

QST

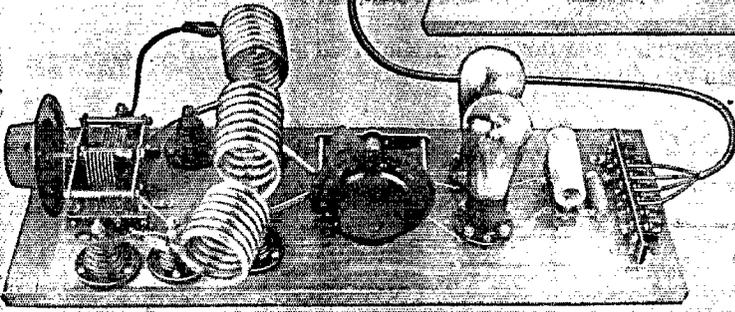
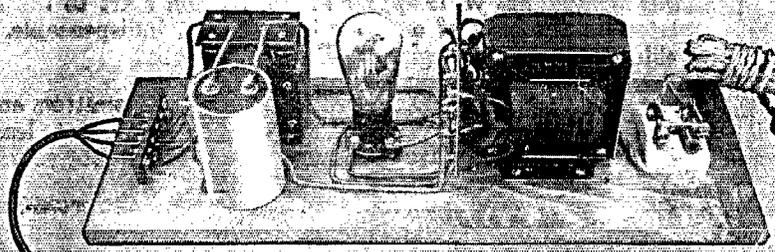
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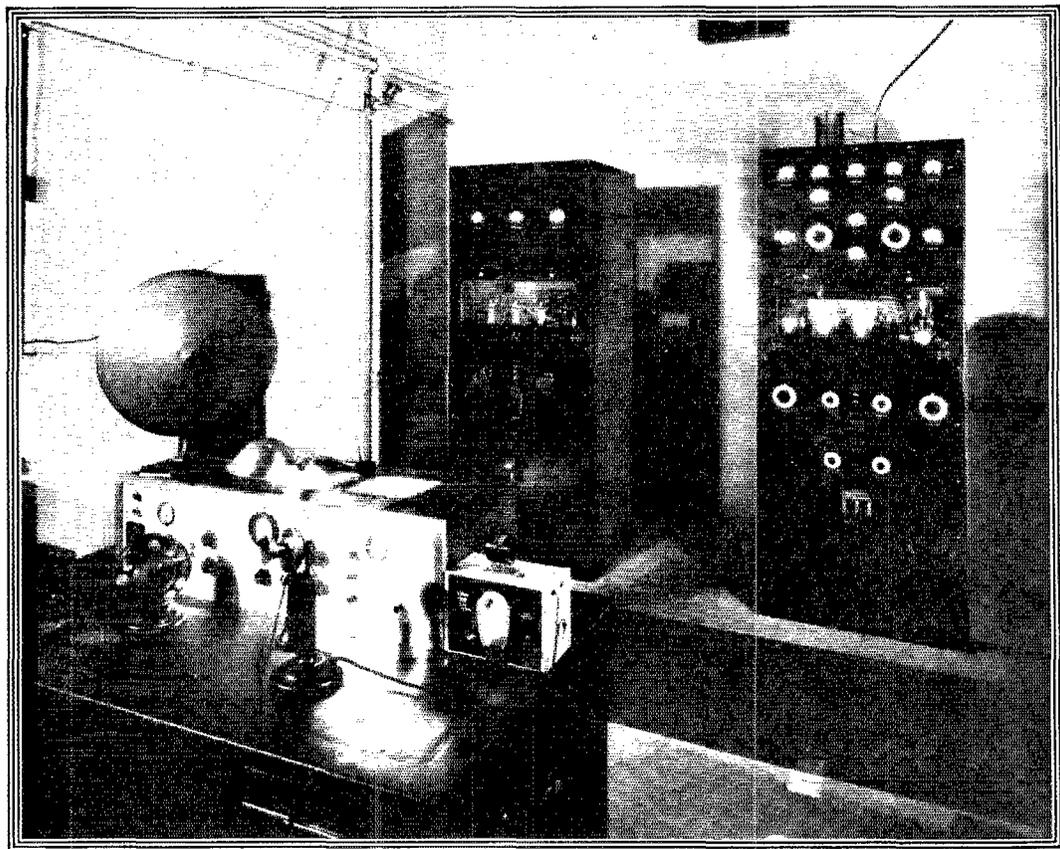
- Each chapter has been scrutinized for necessary alterations and changes made to bring the material up to the minute. Practically all of the old material on transmitters, receivers, antennas and frequency meters has been thrown out bodily and replaced by the latest dope from League Headquarters. *Some of this material has yet to appear in QST.* From start to finish it represents the latest in the way of amateur information, indispensable, as always, to the older amateur and beginner alike.
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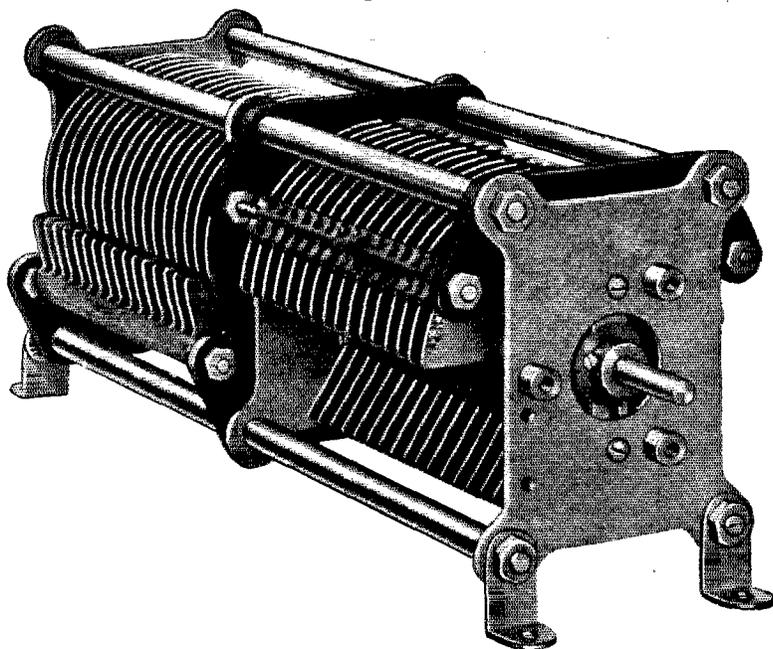


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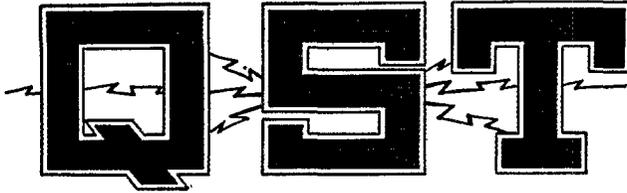
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The Official Organ of the A.R.R.L.

VOLUME XIV

NOVEMBER, 1930

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Kenneth B. Warner (Secretary, A.R.R.L.), Editor-in-Chief and Business Manager

James J. Lamb
Technical Editor

George Grammer
Assistant Technical Editor

Clark C. Rodimon
Managing Editor

David H. Houghton
Circulation Manager

G. Donald Meserve
Advertising Manager

Advertising Offices.....55 West 42d Street, New York City
 Editorial Offices.....1711 Park Street, Hartford

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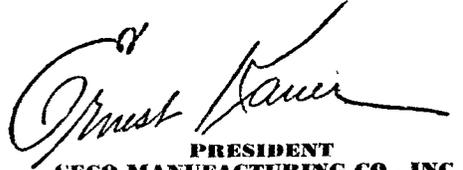
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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors.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

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

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

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EDITORIALS

THIS issue of *QST* reaches members on the eve of elections for director in half of the A.R.R.L. divisions. It is the time of year when we members of the League must do a bit of serious thinking for the welfare of our organization. "These elections," as the printed announcements say, "are the constitutional opportunity for members to put the man of their choice in office as the representative of their division."

Too many of us, we fear, are ignoring a certain responsibility of A.R.R.L. membership. Civic affairs frequently suffer because many citizens shirk their responsibility at election time. Surely we are deeply enough interested in our amateur radio and its organization to warrant the expenditure of some constructive thinking once in two years. As we see it from headquarters, there are too many members of the League who make no effort to get a man of their own choice nominated for director, who make no effort to boost a candidate who is their idea of what a director ought to be, who don't even bother to vote in the elections, but who don't hesitate to complain at almost everything their directors do and who indiscriminately throw brickbats at a director they couldn't be troubled about nominating, electing or advising. If these members, instead of "kicking" over what an already-elected director does, would put this same amount of energy into looking over the men in their division, picking out a really good one, backing him with some work and effort, and generally take part in League affairs before the election, everything would be much sweeter.

The reader, as an individual member of the League, ought to make it his business to back and vote for a candidate who stands for the things the member wants to see in A.R.R.L. That is the basic idea in our system of government. That gives the greatest available assurance that the director thus chosen will be representative of majority opinion on important amateur topics in his division. "These elections are the constitutional opportunity for members to put the man of their choice in office as the representative of their division."

It is of the utmost importance, too, that the League have good intelligent direction. It is vital to the life of amateur radio in this country. The next two years are really of tremendous importance in our future. This future, this welfare of amateur radio in the years to come, depends upon the quality of the judgment which our Board of Directors can bring to bear on our problems. It is up to you members, then, to send *good* directors to the Board, men chosen not so much because they suit your prejudices on certain amateur problems as because they can add to the depth of vision of the Board — men whose ability you respect, whose judgment you will be willing to trust when they assume their responsibility of directing the work of our League.

Remember that the Board "runs the League" but that you select the members of the Board. Theirs is a heavy responsibility but so is yours. Our League is now a large organization, its affairs are of considerable magnitude. The success of the idea of "representative government" in this League would seem in the long run to hinge upon the willingness of each member to give serious thought to the abilities of the directors in whose hands he places the future of his organization. A.R.R.L. "rates" the best direction we members can give it — men of experience, knowledge, wisdom, intelligence and vision!

K. B. W.

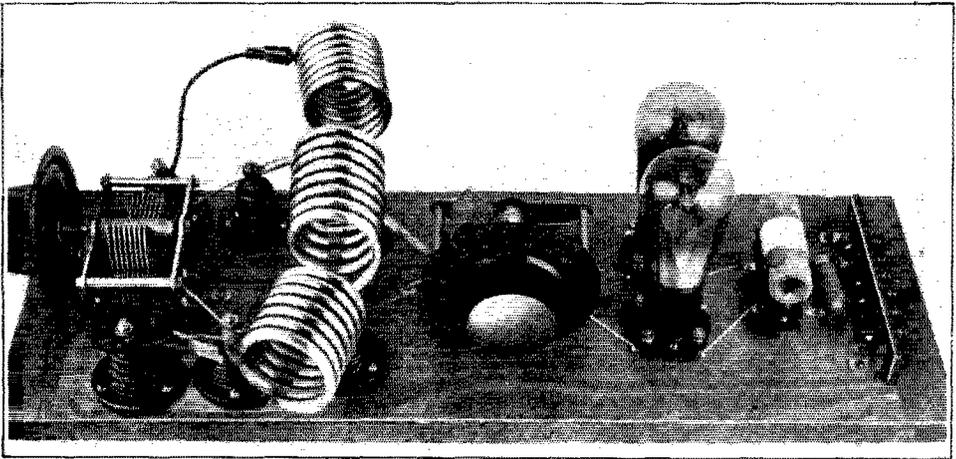
A Complete Push-Pull C.W. Transmitter at Low Cost

By George Grammer, Assistant Technical Editor

IT'S an easy job to build up a low-power transmitter of the conventional pattern using a Type '10 tube as an oscillator with a pair of Type '81 rectifiers working from a 550-volt transformer. It's likewise easy to put together an oscillator using a small receiving tube and a few "B" batteries or a "B" eliminator for plate supply. The first outfit will cost around \$80.00 (list prices) complete with tubes and the necessary accessories, even without allowing anything for the two or three meters which ought to

possible to build a transmitter using a Type '10 tube for the same price as the "B" battery outfit, but it is possible to build a transmitter with as much power output as the '10 will give, the cost of which will be about half-way between the two.

This transmitter, illustrated in the photographs, is built almost entirely of receiving equipment which is readily obtainable; and the cost of all the necessary parts, including the key, is approximately \$45. A milliammeter to read plate current, the use of which is strongly recom-



THE TRANSMITTER

The circuit is the push-pull tuned-plate tuned-grid, with a fixed resonant grid coil. The oscillator tubes are Type '45's. The arrangement of the parts is explained in the text.

be included in an amateur transmitter — but it will "get out" and get plenty of DX with any kind of intelligent handling. The second one is satisfyingly cheap — but the power output is so low that the station is practically out of the running if competition from other stations is bad.

The tendency toward a sort of standardization among broadcast receiver manufacturers, remote though such a movement would seem to be from amateur radio, has resulted in a lowering of prices on the tubes most commonly used, notably the Type '45 and the Type '80, and concurrently a fairly low level of prices on power supply equipment designed to be used with those tubes. The immediate effect of this, so far as the amateur is concerned, is to help bring together the two extremes cited in the first paragraph. It is not yet

mended, will add seven or eight dollars more to the cost. In these examples, of course, the prices given are list, not those which are quoted by bargain houses. It is certainly true that by judicious buying it is easily possible to reduce the cost of the set to \$35 or less.

And the set is not a toy or another flea-power outfit — it is intended for practical communication, and will do anything the typical Type '10 outfit sketched at the opening of this story will do — and perhaps do it better. It will put just about the same amount of power into an antenna that the '10 outfit will — and with better frequency stability. The push-pull circuit takes care of the latter.

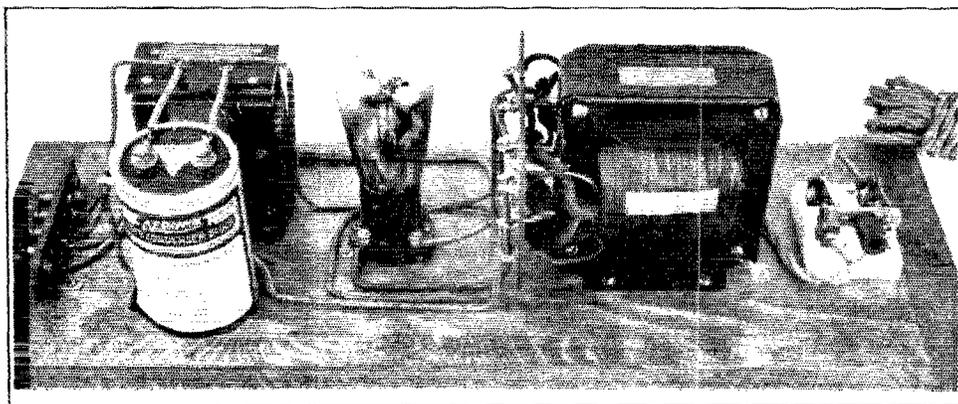
When the Type '45 tube was first introduced it was labelled "not intended to be used as an

oscillator," and most amateurs, remembering bitter experiences with the Type '50, were inclined to believe it. Whatever the intentions may have been, however, the fact is that the '45 is a very good oscillator, exhibiting none of the characteristics which made the '50 infamous. Having made this statement, we suppose that by the time this *QST* is out a week we'll have at least seven letters telling us we're all wet, because the writers personally tried out the tubes with only a thousand volts on the plate and they (the tubes, of course) blew up. If that happens all we can do is write back. "So they ought." It is a fact, however, that a number of the tubes have stood up for continuous runs with 400 volts and more on the plates without showing any signs of an early demise or losing their ability to oscillate. Strange to say, the '45 at 400 volts and less gives more output than the '10 with the same plate voltage. This was found to be invariably true in a number of test set-ups in the laboratory. But don't get the idea on that account that the '45 is a better tube than the '10 — it won't stand the

the 150-watt transmitter in June, *QST*, with a few simplifications. A fixed-tune grid coil is incorporated in the transmitter in place of the usual tuned circuit, and the antenna tuning system has been changed to eliminate one condenser. All circuit elements which could possibly be dispensed with have been eliminated from the set.

The baseboards for both the transmitter and power supply are both the same size, each being half of an 18 x 26 breadboard. They are sandpapered smooth and given three coats of Duco clear lacquer, with a little smoothing treatment with fine sandpaper between each coat. Rubber "bumpers" are used as feet, one at each corner of the baseboard.

Most of the transmitter parts are mounted on top of the baseboard. From left to right are the antenna tuning condenser, a pair of standoff insulators to which the antenna or feeder connections are made, another pair of standoff insulators which support the antenna coupling coils, and a third pair of insulators supporting the plate coils of the transmitter. Next in line is the tank tuning



THE POWER SUPPLY

Utilizing a Type '80 rectifier, a broadcast power-pack transformer and choke, and a double-section electrolytic condenser.

voltage that the '10 will by any means. The point we wish to bring out is this — *two* '45's in a push-pull transmitter with about 350 volts d.c. on the plate will give as much output with as good frequency stability, as *one* Type '10 with 600 volts d.c. on the plate (the usual voltage from a 550-volt transformer with a good filter and normal load on the tube). And the cost is a whole lot less. The latter point is the important one. Aside from that, the r.f. portion of this transmitter can be used with a pair of Type '10 tubes as well as with '45's, with quite an increase in output if the '10's are run with the normal power supply used with those tubes.

BUILDING THE TRANSMITTER

Getting down to constructional details, the circuit will be recognized to be essentially that of

condenser, the tubes and their sockets, the grid coil and mounting, the grid leak, and finally, the binding post strips for connections. The photo of the under side of the transmitter baseboard shows the radio-frequency choke coil in the positive high-voltage lead, the filament center-tapped resistor, the filament by-pass condensers, and the wiring to the connection strip.

The layout shown is about the most logical for a push-pull transmitter, and allows connections to be symmetrical. In fact, the transmitter is laid out in exactly the same way as the schematic diagram in Fig. 1, except, of course, that the connections have been brought out to the end of the board instead of one side of it, as the schematic diagram would indicate. The wiring underneath the baseboard has been kept as near to the center of the board as possible to keep it away from

strong r.f. fields. The center-tapped resistor across the filaments is connected at the mid-points of the wires joining the filament connections on the tube sockets. A home-made strap of thin brass holds the wires, which are No. 14 rubber covered, in place. The r.f. choke coil in the

prevent loosening of the turns and to keep out moisture.

Connections between the grid coil socket and the grid posts on the tube sockets, and also between the tuning condenser and the plate posts on the tube sockets, are made with ordinary bus wire, since these wires do not have to carry heavy currents. The connections between the tuning condenser and the insulators which support the plate coil, however, must be made of the same size of copper tubing used for the plate coil, because these connections are part of the tank circuit and heavy currents flow in them. In placing the tuning condenser and the insulators be sure that both of the copper-tubing connectors are the same length from the connections on the condenser to the insulators, to make certain that the tank circuit is symmetrical.

The insulators which hold the plate coil are spaced $4\frac{1}{2}$ inches between centers. The coils are wound to fit on the insulators, and the spacing between turns can be judged by an inspection of the photograph. The 3500-ke. coil is wound on a piece of pipe with an outside diameter of $2\frac{3}{4}$ inches, while all the other coils are wound on pipe $1\frac{5}{8}$ inches in outside diameter. Each of the plate coils must have an even number of turns so that the clip for the center tap can be placed on the under side of the coil. A brass machine screw is run through the baseboard midway between the insulators holding the plate coil, and a nickel-plated battery clip is connected to the screw by a short length of flexible wire. When the coil is fastened to the insulator the clip is placed on the center turn.

The antenna coils are wound on $1\frac{5}{8}$ -inch pipe, one end of the coil being brought out so that the axis of the coil will line up with the axis of the plate coil when fastened in place. Be sure to wind both antenna coils in the same direction. If wound in opposite directions the fields will "buck," and the antenna will not take power from the transmitter. The antenna coils shown have seven turns each, but the exact number to use will depend on the type of antenna system employed. These coils will be satisfactory with a Zeppelin antenna on all bands if the feeders are between 45 and 50 feet long.

The coils will keep a pleasing bright finish if they are carefully cleaned and lacquered. Before winding each coil, the necessary length of tubing should be thoroughly scoured with steel wool. After the coil is finished and the spacing between turns adjusted correctly, it should again be touched up with steel wool and then scrubbed with a rag soaked in alcohol to remove grease. When dry, Duco lacquer, preferably thinned out considerably with the thinner which comes for that purpose, should be painted on with a small brush, making certain that the entire surface is covered, and then allowed to dry thoroughly before the coil is put in service. If the coils are not

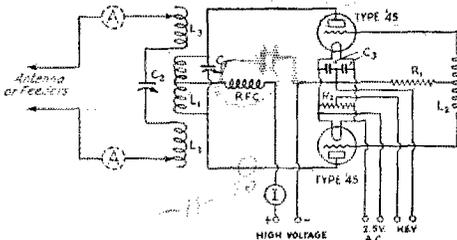


FIG. 1.—THE TRANSMITTER CIRCUIT

Showing series antenna tuning.

C_1 —500 μ fd.

C_2 —850 or 500 μ fd.

C_3 —250 μ fd.

R_1 —50,000 ohms.

R_2 —20-ohm center-tapped resistor.

RFC—Two-inch winding of No. 36 d.s.c. on half-inch form.

L_1 —3500 kc.—12 turns of $\frac{1}{4}$ -inch copper tubing $2\frac{3}{4}$ " inside diameter.

7000 kc.—8 turns of $\frac{1}{4}$ -inch copper tubing $1\frac{5}{8}$ " inside diameter.

14,000 kc.—4 turns of $\frac{1}{4}$ -inch copper tubing $1\frac{5}{8}$ " inside diameter.

L_2 —3500 kc.—72 turns No. 32 s.s.c. on 1" form.

7000 kc.—40 turns No. 28 d.s.c. on 1" form.

14,000 kc.—16 turns No. 28 d.s.c. on 1" form.

L_3 —7 turns of $\frac{1}{4}$ " copper tubing $1\frac{5}{8}$ " inside diameter.

I —0-150 d.c. milliammeter or 6-volt flashlight bulb.

A —0-1 thermocouple ammeters—these are not entirely necessary but are helpful in tuning.

plate lead is connected to a brass bolt which comes through the baseboard, and should be installed as near the plate coil as possible, but at right-angles to it.

The grid coils are wound on rigid insulating forms 1" in outside diameter, and no spacing is used between turns. These coils, together with the plate coils accompanying them, are shown in another photograph. The coils are mounted on General Radio Type 274-BP plug assemblies, and the socket is a Type 274-BJ three-jack assembly. These assemblies are very convenient, although a dollar or so can be saved by using G.R. jacks and plugs and mounting them on bits of hard rubber or bakelite in a similar fashion. In winding the coils it should be remembered that a change in the wire size, or even a change in the type of insulation on the same size of wire, will make necessary a different number of turns. If the diameter of the wire, including insulation, is smaller than that given, less turns will be needed, and vice-versa. The correct number of turns is easily found if a plate milliammeter is available, and the adjustment will be described later. Be sure that the same number of turns is used on each side of the center tap. When the coil is completed it should be "doped" to

lacquered they will oxidize in a day or two. This is particularly true of the plate coils, which get appreciably warm in operation, and if not lacquered will turn a muddy brown color in a very short time.

In building the transmitter be certain to use exactly the same values for the circuit elements as are specified in Fig. 1. They are the ones which were found to be best after a considerable period of experimentation.

THE POWER SUPPLY

There is nothing unusual about the power-supply unit, except that the output voltage is somewhat lower than that commonly employed in low-power transmitters. The high-voltage winding of the power transformer furnishes 350 volts each side of the center tap, which is rectified by the Type '80 tube, and then fed into the filter. The latter is a brute-force arrangement, using a double-section dry electrolytic condenser and a 30-henry choke. Each of the condenser sections is rated at 8 μ fd. and will stand 500 volts peak. The peak voltage of the transformer output is safely within this rating. An actual test of the power supply unit showed that the no-load voltage delivered by the rectifier and filter was between 450 and 500, dropping to about 350 volts under a load current of 100 milliamperes, the normal current taken by the transmitter when delivering power to the antenna.

The power transformer is of the type often used in broadcast receivers, and in addition to the high-voltage winding has a 5-volt winding for the filament of the Type '80 rectifier and two 2.5-volt windings, one of which is used to light the filaments of the Type '45 tubes in the transmitter, the other being left idle.

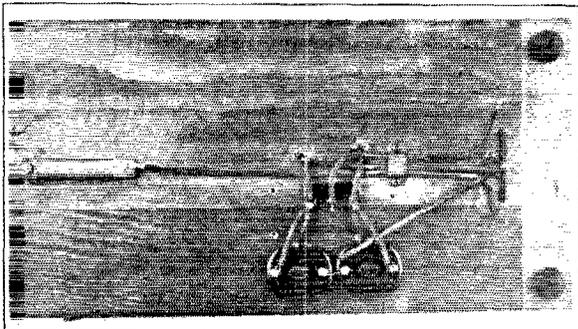
All of the wiring is above the baseboard in the power supply. No. 14 rubber-covered wire is used for connections, the insulation effectively preventing short-circuits. A double-pole single-throw switch for tuning the line voltage on and off, and a cord and plug for making connections to the house current complete the outfit.

When using electrolytic filter condensers be sure to connect them in the circuit with the polarities correct. The outside can is usually the negative connection, the positives being the binding posts on top. Instructions usually accompany the condenser.

With this power supply it is easily possible to get a pure d.c. note on all bands if the transmitter is well built and properly adjusted. If the d.c. note is not forthcoming look to the transmitter itself and not the power supply — this same trouble was encountered in working out the details of this outfit and it can be overcome with a little patience.

GETTING INTO OPERATION

There is nothing more hopeless than trying to adjust a transmitter without the means of knowing just what effect each change made has on the frequency, note and output. Two things at the very least are necessary — a monitor and some sort of indicator for telling when the antenna is taking load. The monitor should be used in conjunction with a frequency meter, or at least should be calibrated so that it is possible to tell with certainty whether the transmitter is in the band or not. Radio-frequency ammeters in the feeder leads are useful for determining when the antenna is tuned correctly, but the plate milliam-



THE WIRING UNDERNEATH THE BASEBOARD

The plate choke, filament center-tap resistor and filament by-pass condensers are shown in this photograph. Note that the condensers and resistor are connected to the midpoints of the wires joining the filament connections on the tube sockets.

meter is the handiest all-around meter to have, because with it the input power can be estimated and it can be used to indicate resonance with the antenna. By its use it is also possible to tell whether the tubes in the set are being overloaded or not. A 6-volt flashlight bulb or dial-light may be substituted for the milliammeter and will serve as a resonance indicator, although the actual plate current cannot be read in this case.

Suppose now that the monitor is ready for use and that a milliammeter or bulb is connected in the positive high-voltage lead to the transmitter. The transmitter is to work on the 3500-ke. band for this illustration. The proper coils are in place and all connections are tight.

First make sure that the antenna or feeders are disconnected and that the antenna coupling coils are moved as far from the plate coil as possible. Set the plate tuning condenser at maximum and close the key. The milliammeter reading should be somewhere between 25 and 45 milliamperes. Slowly turn the plate condenser, watching the milliammeter at the same time, and see if the plate current decreases to a minimum at some reading and then begins to rise again. This dip should occur at very near full capacity on the

not altogether necessary. The antenna current values are really meaningless, and if the meters are used the transmitter and antenna tuning should be adjusted so that the current through both is the same, regardless of the actual value of that current. A scale of 0-1 ampere will be sufficient for a set of this power.

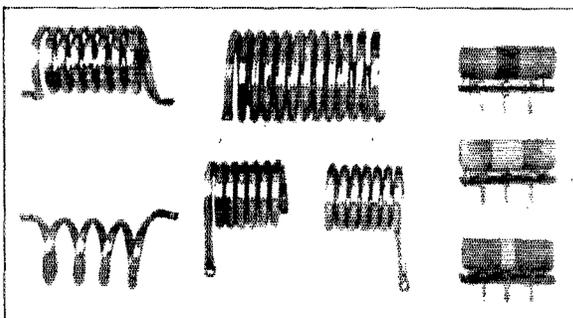
SOME TROUBLES

One of the worst problems encountered in building the set was that of eliminating unwanted r.f. in the power supply. R.f. wandering back into the power transformer and filter always makes itself known by roughening up the note — the blame for which is usually placed on the filter. The d.c. returns to the grid and plate in this circuit are fed in at a point of minimum r.f. voltage so that no chokes would seem to be required. This is true so far as the fundamental frequency is concerned, but unfortunately, as pointed out in the September "Uncle Jimmy" story, the second harmonic flows in these leads with much gusto unless something is done to prevent it. This happened with this transmitter and led to some rather curious results.

In an experimental "haywire" layout first built up for the purpose of testing out the '45's, a generator was used to supply plate voltage so the voltage could be readily adjusted, and the filament winding on a "B" supply furnished the filament power. The set was reduced to the bare essentials — no chokes or by-pass condensers were in it at all — and consisted of a plate coil, plate tuning condenser, two tubes, an untuned grid coil and a grid leak. A dummy antenna was used for a load. No trouble was experienced in getting a very good d.c. note on 14,000 kc. with this rig, even though no attempt was made to filter out the commutator ripple of the generator.

Next the outfit shown in the photographs was built up, but without any chokes or by-pass condensers in the transmitter itself. The 2.5-volt winding on the power transformer had no center tap, and since no center-tapped resistor was handy at the time, the filament supply used with the experimental set — which was center-tapped — was used temporarily. The power-supply unit shown furnished the plate power, however. This set performed in exactly the same way as the first one, which naturally was expected. In the meantime the center-tapped resistor arrived from downtown and was installed in the set — and then our troubles commenced. Using the 2.5-volt winding on the power transformer, the set simply would not give a d.c. note on any of the three bands — yet as soon as a separate filament supply was used the note became d.c. again.

Checking on the monitor showed that a strong second harmonic was present, and the inference was that this harmonic was getting back to the power transformer through the filament wiring and thus into the plate-supply system. With a separate filament transformer it was probably "washed out" in the line before it could get back to the plate supply. 500- μ fd. by-pass condensers were then tried across the filament, and on 3500 kc. the note immediately changed to pure d.c. On 14,000 kc., however, the note was much worse with the by-pass condensers than without them. This didn't look so good, so the next thing tried was a small choke in the positive lead, leaving off



THE TRANSMITTER COILS

The two copper-tubing coils on the left are the 7000-kc. and 14,000-kc. plate coils. The large coil in the center is the 3500-kc. plate coil, and the two below it are the antenna coupling coils. The grid coils for the three bands are at the right.

the by-pass condensers. The note immediately changed to d.c. on 14,000 kc., which was highly encouraging, but back on 3500 kc. there was still a noticeable ripple, although less than without the choke. A larger choke (the one shown in the photograph) was next tried with some improvement on 3500-kc. and no change in the d.c. on 14,000 kc. No larger chokes were available, so the filament by-pass condensers were tried again, this time with the choke in the circuit, and the note was again pure d.c. on 3500 kc. But again there was some ripple on 14,000 kc.

Finally 250- μ fd. condensers were substituted for the 500- μ fd. size which we had been using, and this capacity proved to be large enough, in conjunction with the choke, to give the desired d.c. note on 3500 kc., and still small enough not to upset things on 14,000 kc. On 7000 kc. this combination functioned equally well. With a good-enough choke the by-pass condensers could probably be eliminated on all bands — and if a separate filament transformer is used for the oscillator filaments neither choke nor condensers are necessary. Certainly there are more things than the filter alone to be considered in getting that elusive d.c. note on high frequencies.

INCREASING POWER

The fact that Type '10 tubes can be used in the set has been mentioned previously. The power output can be considerably increased by using a pair of '10's with about 600 volts on the plate, although there is no advantage in using these tubes with the power supply illustrated — rather the opposite. It may be found desirable to change the size of the grid coils slightly to get the best results with Type '10 tubes, and the method of adjustment already described should be followed. No changes in the other values are necessary, except that a 10,000-ohm leak would allow slightly greater output. The high-resistance leak specified for the '45's is necessary because greater bias is required for efficient operation, the amplification factor of the '45 being less than half that of the '10.

The set is an excellent one for the beginner just as it is, giving as it does a reasonable amount of power output with excellent frequency stability. If higher power is desired later, the money invested is not wasted, because this outfit forms an ideal master-oscillator to feed a pair of amplifier tubes. The output is more than ample to swing a pair of Type '10 tubes with 750 volts on the plates as a neutralized amplifier, and although we have not had an opportunity to try it with larger tubes, should be capable of feeding a pair of '03-A's or '52's to give normal output. Use of the outfit as a master oscillator is highly recommended, because the effect of a swinging antenna on the frequency is eliminated, and since a separate power supply for the oscillator is available the regulation under load conditions is good. In addition, the separately-excited amplifiers will give more output and can be adjusted for greater efficiency than when the same tubes are used as oscillators.

Central Division Convention

(Ohio State)

THE convention this year was held at the Dayton Biltmore Hotel in Dayton, Ohio. Officially the dates were the 30th and 31st of August; however, on the 29th several of the early comers got together in true ham fashion and held a private party the evening of the 29th and friendships were made and renewed before the actual convention. Saturday, delegates arrived from all Ohio and surrounding states and before lunch there were 150 registrations, which gave promise to be a well attended affair.

K. B. Warner and C. C. Rodimon of A.R.R.L. Headquarters appeared on the scene early and trips to the famous Wright Airport were made by some of the delegates while others preferred to visit the Van Horne tube factory or the General Motors Radio Corp.

After lunch the convention was officially opened when Mr. "Art." John, president of the Dayton Amateur Radio Assn., sponsors of this year's convention, welcomed the delegation and was followed in turn by Mayor MacDonald. Director D. J. Angus then gave the fellows a "handshake" and introduced Secretary-Editor Warner and C. C. Rodimon, W1SZ. Short talks were then given by George Morton on "Condenser Microphones"; W. T. Walter, of Jewell Elect. Inst. Co., about "Electrical Measuring Instruments and Their Application to Amateur Radio"; E. C. Estey, of Aluminum Co. of America, told about some of the high spots in the Toronto I. R. E. Convention and also of the "Application of Aluminum to Amateur Radio"; C. H. Vincent, WSRD, spoke on "Aircraft Radio Communication" and H. F. Breckel gave a Naval Reserve talk.

After dinner the gang assembled and listened to talks by F. R. Finehout, E. Springer, J. R. Martin and F. H. Schnell. Schnell of Radio and Television Inst., Chicago, did not have a chance to finish his talk, so it was finished with illustrated slides after the banquet on the following evening. After adjournment Saturday evening, informal chats were held here and there around the hotel until listeners, gradually overcome by the strenuous day, were forced to retire.

Sunday morning a good attendance was noted at the Traffic Meeting. This meeting was presided over by Director Angus and several points that were heretofore hazy were cleared up to the satisfaction of all those present. After this spirited meeting those present assembled out doors and had a group photo taken.

During the afternoon most of the fellows took the trip out to Mason, Ohio, to give WLW-WSAI the once over. The 'phone men were in their element at this Mecca.

All assembled back at the hotel for the great event of the convention — the banquet. The final registration was 201 and when all were seated at the banquet tables there were about 250 present. After a delicious dinner, entertainment and the general hilarity had settled down Director Angus acted as toastmaster and all hands entered in and gave a hand to the Program Committee and D.A.R.A. for one mighty fine convention. Mr. Warner talked on amateur matters and regulations. This was followed by talks from C. C. Rodimon and H. F. Breckel. Mr. Schnell then finished his talk on a superheterodyne receiver. After the prize drawing of some seventy prizes and the 'phone and c.w. men had a general open meeting the curtain was lowered on one more of these amateur conventions which are getting to be more and more cosmopolitan. Mr. L. E. Furrow, W8IX, and his helpers on various committees are to be congratulated on the enjoyable meetings and get-togethers.

— C. C. R.

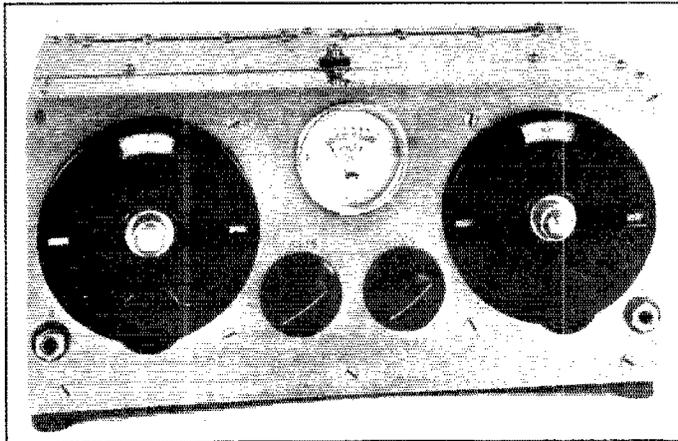
Something New in Receiver Design

By C. R. Stevens*

A SENSITIVE, selective and rugged high-frequency receiver capable of power output sufficient to operate a loud speaker need not be much more bulky than the usual ham receiver having lesser qualifications, and the receiver described in this ar-

circuit impedance coupled to the tuned grid circuit of the following r.f. stage. The tuned r.f. amplifier also uses a Type '22 tube.

The most unusual circuit feature of the receiver is the detector arrangement. This consists of two tubes, one of which acts as the oscillator



COMPACTNESS AND RIGID MECHANICAL CONSTRUCTION ARE FEATURES OF THIS RECEIVER

The tuning control at the left is that of the radio-frequency stage and that at the right is for the detector. The meter indicates filament voltage. Beneath it are the filament rheostat and regeneration control knobs. The jacks are for 'phones or loud speaker.

title demonstrates just how one can be built. Although the set is extremely compact, measuring but 12" long by 5 3/4" high by 6 3/4" deep, it contains six tubes in a circuit combination having unusual and attractive features. The receiver was designed with the peculiar problems of high-frequency reception in mind and none was overlooked during the six months required for the set's development. The result is a receiver that has excellent selectivity, although free of the usual critical adjustments, and delivers loud-speaker performance on any frequency between 37,500 and 1500 kc. (8 and 200 meters).

The set is designed for d.c. operation and comprises a stage of tuned radio-frequency amplification preceded by an aperiodic coupling stage, a special two-tube detector, and two stages of audio.

The circuit of the receiver is shown in Fig. 1 and the arrangement of the components is shown in the illustrations.

The antenna coupling stage uses a Type '22 tube with its grid circuit untuned and its plate

and does the regenerating while the other functions only as a detector. This circuit arrangement

COIL TABLE

Freq. Range	Diam.	Wire Size			Number of Turns		
		L ₁ , L ₂	L ₃	L ₁	L ₂	L ₃	
37.5 to 15 mc.	1"	No. 16	No. 28	5	3	5	
16.7 to 10 mc.	1"	No. 16	No. 28	7	5	7	
10.7 to 6 mc.	1 1/8"	No. 16	No. 28	11	8	9	
6.5 to 4 mc.	1 3/8"	No. 20	No. 32	16	11	10	
4.35 to 3.3 mc.	1 1/2"	No. 22	No. 32	24	14	12	
3.5 to 2.2 mc.	1 3/4"	No. 22	No. 32	30	20	13	
2.4 to 1.8 mc.	1 1/2"	No. 22	No. 32	37	27	16	

The 1" diameter coils are wound on tubing of this size mounted on the bottom of a UX tube base. The 1 3/8" coils are wound on tube-bases. The 1 1/2" forms are No. 131 Silver-Marshall. All coils are wound in the same direction with the tickler windings at the filament ends of the grid windings and spaced 1/8" from the latter. There is no spacing between turns. The wire may be enamel covered, cotton and enamel, d.c.c. or d.s.c.

was suggested in the Experimenters' Section, QST, March, 1930. The regeneration tube is a

* P. O. Box 494, Waterbury, Conn.

Type '01-A and the detector tube is a Type '00-A. Regeneration is controlled by a 200,000-ohm variable resistor in the supply lead to the

makes possible the operation of the detector tube at the values of plate voltage and grid-leak resistance which give greatest sensitivity and at

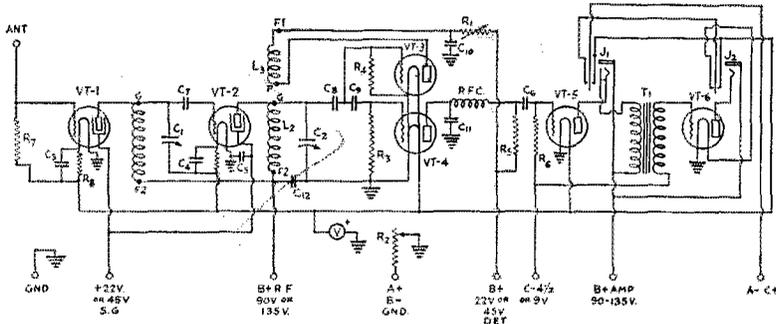


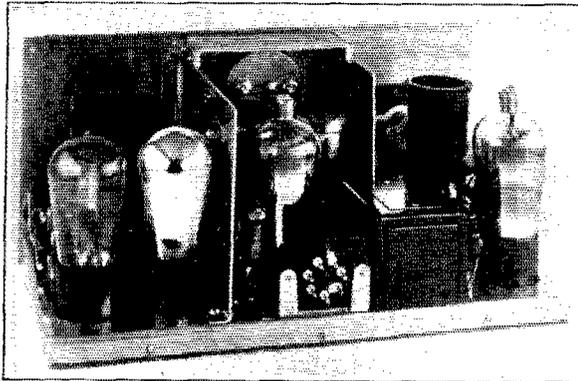
FIG. 1 — THE SEPARATE TUBES FOR REGENERATION AND DETECTION MAKE THE CIRCUIT "DIFFERENT"

- L₁, L₂ and L₃—See coil table.
- C₁—No. 317 Silver-Marshall condenser with 3 rotary and 2 stationary plates.
- C₂—Same as C₁ but with 4 rotor and 3 stator plates.
- C₃, C₄, C₅ and C₆— .01- μ fd. fixed condensers.
- C₇, C₈ and C₉— 150- μ fd. fixed condensers.
- C₁₀— .001- μ fd. fixed condenser.
- C₁₁— 500- μ fd. fixed condenser.
- C₁₂— 25- μ fd. fixed condenser.
- R₁— 200,000-ohm Centralab regeneration control.
- R₂— 6-ohm rheostat.
- R₃— 7-meg. leak.
- R₄— 10-meg. leak.

- R₅— 1.5-meg. leak.
- R₆— 5-meg. leak.
- R₇— 150,000-ohm Durham resistor, 1 watt.
- R₈, R₉— 10-ohm fixed resistors.
- VT₁, VT₂— Type '22 r.f. amplifiers.
- VT₃— Type '01-A regenerator.
- VT₄— Type '00-A detector.
- VT₅, VT₆— Type '12-A audio amplifiers.
- T₁— Silver-Marshall No. 256 audio transformer.
- J₁, J₂— Filament control jacks.
- RFC— 60 turns No. 32 d.c.c. scramble wound on 3/4" diameter form.
- V— Filament voltmeter, 0-6 or 0-7 volts d.c.

regenerator's plate. The separation of the functions of detection and regeneration has several

the same time allows the adjustment of the oscillator for best regeneration and oscillation. This cannot be accomplished so readily with a single tube used as an autodyne detector because the conditions for best detection are not usually those for greatest regeneration and smoothest oscillation. Elimination of the detuning which usually accompanies adjustment of the regeneration control is also accomplished. This makes possible the accurate calibration of the receiver. Moreover, the hissing background peculiar to an oscillating detector is almost entirely absent. This is especially advantageous when both stages of audio are used for loud-speaker reception.



THE SPACE BEHIND THE PANEL IS COMPLETELY UTILIZED

The screen-grid tube in the center compartment is the antenna-coupling tube. The tuned r.f. stage is in the compartment at the right. The left-hand compartment contains the detector unit, the regenerator tube being the one at the right and the detector tube the one at the left. The two audio amplifier tubes are in the center compartment. The coupling lead between the tuned r.f. stage and the detector compartment is run beneath the base. Battery connections are made to the Yazley terminal plate.

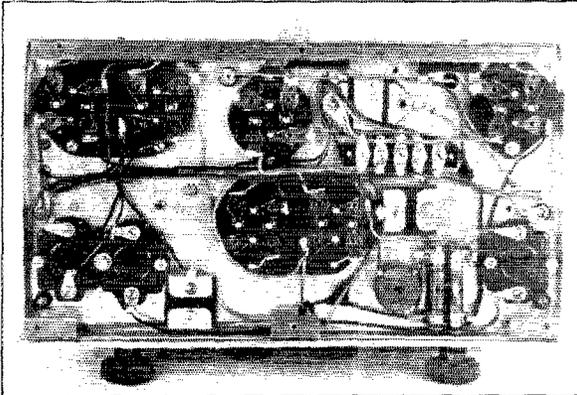
outstanding advantages which make the use of an additional tube worth while. The arrangement

second transformer coupled to the plate circuit of the preceding stage. Both audio stages use

Type '12-A tubes. Each stage is equipped with a filament-control jack so that one stage can be used for head-set reception and two stages for loud-speaker operation.

