League as a candidate for Canadian General Manager. The following form for nomination is suggested:

4. Present Directors from these Divisions are as follows: Atlantic, Dr. Geo. L. Bidwell, Washington; Dakota, Prof. C. M. Jansky, Jr., Minneapolis; Delta, Benj. F. Painter, Chattanooga; Midwest, L. Boyd Laizure, Kansas City; Pacific, Allen H. Babcock, San Francisco; Southeastern, Harry F. Dobbs, Atlanta.

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:
K. B. WARNER, Secretary.
Hartford, Conn., 25 July, 1925.

The Scandinavian Radio Relay League has just been formed. Its debates were held by radio.

An amateur in Wisconsin masqueraded as Z1KA recently as a practical joke. He caused some unnecessary trouble and confusion that resulted in the matter being brought before the Supervisor of Radio. This amateur's license was suspended as a consequence. This should be a warning to others who have used or might use a false call.

9DYW avers that Flivver grease cups can be cut into nice even brass rings for making the small cages used for leadins from counterpoise or aerial. The cups are brass and can be easily soldered to.

Belgium licenses no stations at present. For that reason all communications or QSL's should be addressed to Henrotay, T.S.F., Verviers, Belgium, no matter the station they are supposed to go to. Mr. Henrotay is President of the Belgian Radio Club.
LETTER just received from Mr. Melville Eastham of General Radio suggests that many of our readers do not understand why high ratio transformers (both audio and R.F.) so often fail to give high amplification.

Without attempting to cover the question in detail it may be interesting to consider a few of the possible causes for such a failure.

First of all let us consider the audio transformer. Suppose we begin by connecting one of Thordarson's 2/1 audio transformers between a pair of C301A tubes and measure the amplification (of the second tube and the transformer) at, say, 2000 cycles. In this case we are using a transformer with a very good iron core of ample size and with the windings on the same center leg of the core. Therefore the coupling is very close and we know that the ratio-of-transformation is practically the same as the ratio-of-turns, that is to say 2/1. Putting this in simpler form, if the secondary has twice as many turns as the primary then the second voltage will be twice the primary voltage. The transformer-and-tube combination will give us a voltage amplification that is somewhere near the amplification factor of the tube multiplied by 2/1.

Now let us remove 3/4 of the primary turns, making the ratio 8/1 instead of 2/1. When we try the circuit again the amplification will be much less, except perhaps at some particular frequency where it may stay almost as high as before. What has happened? How can we get less amplification with a higher ratio of turns?

Remember that we are still working with the same good iron core and that the windings are still very closely coupled. Therefore, the ratio-of-transformation is really 8 and the secondary voltage is really 8 times the primary voltage.

The only possible explanation is that the primary voltage has gone down. That, indeed, is what has happened.

The next question is, "Why has the primary voltage gone down?" To answer that question one has to go a very little ways into the theory of vacuum tubes. The easiest way of approaching the explanation is to compare the tube with an ordinary direct current generator, the thing that the high-school text books still call a "dynamo."

There is a general rule that the output of a direct current generator is greatest when the load resistance is equal to the machine resistance. This isn't the condition for the best efficiency but it is the condition for the greatest output and that's what we want in vacuum tubes. At first this rule sounds a bit doubtful. Perhaps it can be made to seem a bit more reasonable by changing the load to see what will happen.

In Fig. 1a we have a generator operating with no load, in other words with full voltage but no current. Very evidently we have no output. In Figure 1b we have the same machine running on short circuit. The current is now very large but the terminal voltage is zero and again there is no output.

![Diagram](image-url)

**OPEN CIRCUIT**

Full voltage at terminals but no current, therefore no output.

**SHORT CIRCUIT**

Very large current but no voltage at machine terminals, therefore no output, although much power is being used up inside the machine.

**LOAD FOR MOST OUTPUT**

Half the generated voltage at machine terminals, heavy current, large output.

**Note:** Conditions (b & c) shown above are impractical for generator operation, however for vacuum tubes we want largest possible output.

**FIG 1 VARIATION OF OUTPUT AS LOAD RESISTANCE IS CHANGED.**

altho plenty of power is being used up inside of the machine. Finally in Fig. 1c we have the load resistance equal to the machine resistance, which gives us the greatest possible output.

This is interesting, but what does it mean when we are talking about audio amplifiers at 2000 cycles? Simply this; the tube will put the most power into the transformer primary if the transformer is so built that its impedance (measured from the primary side) is the same as the plate impedance of the tube.
To do this requires a great many primary turns. Very well, let us put on many primary turns. As soon as we do this we lower the transformation ratio because the secondary turns stay the same. If we increase the number of secondary turns we make the whole transformer bigger and more expensive. We then have a transformer like the Randal “Lyric” or the new type General Radio Transformer. If we do not wish to make the transformer quite so expensive we cannot make the secondary large and we do the next best thing—leave the secondary alone and run up the number of primary turns until the ratio is 2/1. An excellently built example of this practice is the Thordarson 2/1 transformer which actually amplifies more than the 3½/1 of the same type.

Cheaply made transformers do not do any of these things; they skimp the primary turns and the size of the core and in consequence get one of three possible combinations.

a—A ratio-of-turns around 5/1 with terrific amplification at one frequency and none elsewhere, creating terrible distortion. (Last year’s cheap stuff did this.)
b—A ratio-of-turns around 3½/1 with no amplification to speak of. (This is the commonest cheap variety this year.)
c—a construction so badly skimped that there isn’t much amplification, regardless of the ratio.

Picking the Good Ones

The moral is easy. Either pick a transformer with a ratio of 2:1 or perhaps 2.5:1 or else pick a big brute with a large core, many primary turns and a ratio up around 5/1 or 6/1.

Radio Frequency Transformers

The same rules apply to tuned R.F. transformers such as are used in practically all broadcast sets using more than 3 tubes. Suppose we take the neutrodyne as an example and consider the examples of Fig. 3.
mary impedance (at wavelengths between 200 and 600) is far below the impedance of the tube.

Suppose that we increase the primary turns to 20. We now have the arrangement of Fig. 3b. The ratio-of-turns has dropped to 3/1 yet we will get considerably more amplification, partly because the primary "fits the tube" better and partly because we are now able to make the primary-secondary magnetic coupling closer. It is fair to warn the experimenter that the capacity coupling should not be made closer at the same time because this sort of coupling upsets the neutralyde principle. The way out of that is to make the primary of a very small wire and wind it between the slightly spaced secondary turns, after the manner of the Grebe "Synchrophase."

**Regeneration**

Every amplifier, either radio or audio, is regenerative unless some circuit-trick is used to make the thing anti-regenerative. This includes resistance-coupled amplifiers. Heaven knows where the notion has come from that they are not regenerative, for they most certainly are. They not only regenerate, they may also oscillate at any frequency from 1,000,000 cycles per second to 3 per second—the latter situation being hard to distinguish from "audio blocking" since either condition will cause the phones to make a noise like a hen announcing a new egg.

However, that's off the subject. What I started to say was that the amplification of a transformer-and-tube depend on the regeneration as well as the transformation-ratio and the tube constants. It happens that regeneration is strongest when the primary is largest, therefore the large primary gains from this effect also.

In the same way an R.F. transformer will work much more favorably if it has at least 20 primary turns—but it will have to be neutralized more carefully.

In general one can say that the audio transformer will be best if it has a very large primary, even tho the ratio be low, but that three stages will probably be more inclined to howl than would a poorer transformer.

### Good Mica Condensers

At last we can obtain mica fixed condensers which are guaranteed to be accurate within ten per cent of their rated capacity under all temperature and humidity conditions. These condensers are made of mica and brass ribbon moulded under high pressure in brown bakelite. The bakelite moulding completely excludes all moisture and protects the condenser from capacity changes due to pressure. One of the 250 µf size was soaked alternately in hot and cold water for three weeks, taken out and immediately placed in the primary circuit of a 40 meter transmitter with 1 1/2 amperes flowing through it. After being used in this fashion steadily for ten minutes nothing happened and the condenser was used as the grid condenser in an oscillating receiver. There was absolutely no noise and apparently the condenser was as healthy as ever.

These condensers are provided with brass bushings which are moulded into the bakelite. The bushings extend through the condenser and are tapped to take a machine screw. The connecting wires can be fastened under the screws or can be soldered directly to the brass bushings. The soldering iron will not affect the condenser at all.

They are available in capacity ranges from 50 µuf to 6,000 µuf, and at a slight additional cost they can be obtained with accuracies guaranteed to be within 2 per cent of their rated value. For ordinary work no one wants a better capacity guarantee than this. They should find immediate favor in the hands of receiving and transmitting experimenters as grid condensers, by-pass condensers for both transmitting and receiving sets, plate blocking condensers in low power transmitting sets and tuning condensers in input transformers for super-heterodyne receivers where the accuracy must be fairly high.

These condensers are manufactured by the Sangamo Electric Company of Springfield, Illinois. They fill a long felt want.
A Power-Amplifier Transmitter for the Low Waves
By W. H. Hoffman*

The transmitter described herewith has been designed on the same general and basic principles as the longer wave sets in government and commercial use, however, it makes use of a number of principles that have heretofore found little or no space in popular radio publications. Before pointing out a few of its high spots, a word concerning tests made in actual service will be added. It has been in operation over periods of from 1 to 6 hours daily for the last few months and has proven its capability of operating consistently day in and day out. Reliable daylight communication can be carried on to points within a radius of 250 to 300 miles from 9EK, Madison, Wisconsin, and at night time all districts have been worked as well as points in Canada.

Circuit Arrangement
The circuit arrangement is shown in the wiring diagram and photographs where each piece of apparatus has been marked and described.

Simplicity
The oscillator circuit is of the Colpitts type and is as simple as the schematic drawing itself. The only additional apparatus required by the addition of the amplifier is the tube, its socket, filament rheostat and plate coil. It should be noted that the amplifier requires no choke coils, by-pass condensers, "C" batteries, grid leaks nor coupling capacity. Its grid is connected directly to the grid of the oscillator tube. With this type feed, the amplifier tube has never shown a tendency to self oscillate.

The Power Amplifier
The advantage of the power amplifier arrangement lies in its ability to maintain a steady signal even when the antenna is swinging badly. This is due to the fact that the degree of coupling between the antenna and the oscillator tube circuit is very much less than with even a loose coupled oscillator system. It has been pointed out repeatedly that a loud signal is of no use unless it is held sufficiently steady for copying. A tube used as an amplifier for C. W. signalling can be worked at higher efficiency than when used as an oscillator, if the grid excitation is sufficiently increased.

The Colpitts Oscillator
When properly arranged, any of the well known oscillating circuits will work on the shorter waves, at least down to the 20-meter band. However, the Colpitts circuit appears to have some distinct advantages, which are favorable to the extreme high frequencies where circuit constants become small.

The capacities of the Colpitts oscillating circuit are in parallel with the internal capacities of the tube elements and if connecting leads are kept sufficiently short this offers two advantages. First, grid and plate resonant circuits are not present due to internal tube capacity bridging a portion of the oscillating inductance as in other circuits therefore the tendency toward the troublesome spurious or parasitic oscillations is greatly minimized. Sec-
ondly, there is always a relatively large
capacity bridging the input elements of
the tube. This is of great value in sta-
bilizing a tube against frequency changes
due to changes in filament temperature
or plate voltage.

**Tuning Range**

With apparatus as listed with the cir-
cuit diagram, the oscillator adjustments
for 3 of the lower wave bands are as
follows:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>67</td>
<td>17</td>
<td>90°</td>
<td>90°</td>
</tr>
<tr>
<td>40</td>
<td>6</td>
<td>75°</td>
<td>75°</td>
</tr>
<tr>
<td>20</td>
<td>2</td>
<td>60°</td>
<td>60°</td>
</tr>
</tbody>
</table>

For the 75- to 80-meter band, 21 turns
are used on the amplifier plate coil. Data
on this coil for the other wave bands is
not available at this time but proper ad-
justment may be found for any wave-
length by following the instructions for
power amplifier operation as published on
Page 20 of *QST* for June, 1924.

**Keying Arrangement**

The keying resistances and the plate
milliammeter are external to the set. The
grid leak resistance is connected to the
negative H.V. supply end of a resistor that
is in series with the negative H.V. supply,
instead of directly to the filament.

When current flows through this
resistance the grids of the tubes
become highly negative with re-
spect to their filaments stopping
the flow of plate current. In
order to keep a continuous flow
of current through the resistance,
a resistance of high value is con-
ected between negative filament
and plus high voltage. Keying
is effected by the shorting out of
the resistance that is in series
with the negative H.V. This
system has 3 distinct advantages.
First, the supply voltage is not
disconnected from the tube ele-
ments when keying. Second,
there is no audio noise when the
key is open due to high negative
grid charges, as with grid keying.
Third, the keying thump is re-
duced to a point where it cannot
be picked up by any broadcast
receiver having a reasonable de-
gree of selectivity. No sparking
at the key contacts can be seen
even in a dark room.

**Operating Adjustments**

In tuning up any oscillator
circuit for the first time, it is
always well to move the plate
tap so as to include a large num-
ber of turns and to use reduced
plate voltage until it is learned
that the circuit is functioning
properly. Condensers Cg

and Cp should be kept at equal dial set-
tings. This gives a capacity ratio across
the grid to filament and the plate to fil-
ament element of the tube of 2 to 1,
which will be found to always work well
for either 5-watt or 50-watt tubes. For
any given wavelength it will be found
well to keep the capacities relatively large
and the number of turns in the induc-
tance relatively few. After the approxi-
mate wavelength adjustment is found, the
plate tap should be moved toward the cen-
ter of the coil until the rated or desired
plate current is taken by the tube at the
maximum plate voltage that the set will be
worked. Exact wavelength adjustment can
always be made by slight changes in the
settings of Cg and Cp.

The power amplifier plate coil adjust-
ment is made with the antenna circuit
open. Place a milliammeter in series with
the amplifier plate and with the oscillator
tube going at the desired wavelength.
Change the number of amplifier plate
turns until a place is found where but
little plate current is taken. The antenna
circuit may then be closed and coupling to
the plate coil tightened until the amplifier
tube takes the rated or desired plate cur-
rent.

![Circuit of the Power Amplifier Transmitter](image-url)

<table>
<thead>
<tr>
<th>Circuit of the Power Amplifier Transmitter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cg = Cardwell variable air condenser .0005 mfd.</td>
</tr>
<tr>
<td>Cn = Cardwell variable air condenser .0005 mfd.</td>
</tr>
<tr>
<td>Cp = Cardwell variable air condenser .00025 mfd.</td>
</tr>
<tr>
<td>Cb = Two .002 mfd receiving type mica condensers in series.</td>
</tr>
<tr>
<td>Lp = 36 turns No. 22 D C C wire tapped every 2 turns for 8 turns, then every eight turns 3° dia.</td>
</tr>
<tr>
<td>RI = 10.000 ohms (one RCA 5000 leak may be used, two in</td>
</tr>
</tbody>
</table>
series are better.) |
| RF = Remlier heavy duty 3 amp. rheostat 15 ohms. |
| For 77 meters 14 turns are used on Lo and 24 turns on Lp. |

The key contacts are then closed and the
amplifier circuit connected to the antenna.
Two condensers Cg and Cp are used on the
amplifier plate coil. Data on this coil for the
other wave bands are as follows:

<table>
<thead>
<tr>
<th>Wavelength</th>
<th>Grid Cap.</th>
<th>Plate Cap.</th>
</tr>
</thead>
<tbody>
<tr>
<td>67</td>
<td>17</td>
<td>90°</td>
</tr>
<tr>
<td>40</td>
<td>6</td>
<td>75°</td>
</tr>
<tr>
<td>20</td>
<td>2</td>
<td>60°</td>
</tr>
</tbody>
</table>

Circuit adjustments may then be made
for the antenna tuning. If this adjustment
satisfies you, you are ready to try a
broadcast station.

This circuit may be used in a
broadcast station with only a few
modifications. A suitable
oscillator must be
provided. A good
oscillator is shown in
Page 16 of *QST* for
March, 1925.
Summary Notes

The transmitter has been operated at 9EK using dry cell “B” batteries for plate supply and a 12 volt storage battery for the filaments, however, it is believed that it should operate equally well using A.C. on the filaments and Rectified A.C. on the plates.

The tuning range of the oscillator circuit may be extended upward into the 150 to 200 meter range by making Cg and Cp twice the values shown and adding a few turns to the inductance. The ammeter shown between Cg and Cp is only for convenience in making adjustments and checking the set’s operation and may be left out if desired. Besides usefulness where a simple and efficient low power transmitter only is desired; such a set might easily be kept in readiness for emergency work where the main transmitter may normally depend on outside sources for power to operate.

Concerning Tube Sizes

(It will be noted that the master oscillator is of the same rating as the power amplifier. This is not an accident. Experience at many short-wave stations has shown that a master oscillator is very little steadier than ordinary circuits unless the master is made about as large as the amplifier. A little thought will show why this is reasonable and the use of the idea at such stations as NKFI and 9EK will serve as the best proof of its practicability. A weak signal from these stations can be copied regularly because it is steady.—Tech. Ed.)

It Can’t Be Done!

From half a dozen different places we have had news of a remarkable stunt for working “with the antenna only and no counterpoise or ground.” The scheme is simply to disconnect the ground and counterpoise leads of a short-wave sending set and then to juggle things until the set oscillates on the desired wavelength.

Fair enough—but the ground is being used just the same. The difference is that a first-rate counterpoise has been thrown away to make room for the high-resistance path to ground via the capacity between the filament-transformer-secondary and the 110-volt winding of the same transformer. This is a pretty poor way to ground a set. If any amount of power over 250 watts is being used a burned-out filament transformer will be the prompt result.

With less power the result will only be efficiency that isn’t very good. Any station that works this idea to better advantage than the former counterpoise has proved one of two things—either that the old counterpoise was criminally poor or else that the set was terribly out of adjustment.

Meanwhile—let’s admit that oscillators have two ends and that if there’s R.F. on the antenna top and the antenna comes down to the set we will have to provide a counterpoise or ground.

A Good Low Capacity Variable Condenser

For use in those radio circuits requiring a variable condenser having an extremely low minimum capacity, the new “Hammarlund, Jr.” midget condenser is very useful. Unlike other “vernier condensers”, the Hammarlund is not simply cut down from larger stock sizes. The condenser has a minimum capacity of only 4 µfd and a maximum of 32 µfd. The plates are of brass and are soldered, the bearings are cone shaped and the pig-tail is a phosphor bronze spring. The insulation is properly placed and is a small strip of high grade hard rubber. One hole panel mounting is provided, and table mounting can be used by means of bracket mounts which can be obtained. The condenser has a variety of uses; as an antenna condenser in short wave receivers, as a neutralizing condenser in a neutrodyne set, as a vernier in parallel to a larger variable condenser, and last of all as the main tuning condenser in a short wave receiver. When used for the latter purpose it should be excellent, having very low losses, an extremely high capacity range and a maximum capacity just about right to cover one amateur band with one coil. Being very small, its external field should be small, and for that reason its field should not get mixed up easily with the coil field. An excellent job.
Is There a Heaviside Layer?

The radio press of today is showing an irritating tendency to take the Heaviside Layer for granted and to make all transmission effects fit into that theory. It will be far more instructive if we consider transmission effects entirely apart from anybody's theory. If this leads to a new theory of transmission we have made real progress, much more real than by attempting to work our observations into an existing theory.

The application of this thought to the matter of radio transmission has been beautifully worded in a letter just received by Assistant Technical Editor Clayton from Dr. Greenleaf W. Pickard.

"Science has aptly been called the growing edge between the known and the unknown. Around and head of this advancing edge we build a scaffolding or falsework of hypotheses, which are torn down one by one when the inner structure of the hypothesis is complete at any point. But we must not mistake the scaffolding for the building inside; the hypothesis is not necessarily or even usually like the truth.

"There are three elements in radio communication; the transmitter, the receiver, and the waves in the intervening space. All that we know to day about radio transmission is what we can measure at the transmitter and at the receiver; the way of the waves between is purely real than by attempting to work our observations into an existing theory.

"The fundamental objection to any hypothesis involving reflection is that ionisation acts primarily to damp out the wave, and only secondarily to reflect. The imaginary Kennelly-Heaviside layer (if it had real existence) would act toward radio waves very much as lampblack acts toward visible light; it would absorb and damp them out, with but negligible reflection.

"From our transmission data, it appears that the radiation from a transmitter is split into two paths; one direct or low level, and the other indirect or high level. The direct or low level path becomes ineffective at a distance which is some inverse function of the frequency, while the high level waves come back to earth at a distance which is some direct function of the..."
frequency. At frequencies in the broadcasting band, these two sets of waves overlap; that is, there is usually no zone of zero reception. At transmission frequencies of several megacycles the direct wave seems to die out at a relatively short distance, then comes a zone of zero reception, and finally the indirect wave comes back to earth. As the frequency is farther increased, the zone of zero reception increases; it is quite possible that at some rather high frequency the indirect wave would never come back to earth."

Starting Anew

It would be healthier for the entire art if many more of us were to spend a great deal more time in saying, "I wonder if this really is so?" In that remark QST is included. Don't believe a thing is perfect just because you saw it in QST. Just as a scientist is only a trained observer who has his limitations so too this magazine is only a clearing house between its readers and it too must not be taken as being inspired.

Are We Gaining on "static"?

Radio progress, when viewed close by, seems discouragingly slow. Perhaps that is why the Technical Editor has been so much disappointed in the very small attention the membership of this Section gave to trying out the various static eliminating devices that have been presented in QST. Just two men have done anything of the slightest consequence and both of them have been extremely short of time in which to do their work.

Such static elimination as we know of has not been accomplished directly but has been done by moving to other wavelengths or by the use of higher power so as to swamp the undesired disturbances.

This is not true static elimination and this is not where our future lies.

The Organization of the Section

Repeating again, for those who have not seen our past numbers, we wish to explain the nature of this Experimenters' Section.

We are a group of loosely knit experimenters whose only bond is a common interest. Most of us have little laboratory equipment, all of us are limited as to time and finances. Therefore, the Section has no complicated organization nor does it attempt to assign work. It simply issues at intervals of six months a revised list of those engaged in experimental work so that each man may hunt up his kindred spirits from the lists and write to them directly. In addition to this, the Technical Editor and the Assistant Technical Editor of QST attempt to outline certain problems and to coordinate them so that no work is wasted beyond what is unavoidable. Much of this cannot be done as fast as one would wish, mainly because QST itself keeps us about as busy as can be.

Joining the Section is extremely simple. It is only necessary to address a letter to "Experimenters Section, American Radio Relay League, Hartford, Connecticut" requesting the blanks. Do not put anything else in this letter excepting only the request.

Portable Transmitters

Why is the portable transmitter so entirely neglected? In the old days one had the excuse that it took a big storage battery to drive a powerful spark coil and that even then the range was very limited. But that argument is not much good any more. In the first place we get our ranges without burning so much power and in the second place the country swarms with cars that carry good enthusiastic six-volt storage batteries which will drive dynamos, light filaments and so on. If one wants to do the simplest thing what is the matter with lighting the filaments from the battery and supplying the plate by means of a spark coil also driven by the battery. For small sets a spark coil taken from the well-known "Michigan corn popper" will answer, for larger sets one can use an Amrad spark coil or something of that sort.

Those that feel prosperous can use battery plate supply in the shape of dry cells and are then in position to add phone to the transmitter.

Low antennas, temporary single wire antennas, loops, can all be used. Why doesn't somebody do something along this line? Nothing ever seems to happen excepting in the Sunday newspapers.

And that isn't the only need for portable sets, consider the requirements for mine. Emergency work.

Come on now, let's see the famous American amateur perform on a job he has been overlooking.
TRANSMITTING HINTS

Grid Meters

When the efficiency of a tube set is all wrong it is almost a certain thing that the grid current is too large. Of course the way to find out is to use a meter. One with a scale of about 100 mils will do pretty well although the deflections will be small. The real thing is a meter with a scale about 10% of the one used in the plate circuit. If the set is adjusted so that the plates are cool and the grid current is small the efficiency must be somewhere near right.

Transmitting Grid Leaks

8PL of Shawnee, Ohio has been operating satisfactorily with an ordinary receiving Bradley leak and a tube of 50 watt normal rating. That would seem to be crowding the poor "eak" rather hard.

Counterpoise Arrangement

W. H. M. Watson of 5BX, 5AQS, 5DT and 5XAY (there may be three or four other calls we may have overlooked) has been doing some work on the business of putting the counterpoise underneath the antenna.

"We suspected that this business about the counterpoise necessarily having to be underneath the antenna and longer than the antenna was hokum. Tests have been made at three different stations with the same transmitter and the results are so nearly the same that one report will tell about all of them. Our experiments were made with counterpoise run at right angles to the antenna and also with a 10-foot counterpoise under a 100-foot antenna but at right angles to it. The nodal point was easily found and the transmission was perfect. Reports from distances were as satisfactory as before. This seems to indicate that having the counterpoise directly under the antenna was not of any particular importance.

"After reading the Italian (ACD) that used one antenna and two counterpoises, or vice-versa, we made frequent tests to see what the advantage of so many radiating systems might be. We found that the antenna current would rise from 20 to 40 percent when an extra radiator was used, but the reports from distant stations were generally not as good as before."

Why all the excitement about getting the c.p. right under the antenna? Anyway 9RR has told us about 9DXN and 9FM which stations work very well, although the c.p. is not right underneath the antenna — also you have certainly heard of IARE who has his out on the other side of the house.

"Meissner Coils"

The sketch below is so somewhat unusual arrangement of the 4 coil tuned Meissner circuit which was laid out by Mr. L. C. F. Horle, Chief Engineer. Federal Telephone Company. The design was intended for C-302 tubes in the 150 to 200 band, using two, three or four tubes.

Special Generators

The Electric Specialty Company of Stamford, Connecticut, will, on special order, wind any of their generators for a higher voltage, about 50% above the catalogue voltage. Of course there is an extra charge
and extra delay on such work. However this may be of interest to those of us who delight in using a small plate current at high voltage.

The Loose-coupled Meissner Circuit

In the special Meissner circuit described in QST for Oct., 1923, there was no variable condenser across the grid coil. W. K. Francis of SPL finds that it helps greatly to add such a condenser, even though there is one more thing to adjust.

Masts for Cramped Spaces

When cramped for space at SK1, G. E. May managed to get up a mast by the scheme shown in the sketch. The lower section was set up as usual, but with metal straps screwed to the sides to act as guides for the topmast. A tackle was then rigged and the mast was equipped with U-shaped metal strap guides near its upper end and the topmast was slipped into these guides while the whole thing was on the ground. The two were then set up together and guyed into place. Next a tackle was rigged between the top of the lower section and the butt of the topmast after which the topmast went right up and nothing remained except to secure the top guys.