CONSTRUCTION

Mechanical design has been given just as much attention as the electrical features with the result that the receiver not only performs well but may be depended upon to continue doing so despite the more or less rough handling which any ham receiver must sometimes withstand. The apparatus is assembled on a heavy aluminum panel and sub-base which fit into the aluminum case. The aluminum panel is 12" long by 5 $\frac{3}{4}$ " high by $\frac{1}{8}$ " thick and has mounted on it the two tuning condensers, the voltmeter, telephone jacks, the filament rheostat, and the regeneration control resistor. Particular care must be taken to insulate from the panel both filament control jacks (J_1 and J_2), the Centralab resistor (R_1) and the r.f. stage tuning condenser (C_1). The detector tuning condenser (C_2), which is at the right, and the filament rheostat (R_2) should not be insulated from the panel.



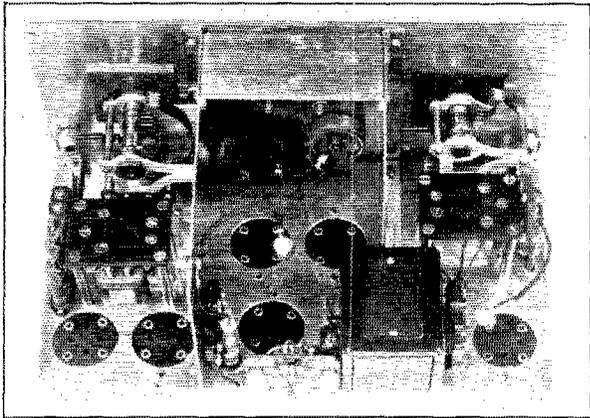
ALL CONNECTIONS TO TUBE-SOCKET TERMINALS ARE MADE BENEATH THE SUB-BASE

The detector sockets are at the upper left, the antenna coupling tube and audio tube sockets are in the center, and the tuned r.f. tube socket is at the right.

The sub-panel is made from a piece of $\frac{1}{16}$ " aluminum sheet 12 $\frac{3}{4}$ " long and 7 $\frac{1}{2}$ " wide. A $\frac{1}{2}$ " lip is turned up on all four edges, making the resultant dimensions 11 $\frac{3}{4}$ " by 6 $\frac{1}{2}$ " by $\frac{1}{2}$ " deep.¹ The sub-panel is bolted to the front panel by three $\frac{6}{32}$ " flat head machine screws, $\frac{3}{32}$ " from the bottom and $\frac{1}{8}$ " from each end of the front panel.

¹ A good method of bending angles on aluminum sheet is desirable in *Building Shields*, QST, Nov., 1929. — Editor.

The unit is now ready for the mounting of parts on the sub-panel. The layout of parts is shown in the illustrations. In the rear view of the



SUB-PANEL SOCKETS MAKE FOR ECONOMY IN SPACE

The plug-in coil mountings are elevated above the base board. The antenna connection is made to the insulated terminal on the shield between the center and left-hand compartments.

assembly the compartment in the center contains the screen-grid antenna coupling stage and audio tubes. To the right, separated by a $\frac{1}{16}$ -inch thick aluminum shield, is the tuned radio frequency stage. The audio transformer is mounted half in each compartment.

On the left, also separated by $\frac{1}{16}$ -inch shield from the antenna coupling compartment, is the two-tube detector compartment, the detector tube being the one at the left. This layout of parts was thoroughly tried out, and to avoid tube coupling this arrangement was found the most satisfactory.

Sub-panel sockets of the rigid type are used throughout and allow all wiring to be on the underside of the sub-panel, as are most of the condensers, resistors and chokes.

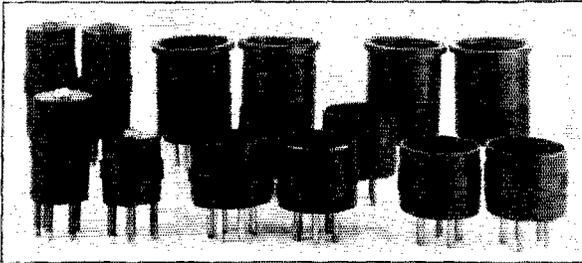
The plug-in coil sockets are raised $1\frac{1}{4}$ inches above the sub-panel, keeping the coils insulated as much as possible from other parts. A Yaxley No. 660 cable connector takes care of all battery leads. Any similar cable connectors having seven or more leads might be used. Care should be taken in wiring to have wires as short as possible, and to ground the "A+" and "B-" by the shortest path to the sub-panel.

After the unit is completed the next step is to construct a cabinet. Aluminum $\frac{1}{16}$ inch thick was chosen as the ideal material. A piece of sheet iron is used as a stronger bottom. The two ends are cut first; one left, one right. Both are 6 $\frac{1}{4}$ inches by 6 $\frac{5}{8}$ inches, each being bent $\frac{1}{2}$ inch up from the 6 $\frac{1}{4}$ -inch side to form a 90-degree angle,

making them the same height as the panel, or $5\frac{3}{4}$ inches.

The back is then cut $11\frac{7}{8}$ inches by $6\frac{1}{4}$ inches and is also bent to form a right angle $\frac{1}{2}$ inch up on the long side, making it $11\frac{7}{8}$ inches by $5\frac{3}{4}$ inches.

Angle brackets cut out of brass $\frac{1}{16}$ inch thick are used to fasten the back and sides. These brackets are first fastened to the rear section at the extreme edges by $\frac{6}{32}$ round-head screws. Then the sides are fastened to the back so the edges come flush with the outside, using $\frac{6}{32}$ round-head screws.



THE COMPLETE SET OF COILS

The coils are arranged in pairs, the ones with two windings being the detector coils and those with the single winding the r.f. coils.

The bottom section can now be made, and added to the two sides and back. It is made of sheet iron $\frac{1}{16}$ inch thick and is $11\frac{3}{4}$ inches by $6\frac{1}{2}$ inches and is fastened to the two sides and back by $\frac{6}{32}$ round-head screws with the heads of the side and back sections on the underside of the bottom section.

The top of the cabinet is constructed of three pieces of $\frac{1}{16}$ -inch (thick) aluminum, cut to the following sizes: 1 inch by 12 inches, 2 inches by 12 inches, and $3\frac{3}{4}$ inches by 12 inches. These are placed in the following way, covering the sides and back section: 1 inch by 12 inches, along the back lapping over the sides and back; 2 inches by 12 inches, along the front lapping over the sides, but even with the front edges of the side sections; the third piece, $3\frac{3}{4}$ inches by 12 inches, is fastened to the back strip by hinges, making a hinged lid which is very convenient for changing coils or tubes.

The ground binding post is fastened to the metal cabinet. The antenna binding post is insulated from the cabinet and a flexible wire connects it to the grid of the antenna coupling tube. The cabinet is then completed, and makes a very rigid, and compact container for the chassis.

After the assembly and wiring is completed, a thorough test is always a good "safety first" idea. It never pays to just say, "I think I have everything O.K." The simplest test method is by the use of a $4\frac{1}{2}$ -volt "C" battery and a voltmeter. Proceed in the usual manner, noting particularly the following: Test all leads and

terminals for any possible short circuit to the metal chassis or panel. Test all connectors that are grounded, and make sure they are grounded. Make a thorough examination of the condensers, C_1 and C_2 , making absolutely sure that the movable plates do not touch the stationary plates in any position. A possible short at a point like this may prove very disastrous, especially in C_1 .

Operation of this receiver is as easy as that of any two-dial receiver. In this circuit each control, radio frequency and detector tuning, shows the same amount of sharpness, a feature in itself giving extreme selectivity. The tuning is as sharp as that of the average superheterodyne circuit — and that's sharp! This sharpness is absent in many short-wave tuned radio frequency receivers, especially in the radio frequency stage. When the radio frequency stage is really sharp, incoming signals do not have the slightest tendency to hang on but really cut off as either dial is moved slightly. The receiver should not squeal or make any disagreeable noises while being tuned, but as both dials are brought into tune a slight "pluck" or "swish" — as is evident in a B.C. superhet —

will be heard, disappearing upon the retarding adjustment of the regeneration control. Tuning is most satisfactory when the regeneration is just enough to show that the radio frequency stage and the detector stage are in resonance.

All amateur bands cover a large space on the dials. The 14,000-ke. band occupies 30 divisions, the 7000-ke. band 43 divisions and the 3500-ke. band 70 divisions.

The New England Division Convention (Maine Section)

THE Third Annual Maine Section Convention was held at Portland, Friday and Saturday, August 22nd and 23rd, under the very able auspices of the Portland Amateur Wireless Association.

Early morning of the 22nd found various members of the Convention Committee dashing hither and thither, busily engaged in "getting things organized" for the official opening of the first day's session. The registration booth was set up at the Eastland Hotel, and preparations for signing up the delegates were made. An amateur station was installed in the Sun Room of the hotel under the supervision of W1ATO, and was operated under his call. The Sun Room was a very popular

(Continued on page 80)

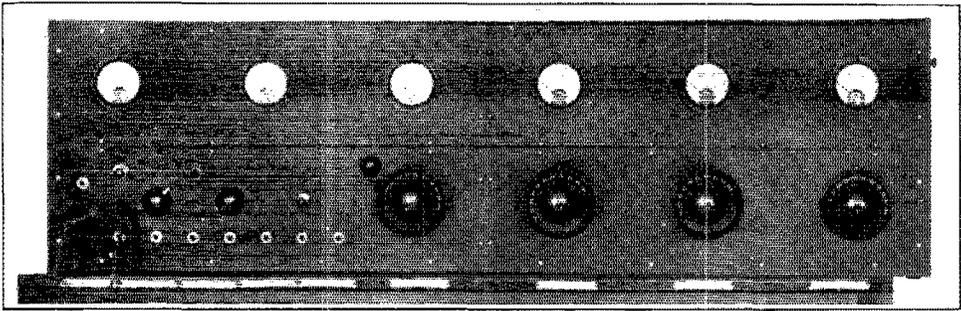
A Modern 50-Watt Radiophone Transmitter*

By Howard A. Chinn and Paul S. Hendricks †

DURING the past year it became evident that a modern radiophone transmitter for operation on the amateur and experimental frequencies between 3000 and 17,000 kilocycles would be an useful addition to the equipment of the Round Hill Research Laboratories which are sponsored by Colonel E. H. R. Green and under the direction of the Massachusetts Institute of Technology, at South Dartmouth, Massachusetts. The apparatus was desired for communication with field parties,

output from such an arrangement when the output tube is being modulated. An isolating or buffer-stage, employing a screen-grid tube is, therefore, used between the oscillator and the output amplifier. All tubes in the radio frequency circuits are thus operating at the same frequency.

Three stages of speech amplification employing two Type '12-A and one Type '50 tube are necessary so that a two-button carbon or a condenser microphone of the type common in broadcasting stations can be used. The condenser microphone



FRONT VIEW OF THE 50-WATT 'PHONE TRANSMITTER

with itinerant aircraft and for experimental work in connection with the transmission and utilization of standard audio frequencies.

After a careful survey of the many transmitter circuit arrangements possible, it was decided to design and construct a transmitter having a carrier output of fifty watts and capable of high percentage modulation with a good overall audio frequency characteristic. If it was found desirable or necessary to obtain a greater output power a linear radio frequency amplifier could be added at any time. The complete arrangement of tubes finally adopted is outlined in Fig. 1.

The radio frequency circuits consist of a Type '10 oscillator, a Type '65 buffer amplifier and a Type '11 output amplifier. The oscillator tube is arranged to be used as a crystal controlled tube if a quartz plate of the desired frequency is available or as a self-controlled oscillator when this is not the case. While the $7\frac{1}{2}$ -watt oscillator tube is capable of supplying enough energy to excite the 50-watt power amplifier directly without an intermediate stage of amplification, it is very difficult to maintain a constant frequency

itself usually has at least one stage of amplification incorporated in the microphone stand and this brings the output level of this unit up to that of the two button carbon microphone so that they are interchangeable. Both of these microphones, while capable of faithful electrical reproduction of the sound impinging upon the diaphragm, have a very low output level as compared to that of the ordinary single button microphone. If this latter type were to be used exclusively, a single stage of transformer coupled amplification would probably suffice to supply the grids of the modulators with the necessary audio frequency energy. A pair of UV-845 tubes connected in parallel is used to modulate the Type '11 radio frequency amplifier. This combination, with the particular circuit arrangement used, permits a high degree of modulation with relatively little distortion. A complete schematic diagram of the transmitter is given in Figs. 2 and 3.

The transmitter may be keyed for c.w. telegraph transmission by the usual methods.

The entire transmitter, exclusive of the power supply equipment and modulator reactors, is built into a single unit having an overall length of 48 inches, height of 14 inches and depth of 18 inches. The framework is of 1" x 1" whitewood

* Contribution from the Round Hill Research Division of the Massachusetts Institute of Technology.

† W1AXV-W1XP, Round Hill, South Dartmouth, Massachusetts.

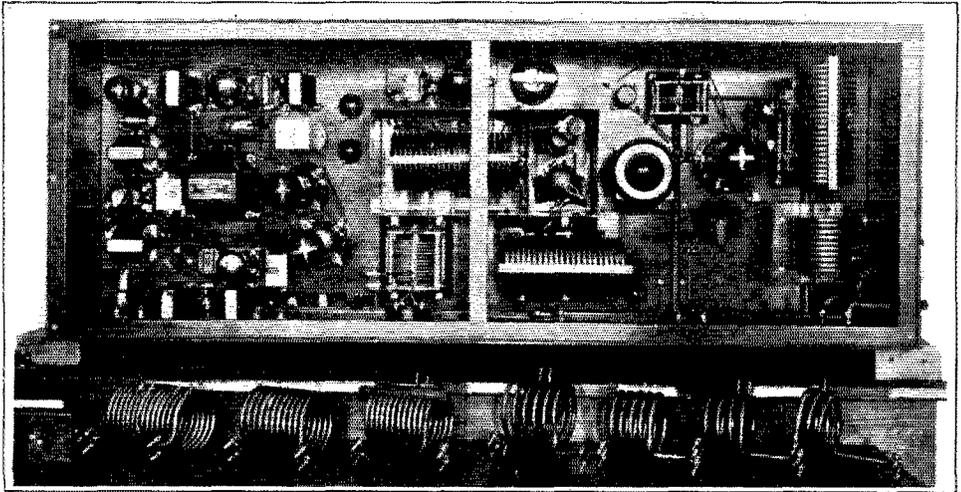
having a deck of $\frac{1}{2}$ " thickness mounted three inches up from the bottom, thus providing a space for the by-pass condensers, resistors, etc., as shown in the photograph of the under side of the set. The front panel is made up of four separate units of standard 7" x 24" x $\frac{3}{16}$ " bakelite stock. The framework is made smaller than the panels so that the complete unit can be enclosed by a cover of $\frac{1}{4}$ " wallboard. Both the framework and the wallboard cover are stained walnut and given two coats of shellac.

THE RADIO FREQUENCY SYSTEM

The radio frequency oscillator is a type Type '10 tube which may be crystal controlled

plugs in parallel at each end to make the coils readily interchangeable. Two plugs in parallel at each terminal have been found quite satisfactory to handle the amount of power used in this transmitter.

The screen-grid Type '65 buffer stage is coupled to the oscillator by means of the midget variable condenser C_{13} . A variable condenser is used in this position so the magnitude of the excitation voltage on the grid of the buffer tube may be adjusted to the desired value without necessitating a variable tap on the oscillator plate circuit coil. The plate voltage of 500 volts for the buffer tube is obtained from the 1000-volt source through the series resistor R_{11} . The screen voltage



PLAN VIEW OF THE TRANSMITTER

Details of the assembly are given in the text.

by plugging into its grid circuit a suitable quartz plate, or it may be operated as a self-excited Hartley oscillator by omitting the crystal and connecting the grid blocking condenser to the lower end of the tank coil L_5 . This operation is quickly accomplished by a plug arrangement. The filament tap is placed on L_5 at the point for proper operation as a self-excited oscillator and does not need to be changed when operating with the crystal. The plate power is obtained from a 1000-volt source and is reduced to about 250 volts by means of the series resistor R_{10} . It was found that this low plate voltage was more than sufficient to provide adequate output to excite the grid of the buffer amplifier tube. A milliammeter M_3 indicates the plate current of the oscillator tube. The tank circuit of the oscillator, as well as that of the buffer and the power amplifier, is composed of a 230- μ fd. National transmitting variable condenser C_{10} and an inductance wound of $\frac{1}{4}$ " copper tubing. These inductances are each fitted with two G.R.

is obtained by using a potentiometer arrangement which is provided by the resistors R_{12} and R_{13} . This method of obtaining the desired screen voltage from the plate supply has been found much more satisfactory than the use of a series resistor, as sometimes recommended. The screen or plate current may be read by plugging a milliammeter into jacks J_8 or J_9 respectively.

To take advantage of the isolation afforded by the screen-grid buffer tube between the oscillator and the power amplifier, it is necessary to provide adequate shielding between these circuits. For this a shield of 35 mil sheet copper is provided for the portion of the circuit which comprises the oscillator output and the buffer input circuits. It was found that this was all the shielding necessary to effectively prevent disturbances in the power amplifier circuits reacting upon the oscillator. This copper shield, as well as the copper tubing inductors, were polished and given a coat of clear lacquer to keep them bright and to prevent a possible increase in the radio

frequency resistance when the surface became oxidized.

The Type '11 output power amplifier is excited

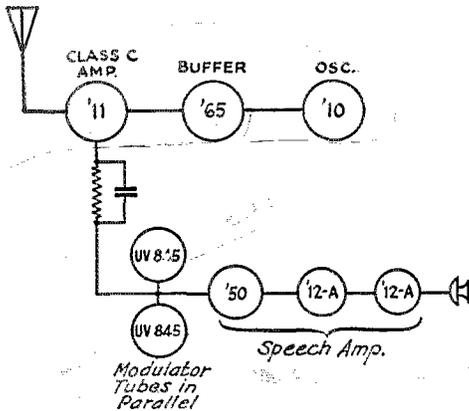
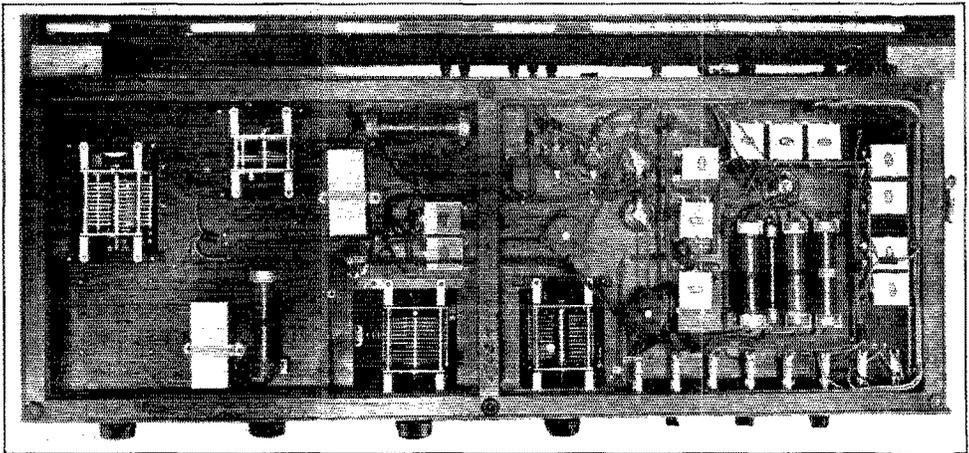


FIG. 1.— THE TUBE LINE-UP OF THE TRANSMITTER

from the buffer stage through the variable coupling condenser C_{11} , which is a National transmitting condenser having a capacity of $230 \mu\text{fd.}$ The

this stage of radio frequency amplification. For this purpose a neutralizing condenser C_{15} (a National transmitting condenser of $50\text{-}\mu\text{fd.}$ capacity) is connected between the grid of the tube and the lower end of its tank circuit coil. The radio frequency return, or high voltage tap, is then placed on the tank inductance at the point for proper operation of the tube, which is usually in the neighborhood of two-thirds of the way from the plate end of the coil.

Coupling to the antenna system, when using a quarter wave antenna and ground, is accomplished inductively by means of the 10-turn coil which is built into the set. This same coil is satisfactory when coupling by means of any two-wire feeder system and may also be used to couple a single-wire feeder inductively, by connecting one end of the coil to ground. The single-wire feeder system may also be used by tapping directly on the tank inductance, usually a turn or two towards the plate end of the coil from the filament tap. Inasmuch as series plate supply is used, it is advisable to put a blocking condenser in series with the feeder wire to keep the plate voltage off the antenna system. Series plate supply is consistently used throughout the transmitter because of the likelihood of trouble occur-



THE UNDER SIDE OF THE SET

Resistors and condensers in the supply circuits are placed beneath the apparatus with which they are associated.

plate voltage for the power amplifier is obtained through the modulation choke L_s and series resistor R_s . This provides the amplifier tube with 750 volts and permits an arrangement whereby a high percentage of modulation is possible. The resistor R_s must be by-passed for audio frequencies and for this purpose a $1\mu\text{fd.}$ high voltage condenser C_3 is used. A 300 milliampere meter M_4 indicates the current being taken by the plate of the tube.

The Type '11 being a three-element tube, it is necessary to provide a means of neutralizing

ring with radio frequency chokes that may operate poorly. These different feeder systems are used with this transmitter depending upon the operating frequency desired and the antenna that is available for the particular work.

It should be noted that care must be taken when using a single-wire feeder, that the entire system does not operate as an ordinary antenna-ground combination. This can be easily checked by noting whether the current distribution on the feeder wire is uniform over its entire length. In order to determine this, a low reading

thermo-ammeter (0.25 or 0.5 ampere) may be clamped onto the feeder wire at various places along its length and although the meter will not indicate the true current because of the shunting action of the short piece of wire that it spans, the reading should be alike anywhere on the feeder. If this test is tried at four points each one-eighth of a wavelength apart, beginning at any convenient point on the feeder, and the current is found to be equal at all these points, in all likelihood the current distribution is nearly uniform along the entire feeder.

Antenna tuning condensers were not built into this transmitter because at Round Hill it has been found more convenient to mount the necessary condensers on the wall at the lead-in insulators for the various antennas. Thus the antenna or feeder tuning condensers are associated with the antenna and not with the particular transmitter being used.

The radio frequency chokes in the grid circuits of the tubes are the G. R. 8 millihenry type. For use in the plate circuits a very satisfactory choke was found in the form of a machine wound inductance which is $\frac{1}{8}$ " thick, has an outside diameter of $1\frac{1}{2}$ " and is wound of No. 33 wire. The completed coil is thoroughly impregnated with paraffin to exclude moisture. These "pies" were secured from an old Amrad spark coil, one of which will keep an amateur supplied with r.f. chokes for several years. To prevent the various audio- and radio-frequency currents from wandering into places where they do not belong with the resulting probability of singing or "motor-boating" action, the circuit has been provided with ample by-pass condensers which are placed in the circuit both electrically and physically to provide the shortest alternating-current paths feasible.

All tank circuit inductances are wound of $\frac{1}{4}$ " copper tubing and have an outside diameter of $3\frac{1}{2}$ ". The spacing between turns varies for the different sets of coils. To make the large coils rigid mechanically it was necessary to clamp the turns with a pair of $\frac{1}{2}$ " x $\frac{1}{2}$ " notched oak strips, running the entire length of the coil and at right angles to the turns. The number of turns in the various coils, together with their frequency ranges, are tabulated below:

FREQUENCY RANGE (KILOCYCLES)

		2800-4600	4600-8300	12,000-17,000
Oscillator: Turns		22	12	3
L_o Spacing		$1/16''$	$1/8''$	$5/16''$
Buffer: Turns		22	11	4
L_b Spacing		$1/16''$	$1/8''$	$5/16''$
Amplifier: Turns		22	14	5
L_c Spacing		$1/16''$	$1/8''$	$5/16''$

In the photograph of the front panel the meters from left to right are: A 0-100-milliammeter M_2 , which is attached to a cord and plug, to be used for measuring the microphone, grid and

plate currents; a 250-milliamper meter M_1 , in the plate circuit of the modulators; a 15-volt a.c. meter M_5 , for the filament circuit; a 100-milliamper meter M_3 , for the oscillator plate current; a 300-milliamper meter M_4 , for the power amplifier plate circuit; and a 1.5-ampere thermo-meter to measure the radio frequency output current to the feeder or antenna. The left hand dial of the group of four large dials controls the oscillator tank condenser C_{10} . The knob which operates the small vernier condenser C_9 is just above this dial and to the left. The vernier condenser is necessary in this transmitter in order that the frequency may be adjusted precisely to the particular value called for by the experimental license being used. For operation in the amateur bands where precision setting of the frequency is not essential *except* when operating near the edge of the band, the vernier condenser is not necessary. When crystal control is used the vernier condenser is of no particular value. The second dial from the left is the buffer tank condenser, the next the power amplifier neutralizing condenser, and the right hand dial controls the amplifier tank condenser.

The photograph looking down on the set from above is with the rear of the transmitter at the top of the illustration. At the back of the set and immediately to the left of the center cross member of the frame is the oscillator tube V_4 with the plug-in crystal holder, or the alternative—a grid condenser C_3 to the left of the tube. The filament, grid and plate by-pass condensers are grouped closely about the tube socket thus facilitating short leads. The plate circuit r.f. choke is mounted to the right of the tube and the frame center cross member. The copper-shield box which is divided into two compartments is at the center of the set and is shown just forward of the oscillator tube, with the lid removed. In the left hand compartment of this box is placed the oscillator tank circuit inductance L_4 . The variable tank condenser C_{10} is between the coil and the front panel. This condenser is connected to its dial by means of a short fibre shaft which helps to overcome undesirable "body capacity effects." The smaller compartment at the right hand end of the shield contains the buffer tube V_5 , the r.f. coupling condenser C_{13} , the grid r.f. choke and the grid and filament r.f. by-pass condensers associated with this tube. Immediately in front of the buffer tube is the tank circuit inductor L_6 . Below this is mounted the tank circuit condenser, hidden from view by the coil. The jacks, into which this inductor plugs, are supported directly by the condenser frame on brass strips, thus making very short and heavy tank circuit leads. When the set is in operation a cover fits snugly over the shield box and a flange on the underside of this lid fits over the compartment wall to effectively isolate the two compartments. Small holes in the lid directly

over the tube provide sufficient ventilation for this compartment.

To the right of the shield box is seen a dial underneath which is the r.f. condenser C_{14} ,

it is necessary to cut the shelf away to mount these condensers in place. The photograph of the bottom of the set shows this clearly and also indicates the positions of the variable condensers

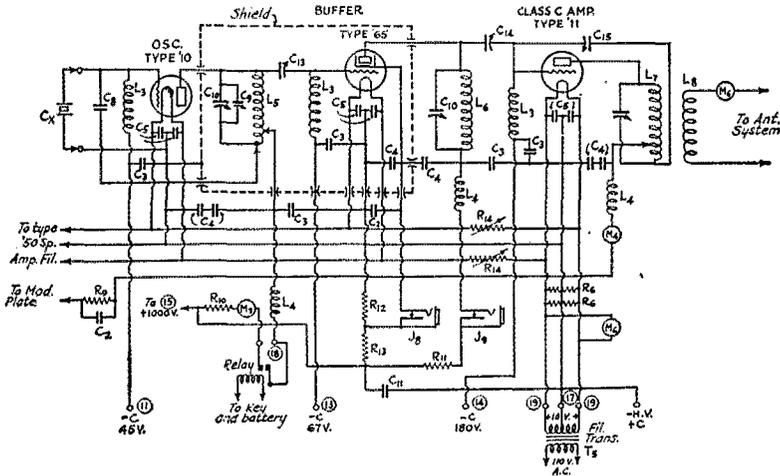


FIG. 2. — SCHEMATIC CIRCUIT OF THE RADIO-FREQUENCY UNIT

- J_8 — Screen-current jack for buffer stage
 - J_9 — Plate current jack for buffer stage
 - C_2 — 1- μ fd. by-pass condenser, 1000-volt
 - C_3 — .002- μ fd. Sangamo receiving type
 - C_4 — Two .002- μ fd. Sangamo receiving type in series
 - C_5 — Filament by-pass condensers, same as C_3
 - C_8 — .001- μ fd. grid condenser for Hartley oscillator
 - C_9 — 2-plate midget variable
 - C_{10} — 230- μ fd. National double-spaced transmitting condenser
 - C_{11} — 2- μ fd. 1000-volt filter condenser
 - C_{15} — 100- μ fd. midget, coupling condenser
 - C_{14} — 200- μ fd. National double-spaced, coupling condenser
 - C_{15} — 5-plate National double-spaced neutralizing condenser
 - L_3 — G. R. radio-frequency chokes
 - L_4 — Plate circuit r.f. chokes. (See text for details.)
 - L_5, L_6, L_7 — See coil table
 - L_8 — 10 turns of $\frac{1}{4}$ " copper tubing, $3\frac{1}{2}$ " outside diameter, spaced $\frac{1}{8}$ "
 - R_{10} — 20,000-ohm, 85-watt fixed resistor
 - R_{11} — Same as R_{10}
 - R_{12} — 5000-ohm 85-watt resistor
 - R_{13} — 20,000-ohm 85-watt resistor
 - R_{14} — 0.75-ohm G. R. rheostats
- The specifications for the meters, etc., are given in the text.

coupling to the power amplifier, the condenser being mounted vertically on the deck. To the rear of this condenser is the power amplifier r.f. grid choke and to the right of the choke is the neutralizing condenser C_{15} . A long fibre shaft connects this condenser to the dial on the front panel.

The power amplifier tube V_6 is just at the right of this shaft and in front of this tube may be seen the plate circuit r.f. choke. The by-pass condensers associated with this tube are grouped about this socket also. The power amplifier tank circuit inductance is shown at rear right-hand end of the set and is mounted on its tank circuit condenser which is directly below the coil. This condenser is connected also to the dial on the front panel by means of a fibre shaft. The output coupling inductance is mounted on an adjustable slide just forward of the tank inductance.

The four variable condensers which are controlled by dials on the front panel are on approximately the same level as the deck. Consequently

which were determined after consideration of the length of the resulting radio frequency circuits. It will be noted that none of the radio frequency circuit wiring extends below the deck. The resistor near the center, at lower edge, is R_{10} in the oscillator plate supply lead. The one above the neutralizing condenser is R_9 in the plate lead of the power amplifier and the by-pass condenser C_2 is directly alongside.

THE AUDIO FREQUENCY SYSTEM

The output of the carbon or of the condenser microphone is coupled to the grid of the first speech amplifier tube through a Samson microphone-input transformer T_1 . An adjustable potentiometer R_1 across the secondary of this transformer provides a means of obtaining the desired audio signal level on the grids of the modulator tubes. The first and second interstage coupling transformers, T_2 , are Samson "Symphonic." The coupling impedance L_1 between the third speech amplifier stage and the modula-

tors is a Samson 30-henry, 80-milliamperce choke and the grid impedance L_2 , is a Type G choke manufactured by the same concern.

The current for the carbon microphone is obtained from the same battery that supplies the filaments of the first two speech amplifier tubes. A 200-ohm potentiometer, R_6 , connected across the filament supply permits the microphone current to be adjusted to the desired value. It is important to note that a good carbon microphone

200 milliamperce chokes, two units being used merely because it was easier to obtain the desired inductance at the existing current density in this way. These chokes were mounted externally to the set itself to prevent any mechanical or electrical feedback. The plate supply for the two UV-845 modulator tubes is obtained from the 1000-volt source through these reactors.

In the photograph of the front panel the plug attached to the milliammeter M_2 is shown in the

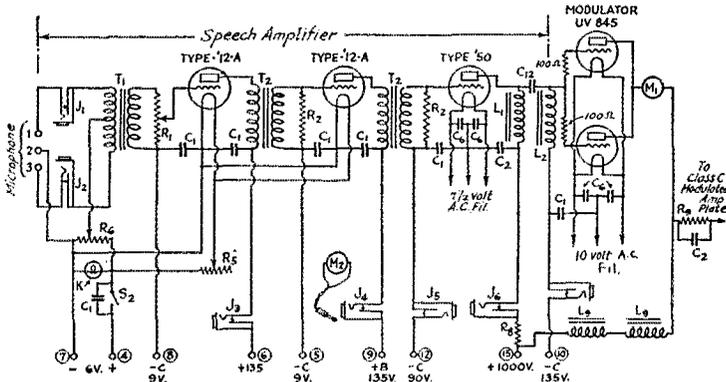


FIG. 3.—THE MODULATOR AND SPEECH-AMPLIFIER CIRCUIT

C_1 — 2- μ fd. by-pass condensers

C_2 — 1- μ fd. 1000-volt by-pass condenser

C_3 — 2.0- μ fd. by-pass condenser (single unit)

C_{12} — .01- μ fd. 5000-volt mica coupling condenser

R_1 — 500,000-ohm Eiectrad potentiometer (Gain control)

R_2 — 100,000-ohm fixed resistor

R_3 — 150,000-ohm fixed resistor

R_5 — 12-ohm G. R. rheostat

R_6 — 100-ohm potentiometer for microphone circuit

L_1 — 30-henry 80-m.a. choke. (See text.)

L_2 — 220-henry grid impedance. (See text.)

L_9 — Modulation reactors. (See text.)

is easily ruined by suddenly opening the battery circuit several times, as would be the case if switch S_1 were operated when current was flowing through the microphone. The inductive "kick" caused by the collapse of the transformer field produces sparking between the carbon granules of microphone buttons and ultimately leads to a "packed" transmitter. A condenser C_1 , across the battery switch S_2 will help to protect the microphone to a limited extent in the event that the switch is operated before the microphone current has been gradually reduced to zero by means of the potentiometer S_6 . The current in each microphone button is measured by plugging the milliammeter M_2 into either jack J_1 or J_2 . The pilot light K associated with this circuit serves to indicate whether or not the battery circuit is closed.

The plate circuits of the three speech amplifier tubes are provided with jacks to permit the insertion of the milliammeter M_2 in the circuit to check the operation of the tubes. The grid current of the last speech amplifier and that of the modulators may be determined in a similar manner. The plate current of the modulators is read on a meter permanently connected in the circuit.

The modulation reactors L_9 , are each 15 henry,

lower of the two microphone current jacks. The lower row of jacks permits the measurement of the various grid, plate and screen circuit currents as has been mentioned. The knob to the left controls the microphone current potentiometer and the one to the right controls the audio-amplifier gain. Above and between the two knobs is the pilot lamp, K , and above the second jack from the right is the battery switch S_2 .

The apparatus of the audio frequency system is seen at the left end of the view showing the interior of the set from above. The row of equipment along the left edge, reading from front to back, consists of the microphone input transformer, the first Type '12 amplifier, the first interstage transformer, and the second Type '12 amplifier; then across the back of the set; the second interstage transformer, the Type '50 amplifier and the grid impedance L_2 for the modulators. The large choke in front of the Type '50 tube is L_1 the plate circuit coupling impedance for this amplifier. The mica grid-coupling condenser C_{12} is mounted between the choke and the tube socket. The two UV-845 modulator tubes are at the right. The two knobs to the right rear of the modulators are the filament rheostats R_4 . Several by-pass condensers are seen in this

view but most of those used in the audio circuits are on the under side of the deck. The remainder of the equipment is associated with the radio frequency circuits and has already been described.

The view of the under side of the deck shows the additional by-pass condensers together with the series plate circuit resistors R_8 , R_{11} , R_{12} , and R_{13} , and the filament rheostats R_{14} .

The wire used for connecting most of the apparatus, excepting the radio frequency circuits, is automotive lighting cable. This wire is stranded, has a rubber covering and an outer braid of varnished cambric. It is particularly well adapted for use where the wires are run through holes in metal shields or around sharp bends because its tough covering is not easily injured.

POWER SUPPLY EQUIPMENT

A 1000-volt, 400-milliamperere motor-generator set supplies the plate voltage and an 11-volt 15-ampere transformer heats the filaments of all the tubes in the transmitter with the exception of the first two speech amplifiers. A 1250-volt plate supply would be more suitable for this service and on occasion this transmitter is operated from a rectified plate supply giving this voltage. The filament transformer is provided with a primary rheostat that permits the secondary voltage to be adjusted to 10 volts for the Type '11 and the UV-845 tubes. The additional drop necessary to reduce this voltage to 7.5 volts for the filaments of the Type '10, '50 and '65 tubes is obtained by means of the series resistors R_{14} . A common center tap resistor is used for the return of all grid and plate direct currents and this resistor must be sufficiently large to handle approximately 100 milliamperes. The grid bias voltage for all the tubes both in the audio and radio circuits, excepting the first two speech amplifiers, is obtained from a common tapped bias battery of 180 volts. This battery is located on the shelf below the transmitter and is connected to the set by means of a five-wire cable and plug which connects to the group of terminals which are numbered 10 to 14 inclusive.

The filament, plate and grid voltages for the first two audio amplifiers are obtained from batteries which are placed on a shelf directly below the transmitter and connected to it by means of a six-wire battery cable and plug that connects to the group of terminals numbered 4 to 9 inclusive.

GENERAL

The method of tuning and operating this type of transmitter has been explained many times in recent articles in this publication and will not be discussed here.¹ The checking of the performance of the set is aided considerably by the provisions that have been made to read the current in all

the important circuits. A monitor² to check for possible frequency modulation and a modulator to measure the percentage of modulation and to check the overall operation of the transmitter are quite essential to obtain best operation.³

The transmitter is preferably operated with crystal control of the frequency, in which case it has been found that the carrier frequency remains constant even with 100 per cent modulation of the output. When the oscillator is used as a self-excited Hartley circuit care must be exercised not to over-modulate as there is likely to be a tendency to modulate the carrier frequency as well as its amplitude. This is particularly true when operating in the vicinity of the 14-mc. band. This difficulty may be overcome by using a separate plate supply, such as a "B" substitute, for the oscillator tube.

For convenience in operating the set, the microphone input circuit has been extended from the transmitter to the operating desk by means of a three wire cable in flexible conduit. To prevent radio frequency pick up in this cable a choke is connected in each lead as it leaves the set. The chokes used consist of 90 turns of three strands of No. 26 d.c.c. wire in parallel on a $\frac{1}{2}$ " wooden dowel. Each wire then forms a choke of 90 turns, one of which is placed in each lead. The audio input circuit and the control pair may be extended as far as desired if proper precautions are taken with the audio circuit and thus the transmitter may be remotely controlled from any desirable point.

A relay with its contacts connected between terminals 18 permits the oscillator to be started at will by merely closing the switch that operates the relay. Thus the power supply may be left running and the transmitter stopped when it is desired to receive, by operating one switch.

In conclusion particular attention is called to the fact that the mechanical layout and the wiring of such a set are very important, particularly when the audio and radio circuits are so close together and provided with so little shielding. It would, perhaps, have been better to build the audio and the radio circuits in separate units and to place them at a considerable distance from each other. In this transmitter it was necessary to connect the cases of all transformers, chokes, by-pass condensers, etc., to a common ground wire in as direct a manner as possible.

This radiophone transmitter has been in continual use at W1AXV-W1XP for the past year and has given very satisfactory service for every use to which it has been put, including amateur communication from W1AXV, as well as communication to airplanes and airships, and the transmission to distant laboratories of standard frequencies in the audio frequency spectrum from W1XP.

¹ QST, April and Sept., 1929. Also *The Radio Amateurs' Handbook*, 7th Edition, Chapter VIII.

² QST, Nov., 1929.

³ QST, Aug., 1929.

An Old Timer Gets Back in the Game

By Eugene A. Hubbell, W9ERU*

THE correct way to begin this story is: "Once upon a time there were two transmitting amateurs talking," but since it is an up-to-date story, it really begins like this: "Tweet-tweet-tweet-tweet, tweet-tweet-tweet-tweet-DAWW-DI-DAWW-DI-DAAWW DI-DAWW-DAWW — ZZZZ — ZIT-ZTI-IT-IT-ZZZZZ-BRRRRROUGH-Click."

"Sounds fierce tonight, doesn't it?" exclaimed Lee, as he pulled the switch on the receiver.

"Sounds like most of the c.w. fellows have taken up the 'phone idea and have all gone in for one hundred percent modulation," replied Ed. "Say, you know so much, why are those signals so darned broad?"

"Why, you ought to know that, even if this is your first week on the air in two years. It's because of what some fellow at Headquarters terms wobbleulation; that is, frequency modulation. You see, the oscillator is so easily influenced by variations in input and variations in load, due respectively to a poorly constructed power supply and an unstable antenna." Lee reached up on the bookshelf and took down his *Handbook*.

"Then what a fellow needs for a first-class signal is an outfit that is steady in every part, in order to get steady output?" Ed. queried, craning over Lee's shoulder to look in the book.

"Yeah, that's it, all right. Oh, here we are, page 102 in my edition of the *Handbook*. 'Unsteady Signals' is the heading, and believe me, it gives you the right dope. Just look that over for a minute."

Silence fell — no one hurt.

"Yes, this is fine to tell you what might be causing the unsteady signals, but how does a fellow get away from any chance of having it in the first place?" Ed. shut the *Handbook* with a bang.

"Of course, I might tell you to read the whole *Handbook*, and when you got done you would know — and then again, you might not. How does a fellow get away from any chance of QSX in the first place? That's a large order, but here's what dope I can give you, and what I have learned from experience." Lee pulled out pencil and paper and started.

THE POWER SUPPLY

"We'll say this outfit is going to be a Type '10 transmitter. I think that covers about 50 percent of all ham stations in the U. S. A. I'll start with the power supply. Of course, for good regulation this must be amply large. If it is to be r.a.c., then the transformer must be a good husky one. If

motor generator, then it should be of considerably larger rating than the maximum of power to be taken from it. And the motor should be a constant-speed affair, so that as the load is applied it will not slow down. We needn't bother much with the m.g., though, as it isn't so popular as r.a.c. anyway. R.a.c., that's getting to be an insult — when a fellow tells you your note is 'r.a.c.' Still, I'm willing to bet that 90% of the sets in the U. S. A. use it, so why not call it r.a.c.? I think it must be because the fellows naturally associate r.a.c. with the worst sounding signals on the band. Maybe they think it means 'raw a.c.' Hi!"

"I think it must be because most fellows envy the motor-generator equipped stations," Ed. threw in.

"Well, it doesn't matter, but r.a.c. supply is the cheapest, and can be made the best. The most important thing is the rectifier. One thing

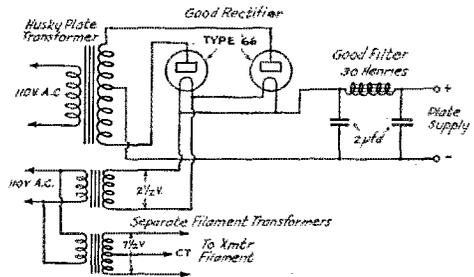


FIG. 1. — "I'll start with the power supply."

is sure; we have the advantage over the fellows in the game back in 1928, and before, since we have cheap mercury vapor rectifiers available, which they didn't. Now take these Type '66's, or the GEX Rectobulb, or any number of other makes. They all provide a real rectifier which doesn't strangle your output with high resistance. Naturally they have to be kept within their rating, but their rating is plenty high, compared to the old tube rectifiers. Of course, for a Type '10 the Type '81 tube is fairly good, for it will stand 750 volts on the plate, and with a moderate amount of current being drawn, with good filter, will deliver 500 volts without blushing.

"Occasionally a fellow can pick up a mercury arc tube, which is what I consider about the best. One doesn't worry about rectifier filaments with an arc. Of course, there is considerable experimentation to be done before one gets the thing to tip correctly, but after that, everything's all set. And believe me, the output from a mercury arc

* 227 North Fourth Street, Rockford, Ill.

is limited only to the transformer's ability to stand the gaff; that is, for amateur work.

"Let's take the filter next. Did you notice that article in *QST* not long ago on filters?¹ Oh, no, I forgot, your reading has been rather curtailed, being so busy. Well, anyhow, it was to the effect that amateur filters should use more chokes and less condensers, in order to save the mercury-vapor type rectifiers. After the key is let up on the transmitter, the condensers figuratively just open their mouths and gasp down all the juice. Of course, when the rectifier tubes aren't of ample rating to take care of this, they are strained to the limit. It doesn't take long to ruin them at that rate. The article went on to explain how the choke stored up energy but not at such a rate as the condenser, and exerted good filtering action, but not so much at the expense of the rectifier. It's a good one to read.

"And then March *QST* had an article on electrolytic condensers.² The sum of the findings seemed to be that around 2 μ d. of capacity was sufficient for filter on any good c.w. outfit. I don't know whether that is entirely sufficient; personally I prefer four mikes. Still, I know one fellow who produced as beautiful a DX note as anyone could ask for with only two mikes."

Here Ed. took possession of the pencil. "Your points then, on the power supply are: One, a good big transformer; two, a good rectifier, preferably mercury vapor; and three, good filter of, say, two mikes each side of a choke. Is that all right?"

"Why, yes, Ed., that hits the bell. Perhaps some one would object to the four mikes and one choke. An alternative would be a low value double choke, that is, about 18 henries each choke, one mike on the input side, one in the middle, and one or two mikes on the output. That's my ideal. Of course, all must have good high-voltage rating, and the chokes should be able to carry far more current than will ever be necessary — for best results." Lee stopped a minute and sketched out the filter. "Here, keep this."

"Say, you forgot the filament supply. Or maybe you intended that to be on the plate transformer, eh?"

"No, I just forgot it. Of course, the mercury vapor tube rectifier filaments must be lit by a good transformer, and the transmitting tube as well. Personally, I believe in separate transformers for each — for better regulation — although the two filament supplies could come from the same transformer. But I never want the plate and filament supplies on the same transformer. I've seen too much grief come from that.

"You see, it is impossible to vary the filament voltage independently by changing the primary

voltage with the filament and plate windings on the same transformer. And then, too, the insulation isn't nearly so good, especially for the high voltages now used. And it is really almost ridiculously easy to wind a new secondary on some small transformer for filament supply, to say nothing of being able to buy them very cheap.

"The center-tap on the filament supply is important. If the transformer winding isn't center-tapped, and accurately, use a center-tapped resistor. One of two hundred ohms is O.K. — or a 200-ohm potentiometer. I don't like the lamp type of center-tap unless good automobile headlight bulbs are used; they are more uniform in resistance than the Christmas tree kind usually are. Some of these mercury-vapor tube rectifier circuits require no center-tap, however."

"Of course, voltage control is important, and that is where the separate filament transformer comes in at its best. It is an easy matter to find some resistance wire that will cut down the primary voltage to make the secondary the correct value, but a rheostat to cut down voltage at one and a quarter amperes is harder to obtain for secondary control. And then either two rheostats are needed, or a resistance center-tap, which is not so good. A good rheostat in the primary is just the thing."

"Well, that about finishes the power supply, doesn't it — or can you think of anything else?" said Ed.

THE TRANSMITTER

"No, I guess the oscillator comes next. I think we can disregard all circuits for common use excepting the Hartley and tuned-grid tuned-plate.

"First, shall we use series or shunt feed? I'll take both circuits right together. Now in the Hartley circuit, series feed requires a split coil affair that is a messy mechanical job, with doubtful advantages, so we might as well count that out. However, the tuned-grid tuned plate affair can be made series feed with very little trouble. In fact, I found efficiency increased about 15% with just that one change here. You see, in series feed, the plate high-voltage is fed to a point of low radio frequency potential, thus eliminating — or at least decreasing — the amount of radio frequency feeding back into the power supply."

"Wait a minute, wait a minute! Your explanation is lucid and explicit, but remember, I've been rather out of touch with radio for a couple of years. Just what does all that amount to, anyway?"

"Just this. There is no need of an effective radio frequency choke. In fact, one isn't even needed usually, but is used merely as a precaution, see? The high voltage 'plus' is fed to a part of the circuit which isn't hot. And so the r.f.

¹ "Plate Supply Filters and Keying," *QST*, Jan., 1929.

² "Electrolytic Condensers and a High-Voltage Rectifier," *QST*, March, 1929.

hasn't much chance to leak back through the power supply. Get it?"

"You bet. GA, old man."

"Well, here's Diagram 1, the shunt fed Hartley; Diagram 2 is the shunt fed t.p.t.g., and Diagram 3, the series fed t.p.t.g. Of the three, the Hartley is the simplest, the series fed t.p.t.g. seems to give the most r.f. output per amount of input, and the shunt fed t.p.t.g. is merely shown for convenience, since there is no

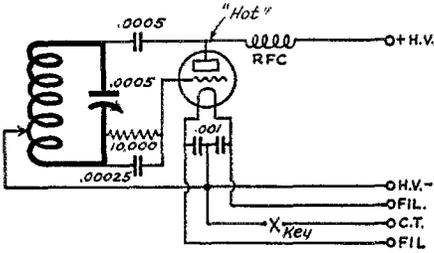
"Oh, say, Lee, why all this stuff about small coils and big condensers? When I was on before, everything was the edgewise wound dope; now copper tubing seems to be the rage."

"Simple enough. Take the Hartley circuit in front of you. You can readily see that there is capacity between each pair of elements in the tube, can't you? Well, then, if the shunt capacity across the coils—which is made up of tuning condenser, and three tube capacities is small, the tube capacities will be a larger percentage than if the total capacity were large; understanding of course that the tube capacities do not change appreciably while we are changing the tuning condenser. However, if we have the old style set with small tuning capacity (50 $\mu\text{fd.}$ was plenty of capacity in those days, I remember) the small change in tube capacities due to heating would be a relatively large change if the total shunt capacity was large, as nowadays—350 $\mu\text{fd.}$ say for 7 mc. band. Get it?"³

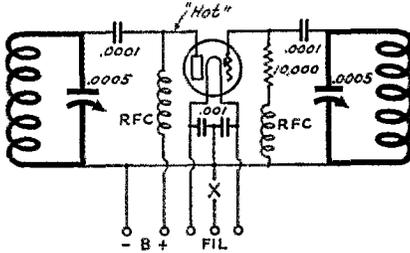
Ed. considered a minute. "Ye-s, I think so. Oh, sure I do."

"Well, then, to have a stable oscillator, we need plenty of capacity, which means small inductance. But then we run into a snag. We have extremely high currents then, and believe me, radio frequency currents sure do some heating. We must use heavy inductance for the Type '10, preferably, quarter-inch copper tubing. And remember that all connections to the condenser in this tank circuit must be just as heavy as the inductance, or the strain goes on these parts. It is best to use the same size tubing for connectors. If plug-in mounts are used extreme care must be used to have them heavy enough to carry the current without heating. The best I can think of would be of solid brass with a $\frac{1}{4}$ " hole drilled for the coil and a set-screw to fasten it in. Old dial bushings do equally well, if mounted solidly on insulators. The set-screw can be equipped with a large head or thumbnut."

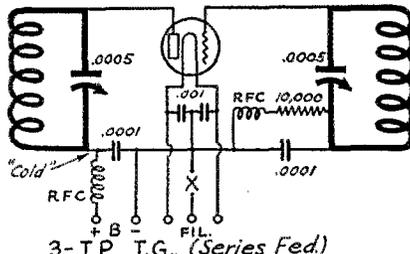
"I'll use the dial bushings for mine. I've a half-dozen old dials home I'm just considering throwing away. Their bushings will be just the thing." Ed. pencilled a note on the paper.



1 - HARTLEY (Shunt Fed)



2 - T.P. T.G., (Shunt Fed)



3 - T.P. T.G., (Series Fed)

FIG. 2. — "Well, here's Diagram 1, the shunt fed Hartley; Diagram 2, the shunt fed t.p.t.g., and Diagram 3, the series fed t.p.t.g."

real need to even try it. It works all okay, though, in case you do want to try it."

Ed. considered the diagrams carefully. "Well, that looks all right to me. I used the Hartley all the time I was on the air before, but I suppose these others are just as good."

"Yes. The only difference seems to me to be that the Hartley draws a bit more current without the antenna coupled, but that may be my individual results. And the circuit had the same parts as the t.p.t.g. I used to have (and used for 18 months) and the same coils."

³ The High-C type of oscillator circuit derives much of its frequency stability from another consideration. The dynamic stability (stability with rapid changes in plate voltage, etc.) is due to the low ratio of load impedance to tube plate impedance. This follows from the equation for frequency of oscillation:

$$(2f)^2 = \frac{1}{CL} \left(1 + \frac{R}{r_p} \right)$$

The dynamic variable is the plate resistance of the tube, r_p . By making the load resistance, R , small in proportion to r_p , the effectiveness of variations in the tube's plate impedance is greatly reduced, as far as frequency variation is concerned. A High-C plate tank circuit therefore is effective in reducing both the frequency variations due to tube heating (mechanical instability) and those caused by variations in tube plate impedance (dynamic instability).—EDROR.

Handwritten scribbles and a signature at the bottom of the page.

"Use G. R. insulators for mounting them, then. You can get them cheap. I mean those small ribbed stand-off insulators used for mounting all sorts of parts. They are fine business for plug-in mounts of any kind. To go back to the size of the condensers and coils to be used, for the 3500-ke. band I believe about 400 $\mu\text{fd.}$ of capacity is desirable. On 7000 kc., from 300 to 350 $\mu\text{fd.}$, and on 14 mc., perhaps 250 $\mu\text{fd.}$ though I have found this too high for a reasonable input, and have used as low as 150 $\mu\text{fd.}$ with fair results. To determine the size of coil, I would reduce the input to a low amount and put clips on the coil instead of the regular mountings, and just reduce the number of turns until the amount of capacity required to tune the coil to the top of the band was close to the above amounts. It isn't at all critical to find the size coil required by this method. Just as a starter, 12 turns of tubing wound on 2 3/4" form seem to be about right for 3500 kc. work. For 7 and 14 mc. six and four (or three) turns, respectively seem the right values."

"How about the tuning condensers?" Ed. queried. "You know I have a bunch of old-timers home I hate to throw away. I guess I must have a half-dozen Cardwells, General Radios, and even some of the old Acme Low-Loss. You know, the kind with the celluloid cover?"

"You bet I know. Why, they are just as good as anything. In fact, I consider them about the best, except for their bulk and the fact that they cannot be mounted very well on a bread-board. The rotor and stator plates are soldered into one unit, something worthwhile, and the dustless feature helps considerably. Besides, the capacity is 500 $\mu\text{fd.}$, which is just what is needed. However, the Cardwells will make a neater looking job."

"Guess I won't throw 'em away then. They're hard to make connections to, however — at least to the stator."

Lee considered a minute. "Yes. I believe they are, but it can be done. Just make a couple of connections, one to each side. Well, to get on with the set."

"Use a good UX-type socket. Anything but a 'floating' socket is O.K. Look out for possible flashovers though, and pick one with connections far enough apart."

"The plate blocking condenser in the Hartley should be of about 500 $\mu\text{fd.}$ capacity. However, I have used values up to .003 $\mu\text{fd.}$, and down to 100 $\mu\text{fd.}$ and found that the larger value (above .0005) worked just as well, but that the smaller ones increased the input quite a bit. The grid condenser isn't critical, but a value in the neighborhood of 250 $\mu\text{fd.}$ is fine. For the tuned-grid tuned-plate circuit I found 100 $\mu\text{fd.}$ enough for good results in both the plate and grid circuits. Larger capacity is usually all right, though. For filament by-pass most any old thing is O.K.

providing it is .001 $\mu\text{fd.}$ or so and the voltage break-down is fairly high. I have had trouble with some small receiving condensers here, where the stress is considerably less than in the plate circuit. However, good receiving condensers will stand up in the filament circuit of a Type '10 outfit. The plate and grid condensers should be really good, though. I find mica-type receiver condensers stand up, but the margin of safety isn't really enough. Two in series should be just right."

"Hold on a minute, let me write those down." Ed. was silent for a minute while he wrote busily. Then, "What about the grid leak?"

"I was just coming to that. Ten thousand ohms is just the size for a Type '10 oscillator. I have used all the way from 5000 to 12,000 ohms with little difference in output, but the 10,000 size seems best; over that, the circuit isn't so stable because the bias is too great. The gridleak in my t.p.t.g. you might notice, is across the grid condenser with an r.f. choke in series to keep r.f. out of that side of the grid coil — found it wouldn't work without the choke there. However, any good receiving choke stands up there all right. Speaking of r.f. chokes — I haven't said anything about them yet, have I?"

"No, hop right along, that used to be a sticker," said Ed.

"It still is. A fellow named Lidbury wrote an article back in 1927 in the Experimenters' Section in *QST*. Just wait a minute." Lee looked in his file of *QST*'s. "Yes, here it is, October, 1927."

"Let me look it over to-night, will you?" Ed. reached for the magazine.

"Sure, take it along. The main thing is that he recommends very small diameter chokes, and his tables are all for No. 38 wire. However, I have found several receiving chokes to work fine. The Silver-Marshall No. 277, and the Samson Helical Wound No. 85 are both good. A layer wound, or rather scramble-layer-wound, seems to work in most cases. Just cut and try on the same foundation as Lidbury gives."

"Well, that covers everything. I guess, doesn't it? Oh, no, what about arrangement of parts? I don't seem to be very good on that."

"Well, a number of good lay-out arrangements have been shown in *QST* as well as in the *Handbook*. As a rule they follow the schematic circuit diagrams pretty closely, especially the t.p.t.g. outfits. A good arrangement for the Type '10 Hartley with a Cardwell tuning condenser is the High-C set described in August, 1928, *QST*, and in the sixth edition of the A.R.R.L. *Handbook*. The inductance can be placed behind the tuning condenser with the tube socket on top of the condenser or the inductance can be on one side of the condenser with the tube socket in the rear. The main idea is to make the leads between the tuning condenser and the inductance

plenty heavy and not too long. The other leads should not be all jammed together. I have found that when the leads were cut too short and everything was crowded, r.f. currents worked in where they weren't wanted and more difficulty was experienced than with apparatus quite widely separated."

Ed. looked at his watch.

"Let's move on to the antennas. It's getting late."

ANTENNAS

"Well, for practical work we have a choice of a lot of antennas, but the three we can really spend time on are the split Hertz (antenna-counterpoise) system, the single-wire feed Hertz and the Zeppelin. I won't go into detail on the lengths, because there is plenty of dope in *QST* and the *Handbook*.⁴ But just a word on the lead-ins, etc.

"With the Zeppelin, a primary consideration is to keep the feeders from swaying. Use light spacers between them. Heavy spacers have too

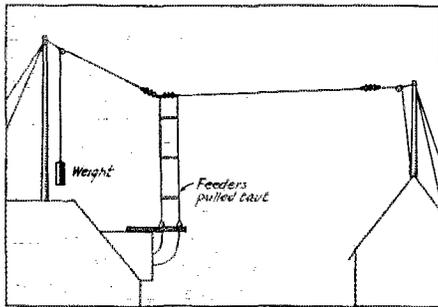


FIG. 3.— "With the Zeppelin, a primary consideration is to keep the feeders from swaying. . . . And what we want is that the antenna be as tight as possible."

much inertia and the wires swing but the feeder spacers stay in place. Quarter-inch wood dowels well boiled in paraffin are the best spacers. Use good strain insulators. Make the masts good and strong, well guyed, and have one end of the antenna tied fast. The halyard on the other end should go through the pulley and have a really heavy weight tied on the lower end. A couple hundred pounds is none too much in any weather. And what we want is that the antenna be as tight as possible. The feeders should sag the antenna considerably by being pulled down tightly."

"But that takes height off the antenna!" Ed. objected.

"Sure it does, but it doesn't matter how high your antenna is if you don't get out with it, and you'll not get out with a wobbly signal in these crowded bands."

⁴ *Radios Amateur's Handbook* (Sixth Edition), Chap. VIII.

"You're right, there; but it sure does hurt to see fifty-foot masts with the antenna sagging to thirty-foot height in the center or wherever the feeders come."

"You should worry about that. Thirty feet is just right for the Zeppelin feeders, anyhow." Lee drew a picture of the Zepp system.

"How about lead-in insulators. Do they have to be 1-kw. Pyrex bowls?"

"No, but the bowls are good. Personally for small power, I favor, if possible, putting holes in the window pane; and if not, putting a board at the top of the window and leading in the feeders on the Pyrex bowl idea, but using just the small G. R. stand-off insulators, one on each side of the board for each lead-in. That works fine at my shack. The old mud bushing is *passé*."

"There's that five-dollar word again; seems to be a pet of yours, popping out every once in a while. Well, Old Man, think you have done me a lot of good to-night. I'm going home and read over what you wrote here, and believe me, I'm going to put out a real sig from now on." Ed. rose, Lee reached over and tuned in a station on the receiver.

"Peep-pip-pee-pip, peep-peep-pip-peep."

"Boy, isn't that pretty? And not a bit of QRM!"

The Vanalta Division Convention

"GOOD to the last drop!" And, in this case, there certainly was nothing wrong with the last drop. The coffee manufacturer who popularized this slogan never will know how near he came to describing the Vanalta Division Convention held at the Chamber of Commerce Hall, Victoria, B. C., on the 30th and 31st August. Use your imagination as you will, if you did not attend it you never can realize how this holiday, so well managed by the Victoria Short-Wave Club, could have been so pleasant. Not only was it favored by being held on Canadian soil, but it had as well a beautiful setting in lovely Victoria and was attended by the most genial group it has been the pleasure of the writer to meet.

After registration during Saturday morning, the delegates assembled at 3 p.m. to hear Mr. Louis R. Huber, W9DOA-W9SU, Midwest Division Director representing A.R.R.L. Headquarters, describe the major problems confronting the amateur fraternity to-day and tell how the Board is meeting them. Mr. J. King Cavalsky, VE5AL, S. C. M. of British Columbia, then presided over a general discussion, following which the fellows hob-nobbed over pipe and cigar.

Imagine it! — an A.R.R.L. banquet starting on time! Yet this one did it at 8 p.m. and, what is more, was broadcast successfully by CFCT!

(Continued on page 86)

The Milkotron

As Told to the Old Connecticut Yankee

By Woody Darrow, W3JZ*

IT is with the greatest of pleasure that I assume my new duties of insulting engineer to the technickle staff of *QST*. It all started at the Worcester Convention. Jim Lamb, who is the Chief Tech, and George Grammer, next in command, was both complainin' about how hard the work on *QST* was. Some of the questions asked was so hard that they couldn't answer them, so I says I'd be glad to take a job as insulting engineer to the technickle staff at the nominal salary of $3\sqrt{-7}$ per alum. My job meant less work for Jim and George, so they both agreed it was a good thing. Along came the check and double check from K. B., Hebee, and Hiram, and I was sent to Pisacci, New Jersey, to meet Freddy Link and Johnnie Knight (W2ALU) at the de Woods Radio Co., who in turn pass me over to H. Rouclere (W2AWI), who is in charge of the Engineering Department, where all the bright ideas come from. Mr. Rouclere was a tall, slender chap, with blue eyes and dark hair. He was such a modest fellow that I could hardly believe that he was the man who had invented the Milkotron, the new tube that was to revolutize radio by annihilating the skip distance phenomena.

I looked at Mr. Rouclere and he looked at me, and we might have been looking at each other for days if Mr. Rouclere hadn't up and said, "Hello!" To which I replied, "Fine, thanks" — and the interview was under way. "Are you troubled by fading signals, skip distance effects, low antenna current, static-itus, heart burn, weak ankles, or halitosis?" asked he. I hated to admit my weakness so I up and says, "Says you." This didn't stop Mr. Rouclere; he continued by telling me to fill out coupon at the bottom of page 99 of this *QST* and mail it to the nearest drug store, or drop it in the waste basket. It really didn't matter, as even my best friends wouldn't tell me.

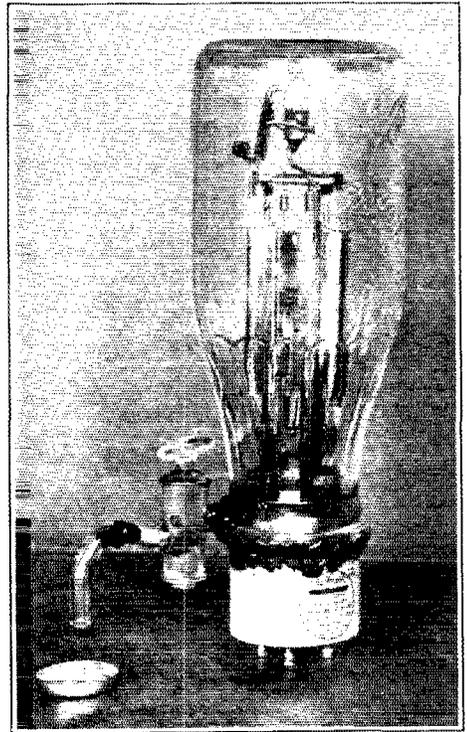
Frankly, I was amazed at the technickle knowledge of this lad and I begged him to tell me more of the outstanding sensation of the decade — The Milkotron — which had helped to alleviate the suffering caused by skip distance phenomena.

"Well, first off, there is 'Not a Bull in a Car-load,'" he began.

I told him bulls never bothered in any way, as most of my trouble was caused by parasitics.

"This tube may be had in any capacity up to

and including 500 quatts¹ and in any distance range desired, plus or minus five miles," he continued. "The new principles involved in governing the distance at which signals from a transmitter employing this tube may be heard have been kept in a sealed metal receptable inside the tube cooling tanks at W2XC'D. But due to the fact that the tube persisted in heating up,



UNDERWOOD & UNDERWOOD

THE MILKOTRON

somebody opened the tanks and removed the obstruction which made it possible to present this information to the select circle of *QST* readers."

I could tell from the way he talked, and the fact that he worked in a tube factory, that Mr. Rouclere would have to be pumped. His knowl-

¹ A new unit of something or other, chiefly the latter. Cf. Borden and Sheffield, "Principles and Practice of MOO-PA transmitting Circuits."

* 5623 Germantown Ave., Germantown, Philadelphia, Penn.

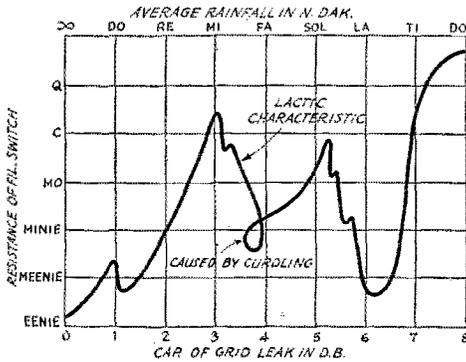
edge proved to me that no vacuum existed so far, so I say, "Tell me more."

He continued: "The secret is merely the fact that instead of bounding our signals off the Heaviside layer and letting them get knocked for a loop out into boundless space, we utilize the reflecting power of the *milky way*! By depositing on the plate of the Milkotron varying amounts of desiccated cow-juice, the angle at which the produced wave is reflected from the milky way is controlled to a much better advantage."

I says, "That's a fine theory, but will it work?"

"How can it help but work? It's in de Woods and when I says a tube is in de Woods, why go any deeper?"

The accompanying graph² gives the distance at which signals may be expected to come to earth again for a given deposit on the plate:



BIG CHIEF CHARACTERISTICS OF MILKOTRON

Type	Purpose	Use	Tel. Votes
413	Power Pacifier	After Meals Shake Well	10 flat
Fil. Current	Clean Grid	General Character	
Oh, sho, sho!	Voltage 3 below	Good	

Department:
Check and Double Check.

"Don't forget," added Mr. Rouclere, "to tell the credulous amateur that in ordering the Milkotron to state whether he wants his signals to come back to earth in 100 miles, 200 miles, 1,000 miles or in a tail spin. The Milkotron will be sent C.O.D., milk tickets not accepted."

I have only had the Milkotron in my own laboratory for about a week, and it seems sour already.

It operates much the same as any vacuum tube. That is, when the grid is positive it's very positive and when it's negative, it curdles. The grid leak which is enclosed in the tube cuts the resistance down to about 2 milavotes per meter, which is simply great when you consider that the grid is crooked anyway and robs the filament of its elections. The plate is held in place by two

false teeth with roots embedden in the base. These teeth are slightly decayed and give off a gas which, when ignited by the electromhos (positive hunks of raw a.c.) cause the pilot light to glow in the tube, eliminating an antenna meter. The brighter the glow the more antenna current. If the tube is overloaded, the gas backs up into the teeth causing them to bite off the plate current, thus stopping the filament from burning out as the tube ceases oscillating. The Milkotron is truly the most remarkable improvement amateur radio has ever seen, and if there are any questions, either on this tube or other ham problems, send them in to the Insulting Engineer of the Technickle Staff of QST.

A New Section Created in Pacific Division

AS provided in the Constitution and By-Laws of the A.R.R.L., the operating territory of the League is apportioned into Sections for the purposes of administration of the League's field organization. Action may be taken by the Communications Manager acting with the advice and consent of the Division Director concerned in the United States, its territories, and Cuba, and with the advice and consent of the Canadian General Manager in Newfoundland, Labrador, and the Dominion of Canada.

Recently fifty-eight members in the San Joaquin valley territory in the Pacific Division petitioned for the formation of a new section. The matter was discussed with Section Managers Sandham and Quement, who each agreed to relinquish certain California counties proposed for inclusion in the new Section. Division Director A. H. Babcock gave the matter his full consideration and consent and recommended the matter to Headquarters for the action requested.

This notice announces the creation of a *San Joaquin Valley Section* of the Pacific Division to include the counties of Amador, Calaveras, San Joaquin, Tuolumne, Stanislaus, Mariposa, Merced, Madera, Fresno, Tulare and Kings of the state of California. All amateur operators and stations in this territory are invited to report activities regularly to a San Joaquin Valley Section Communications Manager effective with his election.

A.R.R.L. members residing in the new section have already received mail notice of its formation, together with a notice soliciting nominating petitions for a Section Manager. By the time this information is in print an election by mail ballot will be in progress, or should the Section be unanimous in choice of a candidate the election will be completed by October 15th and the address of the S. C. M. may be obtained by dropping a line to A.R.R.L. Headquarters.

— F. E. H.

² Tech-nickel word meaning "rake-down on signals."

Volume Level Indicators

By Guy C. Omer, Jr.*

VOLUME level indicators are another member of that quite useful family, the vacuum tube voltmeters. They are almost universally used wherever speech equipment is found, be it broadcast station, public address system, or what have you. A volume level indicator would likewise prove to be a very fitting addition to the up-to-date amateur radiotelephone.

The great value of the volume level indicator lies in its indicating visually the instantaneous volume-level of the speech input. Not only are visual measurements more accurate and dependable than aural, but also — because the average amateur phone is a one-man station — aural measurements, during operation, are a near impossibility. By the visual indicator's use, the audio-frequency input to the modulator may be kept at the value giving the greatest percentage of modulation and yet be maintained just below the value that causes distortion.

An amateur might put in much time and spend much money building a radiotelephone station "à la Hull" but, by overloading his audio amplifier and by overmodulating, ruin the tonal qualities and make his phone sound like an early "Dark Ages" model. Again, the reverse might occur. An amateur might work and work to build a modulator capable of producing 100% modulation, but by running the volume level low obtain only 30% or 40% modulation, thereby losing efficiency as well as the fruits of his labors. The best of engineering can be ruined by improper operation.

The above reason alone is more than enough to warrant the use of a volume indicator at every amateur radiotelephone station — and the volume indicator has other uses also. For instance, if an audio oscillator of widely variable frequency is available, a frequency run can be made on the speech amplifier, disclosing any faults that might be present.

Also, by watching a volume level indicator while speaking into the microphone, defects in delivery are shown up. An even speaking voice is to be preferred in radio, since the level can be made quite high without causing distortion. A speaking voice containing heavily accented syllables is to be avoided, for the average level must be brought down to prevent the heavily accented syllables from causing distortion. The amateur might, otherwise, never realize how irregular his voice is, but would see strange things when observing a volume indicator while speaking. By

practice a good "radio voice" can be cultivated to give a high average level without causing distortion. However, accents must not be subdued too greatly as the voice *must* remain clear and concise.

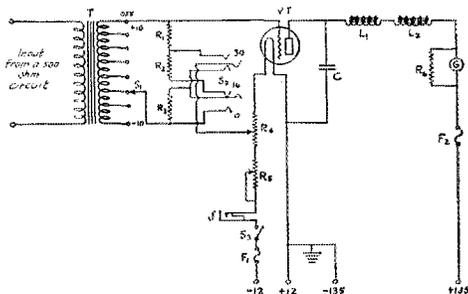


FIG. 1.—THE WESTERN ELECTRIC 518-B PANEL
 T — 208-AD input transformer.
 R₁ — 38-AC 7500-ohm fixed resistance.
 R₂ — 38-AB 30,000-ohm fixed resistance.
 R₃ — Two 38-W 100,000-ohm fixed resistance in series.
 R₄ — 42-H 5-ohm potentiometer.
 R₅ — 42-N 15.9-ohm rheostat.
 R₆ — 1-K 50-ohm galvanometer damping resistance.
 L₁-L₂ — 75-B filter inductance.
 C — 57-A 2-μfd. filter condenser.
 G — Weston galvanometer Per KS-2665.
 S₁ — 146-A 12-point dial switch.
 S₂ — 501-N key.
 S₃ — 272-A key.
 J — 248-A jack.
 F₁ — 35-B fuse.
 F₂ — 62-B fuse.
 VT — 102-D triode.

While we are on the subject, something may be said about the use of a microphone. A microphone should not be handled while current is flowing through it but should be left suspended in some convenient position. The speaker should not be too far from the microphone, because the high frequencies, which add color, will tend to drop out. Neither, by all means, should he be too close to the microphone. Then the microphone will pick up the sounds of the breath and lip movements. It is best not to speak directly into the microphone at close range, since the air emitted from the mouth to form the sound waves will cause whistling sounds as it strikes the diaphragm and the supports of the microphone. Probably the best microphone "delivery" is to talk in normal tones and voice level, and work fairly close to the microphone and at an angle to the side.

To the experienced operator, the volume indicator reveals many other things, among which is the proper operation of the speech amplifier and

* W9EBF-W9FSC, KMMJ, Clay Center, Nebraska.

the audio circuits. Foreign noises and feed-back which might be present are readily shown up together with their strength. These noises, due to their low frequency, often cannot be detected by a monitor.

COMMERCIAL TYPES

From the above, it may be seen why volume level indicators are considered so indispensable in a broadcasting station. Let's take a look into the commercial field, and see what they use.

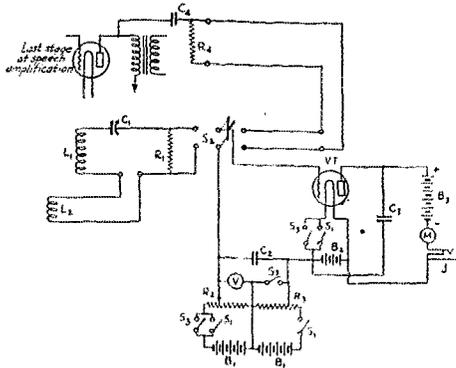


FIG. 2. — THE JENKINS & ADAIR VOLUME LEVEL INDICATOR CIRCUIT

- VT — Western Electric 103-D triode.
- T — Jenkins & Adair T-43 input transformer.
- R₁ — Jenkins & Adair 16-point potentiometer, 350,000-ohm.
- R₂ — 2-ohm potentiometer.
- R₃ — 7-ohm rheostat.
- R₄ — 50-ohm galvanometer damping resistance.
- L — Jenkins & Adair S-48 filter inductance.
- C — 1-μfd. filter condenser.
- S₁ — Input switch.
- S₂ — Filament switch.
- S₃ — Plate circuit switch.
- J — Closed circuit jack.
- G — Galvanometer.

The circuit and the constants of a widely used commercial volume level indicator, the Western Electric 518-B Panel, are given in Fig. 1. This panel is calibrated to work from a 500-ohm transmission line.

The input to the triode is controlled by the variable ratio transformer and the three-position potentiometer, thereby greatly extending the range over which the instrument will register. Grid bias is furnished by the voltage drop across the 5-ohm potentiometer and is readily controllable. The 2-μfd. condenser and the choke in the plate circuit of the triode form a filter. The galvanometer is shunted by a 30-ohm galvanometer damping resistance which allows the use of a delicate meter in the plate circuit through which high currents are flowing.

Filament current is controlled by the 272-A key and the 42-N rheostat and is measured through the 248-A jack. The filament and plate circuits are protected by the 35-E and 62-B fuses.

This unit is calibrated in decibels. Such cali-

bration, while convenient, is not at all necessary for amateur work. The range is from -10 decibels to +40 decibels in two decibel steps. The level is read as the algebraic sum of the readings of the meter, the potentiometer, and the rotary switch.

The diagram of the Jenkins & Adair volume level indicator is given in Fig. 2. The only major difference between this panel and the Western Electric 518-B is that in this unit the input to the triode is entirely controlled by a potentiometer. The range is from +20 decibels to -10 decibels, also in two decibel steps.

R.C.A. and other companies manufacture volume level indicators, but generally these are closely similar to the two described.

THEORY OF OPERATION

The principles underlying the volume level indicator are well known to all of us. A voice-frequency alternating current is very complex, varying in amplitude and component frequencies. The volume level is proportional to the instantaneous amplitude of this alternating current. So, to indicate this volume level, a triode employing plate detection and working on the lower knee of the plate-current grid-voltage curve is coupled to the last stage of speech amplification. The increments of the plate current are read by a suitable meter, after being more or less filtered to make the current through the meter more closely

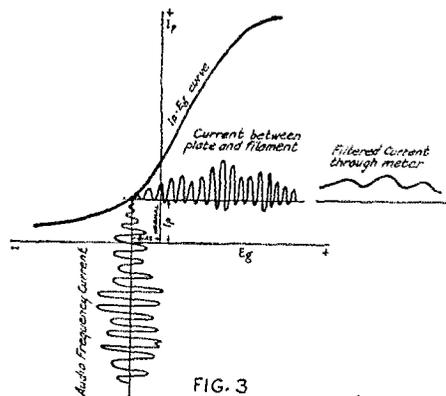


FIG. 3

proportional to the instantaneous amplitude of the audio frequency current. These actions are graphically illustrated in Fig. 3.

AMATEUR TYPES

The amateur usually prefers to stray from the beaten path and design his apparatus to fit his needs, so let us outline the "innards" of the volume level indicator. The essentials of a volume level indicator are:

1. A means of coupling, which will effect the speech amplifier as little as possible.

(A) An impedance-resistance coupling is illustrated in Fig. 4A. This scheme utilizes the primary of the output transformer of the audio frequency stage to which the volume indicator is coupled as the impedance.

(B) Where a transmission line is used to couple the speech amplifier to the modulator, transformer coupling may be used as illustrated in Fig. 4B. The primary of the coupling transformer should match the impedance of the transmission line which is usually 500 ohms. This method is used in most commercial volume level indicators.

2. A method of limiting the increments of the plate current to values such that the indicating meter will conveniently register them. This may be done:

(A) By controlling the input to the triode. This is commonly accomplished in two ways: (a) by a potentiometer, as in the Jenkins & Adair panel in Fig. 2; or (b) by varying the ratio of the coupling, as in the Western Electric 518-B panel in Fig. 1.

(B) By varying the detecting power of the triode. This is usually accomplished by varying the grid bias as in Fig. 5.

3. A triode and its associated apparatus. The triode may be a Type '99 or a Type '01-A, for battery operation, or — for a.c. operation — a Type '27. If greater variation of plate current for a given input is desired, a Type '40 would make an excellent tube. This tube is nearly similar in characteristics to the Western Electric 102-D

plate power supply, which may or may not be the power supply of the speech amplifier. Also, the proper means of controlling it, such as switches and rheostats for the filament supply.

4. A filter, which in simpler installations consists simply of a large condenser shunted from ground to the plate of the triode. More elaborate panels have an inductance in series with the plate

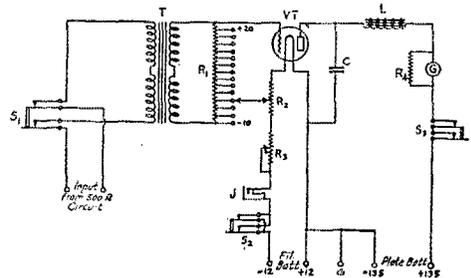


FIG. 5. — CONNECTIONS FOR THE MODULOMETER

C₄ — 1-μfd. coupling condenser.

R₄ — 1-megohm grid leak.

S₂ — Three-pole single-throw switch, any type.

The remaining components have the same values as given in Fig. 1, page 9, QST, August, 1929.

lead directly after the tube in addition to the condenser, as in Figs. 1 and 2.

5. An indicating meter, which is usually either:

(A) a low-reading milliammeter, or

(B) a galvanometer. A very sensitive instrument should be shunted by a galvanometer damping resistance of 30 or 50 ohms.

By following the above outline, the amateur may design a volume level indicator to fit his own particular needs.

The modulometer, which no amateur radio-telephone station should be without, can readily be made to put its spare time in as a volume level indicator.¹ Fig. 5 illustrates a suggested way of doing this, by the addition of a small switch and a simple input circuit to be built into the speech amplifier. The type of coupling used is the one outlined under 1(A), and the method of limiting the variation of plate current to values that the indicating meter will register is that outlined under 2(B). The grid bias is now measured by the voltmeter. This voltmeter will be handy in keeping the unit in calibration. The unit could be operated from the speech amplifier power supply during service as a volume indicator, and so save the portable batteries for general use as a modulometer.

The diagram of another suggested volume indicator is given in Fig. 6. This volume indicator uses an a.c. operated tube, the Type '27, and could be operated from the same power supply as the speech amplifier. This volume indicator

¹ The Modulometer, QST, Aug., 1929

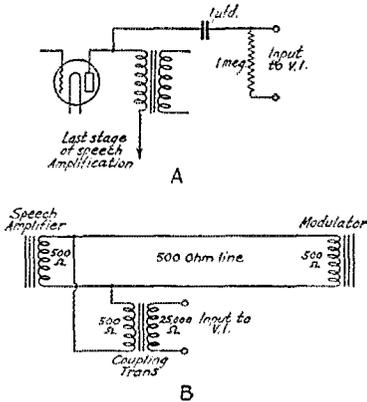
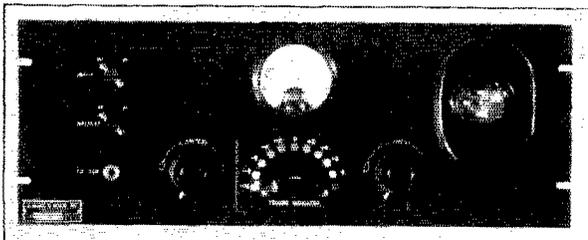


FIG. 4

triode. In fact, almost any tube on hand may be used with more or less success. The associated apparatus consists of: (a) grid bias and a means of controlling it. (Grid bias may be obtained by a "C" battery and a potentiometer, or by resistance drop (as in Figs. 1 and 2) or by any other conventional method); and (b) filament and

is to be coupled to a transmission line, as outlined under 1(B). A transmission line should be used if the speech amplifier and transmitter are very far apart. The potentiometer is used to control the triode input.

Small dials with easily read scales should be fitted on the grid bias control and the triode input control, if used. The grid bias control should be mounted front-of-panel, as it requires frequent adjustment, but it is best to place the triode input control behind the panel to protect it against accidental manipulation or the inquir-



THE JENKINS & ADAIR VOLUME LEVEL INDICATOR

ing fingers of little brother, since a different adjustment would throw the calibration off entirely.

The volume indicator may be built directly into the speech amplifier panel as a part of the speech equipment. If a converted modulometer is used, it should be mounted separately with some plug-in method to couple it to the speech amplifier, allowing instant use as either modulometer or volume level indicator.

CALIBRATION

The first step in calibrating the volume level indicator is to determine the maximum volume level which may be used without causing distortion.

To determine the level at which distortion first occurs, some means of constant amplitude sound input must be provided. To accomplish this, a vacuum-tube audio oscillator may be coupled directly to the input circuit of the speech amplifier, or a telephone unit in the plate circuit of the audio oscillator may be mounted on the microphone as illustrated on page 11 of the August, 1929, *QST*. The frequency of the audio oscillator should be around 500 to 800 cycles, as this is about the average of voice frequencies.

With constant amplitude sound input and with volume level indicator, speech amplifier, and transmitter operating, we are ready to proceed.

The gain control on the speech amplifier should be advanced until distortion first occurs. On a well-designed transmitter, this point is where the modulator first starts to draw grid current. When the level at which distortion first occurs is found, the gain control should be retarded a point or two. This is the maximum level to be delivered to the modulator hereafter.

With volume indicators using the method of controlling the variations of plate current outlined under 2(B), the detecting power of the triode is varied by varying the grid bias until the plate circuit meter reads some convenient value half or two-thirds scale.

With volume indicators controlling the plate current variations as outlined under 2(A), however, we must first set out grid bias to some convenient value around the point of best detection. The point of greatest detection can be found by reducing the input to the triode to a low value and adjusting the grid bias for maximum plate current. Vary the triode input control until the meter in the plate circuit reads some convenient value half or two-thirds scale. With this type of volume indicator, both the maximum (excited) and minimum (unexcited) plate current can be adjusted so as to make them stand at easily remembered round numbers.

The volume indicator is now calibrated and ready for use. The reading of the plate circuit meter with maximum volume level (reading without excitation) and the bias voltage (if known) should be recorded. For example, with a meter graduated from 0 to 100,

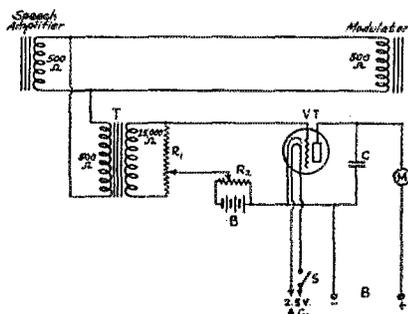


FIG. 6.—A PRACTICAL AMATEUR VOLUME LEVEL INDICATOR

T—Input transformer (500-ohm primary; 25,000-ohm secondary).

R₁—High resistance potentiometer (25,000 ohm or 50,000 ohm).

R₂—200- or 400-ohm potentiometer.

M—0 to 1 milliammeter.

C—2-μfd. filter condenser (value not critical).

VT—Type 2J triode.

B—"C" battery for grid bias supply.

S—Filament switch.

the maximum might be 60, the minimum 5, and the grid bias — 1.1 volts.

Each time we use the volume indicator hereafter, we must see that the initial conditions are fairly well duplicated. With our example, after bringing the filament and plate voltage to the proper values, the reading of the meter in the plate circuit without excitation should be 5. If

(Continued on page 37)

What Feeling Exists Between American and Foreign Amateurs?

By Clarence E. Brockert*

THE feeling existing between American and foreign amateurs is a feature of amateur radio the writer has long wished to investigate. Opportunity for such an investigation came while attending the University of Wisconsin. The results are presented herewith, and it is hoped they will be found of as much interest to others as they were to the writer.

In conducting the investigation, questionnaires were sent to two hundred amateurs who were known to have held foreign contact, and who, it was believed, were capable of answering the questions as fully and comprehensively as possible; 102 of the questionnaires were answered, and upon 100 of these were based the conclusions which follow

TABLE I

Question 1. What kind of feeling arose in you when you first worked this man (in foreign country)?	Mutual.....	97	%
	Indifferent.....	2	%
	Weak.....	1	%
Question 2. Would you feel right if the U. S. went to war against this man's country?	Yes.....	7.	4%
	No.....	56.	2%
	Uncertain.....	36.	4%
Question 3. Did you feel you had an unbiased and absolute feeling toward this man politically, socially and economically?	(a) Politically:		
	Yes.....	74.	8%
	No.....	12.	1%
	Uncertain.....	13.	1%
	(b) Socially:		
	Yes.....	92.	8%
	No.....	4.	1%
	Uncertain.....	4.	1%
	(c) Economically:		
	Yes.....	77.	9%
	No.....	6.	5%
	Uncertain.....	15.	6%
Question 4. Do you think that through the medium of amateur radio better international relations will be encouraged?	Yes.....	81.	15%
	No.....	1.	03%
	Uncertain.....	17.	82%
Question 5. Do you think that a course in Radio, Ethics in every high school would encourage a better international feeling among the youth of the country?	Yes.....	43.	8%
	No.....	9.	3%
	Uncertain.....	46.	9%
Question 6. Do you think the public fully realizes the benefits and accomplishments of amateur radio?	Yes.....	1	%
	No.....	98	%
	Uncertain.....	1	%

Yes.....	81.	15%	
No.....	1.	03%	
Uncertain.....	17.	82%	
Question 5. Do you think that a course in Radio, Ethics in every high school would encourage a better international feeling among the youth of the country?	Yes.....	43.	8%
	No.....	9.	3%
	Uncertain.....	46.	9%
Question 6. Do you think the public fully realizes the benefits and accomplishments of amateur radio?	Yes.....	1	%
	No.....	98	%
	Uncertain.....	1	%

In reality, the problem incorporates a two-fold purpose. First, from the standpoint of the American amateur it presents a picture of the reactions supplied by international communication.