Variable Transmitting Grid Leaks

The "Bradleyohm" which goes to 10,000 ohms can be used for a transmitting grid leak on one or two "five watters". Now if we had another thing like this that went down to 1,000 ohms and up to 10,000 we would have a beautiful grid leak for our larger sets, excepting only those that use the UV-204. But then the owner of a 204 is rich anyway and can buy Radio Corporation leaks...

"Filtering the Motor Generator"

Mr. M. G. Nicholson, Jr., of 4FG says he has found it to be extremely important to use radio frequency chokes in addition to the filter when the plate power is supplied by a generator.

This is found to increase the effectiveness of the filter enormously, a previously bad note becoming quite clear. A tuned radio frequency trap was found very effective and incidentally gave greater freedom as to the position of the nodal point. It is now possible to get the nodal point a turn off the filament clip without having disaster following immediately.

Small Pyrex Lead-in

Where the regular Pyrex cup lead-in is a bit large, the following suggestion from our old friend, M. B. Lowe, (DZ) will come in handy.

WANTED: A good lead-in insulator that is within the means of the average amateur.

SUGGESTION: Secure at the favorite hardware store two of the standard "custard" cups made from pyrex glass and then proceed to the local plate glass dealer who will for the sum and total of fifty cents proceed to bore the two holes in the bottom of the cups. Place one cup on each side of the window board and run threaded brass rod through, fasten said antenna on outside and the noise maker to inside.

Total cost: 2 cups ....@ .35c ea....$ .70
Drilling cost ..........@ .25c ea.... .50
Brass rod (generally lying around) ....... $ .70

Value: Undetermined but very high.

"DZ"

Wooden Spreaders

5XAY of Dallas calls attention to the fact that wooden spreaders in the average aerial will lower the radiation after a rain because they make high resistance connections between the wires. With a metal spreader the wires will always be connected and rain will not change the radiation.

According to tests at 8AQO and 1XAO the same results can be had by running a jumper along a wooden spreader connecting the various wires together.

Counterpoise Wire

5XAY suggests that since the resistance of the wire in the antenna is not worth fretting about anyway, galvanized guy wire can be used to make counterpoises that will be strong and permanent at small expense. We believe he is right. The resistance introduced into the antenna circuit by junk in the neighborhood is a hundred times more important than the kind of wires used—unless you fool with stranded and corroded wire.

Filter Parts

Again we hear from 5XAY. He calls attention to the useful flyer coil. Even when damaged it is usually possible to get out of these things a primary condenser or some parts of a secondary. These things are particularly useful in filters. When more current is to be used than the secondaries will carry try the primaries, using several in series.
The Month With NRRL

With but comparatively few reports from the A.R.R.L. membership as to the activities of NRRL and NEPQ, and with the absence of a log of "heard" and "worked" stations from Schnell, this month's report of the SEATTLE's activities is rather meagre.

At the time this is being written, NRRL has just arrived at Melbourne. Complete silence from the SEATTLE's short-wave sets for the week or so preceding the arrival in Australia led to some speculation as to whether or not the signals were reaching this country. The explanation for the silence came when 6CGW worked 2CM on July 28. Schnell was at the key at 2CM, and explained that NRRL was out of commission temporarily with a burned-out generator, while NEPQ, the RELIEF, was also off the air with a shot transformer. The trouble was evidently cured almost immediately, since 5UK reports working NRRL on July 30. On August 1, the signals were reported again by 2WC. 1BES heard them R8 on August 2, and worked him on August 3 at 6:11 a.m., with signals varying between R8 and R6.

In general, the 40-meter wave still continues to be heard extremely well in all parts of the world. The best reports on this wave during July were from Belgian 4RS, who, on July 19 heard NRRL's signals with an audibility of R8, and remarkable steadiness. The next morning, July 20, they were again heard R8. Since NRRL at this time was nearing Australia, this makes the distance something like 11,000 miles! British 6JO, at Cornwall, England, also reports reception of NRRL on the 19th, with an audibility of R5.

Twenty-meter work is apparently improving. On this wave both NRRL and NEPQ, the U.S.S. RELIEF, of which Ed Willis, 6TS, is the operator, have worked U. S. stations while approximately 5000 miles from the Pacific Coast. Some of this work was done with daylight practically all the way, and good readable signals were reported by 6AGK, 6CGW and 6BUR, who accomplished the communication.

In conclusion, we wish to urge everyone who has any record of reception of NRRL or NEPQ during July and August to send it to both League Headquarters, and to the Naval Research Lab., at Bellevue, D. C. No matter how small this report may be, send it along. Twenty meter reports especially are desired.

Log of NRRL
No log received from Schnell; the following calls represent only those who have reported to Headquarters as having worked, or heard, NRRL and NEPQ. QRH 40 meters unless otherwise specified.

**WORKED:** 1bes, 1ka, 1py, 5yk, 6agk, 6agn, 6aii, 6cw, 6m4d, 6mhn, 6myr (20m), 6cgw (20m), 6chz, 6eln, 6nc, 6nr, 6rd, 7el, 7ak, 8agk, 8py, 8ahn, 8el, 9bht, 9j4n, 9ed, 9fth, 9su, 9tw, mba, a2yi.

**NRRL REPORTED BY:** 1axa, 1bes, 1am, 2apy, (20m), 2wc, 3hwa, 3he, 3m, 3oww (30m), 5agp (40 and 20m), 5au, 6aj, 6aaf, 6bsc, 6clt, 6cyo, 6er, 6kty, 6kx, 6kt (20m), 6lr, 6nly, 6sht, 6th, 6ti, 7ab, 7ac, 7ak, 7ck, 7cr, 8ahs, 8agk, 8cr, 8el, 8ed, 9bht, 9ed, 9fth, 9su, 9tw, mta, a2yi.

**Log of NEPQ**
No other reports received.
PRACTICALLY all of the equipment used at this station was designed and constructed by the owner, Paul G. Watson, of 1107 East 37th Street. The large set at the left of the photograph is a C-7 superheterodyne equipped with removable coils, thus covering a band of waves from 25 to 800 meters. The customary second oscillator for receiving C.W. signals is included in the cabinet and can be cut out for music reception. Although short wave superheterodynes are not in general use in ham stations, Watson has found a super to meet all of the requirements of a satisfactory DX receiver and as in the case of the usual broadcast super, gives much better signal strength than the usual regenerative set.

Next to the C-7 is a conventional three tube short wave tuner. This tuner is used mainly to check up the performance of the superheterodyne. The regenerative receiver uses the regular tickler feedback three coil circuit with a tuned antenna circuit. The Navy receiver at the right of the regenerative is a type CM 294 and tunes from 250 to 3100 meters. It is used for 600 meter reception and for NAA "time ticks."

The transmitter is a 100-watt affair using an inductively coupled Hartley circuit with series condensers in both the antenna and counterpoise. The indicating meters are all mounted on the panel. The primary tuning condenser and one of the series antenna condensers are mounted behind the panel, the other series condenser being at the right of the set. All of the transmitter wiring is done with copper tubing.

The under side of the top of the operating table is wired with six No. 12 feed wires which connect to double throw switches so that any set can be cut in and all battery and other circuits disconnected from the rest of the sets. All battery circuits and the antenna leads are transferred, each set of taps coming out to a binding post strip back of the terminals on the set and from there connections are made to the set by means of short leads.

4XX has been heard in Chile, Italy, England, France, Holland and Hawaii, and in the language of Watson, "the old bus sure does mote."
3APV, Chevy Chase, Md.

This station is located in one of the suburbs of Washington, D.C., and is owned and operated by B. J. Kroger. The antenna is a flat-top of the inverted L type, with lead-in taken off from the south end. The antenna consists of four wires, forty feet long on 15-foot spreaders. The average height is about 40 feet. The counterpoise is made up of six wires 110 feet long, spread in a fan shape 60 feet wide at the far end, and supported 6 feet above the ground.

The transmitter is at the right of the photograph. It uses a coupled reversed feedback circuit with series plate supply. All tuning condensers are omitted, all tuning being done by inductance and distributed capacity of the coils. The plate and grid coils are made of ¼-inch copper tubing and the antenna coil is the secondary of an old Murdock O.T. The large inductance in place in the photograph is used for 40- and 80-meter work. The coils can be removed and the wavelength switched to 20 meters in about 30 seconds. The 20-meter inductances are at the left of the receiver. On the floor under the table is the 21-jar chemical rectifier. This rectifier handles 1200 volts without heating. Above the rectifier on the shelf is that homemade filament heating transformer. On the floor and to the left of the rectifier is the plate transformer. It is a 1-K.W. pole transformer and supplies secondary voltages of 550, 1100 or 2200 volts from either side of the center tap.

The receiver uses the same reversed feedback hook-up. All coils are fixed. The antenna is untuned, the grid coil shunted by a 250-μfd variable tuning condenser and the phones and B battery by another 250-μfd variable which controls regeneration. The tapped switch on the receiver panel is a remnant of bye gone days.

3APV is known for his consistent operation, and says that he has never received a report from New Zealand or Australia.

8ZE-8GX, Oberlin College, Ohio

Radio station 8ZE-8GX is operated under the Department of Physics of Oberlin College. Since September, 1921, the relay transmitter has been operating on 78.0 and 38.5 meters. For experimental work the station has a license
with call letters 8XT. The transmitter is necessarily arranged for experimental work. The inductances are copper ribbon pancakes wound on cardboard supports. The antenna series condenser is a Cardwell. The series condenser is not used when operating in the 40-meter band, as the transmitter is operated on the 3rd harmonic for 40-meter work. The tube is a W.E. 50-watt type minus socket and base. Thereby hangs a tale—for while attempting to remove the base of the tube one of the lead wires was broken off beneath the surface of the glass. Contact to the broken lead wire is made by means of small mercury cups constructed around the lead. The terminals of the leads to the power supply and to the inductance are simply immersed in the mercury cups. Plate supply is obtained from a Radiocorp power transformer which gives 1500 volts on either side of the center tap. A 48-jar chemical rectifier (in a box under the operating table) and a filter consisting of one microfarad on each side of a large audio frequency choke give the note a piercing quality which seems to carry very well through QRN.

The receiver at the left of the photograph is of the 1BFG type and tunes from 10 to 125 meters. One stage of audio frequency amplification is all that is used. The coils are suspended by thread from the glass rod supported above the panel. The entire tuning system is mounted back from the panel in order to avoid any body capacity effects. The condenser and coupling control are connected to the dials by means of glass rods.

For receiving, a small indoor antenna is used in connection with a one-wire counterpoise 60 feet long. A wavemeter calibrated from WWV and a set of resonance coils are visible to the right of the power switch. Due to QRN from the powers that be, it has been impossible to use the large smokestack of the College heating plant as a transmitting antenna mast. A three foot cage is swung between two of the College buildings at a height of 55 feet. It is 40 feet long and has a 6-inch cage lead-in 20 feet long. The counterpoise is a two-wire fan 60 feet long and 15 feet high. The operating staff is morally certain that the forbidden smokestack has its purpose. The fact that the signals from 8ZE are consistently reported as having a strength of R-9 in Australia and New Zealand must be due to the wave pulling up the east guy wires and sliding head-first down the west side of the stack, thus getting a good start toward Australia.

E. W. Thatcher, "GX", is Chief Operator at the station, and it is an active O.R.S. 8ZE has done some wonderful DX work and can always be counted on for a QSR.

New Coil Forms

The American Hard Rubber Company has just made available some Radion tubing which will fill a long felt need in many amateur circles. This tubing takes the form of ribbed moulded pieces in stock lengths of six inches. The tubing has an outside diameter of three inches and the ribs, which are integral parts of the tubing, are 3/32 inch high. There are twelve ribs extending horizontally along the length of the tube. Very solid space-wound coils can be made by cutting shallow notches in the ribs and winding the wire in these notches. The wall thickness of the tubing is such that with ordinary handling the coils will hold their shape (and calibration) indefinitely. Having actual contact with solid dielectric at only twelve points, coils wound on tubing of this sort should be almost equivalent (electrically) to air supported coils while at the same time being vastly superior mechanically.

Strays

If Calls Heard are sent in indicating reception on different wave bands please head each group "20 Meters" or "40 Meters" and run the calls in each group in numerical and alphabetical order. Don't forget the double spacing, please.

There will shortly be a transmitting station in Macoa, China with the call p9MC. A second is planned with the call p9MC4 also.

0JSP and 0JAI of Johannesburg, South Africa, are on 84 meters. QSLs should be addressed to Mr. Arthur Sydney Innes, 47 Rockey St., Bellevue East, Johannesburg. Another link in the "round the world relay."

A rich man had a thousand watts,
And a special call had he,
But the poor man had two two-oh-twos
And made 'em work, by gee!

Another country is on the air. PKX at Malabar, Java, is on 84 meters with apparently plenty of power.
Three New Canadian Division Managers

W. M. SUTTON, "NI" OF 3NI

W. M. Sutton, Manager of the Ontario Division, came to Montreal from England early in 1918. He started his radio career in 1919 with the call 2AU and a 1 K.W. spark which never reached out very well. In April of 1922 he moved to the Fort William station of the Pacific Cable Board at Port Arthur where he opened up with 3NI as a call and a 20 watt c.w. as the punch behind the call. From that date on, improvements were constantly made until 3NI has acquired a lot of excellent DX records. In the summer of 1923, Sutton was made Radio Inspector for Fort William, Port Arthur and District. Last July 3NI and 3WS combined. Sutton signs NI as his personal part of the 3NI call.

W. R. POTTELE, c4PA

The new manager of the Winnipeg Division is Walter R. Pottle. Wallie was one of the first to stick up an antenna out on the Prairies. By 1913 he had an old rock-crusher on the air. The spark was soon junked in favor of a C.W. outfit and 4AO has been going strong ever since. Pottle says he has never done anything startling in the way of super-dx but 4PA is always ready to QSR and always has time to yarn with the gang. In 1921 he was President of the Moose Jaw Amateur Radio Association; he was City Manager for the A.R.R.L. in Moose Jaw during 1922 and District Superintendent of the Winnipeg Division for 1923-1924. He is government Radio Inspector for Moose Jaw and District, and a keen A.R.R.L. supporter.

WM. ROWAN, c5GF

Bill Rowan, c5GF, who manages the Vancouver Division first fell for radio way back during the war days. Along came the BC rage and Bill decided that he wanted to make CJCE the best broadcasting station on the map. Bill soon found out that the BC game is not the game so he quit in favor of a ham outfit. This was in May, 1924. Ever since then c5GF has been on the air constantly. The set now uses one 50 watt tube in an inductively coupled circuit, operating on 75 to 85 meters.

Rowan is president of the British Columbia Amateur Radio Association and says that with the help of his co-workers he intends to bring the Vancouver Division right up to the very front.
The first general meeting of the French Section of the I. A. R. U. was held in Paris on May 30th. Mr. Jack Lefebvre, F8GL, presided. Mr. Lefebvre in a few words told of the object of the section, and reported the results of negotiations with the Post, Telegraph and Telephone administration. Two classes of amateur transmitting stations have been created. Under one class authority is granted to amateurs to transmit (private telegrams and the relaying of same being forbidden) on wavelengths between 180 and 200 meters, with an input not exceeding 100 watts. Transmission may be done at any hour of the day or night. The other class permits transmission on all wavelengths from 0 to 180 (with a few restrictions on several waves which are reserved for other classes of communication) between midnight and 10 a.m. and between 3 p.m. and 4 p.m. Additional power can be used with this class of license which is granted for a period of six months. Upon application for renewal of such a license, the amateur must furnish complete details of the work done and the results secured by means of the excessive power.

The "Journal des Huit", managed by Mr. Veuelin, was chosen as the official organ of the French Section. Mr. Maxim was unanimously nominated an honorary member of the French Section. Mr. Richard James, who will be in France until September 1st, presented an elaborate program for two-way transmission which he plans to conduct next winter during his sojourn at Saigon, Indo-China. Mr. Sa cazas, F8SM, reported a series of communications which 8SM had had with foreign amateurs on 10, 20 and 40 meters during the months of May and June. 8SM has been QSO 8Z1AB a number of times and with the U.S. gang regularly. He is reported as having an audibility of R-T at 21AG. Mr. Perroux, F8BV, although located right in the center of Paris and having his antenna surrounded by tall buildings, has secured some splendid results on a wavelength of 40 meters. He has been QSO New Zealand a number of times. A number of French amateurs are doing good DX work on the shorter wavelengths. Among these particular note should be made of the work of SDE, 8AR, 8BQ, 8JE and 8EN all of Marseille, and 8SM of Toupin. Transmissions are carried on on wavelengths between 14 and 16 meters every Friday from 20:30 to 21:20 GMT. Any of these stations will be ready to test with any U.S. amateur upon request.

In Spain amateur transmission is growing rapidly, coincident with the forming of the I. A. R. U. At the time of the April Congress those who had official licenses limited themselves to local work and looked forward to the definite inauguration of international traffic. Among these are EAR1, EAR2, EAR6, EAR9 and EAR10. Official licenses are given to all applicants who have, in the judgment of the administration, credentials which will guarantee the proper operation of the transmitter. There is an annual tax of 2 pesetas for each watt in the generator, and a limit of 100 watts input. All wavelengths between 0 and 130 meters are authorized for amateur transmission. The engineers of the Director General of Communication in charge of the granting of amateur licenses and the inspection of amateur transmitters have shown a spirit of tolerance worthy of great praise. All the EAR's are members of the I. A. R. U.

For years we have dreamed of a round-the-world relay. We have talked of the day when we would be QSO all the way around and have even planned how we hoped the thing would be done. Then when international relay work became a fact we forgot our round-the-world relay. Then without any prearrangements or schedules of any kind, Windom of 8GZ at Columbus, Ohio stepped in and gave g2CC a MSG on May 18th, addressed to A.R.R.L. headquarters. This was on 20 meters. From g2CC the message was given to g2OD who QSR'd it to a2UM in daylight. 2CM in turn gave it to 06CIX from whom it came to Hartford via U.S. mail. On May 21st 8GZ started another one—"Fm Columbus, Ohio May 21 br 67 to A.R.R.L. Headquarters, Hartford, Conn., U.S.A.—BEST REGARDS BY ROUND THE WORLD RELAY—(sig) Windom, 8GZ". This one went to 2ZAC, F8QQ.
The U.S.S. Pillsbury, NUQG, while at Chefoo, China recently held two-way communication with chIeg. The Pillsbury was using one 60 watt tube on 40 meters and was QSO on July 13th, 14th and 15th. Previously, on the morning of June 10th NUQG and G6BUR were in communication. At that time NUQG was using a single W.E. "E" tube with an input of 37.5 watts.

1LJ reports reception of PCUU who gave his QRA as The Government of the Netherlands, Colonial Department, Technical Department, The Hague, Holland. This was on June 22nd. Anyone heard PCUU since then?

On July 10th 6HU-6AAF heard a two way communication between mIAA and a new station, YDCB whose QRA was given as Colombo, Ceylon, India. We would appreciate details on YDCB from anyone who has worked him.

HISTORY


"Mr. Marcuse . . . . held up his end very well indeed by giving the Congress a speech which lasted exactly two minutes, whereas Mr. Maxim dealt with platitudes for close on an hour, with M. Deloy standing by to translate from American into French June . . . . Briefly reviewed, the Congress appears to have been carefully stage-managed by the American delegates, who, as the reader will see, have secured the reins of government. The fact that one dollar is charged for entrance fee, that the headquarters of the Union are in America, etc. etc., and that the Union is primarily concerned with radio transmitting work, will, I think, allow the ordinary amateur in this country, who is chiefly concerned with reception, to decide whether the Union is worth joining or not."

The transmitter at POY which operates on 26 meters with LPZ is located in the immediate vicinity of the high power station at Neuen, Germany. The transmitter is a 2 K.W. affair. The second transmitter, POW, uses a 10 K.W. water-cooled tube on 25 meters. The antenna of this set is 130 meters high, and is strung from the towers of the high power station. POY is the experimental set housed in the main station house. It is similar to POX, but uses a variety of different wavelengths.

G2NM, u1ARE and hence to Hartford! I whole Business, OM's. All credit to you all!

Although subject to change without notice, the following list of "N" calls together with their QRA and wavelengths will prove of interest to the gang. The wavelengths stated are only approximate and may vary somewhat.

---

**Call**  
**Location**  
**Wavelength**  
---

NKF  
Beleue, D. C.  
20, 41.0, 54.4, 71.5, 81.5

NPM  
Honolulu, T. H.  
49

NPG  
San Francisco, Calif.  
40, 43, 81

NPU  
Tutuala, Samoa  
53

NBA  
Balboa, C. Z.  
54

NPO  
Cavite, P. I.  
70

NAJ  
Great Lakes, Ill.  
76

NEL  
Lakehurst, N. J.  
80

NFY  
Quanticoo, Va.  
77.4

NPL  
San Diego, Calif.  
71.7

NQG  
San Diego, Calif.  
70.5

NAL  
Washington, D. C.  
20.0, 30.6

NRRL  
U.S.S. Seattle  
40

NEPQ  
U.S.S. Relief  
20

NCR  
U.S.S. California  
119 to 149

NIRX  
U.S.S. Canopus  
75

NERM  
U.S.S. Los Angeles  
70 to 84.5

NQW  
U.S.S. Mexico  
40

NUQB  
U.S.S. Pope  
75

NERK  
U.S.S. Shenandoah

NITZ  
U.S.S. Sturgeon Bay  
150

NEDJ  
U.S.S. West Virginia  
119 to 149

---

Established for the first time communication was established between Italy and New Zealand when, on the morning of May 31st, 11ER worked z2XA. 2XA is the station of Mr. E. A. Shrimpton at Wellington, N.Z. We all know 11ER. Then on June 14th 11ERG, the station owned by Il Radiogirnale at Milan was QSO z4AK operated by Mr. W. L. Shiel of Dunedin, N.Z.

We have received a great many requests for the QRA of the following South American amateurs who can be heard almost every night around 36 meters, b21AB, Alvaro S. Freire, 16, Rua Oswaldo Crus, Icarahy-Nietheroy, E. do Rio, Brazil and b22SP L. Y. Jones, Jr., Rue Frei Caneca 22, Sao Paulo, Brazil.

A number of the West Coast fellows have been QSO p11HR, 6AWF, 6EA, 6BB, and 6BUR have been working him regularly. His QRA is Lieutenant Hayden P. Roberts, Fort McKinley, Manila, Philippine Islands. 6BUR is working him on schedule regularly and is ready for Philippine Islands traffic in any quantity, p11HR is on 40 meters, RAC, and can be heard on the West Coast between 3 and 6 A.M. PST.
Although amateur transmission is still prohibited in Holland the amateurs there are making a most strenuous effort to get Government recognition. With the cooperation of the principal radio society of the country, Nederlandsche Vereeniging Voor Radio Telegrafie, it is hoped and expected that Governmental action in favor of the transmitting amateur will soon be forthcoming. There are over 40 members of the I.A.R.U. in Holland, now.

From Mr. W. G. Dixon, Secretary of the British Section of the I.A.R.U. we have a report on the following British activities:

As the organization is still young an account of the work done in June is necessarily meager. Through the activities of a comparatively small "summer group" all foreign countries that were worked during the winter months are still being communicated with. g2OD has been working regularly with a2CM on special schedules to collect data on aerials and different wavelengths from 20 to 45 meters. 2OD has worked z2AE on 40 meters and bZ1AF on 20 meters. The Challenge Cup donated by Mr. Marcuse for the best season's DX has been awarded to g2OD for 1925. g2LZ is doing splendid work on 40 meters, having been QSO z2AE, z2XA, and z2AC and and also a2YI and a3BQ. On April 18th g5NN was heard in Melbourne, Australia on 18 meters in daylight. This one way work preceded g2OD's two-way work by one day, g5NN was also the first Britisher to log NRRL. g2KF is reported to have worked NRRL although this report has not been confirmed. 6LJ, despite the fact that he is taking a rest from super-receiving, has heard u6AWT and u4SA in daylight recently. 6UV has left the 90 meter band and has gone down to 40 meters on which wavelength he has been QSO all but three of the U.S. districts.

The Bristol hams have formed a transmitters section of the Bristol & District Radio Ass'n. g6RY is working on 46 and 23 meters and has an experimental 10 meter set in operation. In the northern section g6YR has been heard in New York when his input was only 3½ watts. g2CC has been very active on low power on 23 meters and has bagged a number of U.S. hams.

m-GHH1, the call used by Captain Durant at Mosul, Mesopotamia has been changed to m-1DH. ex g2JO is in Borneo and as no details of his exact QRA are available anyone hearing him somewhere around 45 meters will please pass the news along. The British I.A.R.U. secretary will be glad to enter into correspondence with secretaries of Colonial Clubs and will be pleased to arrange schedules of operation with any foreign amateurs or radio clubs. He can be reached at Dipwood, Rowlands Gill, Co., Durham, England.

Correction

Last month, on page 43, we published a list of short-wave stations which looked very much like the list below. But it wasn't! It was badly "shot" with errors. We think this one is correct. Please use it for reference and not last month's; and accept our apologies for last month's mistakes.

<table>
<thead>
<tr>
<th>Wave length</th>
<th>Call letters</th>
<th>Location</th>
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<tbody>
<tr>
<td>20.0</td>
<td>POX</td>
<td>Nauen, Germany</td>
</tr>
<tr>
<td>25.0</td>
<td>2YT</td>
<td>Poldhu, England</td>
</tr>
<tr>
<td>25.0</td>
<td>POY</td>
<td>Nauen, Germany</td>
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<td>Nauen, Germany</td>
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<tr>
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<tr>
<td>36.0</td>
<td>LPZ</td>
<td>Buenos Aires, Argentina</td>
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<tr>
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<tr>
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<td>WGH</td>
<td>Tuckerton, N. J.</td>
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<td>105.0</td>
<td>WHU</td>
<td>S. S. &quot;Big Bill&quot;</td>
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</tr>
<tr>
<td>146.0</td>
<td>6XO</td>
<td>Kahuku, T. H.</td>
</tr>
</tbody>
</table>
IAZK, 128 Grove Street, Chelsea, Mass.

9cja, Helt, 9cvn, Demd, 9ox, ~tm--:W and 40 meter hands

g5gd.

PY, Longmeadow, Mass.

19cja., 19cvn, Demd, 19ox, ~tm--:W and 40 meter hands

g5gd.

IACL, Attleboro, Mass.

`20 meter band.

1AQW, Waterbury, Conn.

40 Meter Band

2CWB, Ferndale, N.

2CH, Watervliet, N. Y.

2BV, York, Penna.

9cja., 9cvn, Demd, 9ox, ~tm--:W and 40 meter hands

g5gd.

6CWP-BUX, Pomona, Calif.

1AQW, Waterbury, Conn.

40 meter band

6CUB, Venice, Calif.

7NQ, Hoquiam, Washington

7WA, Latak, Wash.

7WI, Portland, Oregon

SAVE, Buffalo, N. Y.

QST 945

September, 1925
A New Process Grid Leak

A new method is used in the manufacture of the Durham Metalized Filament grid leaks. It was found that when two electrodes are enclosed in a vacuum and a source of very high electric potential is introduced between them, a very fine invisible "spray" of metallic particles is produced. These particles are drawn toward the positive electrode and will deposit themselves upon any substance between the two. The negative electrode will shoot off a very fine invisible "spray" of metallic particles. After it has condensed, the negative electrode will also deposit metallic particles. It was therefore photographed and the film was baked in order to make it adhere to the glass.

The glass is then cut into standard lengths, in-

serted to their use as grid leaks these resistances should serve admirably as coupling resistances in a vacuum tube and should be coated with this spray from the negative electrode.

After becoming so hot it could not be touched it was allowed to cool, accurate to 40,000 ohms to 10 megohms.

The result is an absolutely noiseless grid leak, accurate to a very close degree and extremely constant in its resistance. One of these leaks was used in a transmitter and was coated with this spray from the negative electrode. After it had not changed in the least, it was perfectly quiet in operation and its resistance apparently had not changed in the least.

In addition to their use as grid leaks these resistances should serve admirably as coupling resistances in a vacuum tube and be coated with this spray from the negative electrode. After it had not changed in the least, it was perfectly quiet in operation and its resistance apparently had not changed in the least.
Tune for 'Em, OM's

Editor, QST:

I am in receipt of a letter from Mr. Federico Nosiglia of Buenos Aires, Argentina, who operates station AH-2. Among other things he says, "Many times I answer your CQ's in hope of being heard by you, but evidently without result, due to the short wavelength (30 meters) I am using. Up to now I have received no replies to any of my US calls. I would appreciate it if you would let the American hams know that there are quite a few radio amateurs in Argentina who are operating on wavelengths less than 40 meters between 9 and 10 p.m. every night. These Argentina amateurs including myself are very deeply interested in that their calls be heard and answered so as to intensify inter-American radio relations and amity."

Keep an ear open for the foreigners just above and below our regular bands, gang.

—Jack Bertiant, 2BEE

The Other Side

Editor, QST:

At many times during the past year or so American amateurs have been harassed by foreign amateurs. Of course this may be justifiable but I think a good deal can be said on the other side. I think if the foreigners kept this in mind they would not seem to feel so prone to jump on us for alleged misconduct. Take for example the habit of sending cards. In the July issue of QST it was stated that some Australian sent three hundred cards and received one reply, and another sent eighty cards and received no reply.

Several prominent amateurs that I know of in the Twin Cities answer all of their cards and it does not seem possible that three hundred cards should have come out of Australia without at least some of them going to the Twin Cities.

Since this discussion has come to the front, many of us can recall having sent as many cards to these very same foreign amateurs and in some cases out of a good batch of cards we have never received a single answer. Personally I don’t expect an answer, but would rather have reports concerning the operation of the station than have to answer correspondence which is complete within itself. I think a great many others are like this and would rather have the answers come as the station is worked and so do not feel badly in any way should a mere report be left unanswered. I believe that they expect an answer too promptly, forgetting that the average American amateur is a very busy person and cannot always keep up his end of correspondence. At 9ZT, for example, over five thousand cards have been addressed during the past two years. About once a month all correspondence is cleared up, but we must confess it is rather difficult.

I think we will all agree that the substantial CQ is a necessity. Personally I have heard five and ten minute CQ's from Australia and New Zealand more frequently than I have from the United States. This is in spite of the fact that there are twenty or thirty times as many stations in the United States as there are in these two combined. The logs at many stations will also show this to be a fact. We do not think, however, that this is a serious offense as when a station gives a substantial CQ it usually means that he is having difficulty in receiving and would like a big call in return. Ordinarily we agree that a short snappy CQ is effective, but this is not always the case.

—Don C. Wallace, 9ZT

20 Meter Reception in S.A.

Editor, QST:

With regards to the reception of 20 meter signals from the U.S. I think it is rather unsatisfactory, at least during what we call daylight. I have been listening on the 20 meter band for several Sundays but relatively few stations have been logged. I have been unable to pick up any U.S. signals on 20 meters before 5:30 or 6:00 p.m. Rio time; at that time they begin to come in, first weak, getting stronger and stronger and gradually dying out in two or three hours. At 10 or 10:30 p.m. Rio time nothing more can be heard on 20 meters. As far as signal strength itself is concerned the 20 meter signals seem to be stronger than the 40 meter ones, and also are easier to read (if the wave is not swinging) as static is not so bothersome as on 40 meters.

We are badly handicapped by the most
varying and unstable weather conditions, and chiefly by an extraneous and continuous type of static which hinders reception to an appreciable degree. Fading is also very pronounced in the signals coming from the U.S. although not bad in signals from Europe or New Zealand. It seems that a place exists somewhere between our countries where great absorption takes place.

—Alvaro S. Freire, bzt1AB

Keying

845 East 13th Street,
Brooklyn, N. Y.

Editor, QST:
I take exception to what Mr. Keene, 1AE1, says about keying in the grid circuit. Grid keying has many drawbacks that plate, or high voltage, keying has not. In the first place, the high voltage is always on the tube. This is the cause of many breakdowns, especially when the tube is being overloaded, that are not experienced with high voltage keying. Next, the grid leads have to be very short. This is not the case with plate keying. With grid keying the tube, although it may be drawing little plate current, nonetheless is oscillating strongly. It may oscillate, but very weakly, with plate keying.

—Edward M. Glaser, 2BRB

The Printer's Devil

Boston, Mass.

Editor, QST:
What in Sam Hill are you talking about? I've taken my crack at Greek and Latin and the rest of the "compulsives" and even seen a letter written by the Grand Puchow of the province of Tienstan, but I'll have to admit that:

"...just below the samodorlyids escropot Z . .Glb."

which appeared in QST on page 36 of the July issue means absolutely nothing at all to me—nor as much as that! No wonder there's a "gulp" on the end of it—anybody would gulp trying to get that off his thorax!

—E. P. Gordon

Harmonic Transmission

Oberlin, Ohio

Editor, QST:
My interest was aroused by a note which you annexed to the article on the Hertz Antenna by H. M. Williams (July QST). I believe that I have one key, perhaps, to the solution. It is frequently noted that stations work much better on the 1st, 3rd and 5th harmonic of the antenna fundamental than on the 2nd, 4th, 6th, etc. That is, when the oscillating circuit is tuned to 1/3rd of the antenna circuit, better results are secured than from ½ wave. Exactly this condition was found to exist at 8ZE when operation was first attempted on 40 meters.

If the antenna system be represented schematically with the transmitter at T, the voltage-current curves for operation on the fundamental is shown at A. The second harmonic is represented by B and the third harmonic by C. Now in both A and C the voltage node is near the inductance, and the current is high. In B, on the other hand, the inductance is located at a current node where the voltage is high; hence the coil and the antenna wiring near it are "hot" to ground, and leaks at points where these come in contact with dielectric supports are much more likely to occur than when the voltage node is located in the inductance.

—E. W. Thatcher, 8ZE

Aluminum Rectifiers

Albany, Indiana

Editor, QST:
It seems that many of the gang are passing the buck! All poor notes are not due to punk aluminum in a chemical rectifier. I have been using all kinds of aluminum for the past two years. My first rectifier consisted of 12 small jelly glasses with aluminum 1/16 inch thick. The rectifier was entirely satisfactory but the aluminum was too thin. My next effort was a 10 quart affair. This one used 1x7 inch aluminum strips one-eighth inch thick. This aluminum came from an automobile body works and is the best I have ever used. Aluminum wire, bent back and forth to give a larger surface, has been used and it works F.B. The trouble with the chemical rectifier is that most of the fellows either don't know how to build one, or will not take the necessary time and precautions to turn out a good job. If any ham will follow the following directions and turn out a bum rectifier I will eat the darn thing. Use almost any kind of aluminum you can buy. Take a piece of medium coarse emery cloth and work every piece of aluminum until it is perfectly clean on both sides. Do the lead the same way. Bolt them together with any good brass or iron bolts. Wash the glass containers until they are perfectly clean. Mix
up the water and Borax before you start building and let it set. Use all the Borax the water will soak up. Space your containers at least ¼ inch apart. Fill them and then put in the electrodes. Put a thin layer of oil on top of the solution to prevent creeping. Connect the rectifier to your power transformer and turn on the juice. It will take some time for the rectifier to form, and you will have to watch the secondary of your power transformer as the rectifier, initially, places almost a short circuit on the transformer. Locate the rectifier at least 5 feet from the rest of your apparatus. This will keep the a.c. in the rectifier from bothering you.

—Walter L. Major, 9AUC

Re Sulphur

Laplata, New Mexico

Editor, QST:
The article on R.F. Properties of Insulating Materials in February QST prompts me to say that sulphur is a very promising material to investigate. At the suggestion of the late Professor B. O. Pierce of Harvard, I used pillars of sulphur to insulate the quadrants of a Doleckalek Electrometer twenty years ago with entire success, in the place of hard rubber to avoid surface deterioration. If I am not mistaken no other material of equal cost could be used as easily in radio work in rods or bushings which can be moulded in place, or fixed by moulded inserts. Sulphur is easily purified, consists of a single element inert at room temperature, non-volatile, can be machined or worked in a lathe to a good permanent surface and has a dielectric constant of about four.

—Harrison H. Brown

D. C. Filters

Dubuque, Iowa

Editor, QST:
Regarding hard-to-filter D.C. generator plate current supplies; a radio frequency tran in the supply leads can make a lot of difference in the interference problem. Two small chokes (W. E. Co. 67-A's are just the thing) in the armature leads right at the brushes and shunting the brushes by a 1 μfd condenser will do the trick. It may be necessary to ground the frame of the generator and the negative lead at the brush side of the choke. Such a combination changed my particular installation from an apparently unfiltered supply to an excellent imitation of storage battery supply with only a 3 henry series choke and a 2 μfd shunt condenser for a filter system.

Yes, I can now work on 170 meters and cause no interference to my neighbor next door on 210 meters—the lower limit of his tuner.

—C. M. Smith, 9BYP

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The greatest improvement

Absolutely new in construction—perfected through years of research, the new Eveready Layerbilt "B" Battery is as superior to the old type as a tube set is to a crystal.

Heretofore, all dry "B" Batteries have been made up of cylindrical cells—no one knew how to make them any other way. The new Eveready Layerbilt is made of flat layers of current-producing elements compressed one against another, so that every cubic inch inside the battery case is completely filled with electricity-producing material. Layer-building heightens efficiency by increasing the area of zinc plate and the quantity of active chemicals to which the plate is exposed.

After the most rigid laboratory tests, more than 30,000 of these new Eveready Layerbilt "B" Batteries were manufactured and tested by use under actual home receiving conditions. These tests proved that this new battery is far superior to the famous Eveready Heavy-duty Battery No. 770, which up to now we have ranked as the longest lived "B" Battery obtainable.

On 4-tube sets, 16 mil drain, it lasts 35% longer.
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it's all battery. With every cubic inch packed to capacity, it contains about 30 per cent more electricity-producing material. All chances of loose or broken connections avoided by contact of full area of carbon plate against zinc plate. The scientifically correct construction.

ever made in "B" Batteries

On 6-tube sets, 24 mil drain, it lasts 41% longer.
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The new Layerbilt principle is such an enormous stride forward in radio battery economy that we will bring out new sizes and numbers in this Layerbilt form as fast as new machinery is installed. For the present, only the extra-large 45-volt size will be available.

Buy this new Eveready Layerbilt No. 486 for heavy drain service. It far exceeds the performance for which Eveready Radio Batteries always have been famous and is, we believe, by far the most economical source of "B" current obtainable.

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Radio, with all its romance, knows no more magic name than Crosley.

From the time that Powel Crosley, Jr., first enabled millions to build their own sets by offering parts at a fraction of existing prices—down to the present day, radio progress and Crosley achievements have gone hand in hand. Now Crosley announces not only vital improvements in radio performance—but in the Crosley "PUP" offers this finer performance at the lowest price in radio history.

This compact, efficient receiver is a development of the famous Crosley one tube set, with which Leonard Weeks, of Minot, N. D., heard the MacMillan Polar expedition while the rest of America listened in vain.

The employment of the double circuit not only reduces radiation to a minimum, but radically improves selectivity. It can be tuned through local stations more readily. Under average conditions, its radius, with head phones, is 1500 miles or more.

You can use the "PUP" to check the performance of your larger set; to entertain the youngsters whose curious fingers cannot resist the lure of dials and switches; to install in the maid's room, or even in your office—for the air is full each day. You can take it on canoe trips, picnics, outings and on your business journeys—for it's only half the size of a shoe box.

Engineered and built to the strictest standards of Crosley quality, this genuine long distance set can be offered at the phenomenal price of $9.75 only because of its simplicity and Crosley's tremendous manufacturing facilities.

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3 Tubes do the work of 6 in the new SUPER-TRIRDYNS!

You have not heard the perfection of radio reception until you have listened to these two new Super-Trirdyns. In them the need for more than three tubes is eliminated by the famous Trirdyn hook-up—which combines tuned radio frequency, Armstrong regeneration and reflex amplification. There is no radiation. Distant stations come in clear and sharp on the loudspeaker and can be accurately located. Offered in solid mahogany cabinets, these new models are the aristocrats of radio reception at democratic prices.

DE LUXE COMBINATION

At the extreme right shown in outline is the new Super-Trirdyn Special Deluxe Combination solid mahogany table, the Super-Trirdyn Special (batteries self-contained) at the Musicone De Luxe. Table $35, Musicone $27.50. Combination $112.50.

CROSLEY RADIOS FIT EVERY PURSE

One Tube Sets—the tremendous popularity of Crosley Models 50 and 50 Portable is proof of the efficiency of the Crosley Armstrong regeneration hook-up. Real long distance reception with dry batteries. Model 50, price without accessories $14.50. Model 50 Portable, price without accessories $16.00.

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2-Tube Special De Luxe 3-Tube Special De Luxe

Of interest to the millions who know Crosley's past achievements in the direction of better and less expensive sets are these two new cabinet receivers. There low priced models represent radical improvements. More selective control and improved selectivity have been achieved by the use of the new Armstrong oscillator, the new Crosley vertical plate condenser and the double circuit. Radiation is reduced to a minimum. Both cabinets are attractive in design, with sloping panels and mahogany finish. Both are genuine Armstrong regeneration circuits, the 51 with one stage of audio frequency amplification; the 52 with two. Both are true long range receivers.

New 2-Tube 51 Special De Luxe
Mahogany cabinet—sliding panel, new style controls—refined metal dials, cabinet will hold necessary dry batteries. Priced with out accessories...

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Mahogany cabinet of popular sliding panel, new style controls and art metal dials, cabinet will hold necessary dry batteries. Priced without accessories...

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We are beginning now to find out what you radio experimenters want, and have put your suggestions into the new model machine, shown above. Not only is it complete for both sending and receiving pictures and picture-messages by radio (or by wire), but it is a beautiful piece of workmanship. The price to A.R.R.L. members is but $45—less than it costs. Why? Because we want your assistance in developing visual radio. But whether you buy a machine or not send for information about prizes for suggestions, for each of which a copy of the book "Radio Vision" is sent, whether you get in the cash prize lists or not. We are after helpful suggestions. Shoot 'em in, and we will do our part.

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THIS is the perfect socket, especially for high frequencies. Says 4RR-4VL: “I used no sockets at all in the detector circuit, soldering the leads to the tube base tips. When your sockets were tried, the same results were obtained — oscillation over the same wave lengths, etc. — showing that the sockets were perfect.” Station 9DXY says: “They are all that a socket should be.” You have surmounted all the difficulties and in addition, have put a wiping contact on the side of the prongs where it belongs.” Write in for Catalogue 6W—more things as good as the Socket!

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Many set builders have written us that our booklet, "Building Your Own Set", is the most practical and helpful they have seen. It gives wiring diagrams, front and rear views, shows new set with slanting panel, sets with the Radion Built-In Horn, list of parts and direction for building popular circuits. Mailed for 10c. Send the coupon today.

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THE Navy-MacMillan Arctic Expedition is using PYREX Insulators for the various antennae and leads on the "Bowdoin", "Peary" and the planes.

Radio communication is a vital part of present day Arctic exploration, and the choice of PYREX is a compliment to this unique material.

PYREX is made in a variety of shapes for amateur use.

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Wait--'till You've Heard the Slagle!

Is There A Best Radio Receiver?

Only deliberate comparison of various receivers can determine. The ideal receiver is a musical instrument—that's a Slagle! Its vast reserve of power is operated by one simple control. Go to a Slagle dealer and ask for a demonstration. It will mark the end of your quest for the best in radio achievement.

SLAGLE RADIO COMPANY
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The Tungar is a G-E product developed in the great Research Laboratories of General Electric.

The new Tungar charges radio "A" and "B" batteries, and auto batteries.

Two ampere size (East of the Rockies) . . . $18.00
60 cycles—110 volts

Last thing at night—concert over—time to lock up. Radio battery low? Just clip on the Tungar, and plug it in.

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Merchandise Division
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The Pacent Autoplug is different —
The entire length of the cord tips is encased in the plug shell of genuine Bakelite. No screws are used in its assembly and there is nothing to work loose or cause trouble. It's simple to connect the Autoplug. Drop the cord tips in the recesses in the bottom of the plug shell — press in on the push buttons at the same time. When the push buttons are released the cord tips are held with a biting, electrically perfect grip. The polarity of the connector springs is indicated by the red (—) and blue (+) push buttons.

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Autoplug 60G (with gold plated metal parts) Price $1.00

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STRAIGHT LINE FREQUENCY CONVERTER

THE modern radio receiver has abundant tone, volume and power—now it may have perfect, simplified control.

The Rathbun Straight Line Frequency Converter is adapted for use on your receiver—every receiver—without change of equipment—except the condenser dials. Each station is given a distinct reading at a uniform distance from the next. Real logging becomes a fact. The stations are distributed with flawless precision over 360°—one complete revolution of the Dial. There is no limitation or crowding as on controls using only half a dial. Radio control is simplified.

Practically even separation over half the dial with a Straight Line Frequency Condenser.

The Rathbun Straight Line Frequency Converter provides straight line frequency tuning with ordinary capacity condensers. It is interchangeable with any condenser—on any receiver. It is sold with the guarantee of reliability and satisfaction attached to all Rathbun Radio Apparatus.

See and Try it—at Your Dealer's

If your dealer cannot supply you, send Money Order ($3.50 each) and your order will be shipped promptly by Parcel Post prepaid.

Rathbun Manufacturing Co., Inc.
Jamestown New York

Stations indicated in kilocycles and wavelengths showing crowding with an ordinary capacity condenser.

Stations partially separated and tuning slightly improved with a Straight Line Wave Length Condenser.
Scientific Research for Radio Manufacturers

Radio Manufacturers are constantly faced with scientific problems due to the discovery of new principles and the necessity for keeping their product in the front rank in Radio's rapid advance. Kalmus, Comstock & Wescott, Inc. offers to the Radio industry resources, equipment, and trained scientific skill necessary to solve these problems. We maintain a staff of highly trained scientists and engineers with years of practical experience in the various fields of industrial research. Our Laboratories, personnel and experience are available to Radio Manufacturers for a reasonable compensation. It will pay you to write for complete information.

KALMUS, COMSTOCK & WESCOTT Inc.
110-114 BROOKLINE AVE. Industrial Research Engineers. BOSTON, MASSACHUSETTS

The Great Manufacturers’ Exposition
Attended by Leading Jobbers and Dealers

The Official 1925 R.M.A. Show
RADIO WORLD’S FAIR
NEW YORK CITY
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SEPTEMBER 14th to 19th
MONDAY NOON TO SATURDAY MIDNIGHT
ENTIRE EXHIBITION ON GROUND FLOOR
IN THE LARGEST HALL IN THE WORLD
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SAY YOU SAW IT IN QST—IT IDENTIFIES YOU AND HELPS QST
General Radio Rheostats and Sockets mean higher tube efficiency

Type 301
6, 10 and 30 Ohms
Price $1.25

Type 214
2, 7, 20 and
50 Ohms
Price $2.25

General Radio Rheostats Are Smooth Running and Uniform

There is only one way to operate tubes at their peak of efficiency—by the use of properly designed rheostats and sockets. In building your set, remember that vacuum tubes are important factors in successful radio reception, and require rheostats which provide a gradual and uniform resistance control over the filament.

General Radio Rheostats are smooth running, uniform, and capable of very minute variations. Many of the well-known manufacturers of receiving sets have chosen General Radio Rheostats and Sockets as standard equipment because of their high efficiency in tube operation. Why not use them in the next set you build, and get more out of your tubes?

Sold at all good radio stores
Write for New Radio Catalog 920

The red cartons with the General Radio label are your unfailing assurance of satisfaction.

General Radio Co.
Cambridge, Mass.
A New Two-Inch Radio Panel Voltmeter

of WESTON Standard Quality

THESE Model 506 instruments fill a long felt need for small Panel Voltmeters for radio receiving sets. They have all the precision, craftsmanship of assembly and ruggedness of the famous Weston line.

Made in single and double ranges for measuring filament and battery voltages, they have an exceptionally high internal resistance—125 ohms per volt. Regularly made with a black finish and narrow flange type of case, fastened to the panel with a special type of clamp supplied with each instrument.

For further information address

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

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Come to Atlantic City, the Country's Playground,

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Meet Brother Hams from everywhere in an atmosphere of bracing sea-air and goodfellowship. Tickets, including the Banquet and all the many features, are only Five Dollars. The Convention is endorsed by the A. R. R. L. Don't miss the time of your life, OM. Write now to

CHARLES GOODFELLOW, Convention Chairman

Third District, Executive Radio Council,

146 South Maryland St., Atlantic City, N. J.
Advance Announcement

ALL-AMERICAN Trade Mark

STRAIGHT-LINE-FREQUENCY TUNING

All-American Toroid Coils
Type T-1 Antenna Coupler $3.50
Type T-2 R.F. Transformer 3.50
Set of 3 Coils complete .. 10.50

ALL-AMERICAN TOROID COILS

Numerous theoretical advantages of the toroid or endless-field type of coil have been familiar to engineers for some time. Special machinery now available in the new ALL-AMERICAN factory enables us to offer precision-wound toroid coils carrying the same unconditional guarantee as the standard ALL-AMERICAN Audio Transformers.

ALL-AMERICAN R.F. Transformers of the toroid type embody an air-insulated primary winding of exceedingly high electrical efficiency, which increases selectivity and reduces danger of oscillation to values hitherto unobtainable.

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Dispensing entirely with the usual rotor plates which become, in the straight-line-frequency shape, so bulky and difficult to align, these condensers provide, nevertheless, a smooth dial motion accurately proportional to frequency, covering from minimum to maximum capacity a range of 360° rather than the usual 180°. Panel space required is one-half (or less) of that for the rotor types. Condensers are completely shielded, making them dust-proof and eliminating absolutely all practical effects of body capacity in tuning. The minimum capacity at 400 meters represents a max.-min. ratio of over 30 to 1.

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ALL-AMERICAN RADIO CORPORATION, 4205 Belmont Ave., Chicago
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ALL-AMERICAN
Pioneers in the Radio Industry

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IT HAS BEEN SAID—

"That over 60% of all Radio trouble is traceable to poor or run-down batteries."

Our No. 57 has been designed to meet the demand coming to us from serious experimenters for an accurate all around semi-portable instrument for battery, filament and grid voltage tests.

Jewell Instruments lead in the Radio field. They are fully illustrated with diagram connections, in our 15-B radio catalog.

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Because it transmits STRONG signals at any desired speed with less than one third of the labor required in key sending. Easy to learn and operate. Simply press the lever—the Vibroplex does the rest.

Special Vibroplex Requires No Relay

Equipped with 3/16-inch contact points to break high current without use of relay. Radio operators say fills a long felt want ........................................... $25

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As your lapel emblem gives you distinction and gets you recognition from brother amateurs when you’re on foot, so the A. R. R. L. Automobile Emblem on your radiator proclaims you to the whole motoring world as one of the aristocracy of radio.

Gold and black, heavily enameled on sheet steel, 5 x 2¼”, holes top and bottom for handy attachment, only 50c postpaid to members.

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Aids to Distance, Volume and Quality Reception

More DX reception is judged by loud speakers than by audibility meters. The powerful signals all Stromberg-Carlson Loud Speakers deliver without extra batteries or stages and the high plate voltages their windings can handle, has helped many records of DX with loud speaker volume.

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The same is true of reception with Stromberg-Carlson headphones. Any single Stromberg-Carlson headphone unit equals the average loud speaker unit—excels the majority in combining sensitivity with ability to handle volume. A pair of such units compels better DX results.

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And when it comes to delivering power to speaker or headphones, Stromberg-Carlson Audio Transformers excel for the same reasons Stromberg-Carlson Loud Speakers and Head Sets excel. All these three pieces of apparatus are

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The coils in Stromberg-Carlson radio apparatus are wound one layer at a time, with a wrapping of tough insulation between layers—and vacuum impregnated. That is why they stand up indefinitely under present-day high plate voltages.

Sold by authorized Stromberg-Carlson Dealers

Stromberg-Carlson Telephone Mfg. Co.

Rochester, N. Y.
Shielded Radio Frequency Transformer!

HARPER METALOID

The Original Canned Coil

Simplifies Building!  Improves Reception!

An instrument designed exclusively for Cribben Radio Corp.

A remarkable improvement in Radio Frequency Transformers. Lowest curve of resistance of any transformer on the market. Effective Electromagnetic and Electrostatic shielding; reduces interference from strong local signals; permits more compact construction; eliminates inter-stage coupling, which prevents stray feed-back, thus allowing better control of regeneration. The undeniably superior space wound solenoid form of inductance is used. No critical angle for mounting. Mounting base 3½ x ½ inches. Easily substituted in your present set. Primary tapped for all tubes. Write for circular.

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Radio amateurs quickly appreciate the latest FARADON MODEL Tube-Metal-Mica-Board condensers. Special construction and treatment assures constant dielectric spacing, permanent accuracy, low thermal loss, and quiet operation. The New Grid Leak—so good we put our famous FARADON tube mark on it—likewise permanently accurate and invisible, satisfying those who want the best. In addition to having superior electrical characteristics they are most pleasing in appearance.

We have prepared some interesting descriptive and operating data. It is free for the asking. If you mention QST, write us now for your copy.