NUMBER REPLYING

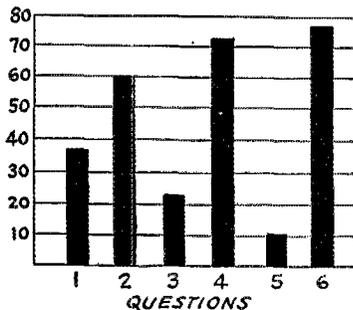


FIG. 1.—NUMBER REPORTING PREVIOUS INDEPENDENT THOUGHT ON QUESTIONS ASKED

Second, from the standpoint of the educator it presents a basis for the introduction of a course in transoceanic communication in schools. It should be understood that such a course would necessarily take the form of an outside activity, to be supervised possibly by some sort of club, since school programs are usually already filled to capacity with other subject matter, some of which is more or less related.

A careful analysis of the following data will reveal many interesting facts. Note, for example, the wide variance in the answers to Questions 4 and 5. In Question 4, eighty-one percent as-

* Ex-W9OM and W9ERC 401 N. Murray St., Madison, Wis.

serted that better international relations could be fostered by the course hereintofore mentioned. Fig. 2 will serve to more fully illustrate this.

The question follows, what of it? It is my objective to construct an outline of a course of study dealing with the advantages derived from

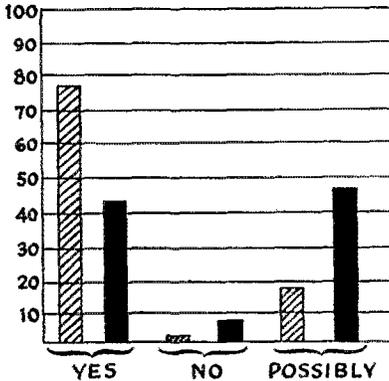


FIG. 2. — SHOWING THE RELATIONSHIP OF ANSWERS TO QUESTIONS 4 AND 5

Question 4 // // // //
Question 5 ■■■■■■

participation in amateur radio. I think such a course would be warranted from the fact that there was little thought given to that phase of radio as was revealed by the answers to Question 5. It is true that there are already a great number of activities in which boys indulge while out of school, but I feel, and my own experience and that of others bears me out in this, that an unlimited amount of real vitalized instruction, and a better understanding of one's fellows, will thus be most efficiently obtained. If more boys and young men were given this opportunity it would result in a beneficial application of amateur radio toward the end that more harmonious international relationships would exist.

In conclusion, I wish to take this opportunity to express my sincere thanks to those who so willingly assisted me in obtaining this material. This is additional splendid evidence of the quality of amateur radio coöperation.

The Hawaii Convention

WHO should have thought, a few years ago, that a typical "ham" convention would be held in a far away island in the Pacific Ocean. This is exactly what came to pass in Honolulu, Territory of Hawaii, on August 8th and 9th; the convention being held under the sponsorship of L. A. Walworth, W6CIB, A.R.R.L. Section Communications Manager.

This first A.R.R.L. Hawaiian Convention was

affectionately dedicated to the memory of Kenneth A. Cantin, former SCM, whose untiring efforts, unexcelled sportsmanship and inspiring personality did more for the cause of amateur radio than any other person in Hawaii.

All the activities of the convention were held in the new Army and Navy Y. M. C. A., through the courtesy of the staff, and no better place could have been chosen — it was an ideal spot for the affair.

Dr. N. S. Fairweather, K6BQJ, presided at the opening session on Friday. The opening exercises included the sending of an Aloha radiogram to Mr. Ray Wilbur, Secretary of the Interior at Washington over the convention's own transmitter, operating under the call, K6EIG, and the message was signed by Territorial Delegate Victor S. K. Houston, who was the guest of honor. Following the opening address by Dr. Fairweather, who welcomed the delegates with well chosen words, Mr. M. A. Mulrone, radio engineer and director of KGU, gave a talk on "Interference" and its problems with particular reference to atmospheric interference. Parker Lewis who spoke in place of W. H. Friedly, absent because of illness, gave an intimate story of the former Radio Club of Hawaii. One of the most interesting speakers of the convention was W. I. Harrington, Mutual Telephone Co., who spoke on the use of ultra-short waves and the great care necessary in handling the equipment at such high frequencies. J. K. Shibata, the last speaker, gave a good talk outlining important facts in tuning transmitters and balancing circuits.

Stunts which are a part of all conventions were carried out and much interest created over the high speed sending and receiving contests.

The convention station K6EIG was active during all the convention time and Jack Shibata certainly deserves a lot of credit for sticking to it as he did. Here are some of the stations that were worked: W6BCH, W6BBP, W6DWI, W6ECN, W6BCK, W6BQK, CE1AH, W7BA, W6EOU. A large number of messages was handled.

The banquet was the big event of the convention, and the chef did justice to his art; whilst D. W. Horstmeyer proved equal to the occasion as the toastmaster. His Honor, Mayor John H. Wilson was one of the guests, and if reports are true another inoculation of "Hamitis" will see a new call letter. Another guest was William L. Holland of Christ Church, New Zealand, who spoke on the value of amateur radio to international friendship. Several resolutions were passed at the convention to be transmitted to Director Babcock as expressions from the Hawaiian Section. The sincere thanks of all go to SCM L. A. Walworth for his untiring efforts and those who assisted him in making this first Hawaii Convention such a huge success. And now Aloha Nui Loa from Hawaiian Amateurs.

— A. A. H.

Standard Frequency News and Schedules

THE number of standard frequency schedules that will be on the air after November 1st should make it possible for any amateur to calibrate his new dynatron frequency meter at his own convenience, no matter where he may be located. The Pacific Coast station will transmit its first schedule on that date, starting off at the early hour of 4:00 a.m. (P.S.T.) with a BX schedule for the gang in Oceania and the Far East. W9XAM-W9SI started transmissions September 12th, in spite of the inevitable handicaps surrounding the setting up and adjustment of a standard frequency station on short notice. A number of difficulties were encountered and a few are still being ironed out at this writing. W1XP-W1AXV is giving its usual fine consistent service and will be using a new oscillator-amplifier set by the time this issue of *QST* is off the press. The complete description of the standard frequency equipment used at Round Hill will be an important feature of the next issue of *QST*. The transmission of standard frequency signals is an art in itself and the description of W1XP-W1AXV should be of more than usual interest to every amateur.

The frequency standard for the Pacific Coast station has been given a calibration of 100,000 kc. by the Bureau of Standards at Washington, the accuracy of the standard being to within 1 cycle at 100 kc.—the same as that of the one calibrated for W9XAM. A calibration has also been made by the Bureau of Standards on the signals of W1XP-W1AXV so that all units of the A.R.R.L. Standard Frequency System are now using frequency standards which have been calibrated from the National Frequency Standard.

The best procedure for using the standard frequency signals to calibrate a heterodyne frequency meter is that described by George Grammer in the article on the dynatron frequency meter in October *QST*. Incidentally, this frequency meter is the finest ham frequency measuring gadget we have met up with and anyone who has not read that article from end to end has missed something.

The complete schedules for November and December follow. The schedules for November are as published in October *QST* with the exception of W1XP-W1AXV's Schedule C, which has been shifted from November 9th to November 16th, and the addition of a W9XAM Schedule C on November 30th. The assignment of the Pacific Coast station's call has been delayed, but there should be no difficulty in identifying the signals. When you hear a "W6X" calling "QST" on the schedules shown below

you will know that Harold Peery and his gang are on the job.

DATES OF TRANSMISSION

Date	Schedule	Station
Nov. 1, Saturday	BX	W6X-
Nov. 2, Sunday	C	W9XAM-W9SI
Nov. 7, Friday	BB	W6X-
	B	W1XP
	A	W9XAM
Nov. 8, Saturday	BX	W9XAM
Nov. 9, Sunday	BB	W9XAM
	C	W6X-
Nov. 14, Friday	C	W6X-
Nov. 16, Sunday	C	W1XP
Nov. 21, Friday	A	W1XP
	B	W9XAM
	B	W6X-
Nov. 28, Friday	BB	W1XP
	B	W9XAM
	A	W6X-
Nov. 29, Saturday	BX	W6X-
Nov. 30, Sunday	C	W9XAM
Dec. 5, Friday	BB	W6X-
	B	W1XP
	A	W9XAM
Dec. 6, Saturday	BX	W9XAM
Dec. 7, Sunday	BB	W9XAM
	C	W6X-
Dec. 12, Friday	C	W6X-
Dec. 14, Sunday	C	W1XP
Dec. 19, Friday	A	W1XP
	B	W9XAM
	B	W6X-
Dec. 26, Friday	BB	W1XP
	B	W9XAM
	A	W6X-
Dec. 27, Saturday	BX	W6X-
Dec. 28, Sunday	C	W9XAM

STANDARD FREQUENCY SCHEDULES

Friday Evenings Schedule and Frequency			Friday and Sunday Afternoons Schedule and Frequency		
Time (p.m.)	A	B	Time (p.m.)	BB	C
8:00	3500	7000	4:00	7000	14,000
8:08	3550	7100	4:08	7100	14,100
8:16	3600	7200	4:16	7200	14,200
8:24	3700	7300	4:24	7300	14,300
8:32	3800		4:32		14,400
8:40	3900				
8:48	4000				

Saturday Morning Schedule and Frequency	
Time (a.m.)	BX
	4:00
	4:08
	4:16
	4:24

It is possible that the Pacific Coast station may use the call W6AQQ if the special "X" license has not been issued in time for the first scheduled transmission.

The time specified in the schedules is local standard time at the transmitting station. W1XP

uses Eastern Standard Time, W9XAM, Central Standard Time, and W6X-, Pacific Standard Time. Schedule BB transmitted by W1XP is intended particularly for European amateurs and starts at 2100 G.C.T. Schedules BX are transmitted especially for amateurs in Oceania and the Far East. They are transmitted starting at 1000 G.C.T. by W9XAM and at 1200 G.C.T. by W6X-. Reports on these special schedules are particularly desired, not only from overseas hams but from those in the Americas also.

Although the frequencies of the transmitting stations are not guaranteed as to accuracy, every effort is made to keep to within 0.01% of the announced frequencies. Frequent checks on the transmissions are made by laboratories equipped with accurate frequency standards and the transmissions are also checked by the U. S. Department of Commerce monitoring stations.

TRANSMITTING PROCEDURE

The time allotted to each transmission is 8 minutes, divided as follows:

2 minutes — QST QST QST de (station call letters).

3 minutes — Characteristic letter of station, interrupted by call letters. Characteristic letter of W1XP is "G", of W9XAM is "D", and of W6X- is "F".

1 minute — Statement of frequency in kilocycles and announcement of next frequency.

2 minutes — Time allowed to change to next frequency.

THE TRANSMITTING STATIONS

W1XP: Massachusetts Institute of Technology, Round Hill Research, South Dartmouth, Mass., Howard A. Chinn in charge.

W9XAM: Elgin Observatory, Elgin National Watch Co., Elgin, Ill., Frank D. Urie in charge.

W6X-: Don Lee Broadcasting System, Los Angeles, Calif., Harold Peery in charge.

Do not forget to QSL the transmissions. All reports should be sent to the A.R.R.L. Standard Frequency System, 1711 Park Street, Hartford, Conn. A record will be made at Headquarters and the report will be then forwarded to the proper station. S. F. report blanks can be obtained from Headquarters, free and postpaid, upon request.

"Make every Friday night Standard Frequency Night."

— J. J. L.

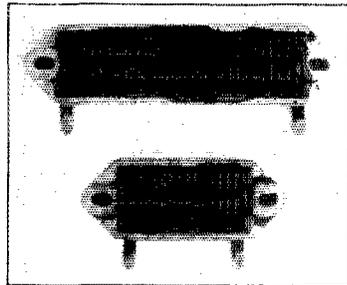
A Non-Inductive Resistor

A NEW wire-wound resistor with negligible inductance has been developed by the Ward-Leonard Electric Company, Mt. Vernon, N. Y. The new resistor is known as the "plaque" type, and except for the flat shape and

method of winding the resistance wire on the form, is similar to the other Vitrohm resistors manufactured by this company. They are made in two sizes, as shown in the photograph, the larger having a power dissipation rating of 40 watts and the smaller 25 watts.

In the 40-watt size values of resistance between 0.5 and 9000 ohms can be obtained. Resistances between 0.25 and 4500 ohms are furnished in the 25-watt size. Taps may be brought out under certain conditions.

These resistors may be used in radio circuits where a non-inductive resistor is required. A 70-ohm sample of the 25-watt size was tried out in the QST lab. as a load for a dummy antenna, and at 14,000 kc. apparently had no more inductance than an ordinary 60-watt lamp. The 70-ohm size was used because this represents the average characteristic impedance of most Hertz antennas. Since the change in resistance in heat in these units is negligible it is impossible to measure the power developed by a transmitter by simply measuring the current through the resistor in



the dummy. This cannot be done with an ordinary lamp because the resistance of the lamp is subject to drastic variations with the amount of current flowing through it.

The new plaque resistors should also be excellent as transmitting grid leaks. Ordinary wire-wound resistors sometimes try to act as r.f. choke coils and burn out because of circulating currents.

Strays

Bus wire that has become bent in handling can be straightened easily with the aid of a vise and a heavy pair of pliers. Take the piece to be straightened and clamp one end in the vise. Get a firm grip on the other end with the pliers and give a hard yank. Kinks and bends will disappear.

— W3CA.

Dictaphone operators here at HQ have their troubles. The YL who handles the Information Service letters recently wrote "secure" instead of "cure" in a letter about key clicks. The chap who got it wrote back, "I can do that quite easily now". Hi! So say we all.

Experimenters' Section

Radiophone Reception

By C. H. Vincent, W8RD-W8XB

MY five years of experience with amateur and experimental radiophone work have shown that one of the greatest faults in the average station is the failure to provide a receiver that is reasonably efficient when radiophone signals are to be intercepted. This holds true not only at the average amateur station but also at the college experimental stations where one would naturally expect to find the most efficient receivers.

I believe the amateur neglects this part of the job because he thinks that an entirely different receiver, with a high grade audio system, is required for such work. Experience teaches that any audio system that will bring in c.w. signals of average steadiness will also prove satisfactory for voice reception. In fact a reasonably sharp peak is an advantage, tending to reduce QRM on crowded bands. This leaves only the radio frequency circuit (if any) and the detector circuit to be considered, and since most amateur receivers do not incorporate any radio frequency amplification I will confine my suggestions mostly to the detector circuit.

A sensitive detector tube is absolutely necessary if anything like maximum results are to be obtained. Numerous tests with the ordinary '00-A type of tube have shown that, while very sensitive, it tends to be noisy and most important of all the filament temperature must be kept constant if reasonable stability is expected. The tubes are not very uniform, however, and some makes will be found much more satisfactory than others. A good one is a tremendous improvement over the Type '01-A. Possibly only one tube out of four will be satisfactory on frequencies above 10,000 kc., whereas at least two out of three will be satisfactory on frequencies below 5000 kc. Some of them, of course, tend to squeal or lack stability at the highest frequencies even though they may be (and usually are) perfectly satisfactory on broadcast frequencies.

Assuming that a satisfactory detector tube has been secured the next point is to make sure that it will slide into oscillation with a very slight hiss instead of the "plunk" commonly associated with regenerative receivers. On a well-designed and constructed receiver this is easily accomplished by inserting a variable resistance (fifty thousand to one hundred thousand ohms) in the detector plate circuit and raising the voltage to the point where thirty to fifty volts reaches the plate when at least two-thirds of the resistance is in series. This variable resistor can be used as an oscillation control if shunted by a condenser of 0.25 to 1.0

μ f.d. capacity but my personal preference is for capacity feed-back, varying the resistance only to secure best results with different inductances.

The grid leak resistance, of course, is an important feature and most of these tubes operate best with 4- to 7-megohm leaks. Fringe howl does not occur very frequently, and is less likely to show up if the first audio transformer has a fairly high ratio, such as 6 to 1. When encountered it can often be eliminated by shunting the secondary of the first audio transformer with a 2- to 3-megohm leak or by re-adjusting the detector plate circuit resistor. By-pass condensers should also be connected from each high voltage lead to ground, particularly if the batteries are to be used until the internal resistance becomes fairly high.

Assuming the receiver is fitted with a sensitive detector and operating in a smooth manner, it will be found advantageous to use the zero-beat method of reception on weak radiophone signals particularly if QRM from other stations is not bad. Many amateur radiophones, of course, will not stand this method of reception because the carrier suffers too much frequency modulation but a large percentage of the transmitters now on 14,200 kc. and many of those on 3500 kc. will stand it, with a considerable increase in signal strength resulting.

Few vernier dials have a sufficiently low ratio to make such fine tuning easy, consequently I always incorporate a small vernier condenser in parallel with the main tuning condenser. This vernier unit is usually made from a two-plate Hammarlund Midget in which the spacing has been increased to three-eighths inch. This is just about the right capacity to make zero beat tuning easy while at the same time enough capacity variation is provided to cover the frequency creep on the average transmitter of reasonably good design.

Most amateurs probably have not constructed receivers incorporating tuned radio frequency circuits but many of them have used one Type '22 as a coupling tube. My general purpose receiver originally used a tube of this type but I find that a '24 gives much better results. When the antenna coupling tube first came into fairly general use there was much difference of opinion as to whether there was any real signal gain through it, but when a Type '24 tube is used there is no question but that some gain is effected. My own impression is that the signal strength is doubled or tripled as compared with the same receiver using plain capacitive or inductive coupling. The filament of this tube can, of course, be heated from the regular storage battery, but since it must be kept lighted all the time the station is on the air I provide a filament transformer for this tube

alone. No trouble is experienced with hum if the transformer is kept at a reasonable distance from the detector circuit and a twisted pair used to carry the current.

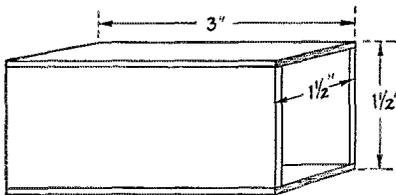
If a loud-speaker is to be used, many of the old discarded units will be found superior to the newest reproducers for voice reception only. Voice frequencies do not as a rule cover much territory and the audio system or reproducer that is necessary to bring in a full orchestra will produce a lot of extra noise when speech alone is to be considered.

An All-Purpose Filament Transformer

By S. M. Douglas, Jr., W4ACB

Here is a transformer that will give a variety of voltages that will be found useful around the shack, and also one that can be used as a "spare" in case the main one goes south, or west, or wherever it is that transformers go when the windings get tired of carrying the juice.

The items needed for its construction are few, and it is very easy to build. The writer used



FORM FOR WINDING COIL

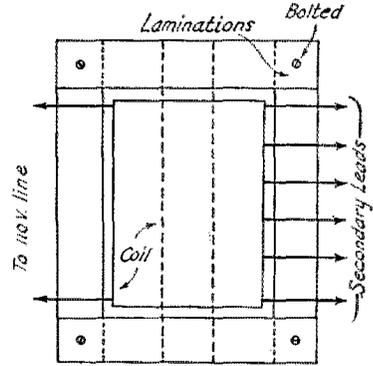
FIG. 1.

four pieces of cigarbox wood as a winding form, cut three inches long and one and one-half inches wide, as shown in Fig. 1. These were tacked together with small brads to hold them in place in the form of a box, then the whole thing wrapped with a couple of layers of waxed paper. The paper was put on to allow easy removal of the wooden form.

Number 24 d.c.c. enameled wire is used for the primary. In case this size does not happen to be handy, it can be purchased at almost any automobile generator repair shop. It will be found that with the form dimensions given above, about one-half to three-quarters of a pound of wire will suffice. There are approximately thirty turns to the inch, and therefore it will be possible to get about ninety turns on the three inches of layer. Start at one end and wind to the other, then wrap another layer of paper around the coil and continue back to the beginning, then another layer of paper, and so on until the whole spool of wire is used, or until there are approximately 650 turns.

This finishes the primary, and it should be well wrapped with waxed paper and prepared for the

secondary. This is wound with number 18 d.c.c. enameled wire. For the two 7½-volt windings, use fifty turns each with a center tap at the twenty-fifth turn on the first winding and no center tap on the second. Combined, these two will give 15 volts, with center tap. The two 2½-volt windings will take about 15 turns each. One



DETAIL OF MOUNTING ON LAMINATED CORE

FIG. 2.

A shell-type core taken from an old transformer is used, or one may be built up from transformer iron laminations. The cross section of the core is 1½ by 1½ inches.

of these windings is center-tapped at the seventh or eighth turn. These will give a combined voltage of 5 volts, center-tapped.

The whole business is now wrapped with good waxed paper, varnished cambric, or electrician's tape, and is ready for the laminated core. I used the core of an old transformer, and found no difficulty in getting the coil on it. However, if such is not available, one can be made from some straight pieces of stock. First, put the center pieces in as in Fig. 2, then the tops, and lastly the

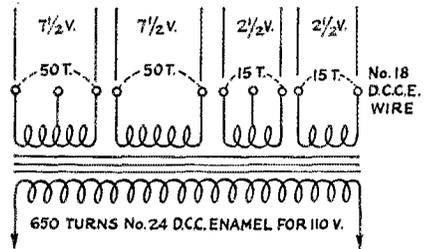


FIG. 3.—SCHEMATIC DRAWING OF THE TRANSFORMER

The addition of taps on the primary winding will help in securing the correct voltages from the secondaries under different load conditions. A good way to arrange the taps would be to bring them out every 25 turns, starting with the 600th turn, and making the primary winding have a total of 700 turns.

side pieces. These should be alternated all around and, when all are in place, bolted together securely. If the transformer hums when it is con-

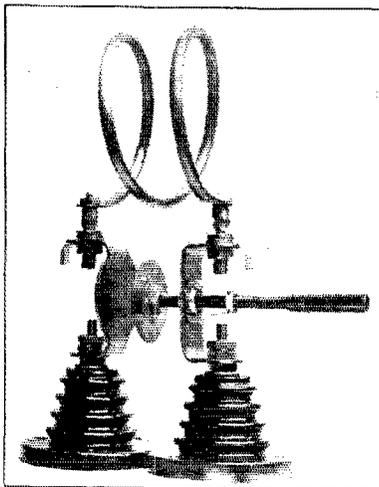
nected in the circuit, drive some wedges in the center to make it tight fitting. Care should be taken that the iron pieces of the core do not short-circuit any of the windings.

When completed, the whole thing can be mounted in a metal box, and a piece of bakelite used on one side for a panel, to which all leads are brought out to binding posts. The leads should be tagged for identification. After connecting all the leads to the posts, fill the can with some battery compound, such as wax compound off the tops of old "B" batteries. Do not use hard rubber for the panel as the hot compound will ruin it.

After the compound has cooled and hardened, the box can be painted to match the other apparatus and the transformer is ready for operation. Of course before putting the whole thing in the box it will be well to test the windings to see if they are delivering the proper voltages. It will be found that the voltages will vary with the size of the coil.

This may be some trouble to a lot of hams, but the writer likes to experiment and this transformer is one of his experiments. It works well and the total cost is not over \$1.50, if most of the parts are to be found in the shack's junk box.

disc is 1 1/4" in diameter and is the movable plate. The stator is 1 1/2" across by 2 5/8" from top to bottom. The inductance is fitted with two G.R. plugs and it can be replaced by others for differing



THE 56-MC. TUNING CONDENSER AND COIL

A 5-METER VARIABLE CAPACITY

"If for no other reason than the fact that the '5-meter band' occupies 4000 kc. it is highly desirable to cover only 7 cm. with a given inductance. The photograph shows plainly what has

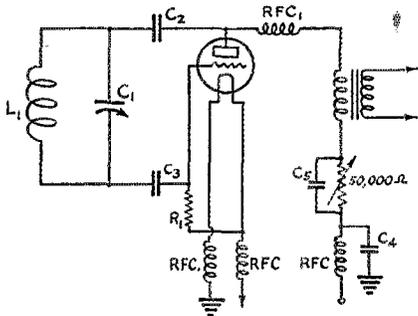


FIG. 4.—THE 56-MC. ULTRAUDION RECEIVER CIRCUIT

- L₁—2 turns of No. 8 copper wire. Coil is 2" in diameter and the turns are 1" apart
- C₁—See text and photograph
- C₂—200 μfd.
- C₃—100 μfd.
- C₄—1.0 μfd.
- C₅—4.0 μfd.
- R₁—7 megohms
- RFC₁—180 turns No. 32 d.s.c. wound in 10 sections spaced at 1/4" intervals on 3/8" glass tube
- RFC₂—15 turns No. 20 d.c.c. on 1/2" glass tube

been evolved after a lot of experimenting and picking up of signals over a distance of 170 miles when they were found to be terribly sharp and difficult to hold. The circular copper rotating

frequencies. An extension handle of hard rubber 10" in length is recommended to get the field well away from the operator. The recommended circuit is the ultraudion and with an extremely low-loss tube socket and a tube with good characteristics there will be no trouble in getting down to 1 meter with this arrangement. The writer has had a screen-grid tube (Mazda SG215 with grid plate capacity of 0.0045 μfd.) down to 4.9 meters easily."

— E. G. Somerset, G2DT

REMOTE CONTROL

"The diagram of Fig. 5 shows a keying system that has been in use here for some time. This is a nice arrangement for those who want to use remote control.

"When the key is pressed relay No. 2 closes, lighting the filament of the Type '80 tube. When the filament reaches the correct operating temperature current flows in the plate circuit, closing relay No. 1, which is in the a.c. line to the power transformer. After the key is opened it takes four to six seconds for the a.c. line relay No. 1 to kick out. Relay No. 1 should be a good one which will operate on 50 to 100 milliamperes. The other relays are made from automobile generator cut-outs that can be bought at any garage. The Type '80 is used as a time-delay tube and 6 to 8 volts is put on the filament. The greater the filament voltage the longer the a.c. line relay will stay in.

"Relay No. 2 is not necessary if the Type '80 tube is near the key. With a long line, however, the filament would get little current because there

would be a heavy voltage drop. With the relay, any length of line may be used, provided the filament battery is near the tube.

"The keying relay, No. 3, is placed across the filament of the Type '80, and as the key is

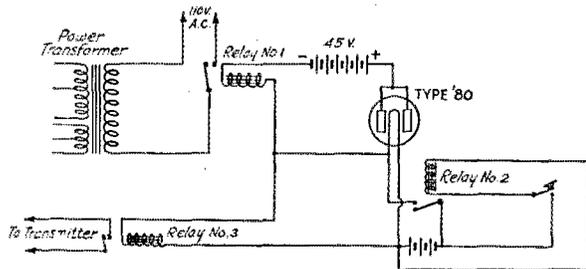


FIG. 5

pressed the keying relay also responds. The key is held down a few seconds to start the a.c. line and after relay No. 1 closes, the set may be keyed in the usual way. If the key is left open the transmitter automatically shuts itself off after a few seconds."

— Francis H. Thisse, W8BJI

ANOTHER STUNT FOR CHANGING BANDS

"Several ways of rapidly changing from one band to another have been presented in QST, and an additional method is shown in Figs. 6 and 7. The idea is to use two separate detector tuning circuits with the same audio amplifier and regeneration control.

"The tuning condenser is a two-gang affair,

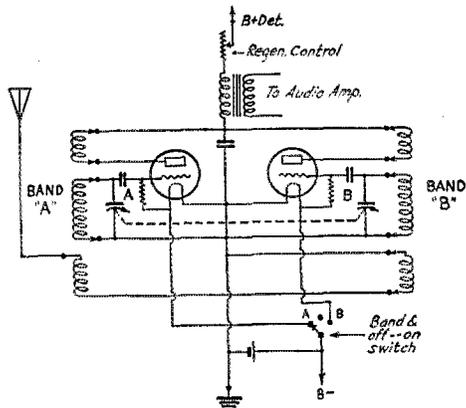


FIG. 6

each section having enough plates removed to satisfactorily spread the band on which it is to tune. Since one shaft turns both condensers, only one tuning dial is required. To change from one band to another it is only necessary to set the

filament switch so the proper detector tube gets filament current — a change which only requires a second and which can be made from the front of the panel.

"The idea can be extended of course to cover three bands by using a three-gang condenser and three detector circuits. Chaps who dislike the bother of plugging in coils (and perhaps also condensers) will find this about the simplest possible method of changing bands in a hurry. Of course a little additional equipment is necessary, but the parts are inexpensive."

— R. C. Alexander, W6ESO-W6DPW

MAGNIFYING THE DIAL SCALE

"I am one of those fellows who has to wear 'specs' because of rather bad eyesight, so have utilized a little stunt that may be of use to others in the ham game.

"The ordinary vernier dial used on so many

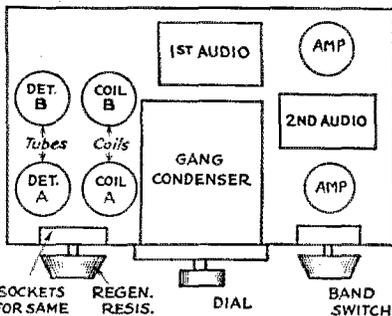
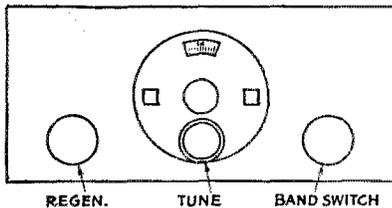


FIG. 7

ham receivers has a scale of comparatively small figures and divisions. To make those figures and divisions clear and easily read from my operating table which is located some three feet from the receiver, I have made use of a lens from an old flashlight to enlarge them. The attached diagram explains how it's done. The lens is inclined at an angle determined by the distance from the operator and the height in relation to the eye level. This particular dial is one of the old Pilot Kilograds but the same idea can be applied to many of the other similar dials commonly used.

"This arrangement gives brilliant illumination, and the figures can be read easily at a distance of four feet. Does another thing, too; eliminates glare from the panel lights and one can operate in

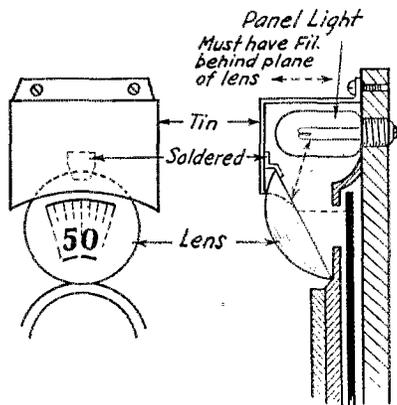


FIG. 8

subdued light — something conducive to nice QSO's! Might come in handy for the boys who work the YL's!"

— H. Guy Moats, WSAE

LOW LOSS COILS

Director Babcock suggests the following method of making coil material of the type that used to be sold "by the inch" some years ago.

Take a 5 x 7 non-curling photographic film and remove the sensitized emulsion by soaking the film in a mixture of hot water and washing soda or household ammonia. The film is then wound around a 2-inch mailing tube and the lapped-over portions cemented together with collodion or one of the varnishes. Two of the films will just cover a 10-inch mailing tube, which is an easy size to handle. After the ends are firmly set, the winding is put on, using No. 22 d.c.c. wire, with a space between each turn equal to the diameter of the wire. The coil is then painted with lacquer, collodion or other coil dope and allowed to dry thoroughly.

If a spiral mailing tube has been used it is a very simple matter to remove it from inside the coil. Catch the inside point of the tube material with a pair of flatnose pliers and then twist against the lay; the whole thing will unwind and come out without any trouble.

PROTECTING THE RECTIFIER

"If the transmitting tube stops oscillating or one of the filter condensers blows the filaments of the rectifier tubes are likely to go west in a hurry because of the heavy current, unless the operator gets the power switch open pronto or unless some

protective device is used. The latter is the safest method, and it is quite simple and inexpensive.

"Fig. 9 shows how two flash-light or panel-light bulbs may be used to provide the necessary protection for the rectifier. The lamp in series with the filter condensers may be one of the very small flash-light bulbs (6-volt size is satisfactory) since it carries practically no current and its only

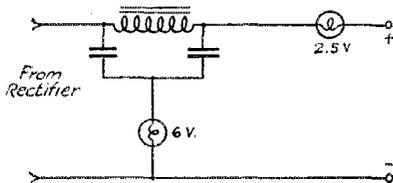


FIG. 9

function is to immediately burn out if one of the filter condensers blow. The lamp in series with the positive high voltage, however, must be capable of carrying the plate current taken by the transmitter without blowing, yet should burn out if the current goes much above normal. The 2½-volt lamps will be better in this position than the 6-volt size if the current is 100 milliamperes or more."

— H. E. Hurley, W6CKS

INDUCTIVE GRID LEAKS

Norman B. Krim, W2AJP, writes that he ran into a rather unusual condition with his Type '10 Hartley outfit which resulted in extremely high plate current and a very poor note on the 14,000-kc. band, although the set was perfectly normal on 3500 and 7000 kc. On the two latter bands, the plate current with the set unloaded was in the vicinity of 50 milliamperes, while on 14,000 kc. the current would not go below 115 ma. Naturally the r.f. chokes came under suspicion, but experimenting with different sizes and shapes brought very little relief.

It was noticed that the grid leak was very hot on the band in question, indicating the presence of r.f. in the leak, and this led to the idea that perhaps the grid condenser and leak together formed a tuned circuit which was resonant near the operating frequency. Substitution of a grid condenser of higher capacity confirmed this conclusion, because the transmitter began to act as it should on 14,000 kc. and a similar "bad spot" appeared at about 9000 kc.

So many things of this sort can and do happen that the success most amateurs have with their equipment is little short of surprising. The natural tendency is to blame the rectifier-filter system if the note is poor, but at least 99% of the poor notes heard on the air could be greatly improved with a little thoughtful and patient "operating" on the transmitter itself.

CLICKLESS KEYING

A rather unusual form of blocked-grid keying is suggested by A. S. Waterbury, WSBCL, of Perry, N. Y. Absolute elimination of clicks is claimed for this method, and it has made possible the operation of WSBCL's transmitter with a

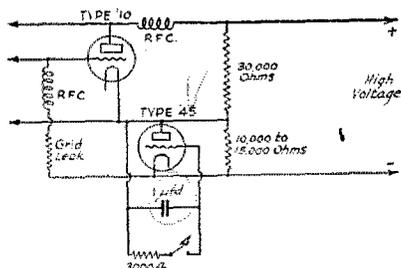


FIG. 10

sensitive broadcast receiver in the next room without interference. The diagram is shown in Fig. 10.

The 'Type '45 tube in the keying circuit furnishes the time lag. Ordinary practice with this form of keying would be to connect the key directly across the 15,000-ohm resistor, which because of the method of connecting it in the circuit biases the grid of the oscillator tube sufficiently to prevent the flow of plate current when the key is open. This extra bias disappears when the key is closed.

In this circuit, however, the bias resistor is in parallel with the '45, which acts as a variable resistance. A probable explanation of the action of the tube is that during the time the key is open the 1- μ fd. condenser becomes charged, which automatically regulates the grid potential and thus limits the flow of plate current. When the key is pressed an appreciable amount of time is required for the condenser to discharge through the 3000-ohm resistor, and this in turn varies the grid potential at a comparatively slow rate, with the result that the bias on the oscillator drops slowly to a final value, during which period oscillations build up. The time lag thus provided eliminates the click when the key is pressed. When the key is opened an appreciable period of time is required for charging the condenser, with the result that there is again a time lag.

A GOOD RELAY

While looking over my junk box I found an old Yaxley Automatic Power Control which looked as though it might have possibilities as a keying relay. The original circuit of the Power Control is shown in Fig. 11 (A). The two parts of the armature are insulated from each other.

To convert the Power Control into a keying relay, simply remove the wires to the plugs and connect the contacts as in Fig. 11 (B). There are

four wires to solder, and these are soldered in pairs.

The contacts may be adjusted by means of screws provided for that purpose. On testing the relay I found it would follow my bug at its fastest speed.

— John Payne, W1CCP

ANOTHER USE FOR THE AUTOMATIC POWER CONTROL

Sheldon E. Brink, W8DXJ, suggests that the same type of relay can be used to shift the 'phones to the monitor when transmitting.

Referring to Fig. 11 (A), the leads from the two armatures are connected to the headphones, the set of contacts nearest the magnet to the output of the receiver, and the back contacts to the output of the monitor. A switch is placed in one of the leads from the 6-volt battery to the magnet. When the receiver is in operation the switch is closed, connecting the 'phones to the receiver. To shift the 'phones to the monitor the switch is opened.

If the filaments of the tubes in the receiver are ordinarily turned off during transmission, the change can be made automatic by making the switch control both the receiver filaments and the

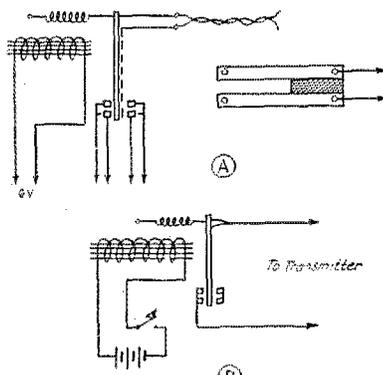


FIG. 11

magnet in the relay. By using one blade of a double-pole double-throw switch for the 110-volt line and the other blade for the 6-volt battery, it is possible to automatically connect the 'phones to the monitor when the transmitter is turned on, and by throwing the switch the other way connect the 'phones to the receiver and turn on the filaments.

Strays

A bell-ringing transformer can be used as a microphone transformer for a single-button mike if a regular transformer is not handy.

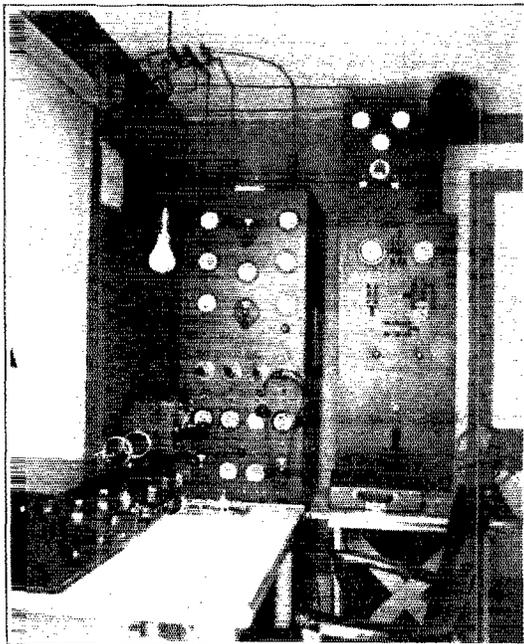
— W6BRI

W5ZG—W5VY

THIS station is the result of years of planning and thought and incorporates some innovations that facilitate convenient and efficient operation.

It is owned by H. C. Sherrod, Jr., Galveston, Texas, and is located in two rooms adjacent to the garage at his house and is entirely a "one man" outfit. Sherrod first broke into the game back in 1920 under the call 5VY, with a small spark transmitter. This was soon changed to c.w. with four UV-202's, operating on 190 meters. The call 5ZG was acquired in 1923. With the advent of high-

and the intermediate amplifier operate from the same filament supply. Although the intermediate amplifier uses two Type '10 tubes in parallel no overload is placed on the filament of the oscillator as the Type '10 tubes operate very well with only six volts on the filaments. This has proved to be both economical and efficient. The quartz plate controlling the oscillator is mounted in a shock-proof holder and the whole enclosed in a heat-proof box. Two twelve-volt bulbs supplied from a transformer having primary control maintain the quartz plate at practically constant temperature.



W5ZG-W5VY

A neat and convenient station layout

frequency work the transmitter was rebuilt, using two UX-210's, operating on 41 meters. Since that time various small transmitters have been used while the preparations for the present outfit were being made.

TRANSMITTERS AND POWER SUPPLY

The transmitter to the left of the switchboard is crystal controlled and operates on a frequency of 7130 kilocycles using the call letters W5ZG. This is the main transmitter and the one to which primary consideration has been given.

The crystal oscillator is a Type '12-A and operates on 3565 kilocycles. Both the crystal oscillator

No thermostat is necessary thanks to the very good regulation of the domestic supply. This has proven to be a very satisfactory arrangement and much favorable comment has been received regarding the purity and constancy of the signals from W5ZG.

The intermediate amplifier consists of two Type '10 tubes in parallel. Because this stage is operated as a frequency doubler very high grid bias is necessary, the grids being biased beyond the cut-off point. With a plate voltage of 500 efficient operation of this amplifier requires 125 volts for grid bias. Both the crystal oscillator and intermediate amplifier receive plate voltage from a

Westinghouse 500-volt 100-watt machine. Incidentally this motor-generator has been in regular service for nine years and still seems to be going strong. The voltage-dividing resistance shown in the diagram as R_3 permits reduction of the gen-

erator voltage used to start and stop the transmitter. The circuit-closing switch on the Vibroplex is mounted on a small square of bakelite which is bolted to the metal base of the key. The bolt holding the bakelite is of course in contact with

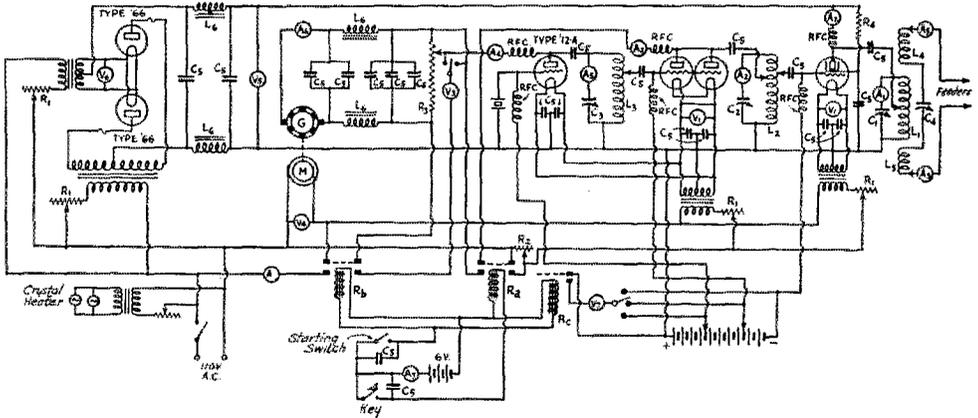


FIG. 1.—THE CRYSTAL CONTROLLED TRANSMITTER AT W5ZG-5VY

- L_1 — 6 turns of $\frac{1}{8}$ " copper tubing 3" diameter
- L_2 — 4 " " " " " " " "
- L_3 — 8 " " " " " " " "
- L_4 — 5 " " " " " " " "
- L_5 — 5 " " " " " " " "
- RFC — 300 turns No. 22 d.c.c. on 1" form
- L_6 — 30 henry, 310-milliamperes chokes
- C_1, C_2 — 500 μ fd.
- C_3, C_4 — 1000 μ fd.
- C_5 — 1 μ fd.
- R_1 — Bradley Radiostat
- R_2 — 6-ohm rheostat
- R_3 — 25,000 ohms
- R_4 — 100,000 ohms
- A_1 — 0-10 thermocouple ammeter
- A_2 — 0-300 d.c. milliammeter
- A_3 — 0-5 thermocouple ammeter
- A_4 — 0-100 d.c. milliammeter
- A_5 — 0-3 thermocouple ammeter
- A_6 — 0-500 d.c. milliammeter
- A_7 — 0-10 d.c. ammeter
- A_8 — 0-30 a.c. ammeter
- V_1 — 0-15 a.c. voltmeter
- V_2 — 0-250 d.c. voltmeter
- V_3 — 0-500 d.c. voltmeter
- V_4 — 0-150 a.c. voltmeter
- V_5 — 0-2000 d.c. voltmeter
- V_6 — 0-10 a.c. voltmeter
- R_5 — Keying Relay
- R_6 — Starting Relay
- R_0 — Voltmeter Relay

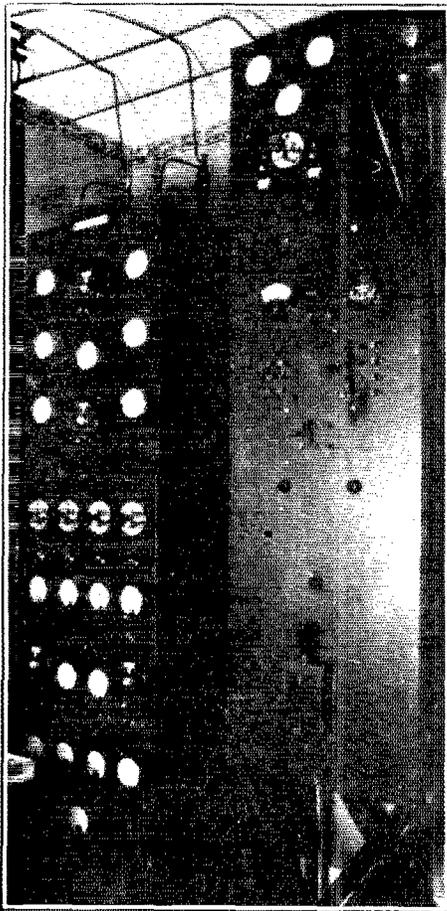
erator voltage for the crystal oscillator. This arrangement was used in preference to a series resistance in the plate of the oscillator tube because of the greatly improved regulation obtainable. The plate voltage supplied to the crystal oscillator is 250 volts and the plate current is 50 to 60 milliamperes. Although the intermediate amplifier current is 150 to 175 milliamperes the voltage regulation of the oscillator plate voltage is less than two percent.