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ELECTROSTATIC CONDENSERS FOR ALL PURPOSES

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The Peer of Neutrodyne Receivers

The distance and volume you expect to get, plus the dependability and sterling quality of reception that is characteristic of Eagle. Your dealer will demonstrate the Eagle, or you can see each model in our booklet. Just request a copy of "Radio at Its Best"

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THE new models U. S. Tool Condensers
embody the latest refinements made pos-
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U. S. Tool Condensers have always been good
condensers. The new models are better con-
densers. When the best condensers are made,
U. S. Tool will make them.

MODEL 8
An efficient condenser made with new and
patented one-piece stator, guaranteed to give
sharp tuning at the lower broadcasting wave
lengths.

Capacity, Max. .00025, Min. .0000076, $2.75
Max. .00030, Min. .0000086, 2.95
Max. .00035, Min. .0000096, 3.25
Max. .00050, Min. .00011, 3.75

MODEL 9
Same as Model 8, but with Vernier and
Kurz-Kasch Dial.

Capacity:
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Max. .00030, Min. .0000086, 2.95
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Max. .00050, Min. .00011, 3.75

MULTIPLE CONDENSER

For Single
Control
Receivers

You can now build a single control receiver with two
or three units of U. S. Tool Condensers. The same
efficiency, but greater simplicity. One dial enables
any novice to tune in stations at will.

See These New Models at Your Dealer's

U. S. TOOL CO., INC. AMPERE, N. J.
Nothing will change their accuracy

"WHATS wrong with my set?" asks many a puzzled builder, forgetting that inaccurate fixed condensers throw the whole circuit out of electrical balance.

Perhaps this is your trouble. With Sangamo Mica Condensers you can be sure of dependable accuracy no matter how severely they are used.

For here is a condenser that is guaranteed to be accurate within 10 per cent of marked capacity, and to sustain that accuracy under all conditions of service. It is solidly molded in smooth brown bakelite; impervious to moisture, acid fumes or salt air.

Even boiling and freezing will not injure a Sangamo Mica Condenser. Soldering has no effect upon the capacity; heavy surges of current in special uses will not break it down. Its great mechanical strength gives protection against shipping or cracking even if dropped on hard cement. Approved by all nationally recognized radio laboratories.

First class radio dealers have Sangamo Mica Condensers in stock—or can quickly obtain them for you. Insist!

PROFESSIONAL SET BUILDERS and dealers who build sets

WE will shortly begin a series of newspaper advertisements, featuring the work of individuals and dealers who build sets using Cardwell Condensers.

If you build to specification or from original design, it will be to your interest to communicate with us immediately.

Ask for details of plan. Be sure to give name of your jobber.

ALLEN D. CARDWELL
MANUFACTURING CORP.
81 Prospect Street, Brooklyn, N. Y.
And Now—

The B-T Tandem Condenser

THE same high efficiency, and unequalled construction that put the B-T “Lifetime” Condenser in the front rank is also available in tandem form. More than just a “Double Condenser,”—two carefully balanced units in one frame, working from a single shaft. Independent auxiliary “Trimmers” provide the accurate balance vitally necessary in correct tandem design.

A product that really fulfills its purpose,—Simplified Control.

Complete information on request.

The B-T Torostyle Transformer

A “Toroid” that really works. Exhaustive research and years of experience in inductance pitfalls are behind this coil.

Arranged for short leads and easy wiring. Used in patented B-T Circuit.

Write for descriptive literature.

The B-T Torostyle Transformers and Tandem Condensers are the heart of the “COUNTERPHASE”.

The patented B-T “bridge” circuit gives maximum efficiency on all wave lengths. The greatest of the B-T Circuits.

The B-T Tuning Control

Decorate your set, while making tuning easier with this “Control.” Its smooth easy action is a delight.

Straight Line Frequency vs Straight Line Wave Length.

You’ve heard a lot about Station Separation on the lower waves. Is the answer in any condenser? We build both kinds,—and tell both sides,—in “Better Tuning,” 8th Edition,—postpaid 10c.
The "pi" type of filters described in numbers 7 and 8 of this series while excellent for C.W. and some forms of phone modulation are not suitable for Heising modulation. The large condensers tend to short circuit the modulating frequencies. This may be overcome by the addition of a small choke, 5-10 henries, in the plate lead directly after the filters, followed by a small condenser not over .005 mfd. across the line.

Bulletin No. 257-9 lists over three hundred motor-generator combinations that will give the maximum miles per watt. Write for your copy to-day.

ELECTRIC SPECIALTY COMPANY
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This complete series with other valuable motor-generator information may be obtained in pamphlet form. Write for your copy.
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but in fact it's Bakelite

So perfectly is the grain and color of mahogany and walnut reproduced in these Bakelite Radio Panels, that the eye cannot distinguish them from the natural woods.

By using a Bakelite Panel that matches the wood in the cabinet, your finished set will be far more handsome than if a plain panel is used.

Rigid and strong, Bakelite Panels support the weight of heavy instruments without sagging. They will not compress, or cold-flow, under pressure of binding screws. Because of their resistance to extremes of heat, cold and moisture, they will not warp nor split. These properties and their insulation value, color and finish are permanent.

Be sure to ask your dealer to show you these wood finish Bakelite Panels — obtainable under any of the following trade-names:

- Formica
- Celoron
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A Bakelite Panel on a set is an indication that the manufacturer has used the best.

Write for Booklet 27

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THE MATERIAL OF A THOUSAND USES

SAY YOU SAW IT IN QST — IT IDENTIFIES YOU AND HELPS QST
A Revelation in Tone—Volume—Clarity

The Kellogg Symphony Reproducer brings the broadcasting studio into your very room, so realistic is its reproduction.

Piano music, the most difficult to reproduce, sounds so natural that you are completely carried away by its beauty.

Vocal selections retain all of the tone colorings of the artist.

Orchestra music is indeed a recreation, every instrument can be heard, clear and full.

Magnetic diaphragm control—used exclusively in the Kellogg unit—is the new principle that performs wonders in radio reproduction.

Nothing like it at twice the price—$20.00 each.

At your dealers—Hear one today.

The Kellogg Switchboard & Supply Company
1066 W. Adams St.    Chicago, Illinois

KELLOGG SYMPHONY REPRODUCER

Make Thousands of New Friends
WITH THE
ADVANCE "SYNC' RECTIFIER
MORE IN USE THAN ANY OTHER RECTIFIER MADE ANYWHERE

Make your calls heard over maximum territory. Give them clearer tone—better volume. Reach hundreds of sets all over the land that did not know your station was in existence. The new improved ADVANCE "SYNC" RECTIFIER will do it. Very efficient on short waves. Requires no attention—always ready.


Complete with Westinghouse 1/8 h. p. Synch-synch Motor ......................... $40
Rectifying wheel with complete brush assembly and mounting ring to fit your own motor ........................ $15

We Pay All Transportation Charges in U. S. A.

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1260-1262 West Second St. Los Angeles, California

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TUNE-IN
More Stations!
Get those far-away ones quickly, easily, clearly just replace your dial with

WALBERT
WALBERT MFG. CO., CHICAGO

Crescent Lavite Resistances for Distortionless Amplification
32.000, 48.000, 50.000, 100.000 Ohms. List $1.50 ea. Special Sizes to Order $2.50 ea.
Dealers write for discounts. When Better Resistances are made they will be Crescents.

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For amateur transmitting stations—the Dubilier Condenser No. 668. It may be used as a series antenna condenser; a plate blocking condenser or a grid coupling condenser in tube transmitters of 500 watts or lower.

Capacity .0001 to .075 Mfd. operating voltage 1000 to 3000 volts continuous at a current of 5 amperes—radio frequency of 750 to 1000 kilocycles.
THE SUPER-SYNC
The only synchronous rectifier that can be filtered

What are you doing to warm the plate of that 250 with this fall OM? Of course a motor generator would do it providing it is large enough, but the price is usually well above what the average Ham's pocket book can afford. Now OM what would you say to a rectifier that gave equally as good if not better results than a motor-generator but at a price well within the reach of all? This is exactly what the SUPER-SYNC offers you. With its large rectifying commutator and excellent insulating materials it easily supplies power for the transmitter using the larger size tubes, and naturally it is just as efficient on the lower powered sets. Thus the Purchaser of a Super using the small tubes is assured his rectifier will function perfectly in the event that he should decide to increase power. This is true of no other form of rectifier than the Super. The main advantage that the Super offers, however, is the fact that it can be filtered. No mysterious apparatus is required to filter the SUPER. In other words the usual Brute Force type of filter is just as effective on the Super as on a motor generator. Another advantage of the Super is the fact that it requires practically no care, once adjusted it stays put, and an occasional oiling of the motor bearing is all the attention that is required. The motor, by the way, is a husky 1/2 H.P., 1800 R.P.M. sync motor, and none have ever been known to slip a pole or fail out of Synchronism.

PAT. PENDING
PRICE $75.00 F. O. B. ST. LOUIS
MARLO ELECTRIC CO., 5241 Botanical Ave., St. Louis, Mo.

“Windham” Wire Former
(Pat. Pending)
A complete and handy tool for electricians, radio set builders and mechanics. It will accurately form loops or eyes for No. 4, 6, 8, 10 and 16 gauge, make easy radius and sharp right angle bends, cut flat bars and wire cutters. This tool is made of the best quality steel, dropped forged and carefully tempered in oil.
We guarantee every tool against defects in workmanship and materials and will promptly repair or refund money on any found defective by purchaser.

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Ask your dealer
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THE GOYER COMPANY
Willimantic, Connecticut

Western Electric
Portable Navy Telephone
Transmitter and 3 Tube Receiver Complete

Consists of Transmitter and Receiver Cabinet, Microphone, Head Set, 12 Volt, to 14 Volt, Dynamotor and Cable. Price without tubes or batteries.
Slightly Used, $10, Express Paid.
Other Navy Apparatus at Special Summary Prices.

AMPERITE controls the flow of current through the tubes automatically just as the heart controls the flow of blood through the body. Does away with hand rheostats and filament meters. Eliminates guessing and all tube worry. Prolongs tube life, lowers set cost. Proved and adopted by more than 50 set manufacturers. For perfect filament control you must use AMPERITE. $1.10 everywhere.

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Write for FREE Hook-ups

AMPERITE
The “SELF-ADJUSTING” Rheostat

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

To you who are scientifically interested this is of even greater interest than it is to opera-goers, patrons of lectures and concerts, or to the dancing set.

Artistic radio has come with Thorola Isodyne, the only receiver embodying the Isolated Power principle made possible by Thorola Low-Loss Doughnut Coils. They conquer the causes of interfering currents, pick-up feed-back, uncontrollable oscillation, complicated and freak wiring, uncertain operation. Radio experimenters know what all this means. Radio listeners no longer need to know!

Isodyne action now keeps every set of radio impulses clear, free, separate. The one station wanted is cleanly selected, even in the broadcasting centers. Utmost power, unscattered, is isolated—focused—on this one set of signals only. The impulses do not conflict or neutralize. Full tone, unmodified—full volume, full distance at last are possible, at all wave lengths.

With the uncontrollable, temperamental factors of radio reception banished, Thorola Isodyne achieves uniformity of results. Every Thorola Isodyne is as good as the best one ever built. The same stations keep coming in the same. The set you inspect tells what every Thorola set does.

Radio reception is unmistakably elevated to a new plane. What you knew would some day, is now accomplished. There is a complete Thorola receiver leading its field by far, just as Thorola excels in loud speakers and other apparatus.

The Thorola name is surety of radio development which nothing will eclipse. The intense interest in the 5-tube Thorola Isodyne receiver at every radio store will tell you where expert opinion centers today. Go and make your own tests.

REICHMANN COMPANY, CHICAGO

Thorola Low-Loss Doughnut Coils installed in other sets as recommended will provide many of the greatest Thorola advantages. For the complete set of three ........................................ $12

Coupler and transformer coils, each ........................................ $4

Thorola Loud Speakers with new horn-like bakelite horn and gold throat-bell are still better in appearance and performance.

Thorola No. 4 $25
Thorola Fan No. 12 ............... $15
Thorophone Power Type ............. $45
Thorola Fan No. 5 Phonograph Attachment ......... $7.50
Thorola (Large Unit) No. 6 Phonograph Attachment .......... $15

The very proportions of Thorola Cabinets suggest new internal design.

In smart Thorophone Cabinet the Standard Thorola Isodyne is ........ $85

In stunning Burled Walnut Cabinet with Circassian top the Supreme Thorola Isodyne is ........ $115

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Antenna Series
Condensers

Built to Amateur Specifications for the amateur.

Type 150 — 3000  150 MFD. (.00015 MF).
3/16" spacing (ordinarily known as double spacing), 5000 volt flashover. Fine for 5W and normal 50W sets. Proper size for primary circuits.  Price $7.50

Type 450 — 3000  450 MFD. (.00045 MF)
3/16" spacing, like those NATIONAL supplied to N.R.R.L.  Price $16.50

Type 100 — 6000  100 MFD. (.00010 MF)
2/3" spacing, 6000 volt flashover, for the overloaded "50" and the "250"W. Plenty big enough for the primary, too. All prices include 4" Velvet Vervier Dial.  Price $12.50

"NATIONAL" can furnish you with 5 or 3 plate Receiving Variables for that short wave receiver. Send for Bulletin 106 Q S T

NATIONAL COMPANY, INC.,  ENGINEERS AND MANUFACTURERS
110 Brookline Street, Cambridge, Mass.

NEW
LOW WAVE
LOW LOSS
unal Sam
Coil

SIZE
2 1/2 x 2 1/2 In.

Tunes from
35 to 150
meters with
0.0005 MFD.
Condenser.

FREE
Ask your dealer or send us four cents
in stamps for wiring diagrams in
which this unit can be used.

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SOMETHING decidedly new, different and better has been perfected in radio. Interesting information is ready for you. Write us at once.

PREMIER ELECTRIC CO.
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ULTRA-LOWLOSS
Condenser

SPECIAL CUTLASS PLATES DISTRIBUTE THE ADJUSTMENTS EVENLY OVER THE DIAL. SIMPLIFIES TUNING CAPACITY 90% MFD.

$5.00

PHENIX RADIO CORP., 1116-F East 25 St., N.Y.C.

CRISS-CROSS
THE COUNTRY WITH
Premier
5 TUBE
Ensemble

PREMIER ELECTRIC CO.

Say you saw it in Q S T— IT IDENTIFIES YOU AND HELPS Q S T
Once again that intrepid explorer, Donald MacMillan, has gone into the Frozen North. And once again—for the fourth time—he relied on Exide Batteries to serve him, without flinching, through the extreme rigors of the Polar region. Each item of equipment on such an expedition is chosen with utmost care, for life or death hangs in the balance. On previous voyages to the Arctic with MacMillan, Exide Batteries have been through shipwreck, blizzard and incredible cold and never once have failed.

On this latest adventure all the storage batteries are Exide—for radio sending and receiving, for electric light aboard ship and on shore, for operating the sensitive scientific instruments. The three U. S. Navy airplanes that accompanied MacMillan’s two vessels are equipped with Exide Batteries. Wherever radio must not fail, you will almost always find Exide Batteries have been installed—in government and commercial plants—on the giant ship Leviathan, on the Navy dirigible Shenandoah, on the new British airship R33; on every continent and the seven seas speeding up communication throughout the modern world.

The same qualities that make Exide the choice where lives are at stake are built into the Exide Batteries that you can have with your own receiving set. Staunch and dependable, the Exide gives uniform current through a long period of discharge and assures the clearest reception of which your set is capable. There is a type for every tube and a size for every set, obtainable at radio and all Exide dealers.

THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia
Exide Batteries of Canada, Limited
153 Dufferin Street, Toronto

Exide 6-volt "A" battery
in one-piece case

There are also Exide "A" batteries for 2-volt and 4-volt tubes and "B" batteries, 24 and 48 volts, of 6000 millampere capacity. The Exide line includes a most economical "B" battery rectifier.

FOR BETTER RADIO RECEPTION USE STORAGE BATTERIES
SAY YOU SAW IT IN Q S T—IT IDENTIFIES YOU AND HELPS Q S T
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.

Being genuinely interested in Amateur Radio, I hereby apply for membership in the American Radio Relay League, and enclose $2 ($2.50 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!

RADIO SPARK TRANSMITTERS (75 PORTABLE)

Made for U. S. Army Aeroplanes

This is a tuned spark coil transmitter, with a wave length of 100-300 meters. The set is made of the finest of materials and the essential parts are the spiral tuning inductance, the induction coil, sending condenser and spark gap. Can easily be converted into spark coil CW set. Brand new, in original cartons.

ORIGINAL GOVERNMENT COST, $47 EACH

OUR PRICE $5.75 EACH

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NATIONAL RADIO EXPOSITION
Grand Central Palace, New York
September 12th - 19th incl.

- the fourth successive national exposition representing all the leading manufacturers of the radio industry;
- the only great radio exposition of 1925 to be held in the metropolitan center of New York;
- the greatest spectacle of the year in the scientific, industrial and business progress of radio!

Business Office
AMERICAN RADIO EXPOSITION CO
522 Fifth Avenue, New York

HAROLD BOLSTER, Director
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Clearing Up Odds and Ends!

We have for sale the following material at special prices subject to prior sale:

9—1/2 Horse-power A.C. 110 Volt 1 phase motors. brand new at $12.00 each
1—Telefunken U.S. Naval Radio Laboratory wave-meter 65-3000 meters with calibration within 1% on first coil, slightly used. including thermo couple $40.00
4—900 Cycle Aeroplane transmitter complete new $15.00 each
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6—Electrode 24” antenna insulators at $1.50 each
1—Holtzer Cabot 500 cycle motor generator 110 Volt D.C. Drive 1/2 K.W. brand new $30.00
30—R.C.A. U.C. 485-1 mfd condensers $1.00 each
2—Dublier .004 aluminum case condensers 12500 Volts tested, shopworn $12.00 each
4—1/5 K.W. Dublier Protective devices for transmitters $1.50 each
1—Roller Smith 750 Watt Meter $8.00
2—2 K.W. 500 cycle Telefunken transformers, shopworn $15.00 each
20—R.C.A. UC 1846 Faradon Antenna series condensers $50 cents each
1—U.V. 217 Kenotron slightly used $15.00
60—R.C.A. PR-585 Rheostat for U.V. 202 tubes. List at $1.50. Special 90 cents each
1—C.N. 240 Tuner in perfect condition, but slightly used, 1000-10000 meters $35.00

Write for New Detailed List No. 2 for New Specialties Too Numerous to Mention

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KENOTRON RECTIFYING TUBES (Type TB-1)
Manufactured by the General Electric Co., new, in original cartons.

These tubes operate on a filament voltage of 7.5 volts, and an A.C. input voltage of 550 volts. Their normal output is 20 watts at 350 volts D.C.

Eliminate your transmitting plate supply troubles with these tubes.

Make your own B-Battery eliminator with two of these Kenotrons and a suitable filter.

And the bargain price, OM, is only $1.50 each.

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Coupled S. W. Inductances $10.50

Postage Extra 20, 40 or 80 meters all one price. Higher rates to other parts. See Coils only no stand $7.00. Used for all leading tubes. If your set won’t perk up a lot of times. Complete transmitters on hand.

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BLUEBIRD RADIO TUBES—are powerful-sensitive for distance, give clear volume and long service.

GUARANTEED to work in Radio Frequency, Noiseproof, Super Heterodyne and Reflect.

WITH BAKELITE BASE

Type 200 $2.00
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Type 202 5 watt Transmitter $3.00

When ordering Mention Types Shipped Parcel Post C. O. D.

BLUEBIRD TUBE CO.
200 Broadway Dept. S, New York

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SAY YOU SAW IT IN QST—IT IDENTIFIES YOU AND HELPS QST
HAM-ADS

IMPORTANT NOTICE! NEW RATES ADVANCED CLOSING DATE

Effective with May QST, the HAM-AD Advertising Rates are TEN CENTS A WORD. Name and address to be counted, each initial counting as one word. These rates are shown on QST Rate Card No. 6, in force with the May issue.

The closing date for HAM-ADS is now THE TWENTY-FIFTH OF THE SECOND MONTH PRECEDING DATE OF ISSUE. For example, all HAM-ADS for the June issue must be in this office not later than April 25.

Hereafter no HAM-AD will be accorded any particular or special position.

Rates for the QRA Section remain the same; 50¢ straight. See heading of that section for details.

$2.50 — OUT AT LAST!

"THE Hawley," An alkali un-acid rechargeable "B" storage Battery of 221/2 volts. Not an unassembled battery but ready to use—no extra parts to buy. Uses the largest sized tested Alkaline elements (Edison). Heavy closed top glass case. Chemical electrolyte included and shipped separately. Any detector or amplifying voltage easily had. Special offer. 22½ volts $12.50; 11½ volts $7.50; 13½ volts $14.75; 15½ volts $16.80. For those wishing to put their own together buy the knock-down kit. Put up in all voltages at still greater savings in price. The only battery of its kind sold on a 30 day trial with complete guaranteed satisfaction or your money returned in full without any ifs, ands, or buts. Further guaranteed 2 years. Order direct and save money. Express your cost plus the small carrying charges. Patent pending. Same day shipment. Write for our guarantee testimonials and literature. It’s free and it’s interesting. Complete sample cell 50¢ prepaid. B. Q. Smith, 31 Washington Ave., Danbury, Conn.


TELEGRAPH — Morse and Wireless — taught at home in half usual time and at trifling cost. Omniphonic Automatic Transmitter will send, on Sounder or Buzzer, unlimited messages and speed, just as expert operator would. Adopted by U. S. Govt. and used by leading Universities, Colleges, Technical and Telegraph Schools throughout U. S. Catalog free. Omniphonic Mfg. Co., 13M Hudson St., New York.

REBUILD YOUR NEUT—Use same panel, same parts. No neutralization. 22 feet gold wire, only extra part, circuit and complete, simple instructions—$3.00 prepaid. Hundreds of Neut owners use this Kit. Details 45¢. Bulletin 201, 10¢. Sample succeeded as cash.

KLADAG RADIO LABORATORIES, KENT, OHIO.

MAKE $120 WEEKLY IN SPARE TIME. Sell what the public wants — long distance radio receiving sets. Two sales weekly pays $120 profit. No big investment. Be canvassing. Sharpe of Colorado made $955 in one month. Representatives wanted at once. This plan is to open the country — write today before your county is gone. OZARKA, 353 Washington Blvd., Chicago.

AMRAD No. 2706 Lightning Switch, $1.50. AMRAD No. 4000-1 "I" Tubes, Lowest Prices. AMRAD-Sound-Receive Switch No. 2834, $5.00. AMRAD-New Type Varimeters, 87.2. AMRAD-UP-141 Mike Transformers, $5.75. UC-1001 Variable Trans. Condenser. $1.50. Roller-Smith Radiation Meters 0-3 $3.75. ALL POST-PAID. Send for list.

STATE RADIO COMPANY, 546 Columbia Road, Dorchester, Mass.

Send for our FREE CODE LESSONS showing simplicity of learning Radio. Positions secured for graduates paying $200 to $500, per week. Additional information begins September 14. Free Scholarships for a few lucky ones. INQUIRE! Catalog free. MASSACHUSETTS RADIO SCHOOL, 15 Boylston St., Boston, Massachusetts.

FOR the first Sept., and Dec. 1923, Jan. Feb. Mar. April, July, and August 1924 QST copies received will extend your QST subscription one year. Address to David Houghton, c/o A.R.R.L., 1711 Park Street, Hartford, Conn.

200-20,000 Meter receiver including radiotron $25.00; two step amplifier $18.00. Smith, 4116 Market, Philadelphia, Pa.


NEW PARTS OMS. CARDELL 5 PLATE CONDENSER FOR LOW WAVE TUNERS $4.00. CARDELL DOUBLE SPACED TRANSMITTING, 00005 $15.00 AND IT HOLDS 1000 VOLTS SAME TIME. 5000 VOLTS PRICE $10.00. GIVES YOU EASY TUNING. RADIOSTATIONS FOR FLEXIBLE FILAMENT CONTROL $20.50 ACME TRANSFORMER ORDER WHAT YOU WANT. WE HAVE IT. THE TIME TO GET THE OLD MILL IN SHAPE FOR THE REAL DX IS TODAY. NOT TOMORROW. DROP US A CARD AND GET Newman 7200. Radio Supply Co., Ft. Worth, Texas.

TO TRADE—Three A Graflex Camera, on fifty watter parts. S. E. E. F., Coffeyville, Kansas.

PLENTY of Western Electric condensers 3mfd, tested 500 volts $1.25 1mfd 1000v. $1.25 1mfd 400v. 50¢, postage extra. Other supplies. R. Wood, 38 Way Avenue, Corona, N. Y.

MANHATTAN Senior Loud Speaker. $15. Cost $18. F. A. Mall, Trippol, Iowa.

ELECTRICALLY WELDED connections for that RECHARGEABLE EDISON "B" BATTERY. Largest size elements with 2 weds of pure nickel wire on each negative and one wend on each positive element for 74% cents pair postpaid. Hard rubber separators 1/4 cent each. Sample pair and "dope" sheet 10 cents. Paul Mills, Woodburn, Oregon.

NEW—RCA 40 H. Chokes $8; $12.50 RF chokes at $5; $25. 1mfd $4.50, 1mfd $7.50, 3mfd $10.00. Cardwell Transmitting Transformers $7.25; UC1019 Ant. Series $3.50. 3 HOV.

HEADQUARTERS FOR AERIAL EQUIPMENT THE SUMMER MONTGOMERY 1000-1500-1750 WATTS FOR SIZE 2 METERS PRICE $100. ELECTRIC SYSTEM. Dr.NEX SOLID COPPER ENAMEL WIRE. No. 12, 1c ft. $3.50, 1000', $4.75, 10000' $2.25, PYREX GLASS TRANSMITTING INSULATORS $1.50. LIGHTNING SIZE 50C OHIO BRASS INSULATORS $1.50. SHEET LEAD 90c SQ. FT. 1/16 ALUMINUM 30c SQ. FT. DINEX HOOPS FOR THE CAGE. 8", $2.50, 10", $3.00, 12", $3.50, CARDWELL TRANSMITTING CONDENSERS $12.50. CARAD—PYREX SOCKETS.

MAKE $120 WEEKLY IN SPARE TIME. Sell what the SAY YOU SAW IT IN QST—IT IDENTIFIES YOU AND HELPS QST
GLASS ANTENNA INSULATORS, 48c. Linn Collins, Jr., 1401 West 10th St., Cleveland, Ohio.

GORTON PANEL ENGRAVING — one day service. We cut bakelite panels any size and thickness. All sizes bakelite tubing in stock. Complete line of receiving and transmitting apparatus including Gen'l Radio, Cardwell, Reamer, Acme, etc. BROADCASTING EQUIPMENT — LIFECARDED Microphones. All sizes wire tubes, transformers and generators, etc. Can supply any special radio equipment for any installation. Write us your requirements for our S.E.X. RADIO SERVICE. 223 VAN HUREN ST., JOLIET, ILLINOIS.

HARGAINS—Grebe Cr 5, $25. Rond. Fats, $50. Fats, four, $40. Rhd, three, $30. Western Electric five-watters, $5; E.S. Cr. with tubes, less cabinet $70; E.S. intermediate transformer $1. Mccraon, 226 Nott Ave., Long Island City, N. Y.

4UC SELLING OUT. Going to College. Prices cut very low. Write for list. Donald B. Whittemore, Box 4, Scarsdale, N. Y.

PORTABLE set users. Special 2 volt 60 amp. storage batteries $2.50 each, and $4.25 paid up in USA. Send for circular. Precision Electric Company, 174 West 24th St., New York City.

TWO NO. FOURTHOUSAN D S TUBES WITH S O C K E T S SIXTEEN DOLLARS. SINGER TUBE WITH GENERAL ELECTRIC SET WITH 1200 VOLT 12 HOURS DOLLARS. VIBRPLEX GOOD CONDITION. EIGHT DOLLARS. DANA, GRANTWOOD, N. J.

TIMEGRAPH—SHOWS DIFFERENCE IN TIME OF ALL COUNTRIES. PRICE TWO RITS. 7KU, 2500 E. HELEN ST., SEATTLE, WASHINGTON.

"AMATEUR RADIO EXCLUSIVELY" AND SHORT WAVE WORK. WHEN YOU CANNOT MAKE YOUR OWN FITS WORK DROP US A LINE. WE NOW TAKE CARE OF ANY TWENTY METER WORK IN THE TRANSMITTING LINE. LOWER IF YOU LIKE. SEND US YOUR EXPERIMENTING AND GIVE US THE DETAIL OF YOUR REPORTS! WE BUILD TO ORDER ANYTHING IN THE TRANSMITTING AND RECEIVING LINE. IF YOU HAVE THE PARTS SEND THEM IN AND WE WILL BUILD A BRAND NEW TRANSFORMER, RESCO MOTOR GENERATORS, THORADSON AND ACME PLATE TRANSFORMERS, POWER TUBES, FILTERS, JEWEL JUNGS AND WESTGATE TRANSFORMERS. ALSO INDUCTIONS FOR ANY WAVE-LENGTH FOR THAT TRANSMITTER OR RECEIVER. THIS SHORTY WE'VE RECEIVED HERE WORKS FROM 7 TO 300 METERS. WHEN YOUR SUPER-HETERODYNE FAILS TO "PEEK" SEND IT TO US. IT WILL WORK AFTER, DON'T KNOW YOUR WAVELength? BUY A WAVEMETER! We build SPECIAL EXPERIMENTAL EQUIPMENT, ANYTHING SHOWN IN QST, OUR PRICE IS RIGHT FOR ANY WORK YOU THINK YOU CAN DO. THE BEST IN AMATEUR EQUIPMENT DROP US A LINE. IF IT'S HAM LET'S HAVE THE PROBLEM. SEND US YOUR QUIRKY QUESTIONS, LESTRADE-GLASS CO., 2106 S. GRANDVIEW AVE., WARREN, OHIO. (Designers of High Grade Amateur Equipment)." $10 RCA PT 357 RHEOSTAT $2.50. $17.00 RCA 177 1307 (5% to 5 amperes) Magnetic Modulator. $11.95. Grid leak for 25 step if not wanted. Write for list transmitting-receiving accessories. Kirk Burg. 2296 Palm St., St. Louis, Missouri.


MUST SELL—Transmitter, receiver, tubes and junk. Cheap. List. SAXO, Wyatt Hall, St. Charles, Virginia.

INTENSIVE SPEED PRACTICE TESTED AND FOUND FB. SPEED INCREASED FROM 25 to 35 PER IN TWO EVENINGS. If interested ask for information. Dodge Radio Shortcut, Mamaronac, N. Y.

We bought 200 five tube receiving sets used by the air service during World War. Made by The General Electric Company. 5 stages radio frequency amplification. Untuned. Remote Control. Without batteries, telephone or tubes. Mounted in durable box on rubber cords. Price $10.00 per set while they last. J. A. Rowenstine, 106 So. High St., Columbus, Ohio.

RECEIVERS built to order. WORK guaranteed. Earl R., Racine, Wisconsin, Illinois.

WELCOME RADIO WEATHER BACK WITH AN EDISON IN THE STEEL. ALKALINE LIFE TIME BATTERY! A TROUBLE FREE POWER PLANT FOR YOUR SET. ELEMENTS ELECTRICALLY WELDED TO HEAVY NICKEL CONNECTORS. $5 VOLT $8.50. 10 VOLT $10.50. GREAT SAVING. LARGEST ELEMENTS, REAL EDISON SOLUTION. A BIG 2000 MILLIAMP HOUR B FOR THE MULTITUDE SET, 106 VOLS $24.00, CELL PARTS $15.00, DRILLED 19c, ASSEMBLED CELLS 24c. QUANTITY DISCOUNTS. EDISON A ELEMENTS 5c, WELDED PADS 75. A NEW SUPERCIL, 2000 MILLIAMP HOUR, 40 SAMPLE 25c, ANNEALED TEST PADS 2c, 5c, SHOCKPROOF JARS 1 x 6-1/2, 11, 15 x 5c. PUREST SOFT 502 NICKEL 1 foot RUBBER SEPARATORS 5c. REAL EDISON ELECTROLYTE. $1.25 MAKES 5 lbs. WILLARD COIL—A REAL B CHARGER, 50 VOLTS $2.00, JUMBO $3.00. 100 VOLTS FOR $5.00. DRILLED 19c, SEPARATED TO HIGHEST INPUT AND OUTPUT EFFICIENCY USE NO. 12 ENAMELED AERIAL WIRE—75c 100 FT. OHIO BRASS, WET PROCESS AND PYREX INSULATORS. NEW INSULATOR—PURCH ASSEMBLED. MAXIMUM. PLEX—NEW PRICE 21.30. ANYTHING YOU NEED. RADIO SM. FRANK M. J. MURPHY, 488 ROCK-WOOD ROAD, CLEVELAND, OHIO.

FOR SALE—9EH complete station. New stuff. 50 watt transmitter with tubes, dynamos and other. Loss receiver. Write for list as priced. Bargain for sum one. C. W. Clement, Java, South Dakota.

ATTENTION—By common consent as evidenced by Universal Patronage—The very best and most economical! See our "Cat" on page 58 this issue.

THE JACK GRAY PRESS
Stationary Specialists
Evanston, Illinois.

SACRIFICE—Grebe CR 192.00. WORK two stage $19.95. WORK 1100 Mi. Magneto $3.50. 일본 SEPARATE DOUBLES FROM SHEETS $3/16 x 1/8 5c & STREET, CHEMICALS FOR 3 LBS. BATTERY SOLUTION, ENOUGH FOR 100 VOLTS 75c. EDISON SUPPLEMENT ONE HOUR A BATTERIES IN PERFECT CONDITION. EIGHT LINES, 10 c., POSTPAID, SEND REMITTANCE WITH PHOTOS. BROWN STOTT, 50 PALLISTER AVENUE, DETROIT, MICH.

EDISON B BATTERY SUPPLIES. LARGEST SIZE TYPE A ELEMENTS 4c A PAIR, DRILLED 5c A PAIR, WIRE IN PAIRS 5c. PURE NICKEL WIRE 1 A. FOOT. FORMATED, BONDED SEPARATION BATTERIES FOR BATTERIES 1/3e EACH OR CUT YOUR OWN SEPARATORS FROM SHEETS 5 3/16 x 1/8 5c & STREET, CHEMICALS FOR 3 LBS. BATTERIES SOLUTION, 1/1000 VOLTS 75c. EDISON SUPPLEMENT ONE HOUR A BATTERIES IN PERFECT CONDITION. EIGHT LINES, 10 c., POSTPAID, SEND REMITTANCE WITH PHOTOS. BROWN STOTT, 50 PALLISTER AVENUE, DETROIT, MICH.


RELIABLE WAVE METERS in cabinets, rugged, accurate and dependable, $20-260 $14.00, postpaid with curve charts. Accuracy GUARANTEED within 1%. Also Crosby Tridyn Special demonstrator, can't be sold from new, fully guaranteed $40.00. Edward Bronner, Jr., Whitewater, Wis. 9CSM.

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

SPECIALS ON A FEW RCA VOLTMETERS AND THERMO-AMMETERS: This is only a part of what you'll find in the HAMALOGO, besides lots of helpful information. It's free, get it now. Let's have your orders and don't forget, postage, please. E. F. JOHNSON, 9A1D, Wases, Mlnn.

HAMS, Get our samples and prices on Printed Call Cards made exclusively for YOU by H. V. HINDS & EDGARTON, 19 S. Wells St., Chicago, Ill.

SAMQ selling out. 500 volt B hat, 10e cell 2 volts per cell 8 volt storage bat., 135 AH cap. $20. Write for list of other stuff. L. W. Jenkins, Crookston, Minnesota.

TRANSMITTING and receiving apparatus and radio magazines for sale. Write for list, McAllister, 100 Baltic St., Brooklyn, N. Y.

DODGE RADIO SHORTKUT HAS PRODUCED REALLY WORTH WHILE RESULTS EASILY AND QUICKLY. DX'ER Speed was 12 New 25. Total attention was about 3 hours. 1COB Memorized Code in fifteen minutes. Now Commercial First. 2CPQ Dodge Shortcut helped me much. 9AMU bought new Code. Could not receive. In one week passed. 4QV find license, in five hours my receiving speed. 9BT Speed was five. After brief study and practice speed 15. 4CDY Long unachieved AC. So two evenings. Can now do 15. 6GQ Did master Code your way to stay put in fifteen minutes. 7IE Long unchanged at 20. 9AB Farley entered now. DX'ER Speed was 15. After attention four hours can do thirty. 9BHM Am now ORS. This was impossible before. 9ALB ADAM M. Callenders. AC Speed. Speed 6. Jumped to 29—6 days. WILL PAY INVESTIGATION BY OLD TIMERS, BRASS PAPER BAG, THE MAGAZINE, AND OTHER RADIO FANS AND ALL INTERESTED IN TWO WAY RADIO—REAL RADIO, HONOR ROLL TELLING OF PROGRESS MADE BY 200 STUDENTS ALL LIQUID MAILED OR RETURNED AT OUR EXPENSE IN U. S. AND CANADA—ELSEWHERE $2.00, KILLS HESITATION. Dodge Radio Shortcut, Mamaroneck, N. Y.

WE SORCE AGAIN—NEW RCA UV202 Bottles 50.00. Complete Ham Station equipment at MONEY SAVING SPECIALS, 1224 S. 42nd St., Seattle, Wash.

BARGAINS: 3—New 200's @ 8.15. Acme mounted 500 watt Plate Transformer 814. R.E.A. Oscillation Transformer 8$. Keyling Relay 6 volt $2.00. 5 amp. Tungar 115. 2 amp. Tungar bulb $2.50. 2—50 watt sockets $1.00. CAZ Large Speaker, $1.00. Paul Kern, 1630 N. 10th St., Reading, Pennsylvania.

EDISON A ELEMENTS 4c PAIR. OTHER APPARATUS. WRITE SADY, 3812 P GALVESTON, TEX.

WAVEMETERS, 10 to 100 meters, two coils, individually calibrated. Accuracy guaranteed within limits of construction. Excellent construction and handy size, with flash lamp, $12.50. Postpaid. "ALL-BAND" AMATEUR TUNER, 18 to 220 meters, Includes four plug-in cellular supported coils, rotor, and variable antenna coupling condenser all in one compact unit, $5.00. We build real amateur equipment and carry all types. Address for list. Seattle Radio Laboratory, 3325 33rd Ave., South, Seattle, Washington.

HAM AND BCL BARGAINS—here are a few: write for complete bargain list. HAM & BCL 75 c a week. New Power ~ewell meters 25% off. Amateur and broadcast Lopez turners $7.50. UV216 Kenotrons $5.00. 500 cycle quartz KX Generator $3.50. Condensers, $4.50; $5.00. Wingers stand hvoltage $2.10. Baldwin phones $7.70. W.E. $6.50. $3.50 approved lightning shield, $2.50. 30 watt $4.00. Acme RF and suction heterodyne transformers $3.50; $5.50 Receptor longitudinal heterodyne transformers $3.50: $5.50 Nagal RF transformers, $2.00. Stube Stoll set worth $75.00; $50.00. $2.00 free. Pushbutton Medic Radio Company, 1810 N. Lawdale Ave., Chicago, Ill.

ROICE 3-WATT DX BABIES $8.00. CURTIS-GRIFFITH, FORT WORTH.

RECEPTIBLES for those incoherent tubes are now 6s. There's a reason. Ask the one that uses them. A. Mallins, 59 Webster Av., Brooklyn, N. Y.

FOR SALE 3BDO ten watt transmitter. DX 21 foreign countries. Complete with tubes, meters, rectifiers, transformers, etc. $50.00. R. Waite, Vineland, N.J.

WE have quite printing expensive catalogues. Order from this ad. Only-satisfaction B eliminator $10.00 net. Uses 22A tubes. Fifty Henry choke for eliminator $3. Transformer 110y primary 300v secondary $25. Two medium salvaged condensers 75c. Any color bakelite any thickness cut to any size $2.50 lbs. 20 cu. inches to pound. Any article in radio line 25% discount cash with order, except power tubes 10%. The Radio Club, Inc., LaForte, Ind. W.R.A.P.

POLE TRANSFORMERS, 3200/1100 x 220/110 Volt. Westinghouse-1 Kw. $35. General Electric-6 Kw. $20. Just the thing for Hi-Voltage plate supply.

FILTER CONDENSER, Hi-Voltage, and capacity, made at home at nominal cost. Full instructions with each. Write for price receipt to you upon receipt of $1.00. P. Getz, Box No. 49, South Station, Yonkers, N.Y.

TELEFUNKEN 200 WATT TUBES $30; filament 14 volts, 4 amps, plate 3000; TELEFUNKEN 90 watt tubes $16.50; filament 10 volts 2 amps, plate 1000; NEW R.C.A. VARIOUS TYPES: chopper wheel $1.50; filter reactor U P 1654, $0.50; Meters, H.W. (f-1/2) (0-5) $2.50; thermostat, 15-50, milliamps., (0-500), $0.50; 0-1500 volts, 10-000; P R 535 Thermostat, $1.50; U C 1503, 1900, 1015, condensers $0.25; also some shopworn U T 1967 Magnetic modulators, $1.50 (list $17); U P 1656 filament transformers 12-300, 1200, 2400, 4800, $0.01 each. EVERYTHING guaranteed. ARTHUR RYER, 106 Morningside Drive, New York City.

SEND 3c for "The "HAM-LIST," CURTIS-GRiffith, FORT WORTH.

AMRAD "S" TUBES, Type 4000-L $9.00 each. Immediate shipment. DEALERS SUPPLIED. George Voigt Radio Supply Co., Dept. Q, Mayfair, N. Y.

Bargains: Crystalstat panel mounting detectors, wonderful for reflex, 95c. Crystalstat Crystal mast mounted 25c. Lowcost varicoupler $1.25. Lowcost Crystalstat Receiving sets $1.25. Martin Vibropix $12.00. All Prepaid. BUCHER ELECTRIC, 1923 LYSANDER, DETROIT.

FOR SALE CHEAP—U NO HOW IT IS, OM, WANT SOMETHING ELSE. WILL SACRIFICE FOUR TUBE SUPERS 2000 MICRO H.P. TAKE ALL FOR 20 YOU GET $2.50 FOR RADIOLAS AND TUBES FORTH BUCKS. THREE TUBE GENERATIVE, KELLOGG 150 to 250 VARICOUPLER, KELLOGG VARIOMETER, HAMMAR-LUND "C" 43 PLATE VERNIER WITH TUBES FORTY SIMOLESONS, SUPER-DICON, NEW TUBE UVES, SIXTHERS COMPLETE. R.C.A. RADIO TRANS UV-1714 THREE BERRIES EACH. THORDARSON PUSH FULL TRANS, BOARD MOUNTED, SOCKETS, RHEOSTAT, SWITCH. PLUG AND JAC IN FIFTY. HENRY NACE, GILBOA, NEW YORK.

WANTED—Your attention to our "sdi" on page 55 this issue of QST. In addition to our wonderful value in personal STATIONERY we produce the following items of QST, A DIAGRAMS AND LOG SHEETS. Send for Samples and prices.

THE JACK GRAY PRESS
Stevens Specialist, Evanston, Illinois.

Hi-voltage transmitters 250 Watt 1100 Volt with center tap $11.90. All new. HDAL, Arkansas City, Kansas.

ALBRIGHT VIBROPLEX $7.50. CURTIS-GRiffith, FORT WORTH.

QSL cards—start the DX season right—supply yourself with some honest to goodness cards that will be a credit to your station. Supplies and prices cheerfully furnished. WHIT Press, 701 Walnut Ave., Scottsdale, Pennsylvania.


TEST TUBES 3/4 by 6.3c. PEppo, 1895 TAYLOR AVE., DETROIT, MICH.

GENERATORS—new-rated at 275v-120 watts, but will give output up to 500v DC $8. UC1831 variable transmitting condensers $1.50, UC1015 $2, VT1 and VT2 $3. Available also: 100, 200, 400, 500, 750, 1000, 1500, 2000, 3000, 4000, 5000, 7500 volts per hundred, 1500, 3000, 5000, 7500, 10000 volts. For 1500 volts $150; 4950 for 3000 volts. Combine with any other unit. Automo- tive, Airplane and airtight cells, without any rubber separators. 10 cents each. Many nickel wire de per foot. COMMON CHEMICALS FOR EDISON TRANSFORMERS, NEW TUBES, etc. (6 volts-1000 volts). PREPAID. ATTACH REMITTANCE TO ORDER. NORTHWESTERN RADIO LABORATORIES, 1606 Taylor Ave., DETROIT, MICH.

Genuine indoor Transformer steel cut to order $5. cents lb. 10 lbs. and over, 4 cubic inches, weight 1 lb. postage extra. Geo. Schulz, Cabinet, Mich.

Lalley Electric plate 92 volt with Willard Batteries.


EDISON ELEMENTS LARGE SIZE WITH CLAMPED CONTACTS 50 each. PREPAID. ATTACH REMITTANCE TO ORDER. RADIO TRANS UES, PERFECT CONDITION $25.00. GET PRICE LIST. WM. WOODS, 6876 W. 30TH ST., NEW YORK CITY.

THORDARSON 650 VOLT POWER-FILAMENT TRANSFORMERS FOR 5-WATTEES $6.00. CURTIS-GRiffith, Fort Worth.


HERE you can number twelve annealed enamid wire at six seventy five $ thousand or seventy five cents a hundred. All kinds receiving and transmitting supplies. Drop me a card. Edwin L. Hopp, Decker, Indiana.

PURE ALUMINUM and lead rectifier elements, drilled, brass screws and nuts, pair 1/16", 1/16", 13c. 1x 1 1/2, 15c. 1x 3 1/2, 40c each. Single half priced. Aluminum 1/16", 1c. 1/8", 3c. 1/16", 1c. Half square priced. Geo. Schulz, Cabinet, Michigan.

TEN WATTER and honeycomb coils for sale. Best offer takes them. 80UT.

SELL: Haynes Griffin Superheterodyne with tuner in case, $35.00 2; two solid-state amplifying unit $6.00; Radio Corporation potentiometer $1.50; 2 general apparatus radio frequency transformers 200-500,500-1000,5-6,000, single half priced. Aluminum 1/16", 1c. 1/8", 3c. 1/16", 1c. Lead 1/8 square square priced. Geo. Schulz, Cabinet, Michigan.

EDISON ELEMENT STORAGE "B" BATTERY PACKS IN 110 VOLT LITE. LIFETIME GUARANTEE. NO EXCEPT CHARGES REQUIRED. 100 VOLT TRANSFORMERS 12" C-UNIT WITH PERFECT 100 VOLT TYPE A UNIT, 6" x 6" x 12", 20.90 COMPLETE. YOUR TUNGER OR RECTIFIER "A" BATTERY CHARGERS CAN EASILY RECEIVE TYPE "A" BATTERY WITHOUT ANY SPECIAL
ATTACHMENT. TYPE "A" ELEMENTS WITH ELECTRICALLY WELDED CONNECTORS, 5c PER PAIR. DRILLED "A" ELEMENTS 4c PER PAIR. 3 x 4 HEAVY GLASS TUBES, 3c. 1 x 6" 4c. NO. 20 PURE NICKEL WIRE, 1c PER FT. NO. 18, 15c. SEPARATORS 1/4c. CHEMICALS FOR MAKING 5% ES. EDISON CO. LYE, 28 CENTS PER POUND. RACK FOR 8 x 6" TUBES 31.95. J. ZIED, 550 CALLOWHILL ST., PHILADELPHIA, PA.


EDGEWISE wound copper ribbon, the only really satisfactory antenna insulator, 350° wide; 3/4" diameter. 10c a turn; 4 1/2" diam., 15c a turn; 6 1/2" diameter, 16c a turn; 7 1/2" diameter, 20c a turn, prepaid. Geo. Schulz, Calumet, Michigan.

JEWELL METERS. Overstocked. All types and patterns 25% discount. Write for catalog. Suction tubes 34.00. Western Electric 518-W Speaker 325.00, slightly used. F-Z-Toon Dial 4"-1.69; 7"-1.80. Fil-Ko Restorers $1.15. Pyrex Insulators special. Liz Wire 68. Honeycomb coils 25% discount. DeJur Rheostats and Potentiometers 7c. Phoen Low-Loss high-glass products, lead-in bushings 82; stand-off 8" bronze base 90 and 8 1/2" antenna insulators 95. Storad 100 A H. 6 volt A Battery 11.00. 120 A H. 6 volt 13.00. Storad 4500 MV 10 volt for D. C. Transmitter, all Storads guaranteed 2 years. France Super-Charger 16.00, changes A and 120 volt B. Electron Tube Type 6 ammeter 21.00. Two amperes size 13,50, both charge 100 volts B. P. Fleron low-loss, high-glass porcelain sockets, both sizes 46. Number 12 enamelled copper 55 per hundred. $2.75 2-2 and $1.50 2-1 enamelled copper. Magnet wire, all sizes special price. 16-82 silk covered enamelled loop wire .95. New York Coll mica fixed condensers, all sizes 25¢ discount. Bakelite sockets 65. Connect with Telephone & Electric Products, highest quality. 5 to 1 transformers, completely shielded, not affected by salt air or moisture. 3.00. Triple Range, low-loss, straight line condensers, 11-23 and 43 plate combined, 2.15. Push-pull battery switches .35. Six amper Reclton Charger Bulbs 6.40, two amper type 8.20. Amphenan transformers 5.25. Enamelled low-loss, silver-plated, straight line condensers, 11 plate 2.63, 15 plate 2.82, 23 plate 3.00, other sizes. Discounts to dealers and amateurs only. No orders less than $5.00 shipped. Two dollars with each order to guarantee transportation charges: balance C. O. D. Celeron bakelite panels, tubing and rods. All sizes and specials. Cut, drilled and engraved if necessary. 25% discount. All merchandise fully guaranteed. Established since 1915. Roy C. Stage, Wholesale Radio, 202 Burt St., Syracuse N.Y.

FOR HAMS:—Irrving Vermilya, at Mattapoisett, Mass., has the following material on hand for sale. Prices are F. O. B. Mattapoisett. Float coils new at $2.00 each. 1 Motor Generator set 500 watts 1500 volts Essex Machine. Motor 110 volts 60 cycles single phase or 220 volts 60 cycles, $125.00. Four 50 watt sockets 40 $1.00 each. 18 volt 100 watt 15 1/2" Westinghouse tandem ammeter and 100 ampere ammeter, $90.00. 1 R. C. A. Transformer filament and plate good for four fifties 67.50. Irving Vermilya, Mattapoisett, Mass.

Q R A SECTION

50¢ straight, with copy in following form only: CALL—NAME—ADDRESS. Any other form takes regular HAM-AD rates.

1AAO—H. H. Cooley, 460 Ward Street, Newton Centre, Massachusetts.

1ALP—Frank L. Baker, Jr., 30 Minot St., Neponset, Massachusetts.

3HP—George E. Stewart, 220 Collins Ave., Baltimore, Maryland.

5HE—G. N. Wittine, 300 Kennedy Ave., Alamo Heights, San Antonio, Texas.

6ACD—Hugh Avery, Jr., 333 East 16th Street, Oakland, California.

6HAP—St. Clair Adams, 409 Harris St., Eureka, California.

9AI—P. S. Pfeifer, 4887 Fulton St., Chicago, Illinois.

9ARA—Robert E. Henry, 307 West Pine St., Butler, Missouri.

9CFO—Theodore Lange, 914 North Division Street, Appleton, Wisconsin.

9CN—A. C. Agarim, 2289 N. Kezdie Blvd., Chicago, Illinois.

9CNB—E. L. Fletcher, 1802 Irving Pk., Chicago, Illinois.

1HRG—Radioformule, Via Maino 3, Milano, Italy.

N-PBS—H. A. Verine, Gerard Schep Straat & Amsterdam, Holland, ex-N-OLL.

HAVE YOU BOUGHT YOUR A.R.R.L. AUTOMOBILE EMBLEM YET, OM? SEE DISPLAY AD IN THIS ISSUE PAGE 72.

For Amateurs! this 1000 cycle audio

Here is a new transformer built especially for the amateur. Often it is desired to heterodyne all signals to one frequency and then amplify them. The Era 1000 cycle n shield will do this with 5 advantages.

1. Only one frequency is amplified appracisely. Any static discharges occurring at any frequency except approximately 1000 cycles are not amplified.

2. Harmonics from broadcasting stations picked up by the amateur's short wave set are amplified only at one frequency, causing suppression of this interference.

3. Enables differentiation between heat notes of different frequencies by audio tuning effect.

If you want this remarkable new invention send $6.50 apiece and transformers will be shipped at once.

Electrical Research Laboratories, Dept. 29
2500 Cottage Grove Ave., Chicago, Ill.

Note: This instrument is unsuited for broadcast reception.
There are many improvements in the new Prest-O-Lite Battery

In this new battery you'll find all the good points and high quality that have made Prest-O-Lite an unfailing aid to better radio. And in addition there are many important refinements and improvements that make it the most attractive, most convenient battery you can buy.

This new battery has a beautiful stippled finish hard rubber case that blends with any furnishings. The case is molded in one piece, giving sturdy, leak-proof strength.

To make the battery convenient to carry, the handle has been given a comfortable rubber grip.

The oversize terminal nuts on the binding posts are easy to turn and ensure perfect contacts.