It will be noticed that the keying relay R_3 has two sets of contacts. One set is used for keying the transmitter; the other set of contacts is across the variable resistance R_2 , a six ohm receiving-type rheostat. This rheostat is in series with the 110-volt supply to all of the filament transformers and permits absolute balance of the filament voltages whether the key is up or down. Though of secondary importance this feature is desirable as it prolongs the life of the tubes and theoretically contributes to constancy of the emitted frequency.

Another "wrinkle" which contributes no small amount of facility to the rapid operation is the

the base of the key and also serves as a contact point for the remounted circuit-closing switch. The arm of the switch, the base of the key, and the key contacts constitute the three lines from the key as shown in the diagram. A flip of the circuit closing switch with a finger starts the transmitter by closing the relays marked R_5 and R_6 . R_6 is a relay to connect the voltmeter which shows the grid voltages on the various stages by means of the three-point switch. R_5 is the starting relay proper. This relay also has two sets of contacts. A small set of contacts is in series with the high voltage supply and disconnects it immediately upon opening the starting switch. This prevents the voltage on the crystal oscillator from rising while the filament of the oscillator tube is cooling. This is necessary because the filament cools much more rapidly than the generator slows down, and as the current through the tube diminishes the voltage across it increases to a point where the quartz plate might be endangered by a voltage surge. The installation of this device is not absolutely necessary but precludes any possi-

bility of ruining the quartz plate by puncture. The loss of three such plates at W5ZG by various accidents causes the owner to be very solicitous of



THE TRANSMITTERS AND POWER PANEL

The large transmitter on the left is the 75-watt crystal-controlled outfit. The switch panel on the right controls all the power supply equipment for both transmitter and receiver. On top of this unit is the low-power transmitter which is used for experimenting with various circuits.

the welfare of the present incumbent. A set of half-inch silver contacts on the same relay opens and closes the 110-volt supply to the transmitter.

The final stage of the transmitter consists of a Type '60 screen grid 75-watt tube. The screen voltage is obtained from the high voltage rectifier by the series resistance method. This is preferable to other systems as the screen voltage will vary in direct proportion to the voltage applied to the plate of the Type '60. The plate voltage of this tube can be set at any value between zero and 2000 volts, but more than 1500 volts is seldom used.

The antenna stage is coupled to a half-wave Zeppelin antenna having quarter-wave feeders. This radiating system has proved to be the most efficient tried.

To be doubly sure that the transmitter is always operating on its proper frequency a frequency meter is permanently mounted on the wall just below the antenna lead-in and gives a constant check on the frequency being emitted. This instrument uses a low-capacity circuit and has a frequency range of 6800 to 7500 kilocycles.

Immediately above the frequency meter on the wall is the change-over switch which connects the radiating system to whichever transmitter is used.

Mounted on the top of the power control board is the small transmitter which is used to test various circuits, ideas, etc. This outfit is never the same from one week to another and no definite description can be given. At the time of this writing it is a Hartley circuit with 225 volts of "B" battery on the plate of one Type '45 tube. With an input of four and a half watts the best DX is W9AXU at Glencoe, Illinois. He was successfully worked and gave a report of QSA3 p.d.c. This transmitter is entirely battery supplied. This form of power supply is being tested, as the installation of an emergency transmitter independent of the local power supply is being considered.

The large panel at the right of the main transmitter is the power control board. This panel controls all circuits necessary for the operation of the transmitters and receivers. Like all of the rest it is of quarter-inch bakelite. The three-pole double-throw switch in the top center connects the key and starter switch to either transmitter it is desired to use. The four-pole double-throw switch below this and to the right, controls the battery charger, "A" power for the receiver, and the "B" eliminator from which the receivers ordinarily operate. When to the right this switch connects the storage battery being used to the two receivers and turns power on the "B" eliminator. When to the left the receivers are disconnected from the "A" power, the "B" eliminator cut off and the battery being used placed on charge. A homemade five-ampere charger using a Tungar bulb is behind the panel. The double-pole double-throw switch at the upper left selects one of two storage batteries available for use on the receiving equipment. The lower double-pole double-throw switch connects the remaining battery to the transmitter. This is necessary to operate the relays already mentioned. The large double-pole single-throw switch on the bottom center of this panel is connected in the power supply for the entire station. It is within easy reach of the operator when sitting at the operating desk. The knob and pointer in the center of the panel immediately above the main line switch controls an eight-pole double-throw switch which connects the receivers to either the "B" eliminator or 90 volts of battery which is also available

in case of an emergency. The meter in the upper right corner is the charge-discharge ammeter, a 20-0-20 ampere Westinghouse affair salvaged some years ago from an automobile that had outgrown its usefulness. The meter to the upper left is a 0-750 watt Roller-Smith instrument and shows the power being drawn from the city mains by the station. With the exception of the small 0- to 2-ampere Weston meter on the panel of the short-wave receiver all of the indicating instruments are Jewells. This of course does not include the two instruments on the power control board which have already been described.

Following is a table of the values in the various circuits when the transmitter is in operation:

	Plate Volts	Fil. Volts	Grid Volts	Plate Current	R. F. Tank Current	Antenna Current
Crystal						
Oscil-						
lator	250	6	22.5	50	3	
Int. Amp.	500	6	125	175	3.5	
Final						
Amp.	1500	10	90	90	5	2.5
Line Watts, 550; Line Volts, 110; Line Amps., 5.2; P.F. 95%.						

RECEIVING EQUIPMENT

Two receiving sets are used at this station. At the left of the operating desk is the short-wave receiver which, by the use of plug-in coils, covers

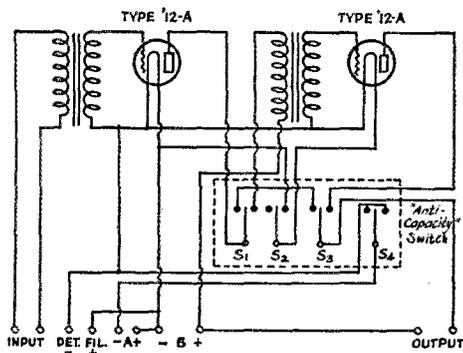


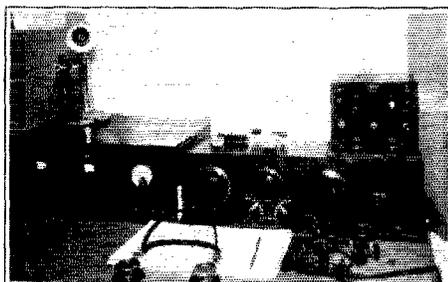
FIG. 2. — THE AUDIO AMPLIFIER SWITCHING SYSTEM

all of the amateur bands. The coils used are of the fixed-tickler type and regeneration is controlled by a 150- μ fd. condenser. This is the conventional arrangement used by many of the amateur fraternity and needs no further explanation.

Immediately below the filament ammeter is an "anti-capacity" switch which is wired as a selector switch for either the first or the second stages. This switch incorporates full filament control and permits rapid changing from the first to the second stage.

A diagram of this arrangement is shown in Fig. 2. For the sake of convenience the blades of the control switch are numbered S_1 , S_2 , S_3 and S_4

from left to right. When all blades are to the left the output is connected to the first stage, the filaments of the detector (if control of screen grid stages is desired the filaments may be connected



THE OPERATING TABLE

The receiver on the left is the homemade short-wave outfit, using a detector and two stages of audio amplification. The Grebe CR-8 and its RORX amplifier are used for intermediate and long wave reception. The revamped Vibroplex and a straight key are in the foreground.

in parallel with the detector filament shown on the diagram) and first stage turned on, and the filament of the second stage turned off. When all blades are in neutral all filaments are cut off and the set does not operate. When all blades are to the right the output is connected to the second stage and the filaments of all tubes are lit. S_1 is connected to the plate of the first amplifying tube and when thrown to the right connects the plate to the primary of the second audio transformer. When thrown to the left the plate of the first amplifying tube is connected to the left contact of S_3 . One side of the output is permanently connected to the positive side of the "B" battery supply. The other side of the output is connected to the bar of S_3 . When S_3 is thrown to the right the output is connected to the plate of the final audio stage. When S_2 is thrown to the left the output is connected through the left side of S_1 to the plate of the first audio tube. S_2 is the filament control switch for the final amplifying tube. The left contact of this switch is unconnected. The blades and right contact are connected in series with the filament supply to the final stage. S_4 is the filament control switch for the first stage, detector and screen grid tube if one is being used. The manner of connecting the screen grid tube has already been described. The contacts of S_4 are connected together. The contacts and blade are then connected in series with one side of the filament supply to the set.

The above arrangement provides a rapid and very convenient means of changing stages and will be appreciated by those to whom the use of plugs and jacks is inconvenient. The only disadvantage is that the use of the detector alone is impossible. However, this presents no difficulty

(Continued on page 82)

I. A. R. U. NEWS

Devoted to the interests and activities of the
INTERNATIONAL AMATEUR RADIO UNION

President: H. P. MAXIM

Vice-President: C. H. STEWART

Secretary: K. B. WARNER

Headquarters Society:
THE AMERICAN RADIO RELAY LEAGUE, Hartford, Conn.

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 Asociacion E. A. R.
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 Lwowski Klub Krotkofalowcow
 Nederlandsche Vereeniging voor Internationaal Radio-
 amateurisme
 New Zealand Association of Radio Transmitters

Norwegian Radio Relay League
 Radio Society of Great Britain
 Réseau Belge
 Réseau Emetteurs Français
 South African Radio Relay League
 Sveriges Sandareamatører
 Union Schweiz Kurzwellen Amateure
 Wireless Institute of Australia
 Wireless Society of Ireland

Conducted by Clinton B. DeSoto

On the morning of September 8th, Hiram Percy Maxim, president of the Union, pressed a key officially opening the initial ceremony of the annual exhibition of amateur radio gear held by the Wireless Institute of Australia, by the taking of a flash-light picture. Mr. Maxim made three five-second dashes on a telegraph key at 5:12 a.m. E.S.T. (10:12 G.C.T.) which were carried by Western Union telegraph wire from Hartford to Montreal, Canada, where they actuated relays controlling the Marconi beam transmitter working into Australia, being received by Amalgamated Wireless. Within a quarter of a second the signal reached Melbourne Town Hall, where the exhibition was held, and the ceremony was executed with complete success.

This international coöperation and familiarity between amateurs and their organizations is branching out along many different lines.

No better example of the above can be found than the success of the International Congress of Amateur Short Wave Operators held at Antwerp during July of this year. It was remarkably well attended, and aroused untold interest. Of particular interest to this department are the resolutions adopted by the eight official delegates of the amateur organizations represented, all but one of which were European member-societies of the Union. The high lights of the results of this conference will be presented briefly.

It was resolved to request of the respective

governments, facilities for amateur representation at international conferences; these representatives to be under the leadership of K. B. Warner, I.A.R.U. Secretary. Closer relationship between European Sections was advocated; and a successive series of international meetings similar to the present one scheduled, to be held in order annually in Italy, Spain, England and Germany.

The need for stricter observance of technical regulations prescribed by the Washington Convention was pointed out, and to this end Mr. Raymond Brailleur, president of the Technical Committee of the U.R.S.I. (International Scientific Radiotelegraph Union) was requested to place calibrated frequency meters at the disposal of European I.A.R.U. Sections, together with regular monitoring of amateur stations from his control center in Brussels. He was tendered a vote of thanks for his application to amateur interests.

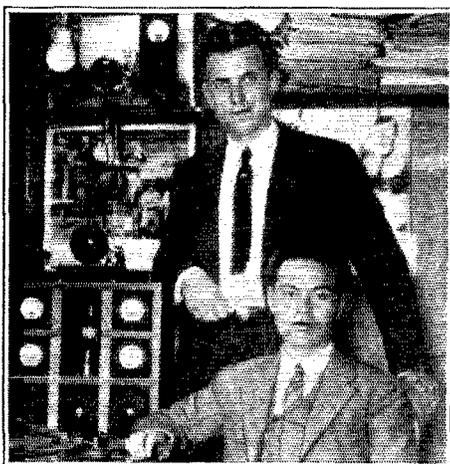
An energetic demand was made for the absolute suppression of commercial operation in amateur bands. After consideration of a suggestion for the seclusion of certain territory to be used exclusively for 'phone operation, this was declared impractical, and telegraphy was resolved to be the established medium for amateur communication. Band marker stations were advocated, and certain British marker stations applauded for their past work. I.A.R.U. Headquarters was requested to have pamphlets prepared listing regulations existing in the countries of all member-societies.

It was further resolved to make efforts to ac-

quire the 3.5-mc. amateur band as exclusively amateur territory. QSL forwarding services are to be continued to "pirate" operators, but no cards should be handled bearing any sort of propaganda, whether political or religious, according to the recommendations of the delegates. Modifications in the process of issuing WAC certificates were suggested.

The official communications were concluded with the vote of thanks to Mr. Brailled noted above, as well as another to Mr. Maxim and Mr. Warner. The committees of the Antwerp Congress and the Belgian Network Management were felicitated, congratulated and thanked.

In general, the Antwerp meeting was a successful and valuable affair, which resulted in the



KYOZO ASAMURA, J3CR, AND D. B. WILLIAMS, W6DZG, IN THE LATTER'S STATION AT HIS HOME IN LONG BEACH, CALIFORNIA

J3CR, a student at Kyoto Imperial University near Osaka, Japan, was royally entertained during a recent week-end in Long Beach by W6DZG and Henry Sasaki, W6CXW, culminating a staunch friendship built up by international QSO.

crystallizing of European amateur sentiment, and should aid in establishing a suitable background for coming international radio regulatory conferences.

Hong Kong amateurs are anxious to work Canadians on 14 mc. according to reports received here, but unfortunately not one VE has been heard there in two years. Can't some of you Canadians do something about this?

All amateurs, and particularly those in Europe, Asia, and Oceania, are requested to listen for station PHAGA, which will be installed on a Fokker F IX plane, one of those which the Dutch Air Lines (K.L.M.) are using on regular weekly flights from Holland to the Dutch East Indies and return. A. O. L. Strijkers, PAOSV,

chief of the aeronautical radio station Waalhaven near Rotterdam, will be the operator.

The first flight will start on November 13th. The transmitter will have an input of 75 watts, and the tone will be modulated d.c. (1000 cycle). Batteries are carried for operation while resting on the ground. It is probable that frequencies near the 7-mc. band will be used. Prizes are offered by the K.L.M. to those amateurs turning in the most valuable reports and offering the most reliable contact. All reports should be sent to Mr. A. O. L. Strijkers, Post Box 400, Rotterdam.

The purpose of the test is not only to handle regular traffic, but also to determine if amateurs can render assistance in relaying distress messages in the event of the plane being forced down in the jungle, some distance away from long-wave stations and immediate relief. It can readily be seen that the equipment has been installed not only for purposes of testing its usefulness and efficiency, but also to determine the extent of the same qualities in our proffered amateur assistance. Because of this the N.V.I.R. earnestly requests the cooperation of all amateurs in making this trial flight a big success.

Due to an error in recording WAC applications in the order of their receipt, the 'phone WAC issued H. Ray Carter, VK2HC, was never properly noted in these pages. This certificate was issued on April 28, 1930, and was the first to be issued a British Empire amateur 'phone station.

In the foregoing résumé of the Antwerp Congress, mention is made of the forwarding of QSL cards to "pirate" operators. This brings to mind another situation of an equally delicate nature when viewed in its ethical aspects, and that is the choice of calls made by these illegal operators. We are all fairly well agreed that under present conditions the operation of some of these stations is justifiable, but there are many remedial difficulties created by certain practices of our outlaw stations.

Probably the worst of these is the adoption of a foreign prefix, merely for purposes of identification, and not because of any connection with the country to which the prefix has rightfully been assigned. Such uses place the country in question in an intolerable position, since it can well be and probably is blamed for allowing useless outlaw operation inside its borders, when such is not the case at all. Can't we take this more fully into consideration, in choosing calls in the future?

AUSTRALIAN SECTION

By W. G. Sones, Dtr. Fed. Publicity, W.I.A.

Poor receiving conditions continued in Australia through July, during which comparatively few international stations could be heard. This

(Continued on page 62)

Calls Heard



*VK3KO, C. M. Fowles, 138 Mitford St., Elwood
S3, Victoria, Australia*

7000-ke. band

wlts wlaow wlaqj wlsz wiemp w2x1 w3anh w3ant w4aef
w4rb w4oc w5ql w5va w5asm w5axs w5td w5zav w5aqy
w5ahb w5bbc w5ms w6eou w6ben w6bfb w6ebn w6eak
w6bzp w6btd w6bck w6ayg w6by w6cac w6dmk w6dzm
w6er w6eau w6dpu w6efv w6hm w6ea w6cwx w6bet w6asl
w6akf w6bvx w6bdd w6cto w6cxi w6bln w6erz w6cks
w6cww w6cfl w6dgg w6eke w6dss w6dnn w6ad w6wh
w6ann w6eif w6bjf w6cut w6cjs w6dwp w6egh w6euh
w6ebg w6dju w6axe w6cgm w6btz w6bpo w6anl w6dlj
w6chw w6akw w6bxi w6aak w6byz w6eos w6edo w6cha
w6aoo w6awa w6eil w6dpa w6ere w6abq w6agx w6awp
w6tk w6dca w6am w6dtd w6dpl w6dqd w6epz w6eej
w6caj w6dwi w6drr w7aat w7agw w7aik w7ao w7ajw
w7amx w7be w7iq w7rr w7lz w7hb w7aow w8bau w8cyp
w8mb w9bpm w9aok w9bez w9dfy w9ara w9pu w9bwt
w9dr w9dqe w9eve w9um w9bnh w9ed kcalc kalpw
kalhr kalcy kalaf kalre kalza kalj kalbd kalme kalhc
kalwe kalce kaldj kalac kalae kalim kalke kalgqm k6gm
k6alm k6cfq k6ch k6cjs k6boe k6dpg k6dtg k6bqh k6axw
k6bjj k6bra k6etf k6oga k6deg k6btz k6dju k6dyc k6eqm
k6ewb k9ms kfr5 illl vs3ab vs6af om1tb et1aa pk3bm
ve5dd ve3ez j2mso j1ct j3cr j3ct ac8rv ac8ew ac8ls ac8go
ac8go ac1ts ac2aw ac2ay ac1bd xw7ef vk3xt wfa wfbt
wsq xgp kuwl sgen

14,000-ke. band

wlry w1ld w1dp w2ag w2arb w2el w2cuq w2afv w2biv
w3anh w4agr w4aef w5rg w6awp w6caz w6car w6dms
w6dzi w6ayq w6dzm w6bam w6dwp w6bax w6ql w8gz
w8dlld w8adm w9fjx w9dgg w9df w9ef kaljr f8wb f8gyn
f8gdj vs3ab pk3bm pk1r ac1bd ku2uu d4yt on4rs on4ij
g5by g5bz ozy lill su8wy su8rs sp3gb zt6x zs4m ce5aa
kuwl cma2 xgp wsq oa4j

James M. Gates, 408 Railroad St., South Fork, Pa.

3500-ke. 'phone band

wlamq wlapk wlauy w1azh w1ky w2cez w2cyp w2fr w2gi
w3ac w3aex w3alq w3bac w3bof w3cv w3jz w3oo w3mp
w3za w4pw w5aci w8aoo w8afq w8agu w8ahz w8aey w8azo
w8bf w8bxy w8cww w8odh w8cjb w8cmk w8epl w8ers
w8dsv w8dzi w8dra w8dsv w8dtk w8dvw w8he w8ih w8rd
w8wf w9aeq w9aid w9bwi w9cdg w9daq w9ewc w9mm
ve3ei

*OK1AQ, Henry Rakosnik, Sedlec, Kutna Hora,
Czechoslovakia*

aulak au8at au8be ct2am fm8eor fm8fs fm8mt k4aef pk1jr
vs7al vs41ma w1mk w1bmm w2alu w2cex w2anr w2aox
w3apm w4afr w4ft yilcd z5ot z5r zu6n xearn kgfc denne

*M. S. Santa Rita from Canal Zone to Chile: J. E.
Reilly W1VE and J. F. Farrell W3ALB, ops.*

wlaeh wlaaz w1hop w1bqf w1cj w1erw w1dp w1gx w1ka
w1kh w1kz w1mk w1ry w1th w1vz w1za w2aaq w2aey w2afr
w2ag w2aib w2api w2avz w2bai w2bmm w2bro w2erb
w2cuq w2cxl w2cyl w2czr w2dp w2fh w2hq w2jn w2lx
w2ma w2rd w2rs w2uk w2wr w3aaz w3acw w3aer w3aft
w3ais w3awh w3aws w3hm w3bph w3bqh w3ec w3hy w3hz
w3le w3lz w3pf w3qw w3zg w4aef w4aei w4afw w4cm w4ei
w4he w4hu w4jo w4le w4lm w4oz w4paw w4afg w5atp
w5bby w5fc w5gi w5kz w5ox w5za w5zav w6ad w6akw w6am

w6auk w6bch w6bcy w6bjf w6bvx w6cf w6cto w6euk w6eten
w6eug w6oj w6xbw w7bb w7be w7ce w7qf w8aa w8aav w8ant
w8avp w8ayf w8ayn w8azq w8bcy w8bgh w8bgy w8bkk
w8bne w8bnt w8bvw w8cft w8chf w8cpc w8cvo v8cqv
w8dev w8dj w8day w8azw w9bad w9beq w9bqc w9civ
w9ake w9apd w9ayx w9azz w9bad w9beq w9bqc w9civ
w9cku w9cwx w9dbj w9def w9dfy w9ef w9eta w9exp w9ffq
w9fmz w9fqs w9fyx w9gdv w9gio w9ggv w9ghp w9giy
py1ah py1aw py1ca py1ea py1ia py2ak py2ba py2bf py2bm
py2cm py2ii py2ik py2bk py2qb py3ah py9ia k4aef k6bra
k6ceb k6etf k6ewc kalaf kaldj kalhc kalhr kalme kalzq
ve2ay ve2bd ve2be ve2bg ve2ca ve3bq ve5kd cm2jt cm8btw
cm8by nn1nic cxckw celhr ce2ab ce3ac ce3bf ce5aa lu1ba
lu2om lu3de lu3dh lu4dq lu8dy oa4j oa4jo oa4p oa4q g5by
ear110 d2ea rx1aa zu3ia zslp hc2jm x1b x2x x5a vk2rb
vk3ax vk3rg x1lbb x1bi x1fr x1ft x1fu x2ldf x2zq
x3lbb x3cm.

*E. J. Harper, 310 Bubblingwell Road, Shanghai,
China*

14,000-ke. band

vk2xr vk2jp vk2jj vk5wr vk2je vk3go vk6wr vk2hb vk3wx
zllan z14ax z1lfw zllaa lu2cm lu8dj lu3pa pk1ex pk2aj
pk3bm pk4az

*DE0939, Karl Wirtz, Cologne, Volksgartenstr. 12,
Germany*

7000- and 14,000-ke. bands

au7bv au7kn celah em8uf cn8rux ct2aa ct2ac fm81av fm8ih
fm8mt fm8kx fm8cr frear149 hc1fs hi6al pk2aj py1ah
py1em py1ed py2ay py2bz su8rs su8wy un7xo ve3bd vk3lp
vk3gm vk3zo vq4lm vs6ag vs7ap ve6ad vtvvz yilcd yilmzd
y1zqg zilas z1do zs4m z5ed z1tzz zu6nd xme xoz7v xon4wm
wlasu w1brk w1bhm w1bux w1cww w1cwp w1vz w1mk
w1mo w1tz w1bmn w1ia w1rw w1en w1bmn w1afd
w2ase w2gg w2vt w2rs w2cx w2dhk w2arb w2dh w2rq
w2btp w2cxl w2bon w2zg w2ns w2ek w2ama w2ad w2eau
w2cdq w3auo w3ky w3iq w4ft w4vw w4mk w4nh w8rx
w8dep w8dyc w8adr w8ady w8baz w8wis w8bji w9egt
w9eap w9eve

*W1BFT, C. B. Evans, 37 Madbury Rd., Durham,
N. H.*

ear21 ear65 ear96 ear98 ear116 ear125 ear149 ct1aa ct1bx
ct1by ct2aa em8uf ctbj cx cx7 cx1af cx1au ce3ag ce3bf
ce3hy ce5aa f8aap f8aor f8saw f8cs f8ct f8da f8do f8er f8g
f8ig f8fr f8gdb f8hr f8lbg f8lx f8olu f8oqp f8prw f8rb f8rx
f8sm f8xh fm8cr fm8gkc fm8rit g2bm g2bz g2gm g5by
g5bz g5is g5ml g5yq g6wo g6wt g6vy g6vp g6xb hc1fg
hc2jc hc2jm hc4jm ilto j2cb k4dk k4kd k6ewb k6zce
k7mn kalhr lah lu1ba lu3de lu3fa lupa lu4bi lu9dt lu9ca
oa4j oa4l oa4q oa4r oa4z oh2nw oh7nb on4eu on4fp on4ft
on4gn on4ij on4jk on4pj on4uu pa0tw nj2pa pk2aj pk3bm
py1aa py1aw py1cl py1cm py2ay py2az py2bf py2bg py2bk
py2ig py2ik qq1a su8rs ve5ao ve5aw ve5er vk2av vk2dy
vk2ek vk2lv vk2rb vk2rf vk2rx vk3cz vk3bx vk3es w3go
vk3jk vk3lp vk3ml vk3kh vk3pp vk3rg vk3ro vk3wo
vk3wx vk4at vk4bh vk4rb vk4rj vk5ch vk5it vk5do vk5jh
vk5jo vk5wr vk7ch vk7wi w6abg w6aef w6adl w6afr
w6aif w6aix w6aaz w6alv w6anj w6aoe w6awg w6awp
w6ax w6ayz w6bax w6bju w6brv w6bsn w6bux w6buw
w6bvx w6byb w6bzd w6cac w6cbp w6che w6chy w6cln
w6elo w6epm w6crq w6cjl w6ctf w6cxw w6cyp w6dcg

(Continued on page 70)

Correspondence

The Publishers of QST assume no responsibility for statements made herein by correspondents.



One for T. O. M. to Think Over

Ensenada, P. R.

Editor, QST:

I have no fight to pick with T. O. M., but as an "old-timer" (yep, I cut my radio eye teeth on an E. I. Co. catalog and used a Wm. B. Duck catalog for a pacifier) I rise right up on my hind legs to say that in my case at least, and quite possibly in others, T. O. M. is barking up the wrong tree in his references to the wife that the young squirt takes unto himself and leaves "Radio Mother." T. O. M. is absolutely right when he sizes up the advantages of R. M., but in my case he is "all wet" in sizing up the wife.

Listen, OM, I have a wife, one Jr. 5 years old, and another one 3 years old. Now cock your weather ear over this way and I'll fill her up. I annexed my OW in 1924 and in 1925 I resumed my amateur radio. You see, the Jr. Op who was born in 1925 and "K4KD" got an even start. Granted: the Jr. got the benefit of the doubt for the first few months, even from the OM himself. Let's skip over the next three years, during which the Jr. and the OM about broke even; sometimes one had the advantage and sometimes the other. But in 1927 it became a 2-to-1 proposition when the second Jr. put in his appearance.

From then on, the OW has pulled her favorite movie star's picture out of the frame, and that frame now holds a certificate won in a contest. This has been repeated several times, as additions were made to the station's collection of plain and fancy wall paper. In these said contests, it was the OW who checked the messages for errors, the OW who kept the log, the OW who wrote up the final report in rough form for the OM to type off. The OW checks the incoming and outgoing QSL cards, as well as fills them out for the outgoing mail, chases up the addresses in the call book, and sees that they are mailed. When the OM had stayed up all night running up points in the contests, 'twas the OW who pulled him out of his bunk, threw water on him to wake him up and saw that he got to work on time. Self-preservation? Maybe, but she is young and would have no trouble getting another OM.

When the OM sets the alarm for 4 a.m. and doesn't hear it go off, it's the OW who routs him out to keep his skeds. It's the OW who files the QSL cards, sticks the photos in the album, keeps the radio shack clean, and gets as much of a kick out of the OM's accomplishments as does the OM himself. It's the OW who forgoes a new dress, a

pair of shoes for the Jrs., a talkie or what have you, so that the OM can buy that new tube or whatever else it is that happens to be needed for the station. Self-defense? Maybe, but here, cock your ear over closer. Maybe the OW thinks the OM is in his second childhood and deserves humoring. But you think up the reason the OM rates even or preferred over the younger Jrs. I'll tell you why: This "XYL" who is my OW has that Radio Mother spirit in her make-up and this OM is cashing in on it. So here is one OM who takes off his hat to the R. M. and takes it off again to his OW with the R. M. spirit, and don't you forget it.

Yours till kilocycles have handle-bars.

— E. W. Mayer, K4KD

KHz Again

2059 Webster Ave.,
Bronx, N. Y. C.

Editor, QST:

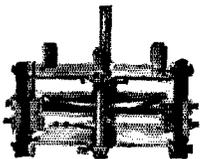
Scientific bodies may decide to call a kc/s a $kc.$, just as well as black could be called white by universal understanding, though a new word for the old meaning of the words "ke." and "white" would have to be found.

But there is hardly any logic in such proceedings because a $kc.$ is not inherently a kc/s just as well as black is not white. Both words would be substitutions with very different original meanings, and somebody who would not happen to know about the decisions of those learned bodies would decidedly misunderstand them.

The logical way is, either to call a kc/s a kc/s or to substitute a word which does not have any other original meaning. The European congress which decided to call a kc/s a KHz obviously acted according to this simple logic.

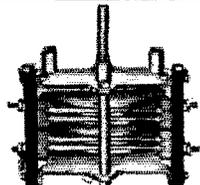
If there is any other pioneer in the high-frequency field who is more deserving of being immortalized by giving his name to an electrical high-frequency unit than Dr. Heinrich Hertz there would be room for argument, but I am afraid there is no serious competitor. Would it, therefore, not be a great and noble gesture to support that European convention which conceived the KHz idea?

The A.R.R.L. is an independent organization and QST is its own magazine, written for the members of this organization. There is no need to wait for somebody else to decide whether we are entitled to support a logical idea or not. Or are our brains—so inferior that we need guidance?

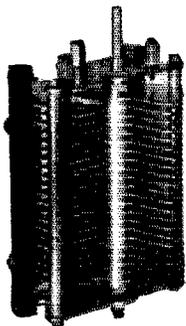


The 201-E (2 Plates). A taper plate condenser for short wave receivers. The stator plate is adjustable, affording maximum capacities of from 50 to 10 mfd. Constant min. 7 mfd. Price \$4.

IF YOU DO NOT WANT OR EXPECT



202-E (Split Stator) Taper Plate.—.000300 mfd. Sections in multiple.—.00075 mfd. Sections in series.—.000150 mfd. per section. Useful for tuning push-pull circuits.



147-B transmitting condenser. Capacity .00044 mfd. Voltage 3000.

**Superlative Performance,
Mechanical Strength,
Long Life and Reliability
Under All Conditions**

in a variable condenser—
then, less than

CARDWELL

quality may satisfy you

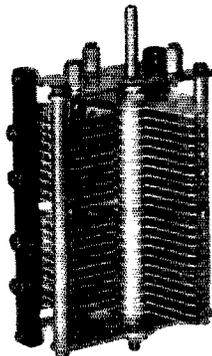
BUT—

The greatest concerns in the country
and the Government use CARDWELLS

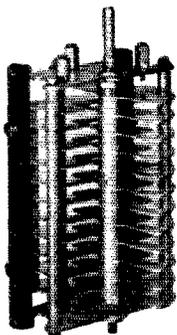
The most useful condensers for
the amateur are illustrated. There
are many more. Send for literature.

The Allen D. Cardwell Mfg. Corp.
81 Prospect Street Brooklyn, N. Y.

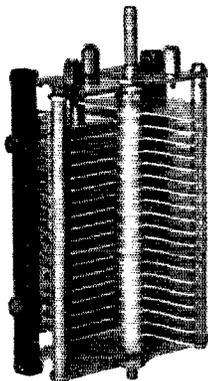
CARDWELL CONDENSERS



The 157-B transmitting condenser (Split Stator) .00022 mfd. each section). Voltage 3000.

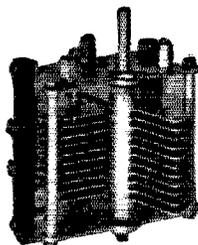


The T-183 transmitting condenser. Heavy polished and rounded plates. Capacity .00011 mfd. Voltage 6000.



The T-199 transmitting condenser. Heavy polished and rounded plates. Capacity .00033 mfd. Voltage 3500.

"THE STANDARD OF COMPARISON"

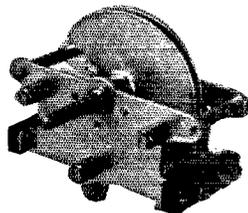


The 164-B transmitting condenser. Capacity .00022 mfd. Voltage 3000.



NEW!

613-A Balancing Condenser with mounting bracket and locking device (50 mmfd.) Made in 6 capacities, single and dual. This locking device will be supplied with any of our standard condensers at a cost of 60c additional or will be sold separately.



191-E (Taper Plate) .000075 mfd. One of five regular receiving sizes supplied. From .0005 mfd. to .00075 mfd.

Your A. R. R. L. EMBLEM



The League Emblem comes in four different forms. Its use by Members is endorsed and encouraged by the League. Every Member should be proud to display the insignia of his organization in every possible way.

THE PERSONAL EMBLEM. A handsome creation in extra-heavy rolled gold and black enamel, $\frac{1}{2}$ " high, supplied in lapel button or pin-back style. The personal emblem has come to be known as the sign of a good amateur. It identifies you — in the radio store, at the radio club, on the street, traveling — you can spot an amateur by it. Wear your emblem, OM, and take your proper place in the radio fraternity. Either style emblem, \$1.00, postpaid.

THE AUTOMOBILE EMBLEM. 5 x $2\frac{1}{2}$ ", heavily enameled in yellow and black on sheet metal, holes top and bottom, 50c each, postpaid.

THE EMBLEM CUT. A mounted printing electrotype, the same size as the personal emblem, for use by Members on amateur printed matter, letterheads, cards, etc. \$1.00 each, postpaid.

THE "JUMBO" EMBLEM. How about the shack wall or that 100-footer? Think of the attention this big yellow-and-black enamel metal emblem will get! 19 x $8\frac{1}{4}$ ", same style as Automobile Emblem. \$1.25 each, postpaid.

**The American Radio
Relay League
Hartford, Conn.**

There is no doubt that a decision of 17,000 or more highly intelligent Americans will carry a definite weight and help materially to foster an idea of obvious value.

Why not bring up this topic again in *QST* and get the opinion of some more members on it?

— H. H. R. Soltau

What's the Answer?

Ironwood, Mich.

Editor, *QST*:

Want to congratulate Headquarters on its very honest radio publication. It smacks of more of the truth than any other. Lots of thought and effort back of its articles and I'm finding it very necessary. No, your articles are not "too technical." Guess some fellows' scorn for algebraic phrases is a hangover from school days. Mental gymnastics should be combined with soldering iron activities. Then we know the "why" along with the "how."

And now answer me this. After all your good "A B C" articles on how to get d.c. sigs and the new Federal Regulations requiring an adequately filtered plate supply — why is an a.c. sig?

— E. H. Buertschy

Seeing America First

Frankfort, Mich.

Editor, *QST*:

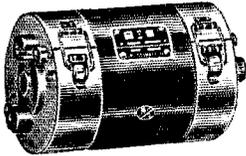
Below is a list of actual figures on amateurs listed for each state of the Union, taken from the last issue of the Government call book.

Arizona	65	New Hampshire	87
Arkansas	105	New Jersey	558
Alabama	91	New York	1,522
Connecticut	256	New Mexico	43
California	2,571	North Carolina	150
Colorado	108	Nevada	23
Delaware	49	Nebraska	211
District of Columbia	90	North Dakota	53
Florida	197	Oregon	305
Georgia	107	Ohio	933
Idaho	68	Oklahoma	289
Illinois	908	Pennsylvania	1,073
Indiana	302	Rhode Island	104
Iowa	321	South Carolina	23
Kansas	233	South Dakota	64
Kentucky	108	Texas	689
Louisiana	139	Tennessee	88
Mississippi	78	Utah	70
Michigan	571	Virginia	126
Massachusetts	959	Vermont	40
Maine	162	Washington	430
Maryland	156	Wyoming	19
Montana	38	West Virginia	105
Minnesota	246	Wisconsin	274
Missouri	314		

After receiving numerous cards from fellow amateurs, some with dozens of foreign countries listed on them but with only 42 states, others that are proud owners of a WAC certificate but admit only working 44 or 46 states, and after working month after month without hearing stations in what nowadays we call our own back yard, some solution was sought without taking locality and our present receiver (which we believe behaves as good as the average) into consideration.

You fellows in the Western states, if you are still looking for a QSO in Delaware, note that it has 19 stations listed — Vermont has 40. Those

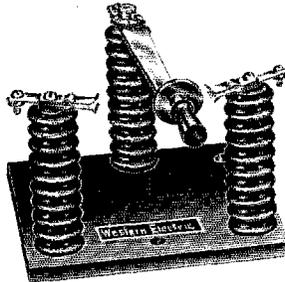
BARGAINS ARMY AND NAVY RADIO SURPLUS



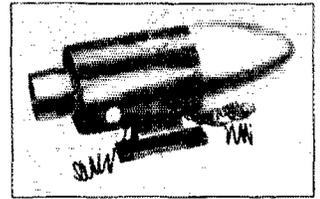
NEW LOW PRICE
Dynamotor 32/350 volt, ball bearing, 80 mills. Special \$9.00. Per pair.....\$15.00



Anti-Capacity Switches, W.E. 6-8-10-12 Terminals, all with Platinum Contacts, value \$3.50 each. Our price, 95c each. Lots of 6.....\$5.00



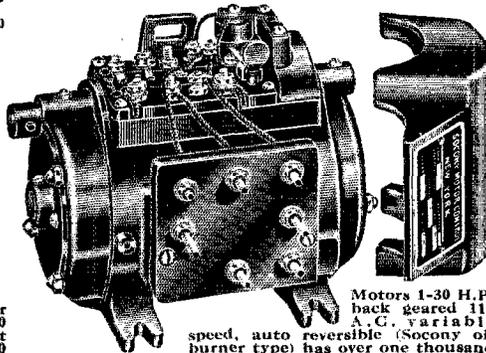
Lightning Switch, High Grade W.E. Heavy Copper Blade and Contacts. Size 7 x 8 x 6 high. While they last.....\$3.50



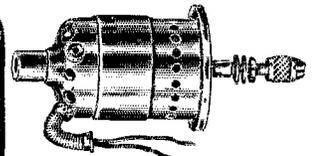
Navy Aircraft Dynamotor, Gen. Elec., new, 24/1000 volts, 1 amp., extended shaft with pulley, can be driven by motor, or propeller, giving 24 volts output for filament and 1000 volts for plate or driven by its own input of 24 volts. Value \$250.00. Our special price, \$75.00



EDISON Storage Battery Cells
Type M-8 1.2 volts, 11 amp, never used, per cell.....\$1.50
Type A-4 1.2 volts, 175 amp, first class, nickel alkali.....\$3.50
Type A-6 1.2 volts, 225 amp, nickel alkali.....\$4.00

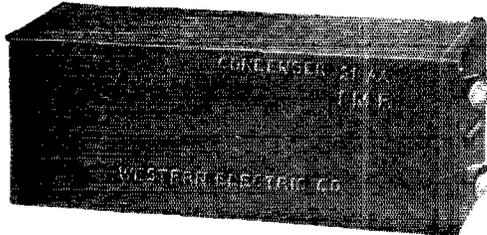


Motors 1-30 H.P. back geared 110 A.G. variable speed, auto reversible (Socony oil burner type) has over one thousand uses, a very good buy. Regular price \$35.00.....\$7.50



Portable Hi-speed Universal Hamilton-Beach Drill, takes up to 1/2 in. Complete with Chuck, Buff and Grind Attachment.....\$7.50

Western Electric Switchboard G.W. 928. Control board for Dynamotor System G.W. 927. Consists of starting switches, fuses, 0-50-500 volt voltmeter with switches for testing main lines and output. Also contains complete filter system. Very special.....\$8.00

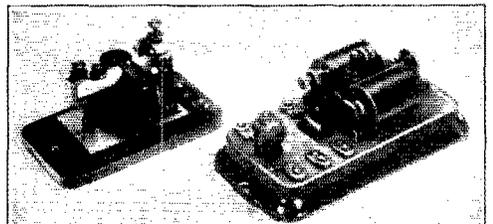


Western Electric Fixed Condenser 21AA. 1 microfarad. 1000 volt A. C. test. Ideal filter condenser for low power transmitters. Fully guaranteed. Excellent value.....\$1.00

Switchboard, 8 line portable Western Electric, magneto rining; dry cell talking circuit; 8 drops, 26 anti-capacity 12 to 16 terminal key switches, regular price \$175.00, special.....\$30.00
Oscillators, navy radio freq. "Drivers" 5,000-30,000 meters, regular price \$160.00, Special.....25.00
Generator, 1 K.W. Navy Gen. Elect., input 24 volt, output 1000 volt at 1 amp. with shaft and pulley, wonderful value.....75.00
Rheostats vitrohm, variable Ward Leonard, 500 ohm .2 to 1.5 amp. 35 tap field reg. type.....5.00
Rheostat, vitrohm, variable, Ward Leonard, 6 ohm 15-5 amp. hat. charge type.....3.50
Resistors, vitrohm Ward Leonard, with leads, ass. sizes per doz.....1.50
Relays 2 and 5 kw. (110 or 220 volt) 1/2 silver contacts.....7.50
Relay West. Elec. low voltage, 2 upper and 3 lower platinum point screws, 3 contact arms.....5.00
Amplifier, W.E. Radiophone, C.W. 926, 3 Stage.....15.00
Heterodyne, Signal Corps, type B.C. 104, 1000 to 3000 meters, with detector.....15.00
Air compressors, Kellogg, Model T, 1 1/4 cu. ft. per min. weight 6 lbs., 600 R.P.M., 125-lb. Requires 1/4 h.p.....3.00
SPECIAL—U. S. Army instruction book on telephony or telegraphy. Hundreds of pictures and diagrams.....1.00
Microphone, Army French, sensitive.....1.50
Charging Board, 32 volt, complete with Weston No. 369 voltmeter 0-50, auto cutout resistances, switches, etc., on slate base. \$60 value.....15.00

Largest Radio and Electric Supply House in U. S. Specializing on Army and Navy Surplus. Write us your particular requirements. Sufficient postage and deposit of 20% required on C.O.D. orders.
NO C.O.D. ON CANADIAN ORDERS. DUE TO LIMITED GOV'T SURPLUS WE DO NOT ISSUE CATALOGS.