Novel rubber insulators completely cover the tops and sides of the cell connectors, preserving the original fine finished appearance at all times and giving protection against accidental short circuits.

No effort has been spared to make this a battery you will be proud to own. Yet, like the rest of the Prest-O-Lite line, it is priced to offer you the biggest value of the day. Ask your dealer to show you this battery and the Prest-O-Lite Chart that helps you select the right battery for your set. Or write Indianapolis for a copy of our interesting handbook on radio storage batteries and how to charge them.

THE PREST-O-LITE CO., INC.
INDIANAPOLIS, IND.
New York San Francisco
In Canada: Prest-O-Lite Company of Canada, Ltd., Toronto, Ont.
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ALWAYS MENTION QST WHEN WRITING TO ADVERTISERS
The Synchrophase now has One, Two or Three-dial Control

The three condensers operate from one dial—or separately at will. This first real, flexible form of "unit-control" marks another milestone on the road of Grebe leadership.

The new Synchrophase has the same Binocular Coils which give that unusual "selective sensitivity" so universally prized; the same Straight-Line-Frequency Condensers that make accurate tuning easy.

Ask your dealer to demonstrate; then compare.

A. H. Grebe & Co., Inc., Van Wyck Blvd., Richmond Hill, N. Y.
New York Office: Steinway Hall, 109 West 37th Street
Western Branch: 441 So. San Pedro Street, Los Angeles, Cal.

This combination of two famous stations WAIB and WBOO also mobile and marine low wave rebroadcasting stations.

Says Grebe apparatus is covered by patents granted and pending.

Synchrophase is also supplied with base for batteries.

SAV YOU SAW IT IN QST—IT IDENTIFIES YOU AND HELPS QST
Use

Allen-Bradley Perfect Radio Devices for maximum selectivity and noiseless control

1 — Bradleystat — Noiseless Rheostat for ALL radio tubes.
2 — Bradleyswitch — Compact Switch for receiving sets.
3 — Bradleydenser — Low Loss Condenser for sharp tuning.
4 — Bradleyometer — Perfect Potentiometer for all circuits.
5 — Bradleyohm — Adjustable Resistor of every application.
6 — Bradleyleak — Adjustable Grid Leak for highest efficiency.
7 — Bradleyunit — Fixed Resistor for Resistance Amplifiers.
8 — Bradleynier — Vernier Knob, easily attached to any set.

ALLEN-BRADLEY CO., 277
Greenfield Ave., Milwaukee, Wis.

Please send me your latest literature on the complete Allen-Bradley line of Radio Devices.

Name........................................
Address......................................
It's a genuine UV-201-A only when it bears the name Radiotron and the RCA mark.

WD-11, WD-12, UV-199, UV-200, and UV-201-A are the type names of Radiotrons. They belong to Radiotrons only. To be sure you are buying the genuine, look for the name Radiotron and the RCA mark on the base. Then you are sure of quality.

Radio Corporation of America
Chicago    New York    San Francisco

Radiotron
AN RCA PRODUCT
Use the Service Message!

A service message is a message sent one station to another station relating to the "service" which we are able to give in message handling, and it may relate to non-deliveries, delayed transmission, or to any phase of message-handling activity. Because there is still some confusion about our A.R.R.L. message form we are explaining "service" which we are able to give in message handling, and it may relate to non-deliveries, delayed transmission, or to any phase of message-handling activity. Be sure there is still some confusion about our A.R.R.L. message form, and illustrating the proper message form and illustrating a service message at the same time.

"HR SVC FM MIAMI FLA 4FM NR 86 AUG 8 (CK TEXT 15)"

To HDQ RDO STN 1MK
1711 PARK ST.,
HARTFORD, CONN.
UNABLE FWD YR NR 202 TO PLEASE SO-AFRICA
SIG HANDY ROUTE STILL UNOPENED
(SIG) WATTS 4PM"

If you receive a message with an insufficient address for delivery, the proper procedure to follow is to try the telephone book and the city directory. If no address can be found, a service message should be written and sent to the station of origin asking for a better address. While it is seldom proper to abbreviate words in the text of regular messages, it is quite desirable and correct to use abbreviations in these station-to-station messages, relating to traffic handling work. The prefix "svc" in the place of usual "msg" shows the class of the message and indicates at once that a station to station message is coming through. Service messages should be handled with the same care and speed that is given other messages. A service message counts as a message originated when traffic figures are reported. Please make use of the "service" message.

All Official Relay Stations are urged to make and keep schedules as suggested by 6FS in his article, "The Five Point System". Send a list of your "five-pointer" to your ADM with the report every month so that we can make up network maps for the whole country for these pages. With maps available better routing will be possible. A few letters will fix some schedules. Don't forget that when you make schedules they must be kept consistently. Originate your share of messages to make the schedules useful and to keep things humming generally.

Contact With the MacMillan Expedition

WITH the signals from these two stations being reported from all over the United States, Mexico, Canada, England, France, and Holland, and with 20 meter daylight work to the United States a matter of record, reliable communication with the MacMillan Expedition seems assured.

Extremely satisfactory two-way work between this country and the expedition has been maintained ever since the ships left Wiscasset. Hundreds of words of press, official messages to and from the Navy Department and the National Geographic Society, and many personal messages to members of the crew have been handled.

One very interesting fact has already been observed; that is, on the 37-meter wavelength the expedition continues to be heard on the Eastern Coast of the United States even while the ships are at Etah, Greenland, the northern base. It will be remembered that on the previous wavelengths the 20 meter signals passed out of the picture completely for East Coast amateurs as soon as the Bowdoin passed the southern tip of Greenland, and the contact was mainly with West Coast stations after arrival at the base in the North.

During the first part of this year's voyage, both ships used a 37-meter wavelength exclusively. This wavelength was most suited to communication with the United States each night and the difficulties of operating on very short wavelengths due to the motion of the ship were overcome by using this wavelength. Some troubles with a poor note and badly swinging signals were remedied. HDQ handled the bulk of the traffic during the trip North. In the past month 140 messages were handled by this station to or from the MacMillan expedition. Many of them were coded by the Navy Department; some of them contained hundreds of words in the check; but by consistent hard work the traffic that arrived at his station was cleared promptly and accurately every night.

On August 2 the Bowdoin had arrived at Etah.
Last reports from the expedition indicate that WAP will continue to use a 31-meter wavelength, while WNP will concentrate on 19 meters, with a transmitting schedule planned from 3:00 p.m. to 7:00 p.m. EST, daily. All amateurs are urged to listen on both 37 and 97 meters for the PEARL and the BOWDOIN, and to do everything possible to insure reliable communication with the expedition and the United States.

All messages from the expedition should be mailed promptly, forwarded by radio, and telegraphed to the National Geographic Society or to the Navy Department when it is requested in the message. Amateur stations are warned to observe strict secrecy of messages in paragraph nineteen of the U. S. Radio Laws and Regulations.

20 Meter Log of WNP (by amateur radio via 9CXX) to April 2:

Logs of WAP and WNP

(Not complete; only those stations reporting to Headquarters are included, as no log had been received from Reinartz at the time this article went to press.)

Worked

By WAP: Iabp, Iaoe, Iaep, Iaseo, Iare, 1bre, Ihgr, Iatm, Ibdw, 1xu, 2bgl, 8bhe, 3dw, 4asr, 5tv, 8agm, Seq, 8ks, 8bkr, 9cap, 9xu, nkt, nsk.

By WNP: 1aao, 1ckp, clar, 1exm, 1ef, Iygr, Iade, 1aqo, g2ef, 32gw, 83tu, 1af, 4ac, a "3" in Seattle, 8ci, 8cfr, 8exm, 9bfr, 9bdf, 9cex (16m), nOBA, nkt.

Stations Reporting Reception to HQ

WNP: clam, 1aao, 1xu, 1tv, 2ch, 82gw, 8iw, 6bbr, 4ja, 6cky, 6bbr, 8aj, 8cvi, 9dhh, 9mm, 9flc, 9flm.

WAP: clam, 1aao, 1xu, 1tv, 2ch, 82gw, 8iw, 6bbr, 8aj, 8bbr, 8by, 9dve, 9ct, Dr. D. Woodward, Hartford, Conn.; Karl Klaudsen, Brooklyn, N. Y.; and Alexis Lavassor and Louis Carrot, Melun, France.

THE TRAFFIC TROPHY

Back numbers of QST contain complete information about the Traffic Department Trophy. When you have over 100 messages in a month be sure to turn in to your local Traffic Officials who will forward them along to the Division Manager. Division Managers will send bundles of messages to Headquarters each month and one man at Headquarters will count the messages and make up a "Brass Pounders' League" each month after which the message file will be returned to the origin station. Only messages containing the CITY and STATION of origin, a SUFFICIENT ADDRESS to insure delivery, the TEXT, and that the QSO's are U.S. citizens will be included. There is no restriction as to number of QSO's, but the inclusion of a date speeds up the message and the number makes it possible to tabulate the messages. The fundamental parts of a message shall determine whether or not it is counted. All messages must be handled in 48 hours or less. If there is any doubt about your messages, send them in and get the credit that is due you.

HELP IMPROVE OUR OPERATING

Official Relay Stations are requested to send in lists of calls of off-wave-length stations, of QG hounds, of stations using improper message forms and of those sending excessively long calls without signing their own station call. These lists are to help us in making amateur radio so well supervised that we are justified in complaining to the Department of Commerce about interference to our service from certain commercial stations. We regard more than five (5) CQ signals without a station call as "abuse of CQ" and we regard more than ten (10) calls for a station without signing as "long calls without signing." Carefully observe the new rules for Official Relay Stations mentioned in August QST and you need not worry about being criticized.

OFFICIAL BROADCASTING STATIONS

The League maintains a broadcasting service which is changed in some respects from time to time. Certain stations are cancelled for failure to keep schedules and additions are made as they become necessary. Beginning September 12 new broadcasting schedules will be in effect. The latest news and schedules are made into a broadcast which is sent each operator of an Official Broadcasting Station to send on such wavelengths and days as he can conveniently be at his station. This service will soon be complete and when some additional stations have been appointed it will be possible for many of your QSL's to be hand delivered by the gang in hand: to look at a list of the Official Broadcasting Stations, and to find who is sending on that particular day; to note the time and wavelength to listen for; to plug the proper coil in the standard plug-in coil receiver, and to get the latest information from A. R. R. L. Headquarters.

Below are listed the present active stations that gave us the information we requested in time for this number of QST. New appointment certificates are being sent them. If a large number of additional appointments come to hand before QST goes to press, we will include a more complete list. Stations not listed below who have been broadcasting under the old system will be dropped unless they wish to continue and unless they send us information to insert in the different columns of a table like that given below:

Every station listed is expected to broadcast on scheduled time and wavelength. The wavelengths are listed so that you will know just where to listen. The schedule for the 19-meter wavelength is scheduled for 60 minutes.

QST FOR SEPTEMBER, 1936

2PF has a good suggestion for the old-timers. Why not print, "Station Established 1918" or whatever year you started in the game, on your station card and let the gang know about it. Another suggestion is that we would like to acknowledge every postal you receive. It is a little matter of courtesy to be sure, but it will pay big returns in creating friendly feelings toward you. AICG was responsible for this one.
TRAFFIC BRIEFS

Lieut. Hayden P. Roberts, pl 1HR, writes us that there are 25 licensed amateurs in and about Manila and he expects to form an organization of those whose interest is in amateur two-way telegraphy. We expect that those following will be instrumental in handling traffic to South Africa, as they are somewhat nearer that country than they are to San Francisco, regularly in contact with many West Coast amateurs. Undoubtedly these stations will be active in handling some high-speed around-the-world relays this fall and winter because of their favorable location.

Lieut. Roberts requests that we call your attention to the proper use of the finish signals and the identification interchanges. It is requested that as many as possible send in calls, some of which looked rather familiar, but which could not be used as they had no identifying interchanges of the proper kind. If any of your friends or relatives in the Philippines, pl 1HR will gladly forward traffic and guarantee deliveries.

He also says, "If any of these birds think I am going to sit here in the heat listening to unnecessary calling in a half hour each day to enable the experimenters to carry on their receiving work to best advantage. Information from League Headquarters will be sent weekly for the benefit of the members and every member keeps his transmitter silent so that all can successfully receive the broadcasts. We should like to establish a regular route for traffic handling work with South Africa through our own or South American stations. Perhaps the best or inferior practice is handled by some in each Division. We are sure that plenty of work while traffic will appear if some international routes are opened and run by such methods. Those who are interested can have two votes. The other vote is to be given some "DX" station. All votes are to be sent by radio to Divisional or National Headquarters. The messages must include the reason for the popularity of the stations for which you vote. If you like this suggestion and want us to set a time for the "popularity relay" drop us a postal or send a radiogram to 1ME, 1711 Park St., Hartford, Conn."

Active Montana amateurs have a chance to get QST free for a whole year. Beginning this month A.D.M. Wilson is offering the owner of the station in his territory who submits the most useful messages and best operating practices, a whole year's subscription to QST. If you did not read the rules that would be followed in awarding the monthly subscription as they were announced in "Montana Ham Hocks" you should read Wilson at once. We understand that another prize will be announced later for the station that maintains the best operating practices for the entire season which begins this month. One can derive a lot of satisfaction from being a good operator and from general recognition of one's efforts. With this additional incentive we expect to see some keen competition among the Montana operators.

Our good friend, g2KF, writes that he should again call to your attention the fact that English stations are not allowed to handle any traffic of a private nature. Any messages for QSR to continental stations or any traffic relating to experimental work with English stations will be refused. Any messages to private addresses cannot on any account be handled without the proper station licenses to cancellation. Partridge recently took the lead in writing to the National Geographical Society from WNP, asking them to use 2BHK for forwarding to Washington. He is operating on 44 meters early every Sunday morning. g2RW operates early evenings on 44 meters.

Here is a new "Q" signal, suggested by 1JR, that will be a timesaver in these days of out-date call books:

QRAF?—Is your call-book address correct?
QRAF?—My call-book address is correct.

1PD is interested in picture-broadcasting. He suggests that the men have all of the telephone machines get together and run some preliminary tests. It will be mighty interesting to receive a nice fresh occupational cartoon and message on one of the machines at a certain time each week. Write Mr. Hubbard if you are interested and we will see what can be arranged.

s2H, 8AND, 3BZV, and 9EJ recently demonstrated the usefulness of amateur radio to Chief of Police Cole of Flint, Michigan. When he attended a convention in Indiana, he requested the head office for the activities of his department in Flint during the entire time of his absence by using the services volunteered by members of the A.R.K. Assistant Division Manager Angus of Indiana helped in arranging the first tests that preceded the actual traffic handling work.

SCPE suggests that we have a popularity contest to decide which stations in each Division are most popular. Each station voting can have two votes. One vote is to be given some amateur in your Division. The other vote is to be given some "DX" station. All votes are to be sent by radio to Divisional or National Headquarters. The messages must include the reason for the popularity of the stations for which you vote. If you like this suggestion and want want us to set a time for the "popularity relay" drop us a postal or send a radiogram to 1ME, 1711 Park St., Hartford, Conn.

For some time after the Santa Barbara earthquake 6AV-601 kept a nightly schedule with 6G2 and M5Y at San Diego, but the broadcast was not regularly handled. 500 word press messages were sent and the stricken district was kept in touch with the rest of the world. The United States and British Marines at Santa Barbara were in daily touch with their base at San Diego.

In less than half an hour after the news of the disaster reached Oakland, California, City Manager Upson had five of his Official Relay Stations standing by for message traffic to Los Angeles. Two stations, Los Angeles, had been given the key end of the work. 6CCT, 6CMG, 6BZV, 6CAK, 6ALX and 6CMG remained at their keys from 10 a.m. of June 29th until 8:30 a.m. the following morning. They are all to be commended for their share in the work.

The West Coast fellows are certainly doing their share in making amateur radio of service to the public. 6RU-6AP got the final reports of the yacht race direct from the Italia, KFIV, on its arrival at Baltimore, Md.

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realized when calling unless the transmitting operator sends the letters "OK in" or "check me" as trigger intervals during his call pausing for a moment thereafter and listening for the reply from the station being called. If the station being called does not reply, the call can be continued. If the station called answers someone else he can be heard and the call broken off until he has finished his business and is again listening and there is a good chance of his hearing the call.

Two stations can use the system to mutual advantage. When stations are being called, if the QRM comes in or if a word is missed because of swamping signals, a few taps of the key will set things right. Always keep the QRM out of the picture whenever whatever was the last word received correctly will save time and unnecessary transmission. If the trouble lasts longer the other station calls back and takes traffic until local reception is improved. Because of its many advantages and general value we urge the immediate use of a "break-in" by every reader of these pages who operates a transmitter. Let's get back to that snappy, clean-out operating that makes it a pleasure to own a short wave receiver and transmitter.

VIGILANCE COMMITTEE

We have wanted to devote some space to the activities of Vigilance Committees, but few reports have been received, and we can print only the information that comes to hand. Most of the Vigilance Committees have found work of little or no significance during the summer. Although primarily organized to correct amateur interference problems, the work has been so light that many of the committees have taken on the work of hunting down other types of interference that came to their attention. From the report summaries that are sent to Headquarters each month on each case of interference investigated, it is evident that less than three percent of the complaints that are received are found to be caused by amateur telegraphers.

The Vigilance Committee at Oakland, California, was most active during the past month. About 200 complaints were investigated, but five of the complaints were traced to amateurs. Improperly operated broadcast receivers and power leaks were found to be giving the broad cast listener most trouble. Two cases of amateur interference were corrected to the satisfaction of both amateur and broadcast listener. The Oakland Vigilance Committee conducts a question and answer forum as a side line and everyone in Oakland makes good use of it. The chairman of the program committee is requested to report to the Assistant Division Manager of his territory each month so that the ideas of each committee can be made as effective as possible in improving our Vigilance Committee service.

The first active Vigilance Committee in the country was formed at Schenectady, New York, where the complaints of amateur interference have been severe and numerous. Immediately the committee advertised its purpose in the papers, complaints to newspapers, to the General Electric Company, and to the amateur clubs of the region. The inference made is that the chronic kickers did not care to have an unbiased committee investigate their complaints because they had been made uninvitingly. On the other hand, they had been getting the blame from power leaks and "bloopers" were left in peace. The broadcast listeners who had been using the commercial non-selective types of receivers still market certain manufacturers' got "cold feet" because they knew that their own apparatus was not blameless. A meeting of the stations who were being complained about was called, and complaints that were received and adjusted the amateur troubles to the satisfaction of all concerned. A. D. M. Raush suggested a get-together meeting through their D.S. or C.M.'s in the future and cancelations will be made if stations on the active list are not reporting. Stations who have reported, but fail to find mention of it in this report, should trace their report through their D.S. or C.M. and see what happened to it. There are over 15 active O.R.S. in Philadelphia, under the jurisdiction of three City Managers, or certainly several reports should report. A. D. M. Raush suggests a get-together meeting of Philadelphia stations and traffic officials. Something should be done about those reports and renewed interest in this particular locality.

DISTRICT OF COLUMBIA—Most of the real "ham" activity is by non-selective types of receivers still marketed by several manufacturers. The Western New York report failed to come through. Traffic is surprisingly good for mid-summer. A good list of stations has been made, and the Traffic Manager of the Western New York report has been received through the entire division. The 150-200 meter band is practically deserted, most of the stations being on the 40 and 80 wavelength. Work in selecting and appointing Official Broadcasting Stations has been slow, as it is necessary that they be carefully selected. Attention is here called to many stations in Philadelphia and parts of Eastern Penna., who have placed themselves in the list, but failed to report. Investigations of this neglect are to be made through the D.S. and C.M.'s in the future and cancelations will be made if stations on the active list are not reporting. Stations who have reported, but fail to meet the requirements specified by the organization have been eliminated from the list, but will be invited to reapply when the requirements have been met. A.D.M. Raush suggests a get-together meeting of Philadelphia stations and traffic officials. Something should be done about those reports and renewed interest in this particular locality.

DIVISIONAL REPORTS

ATLANTIC DIVISION

E. B. Duvall, Mgr.

IT seems that each month something happens to the Division back in the rear. While Western Penna. has come up to the top with a good report showing that renewed interest has been shown by working over the interest in the idea and helping the A. D. M., the Western New York report failed to come through. Traffic is surprisingly good for mid-summer. A good list of stations has been made, and the Traffic Manager of the Western New York report has been received through the entire division. The 150-200 meter band is practically deserted, most of the stations being on the 40 and 80 wavelength. Work in selecting and appointing Official Broadcasting Stations has been slow, as it is necessary that they be carefully selected. Attention is here called to many stations in Philadelphia and parts of Eastern Penna., who have placed themselves in the list, but failed to report. Investigations of this neglect are to be made through the D.S. and C.M.'s in the future and cancelations will be made if stations on the active list are not reporting. Stations who have reported, but fail to meet the requirements specified by the organization have been eliminated from the list, but will be invited to reapply when the requirements have been met.
MARYLAND—Jordan and Oufft of 2HR have sent in a time report from NVE, the U.S. Coast. With very limited apparatus they threw together a 40-meter country for the Washington operation. 500 miles from Balboa, they worked NKF and several eastern stations, among them 3HG. The results on short waves is supposed to develop the Executive Office. They are installed in the basement office and has been increased to 100 watts. "DX" worked so far: Japan, Somua, Argentina, Hawaii, Taiwan, Alaska, Pago Pago, United States and New Zealand. N.R.R.L. and N.F.W.A. in Washington and the bargain he swam married. He used his drain of validity through the year. The J.D.M. will appreciate that activities are on the increase for letter station. This is backed on the list after his vacation. A.T.A. will be especially interested in this District's activities every month. This District's activities every month. This District's efforts from all D.S. and C.M.'s in the future.

TRADE—This state seems to be dead as far as radio activities are concerned. SAE is being the only active station. 3WJ, a new O.R.S., has come to men. 2WB has been working 35 meters with 500 cycle plate supply. Barkley of 381's reports he will have his two 5-watters perking before long, at his new QRA, which is about five miles from Wilmington. A gas engine will be used as the McG set.

3BSL lost his 70 ft. mast in a recent storm, but will replace with a new one immediately. 3BSL is sending logs in Delaware that has been successful in transatlantic "DX," and his sigs have been QSO in nearly every county.

SOUTHERN NEW JERSEY—Everything seems to be heading along as usual throughout this section. 38TRQ is the star traffic man this month. 2SBM and 3SK are in line for O.R.S. appointment certificates. 39CM is on 30 meters. 3SK is an old 8th Dist. "ham," and a real A.R.R.L. man. 3BRM is the most active station in Trenton this month, having handled good traffic. He is on the 80 meter band with a good QSR at last. 32E has been working to improve his 40 meter transmission. 3BEF has tried to get down to 80 meters, but not very successful. 3ZI has been overheard to say he would like to call stations that are generating a new "junior" cap, but is keeping right on the job with his D.S. duties. 3GH is showing a great deal of interest in short wave work. His latest addition is a 40 meter "jigger" antenna. 3XAN will have a 50-watter this fall.

There were no interference reports from B.C.L.'s this month, so consequently no report from the committee.

Rasier seems to be the only D.S. giving a detailed report. 3DHQ is working 120 watts but is having trouble with the 5th and 6th indications and there is no good deal of activity there. The A.D.M. will appreciate a little more interest in 3DHQ. 3BWM seems to have neglected or forgotten to report this month. The 9th N. J. District should have some activity. The A.D.M. will also be glad to hear from 3BWM at this time of the year. 3BWM is used for a man in that territory (Sussex, Morris and Warren Counties) to handle the work of reporting this District every month.

TRAFFIC—38EI, 5; 38WR, 4; 38MO, 5; 38AY, 10; 38WJ, 32; 38QY, 4; 38TQ, 32; 38SK, 7; 38XAN, 1; 38RM, 8; 38RE, 4; 38GBX, 3.

EASTERN PENN.—Reports for this month show that short waves are for better of equipment. 38NU has been "QSO with BER on 40 meters. 9C7Z is back from Bermuda and will work on 40 and 80 meters. 38BAQ, 38CN and 38TP were all successful on 80 meters. 38QO was heard on Pacific waters while using a "river." 38A1/S tower blew down, the airplane he was to equip was smashed and 38LK was on a portable call while on his vacation. 38LW reports having N.R.R.L., Australians and New Zealanders. 38CT is on the air after his vacation. 38AVM reports hearing and working all stations nightly. 38CT is back on the air after his vacation. 38AVM reports hearing and working all stations nightly. 38U$ has a new 5-watt perking.
pure DC notes on short waves. SZE worked NZ, Aus., Mexico, and P. R. consistently, and was reported by OA-4M in Johannesburg, South Africa. SBE with an input of 70 watts into a 203-A worked NZ, WA, and Z-150 and on 20X while doing a job for the Honolulu. SBR is rebuilding for 75 and 40 meters. SAGS went to the convention but had lots of trouble with tires getting there.

Dist. No. 3: Most of the ORS in this district are shut down for the summer, but none have reached the brass pounders league. Reports this month, however, show that the boys are at last getting it in their act. (Keep your gang and make the idea grow, DS) We are certainly sorry to learn that the old timer, SAVT is leaving the game. We will be well pleased when he comes back. STH and SGL are on a trip to Columbus, Ohio and visited stations 8DEM, 8BYN, and SKE. SKEB and 8WKB are back on the air, having been out fishing while leaving the lakes. The young squirt, 8BO, has pulled down a white ticket. SBF, as far as we know, the first Clevelandian to work 8BDR, has taken up the hobby with one "Gifty" on an antenna 17 feet above the ground. SAYO worked WNP a couple of times, taking a 300 word message.

SBEK is back on the job after a short stay in Chicago where he built and operated 9AYT. SADA is pounding brass at 8UK this summer. He has had 8KY, 8KCI, and 8AI as visitors at the station.

Dist. No. 4: Any amateurs who came through Cincinnati and desire information regarding the club rooms of the Union Central Radio Association, or any information regarding the amateurs, will find Mr. Walter Winall, chief electrician of Union Central Building, who is there at all times and can give any information desired by the visitors. The association station is located on the 32nd floor and visitors are welcome.

Dist. No. 5: S8E has not much time to operate. S8Z worked Zellers 59 times in 3 weeks, but says that he is pounding brass at 8SK this summer. He has had 8KG, 8HJ, and 8DD as visitors at the station.

Traffic: S8Z, 185; SBYN, 146; 8B1, 106; SBEK, 98; S8VA, 90; SBY, 44; 8BTV, 39; 8DPP, 28; 8KD, 26; S8E, 22; 8BV, 19; 8BKR, 18; 8DMP, 15; 8MN, 14; 8S2S, 9; 8AV, 6; 8AOE, 6; 8PFW, 5; 8FB, 4; 8UK, 3; 8AV, 2; 8ARR, 2; 8SBEK, 2; 8ZSK, 2; 8SK, 2; 8AFP, 1.