MANHATTAN ELECTRIC BARGAIN HOUSE, Dept. Q, 105-7 Fulton St., New York City



Bunnel High Grade 20 OHM Sounder.....\$1.75
W. E. Platinum Contact 100 OHM Relay.....\$4.50

Generator, airplane, signal corps, with shaft, can be used as motor, 12 volt 33.6 amps, 5000 R.P.M.....\$10.00
Generators, 12 volt, 60 amp, has automatic controls.....20.00
Ammeters, D.C. portable, new Weston model 45, 3 scale 0-1.5-15-150 with 3 scale external shunt and leads 1/4 of 1% accurate.....40.00
Ammeter, Weston No. 425 thermo-couple 0-2 amp., mtg. on large bakelite base with D.P. hi voltage switch.....7.50
Ammeter 30-50-50, Westghse, B.P. Bush mtg......75
Ampere hour meter, Sangamo, battery charge and discharge, type MS 0-500 scale, capacity 15 amp.....10.00
Transformers, General Electric, 125 to 2500, with primary center tap, 60 cycle, 200 watt.....7.50
Transformer, Amertron, oil immersed, 1 K.W., 500 cycle, 2200 ohms, D.C. slightly used, Navy type.....10.00
Condensers, transmitting, Murdock .002 mfd, 12,000 volt, ideal for plate blocking.....2.50
Condenser, Dubilier, mica, op. volts 8500 cap. .004.....10.00
Headphones, West. Electric No. 194W same as C.W. 834, 2200 ohms, D.C. slightly used, Navy type.....5.00
Holtzer Cabot, "Mike" Utah type, carbon granular transmitter, Special......95
Western Electric Radiophone Transmitter unit, 326W.....1.50
Dynamotor, aircraft 32/275 volt, with shaft.....10.00
New spare armatures, G.E. 24/1500 volts.....12.50
Condensers, Mica op. volts, 12,500 cap. .004.....17.50
Dubilier, new.....15.00
Dubilier, used.....15.00
Wireless spec. New.....15.00

THIS NEW STYLE

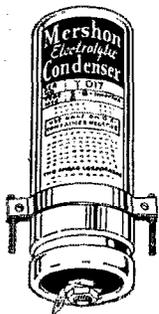
Electrolytic

MERSHON

Condenser

INVERTED TYPE

In Your Transmitter Filter Gives You A Clearer Note and "Puncture Proof" Operation.



Merphon Condensers have almost unlimited life. They actually improve with use.

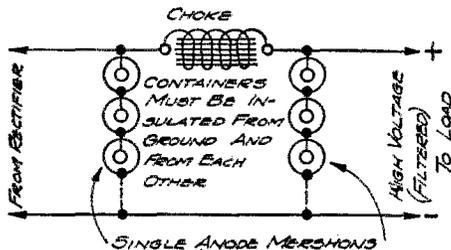
Voltage surges that would ruin an ordinary condenser have no effect on them.

Their use in your transmitter gives it a pure D.C. note hard to improve upon.

NDR, Augusta, Maine, says, "Using bank of Merphons put new NDR on the air and got Xtal report first QSO." W1BES says, "Blew a 4,000 volt bank of — condensers before acquiring the Merphons, but have had no trouble since." W1CCP says, "Had 'RAC' report before, but now am getting 'DC' and 'pure DC'." The success of Merphon Condensers is based upon years of development

and actual experience in service. These quotations from the letters of prominent "hams" are typical of the many received in our daily mail.

Merphons cost less than ordinary condensers of similar capacity and voltage rating, and may be obtained from any one of forty parts distributors. If your distributor does not stock them, write us. We will put you in touch with one that does.



A very effective circuit for high-voltage transmitter filters, using Type Single-8 or Single-18 Merphon Condensers in series groups. Other circuits in the new Merphon booklet "Puncture Proof Filter Condensers." Write for FREE copy.

Manufactured Exclusively by

THE AMRAD CORPORATION
370 College Avenue
Medford Hillside, Mass.

THE AMRAD CORPORATION

370 College Avenue
Medford Hillside, Mass.

- Send me promptly prices and information on Merphon Condensers for my transmitter. Diagram enclosed.
- Send me your booklet "Puncture Proof Filter Condensers."

NAME

STREET

CITY

STATE

of you in the Eastern States glance at Wyoming with 19 amateurs, Montana with 38 — and there is no way of telling how many of these are active.

Trusting this will help you solve your chance of breaking into that State you have been looking for, and wishing you the best o' luck.

— F. K. McKesson, W8YB

Amateur Radio and International Good Will

60, Wellhead Lane, Perry Barr,
Birmingham, England.

Editor, *QST*:

I wonder if amateurs fully realize how they are helping to create a spirit of friendship and good will between the nations of the world? Truly here is an instrument with which the friendship of nations can be firmly cemented.

After having had a QSO with a foreign "ham" I inevitably feel that a bond of friendship will always exist between us, and I am sure I am quite right in saying we all get similar impressions. In our own particular sphere we can be a League of Nations in a small way, and by fostering the "ham" spirit we shall surely be helping forward the claims of international peace and good-fellowship.

Not only can we bring about this state by genial, friendly and helpful operating procedure when on the air, but also by giving foreign and colonial "hams" a jolly good time when they come to our country. Unfortunately we do not get a large number of overseas visitors in the Midlands, but any chap who does look us up is assured of a good time with the Birmingham "Bhoys," and all visitors we have had to date invariably promise similar fare if we pay a reciprocal visit.

Wishing the heartiest success to the "Ham Spirit."

— A. C. Edwards, G6XJ

QRM

12 Forest Hill Drive,
Asheville, N. C.

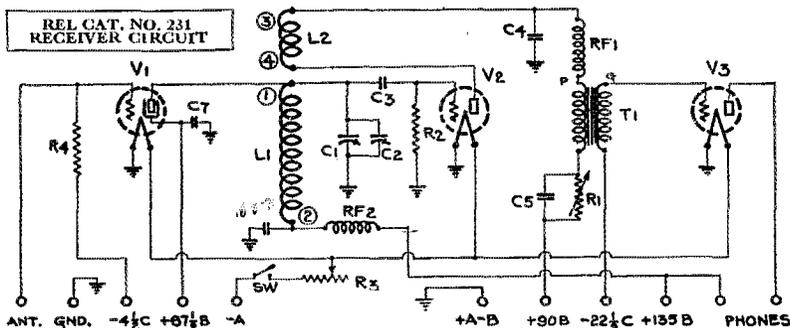
Editor, *QST*:

Having read the new regulations requiring d.c. plate supply, I was just burning up about this infringement on my personal liberty and freedom to use raw a.c. if I wanted to. Just as I had about worked myself up to writing *QST* and cussing out the directors for doing this without consulting me, a near-by ham borrowed the school's transmitter for the summer and came on with raw a.c. Although he at first used only a 201-A tube, it not only blanketed the 7000-ke. band but also ruined 14,000 ke. as well. I gave him a rectifier and he borrowed a filter from the school, and this eliminated QRM on other bands, but he decided that he could not get out so well with this, so he went back to raw a.c., and when I protested he got mad and took to coming on every time he saw a

Build the Finest PRACTICAL AMATEUR BAND RECEIVER!

Designed exclusively for amateur work by the oldest reliable manufacturer of short wave equipment. Some outstanding advantages of this receiver are:

- 1 — Employs new super sensitive 2 volt non-microphonic battery operated tubes
- 2 — Spreads each amateur band over the full range of the dial
- 3 — Equally efficient for DX, CW or tone reception
- 4 — Thoroughly tried and tested circuit guaranteeing consistent results
- 5 — Screen grid RF — detector — power audio
- 6 — Readily calibrated for each band
- 7 — Easily assembled and wired



L1, L2 — One complete set REL. Cat. No. 253 coil kit. (This contains 3 coils and 1 base designed to cover the 3500, 7000 and 14,000 KC bands)
C1, C2 — One REL. Cat. No. 187-E secondary tank variable condenser with special movable vernier for obtaining full scale spread for each band

C3 — .0001 mfd. fixed condenser
C4 — .002 mfd. fixed condenser
C5 — 1 mfd. bypass condenser
C6 — .005 mfd. fixed condenser
C7 — .5 mfd. bypass condenser
R1 — 100,000 ohm variable resistor
R2 — 10 megohm grid leak
R3 — 20 ohm rheostat

R4 — .01 meg. resistor
RF1, RF2 — REL. Cat. No. 132 RF choke coils (price \$1.10 each)
SW — Filament switch
T — Audio transformer
V1 — Type 232, 2 volt tube
V2 — Type 230, 2 volt tube
V3 — Type 231, 2 volt tube

COMPLETE KIT comprising all necessary parts to build this receiver including drilled and engraved panel and metal cabinet. *Price \$30.00*

CAT. NO. 253 — Coil kit comprises three (3) coils and one (1) coil base designed for full spread tuning of the 20, 40, and 80 meter bands when used with Cat. No. 187-E condenser. *Price \$6.00*

CAT. NO. 187-E combined tank and vernier condenser, necessary for obtaining full spread tuning. *Price \$6.25*

Write for our large loose leaf handbook full of information, kept up to date by regular bulletins. Price only 50c.

Our booklet 50 describes Modern Short Wave Receivers and Transmitters.

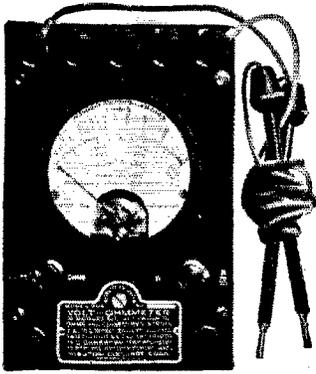
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WESTON

Model 564

Volt-Ohmmeter

*For Checking Voltages,
Resistance and
Continuity of Circuits*

THIS instrument is ideally suited to the needs of radio service. It is handy and very useful for general purposes, especially in experimental work.

Model 564 is compact, completely self-contained. Though moderately priced, it gives that same dependable service for which all Weston instruments are known.

It consists of a Model 301, 3 1/4 inch diameter meter with ranges of 3, 30, 300 and 600 volts (all 1,000 ohms per volt) and two resistance ranges 0-10,000 and 0-100,000 ohms; two toggle switches connect the various ranges of the meter in circuit; a pair of 30" cables with long test prods is provided with each instrument.

Testing continuity of high and low resistance circuits is simplified by means of a toggle switch which changes the sensitivity of the meter to either 1 or 10 milliamperes. Accuracy 2%. Size: 5 1/2" x 3 3/8" x 2 1/8" deep (excluding binding posts). Weight: 2.3 lbs. (including self-contained "C" battery).

Weston
PIONEERS
SINCE 1888

INSTRUMENTS

Weston Electrical Instrument Corp.
602 Frelinghuysen Avenue Newark, N. J.

light in my shack. With a 210 tube and raw a.c. he drowned out all signals of any kind on all the amateur bands. You can bet I was glad that the radio inspector would order him to stop the QRM, so I complained about it and now he isn't on so much, but still uses a.c.

This morning the Aussies were coming in FB and I had hooked a couple on 7000 when another local ham about two miles away came on with his 210 set using rough r.a.c. This blotted half the band and was loud enough on the rest to ruin all DX. I certainly think that the new regulations should be enforced in all cities where there are numbers of hams near each other. This ham usually uses d.c., but just thought he would see how he could get out with no filter.

Another source of QRM is the harmonics of locals on higher bands. They do not seem to be very loud on lower frequencies, but 7000-kc. signals came in very loud on 14 and 28 mc. I have even heard distant harmonics of 7000-kc. stations on 28 mc. and harmonics of 14 mc. stations come in regularly from all parts of the country on 28 mc. I don't know what can be done about this but it is very annoying to call a station and then find it was only a harmonic.

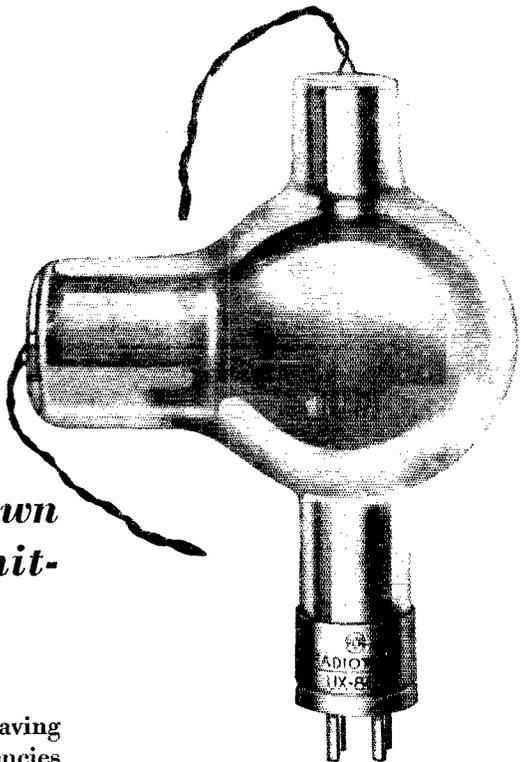
The 14-mc. 'phones also caused more QRM than any other thing here last spring when DX was coming in. I heard one 'phone (one of the best) complaining about a.c. QRM. He said the a.c. station was about 15 times wider than a modern 'phone station. He was then covering more than 10 per cent of the band with his wave and modulation of near-by signals, so this must have been wide QRM all right. I think that 'phones should not be allowed on 14 mc. between 2 p.m. and 9 p.m. local time, as they cause needless QRM at this time to DX. The transmitter and not the license of the operator should also be the means of qualifying for a 14-mc. 'phone. A ham with a good m.o.p.a. set who can't copy the code will have a much better 'phone than the extra-first-grade license holder using loop modulation, and the ability to copy 20 words per minute certainly does not affect the quality of a bum 'phone.¹ The older hams as a rule seem to think that they should have privileges not granted to the beginners, which accounts for complaints that some 'phone operators cannot read the code. If 14-mc. 'phones were required to use crystal or m.o.p.a.'s instead of being required to have a certain grade license and their tickets were suspended for three months for having a bum 'phone or operating off wave, there would be a noticeable improvement in the quality of signals, but in any case a 'phone covers too wide a portion of the band to be used during the afternoon and early evening when 14 mc. is the only band on which you can work Europe, Africa, and South America.

— E. R. McCarthy, W4LY

¹ The present 14-mc. 'phone regulations require that the applicant for the privilege must show special technical qualifications, the extra first-class being accepted as evidence of such qualifications. The 20-word code speed is not required for 14-mc. 'phone, although it is a part of the extra-first license. — Editor.

RCA RADIOTRON UX-860

*One of the well known
Screen-Grid transmit-
ting tubes*



For the amateur or others having transmitters working at high frequencies (above 3000 kilocycles) this tube will be found advantageous, since its internal shielding obviates difficulties due to feedback and self-oscillation.

This Radiotron is primarily designed for power amplification at Radio frequencies. It is not generally satisfactory as an audio frequency amplifier or modulator, for which purposes other Radiotrons are available.

The user will find Radiotron UX-860 possesses the same rugged construction and performance qualities as the well known UX-852.

	75 Watt			
Filament Volts	.	.	.	10.00
Filament Amperes	.	.	.	3.25

Instruction book giving further rating and data information will be gladly forwarded on receipt of request giving the call letters of your station.

Firm net price, \$37.50.

RCA VICTOR COMPANY, Inc.

ENGINEERING PRODUCTS DIVISION

CAMDEN

NEW JERSEY

Ah, that Figure¹!

TO BE found in most every *QST* article, and it takes your eye to the bottom of the page to refer to some past issue or issues of *QST*.

Obviously the reference is there for a real and helpful purpose.

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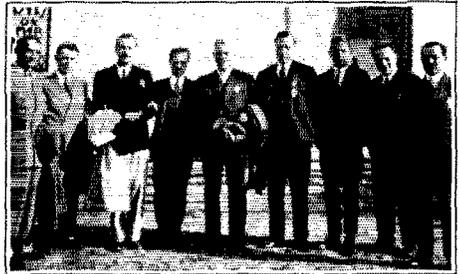
QST

1711 Park St., Hartford, Conn.

I.A.R.U. News

(Continued from page 62)

month is mid-winter in the Southern Hemisphere, and in the Southern States of the Commonwealth is marked by frosts and rain, with foggy and generally cold conditions, although rarely below the freezing point except on the highlands. Even on good receiving days foreign stations do not seem to get through except when accompanied by high noise levels. The theory propounded by the Federal Technical Director, Mr. M. Howden, VK3BQ, for this phenomena is that during our winter the northern hemisphere stations are experiencing summer conditions and that there are fewer of them at work. In addition, the stations we do hear are affected by static and other summer interference, to which is added



DELEGATES TO THE ANTWERP CONGRESS,
JULY, 1930

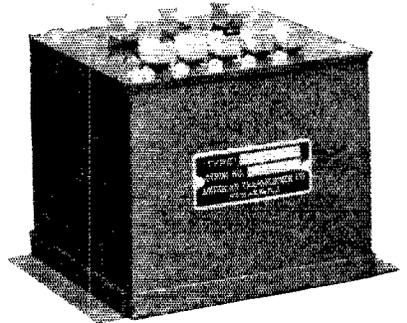
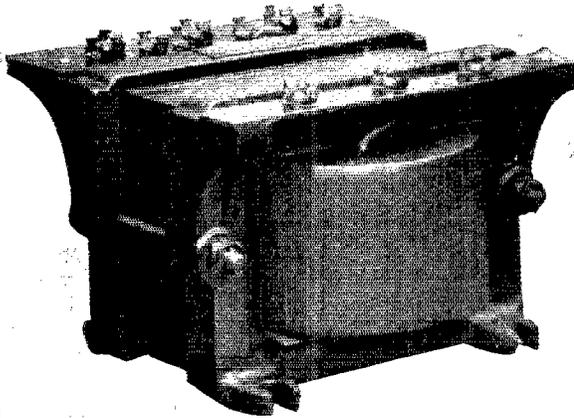
any other interference such as may be caused from power leaks, etc. during our wintry conditions. 3.5-mc. work even for locals is practically out of the question, while 7 mc. is very little better. 14 mc. is not quite so noisy, but seems to be affected more or less for most of the time.

In spite of the poor conditions the men working on 28 mc. continue to get results, and the number of stations using crystal control on this band is growing weekly. Several of them are employing telephone modulation occasionally.

The majority of the Divisions of the W.I.A. have lately held Annual Meetings, election of officers, and balancing of accounts for the year. All reports show an excellent year, of great service to the interests of amateur radio, increased membership and continued enthusiasm. Full reports are not yet available from Divisions other than Western Australia and Victoria, but as the remainder come along interesting extracts should be available for the information of foreign friends.

Western Australian Division reports a membership of 139, with an average attendance of 50 members at each meeting. (Many have to travel considerable distances to attend, because of the scattered nature of the membership.) Twenty-four meetings were held during the twelve months under review. A permanent headquarters has been obtained for VK6WI, the official station. Educational activity through local broadcasting stations for assisting and gaining the interest of B.C.L. listeners; operating and Morse classes for beginners; field days; social activities and ex-

AMERTRAN



Equipment

Designed to meet the new amateur requirements of an adequately filtered D. C. current supply.

Filament Heating Transformers

Voltage regulation within 5%. Note insulation test voltage.

Type	V. A.	Cycles	Line Volts	Sec. Volts	Sec. Amps.	Test Voltage	Type Tube
H-4648	12½	50/60	200/230	2.5/1.25	5	12,000	—66
H-66A	25	50/60	100/115	2.5/1.25	10	12,000	—66
H-4649	37½	50/60	200/230	2.5/1.25	15	12,000	—66
H-4650	50	50/60	100/115	5/2.5	10	12,000	—72
H-4651	50	50/60	200/230	5/2.5	10	12,000	—72
H-4652	100	50/60	100/115	5/2.5	20	12,000	—72
H-4653	150	50/60	200/230	5/2.5	30	12,000	—72

Plate Transformers

P-4656	290/415	50/60	100/108 115/125	2360 1180	O.175	6,000	two 211 two 845
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The above Plate Transformer is designed to deliver 1000 volts D. C. with the average filter. Other Plate Transformers can be furnished upon receipt of specifications giving your requirements.

Radio Filter and Modulation Chokes

Type No.	Inductance (Henries)	Amperes (D. C.)	D. C. Resistance (ohms)	Insulation Test (volts)	Use
4725	8	0.250	65	2500	Filter
557A	15	0.250	130	2500	Filter
4618	70	0.050 to 0.200	410	5000	Modulation

Other standard size Choke Coils available for transmitting circuits. Amertran Radio Parts have long been recognized as the highest quality. Amateurs obtaining the best results realize their value.

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Since 1915

E. T. CUNNINGHAM, INC.
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cursions to places of interest such as radio stations, power houses, telegraph stations, etc.; the equipment of a comprehensive library; and a successful amateur Exhibition during the year, are exemplary of the year's activity.

The Victorian Division report is very similar. The total membership is 166, and new members are enrolled at each meeting. During the year the Division has been able to install a reference library of textbooks for the use of the members; a lending library of technical instruments to assist in the experiments of individuals; the organization of field days, excursions, etc. and experienced an altogether successful twelve months.

Some interesting experiments in measurement of the Heaviside layer were undertaken during July by one of the Victorian telephone stations, VK3BY, cooperating with the Radio Research Board of Melbourne University. Complete details of the results are not yet available, but will be reported later. The measurements were made on the reflected waves from VK3BY, the frequency of which was varied at a known value by means of a small paralleled condenser inserted in the aerial circuit and rotated by a constant speed motor.

DUTCH NOTES

By W. Keeman, Traffic Manager, N.V.I.R.

The months of July and August have been particularly barren of results. The number of reports from our O.R.S. has been rather small, probably in consequence of the stifling heat, and those who sent in their notes were very pessimistic. The word "rotten" was used frequently (T.O.M. — N.B.). No signals were received on 28 mc., but a few DX stations were heard on 14 mc. although few contacts were reported. Operating conditions and practices both were had on 7 mc. The 3.5-mc. band alone showed signs of life.

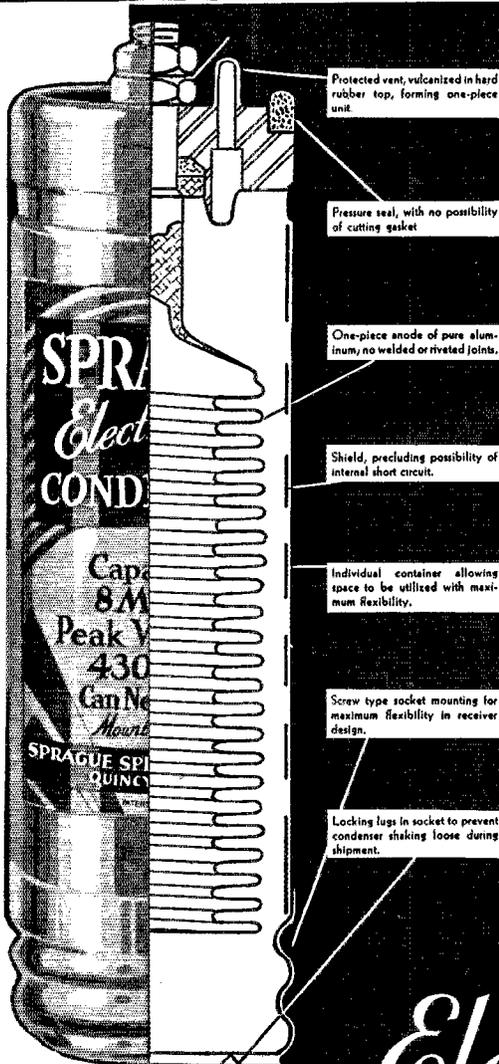
The long awaited book containing all the technical information amateurs should have has been prepared. It was written and edited entirely by our membership, and is gotten out in mimeographed form. The publication program of our society is finished now, and our members now can avail themselves of three books, each dovetailing into each other, in which they can find all the information they require.

Our Board of Directors has made another important decision. This is to the effect that in future all QSL cards which are not in agreement with the regulations of the Washington I.R.C. will be returned to the sender by our QSL service, after having been stamped as follows: "Refused. Does not conform with Washington Regulations." We hope this will help to make an end to the childish effort of a few amateurs to create confusion, and introduce political differences to the detriment of amateur radio. We have hesitated a considerable time before taking this step, but it has appeared to be really necessary if we wish to keep amateur radio the fine, clean sport it has been since the very beginning.

(Continued on page 66)

SPRAGUE

Look Inside the Can



CONDENSERS may look pretty much alike from the outside. But it's the "insides" that does the job. And when you take a look at the Sprague's "innards" you'll see why this new type electrolytic condenser has literally swept the radio industry off its feet.

Here's a standardized unit of 8 MFD capacity, with a rating of 430 volts DC, in a space of $1\frac{3}{8}$ " diameter $4\frac{1}{8}$ " height. Packed with such exclusive features as the one-piece anode, without a single welded or riveted joint. A protected vent vulcanized into the hard rubber top. An individual container allowing of the utmost flexibility in circuit design. Screw socket mounting for ease of attachment. And a proven puncture-proof, self-healing construction that gives it almost limitless life.

Write for illustrated folder which shows the Sprague superiority at a glance

SPRAGUE SPECIALTIES COMPANY
Manufacturers also of the well-known
SPRAGUE PAPER CONDENSER
NORTH ADAMS, MASS.

Electrolytic

CONDENSER



993 pages
5 1/2 x 8 inches
561
Illustrations

Complete data on construction and repair of modern radio sets

These three books cover the entire field of building, repairing and "trouble-shooting" on modern broadcast receiving sets. The Library has been brought right up-to-the-minute in every respect, including the very latest developments in the design and manufacture of equipment. The recent interest in short-wave reception is reflected in a section which deals with the construction of this type of receiver.

Radio Construction Library

By JAMES A. MOYER

Director of University Extension, Massachusetts Department of Education

and JOHN F. WOSTREL

Instructor in Radio Division of University Extension, Massachusetts Department of Education

THESE three books embody not only a thorough home-study course, but a ready means of reference for the experienced radiotrician. Step-by-step information is given on wiring, "trouble-shooting", installation and servicing to get the best tone quality, distance and selectivity in broadcast reception in all types of sets.

Practical data is given on radio equipment such as antenna systems, battery eliminators, loud speakers, chargers, vacuum tubes, etc., etc.

A section is devoted to the identification of common faults in receivers and methods of making workmanlike repairs.

The three books are profusely illustrated with understandable diagrams of hookups, connections, loud speaker units, installation work and antenna erection — as well as numerous photographs, tables and charts which clarify the text.

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By the time these notes are published the Fifth Annual Convention of the R.S.G.B. will have taken place. A full report of the decisions reached will appear later. The Society was represented at the British National Radio Exhibition at Olympia, and exhibited a complete amateur radio station, besides transmitters and receivers designed to operate on 1 and 5 meters.

Many new B.E.R.U. members have been elected and within a few months the full Empire Network will be in operation. Some dozen British amateurs have been appointed Empire Link Stations.

The Rotab Cup (presented in 1926 by Mr. G. Marcuse, G2NM) has been won by Mr. F. Miles, G5ML, whilst the Wortley-Talbot Trophy goes to Mr. C. E. Runeckles, SU8RS. We are sure amateurs throughout the world will join in congratulating these well known amateurs.

Preparations are proceeding apace for the coming 28-mc. tests, and all who desire to assist should advise our Contact Bureau Manager, Mr. Powditch, Porth House, Porth, St. Colomb Minor, Cornwall.

In answer to several requests, we wish to advise all amateurs that the coveted W.B.E. certificate is only issued to R.S.G.B. or B.E.R.U. members who have worked a British station in each of the five continents.

Membership in the Society is open to all genuine amateurs, and full particulars will be sent on application to the Hon. Sec. R.S.G.B. 53 Victoria Street, London, S.W.1.

NORWEGIAN NOTES

By G. H. Petersen, Pres. N.R.R.L.

The outstanding event during August was the Convention and General Meeting at Oslo on August 9th and 10th.

There was a very fine representation from all parts of the country, and many interesting plans were discussed. Much importance was attached to the inland tests to be arranged during the autumn months to establish reliable national relay lines. It was decided to stimulate the exchange of foreign reports and coöperation in international tests, and in this connection it is interesting to note that we have arranged for foreign reports to be distributed to all our members by a monthly circular, which is also to contain bulletins from Headquarters, inland reports, and anything else of interest.

The Board for the coming two years will consist of:

G. H. Petersen, LA1D, President
L. Salicath, LA1G, Vice-president
Captain L. B. Gottwaldt
R. Corneliussen

Our Section Managers at present are:

R. Larsen, LA2B, Fredriksstad
J. Fundingsrud, LA2C, Oslo
R. Pedersen, LA1W, Notodden
F. Knudsen, LA2V, Bergen
K. E. Weedon, Trondhjem

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For checking your note, its stability and whether D.C. or not. **THE ONLY SURE CHECK.** Gives you an accurate idea as to what your signal sounds like to the other fellow. The Leeds Monitor is encased in an aluminum shield, 5" x 6" x 9" overall. Completely shielded, with batteries self contained. Supplied with A & B batteries, but without 1-UX. 199 tube.

Special **\$15.00**

Make your own transmitting and receiving coils. Copper tubing transmitting inductance.

Inside Dia.	Size of tubing		
	3/16"	1/4"	5/16"
2 1/8"	9c	10c	12c
2 3/8"	9c	10c	15c
3 1/8"	10c	12c	17c

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Thordarson 150 watt Transformer. Limited quantity — over 1000 sold at \$3.95, for specifications see previous issues — a few left at **\$3.50**

Leeds 50 watt socket specially priced. See previous issues of QST for details.

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400 Volts D. C. Working Voltage

Type 902—3 Mfd. — 5" high, 2" wide, 2 1/2" deep. List \$1.35 \$4.50. Special.....

7 Mfd.—5" high, 2" wide, 4 1/2" deep. List \$7.50. \$1.75 Special.....



NEON GLOW LAMPS

Made by General Electric Co., type G-10, standard base, 101 uses, as illustrated in QST May issue page 17. Price only65c

Standard electric socket for tube.....15c

WIRE

No. 14 Enamel..... 3/4c Foot
No. 12 "1c
No. 10 "1 1/2c "
Any length up to 1000 feet

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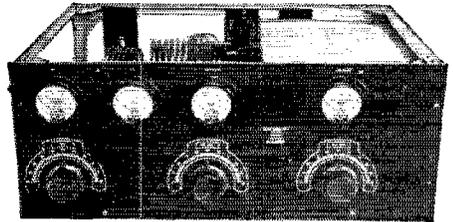
Precision Custom Built Short Wave Receivers and Transmitters

This department under the supervision of the Short-Wave Specialist Jerome Gross. We design, construct and advise on any material for the "Ham" Broadcasting station or laboratory. Write Jerry Gross for advice on any of your problems.

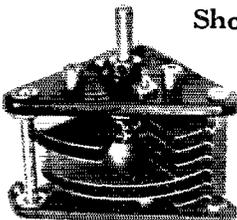
LEEDS Special 75 Watt Master OSCILLATOR—Power Amplifier TRANSMITTER

The ultimate in a real transmitter of medium high power. Finest construction throughout. Angle aluminum framework, oscillator thoroughly shielded with heavy aluminum. Circuit perfectly balanced. Easily adjusted for full output. Size 11" x 19" x 26" overall. Extremely flexible, wavelength changes easily effected. Utilizes one UX210 as oscillator, one UX852 as power amplifier.

WRITE FOR OUR CIRCULARS ON OUR PRODUCTS. QUOTATIONS ON SPECIAL TRANSMITTERS, ETC., SUPPLIED UPON APPLICATION.



G. R. No. 557 Short Wave Condenser



The use of this condenser was suggested in the Oct. article on Dynaron oscillators. The only condenser incorporating as self contained fixed capacity in addition to the variable plates. Condenser consists of 6 stator plates, 2 rotor plates of the straight line wavelength type and 2 additional rotor plates which are complete circular discs. Min. capacity 43 MMF to 70 MMF. Maximum; size 4" x 4" x 4 1/2" for panel mounting only. Price \$3.25.



FILTER CHOKE

30 Henry, 150 Mill — special heavy choke, good for filter circuits for transmitters up to and including one UX852, or as a modulation choke on medium power transmitters.

Specially priced at **\$3.25**



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ALSO THE NEW ENAMELED SLIDE RESISTOR IN VARIOUS SIZES.

We recommend HH Resistors for the following voltages:
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1000 volts — 100,000 ohms — 100 watt 2.95
1000 volts — 60,000 ohms — 200 watt 3.45
1500 volts — 80,000 ohms — 100 watt 3.60
1500 volts — 80,000 ohms — 200 watt — double unit 6.25
2000 volts — 100,000 ohms — 200 watt (double unit) 6.50
100 watt resistors. Size 6 1/2" x 1 1/2"
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All Above Complete with mounting brackets



200 Watt Centre Tapped Transmitter GRID LEAK

Size 8 1/2" x 1 1/2" complete with bracket mounting
5,000 ohm. Special \$2.25
10,000 ohm. Special 2.70
15,000 ohm. Special 2.95
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Triad Engineers have at last made available a T-210 Tube which functions equally well as a power amplifier and an oscillator — and in addition to meeting these requirements, offers a far longer life.

This new Triad T-210 has a thoriated Tungsten Filament. This construction allows it to be easily reactivated, thus greatly increasing the life of the tube. In this construction, Triad engineers have used molybdenum, a material that will withstand excessive heat far better than nickel which is usually used. The using of molybdenum has eliminated grid and plate emission which is the chief cause of noisy tubes.

Here is still another proof of the progressive spirit which has made the name Triad famous, and has won for Triad tubes the preference among those who know!



Send now for Triad bulletin T-210 and for information regarding the remarkable improvements that have been carried out throughout the entire Triad line. A special price is extended to Licensed Amateurs and Members of A.R.R.L.

TRIAD Tubes are fully licensed under all R.C.A. General Electric and Westinghouse Electric Mfg. Co. Patents

Triad Manufacturing Co.
Pawtucket, R. I.

The Convention included a fine hamfest and a very interesting visit to amateur stations, the commercial transmitting and receiving stations at Oslo, the new Oslo broadcasting station, the Sailor School laboratory, and the works and laboratories of the Norwegian branch of Phillips Lamps.

It was certainly regretted that we had no opportunity to welcome any foreign amateurs. We had certainly hoped to see G6YL and SM6UA.

No interesting work has been reported during the month, LA1G moving to a new QRA, and most of the gang reporting bad conditions, or rebuilding for the coming season.

SPANISH NOTES

By Miguel Moya, Pres. Asociacion E.A.R.

The Asociacion E.A.R. has been very active during the past few months, by virtue of the new decree issued by the Spanish Government and originating at the Hague Conference.

Thanks to the intervention of the President of the E.A.R. with the Inter-Ministerial Committee of which it forms a part, the Spanish amateurs have been able to work undisturbed at all hours and on all waves allotted by the Washington Conference, both with C.W. and 'phone.

The number of official licenses granted by the E.A.R. has reached 210.

Another and important group of the E.A.R. has just been organized to take part in the tests periodically conducted by the U.R.S.I. for the purpose of studying the propagation of short waves.

Just recently a communication contest was held between Argentine and Spanish amateurs. The contest was organized by the Argentine Radio Club, in collaboration with the E.A.R. Of the Argentine amateurs, LU3DE and LU8DY, and of the Spanish, EAR98 and EAR96, were the most successful.

In accordance with the resolutions adopted by the League of Amateurs at Antwerp and the recommendations made by the Secretary of the I.A.R.U., the Asociacion E.A.R. has pledged itself to do everything possible to have representatives of the I.A.R.U. meet again at the next International Conference to be held at Madrid in 1932.

NEW ZEALAND NOTES

By S. R. Perkins, Gen. Sec. N.Z.A.R.T.

N.Z.A.R.T. affairs have undergone a change since last year, Headquarters having been changed from Auckland to Wellington upon the vote of members. The new address is now P. O. Box 489, Wellington, N. Z., and this should be used for all QSL cards, correspondence, etc.

Recently concessions have been granted by the Government in the way of reduced license fees and the privilege of exchanging messages. This latter has led to the formation of a Relay Chain and by collaboration with the Defense Department it is hoped to inaugurate shortly an Army-Amateur network similar to that in force in the U. S. A.

WE SPECIALIZE IN REPLACEMENT PARTS



BAL-RAD Replacement Block for Atwater-Kent No. 37

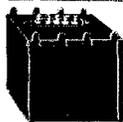
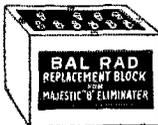
This unit contains the proper chokes and high voltage condensers. All flexible wire colored leads identical to the original. Fully guaranteed.
Each..... **\$4.95**

BAL-RAD

Replacement Block for

Majestic "B" Eliminator

The condensers in this block are composed of High Voltage Condensers. Guaranteed for 1 year.
Each..... **\$2.95**



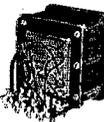
VICTOR CONDENSER BLOCKS

Replacement in All Victor Sets
Contains 10 1/2 mfd.

Our Price..... **\$3.25**

Earl & Freed Power Transformers

For Models 95, 78 and 79, using 5-227, 1-280, 2-245 tubes.
60 cycle..... **\$4.50**
25 cycle..... **4.75**
Model 32, using 3-226, 2-171A, 1-280, 2-227 tubes,
60 cycle..... **\$3.50**
25 cycle..... **3.75**



R.C.A. By-Pass Condenser

Part No. 5996
Comprising one
1/2 and three .1
mfd. condensers.
List **\$3.00** —
Each... **35c**



R.C.A. Double Filter Chokes

Part No. 8336
R. C. A. Re-
placement Part
No. 8336 con-
tains two 30
henry 80 mil
chokes. Each
insulated for
1,000 volts.
Each... **95c**



R.C.A. Replacement 600V Condenser Block

FOR RADIO-
LAS Nos. 18,
33 and 51,
Part No. 8333
Special. Each
\$1.50



Power Transformers

For Replace-
ment in
Zenith Sets
Models ZE
10-33-33X-34.
This trans-
former can also
be used for cir-
cuit in replac-
ing the fol-
lowing type tubes: 5-227 —
1-171A-1-280. Our Price **\$3.50**



VICTOR PUSH-PULL TRANSFORMER

Input and Output

Can be used with 171A — 245 or 250 type tubes. Out-
put matches moving coil on all dynamic speakers.
With
Metal Jacket **\$2.50**



BAL-RAD HY VOLTAGE SURGE-PROOF CONDENSERS

For General Repair and Power-Pack Work
We guarantee these condensers for 100 per cent. free replacement.
Repair man should carry a few dozen in stock.

	Each	Each
One Mfd.	600 Working Volts	30c
Two Mfd.	600 "	40c
Four Mfd.	600 "	60c
One Mfd.	800 "	50c
One-half Mfd.	300 "	25c



PIGTAIL CARBON RESISTANCES

500 ohm	15000 ohm	10000 ohm	} \$1.25 Per doz.
1000 ohm	25000 ohm	20000 ohm	
4700 ohm	2 megohm	75000 ohm	

TERMS: 20% with order, balance C.O.D.
2% discount allowed for full remit-
tance with order only.
NO ORDERS ACCEPTED FOR LESS THAN \$2.50

BALTIMORE RADIO CORP.

47-Q Murray Street, New York City
Send for our latest Bargain Bulletin

Radio Exhibitions have been held in several of the main centers this season and the local hams have acquitted themselves well by installing transmitters at the various shows and have handled greetings messages to friends of the visitors. At one Exhibition alone over 1400 mes- sages were handled in four days.

Calls Heard

(Continued from page 53)

w6dev w6de w6dyg w6dmk w6dfp w6dpj w6dqj w6drb
w6dtj w6dyx w6dyv w6dys w6dxm w6dxp w6eak w6egh w6ehi
w6eif w6ekc w6ekw w6emd w6enl w6eje w6egk w6epx
w6eps w6eqj w6equ w6esa w6esf w6etj w6eug w6ife w6ifs
w6id w6kt w6km w6mx w6qc w6ql w6rf w6su w6va w6ze
w7aat w7acy w7adb w7aec w7aew w7af w7agb w7anj w7be
w7ek w7el w7fa w7k w7ka w7ll w7pr w7qy w7sg w7tu w7ty
w7vy xearn xc xfa xfd vo8ae vo8an vo8mc z12ac z22n z24e
z1tr z1tx z15r z16r z18n

OZ1A, Niels Jacobsen, 29 Bredgade, Copenhagen, Denmark

7000-kc. band

au7ac au8at cn8rux fm8eor fm8fs fm8rit fm8tui w2alu w2cxl
w4aef w4ft yi2gq.

14,000-kc. band

aui1aq au1bs au8at ct2aa ct2ac fm8er fm8ih fm8lav fm8mt
fm8rit fm8tui hc1fg nkf pk2aj pk3bm su8re ve1ar ve2bd
ve2be ve8ak ve8ao vk2ek vk2hc vk2hu vk2jp vk3bq vk3gd
vq4lma vs1ab vs6af vs7ap vu2ax w1afu w1asf w1ase w1bft
w1bam w1bux w1bwa w1caw w1cmx w1co w1da w1dp
w1dq w1lg w2adp w2amr w2aog w2aoy w2arb w2ary w2ayj
w2bia w2bjs w2bka w2ble w2buu w2cix w2cuq w2cyx w2da
w2el w2oa w2rd w2rs w2vd w2zq w4gq w8aj w8auu w8axa
w8bhk w8box w8cvt w8ddl w8oak w9fdj y1aac y1lcm
y1llm z1lan z24m z25w z26d z15r z18n

W6DHM, Vin W. Berry, Los Angeles, Calif.; Hilo, Hawaii

7000-kc. band

w1asf w1mk w1oa w1ry w1si w2lu w2amr w3aag w5aem
w5dm w5dw w5ww w6adw w6ags w6akf w6amp w6aq w6are
w6atj w6auj w6bam w6bam w6bdm w6beb w6bnh w6bnh
w6bpe w6by w6cok w6cto w6cul w6ewi w6exi w6exp w6eyq
w6eyx w6ezk w6ezs w6den w6dep w6dep w6dng w6dhw
w6dot w6dpf w6dvd w6dwi w6dyj w6dyl w6dsu w6dsy
w6ecc w6edd w6ehi w6eib w6eqc w6equ w6eta w6euj w6euf
w6ew w6fe w6ks w6oc w6of w6v w7aaw w7aac w7aax
w7abd w7abq w7aih w7aio w7ait w7aj w7ao w7aol w7be
w7cn w7dl w7fh w7fk w7gp w7hn w7iw w7kr w7ny w7oj
w7po w7re w7rn w7tk w7tx w7zd w8ces w8gz w8jr w9ae
w9arm w9axo w9azy w9bba w9blc w9ceu w9dvp w9el w9ell
w9exw w9ffd w9fp w9fyq w9fyx w9gka w9kd cm8yb
k4dk ve4hl ve4bv ve5er ve5dd vk2hk vk2hu vk2js vk2na
vk2pc vk2rw vk2sg vk2wk vk3bv vk3ga vk4bh vk4do
vk5gr vk5wr z1aa z1as z1lfc z12ac

AC8HM, Mr. H. MacGowan, c/o American Club, Shanghai, China

7000-kc. band

k6arl w6afh w6akw w6aek w6awy w6bax w6bi w6bjd
w6caf w6cok w6cqq w6cqx w6cyi w6cyy w6cxw w6dep
w6dhw w6dkg w6dam w6dvy w6eux w6eje w6ehp w6hm
w6ke w6lk w6oj w7aar w7ahx vk2ek vk5mb vk6fl

14,000-kc. band

z1lap z12ab vk2kj vk3go vk4rb

VK2JT, C. Luckman, 72 Wangee Rd., Lakemba, N. S. W., Australia

w1ahx w1asf w1bes w2ayj w2cbl w2ckl w2aps w2hbn w4ft
w5apu w5ms w5ww w5aea w5axs w6dar w6ebn w6aaa
w6axn w6fts w6fbc w6ebg w6bng w6enx w6lyx w6cbp
w6wvm w6dky w6cxw w6hfb w6xm w6hm w6czk w6bts
w7mo w7adv w7aaf w7anj w7ima w7ele w8cdh w8ant
w8kh w8um w9cd w9fgq w9hbc w9loc w9aag w9ah w9ch
w97ap ve2bd ve3gc pk2aj pk3bm au8at vu2zx oa4q oa4t

BYRD'S Antarctic Radio Equipment

The advanced types of receivers, transmitters, and navigation aids that triumphed on this epochal flight now fully described in this book.

TELEVISION

Mr. C. F. Jenkins, father of television and radio movies, gives you in his own words complete directions for building practical television equipment.

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Tracking down troublesome interference and eliminating it, systematically outlined by W. F. Fleming, radio engineer.

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New automatic device on ships to keep the SOS watch while operator is off duty—fully described in this book.

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Temperature-controlled Piezo crystal oscillator, 100% modulation panel, and other new apparatus completely described, with instructions for operation.

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Latest types of commercial and amateur short-wave apparatus; directions for securing operator's and station license.

MARINE and AERIAL Radio Equipment

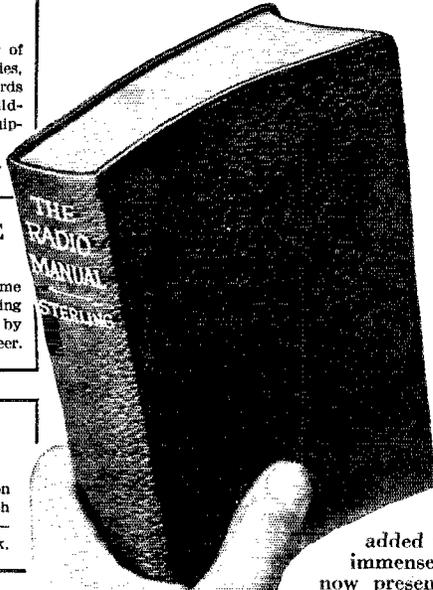
Radio beacons; are radio transmitter for ships; Recd course indicator; latest developments in high frequency transmitters.

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New regulations governing all classes of operators' licenses, U. S. Laws, and I. R. T. C. laws.

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Enables You to Qualify for Gov't License as Operator or Inspector
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Prepared by Official Examining Officer

The author, *G. E. Sterling*, is Radio Inspector and Examining Officer, Radio Division, U. S. Dept. of Commerce. The book has been edited in detail by *Robert S. Kruse*, for five years Technical Editor of *QST*, the Magazine of the American Radio Relay League, now Radio Consultant. Many other experts assisted them.

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RADIO BARGAINS FULLY GUARANTEED

Complete Phone and CW Transmitter 15 to 30 Watts \$39.50. Including tuned plate, tuned grid oscillator with provision for crystal control. Wired for one or two UX 210 tubes. One or two UX 250's as modulators, two stages of speech amplification. Mounted in beautiful two-tone Walnut cabinet. Has ample space for A.C. power supply. Price includes one Stromberg-Carlson microphone.

Power Supply Unit for 15 to 30 Watt Transmitter \$19.75. Will deliver 600 volt 150 milliamperes for plate current. Has filament for 281, 210, 250, 227, and 226 tubes.

World Wide Triple Screen Grid Short Wave Receiver. A four-tube short wave receiver for the highest efficiency for code, phone and ample output for television experiments. Uses 224 in a R.F. stage, a 224 detector, a 224 resistance coupled audio feeding into a 245 power tube. Tubes used make a minimum of micro-phonous noises and are so wired to be used on a 6 volt storage battery. A set of 10 plug-in coils are furnished with this set covering from 14 to 550 meters. Other coils can be made to cover lower frequencies. **\$28.50**

World Wide 2 tube Short Wave Receiver, \$11.75. A two-tube receiver in a beautiful shielded metal cabinet. An ideal all around set which will give loud speaker reception on many stations. Very flexible in tuning. Complete with a set of 6 clip-in coils. Covers 14 to 550 meters. Can be used with any standard base tubes.

Tubes UX type, 30 day replacement guarantee, No. 210, \$2.25; No. 250, \$2.35; No. 281, \$1.85; No. 280, 95c; No. 245, \$1.15; No. 224, \$1.25; No. 227, 75c; No. 226, 65c; No. 171, 75c.

Low Power Transmitter, adaptable for phone or code. With plug-in Coils. \$14.75

Short Wave Sets, one tube complete with 5 coils, 14 to 550 meters. \$6.45

Auto Radio — Uses 3-224, 2-227 tubes and 1-245 Power tube, single dial, tremendous volume. Compact. Fits any car. We guarantee this set to perform better than sets selling up to \$150. \$20.00

Stromberg Carlson telephone transmitter on desk stand. \$2.75

B Eliminator, Dry, 180 volts, will operate up to 10 tube set, with 280 tube, fully guaranteed. \$6.75

250 or 245 Power Condenser Blocks, 13 Mfd., 1000 volt A. C. test, tapped 2, 2, 4, 1 and 1 mid., 1 mfd. \$4.75

2 Mfd. Condenser Packs, 2000 volt A. C. test. \$7.90
1500 volt. \$3.80

Double Chokes, 30 henry each, 160 mila., 1500 volt. 130 mila. \$4.95
130 mila. \$3.75

No. 1003 Power Transformers, shielded, Sec. 600 V. for one 281, one 250, one 227, four 226 tubes and 2 chokes. \$5.00

AG-A. B. C. Power Packs, completely assembled. \$8.75

250 V. B. also has A. C. filament for up to 9-tube set. Can be used as B eliminator. Make your battery set all electric, or build your A. C. set around this pack. 280 tube for this pack, 95c extra.

Thordarson Transformers, 1 to 1. \$1.00

CHAS. HOODWIN CO.

4240 Lincoln Ave., Dept. L-8, Chicago, Ill.

DEALERS IN BANKRUPT RADIO STOCKS

k6aul k6evv k6bjj k6ewb k6dy k6alm k4ww k6emb k1alpr k1alrc k1alaw j2eb j1dp ac8uj ac8jo ac3bd cm8uf om1tb ok1vp g6rb h6ifg

Edmund Lindham, 104-66 110th St., Richmond Hill, N. Y.

7000-kc. band

w6abo w6ae w6aiu w6akf w6am w6ama w6ami w6aps w6aqq w6ar w6ary w6ati w6ato w6aui w6avi w6awd w6awp w6ayg w6bcb w6bck w6bec w6bef w6bfg w6bgi w6bic w6bkk w6blr w6blt w6bly w6boa w6bod w6boq w6boy w6bp w6bpw w6bqk w6bpq w6bqq w6brv w6bek w6btd w6btx w6bvs w6bwi w6bxv w6by w6byb w6bzi w6cah w6cba w6cbp w6cek w6cee w6ceo w6cfx w6cii w6cix w6cnc w6cr w6csc w6ctk w6cuc w6cul w6cuv w6cxw w6czk w6cez w6dad w6deg w6den w6dev w6dew w6dgv w6dje w6djp w6dmh w6dmp w6don w6dpp w6dpl w6dsp w6dtd w6dti w6dui w6dwi w6dyj w6dzm w6dzp w6dea w6eak w6ebg w6ecc w6edo w6efc w6efo w6efv w6ehp w6eib w6eje w6ek w6eke w6eka w6elc w6elm w6emt w6enr w6eod w6eop w6eoz w6tpe w6tka w6tqj w6ecu w6elr w6erx w6esp w6esa w6etr w6eva w6evf w6ew w6ewf w6ft w6jn w6ka w6kd w6kn w6lo w6lx w6nn w6oj w6pw w6tm w6ud w6uj w6yu w7aah w7aax w7aew w7af w7aho w7ahw w7ajw w7auj w7bd w7be w7kt w7mb w7mo w7of w7qf w7yq w7ts w7ua w7vy cm2wa cm2ca cm2cd cm2cf cm2hg cm2uf cm2yb c8tde cm151 cmz14 ct1bd d4abr g5aq g5by h6ifg h12 k1r6 k4k k4kd k4rk k4rf k6bic k6ew nj2pa n1ac ok2et on4jj on4jo on4ka oz7eh sz1az ti2rs ti2wd t1p velca ve2ac ve2ar ve2bb ve3ct ve3ez ve3dr ve3dw ve3er ve3rf ve3bk ve4ai ve4ar ve4bb ve4br ve4ck ve4cp ve4dj ve4de ve4ge ve4gf ve4hg vk2ek vk2hc vk2hu vk2ns vk2pp vk2ra vk2rw vk2xx vk3bw vk3es vk3ju vk3pa vk3v vk5by vk5hg vk6vi vo8aw vo8z x2r x4a x29a xw1m x1bb x1ft x1zac x1zgn x1zba

14,000-kc. band

w6aaz w6ac w6alc w6afc w6afi w6aoc w6aqj w6awg w6awp w6axm w6ama w6bac w6blx w6bpw w6bak w6ban w6bto w6bwm w6bcj w6cuh w6cvi w6de w6dcg w6dcv w6de w6dgg w6dgv w6dlm w6dlk w6dos w6dqj w6den w6dwh w6dwi w6dyb w6dzz w6day w6eak w6ecn w6efe w6efv w6ehg w6eif w6eug w6ew w6id w6jn w6jp w6lk w6mx w6qc w6vge w6vs w6wl w6yu w6zq w6zj w6aj w7ajw w7amx w7bd w7be w7dd w7fa w7fh w7fi w7fp w7if w7iv w7iz w7uo w7nr w7qj w7ag w7ty w7wl celah ce3ag ce3cr cm2ar cm2ay cm2ra cm2sh cm2sd cm2ex cm2hf cm2uf cm2yb x1af x1fb cx2ax cx7 ct1aa ct1ew ct2aa ct2ac ce2ab ce3bf d4xn ea37 ea39 ea96 ea98 fa8ap f8ca f8ct f8da f8ex f8fem f8hr f8mi f8tr g2gm g5by g5ba g5is g5ms g6mt g6xb h6ic h6if h6le h6zm i1cc kf15 k4akv k4kd k4kd lu1ba lu2aa lu2fm lu3de lu3dh lu3fa lu3fk lu3hc lu3pa lu4de lu5b lu8djc lu8dy lu9ce lu9dt nj2pa on4j on4k on4y on4z ok1na on1ac on4di on4fp on4gn on4hp on4jj on4ro on4ry pylaa pylaw pylba pylc pylcm pylvi py2ad py2al py2ar py2ay py2az py2ba py2bo py2bf py2bk py2bu py2ig py2ih py2ik py2az q1a velap velar velas velbr velca velce velco velor ve2hd ve3bc ve3cb ve3co ve3er ve3fs ve3gg ve3xs ve4ai ve4bd ve4bp ve4bg ve4bu ve4bx ve4cu ve4db ve4dj ve4de velc ve4fk ve4fv ve4gf ve4ha ve4hc ve4hg ve4hl ve4hr ve4hy ve4ic ve4rr ve5ao ve5bh ve9as vo8ae vo8aw vo8mc vo8z xeft x9a y1x zp7ab ztir

ON4JX, Jacques de Sagher, Rue Raikem, 5, Liege, Belgium

STANDARD QRH CRYSTALS

Power Type Crystals	Power Type Crystals	Power Type Crystals
\$10.00	\$10.00	\$20.00
1750-Kc. band	3500-Kc. band	7000-Kc. band

Guaranteed — easy oscillators, ONE Frequency. Calibrated to 0.1 per cent. Crystal holders \$3.00. Broadcast band, aircraft and commercial Radio corporations.

Power type crystals from (15 Kc.—20,000 meters) to (14,000 Kc.—20 meters). Prices on request. Temperature control units from 23° to 50° centigrade. Precision crystals checked against a 100 Kc. standard.

Standard QRH Crystal Laboratories
37-64 83rd St. Jackson Heights, L. I., N. Y.

w1ae w1afc w1afd w1afg w1afw w1axz w1aze w1ayo w1awe w1mp w1bwa w1cmx w1bil w1ry w2ag w2ajb w2ajj w2adp w2aoc w2amr w2arb w2auu w2azc w2bia w2biv w2bjg w2bwc w2bn w2bpd w2hj w2jn w2wr w2el w2vd w2atx w2fp w2nb w2sn w2rr w2ov w2tt w2ck w2hh w2cdq w3bmc w3dh w3ajd w3jr w3lg w3vm w4ft w4aef w8adm w8kr w8aed w8lox w8sh w8amh w1eaw w1eek w1bsm w1b w1vw w1bus w1bft w1az w1bds w1bln w1dq w1bkc w1dp w1coz w1da w1kl py1bp py1cr py1ah py1aw py2ba py2ay py2hg lu3dh lu9dt lu8dy lu3de y1ed y1ekr y1zq z13cm z13as z14bn vk2rx vk2hc ve5aa celah pk2aj pk3bn z4m et2aa et5ay cm8uf k4aky vo8mc v77ap frear149 ve1br ve1oo velat ve2be ve2bd ve5ao

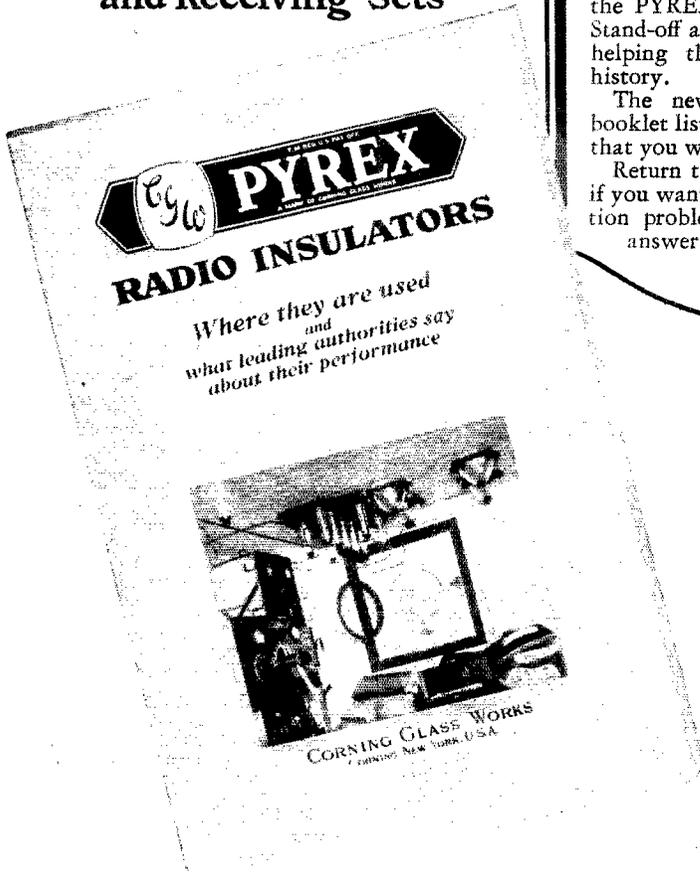
W6CHT, George Dery, American Motor Vessel Australia, Fremantle, Westralia, to Auckland, New Zealand.

7000-kc. band

w2amr w2awu w2ayj w3anh w3ant w3na w3ux w4oi w6ac

A SAFE GUIDE

in the selection of insulation for Radio Transmitting and Receiving Sets



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Corning, N. Y.

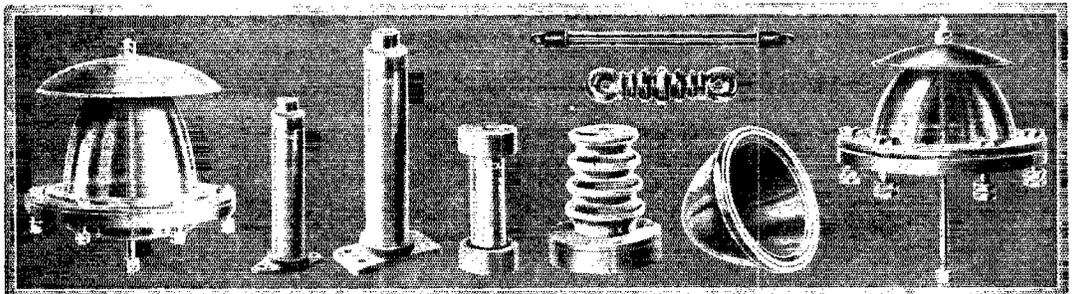
Gentlemen:

Please send me copy of your new bulletin on Radio Insulators.

Name

Address

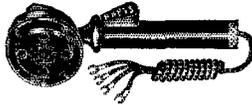
QST 11-30



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Very Sensitive
Push-switch in handle.
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Complete with 6 ft. cord.
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DUBILIER MICA CONDENSERS



.002 Mfd.
6000 volt
working.

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OUR BARGAIN BULLETIN
which contains many items at prices that
WILL SAVE YOU MONEY
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MONEY RETURNED IF NOT SATISFIED
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(Street or P. O. Box)

(City and State)

w6ajw w6akf w6ame w6amw w6avj w6arf w6axm w6bck
w6bdn w6bfb w6bkk w6bpo w6bqq w6bvs w6bwi w6bxi
w6bcp w6cew w6dec w6cfx w6cjk w6ctz w6ctz w6cul
w6cxi w6cxr w6cpe w6dfu w6dje w6dij w6eak w6eag
w6ebg w6ecc w6efv w6eic w6eif w6ekc w6elm w6eot w6eos
w6eql w6eji w6hm w6ky w6aj w6xjb w7aar w7acd w7ait
w7ajw w9cnd w9eve w9fxj ve4gm

VK3PR, W. R. Jardine, 264 Buckley St., Essendon W5, Victoria, Australia

7000-and 14,000-ke. band

w1aow w1aif w2ayj w3anh w4aef w4he w4qv w5bam w5ms
w5pg w5td w6adw w6am w6aov w6avq w6avq w6bx
w6bck w6bcn w6bmw w6bta w6bwi w6by w6byb w6cnx
w6cuh w6cut w6cwx w6czk w6de w6dgg w6doz w6dtd
w6eak w6ebg w6eno w6eot w6epz w6ete w6fe w7amo w7bb
w7drj w8oy w9bwt w9ctw w9cve w9cwx w9cya w9dgz
w9erm w9ext w9fs w9gdv w9go w9ghv w9gv w9ss w9um
w9yc kalel kalhe kalhr kalwj k6bhl k6bra ac1bd ac8rv
v56af oxod

Marshall Colberg, 6231 South Park Ave., Chicago, Ill.

7000- and 14,000-ke. bands

w6aaz w6abo w6ac w6ael w6acp w6ado w6adi w6aej w6afi
w6aga w6ahp w6ajm w6ak w6akf w6akt w6akw w6alw
w6am w6ame w6amu w6amw w6anv w6aoe w6apd w6api
w6aps w6aq w6aqg w6asl w6ase w6ati w6atu w6avj w6awd
w6awg w6awp w6awy w6ax w6axe w6axm w6ay w6ayo
w6ayi w6azy w6bam w6bau w6bar w6bb w6bbm w6bej
w6bck w6bco w6bdd w6bfb w6bfg w6bh w6bjf w6bjl
w6bkx w6blx w6bml w6bnu w6bny w6bod w6bpg w6bpm
w6bqk w6bqp w6brs w6brv w6bsn w6bsu w6btf w6bti
w6bto w6btz w6buw w6by w6byb w6byv w6byz w6bzd
w6bze w6bzi w6bzv w6car w6cbp w6cbw w6ceo w6cf w6cgl
w6cgy w6cju w6chw w6cio w6cjh w6cii w6cim w6cix
w6cks w6cln w6cls w6cnx w6cot w6cpm w6cqs w6cqs
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w6dhw w6djp w6djw w6dli w6dln w6dmk w6dms w6dns
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w7um w7uz w7wr w7zab axl ceah ce2ab ce3ag ce3bf ce3ch
ce3aa cm2jt cm8uf cm8yb cr4ad ct1aa ct1bx ct1by ct2ac
f8mrk fnt g5by helfg helic k4aan k4akv k4dk k4kd k6ewb
kfu5 lu4a nj2pa oa4j pxr pylaa pylah pylaw pylca pylcm
qq1a rx1aa ve1al ve1ap ve1ce ve1co ve1dr ve2aa ve2ac
ve2am ve2ay ve2bb ve2bd ve2bh ve2ca ve2ch ve2hg
ve3bq ve3cg ve3da ve3dr ve3dt ve3ec ve3hd ve3rf ve3xo
ve3xo ve4ai ve4ar ve4bq ve4bu ve4bx ve4cb ve4ck ve4cu
ve4fx ve4gu ve4hr ve4io ve4rr ve5ao x2a x29a ys1ap Za 55x

14,000-ke. phone band

w1bjd w1cei w2aog w2ayj w2el w5ql w9fbj

W3ZG, F. J. Becker, 5624 Pemberton St., Philadelphia, Pa.

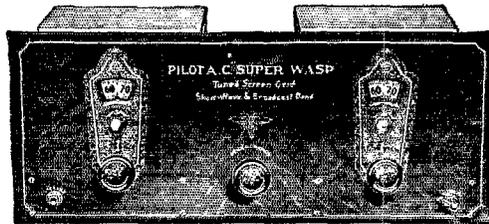
14,000-ke. band

ce2ab ce3ag cm8uf ct1bx ear37 f8ex f8wiz g2cx g2ux g5by
g6yq helfg he2jo k4kf lu8djo on4gn on4ij oz2u pylaw
py1em py2bk py2ik py7ab st2a ve4ai ve4bd ve4bx ve4ck
ve4gf ve4hu ve4ic ve4rr ve5aw vk2ro vk3pp w6alw w6bx
w6bin w6ban w6brv w6cnx w6dev w6dgn w6drb w6eug w6jn
w6ue w7dd w7fa z1as z13as z14ax z14bo f9pm rearm

NRH

says **75%** of his American Listeners
use **PILOT Super Wasp!**

NRH is
located in
Costa Rica,
Central
America



Senor Amando Cespedes Marin—Station NRH (Costa Rica, Central America) writes us that 75% of American requests for confirmation of reception of his world famous short wave broadcasting station are from Super-Wasp users.

MORE and more hard boiled "Hams" are replacing their hay wire sets with Pilot Super-Wasp. They have discovered that the Super-Wasp is "sure fire" on all its wave bands, costs less as a Kit than equivalent parts cost separately, is easy to assemble quickly and looks neater on the operator's table than the usual bread-board job.

Many licensed amateurs are discovering how readily the Super-Wasp can be converted to give full spread on the "Ham" bands. Conviction is growing among amateurs everywhere that Pilot Super-Wasp is the most flexible receiver ever offered for the "Ham's" own use, enabling him quickly to horn in on all transmissions that interest him from 14 to 500 meters.

The first receiver for short waves to have a stage of Screen-Grid TRF ahead of its detector, the Super-Wasp has been proving the soundness of its design for two whole years. Other features particularly interesting to the expert are that all parts of R. F. and Detector stage respectively are enclosed in individual shield cases on the front of the chassis, leaving the audio accessible for those with pet audio ideas.

The battery job has two straight audio transformer stages. The A.C. job has one resistance and one transformer audio stage.

It is Pilot's greatest gratification that the class of radio enthusiasts who developed short waves are turning to the Pilot Super-Wasp.

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Kit K-115: The A.C. Super-Wasp. Use your own ABC pack or Pilot K-111, specially designed for the Super-Wasp. Power Pack and Tubes extra.

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FRESHMAN type 'N' power packs. Brand new and in original cartons. Can be used to power a 210 oscillator or a 250 power amplifier. It solves that problem for getting pure d.c. power supply. D.C. output is 500 volts at 70 mills with taps at 135 and 50 volts. A.C. output is 7 1/2 center-tapped for two 210's or 250's. 2 1/2 for 225 and two 1 1/2 center-tapped windings for 220 tubes. Has a plug for the field coil of a d.c. dynamic speaker. A 281 is used as rectifier. Price, less tube, 281. **\$10.75**

DONGAN 250 watt transformer with line ballast tube. Insures absolutely steady voltage regulation. Completely mounted and shielded. Terminal lugs at top. Tube furnished free. Secondary high voltage output is 1500 volts center-tapped at 750 volts. Filament output is 15, 7 1/2, 7 1/2 center-tapped, and 2 1/2 center-tapped. Get your order in fast as there are very few left. Price, complete. **\$6.50**

KNIGHT 150 watt transformers. Ideal for a 210 power supply using half-wave rectification. High voltage is 600 volts. Filaments are two 7 1/2 center-tapped windings, 2 1/2, and 1 1/2 volts. **\$2.75**

COLUMBIA 30 henry, 200 mill chokes. A real rugged choke for heavy duty power filter supply. Mounted completely. **\$2.50**

COLUMBIA double choke. Each section is a 30 henry, 200 mill choke. Completely mounted and shielded. Price. **\$4.75**

COLUMBIA 30 henry, 120 mill choke. Fully mounted. **\$1.30**

GRID LEAKS — Wire wound and enamel coated. For all tubes up to 250 volts, 10,000 ohm. **\$95**, 5,000 ohm, **65c**.

TUBES of high quality and durability. Guaranteed to stand up. FREE 30 day replacement. Type X231, **\$1.60**; X250, **\$2.15**; X210, **\$2.05**; X224, **\$1.20**; X171-A, **\$7.70**; X280, **\$3.90**; X245, **\$1.20**.

COLUMBIA TRANSMITTING FILTER CONDENSER. Newer and better. We have been swamped with orders since these extra heavy duty condensers were offered. Insulated binding post terminals. And with a REAL replacement guarantee.

Capacity	Working Voltage	1000 d.c.	1500 d.c.	2000 d.c.
1 mfd.		\$1.50	\$3.10	\$3.95
2 mfd.		\$2.40	\$4.60	\$6.95
4 mfd.		\$3.90	\$8.95	\$11.50

COLUMBIA GRID and PLATE blocking condensers. Made with the same strict specifications as the filter condensers. You can't go wrong with these condensers in your set. They DON'T break down!

Working Voltage	.0005	.001	.002
1000 d.c.	90c	90c	90c
2000 d.c.	\$1.05	\$1.05	\$1.05

See our engineering department ad on page 91 for s.w. apparatus.

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 Orders are cash or C.O.D. All merchandise fully guaranteed.
 1038 Longwood Ave. Bronx, N. Y. C.

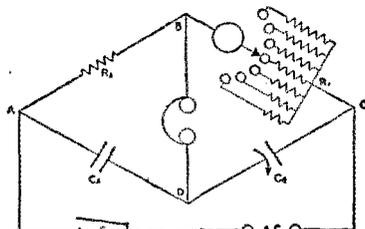
LU2CA, Angel Radaelli, Paraguay St. 2233. Buenos Aires, Republica Argentina

14,000-ke. band

ac1bd ac6ay ac8hm ac8ls ac8jk ac8ng ac9gh ar8ufm celai
 celah celak celal ce2ab ce3ca ce3ch ce3ci ce3cr ce3da
 ce3dg ce3aa ce7aa em2to cpe cplaa ct1aa ct1ae ct1by
 ct1bx ct3ab cx1fb cx1oa cx2ak cx2bt cxwlc d4abg d4vp
 d4vt d4yt ear10 ear21 ear37 ear65 ear90 ear98 eu2bg eu6ak
 f8aap f8eo f8aej f8rnf f8zh f8hr f8gy f8cp f8km f8mmp
 f8ku f8lja f8he f8pro f8fhp f8fj f8olu f8rko f8orm f8pam f8wq
 f8fb f8gi f8aja f8am f8wrg f8ho f8da f8lh f8lhg f8whg
 f8ef f8gdb f8ag f8ha f8swa f8rrr f8dm f8jo f8xe f8bha
 f8mrg f8btr f8lt f8tuni f03ar iQ8w 2ea g2od g2xv g2lz
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 g6vp g6uh g6oo g6ps g6dl g6uj g6by g6vt g6nt g6bd
 g6ta g6qb g6nx g6rd g6xo g6bj g6vj g6pa haf3ch haf3xz
 hc1fg hc2jm i1gl i1ocq i1aw i1tx i2bj i2ba i2jk i3xi i3fz
 j1gn k6avi k6cha k6eti k6bhl k6cjs k6oav k6dju k6obe
 k6rl k6aco k6erh k6bvx k1u5 la1g la1v la1y oa4h oa4j
 oa4l oa4o oa4p oa4q oa4r oa4s oa4t oa4x ob2nap ok1ab
 ok1fm ok1vp on4bt on4aj on4vu on4yu on4ro on4ia on4fp
 on4us on4rs on4bu on4hp on4hc on4ea on4gn on4ia on4fm
 on4lo on4wv on4te on4bz on4ic on4ft on4gm on4fe on4jx
 oz1d oz7z oz7t oz7bl oz7y oz7sch oz7jo oz5a oo8xs pabp7
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 z1zw z1zx z1zy z1zz

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Principles of Radio, by Keith Henney. This book is chock-full of meat for the experimenter. The subjects treated range from the fundamentals of electricity to the most modern concepts of modulation and detection. 477 pp., 306 illustrations \$3.50

Elements of Radio Communication, by Prof. J. H. Morecroft. This is a new book by the author of the "Principles" listed below. It is about half the size of the larger work, and the subject is treated in more elementary fashion. Simple algebra is sufficient. An excellent book for the "first-year" student. 269 pp., 170 illustrations \$3.00

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**Northwestern Division
Convention**

ATTENDING Northwestern Division Conventions is a new experience for this particular member of the Headquarters staff but if all the rest are as good as the one held this year on Aug. 29th-30th at the Dessert Hotel in Spokane he not only hopes he'll get in on future affairs but regrets he missed the past ones.

Registration occupied Friday morning, with President Baird, of the Radio Operators' Club of Spokane, formally opening the convention on Friday afternoon. The acting mayor of Spokane welcomed the delegates, and other notables were called on for brief remarks, following which the meeting turned into a traffic discussion under the chairmanship of SCM Piety — and an excellent job he did of it, too. At 4 p.m. everybody piled into busses for a trip to the natatorium which took up the rest of the afternoon and incidentally was a stroke of pure genius on the part of the convention committee. Suits and lockers were free, the water was just right, and the contests were interesting. (We do believe, though, that parachutes should have been provided for those hardy souls who dove off the rafters!)

Friday evening most of those present ate together informally in one of the private dining rooms of the hotel, apparently under the leadership of the firm of Gunston Gunston Gunston and Gunston. The regular evening session was taken up with talks by Assistant Secretary Budlong, from League Headquarters, Mr. Edan of the A. T. & T., Lts. Street and Pyle, of the Naval Reserve, Mr. Prince (rectifiers and filters) and a final technical session featuring Prof. Woodruff, visiting director from the Atlantic Division, who held the gang until after midnight with his remarks and demonstrations on r.f. chokes, TNT transmitters, etc.

Saturday morning there were trips to KFPY and KHQ. Certain well-remembered "voice DX" between the studio and the Hotel Ridpath featured the KFPY visit! Following a short session in the early afternoon, there was another bus trip to the aviation field, where Lt. Holter, of the local National Guard Squadron demonstrated ship-ground communication and then went aloft to give everybody a chance to guess his plane's height and thus win a free ride. W7AHV won by coming within *ten feet* of the correct height of 3300 feet.

At a Northwestern Division Convention the banquet really is the principal feature. Our first impression, on getting seated, was the R9 appearance of the waitresses and the many YL's. Following the banquet proper, President Baird introduced Director Weingarten, who acted as toastmaster, and called for remarks from Senator C. C. Dill, Supervisor Lovejoy, Prof. Woodruff, Mr. Budlong, Mr. Waskey, Lt. Holter and others. To list all those who spoke would be to list the convention register of 84, for the banquet was delightfully informal and before it was over

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everybody got a chance to say something! We must not forget to mention "Prince Dingbar Sub Pasha," however, nor the impassioned speeches by Messrs. Gunston (the other one, this time) and Iversen for the candidacy of Hashinura Togo (?) for division director.

President Baird, Secretary Moon, Mr. Sturtevant (chairman of the program committee) and their associates of the Radio Operators' Club of Spokane deserve hearty commendation for an extremely successful and most enjoyable convention. The gang at Tacoma have a high mark to shoot at when they put on the Northwestern Division Convention at that city next year.

— A. L. B.

New England Division Convention

(Continued from page 18)

spot "in between times" during the two days of the convention.

With a good number of delegates registered and luncheon over, the gang adjourned to the Chamber of Commerce Building early in the afternoon for the formal opening of the convention. Mr. Perry T. Johnson, WIUS, President of the P. A. W. A., gave the address of welcome, and made every one feel at home. He then introduced Mr. E. L. Battey, Assistant Communications Manager, A.R.R.L., who gave a traffic talk. SCM Brown, WIAQL, was present, and on a suggestion of Fred Best, WIBIG, discussed the possibilities of a Maine traffic net. WIANH, Route Manager, showed his scholastic training by drawing a free-hand map of Maine on the blackboard for the use of the SCM. (We could even determine that it was Maine, and not Utah. — E. L. B.)

After the traffic problems had been somewhat ironed out and plans made for the coming season, the A. C. M. displayed a Dynatron Frequency Meter, which he had brought up from Headquarters. Mr. L. C. Brown, WIAQD, who was scheduled for a technical talk was unable to attend, and while the committee was pondering as to whom they would get to fill in, Mr. Reginald Sherman, WIBJL, came forward and "saved the day" with a very interesting talk on screen-grid detectors. The remainder of the first afternoon was spent in hamfesting and getting acquainted, and it was not until about 7 p.m. that the bunch got together again at the Chamber of Commerce for the contests, stunts, movies, etc. These were enjoyed by all hands, and everybody had an enjoyable evening. It was "past bedtime" when the gang dispersed to spend the remainder of the night as they saw fit — some actually "hit the hay."

The weather was quite poor Saturday — in fact it rained practically all day. But that didn't lessen the enthusiasm of the delegates "one iota." The visits to WCSH and the Telephone Company, which occupied most of the morning, were interesting to all.

Following a luncheon recess, the fellows again assembled at the Chamber of Commerce for the

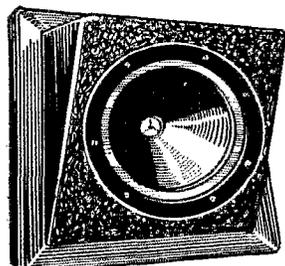
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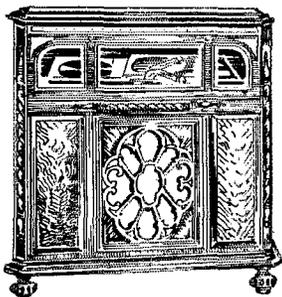
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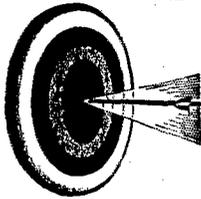
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afternoon technical lectures. Mr. Weston A. Gray of the New England T. & T. Co., the first speaker, delivered an instructive talk on the High Frequency Trans-Atlantic Phone Service. The Army-Amateur, and the U. S. N. R. meetings followed Mr. Gray's talk, and were conducted under the direction of Major J. G. Platt, Liaison Officer, First Corps Area, U. S. Army, and Lt. Paul G. Haas, U. S. N., District Communication Officer, First Naval District, respectively. Mr. F. W. Pratt of the R. C. A. Institutes, Boston, explained and answered questions on Sound Projection.

The gang left the C. of C. having absorbed quite a wealth of information from the very fine lectures, and spent the time before the banquet in talking over what they had learned, and hamfesting in general. At about 7 p.m. everyone gathered in the Sunrise Room at the Eastland for the biggest part of any convention — the banquet. The hall was very attractively decorated with every sign of festivity. Balloons were fastened at each table. Every one had some sort of favor and noise maker, and the result was a lively and joyous banquet. A picture was taken of the gang seated in the Banquet Hall. Director Best assumed his place as toastmaster and introduced the following speakers: Radio Supervisor C. C. Kolster; Lt. Paul G. Haas; Major J. G. Platt; F. W. Pratt; E. L. Battey; William L. Foss, Chief Engineer WCSH, and Mr. Thurston of the Cumberland County Power and Light Company. Following the addresses Lieutenant Haas presented the Lee cup to Section 4, U. S. N. R. in charge of L. C. Brown, WIAQD, for the most outstanding Naval Reserve work throughout the past year. Representatives from the 1st, 2nd, 3d, 5th, 8th and 9th districts stood up as the districts were polled. Auburn made the only bid for next year's convention, and was unanimously chosen as the site for the 1931 affair.

When the formal part of the banquet was over, that part of the convention program which Director Best termed "the real interesting part" took place — the prize distribution. Several interesting "swaps" took place, too. (We refer you to WIAJC for more dope on this. — E. L. B.)

A special ladies program was carried out on both days of the convention so that the XYLS and YLs were cared for during the technical discussions, which meant nothing to them. The State Theater very kindly furnished free tickets to the "lady delegates."

The convention was brought to a close with "three cheers" for the work of the Convention Committee, and everybody hoped to get together again at Auburn next year.

— E. L. B.

W5ZG—W5VY

(Continued from page 50)

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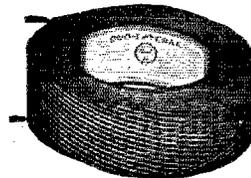
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is a Grebe CR-8 connected to the Grebe type RORK two-stage amplifier. This is a receiver familiar to most of the men who have been in the game for any length of time and needs no comment.

Both of these receiving sets are supplied by a home-made "B" eliminator using a Raytheon type "BH" tube. The "B" power supply is mounted behind the power board to the right of the main transmitter. The two knobs immediately below the D.P.D.T. switch, left and right, control the detector and amplifier voltages respectively. Immediately above the main line switch and below the detector and amplifier voltage controls is a six-pole double-throw switch which permits operation of the receiving sets from either the eliminator already mentioned or from a set of batteries located behind the power panel.

The results with the present transmitter have been more than gratifying, reports having been received from Europe, Asia, Australia, Hawaii, Panama and the Philippines in the nine months it has been on the air. W5ZG is not content to sit back and consider the job finished, however, because plans are now under way to install another power amplifier stage in the transmitter using a pair of Type '04-A tubes, and changes in the receiving equipment are also contemplated. Nevertheless it's a good outfit and one which any ham might be proud to own just as it stands.

Volume Level Indicators

(Continued from page 36)

it is 7 or 8, the grid bias control is varied until it returns to 5. Now the grid bias should be checked to see if it differs greatly from 1.1 volts; if so, the characteristics of the triode have changed, and it should either be replaced by one of similar characteristics, or the volume indicator should be recalibrated. The characteristics of some tubes are unsteady and abnormal at first but after "warming up" will become normal.

After initial conditions are fairly well duplicated, the volume indicator is ready for use at any later time.

The needle of the plate circuit meter will now swing with the amplitude of the audio frequency current when the microphone is spoken into. The gain control should be adjusted to that value which will allow the needle to swing into the high amplitude region (between 50 and 60 in our example) about once every ten seconds. Under these conditions, maximum possible percentage of modulation will be produced without ever introducing distortion. However, the needle must never be allowed to swing beyond the reading representing the maximum permissible volume level.

There is evidently nothing strange or complex about the volume level indicator. It is merely a means of indicating visually the instantaneous volume level, utilizing principles well known to

QST Oscillating Crystals

"THE STANDARD OF COMPARISON"

AMATEUR BANDS:

Winter is coming, and no doubt you are going over your transmitter removing those weak links so as to get the most possible efficiency from your set.

One item of great importance is the *frequency stability* of your set. Does it *stay on one frequency*? If not, our *power crystals* will solve that problem. **SCIENTIFIC RADIO SERVICE** crystals are *known* to be the best obtainable, having **ONE** single frequency and highest output. With each crystal is furnished an accurate calibration guaranteed to *better than a tenth of 1%*. *New prices for grinding power crystals in the amateur bands* are as follows:

1715 to 2000 Kc band.....	\$15.00 (unmounted)
3500 to 4000 Kc band.....	\$20.00 (unmounted)
7000 to 7300 Kc band.....	\$40.00 (unmounted)

BROADCAST BAND:

Power crystals ground in the 550-1500 Kc band accurate to plus or minus 500 cycles of your specified frequency fully mounted for \$55.00. In ordering please specify type tube, plate voltage and operating

temperature. All crystals absolutely guaranteed regards to output and frequency and delivery can be made within two days after receipt of your order.

CONSTANT TEMPERATURE HEATER UNITS:

We can supply heater units guaranteed to keep the temperature of the crystals constant to *better* than a tenth of 1 degree centigrade for \$300.00. Two matched crystals, ground to your assigned frequency in the 550-1500 Kc band with the heater unit complete \$410.00. More detailed description of this unit sent upon request.

ATTENTION AIRCRAFT AND COMMERCIAL RADIO CORPORATIONS:

We invite your inquiries regards your crystal needs for Radio use. We will be glad to quote special prices for **POWER** crystals in quantity lots. We have been grinding *power crystals* for over *seven years*, being *pioneers* in this specialized field, we feel we can be of real service to you. We can grind *power crystals* to your specified frequency accurate to plus or minus .03%. All crystals guaranteed and prompt deliveries can be made. A *trial will convince you*.

SCIENTIFIC RADIO SERVICE

"THE CRYSTAL SPECIALISTS"

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Standard for 20 years. Lists from \$3 to \$5. We just bought a big quantity. Better get them while they last at these special prices.



No. 101..... 95c

No. 103..... \$1.75

No. 244..... 1.75



No. 101



No. 103



MESCO

Half Inch Spark Coil

The coil of a 101 uses. Can be used as a peaked choke. For fixed condensers, etc. Many other uses will suggest themselves to the experimenter.

Reg. \$7. Special **\$1.50**

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 Manufacturer's Export Managers
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POWERTYPE crystals are recognized as the best.

No off frequency operation with
POWERTYPE CRYSTALS

FULLY GUARANTEED BY A RELIABLE COMPANY

Ground by experts and calibrated from precision standards. Crystals for amateurs ground to approximate frequency and calibrated to better than 1/10 of 1%.

1715-2000 kilocycle band	\$10.00
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One inch oscillating blanks	4.00
Plug-in dust proof mounting as illustrated above.....	6.00

550-1500 kilocycle band — calibrated at any temperature plus or minus 500 cycles desired frequency complete with plug-in dust proof mounting — \$45.00. Constant temperature heater oven less crystals \$150.00. We do any kind of special crystal grinding for any frequency.

Grinding instructions furnished with crystal blanks.

You may order direct from this ad C.O.D.

FREE Send name, no obligation, for full information on crystals, holders, blanks, heater ovens, etc.

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1101 Huron Building Kansas City, Kansas

Specialists in frequency precision

all of us. Despite its simplicity, a volume level indicator in conjunction with a Modulometer and a few meters will take all the guess out of amateur radiotelephone operation.

The Vanalta Division Convention

(Continued from page 30)

Following the toast to His Majesty King George V, Mr. John Lawrence, VE5CO, president of the V.S.W.C., introduced Mr. Butterfield, VE5AP, as toastmaster. The speakers were led by Mr. Huber, of the A.R.R.L., in an explanation of why the radio amateur has problems, describing how well the League is prepared for meeting them at present, and making a plea for sober reflection by all on the dignity our hobby has reached and the need for a continuation of its present high status and good leadership. Mr. J. F. Wilson then welcomed all visitors and proposed a toast which was answered by King Cavalsky of Vancouver. The remainder of the evening was spent in conducting liars' and beauty (the latter being won by Mr. Leonard de Geus, W6BTZ, with a full beard) contests, and awarding of prizes.

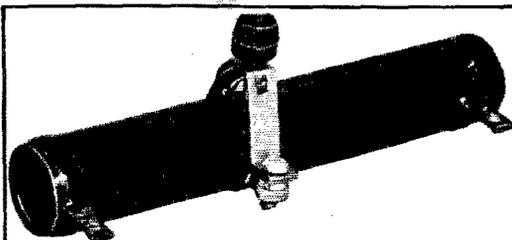
Sunday's activities began at 9:30 a.m. with visits to the government radio station, VAK, on Gonzales Hill, and to H. M. C. S. Naden, the Royal Canadian Naval Barracks at Esquimalt, where the unique privilege of inspecting CKN was afforded kindly by Chief Operator Fox. In the afternoon a caravan of amateur-laden autos wound through the picturesque countryside of southern Vancouver Island to the famous Mr. Butchart's sunken gardens. In the evening a visit was made to radio broadcasting studios of CFCT. The Cleveland Air Race film was shown at 8 p.m., and later, after more contests and more prizes — thanks to the generous manufacturers — the "gang" set out for home not only with the satisfaction of having attended a thoroughly enjoyable outing, but with the knowledge that the *Times* reporter (who had attended every session) had been converted from a BCL into an amateur!

In the mind of the writer the Vanalta Division Convention of 1930 will remain long as the most enjoyable affair he has attended. There are certain advantages in a Canadian convention, not the least one being the fresh viewpoint a Yankee inevitably acquires. We have a great deal to learn from our neighbors next door, and from this consideration the question naturally arises: "Why don't we hold more conventions in Canada?"

— L. R. H.

Strays

A. R. R. L. members using League stationery frequently fail to realize that no address of any sort is printed on the letterheads. Your complete address is a very essential part of the letter — station calls are not sufficient. This is particularly important when ordering apparatus from QST advertisers. The omission of a complete address works to your disadvantage and causes needless correspondence.



The "Burbank" Idea in Slide Resistors!

WE HAVE taken the best points of the slide resistor — and "grafted-on" the best points of the vitreous enameled resistor. The result is a new product, one for which there is a genuine need and one which engineers have been quick to adopt. The HH Enameled Slide Resistor is carefully wound on a refractory tube; then coated with a hard, highly insulating and heat resistant vitreous enamel. An exposed track on one side contacts with an adjustable shoe — one of three optional types. The wire, firmly embedded in the enamel, can be neither moved nor torn. This improved unit now gives you convenience, flexibility, ruggedness and high wattage — all in one. Detailed information will be sent promptly on request.

ENAMELED HSLIDE RESISTORS

HARDWICK, HINDLE, INC.