INDIANA—Dist. No. 2; 3DNA is not doing much, says it's too hot, and fishing is good. He is trying to contact 3DNA and 2AI is finally going again away from his old job in the South. 9ORQ, 9DDT is on 80 but is going to try 40. 8DDT tried to get down to 20 and 40, but was no luck. 8DDL, suggests having a phone for traffic. 8EM has been away since May 4th traveling with a radio show station WKBG. South Bend has a new City Manager, James Freer- muth of 2111 Liberty Ave. South Bend, 8AYR. Three of the locals 89G, 9CCF and 8BBJ went over to the Indianapolis Convention and brought back a flock of prizes. They hope to have the Convention at South Bend next year. 9AXS is a newcomer at South Bend. 9AML is doing fine work with a "liver" on 80. 9DDZ and 9AOL are affiliated with the YL-UTIS. 9A0Q is married, but will be on soon with a 50. DMC dropped his receiver and broke it. 90G works Melbourne, Australia. 9BDJ handles most of the traffic through South Bend. 9ARD is working in a radio store and will be on the air in fall with two "Gifties". 9CU// starts middle class at Playland Park. South Bend station for a ham. 9CP is working only on 20 now.

Dist. No. 3: 9CKH reports traffic slower than usual, which has tried 40 meters and seems to get out well. 9BSC is doing a good job. He is getting along 20, 40 and 80. Amateur radio is getting a great deal of publicity in Evansville. 9BFR will keep his spark up to the maximum as possible even though a new position has taken one of the operators from the station.

Dist. No. 4: 9EJ held up part of a schedule with 8ZH on the police chiefs convention. He also found out that 9BZV rebuilt their set and has changed to a sync after blowing a generator. 8BJL is in New Zealand. 8JT is rebuilding for 40 meters and able to handle the schedule with 8ZH on the police chiefs convention. 8AXK has a new "Gifty" on 40 meters, 9DLT is using two 201's with a new m.g. 9CFJ is reaching the west coast on 40 meters. Most of the Indianapolis gang were too busy with the convention to handle much traffic. This convention went over with a bang. Hams from seven states and four districts gathered at Indianapolis for a big time, and they had it. 8EIS is in his 30 watter down to 20 meters. He still has a "liver" for 40 meters.

Traffic: 9CLO, 50; 9BRI, 42; 9ES, 21; 9EJF, 21; 9AQU, 23; 9DXT, 22; 9BYZ, 17; 9BO, 17; 9ADM, 14; 9RPT, 8; 9DEJ, 7; 9AIY, 5; 9GJ, 4; 9BFL, 4; 9DY, 4; 9BLY, 3; 9CCL, 5; 9ASK, 5.

MICHIGAN—Dist. No. 1: The message total is higher this month, due to 9FOO. 9CMD is rebuilding for 75 and 40 meters. Z-ZAC, Z-LAO, A-2TM, and KFUH while flopped by OA-4M in Johannesburg, South Africa, August, with the lingers getting there.

AGS went to the convention but had lots of trouble leaving the game. DS) We are eager the hams pounding brass at 8UK this summer. He has had KRY, T-AUA, and 2BKJ as visitors at the station. Traffic: BGZ, 17; 8BYN, 146; BBI, 106; 8BFO, 96; SBEK, 85; 8UK, 53; 8AV, 40; 8AOE, 30; 8PFW, 20; 8FB, 15; 8UK, 5; 8ARR, 4; 8SBEK, 3; 8ZSK, 3; 8SK, 2; 8AFP, 1.

Traffic: 9CLO, 105; 9AOE, 95; 9BVI, 95; 9EF, 85; 9BRL, 85; 9BWF, 85; 9AE, 85; 9BHO, 85; 9AOL, 85.
**Dakota Division**

Don C. Wallace, Mgr.

The Dakota Division is to be favored with a trip from NERK, the Shenandoah. At the present writing it is believed that the Shenandoah will leave the Twin Cities about the first of September, and will plan on having communication with amateurs in the Dakota Division, and especially those of the cities, during the entire trip and during the landing in the twin cities.

The communication received from Radio Officer, W.W., Armour of the Naval Air station, Lakehurst, New Jersey, is that they are planning on it, having the twin cities for the summer. AOG handlps traffic on schedule and will plan unhampering communication with all stations. 9ACF is busy with traffic throughout the entire trip and during the landing in the twin cities, during the entire trip and during the landing in the twin cities.

A special telephone line has been run direct from the landing field to 9XI, with provision to have this line and others over to other stations should it become necessary. 9XI will then handle the bulk of the communication, maintaining a twenty-four hour watch. Complete records are kept for communicating with operators on the board the Shenandoah that we are very much alive and on the job in this division.

At the present writing, six car loads of "hams" are planning on leaving the twin cities for the Chicago convention.

Assistant Division Manager Barker (USNRF) is taking a trip on the U.S.S. Paducah on the Great Lakes during August. 9AMD (USNRF) has a home set in operation on the Paducah, using a wavelength of 40 meters. This station will be in operation throughout the balance of the summer.

**North Dakota**—Dist. No. 2: 9EPF is on the job again after a few months' vacation, but reports no traffic handled. He also reports that he is intending to start a code class to give some of the beginners practice. 9NRX-9DFB and 9CRB are the new R.S. in this district. 9CRB expects to install a "fifty" this winter.

**South Dakota**—With the epidemic of rebuilding now in full force South Dakota should have some real activity on the air for this reason.

Dist. No. 1: 9DVX dropped to 41 meters and is on every evening. Nick Hansen, ex-A.D.M., is building a combined home and ham station in Sioux Falls. Not getting fine DX with a truck on a bridge gage.

Dist. No. 2: 9KRX is rebuilding. 9BKW has been working DX on 40 meters, even through strong lightning storms. They are experimenting with television. 9DZI is rebuilding and off the air, as also is 9AGL. 9MR reports too much work around the ranch. 9DBZ has his usual good traffic total. 9DID may move back into town with the w.n.s. short waves and getting good results. 9CBF is busy selling cars for the homestead and got his two towers but had to go to work before he got it raised.

Traffic: 9BKW, 29; 9VZ, 8; 9EH, 7; 9AEO, 4; 9BQK, 3; 9ARR, 1; 9NR, 1.

**Minnesota**—Things seem to be progressing fairly well considering the season, although activities that were dying off somewhat. Guess the fellows are either rebuilding their stations or else the YLs are after them. A lot of the fellows are just getting straightened out after the several destructive winds that have visited our State.

Dist. No. 1: Our new D.S. is Al Palya, 9CDV. His fist is well known on the air, and with the full cooperation of the O.R.S., he will do wonders with his District. Let 9CDV work on the gang. 9EXY, C.M. of Virginia, is getting his city organized again. He reports trouble with the low waves, 9EGF still cannot decide his location but keeps on by a "kicker." 9DKR on 700 K. and 230 K. turns on a C.V. works with the 850 M.b. 9CWM is FB with traffic. 9CMS is at his usual summer rebuilding. 9AYG will be off the scene to attend to new generator. 9RUR is a power house but had to go to work before he got it raised.

Traffic: 9BKW, 29; 9VZ, 8; 9EH, 7; 9AEO, 4; 9BQK, 3; 9ARR, 1; 9NR, 1.

**Arkansas**—5-SN will be on shortly, 5-ANN lost his mast, but connected transmitter to loop and went right ahead. 5-ABI and 5-HN lost their licenses when the RI visited them. 5-QI only on a while. 5-AW is on the air.

**Louisiana**—The New ADM makes his first report and we are glad to see the New Orleans gang represented. 5-NJ is doing his usual good work. 5-GI is on 40 meters. 5-AU is broadcasting under call WAAR. 5-AGD is a new-comer. 5-LH has moved but is back on the air. 5-UK is still heard all over the globe and is the most consistent station in the state.

**Mississippi**—5-AGM, the portable 261-A station at the boy-scout camp, is still on the job, and most of the Meridian gang are turning out. We expect an answer from Meridian to the Memphis gang next month.

Traffic: 4-AJ, 19; 4-BU, 2; 4-CU, 7; 4-DR, 2; 4-EO, 25; 4-GY, 35; 4-IV, 37; 4-KB, 5; 4-KM, 36; 4-JJ, 5; 5-AFV, 3; 5-AGM, 11; 5-APK, 11; 5-ANN, 12; 5-ANQ, 9; 5-ARR, 1; 5-JN, 5; 5-QZ, 11; 5-UK, 7; Total 364.
HUDSON DIVISION
E. M. Glaser, Mgr.

SEP'T. 1st is the first anniversary of the Hudson Division. In the year of existence a sound and constant improvement has been made on the D.S.'s and C.M.'s and backed by 130 O.R.S.'s has been functioning excellently. The D.M. wants to thank both the officials and O.R.S.'s who have put the little space on the map. The D.M. wants to congratulate the officials on not missing a SING-LE SET THE WHOLE YEAR. THAT'S REAL AMATEUR SPIRIT! KEEP IT UP!

Schnell said the Hudson Division had the strictest requirements for O.R.S. in the country. That's something. Let's not loose our prestige. Start the new season with a bang. Get hot after real traffic stations. Stand on the boat and see the real thing. An O.R.S. has been working on the maps. Stand back of the O.R.S. Committee and let them do the whole job. O.R.S.'S MUST FOLLOW THE DOT the op.

Some Manhattan fellows go out after traffic stations. They never get together. EOP is working with their guys, and lately, 2BSL II temporarily 2AGM. They have away 2API. 12; 2H; 2AJ, 10; 2CG, 88; 2EP, 4; 2CP, 13.

2B LA handled more traffic than all the rest of us together. He was in a go with "soap odds" and tubes. 2UD has the same old punch and knock "can dead. "GS" Smithy, is doing practically all the operating at 2CRB while the D.M. is away. A Herk antenna is used on 10 meters. With 260 watts input he is heard everywhere in daylight with good audibility. 2WZ is going to college in the fall. 2CRB is working on a 20 watt meter. 2CHY upped his time at 2KW. 2ABR is working on 40 meters. 2CHU handled the Manhattan traffic. 2CT and 2CRZ are working on the same station with the co-oper. 2BSL is temporarily 2ACM. 2AVE is away. 2EP is keeping up the good work. 2BXX is keeping up the good work. 2CXM has put in a better outfit. 2AKK is rebuilt and ready for real work. 2EG has a new "river.

Traffic: 2BRE, 25; 2BRX, 26; 2BO, 19; 2ZW, 5; 2PB, 2; 2CHY, 4; 2CA, 211; 2CHU, 17; 2CSE, 12; 2AKK, 10; 2AGZ, 88; 2EP, 4; 2CP, 13.

EASTERN NEW YORK—2CLG gives promise of having a good traffic season. He is keeping in step with five stations. His vacation cut heavily into his traffic this month, however. 2BPR is using "S" tower and a horizontal "Herk" antenna. 2AV is on the S.S. Saratoga.

2LA has moved from New York City to New Rochelle. 2CM finds his time limited. He is using a 20 meter wavelength. 2AJQ has a multi for the apparatus. 2CP is been on a trip through the first district. His station operated on 220 was the loudest one we heard. 2CJE is selling his low power apparatus with hopes of installing a "fifty," 2AI is working with a Meierssen circuit. 2BR is having difficulties in 220 meter shack. The D.M. will be operating soon with a "fifty" and a new call. 2CN has a vigilance committee organized in White Plains.

2BFL is "up" but the second "up" keeps the disk off the key. 2AKH, the Poughkeepsie traffic hound, has moved to East Orange, N. J. We're sorry to hear the others are not on 220 meter shack. The D.M. wants to hear from folks in the smaller towns in his district. Send your reports to his shack, even if you're not an O.R.S. His address is Box 113, Yonkers N. Y.

2AGM is rebuilding again. 2CDH continues his good work. 2CHF tickled 2BZP, 1ER, 2GZL and 2BO with his "saw," 2DR is doing fine work with his "Fiver." 2ANM operates on 20 and 40 meters.

2ZKH and 2AO contained on rare reports and are doing fine work. 2OXG has a new antenna, "four," 220 K has a harbor for the summer. 2CMX is busy. 2AUO contains on 20 and 40 meters. 2AMD is working on 10 and 220 meters. He says the French and British amateurs are giving him a good time. He has visited 2GZL, 2GJN, 2GGO, 2GDX and 2EUG, 26E has made an "OY" of his "YL." 2AGO operates mostly during weekend. 2PV at Albany is coming out in the usual fine style. He is Birthing this city on the map. He is working cast regularly. 2GK is working N.Z. and Aust. as well as Brazil, Argentina and Chile. 2CMF, now located at the "green" division, has built an O.R.S. station.

The A.D.M. warns all stations here and now that laxity in reporting will not be tolerated. If things do not pick up and there is a lack of traffic of the woods there will be a lack of cancelled ORS.

Traffic: 2ZLG, 11; 2BPP, 8; 2DD, 1; 2CNS, 1; 2ZKH, 17; 2AKH, 7; 2ANM, 5; 2AKH, 30; 2CXM, 7; 8AUO, 16; 2AGQ, 36; 2AOX, 36; 2GK, 7.

NORTHERN NEW JERSEY—2AFJ forwarded his report from Burlington, N. Y. 2AT is pounding hard on 20 meters. 2ABR has a new pole and vertical antenna. 2KAU is keeping up traffic handling. 2AXF has returned from Canada. 2AKH has moved to East Orange, N. J. 2AO is at Monticlar. N. J. 2GJ is working on a 40 meter wavelength. 2AKH is on 40 and 220 meters at will. 2CM, 2BOZ claims that North White Lake, N. Y., is a "ham's paradise." 2BAW found plenty of traffic to handle. 2CGF has reduced his power. 2CDR and 2WR operate occasionally. 2EGZ is at an Army Camp. 2FO is all set to go as soon as the other fellows have "got it together." 2CMH is keeping on "40" working on "40." 2BGI is still "QSO" N.Z. and Australia. 2AFL, formerly 1AOA, is setting a fine example. 2AVL, formerly 2AV, is keeping up the good work. 2CGK is doing fine work. 2CDH is on "40" and has a new antenna. 2BKP is working on a 40 meter transmitter. 2APM, 10; 2CMI, 21; 2CMG, 33; 2CLV, 18; 2CD, 61; 2AP, 26; 2DH, 41; 2AOH, 12.

MIDWEST DIVISION
P. H. Quinby, Mgr.

NEBRASKA—A record breaking heat wave; force static, heavy winds; swinging signalers 110 degrees in the streets in the state. What then? A shorter antenna and counterpoise built into the attic; higher frequencies in the grid; choking; low power on 100 watt with remote control to the ice box. Results? No static; greater DX; steadier signals; more miles per watt. Yes! That's what we mean by sailing down on low waves.

2FG and 2BHU have built new Schnell receivers. 2AFL is a new comer in bonded "set" in "QRT." For more tubes. 2COG and 2DUO are cruising the Great Lakes. 2CMF and 2ANL are rebuilding. 2AWS is working on loop transmitter. 2APR is now new power, worked 2AVD with 200 volts and 10 mids on a 201A, 2BYG is making new daylight "DX" record. 2AOA is having fine DX. A group of hams in Colorado, 2ON would like schedule with someone on 40 meters to handle traffic.

2BGU worked NRRI but cut his rectifier. 2DAC has gone down on the 201A. 2AKQ is not working. 2BHS has his ears on. 2HLE has gone to California. (Good luck, O.M.) 2EGO has left Lincoln for the summer. 2AKQ has bought a Ford to go to the Convention. 2EBK is a piano tuner. He ought to have a good note! 4AKS, using a "hiver" is now on forty meters. 2PN has been busy repairing phones in the wake of a "young" tornado. 2EGQ has been visiting hams in Denver. 2BHE is looking for an "Optional" to 2AOA, to 2HWW, to 2BFO, to 2AOJ reports that 150 meters is now like a gravy-vead.

The vigilance committees of Omaha and Lincoln report nothing. (Fellows, the reports came through in fine shape this month! Thanks—D.M.)

Traffic: 2AFL, 20; 2CA, 25; 2AO, 11; 2FQ, 7; 2PN, 4.

IOWA—This month the "DX" honors go to station 9UQ operated by 9FK-DNZ and 2BKR-DJD. Using 500 watts, on 38, 20, 17 and 15 meters, 440 on 6, 9 and 2 meters, 2GK on 15, 17, and 20. They have been heard in the Philippines. 9UQ is in the race for the 2AOK-Mulhame short wave races west. 9XX has been away most of the month touring the east and was present at the sailing of WNP and W1. That job on a boat and that going through the east. 9CGY reports his antenna still down and that the well known counterpoise has been stolen. 2AOK is having fine DX. A group of hams and counterpoise. 2BCD has been getting traffic from tourist camps. (F.B., O.M—T.M.) 2DAO is rebuilding. 2BSN is now on 40 and 80 meters. 2BSN burned
out his tubes. 9CS was favored with a visit from our friend "Matz," ex-9ZV.

NEW ENGLAND DIVISION

D. M. Cushing's "Prize Test Message" work is just starting as we write this report. The first message did not make an enviable record for speed by radio though it got safely to its destination. Next month we hope to have it sent with the six messages that are being released in the Division each month for checking the speed of our service. Each must be changed to a time when it will come out on the right by making and keeping some regular schedules. The "five-point" system is explained in June and July QST and all the information on "multiple schedules" was contained in this column of August QST.

No prizes will be given for all-mail messages. We know what service the stamped paper is for. How! Hi! We want to tabulate the speed and routes of the different messages so please forward your tracers promptly.

WASHINGTON, D.C.-The general trend is now towards 40 meters. 1BF was the only Maine station to connect with WNP and WAP, taking a 94 word msg from the latter. 1BNL was heard by 1-1ER on 40 meters using a Blue Bird uv2l2, 1BPT will be on the air soon. 1ACO has just installed a new vertical antenna and counterpoise. 1AVV has decided that just at present 201A's "fifty" on 40 meters is where he always seems to blow. 1P0 sent his report clear from Conn. (That's the spirit we like, OM. A. D. M. 1BHR is at Old Orchard for summer. 1PT is busy supplying the wants of the R. C. L. S. 1KI says he has a timer that satisfries him. When 1BRK dropped from 160 to 40 meters he had to lower the natural period of his homemade antenna. He then improved it when he cut down his big antenna. 1ER is experimenting with antennas trying to find one to suit him. The YL's house has 1IBU on 40 meters. 1IBU is high traffic man this month.

Traffic: 1KF, 8; 1DC, 4; 1AX, 11; 1TV, 5.

DISTRICT NO. 1--The general condition is the same as last month. Traffic is low, and is on 40, H!ZQ. C, M, of Arlington and Washington are high traffic men this month. The YL's have gotten their at last. 1BUB, 4B; 1EF, 16; 1KF, 2; 1KL, 7; 1CJR, 8, 1NFL, 4; 1IS, 3.

NEW ENGLAND DIVISION

I. Vermilya, Mgr.

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QST FOR SEPTEMBER, 1925

WESTERN MASSACHUSETTS—Three new stations in North Adams are 1-AMZ, 1-BFE and 1-AILQ. 1-ARR and 1-AAB are being heard regularly, the later being located in Westfield, Mass. 1-AILQ worked Italian 1-E during the past month. Good work OM! 1-CLN, 1-VC and 1-ARE are all hack.

The A. D. M. wishes to thank 1-WL and 1-AKZ. IADU, 1-AJK and IBOM for their good work in handling Defense Day National Guard reports which was done in August QST.

I.BX has been appointed an OHS. 1AWW had a very serious short in his high voltage circuit, burned a large part of his plate. He is now using high tension cable instead of No. 18 bell wire for 1700 volts. Hi! 1-PLY has laid to rest one 14 meter station and is now a 14 meter station. 1-VU is having trouble with tubes on 75-80 meters. 1-AILQ is doing fine work with Spark Coil CV, and is covering 800 miles 1-Amateur.

IBSJ has not had much time for work on his own set, as he is busy working on the S. R. A. set. 1BVR, our Westfield standby is now home from school. He reports traffic somewhat sparse, but is heard operating consistently. 1AEP worked WAP during the month, taking a long message for the National Geographic Society, which was only 500,000,000.

H. H. has been QSO French 8-FQ three nights in succession, as well as BER and Porto Rico in the afternoon. 1ICF and 1ICL are touting California by auto. 1AKL took a trip through the Yellowstone Park, California, etc. and also does 6A.

The sixth District is busy these days entertaining “Hams” from Northampton.

IBCF-IBOM reports that 1-BC on the top of Mount Sickles, 1-BC has had a new copper tube aerial 80 feet high, and a new set like WNP. 1AOF a new station in Greenfield, has some trouble with orders on order, and will be on this fall. 1ICP is on 80 meters but reports that he is going to 20 meters soon.

1AAL has moved to a new location. He recently worked some stations on 14 meters on order, and will be on this fall. 1CCP is on 80 meters but reports that he is going to 20 meters soon.

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Erie. In the absence of Supt. Scott, 88JV, of the 14th Dist., the report from that territory was handled by 89BP. The D.S. is now present with the National Guard at Mt. Bretona. 88BVJ has installed a new vertical for 40 meter work, 88FL has finally finished the receive set for 40 meters and is now rigging up a 250 watt transmitter for 40 and 80 meters. 88KB has been away for some time. 88BP is working on 40 meters, 88DCY has deserted the transmitter for the summer. 88CMQ burned out his five watt, due to a faulty layout, but is working on a new set on 80 and 40 meters. The A.M. feels that this report shows a very great improvement over any of the past six months and also that much of the work is now being done by people who are making schedules forming the 5 point system? If not, now is the time to show action. We need everyone's cooperation in order to back up what you soon, and promises to make up for all time lost this summer.

WASHINGTON — 40 meters seems to be knocking the stations of the area. Many of our stations on 40 meters declare that as far as radio is concerned, there is no notable effect of so-called summer weather on the A.M. whom further convinces us that summer doesn't effect our sets nearly as much as the conditions. A change is going on in district personnel and it is hoped better service will result. 7AO reports working most of 40 meters with a new antenna. 7WS has worked N.R.R.L. several times and is heard in France. Married life seems to agree well with the Seattle C.M., as he sends in fine reports. He has a "fifty" regularly on all the popular waves. 7AU is active on 80 meters. 7BJ has been appointed D.S. 7OR is preparing to leave for the briny sea. Ditto 7VN. Several new hams have been licensed and we welcome them to our ranks. TRY reports no activity on account of sickness in his family.

Traffic: TOY, 33; 7AZ, 32; 7ABP, 39; 7ZZ, 7; 7AT, 1; 7AK, 6; 7AI, 4; 7ABJ, 2; 7BC, 23; 7BF, 3.

OREGON — Things are about the same for the month with the old stand-bys on the air as much as usual. 7ABJ takes honors for the Division for the largest number of messages handled with 40 meters in his report. 7RJ has worked N.R.R.L. several times and is heard in France. Married life seems to agree well with the Seattle C.M., as he sends in fine reports. He has a "fifty" regularly on all the popular waves. 7AY is active on 80 meters. 7BZ has been appointed D.S. 7OR is preparing to leave for the briny sea. Ditto 7VN. Several new hams have been licensed and we welcome them to our ranks. TRY reports no activity on account of sickness in his family.

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DAHOG—7OB, the A.M., has gone to Canada for his vacation. Don’t worry, he will come back. 781 is home again from the sixth district, where she stayed at 76CD. 7RQ worked some in her absence, but at the end of the month, he met quite a few of the gang. 7TV is QRX until he gets his "fifty" going. 7ZN’s "fifty" finally went where it should be, and a batch of 7TQ and 7VR were also working this month. The R.L. was here and several new licensed hams is the result. 7MU promises to be active soon; he had to move house because of QRM from a power-house close by. 7HAS and 7AC are consolidating for more power and better work. 88QA and 88QB believe in the "A.M. First." They have visited many cities and have generously told some of the gang which stations of the A.M. if you come to town during the summer months. They are now on 40 meters which is a good wavelength to use despite the summer weather. Vigilance committees are working overtime, but the R.C.L.'s fights continue and when they have a chance they came 5000 miles out of their way to see the YL of 7RL.

Traffic: 781, 17; 78Q, 16; 7YA, 11; 7ZM, 4.

MONTANA—PRIZE!! Each month, starting with September, the Territorial A.M. will give a prize of a year's subscription (or renewal) to QST to the owner of the station in his jurisdiction who maintains the best records on his station. The conditions which will be considered are: Reports must be in the mail by the 15th of the month. At least one letter a month to the A.M., giving the following information: That station, the Q.C. rules that you had forwarded all messages within 48 hours; what wavelength or wavelengths did you use; what changes have you made in your operation or operating practice; what was your best DX. What station whom you worked or tried to work did not show that you followed the CQ rules; any new absence by other stations or new men who are about to join the gang. The idea is to pass the prize around among the Territorial gang, but six months of continued good operating practice will be awarded another prize, to be announced later. (What do you say, fellows? Have a heart, your A.M. is just an ordinary Ham with the usual financial limitations, M.M.)

XM leads again, and is the new D.S. and is working on his new transmitter with all short ends and remote-controlled keying relay. TACI of Hamilton has been pitching hay, chopping trees and assembling a wicked ho. Understand he is all toughened up—came home one night and wrapped a message in 40 meters declaration that he certainly means to make a stand. He also promises to do any DX that Reinaerts and McGee are listening for chaps like that. 7DD has also remodelled his set and has it perking PB on 40 meters. 7TF is leaving for Washington after having a good month in the usual summer excitement. Sure sorry to lose you 7OM, GB as GL. 7TF took a vacation. The set is perking to the tune of 40 meters now that he is doing the running, so no DX till September. 7GS is over in the Big Hole pitching hay all day. 7MM is home in Forsyth for a while. 7DS is still in the business of rigging ditches to get much time for the famous spark coil set till school opens. THY says that it is impossible for him to be on the air for an indefinite time. Since 7RS is the first D.S., his office is suspended for the time being. All reports in this territory should be written direct to the A.M. 7ACI is at Edmonston, and 7RJ is now at school. Mrs. 7AGF, his mother, is expected to be running the set soon. Welcome—I’m sure you will find the gang will be glad to RC with you. 7TF is off for a short time.

Traffic: 7MX, 65, 7AT, 60; 7ACI, 3; 7DD, 3; 7FL, 3.

ALASKA — The warm weather must have melted the ice off the sky pieces as they have now brought out action after a winter’s hibernation. 7BW (7AFF of Tacoma) is at Dundas Bay some 90 miles west of Juneau but with a receiver but no transmitter. First station at Unalaska, comes in here at the States in fine shape. It is run by D. R. McCulloch of the Coast Guard who is on duty on the States often, but it is not known at present what he uses. QRA is also run, but is believed to be at Cordova. 7DS is working a lot of DX. 7FL is too busy with his station rigging ditches to get much time for the famous spark coil set till school opens. THY says that it is impossible for him to be on the air for an indefinite time. Since 7RS is the first D.S., his office is suspended for the time being. All reports in this territory should be written direct to the A.M. 7ACI is at Edmonston, and 7RJ is now at school. Mrs. 7AGF, his mother, is expected to be running the set soon. Welcome—I’m sure you will find the gang will be glad to RC with you. 7TF is off for a short time.

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PACIFIC DIVISION

E. McCreery, Mgr. Southern Section

THE writer wishes to thank all his loyal supporters for their backing and to wish Mr. Dann and Mr. Cautin success in their greater responsibilities as Section Managers. Plans to attend college have made gap, "Don" Brockway, give up his A.R.R.L. work for a while. Southern California loses a good man. Ed. sltburgman, 8C0, of Hollywood, is the new A.M. of Southern California, a man who has done a lot of good work in newspapers and radio journals. Perhaps consistent advertising will bring results in the future, and with this in view a good deal of advertising will be done in our newspapers. If your town needs a Vigilance Committee, don’t be bashful about letting the A.M. know about it.
There is no reason for this slow activity with traffic and "DX," as it is on 20 and 40 meters. 6EKC and 6EIZ were active this month. Others reported but were not on the air. Traffic is easily moved in all directions. When you get schedules it will be your own fault if you don't get them. STE is now in Alameda. Good luck. OME 6BFU had a handy antenna but thecope broke. He is building a new "HE" station. It is going strong. In the past few months the most consistent station we have had in Berkeley. 60IQ has moved down from the hot place. He is an O.W. S. 6EKC is going east soon. 6CIL heard YS in Ceylon.

Dist. No. 6: 6E3W is doing good work on low power. He worked 1700 miles with 2 ½ watts input. His station is equipped with emergency plate and filament supply. 6E3B expects to be on soon with 50 watts, and a motor generator outfit. 6C0N is another station. 6ANW is rebuilding his station. 6CTX has a new antenna system starting to work on 40 meters. 6AKU and ex-6C5W and 1B2K will set up a low wave station in Vallejo.

E. A. Cantin, Mgr. Hawaiian Section

HAWAII—Summer QRN failed to put a damper on 40 meter work this year. Stations here made a fair showing considering the poor operating conditions. 6AFF is on the air again with a "sink rectified" transmitter. 6A1R has no difficulty in working the mainland and will take on 40 meters this month. 6A1R worked the work of an O.R.S. operator in his appointment certificate. We're sorry for your lack of time, OM. 6C0Y has had the scarlet fever. 6CAW is working on 20 and 40 meters occasionally. 6CBU has been moved to 6CNO's address. 6CGW works the Amazon and South Americans whenever he feels like it. 6CGW has moved his 40 meter transmitter, worked NITF in the Bering Sea. 6CGK is rebuilding his transmitter into a Master Oscillator rig.

E. A. Cantin, Mgr. Hawaiian Section

ROANOKE DIVISION

W. T. Gravely, Mgr.

Mr. McCaleb of Station WJS paid the DM a visit giving us some dope on a new receiving and transmitting circuit which he claims will work. He also brought along pictures taken on the expedition and other photographs of the crew and the expedition. We enjoyed the visit from Mr. McCaleb immensely.

Northern Carolina—Due to failure to report on the part of some of the O.R.S.'s, a warning is hereby issued. Any ORS who fails to report for two consecutive months, will have his ORS certificate cancelled. If you are unable to send a report in the summer, send in a report to that effect. Inactivity is no excuse for not reporting. Report anyhow. OM, we are always glad to hear from you.

Let's show that Florida gang that they can't beat us when it comes to orderly operating.

K. A. Cantin, Mgr. Hawaiian Section
From the reports sent in it looks as though the "gang" in Dist. No.1 really means business. Several new ORS stations have come into being. One of the old "Spark hounds" have quit and taken up the short wave CW. 40G, a real live wire, has gone to Chicago and is now working as a Enr. Manager for W. Winchell & Salem. All local stations are urged to report to him each month. 4LO is on 80 meters with a fifty-watter. 1AJ is working on 40 meters and is showing what can be done with "QSO" and WNP. He also worked the YL at 7SI. 4OG still leads the district in traffic handling. 4R6 is back on 80 and 40 meters and is being assisted by 4TW. 4OH has repaired his aerial at High Point. 1D7 built a new 90 "footer" and lost both the tower and his disposition in a wind storm. 4GS also has a new tower and hopes for better. 1AM is working a new 100 watter—truly the dead have come to life! 4A4 is on at times.

Traffic: 4BY, 22; 4AJ, 3; 4MI, 31; 4UM, 10.

The summer slump has departed as far as this district is concerned, and they are showing what can be done in the way of summer work. They are now all "burning" on 80 meters and although some of them have had a hard time getting down. 4GY is rebuilding his tuner at present; he has been reported in Sweden. 4NJ labeled out better than ever on 40 meters. 4GW is having trouble getting his big set to work on 40 meters. 4UM has trouble raising anyone on 40 meters. 4TS is at Camp Glenn with the 40 meter guard. He is operating 4CM and 48H in camp. 4MI has been experimenting with antennas on 40 meters. He is using a Herz now and likes it fine.

Report: 4NT-M4-22.

A new D. S. will be appointed soon to take 48X's place, and all stations are requested to please give their address and call sign to the new O.R.S. 4GW has been off the air on account of moving. (He is the last ORS in this district to desert the 150-200 meter wavelength for the 40 meter band A.D.M.).

4A1 has been doing some fine receiving, namely; 4SGM, N. R. R., 2; 4DGT, W.A.P., etc. 4BX is at his new place, and will be on the air soon one hopes. Formerly of Jacksonville, Fla., now in Charlotte and will be on the air. 4JR, badly handicapped by power leak, has managed to work a little through the "QRM." 4A4 at Troy reports that he is greatly in favor of a Roanoke go-get-gether meeting this summer. Setting up "jug".


WIST VIRGINIA: SBDT was on the air for the first time this summer and handled many messages. 4A5OR is not active, and the 4CMF is in Salt Lake City, Utah working with Western Union Engineering crew and visiting sites during summer. 4BSU is working on trolley DC and getting out good. ED blew a tube and is now working with an input of 25 watts. 4BSK, on 80 meters is getting out DB. 8AUL is getting out better than any of the stations in the Wheeling district. He has been heard in France, Snake, W. Z., and Australia and worked CR-8 in South America. 4CVD works Porto Rico often and is "QSO" traffic there. His DX is on 40 and 80 meters. 4CRA is on 60 meters. He is doing his best to make the district "QSO" traffic. He is the "bird" who installed and operated SPC for the Westhouse on Rio de Janero, Brazil. On account of the bad weather, SPC has been working spasmodically recently. 4BJG is at Camp Know, Ky., as is most of the Charleston gang. 8AIP is experimenting with "QSO" traffic for the Experimentors' Section and has at last achieved his ambition, a good note. 4ATP is taking flying lessons. 4DSN has put in a new lead on 4R1. 4LGG is working on 80 meters. 4CMH, SATO, 4AXP, and 4AMD attended the A.R.R.L convention at Indianapolis and visited several stations while going to and from the city.

VIRGINIA—Here we are, the tail-enders. Just exactly what 4JR says about his "gang" about not reporting about work, we are here to make a clean sweep and get rid of the drones. Let's get a good report in and stop this lagging. We can never accomplish anything by pulling back in the rear. Be on the constant look out for the Old Dom inion on the map and keep her there. Let's go!

3CAU is working and has no time for radio, 4MK has a 40 meter in the air, and 4BDL is moving to one wire aerial at this writing. 3SB is working on 40 and 80 meters. 3ALH is at Camp Glenn brig. insurance business and will be off the air indefinitely. 4TI has put up one wire aerial.

3BMB finds a little time to punch the key between tennis and the swimming hole, and can be found on 40 meters. 4ATB is in Ashville, N. C. this summer. 3HM is in a new ORS on 80 meters.

Traffic: 3BNN, 3; 3HM, 8; 3BFE has gone to sea but promises to be back in the fall. 3BGS close on account of no power. 3AA is a new ORS, 3IW has applied for an ORS appointment. 3BHS has sold his transmitter and quit the game. 3HIDZ will soon be on the air. 3CKL was logged by a station 350 miles Northwest of Calcutta, India. Not so bad for a couple of five watters working together with Heriz antenna and likes it fine. 3CA got the four coil Meissner to work on 40 and 20 meters.

ROCKY MOUNTAIN DIVISION

N. R. Hood, Mgr.

COLORADO—Most of the stations in this State take their operating month from the first of the month to the first of the next, and so few of them reported according to the new style. Hence the reports will all go in per their old plan and the new system will go into effect next month.

DENVER—3DEO comes to the front this time for the number of things handled and the number of reports in. He is very active in originating messages, too. 9CBY, the city manager, has been on a trip to Chicago and hopes to be able to stay for the Convention. 3EEA is going to the Convention, and is all ready to work DX as soon as he gets the old Master Oscillator to oscillate. 9COW got tired of "QRM" towards the end of the month and made two appear from the neighbors. 9WO put in a "fifty," but says it doesn't work any better than the old "fiver." The previous "fifty" is on 80 meters. 9EAM has been experimenting with antennas in this State and we are fine. 9EAM has had trouble but finally found the trouble in a poorly insulated lead-in. 9DQG has been sick. 9CAW will be on the air soon. 9AMB got back from the coast and is working again. 9FEY is off the air as a result, as AMB wrecked his high voltage supply when he called for his stuff. 3CAA gets in a lot of work each night. He also plans on taking in the convention at Chicago. 9DUN is moving to Florida for a few months and may stay. Sure sorry to lose u OM. 9BQJ shows up at all club meetings, but doesn't seem to be on the air much. 9UN is selling out, and his O.R.S. is therefore cancelled. 9BV is a new station on the air.

Traffic: 9DED, 108; 9QL, 5; 9WO, 35; 9DQG, 25; 9COW, 2; 9FEY, 21; 3CAA, 35; 9EAM, 4.

SOUTHWEST DIVISION

VEHICLES are back from their vacations. 3CDE was right on time with his report as usual. (Want to congratulate you OM. Records show you have been on the air twice the last two years. F. 3EAF is working on photographs but wants to get in touch with someone else that is interested. New O.R.S. in Colo. are 3D0, 8DVL

Traffic: 3DVE, 8; 3DD, 2; 3EEA, 4.

UTAH—6FM has been visiting numerous amateur and broadcast stations in Los Angeles and San Francisco. He is busy rebuilding his station.

3HRL is rebuilding his station for operation on 20 and 40 meters. He has won several top prizes at the "Nug" Contest and also two other prizes. He says it was all luck, but the prizes more than paid his way. 4CHQ has a new 81 foot tower and a 250 watt "jug." His apparatus is mounted on plate throughout. 5DOJ works everyone he hears which is going somewhere under constant and a constant "QRM" is getting out better than ever now on all "QRMing" on 10 meters, although some 4DJ have built a new ORS since the fire and is now working on 150-200 meter wave off the 200 of 5U1U's input of 25 watts. (He is the hurt on wheel he ran when he got the power leak fixed."

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SOUTHEASTERN DIVISION  
W. J. Gravel, Mgr.

FLORENCE—Our sympathy is extended to 4XE in the loss of his seven year old son. He has a family of nine children. His absence will be felt. The Florida hams are flowering around, visiting and exchanging traffic with stations throughout the Division, and much good is coming of it.

Midsummer is causing no let-up in activities. 4XE worked with 5Y4 in Chattanooga and 4ASR in a 600 meter station in St. Petersburg. He worked WAP and WNP several times.

There is not much change in the lineup of the traffic handling stations. The old reliables are holding the fort, the most notable being 4FM, 3QV and 3CH of southern Florida; 4TR, 4XE, 4TV and 4ASK of central Florida and 4DU, 4RX and 4EZ of North Florida.

PORTO RICOS—Traffic is increasing with the United States. All of our stations are now on the 40-45 meter wavelength band and work the mainland each month. Station 4AF has added Australia, New Zealand to their list of stations worked. 4UR is now doing transatlantic work on 40 meters. 4JE is using a 40 meter wavelength and 4BEI, 40I is on the air and handles quite some traffic.

Traffic: 4SA, 12; 4KT, 15; 4RL, 28; 4UR, 12; 4HJ, 3; 40I, 23.

SOUTH CAROLINA—Connecticut, Here's an answer to your request in the July QST. Every O. R. S. in South Carolina has a 40 meter set. Radio permission is not required, we hope, to have an occupation other than this. Maybe some of us will be manufacturing 000000000000 sets for B. C. L.'s in 1960. 4SH led with a report from Egypt. Traffic handling honors were won by 4IT. 4BW is beginning to get out on 40. 4RR bought a 40 but it was found to be defective.

Traffic: 4ST, 22; 4EK, 18; 4IT, 45. 

ALABAMA—District No. 1. 5AMH leads the district again. 5VV has had another operation which reduced work for the month. 5WS has been doing a three meter watch and the air after an absence of 5 months. He is pounding brass on "40" with a "clesty" and he promises to get busy and win back his appointment. The DN station at 5AV has made some traffic. He is one of the most active stations in this district. 5MI and 5ZAS have been busy shattering work records. 5AL is in the 40 meter wavelength, 5AV has left for the mainland and 5ME is using a 40 meter wavelength. He worked N. Z. twice, 5LZ, 5WS and 5SD who gave him QRA as Cayman, India before midnight one night! The call 5ZAS is used on 20 meters and reports on both 20 and 40 meters are appreciated and answered. 5ARI is the active station of the district and makes reported contacts on both 20 and 40 meters. The Dist. Supr. gives notice to all ORS in Dist. 1 that unless there is more activity among some stations, the certificates will be withdrawn on a wholesale cancellation of ORS certificates.

District No. 2. 5DK has traffic position rebuilt for 40 meter work. The chief has a permanent position in New Orleans, second "op", 5DK, will be in charge of station in the future. He expects to handle a bunch of traffic in the coming months.

5AMO handled several messengers for WAP. He has communicated with several English stations. 5AMO is one of the best stations in this district and can be counted on; traffic is flowing through it. He is a busy station on 40 meters. His signals are heard by FMH in San Salvador. An increase in activity was received from 5AMO and her collection of stations "TVR" for traffic and raring to go; let's continue the good work.

4AAI is the veteran brass pounder has placed a large place in the front of his house begging for messages. (FB, TM) 5DI works 'em right and left. 5WT is the ham with the 100 foot tower whose mighty "sign" reach unto the ends of the world. A card was received from 5ATP, postmarked Peru, Indiana. 5ASU is preparing for big work this fall. 5AJP is doing well. He changed to New Orleans, Louisiana, for a while but now is back in action again. 5ATF is adjusting his transmitter.

This is warning to all ORS in Alabama that unless a report is produced during the month his ORS will be cancelled for lack of interest.

Traffic: 5AC, 11; 5ADA, 20; 5AJP, 3; 5AMH, 29; 5AOI, 38; 5ARI, 7; 5DI, 5; 5VV, 0; 5WI, 21.

WEST GULF DIVISION
Frank M. Corlett, Mgr.

INSTRUCTIONS from the Traffic Manager are to do not mention the stations that DO NOT report! Do not report the activities of your station, look for it below.

NORTHERN TEXAS—Interest is decidedly down over 20 and 40 meters band now. Election Tumers are being build by the dozen. Everyone reports them "Fun!"

5ATZ has completed a new tuner covering 5, 20, 40 and 80 meter bands. He has also overhauled the transmitter. 5SD advises any who wish to get ship dates for next summer to put in their applications now. 5H1 He went to Galveston and found that 108 signed up and waiting for openings—ahead of 5HM who's he's back at Home Sweet Home on 40 meters. 5CV of Waco has left for Mexico, Kentucky and is at work on a "40" Awards trip. While in Kentucky he will go to the Convention at Chicago. 5AKZ has completed a general overhauling of his equipment. 5SD is still running "AUSO" Awards regularly. He maintains several schedules with the assistance of a "TY" isn't OP.

5ZU has more reports they are time.

Traffic: 5ACL, 6; 5AZK, 7; 5CV, 3; 5ATZ, 16; 5ADD, 6; 5JI, 2.

SOUTHERN TEXAS—5ZF has gone to Sevi and sends in his resignation as C.M. of Galveston. He expects to be back in the fall operating on 40 and 20 meters. 50X worked Bermuda, N.Z., Australia, Argentina and Honolulu.

5DU is off the air at present but will be back on with a 100 watt on 80 meters. 5ALR is back and looking for work in South Africa. 5APM is rebuilding his transmitter.

5AEF is back at San Angelo with a 50 watt set on 80 meters. His addition means for West Texas traffic. 5EW is now "OP" at KWGW.

Traffic: 5OX, 25; 5AEP, 81; 5EW, 43; 5HS, 1.

OKLAHOMA CITY—Dist. No. 1: 5ATK is working a new receiver. 5AGN has been having a hard time making the big bottle "week." 5KW went to New Orleans to get a job and will soon be down there. 5AIJ held 5AV, 5APG and 5AAT tried 20 meters but 5ABG is the only one with any luck. 5AAV is going to go on 40 meters. 5ATV and 5APR were "QSO" Z7 and A's several times this month. The "game" at Eald seems to be too busy making "home brew" to do very much. 5AFU had a "150" battery working through the "QRM" on "40." 5AZ is using a "river" on a 40 meter wavelength. 5PI worked all districts last winter with a 20-40 volt battery. There are nine amateurs in Cushing now. 5ADO worked with a "river." 5ADO and 5ASK made a trip through Texas and Louisiana.

Dist. No. 2: 5ATU is still trying to get his equipment working efficiently on short waves. 5GJ has tried to set up meter work on 40 meters but is limited to 30 meter wavelength. 5SD wants to arrange some schedules with seventh district stations.

Dist. No. 3: 5AVW is doing his stuff and handled a lot of messages in half the month. He is now away on a vacation.

Traffic: 5ARD, 18; 5DI, 2; 5ADO, 4; 5ATK, 10; 5ASU, 5; 5AAY, 6; 5/AH, 1; 5IU, 5; 5APZ, 11; 5ED, 14; 5ANL, 6; 5APG, 25.

NEW MEXICO—5LG-5SC had some tube trouble but might be good work this month.

Traffic: 5LG-5SC, 43.

QST FOR SEPTEMBER, 1925
**CANADA**

**THE** summer slump has hit the Canadian Divisions like a tornado and at no time during the past year has there been such inactivity. Everybody seems to be on holidays or busy playing golf, tennis or other outdoor sports. The last month the 120 has been completely unsuccessful, static being very heavy and stations on the air few.

The Arctic, VDM, sailed for the north about the last of this month and the bad luck which followed caused a joint disaster of broken-down engines and burned-out radio dynamo before the ship had gone many miles. Law, Lawrence with the fact that she was tied up for nearly a week just slightly below Quebec. At this writing no word has been heard from her as to whether repairs have been effected to the radio equipment but it is hoped Duster will be able to get her gear on the air again to enable him to let us know somehow about the conditions up north.

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**MARITIME DIVISION**

**W. C. Borrett, Mgr.**

**BEFORE** giving a report of the activities of the division for the month, the D.M. wishes to call the attention of the Maritime Division the fact that we want a report of the activities of all stations besides the O.R.S. The O.R.S. has instructed the fact that in reporting the traffic figures each month to carry out the new system and report number of messages originated at their station, number delivered and number relayed by radio. Traffic figures then have a meaning, Jim Palmer of 1AM Fredericton, New Brunswick, sent in this following report for his station for July which is an example of what is wanted. "Message report of 1AM for July, 1925."

Messages Originated at this station 2
Messages Delivered 4 (local, 3 mailed)
Messages Relay 3
(Does not include Mgr. rec'd & qrs).

Messages—Total handled 12

Many of our stations are copying WAP and WNP those days on the 40 meter band, 1AR and 1AM being among the leaders in this work. IDD, while having copied the MacMillan expedition many times, has only once been QSO with WAP since he has reached Green-Land.

The second visit was the call into Halifax of the Auxiliary yacht "Sweeps," with Mr. Vanderpoel of lunEB as the "OP." Several of the boys worked WAP when he was here and hope to work him again often.

Another yacht, the "Spray II," is erudizing in Canadian waters, using the call letters "KFkw" on 120 meters.

NEW BRUNSWICK—1AM reports working mostly on the 40 meter band and has been QSO with G5DH. 1AK is rebuilding and has visited several of the Fredricton gang this month. 1AF of Millerton reports lack of power as the reason for not being on regularly, but nevertheless takes a turn at the key whenever possible. L1N has a regular schedule with 7LAAO. 1AQ is the call of a new station opening up in Fredericton. Move the merrier! 1AD and 1AB have returned to the fold and are welcome additions to the NS gang. 1AJ, as usual, is the most active NB station on the job.

PRINCE EDWARD ISLAND—Angus Mackie of 1GO spends most of his time on the 40 meter band and has worked WNP once on that band. 1BZ reports that he is now ready to pound brass.

NOVA SCOTIA—1AR has returned from his trip to the U.S.A. gang this month, 1AI of Millerton reports lack of power as the reason for not being on regularly, but nevertheless takes a turn at the key whenever possible. L1N has a regular schedule with 7LAAO. 1AQ is the call of a new station opening up in Fredericton. Move the merrier! 1AD and 1AB have returned to the fold and are welcome additions to the NS gang. 1AJ, as usual, is the most active NB station on the job.

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**VANCOUVER DIVISION**

**William J. Rowan, Mgr.**

The whole division seems to be in a state of reconstruction, all stations rebuilding their sets for forty meter work.

The division held its convention in Vancouver on August 20th. NRRI continues to pound in our ears and seems to be so "QRW" that we can't get a word in edgewise. How many of you are members of the I. A. R. U.? Now then fellows do your stuff!

VANCOUVER—5AN is still undergoing treatment in the hospital and is progressing favorably. 5BA, his side kick, broadcasts "ham" news for him every day. 5HP has a bag key that he is working on the 12 meter band for the International Amateur Radio Union, All the boys are waiting for you, Dame. 20G has been heard on the 1000 meter band, and he is still working on his "QRN" terrible. 5HB reports that he heard very few signals the night before the "quake" in California, 5GW and 5GO are "potted" for his big feet. 5CH has been to Ontario, 5FB, is raving with the regularity. 9BP is still inactive. The Vancouver gang are to be commended for their "fine" traffic handling.

Traffic: 5GT, 37; 5HR, 24; 5HP, 15; 5AF, 2; 5HS, 6.

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**BRITISH COLUMBIA—**Conditions continue to be the same as usual, namely that there is considerable traffic moving out of this D.T., but NONE moving in. Shoot some traffic this way, gang. 5GT is the only station on the air and clears traffic with some regularity. 5CH is still working on his "QRN" and he is "QRN" gang are to be commended for their "fine" traffic handling.

Traffic: 5GT, 37; 5HR, 24; 5GT, 37; 5GF, 7B; 5HP, 15; 5AF, 2; 5HS, 6.

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**CALGARY—**The Calgary gang have just held their annual Association Meeting during the "Calgary Roundup." It was a swell affair, all the "ham" active or interested in Southern Alberta. A number of new members were initiated into the Association. 4AL, a new O. R. S. is welcomed.

Traffic: 4GT, 17; 4AX, 9; 4IO, 2.
WINNIPEG DIVISION  
W. R. Pottle, Mgr.

This "Official Carver" at Headquarters must have been a censor during the great war by the way he carved chunks out of some of our recent reports. Some, but due to limited space this was necessary.—T.M.

WINNIPEG—Things have been quite active here this month and the number of the Front Form is growing quite fast. While 4AW was quite surprised when he got a "Q. S. L." from Wisconsin, while using a pair of 50's, 4EY has been QSA every day as well as England and New Zealand. 4EA and 4FZ are amalgamating their stations which will surely make a Two-Man-Melee—A.D.M.

MOOSE JAW—4BF is getting fine "DX" on 40 meters, having worked 800 miles in daylight with a "Hover". 4ED is rebuilding for 40 and 40 meters and 4ER and 4AO have been away on a well-earned vacation.

Saskatoon, after a lay-off, is back on the air again stronger than ever. 4FN is on 40 meters doing good "Hit." 4BG is giving code lessons every Sunday morning and by all accounts has a big bunch of new "hams" under way. (Good work, O.M.—D.M.) 4BL and 4HA, both new stations, have just opened up on 40 meters. Prince Albert, 4AV, is doing FB on 40 meters. 4FA has worked 1000 miles with a 301A. 4BO, a new station, has just opened up on low power. 4ER is still YL'ing. 4FC is in the process of clearing his transformer for a 50 watter.

4AJ is experimenting. 4EV was doing good work till his pole tricked up and broke off so 4A "Louie" ran into 4AQ's "stuck," which has put him out of commission for awhile. 4AA and 4EZ have combined resources for short wave work.

Traffic: 4DY, 141; 4AW, 101; 4FY, 8.

SASKATCHEWAN—In the absence of 4AO, who was on his vacation, 4CB, D.E. for Saskatchewan, reports that activity is not very great. 4EG in Buchanan has a fine new mast and is rebuilding for the shorter. 4CE and 4EZ will be on in the fall. 4EV of Lockburn has returned from New York for a holiday and has his old set going strong in the 20, 40 and 80 meter bands.

By the time this is in print, Mr. Joseph A. Watson will be on the air with a "Hover." 4CB has returned from his vacation, during which he looked over the installation at 9ZT. 4ED continued to work nearly all the foreign countries with one 6-watter. 4AJ has been appointed C.M. of Regina.

TRAFFIC SUMMARY BY STATES

This month most of the reports came through on the new Front Form reporting cards. We do not yet have a complete check of our message handling work, as some officers neglected to send the reports through on the new Front Form blanks. Less than a thousand messages were originated in the whole country if we are to believe the reports that were received. Each A.D.M. is requested to send in the information that will make his section of the country completely represented. We are now at a low point in traffic handling and these figures will grow from month to month as more stations get on the air and originate traffic. If every Official Relay Station will do its part by originating and reporting one good message this month, we will have a better looking set of figures next time. We have been told that Official Relay Stations who cannot originate and report, at least one message each month, should have their appointments cancelled. Would such action be unjust? Next month we want to see just how closely the number of messages originated and the number delivered in the entire country checks. The comparison of traffic reports by states follows:

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MARITIME DIVISION

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QUEBEC DIVISION

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WINNIPEG DIVISION

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VANCOUVER DIVISION

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<tbody>
<tr>
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TOTAL FOR COUNTRY

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QST FOR SEPTEMBER, 1925