218 Emmet St. Newark, N. J.

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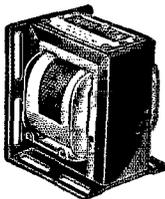
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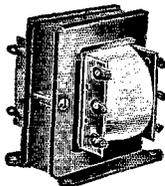
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REPAIRS

50 watt Thoriated type.....	\$19.00
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WE211.....	15.00
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*All work guaranteed against defects
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Midwest Division Convention

THE Midwest Division Convention held under the auspices of the Kaw Valley Radio Club on September 6th-7th at Topeka, Kans., was another one of those affairs which makes a fellow wish he'd started the habit of going to that particular section of the country long before this. It also demonstrated the promising possibilities of Saturday-Sunday conventions; other convention committees may well consider this, since it is undoubtedly easier for many fellows to get to a convention which begins on Saturday than one which starts on Friday.

The convention's sessions were held in the rooms of the Topeka Chamber of Commerce, with plenty of technical dope being given by a list of speakers including R. G. McCurdy, of the Graybar Electric Co., who used up all the loose ciphers in Topeka in telling of the total amplification which took place over the transatlantic 'phone circuit; P. H. (Port) Quinby, W9DXY, former director from the Division; A. W. Hodge, W9CFL-NDP and F. H. Smith, who spoke on crystal control, and "Jim" McCormick, W9BHR, who presented his latest frequency meter.

The non-technical discussions included a talk on League affairs by the assistant secretary of the League, A. L. Budlong; a discussion of the Army-Amateur network by Lt.-Col. W. F. McFarland, W9EVT, the assistant adjutant general of Kansas; and an explanation of the Volunteer Naval Communications Reserve by Lt.-Cmdr. R. H. G. Mathews, who, as usual, showed up from Chicago with a corps of examining officials and doctors and ran through about a dozen recruits. We must not omit, either, the popular editor of "Grandpa's Regret," H. W. Kerr, W9DZW-GP, who came down from Little Sioux, Ia.

Twelve of thirteen candidates for amateur licenses were successful, and H. T. Gallaher, the "R. I." from Chicago, announced that one of them secured an extra-first ticket.

Not content with one banquet, the K.V.R.C. provided two at Topeka. The first, held Saturday night prior to an evening visit to W1BW, was provided through the kindness of the Capper Publications. The second, which was the formal convention banquet, was held Sunday afternoon at the Hotel Jayhawk and was followed by contests and prize awards which kept the 90-odd amateurs in good humor for most of the afternoon. A huge number of prizes was distributed through the kindness of various manufacturers, with Leo W. Born, W9FTY, capturing the main one by popular vote, the prize being a \$200 ten-months' scholarship offered by one of the leading radio schools.

President John Amis, Secretary Frank Tiffany and other members of the Kaw Valley Radio Club are to be congratulated for a highly successful and interesting convention; it is safe to say that all those who attended this year will look forward to the announcement of next year's Topeka gathering.

— F. K. T. + A. L. B.

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Great

*Easy-Working
Genuine Martin No. 6*

New

VIBROPLEX

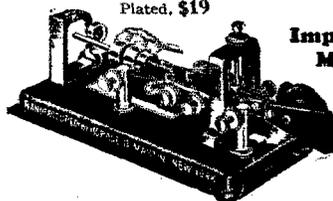
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The smoothest, easiest-working bug on the market. Easy to learn. Easy to operate. Make a sending easy.



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Black or Colored, \$17. Nickel-Plated, \$19



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1. The Vitrohm Plaque Resistor, non-inductive and non-capacitative, is ready. Standard resistance value 5000 ohms, handles the grid of a 50 watt and the price is only \$2.00. Get the dope today.

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1. new!
2. free!
3. ??????!

3. We have a very important matter to discuss with Radio Club Secretaries. Write at once giving the name of your organization and number of members.

Club Members — if your secretary misses this, tell him to drop us a line.

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Wide World
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 1 1/2" plug-in forms, 44 grooves to the inch, either UX or UV prongs, for that new tuner, only 49c
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HOT CATHODE MERCURY VAPOR TUBES—with low and practically constant voltage drop.

For pure D.C. power supply.

Perryman Rectifiers P. R. 872 (illustrated) and P. R. 866 are extremely popular with transmitting amateurs everywhere. Extra long life due to rugged construction, low operating temperature of oxide coated filament and low voltage drop.



P. R. 872
 Fil. Volts, 5
 Peak Amps, 10
 Peak Inverse Volts, 10
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 Voltage Drop, 1.5
 Overall Length, 8 1/2
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 Price, \$13.00

Send me..... P. R. 872 at \$13 each
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 (Write name, address and station clearly on margin)

Attractive prices offered to licensed amateurs
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Strays

NAA is now broadcasting cosmic data collected by Science Service, Inc., in cooperation with the American Section of the International Scientific Radio Union, at 4:00 p.m., E.S.T., daily. The frequency is 16,060 kc. Transmissions, which are in a special code, include information on terrestrial magnetism, solar constant, sunspots and auroral displays. Plain English will be used when extraordinary phenomena demand it. Information on terrestrial electricity, radio phenomena and solar activity will be added if a demand arises.

The gang at WHEC got this one from a helpful BCL the other day: "Before blaming the tubes in your radio try changing the fuses on the circuit leading to your receiver. The fuses may not be shot but too weak to carry reception." When the line voltage is low don't call up the power company — put in bigger fuses!

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, OF QST, published monthly at Hartford, Conn., for October 1, 1930.

State of Connecticut }
 County of Hartford } ss:

Before me, a Notary Public in and for the State and county aforesaid, personally appeared K. B. Warner, who, having been duly sworn according to law, depose and says that he is the business manager of QST and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, The American Radio Relay League, Inc., Hartford, Conn.; Editor, Kenneth B. Warner, Hartford, Conn.; Managing Editor, Clark C. Rodimon, Hartford, Conn.; Business Manager, Kenneth B. Warner, Hartford, Conn.

2. That the owners are: (Give names and addresses of the individual owners, or if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent. or more of the total amount of stock). The American Radio Relay League, Inc., an association without capital stock, incorporated under the laws of the State of Connecticut. President, Hiram Percy Maxim, Hartford, Conn.; Vice-President, Chas. H. Stewart, St. David's, Pa.; Treasurer, A. A. Hebert, Hartford, Conn.; Communications Manager, F. E. Handy, Hartford, Conn.; Secretary, K. B. Warner, Hartford, Conn.

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

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear on the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements, embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association or corporation has any interest direct, or indirect in the said stock, bonds, or other securities, than as so stated by him.

5. That the average number of copies of each issue of this publication, sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is..... (This information is required from daily publications only.)

K. B. WARNER
 Sworn to and subscribed before me this 1st day of October, 1930.

Alice V. Scanlan,
 (My commission expires February, 1934.)

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The MM-1 monitor has the same micro vernier and aluminum case. It is complete with batteries, S.93 tube, and coils for the 20, 40 and 80 meter bands. An instrument that every up-to-date progressive amateur station should have. Price complete, not calibrated \$12.50. Price, calibrated with graphs, \$16.00.

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PLATE power for your set, the very heart of its performance. For quietness, DX ability, life-long permanence, absolute dependability, lowest ultimate cost, no other plate source even approaches the achievement of an Edison steel alkaline storage B battery. Built painstakingly; every joint pure nickel, upset electrically welded. Genuine Edison Electrolyte. Our list describes complete batteries, construction parts, enameled aerial wire, silicon steel. Available immediately, filament and plate transformers for the new 872 rectifier, complete plate power units. Rectifier Engineering Service, radio W8ML, 4837 Rockwood Road, Cleveland, Ohio.

THE finest in radio for amateur, broadcast and marine. The most modern short-wave receivers. Four to ten tube designs. Radiophone CW transmitters of any power or type. We make a complete line of apparatus, including speech amplifiers, filter coils, inductances, power units, etc. Any special apparatus, designs, built to order, using your parts if desired. Prices on request. New bulletin lists complete line of apparatus. Write for copy. Ensell Radio Laboratory, 1527 Grandview St., S. E., Warren, Ohio.

CRYSTALS with a guarantee of complete satisfaction. 7000 kc., \$15; 3500 kc., \$12; blanks, \$4. W9DRD, Herbert Hollister, Edwardsville, Kans.

LEARN Wireless (Radio) Morse telegraph. School, oldest and largest; endorsed by telegraph, radio, railway and government officials. Expenses low — can earn part. Catalog free. Dodge's Institute, 7 Wood St., Valparaiso, Ind.

AMATEURS — experimenters, builders. We serve over 4000 I.R.E., A.R.R.L., etc., experimenters and "nuts." Full discounts. \$50,000 stock approved parts — no sets. Over four pounds catalog, circuits, data, prepaid, 50¢. Weekly bulletins (new items, results of experiments, etc.). 20 weeks \$1. Sample experimenters' "Over the Soldering Iron" magazine, 25¢. Transmitting data, price list, etc., 25¢. Kladag Radio Laboratories, established 1920, Kent, Ohio.

G.E. 1000-watt transformers, 1100-2200-4400 each side center tap. Used by Cornell, Navy and 300 hams. Guaranteed unconditionally. \$12. F.O.B. Write for other sizes and voltages. Detroit, Fred G. Dawson, 5740 Woodrow, Detroit, Mich.

VICTOR latest model condenser blocks. Dubilier made 600 volt, \$1; unmounted, 15¢ each mid. Victor 1000 volt 4 mid. \$1.50, 2 mid. \$1. Victor No. 997 amplifiers, \$25. Radio Specialty Co., 1903 N. 18th St., Philadelphia, Pa.

WESTERN Electric 211E tubes, perfect, \$12. R. C. A. 104 speaker, \$25. Goldberg, 1903 N. 18th St., Philadelphia, Pa.

A.R.R.L. sweater emblems should be worn by all League members. They are yellow and black 5" x 8" diamond, felt letters and embroidered symbol. Only \$1.00. Money order or currency only accepted. Eric Ro inson, 135 Jefferson Road, Webster Groves, Mo.

W8CUX for QSLs. Nuff sed.

SELL — National, 00023-00015, WE211D minus base, two Mooreheads, Thordarson 150W filament, rec. 2 step parts, back issues Radio Broadcast and Popular Radio, May 1922, May 1925. 50 watt socket, Frost hand mike. What'll you give? WIAHT

WANT used motor generator that would step up voltage of a 32V home plant, d.c. to 800-1000V. M. P. Bollesen, Plainview, Nebraska, Route 3.

FOR sale — 3 tube Crosley acc. \$5. Remler Infradyne amplifier \$5. Write for list. Robert Hayler, 715 S. 2nd Ave., W., Newton, Iowa.

TRADE station photographs. Send to W6ERK.

SELL — 15W tone station complete. Bargain. Write W9GBD, Milford, Nebraska for description, DX record, etc.

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TRADE crystals. Your specified frequency and cut. What have you? Want 203As and meters. W6EKS, 1944 Line Ave., Long Beach, Calif.

TRADE — Buescher C melody saxophone like new for transmitter equipment. Also xtal for trade. All inquiries answered. W8CJZ, Route Five, Coldwater, Michigan.

SELL — new Weston, model 507 Thermo-ammeter, 1 1/2 amp scale, \$8. W9FJZ, Box 162, Faith, S. Dak.

SPRAGUE 3 mike condensers, \$2.50, portable ohmmeters (measures unknown resistance), \$6.10. Ed. Keers, 117 Scribner, Johnst, Ill.

NO. 14 solid aluminum wire for rectifiers. Hatry & Young, Hartford, Conn.

THE model 186-R eight tube shortwave receiver, blue prints and data for this, "The Finest in Short Wave Receivers," \$3.50. Write for circular. Ensell Radio Laboratory, 1527 Grandview St., S. E., Warren, Ohio.

SPARE sets, tubes, transformer, choke, Aero transmitting coils, dynamotor, radio course, typewriter, etc. Describe you needs. W8BJO, Dundee, N. Y.

FACTORY machined special sockets for WE212D tubes, \$3. Cash with order. John Matthews, Newton, Iowa.

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NAVY standard receivers, guaranteed. Dubilier condensers. 904 voltage 12500, spark gap units, all sizes. Mariners Radio Service, 38 Park Place, New York City.

WANTED — SE1420-1P501 receivers. Paul Trautwein, 38 Park Place, New York City.

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RECTOBULBS R3 \$10; R81 \$5.25; N65 \$12.50; Power Xtals \$12; Super-Wasp DC \$23.40, AC \$33.40; Flechtheim 2 mfd. 2000 wkg V. conds. \$9.75; Tobe \$11.70; Jewellmeiers MA or volt \$5.50; R. F. \$9.90; 199 Set Analyzer \$69; Leach relay \$9 and \$6.75; Sangamo .002 5000 V. conds. \$1.40. Any other apparatus — Henry's Radio Shop, Butler, Mo.

CONDENSERS 10 mfd. tested at 1000 V., working voltage 600, \$1.75 each. W9ARA, Butler, Mo.

SELL or trade: WE211D, 212D; RCA 852, 203-A, 204-A; power Xtal; 210 Xmitter; 500 V. MG; 800 V. MG; dynamotors; Omnigraph; other apparatus. W9ARA, Butler, Mo.

CRYSTALS: High grade oscillators anywhere in 160 or 80 Meter band, \$4.50. Crystals calibrated to .1% of your stated frequency, 1 to 4 m.c. \$9.00. High Precision 100 Kc. bars \$9.00 Colman & Billey, W8GU, 34 West 8th St., Erie, Pa.

FILTER chokes — new, 15 Henrys, 220 mills, \$1.50. W8DAJ, Robert Thompson, Bay City, Michigan.

WANTED — complete fifty watt transmitter and receiver to buy on installment plan. Good references furnished. Joe Brooks, Mangum, Okla.

CONDENSERS. Non-inductive. Insulation resistance 600 to 2000 Megohms per mfd. 8 mfd. Packs tapped at 1-1-2-4 mfd. 1 mfd. sections tested at 2500 volts; rated working voltage 1000 dc. 2 and 4 mfd. tested at 1500 volts; rated working voltage 750 dc. Flexible leads. Local "Hams" taking advantage of this rare bargain so hurry! 8 mfd. Block sent prepaid upon receipt of \$3.25. Send \$4.50 if you desire Block in can with terminals. John Winter, 151 Madeline Ave., Clifton, N. J.

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TRADE — one 8 x 5 printing press, type, trays, accessories, for transmitter. Write for particulars, L. A. Jewell, R. F. D. No. 4, Cumberland, Md.

QSLs, 100 two color \$1. Samples. W9CKA, Corwith, Iowa.

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WANTED — parts or complete 75 watter. F. E. Norwine, 6601 Clayton Rd., Clayton, Mo.

NEW amateur transmitter coming. Write for bulletin on power transformers, double modulation chokes, filter chokes and transmitter and receiver kits. Pontiac Engineering Co., 1100 Ave. I, Brooklyn, N. Y.

500 Electrical Experimenters, QSTs, Radio News, \$3. volume. Schindler, 116 Rebecca, Scranton, Penna.

SELL — DeForest 250 watter \$22.50, 212D \$32.50, new RCA 211s, \$19.50, new 211Ds, \$15. Guaranteed. W9FME, Kingman, Kansas.

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HAM Christmas cards, QSLs, stationery, etc. Hillcrest, Cranesville, Pa.

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W2CJY — George Rullfs, Jr., 166-37 89th Ave., Jamaica, N. Y.

W2CMW — William James Petit, 1322 Morris Ave., Bronx, N. Y. C.

W2VY — George W. E. Shields, 2574 Bedford Ave., Brooklyn, N. Y.

W5BQW — W. O. Beasley, P. O. Box 110, Muskogee, Oklahoma.

PY1BA — Tenente Adalberto Coelho da Silva, R. João Felipe, 19-Meyer-Rio de Janeiro, Brasil.

V1YB — Thomas A. Archer, Verona, Bank-Hall Road, Barbados, B. W. I.

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W1CEI J. J. Lamb "jim."

W1DF Geo. Grammer "hg."

W1EH K. B. Warner "kb."

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Thanks

For Your Convenience

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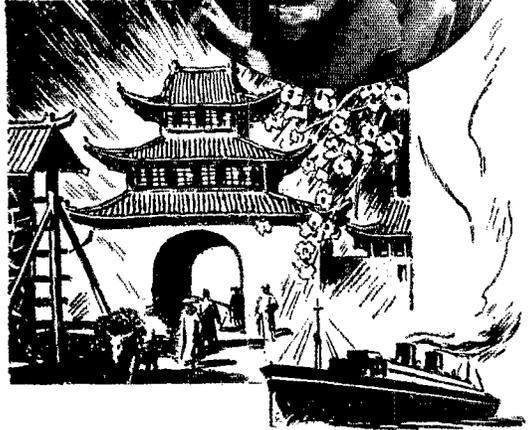
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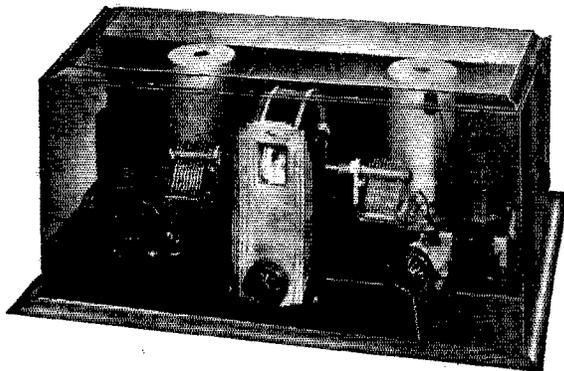
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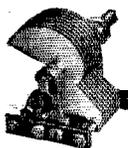


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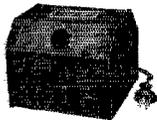
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A MECHANICALLY and electrically stable true A. C. High-Frequency Traffic-Tuner and Receiver for amateur use. Will work with different sorts of antennas without readjustment except of antenna trimmer. Once trimmer is set, Thrill-Box tunes and logs with true single control. Extremely simple to operate. 1080 dial degrees available between 21.2 m.c. and 2.61 m.c. Easily adapted to still wider spreading of bands, if desired. Works down to 33 m.c. Very smooth sensitivity control, no grunting, no back-lash, or clicking on higher frequencies. No hand capacity. DOUBLE SCREEN GRID, with 224 grid-leak detection. Push-pull audio, with special phone-jack before the last stage.

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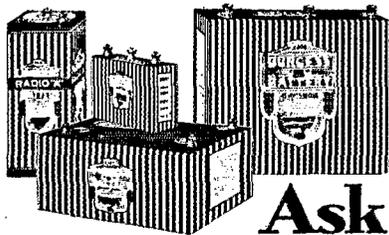
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MADISON,

WISCONSIN

The Communications Department

F. E. Handy, Communications Manager
 E. L. Battley, Asst. Coms. Mgr.
 1711 Park St., Hartford, Conn.



New O.R.S. Certificate Issue Ready

OFFICIAL Relay Station certificates will be pleased to know that the new certificates of appointment are ready. The O.R.S. "tickets" have been completely redesigned and improved. A smaller, neater, certificate will be issued to future O.R.S. and re-issued to every present appointee who makes application, providing he has honestly lived up to the terms of his appointment and will continue active in operating work this season. The new certificates will be distributed during the month of November from the offices of every Section Communications Manager.¹

Present O.R.S. certificates will automatically become null and void at midnight November, 15th. Appointees have been notified by mail approximately one month in advance of this date to give them plenty of time to make application to Section Managers to determine if they are in line to receive one of the new certificates which will be issued beginning November first.

Communications Department field organization has been altered. The new certificate is similar to the photograph reproduced herewith in general make-up. However, a magazine reproduction in black-and-white can hardly do justice to these blue bordered lithographed certificates printed on finest quality stock. Needless to say, the new "ticker" is very attractive. The new size will make the certificates easier to handle and to mount in a uniform arrangement with other station licenses and diplomas which are posted to show visitors and inspectors what is what about a radio station.

As may be noted from the text of the certificate, appointments in the future will be good for *one year only* from the date they leave the office of the Section Manager. In this respect they are somewhat similar to the familiar station licenses issued by the F.R.C. However, it is only necessary to return certificates at the end of a year to the duly-elected Section Manager. The appointment may be continued for



THE NEW OFFICIAL RELAY STATION CERTIFICATE

Now ready for issue through the office of the several S.C.M.s, this 8½" by 11" certificate, beautifully lithographed in blue, appoints qualified stations to the basic post in our A.R.R.L. field organization. Are you in line for one of these?

As noted above, the entire design of the document which affords evidence of appointment to the basic office of our

See page six, any recent number of *QST* for a full list of Sections, Section Communications Managers, and addresses which will reach them and to which monthly activity reports and applications for O.R.S., R.M., O.O. and O.B.S. appointment should be sent.

another one-year period by a simple endorsement of the Section Manager, and thus proper action can keep appointments in effect indefinitely, a single certificate being good for five years if endorsed annually. Of course the official records of the S.C.M. must show reports made and activity to permit the S.C.M. to conscientiously endorse a certificate

and continue it in effect. When stations transfer from one Section to another in the future, a simple endorsement by the new S.C.M. will continue appointments in effect provided the station record is certified by the Section Manager having previous jurisdiction.

A WORD ABOUT O.R.S. APPOINTMENT FOR THE UNINITIATED

To any station not in the existing Communications Department line-up at the moment a cordial invitation is extended. Find out more about this appointment from your Section Manager.² Any amateur who has a station and operator's license and who wants to "do things" with his equipment will find it fairly simple to earn an appointment if he knows the fundamentals of operating, as explained in brief in the Rules and Regulations of the Communications Department² and more fully in *The Radio Amateurs' Handbook*.

While the basic activity followed from month to month is message handling today, just as it always has been since the inception of our A.R.R.L., Official Relay Station activities cover a wider field. These stations are prepared for handling emergency communications. They cooperate with our government and different agencies in conducting experimental or operating tests of different kinds, send code practice lessons on voice and c.w. to assist beginning hams to become more proficient and raise the code speed of others, participate in relays and contests arranged by the A.R.R.L. or held in cooperation with foreign amateur societies, and the like. Section Managers, Route Managers and Official Observers are all fellows who have been through the mill—held O.R.S. appointments—and displayed especial astuteness and proficiency, winning a place in their respective fields by their interest, loyalty, and activity.

The Communications Department field organization includes men interested in every type or amateur communication work. Official Relay Stations are, as the name implies, stations that can be absolutely depended on to see a hard job through—to deliver and relay accurately and promptly the messages that come their way—to hold their equipment in readiness for whatever opportunity for service to the public or to amateur radio that may come their way, whether a special emergency or in the line of ordinary operation. To be known as an Official Relay Station appointee is very much worth while. O.R.S. are the most active and the best regulated stations as far as compliance with regulations and standard operating practices are concerned. The appointment is highly significant since it puts the station owner in a special position as respects the various opportunities for service. The appointment certificate is the badge that shows that an amateur station has "arrived" in the dependable class.

WHY HOLD O.R.S. APPOINTMENT

Are you one of those fellows who got in on the interesting communication problem worked out with the Army Air Corps last January, or are you merely a chap who read about the activities in May *QST*? Do you get the quarterly bulletins with periodic timely data direct from Headquarters, and special information at other intervals when expeditions, trans-ocean flights using radio, "Arctic Patrol" work, etc. are in the wind? Did you ever wonder just how active stations all over the country are picked for work in special and important enterprises undertaken for the credit of the whole amateur fraternity?

Perhaps the reason you never got in on any of these interesting and vital undertakings was because you were not lined up as O.R.S. Possibly there were other good reasons. At any rate it is true that when the A.R.R.L. is called upon to assist in different types of communication work we always turn to the O.R.S. records and files of information on the equipment of these stations first to pick the best men. If a scheme involves running communication or listening over a considerable section of territory (as, for example, our Arctic Patrol flight did) it is only necessary to dig up maps, our records of appointees filed by Sections, data on which stations are reporting greatest activity regularly—and invariably some O.R.S. gets the job.

Six weeks is required as the very minimum of time for printing and distributing information to every corner of the country through the medium of 50,000 *QST*s. Normally

current matters are handled through *QST* of course. But if something big or pressing comes up the C.D. field organization doesn't have to wait six weeks for its information. Amateurs who are always on the job, O.R.S., part and parcel of the organization, hear about things right away, through a C.D. letter if one or a half-dozen operators are to be called on to check-up a suspected illegal station, or by means of a bulletin letter to the key stations in one or several Sections, depending of course on the nature of the work in hand. Calls to service of this sort may come at infrequent intervals, but those stations appointed Official Relay Stations are always in line to receive such information quickly should occasion arise, as it has a number of different times in recent years.

O.R.S. are the "minute men" of amateur radio—always organized, reporting, active, and holding their stations in tip top condition ready for instant service on any communicating problem large or small! Operators of Official Relay Stations are right up to scratch, too. They "keep skeds" and handle traffic right along—get a real kick out of it. How can they help becoming proficient?

HOW TO BECOME AN O.R.S.

The first step in getting lined up as a new O.R.S. is to make application to the Section Manager in whose jurisdiction you may be located¹ and to prove your qualifications and interest. Collect and handle some traffic regularly and don't forget to report your work on time (the 16th) each month, every month. Just a postal card to the S.C.M.'s address will give him information he will be glad to use in his report for *QST*—this regardless of whether you have applied for or secured appointment.

If you can't handle at least 15 w.p.m. and have no conception of the fundamentals of operating procedure don't expect that the S.C.M. can conscientiously hand out an appointment and one of those fine certificates. He can't. But don't let that discourage you. The best things in life aren't the ones that fall right in our laps.

You will receive every encouragement. Make some schedules with the more reliable of the stations you hear and with those you find listed in *QST* as handling traffic. Tell the S.C.M. how you are getting along when you report unofficially each month. Read up on operating procedure in the Handbook and find out not only the information needed to properly fill out the questionnaire which S.C.M.s send O.R.S. applicants to consider and fill out, but really put into practice the things that you read. Before you know it you will be a full-fledged Official Relay Station appointee and be taking part in all the regular Section competitions as well as special activities.

Drop a line to your S.C.M. today and ask for application forms for O.R.S. appointment. Present appointees should get their request for continuance in at once if the matter has not already been taken up, since the first supply of the new certificates sent Section Managers was a limited quantity.

F. E. H.

O.R.S. appointees are entitled to wear the distinctive blue A.R.R.L. pins, similar to regular membership pins except that they have a blue instead of a black background.

W1MK

A.R.R.L. Headquarters' Station W1MK operates on frequencies of 3575 kc. and 7150 kc. Robert B. Parmenter, "RP," is the chief operator; his fist is familiar to most of the amateur fraternity. Occasionally other members of the Headquarters staff operate at W1MK. Their personal signs may be found in the QRA Section of *QST*.

Throughout the following schedules Eastern Standard Time will be used.

OFFICIAL AND SPECIAL BROADCASTS are sent simultaneously on 3575 kc. and 7150 kc. at the following times: 8:00 p.m., Sun., Mon., Tues., Thurs., and Fri.

10:00 p.m.: Mon. and Fri.

12:00 p.m. (midnight): Sun., Tues., and Thurs.

GENERAL OPERATION periods have been arranged to allow everyone a chance to communicate with A.R.R.L. Headquarters. These general periods have been arranged so that they usually follow an official broadcast. They are listed under the two headings of 3500 kc. and 7000 kc. to indicate whether the watch is devoted to listening on the 80-meter band or to the 40-meter band.

² Copies of the Rules and Regulations of the Communications Department contain the full text of the F.R.C. amateur regulations in addition to the condensed information on amateur operating procedure. A postal will bring you a copy free of charge.

3500 kc.

8:10 p.m. to 9:00 p.m. on Sun., Mon., Tues., Thurs., and Fri.

10:00 p.m. to 11:00 p.m. on Tues. and Thurs. (No OBC sent before these periods.)

12:00 p.m. to 1:00 a.m. (or later) on Sunday night (Monday morning).

7000 kc.

10:00 p.m. to 11:00 p.m. on Sun., Mon., and Fri.

12:00 p.m. to 1:00 a.m. on the following nights (actually on the morning of the day following): Mon., Tues., Thurs., and Fri. (Only on Tues. and Thurs. does the OBC precede these periods.)

SCHEDULES are kept with the following stations through any of which traffic will travel expeditiously to A.R.R.L. Headquarters, on 3500 kc.: W1ACH, W1BXB, W1CTI, W1ZB, W2JF, W2WK, W3AVI, W3BWT, W3CXM, W90X, NEDF; on 7000 kc.: W4SK, W60J and W9BCL.

QSL CARDS for W1MK should be addressed in care of A.R.R.L., 1711 Park Street, Hartford, Conn. A complete log of every transmission is made and W1MK is always glad to send any station worked a card, but frequently cards are lost when sent direct to the station at Brainard Field. W1MK always QSLs upon receipt of card from station worked.

ELECTION NOTICES

To all A.R.R.L. Members residing in the Sections listed below: (The list gives the Sections, closing date for receipt of nominating petitions for Section Manager, the name of the present incumbent and the date of expiration of his term of office.) This notice supersedes previous notices.

In cases where no valid nominating petitions have been received from A.R.R.L. members residing in the different Sections in response to our previous notices, the closing dates for receipt of nominating petitions are set ahead to the dates given herewith. In the absence of nominating petitions from Members of a Section, the present incumbent continues to hold his official position and carry on the work of the Section subject, of course, to the filing of proper nominating petitions and the holding of an election by ballot or as may be necessary. Petitions must be in Hartford on or before noon of the dates specified.

Due to the resignation in the Utah-Wyoming Section, nominating petitions are hereby solicited for the office of Section Communications Manager in this Section and the closing date for receipt of nominations at A.R.R.L. Headquarters is herewith specified as noon, Nov. 15, 1930. Reports from ORS in these sections should be sent to the Acting SCM listed on page 5 of QST.

*In Canadian Sections nominating petitions for Section Manager must be addressed to Canadian General Manager, Alex Heid, 169 Logan Ave., St. Lambert, Quebec. To be valid such petitions must be filed with him on or before the closing dates named.

Table with 5 columns: Section, Closing Date, Present SCM, Present Term of Office Ends. Lists various sections like Alaska, Utah-Wyoming, Vermont, Mississippi, etc.

To all A.R.R.L. Members residing in the Sections listed: 1. You are hereby notified that an election for an A.R.R.L. Section Communications Manager, for the next two-year term of office is about to be held in each of these Sections in accordance with the provisions of By-laws, 5, 6, 7, and 8.

2. The elections will take place in the different Sections immediately after the closing date for receipt of nominating petitions as given opposite the different Sections. The ballots mailed from Headquarters will list the names of all eligible candidates nominated for the position by A.R.R.L. members residing in the Sections concerned.

3. Nominating petitions from the Sections named are hereby solicited. Five or more A.R.R.L. members residing in any Section have the privilege of nominating any member of the League who holds an O.R.S. appointment in their Section as candidate for Section Manager. The following form for nomination is suggested:

(Place and date) Communications Manager, A.R.R.L. 1711 Park St., Hartford, Conn.

We, the undersigned members of the A.R.R.L. residing in the Section of the Division hereby nominate as candidate for Section Communications Manager for this Section for the next two-year term of office.

(Five or more signatures of A.R.R.L. members are required.) The candidate and five or more signers must be League members in good standing or the petition will be thrown out as invalid. The complete name, address, and station call of the candidate should be included. All such petitions must be filed at the headquarters office of the League in Hartford, Conn., by noon of the closing date given for receipt of nominating petitions. There is no limit on the number of petitions that may

be filed, but no member shall sign more than one such petition.

4. Members are urged to take initiative immediately, filing petitions for the officials for each Section listed above. This is your opportunity to put the man of your choice in office to carry on the work of the organization in your Section.

F. E. Handy, Communications Manager.

ELECTION RESULTS

A valid petition nominating a single candidate as Section Manager was filed in Kentucky and Idaho before the closing date that had been announced for receipt of such petitions. As provided by our Constitution and by-law, when but one candidate is named this candidate shall be declared elected. Accordingly, an election certificate has been mailed to the following officials:

Kentucky J. B. Wathen, III, W9BAZ Sept. 8, 1930
Mockingbird Valley, Louisville, Ky.
Idaho Oscar E. Johnson, W7AKZ Oct. 2, 1930
422 Antone St. Sandpoint, Idaho

BRASS POUNDERS' LEAGUE

Table with 5 columns: Call, Orig., Del., Rel., Total. Lists call letters and associated numbers for various stations.

All these stations appearing in the Brass Pounders' League are noted for their consistent schedule-keeping and dependable message-handling work in amateur radio. Special credit should be given to the following stations in the order listed responsible for over one hundred deliveries in the message month: KA1HR, W6ZX, W6ALX, W6QP, W6DWI, W6AGR, W9COS. Deliveries count! A total of 200 or more bona fide messages handled and counted in accordance with A.R.R.L. practice, or just 50 or more deliveries will put you in line for a place in the B.P.L. Why not make new schedules with the reliable stations you hear and take steps to handle the traffic that will qualify you for B.P.L. membership also?

Official Broadcasting Stations

CHANGES AND ADDITIONS

- W9CJQ (3700 kc.) Tues., Thurs., 7:00 p.m. C.S.T.
W1BKN (3700 kc.) Mon., Wed., Fri., Sat., 6:45 p.m. and 8 p.m.; (7200 kc.) Mon., Tues., Fri., Sat., 5:45 p.m. and 6:40 p.m.
W4AI1 (7150 kc.) Every day except Sunday, 4:00 p.m. E.S.T. (3525 kc.) Thursday 7:45 p.m.
W5ACY (7160 kc.) Tues., Thurs., 7:30 p.m. C.S.T.; Sun., 1:00 p.m. C.S.T.
W6BBJ (3850 kc.) 'phone and CW, Mon., Wed., and Fri. 10:35 p.m. P.S.T.

Wanted—Code Practice Volunteers

EVERY year at this season we devote space in this department to the listing of schedules of 1750-kc. amateur stations which broadcast information and code instruction to beginning amateurs. A new and revised

list, effective November 1st, appears elsewhere in this issue. New comers to the amateur ranks are learning to rely upon the 1750-kc. transmissions of stations sending code instruction, and during the last season many were able to bring their speed up suitably to enable them to secure licenses. The new men need code practice more than anything else, instruction in amateur operating practice, and two-way work with patient, experienced operators as soon as they secure their licenses to increase their proficiency in using their stations. Thus it is that we are calling for more volun-

Traffic Briefs

ARMISTICE DAY MESSAGE

The annual Armistice Day message from the Chief Signal Officer to Army Amateurs will be broadcast from WLM on 6990 kc. and W3CXM on 3950 kc. on Monday night, November 10th. The message will be broadcast every hour, on the hour, from 6:00 p.m. until 2:00 a.m. E.S.T. Corps Area Control Stations will rebroadcast the message.

1750-KC. CODE PRACTICE VOLUNTEERS

STATION	LOCATION	FREQUENCY	DAYS	HOURS (LOCAL TIME)	REMARKS
WIABO	Pawtucket, R. I.	1750 kc.	Sundays Wednesdays Saturdays	1-2 p.m. 7-8 p.m. 10:30 p.m. on	
W1AKY	Quincy, Mass.	1750 kc.	Fridays	7-about 10 p.m.	'Phone and CW
W1AOX	South Manchester, Conn.	1750 kc.	Tuesdays, Fridays	7:15 p.m.	
W3MM	Allentown, Pa.	1765 kc.	Mondays, Tuesdays, Wednesdays	7-7:30 p.m.	
W7ACD	Shelley, Idaho	1875 kc.	Mondays, Tuesdays, Thursdays	9-10 p.m.	
W8APQ	Martinsburg, Pa.	1875 kc.	Sundays Tuesdays Wednesdays Fridays	6:30 p.m. 10:00 p.m. 7:00 a.m. 7:30 p.m.	
W8UF	Youngstown, Ohio	1750 kc.	Daily	Midnight-1 a.m.	'Phone, hand-sending and Teleplex
W9AAN	Hewitt, Minn.	1970 kc.	Tuesdays, Thursdays	7:15-8:15 p.m.	'Phone and buzzer
W9AFP	Tabor, So. Dak.	1750 kc.	Tuesdays Thursdays Sundays	9:30-10 p.m. 9:30-10:30 p.m. 9-10 a.m.	
W9BSP	Olathe, Kans.	1795 kc.	Daily	7:30 p.m.	C. C. 'phone
W9ERD	Menasha, Wis.	1715 kc.	Tuesdays, Thursdays Sundays	6:30-7 p.m. 11-11:30 a.m.	

teers to send code practice in the 1750-kc. amateur band. Don't you want to help out by offering your station and a few hours of your time each week to these beginners?

Both c.w. and radiophone stations can engage profitably in broadcasting and two-way work for beginning "hams." Radiophone volunteers are really preferred, however, as by using both microphone and key instruction can be given most efficiently to the listeners. Last season those who took part in this work had gratifying results and built up large audiences and many friends, who listened regularly as soon as the schedules were announced.

If you have a 1750-kc. 'phone or telegraph transmitter and can engage in this most worthwhile work, please drop us a line at once, giving data on your exact frequency, hours of schedules, etc., and prepare to follow your schedule as soon as it is in print. We shall be glad to send you some mimeographed ideas and helps which will assist you in putting this service over to those who copy your transmissions.

BEGINNERS, ATTENTION!

We are receiving many requests for information on how to go about securing amateur radio operators' and station licenses. The January issue of *QST* contained Part 1 of the article, "Passing the Government Examinations for Operator's License." The February issue contains the second part. These articles should answer practically every question you may have on obtaining licenses. Simple receiver and transmitter descriptions were given in November and December (1929) *QST*'s, respectively. Back copies of *QST* may be procured from our Circulation Department for 25 cents a copy.

A list of the "volunteer stations" that are sending code practice and other information on the 1750-kc. band for your special benefit appears elsewhere in this issue. This list has been recently revised and all schedules are effective November 1. If you receive the transmissions from any of these "volunteer stations" we suggest that you write to them and let them know how they are coming through and what help you are deriving from their efforts.

The *Radio Amateur's Handbook* contains just the information you need, if you contemplate building a station. We invite requests for any information you may want. Just drop a line to the Communications Department and we shall do our best to help you.

All Army Amateur stations should copy the message from either: (a) one of the two Army Net Control Stations or (b) from their own Corps Area Net Control Station.

All stations copying the message should mail their copy direct to the Chief Signal Officer, Munitions Building, Washington, D. C. The message should show the operator's name and station call, the hour received, and from what station received.

All Amateur stations, whether members of the Army Amateur Radio System or not, will be listed on the Army honor roll if they copy and mail in the received message.

Traffic Summaries

(AUGUST-SEPTEMBER)

Pacific led by Los Angeles	12,220
Central led by Michigan	4871
Atlantic led by Maryland-Delaware-District of Columbia	2175
New England led by Eastern Massachusetts	1974
West Gulf led by Oklahoma	1114
Hudson led by New York City & Long Island	771
Northwestern led by Washington	731
Roanoke led by Virginia	644
Midwest led by Missouri	640
Dakota led by Southern Minnesota	522
Southeastern led by Florida	355
Rocky Mountain led by Colorado	297
Delta led by Tennessee	224
Ontario	93
Quebec	78
Vanalta led by British Columbia	35
Prairie led by Manitoba	21
578 stations originated 7613; delivered 5025; relayed 14,127; total 26,765. (66% del.)	



Oh! Oh! Los Angeles again!! What Section will stop them?

A traffic summary showing the standing of the various Divisions for the past month is printed above. What place does yours take?

DIVISIONAL REPORTS

ATLANTIC DIVISION

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Forrest Calhoun, W3BBW — Amateur radio once more proved its worth during the storm which swept across Virgin Island and its neighbors. Communication was maintained with K4AAN by the following stations, all of which deserve great credit: W3CAB, W3BWT, W3CDQ, W3LA, W3JQ, W3ALN, W3AI. Maryland: The western Maryland boys take the lead for this state. W3AFF is working a 7000-ke. Zepp on 3500 kc. Hi. W3A00 has a fine bunch of skeds. W3DQ is moving to Richmond. Sorry to lose you, OM. W3ZK, a new ORS, is now using an 852. W3LA handled traffic from WDDE to Texas. W3AW is going to school at Swarthmore and will be heard from W3AJ. His brother will run his outfit. W3BBW is again on his regular 1:30 a.m. to 4 a.m. watch on 3500 kc. W3NY sez with all his 250 watts he can't get any traffic. Hi. W3PQ rebuilt his a.c. receiver. Delaware: W3AIW is the net control station for AA work. W3HC spent two weeks at Bethany Beach with the Del. National Guards as did W3AIW and W3ZN. W3AJH reported. W3ALQ complains of hot wx but by this time should be cool. Will W3BAR please report? District of Columbia: W3CXL takes the lead from our old high man W3BWT, W3BWT rebuilt his 3500-ke. xmitter and has a new receiver. W3CAB did some fine work during the storm. He also had quite a few visitors: W6DNF, W8BYR, W4AER, and XW4AEF. W3PM apologizes for no traffic due to testing MOPA. W3GT will be heard soon. Don't forget, gang, reports must be in my hands by the 18th at the latest. Now, on with the battle.

Traffic: W3CXL 452, W3BWT 229, W3AFF 53, W3A00 42, W3DQ 23, W3AIW 21, W3HC 19, W3CAB 17, W3ZK 12, W3LA 11, W3AJW 12, W3AJH 5, W3ALQ 4, W3BBW 2.

SOUTHERN NEW JERSEY — SCM, Bayard Allen, W3ATJ — W3ATF is the high man this month, a sked with W3ZZB at the National Guard Artillery Camp doing the trick — Our old friend W3ZI operated W3ZZB at N. G. A. Camp in New York state, where he made tests from Planes to ground station W3ZZB. He reports 100% success. W3ATJ built a new transmitter, with so much success that the foreigners on 14 mc. have to use cotton in their ears. Hi. W3BEI, our official observer, is hard at work at the R. C. A.-Victor plant. W3AWL has rebuilt the entire station now, having tried every known transmitting circuit. W3OH is back on the air with an 852 after a year's absence. W3BUF is having trouble with his MOPA. W3ACX has a fifty which doesn't perk. W3BRE and W3ARP moved to Northfield. W3WW and W3HS left for the west coast to observe this section's signals out there. W3KJ and W3UT are rebuilding for the fall session. W3BDO is a new station in Pleasantville. W3BAN is contemplating moving back to town and a power supply. At present he lives 'steen miles from nowhere with no juice at all. W3SM and W3ASG are modulating every night on the 3.5-mc. fone band. Now that the real season for radio is at hand let's have 100% reporting next month.

Traffic: W3ATJ 6, W3BEI 1, W3ATF 25, W3ZZB 7, W3AWL 14.

EASTERN PENNSYLVANIA — SCM, Don Lusk, W3ZF — W8CWO is back to tlc. again after trying his fling at DX on the 14- and 7-megacycle bands. W3UH just came back on the air with an 852 to crash through QRM, etc. W8VD started in again. It looks as though things are picking up. W3UX has a new recvr perking. W8DHT sez the Electric City Rdo Club is reorganizing and things look very promising. W3MC has been experimenting with a new zepp but is disgusted and is now back on 3500 kc. W8AWO is sick in bed at present. Sorry to hear that, Sid, and hr's wishing you a speedy recovery. W3AHZ is going back to school but sent in a mighty nice report this month. Look for him at W8YA, fellows. W3EV made his first tlc. report this month. W8EU is awakening interest in Billtown once again. Wish that old gang would wake up, up there and pull together like they used to. 'Smatter? W3AQQ has the right idea in mind. He is going to help out our division on the map. Conrats, OM, and I'll root for you. W3FY wonders why his reports have not appeared in QST. The answer is quite simple, OM. None received here. Perhaps you sent them to my old QRA? W3AVI is getting into tlc. circles now. W3ZF

and his OW went to the Roanoke Div. Convention and had a fine time. W3GS is so busy with R. C. A. work that he has no time for ham radio. The SCM will vouch for that, too.

Traffic: W3AHZ 128, W3UX 99, W3UH 55, W3AQQ 24, W3FY 23, W3MC 21, W8DHT 16, W8CWO 9, W8VD 9, W3EV 8, W8EU 12, W8AWO 2.

WESTERN PENNSYLVANIA — SCM, Robert Lloyd, W8CFR — W8CHC reports four foreign schedules on 14 mc. He makes the BPL with a fine total. W8GU is still going along nicely with several schedules. W8DLG is lining up schedules for the winter months. W8AVY can't get his crystal working. W8AGO reports a fine array of crystal transmitters in use. W8CUG is kept busy with the Navy Net and has just finished putting up a beautiful new fifty-eight foot mast. W8ARC expects to be on the air for the Army-Amateur schedules. W8CEO had a visit from WIADK recently. W8DUT reports a new Junior Op making QRM. W8BNU quit 14 mc. for 3.6 mc. and has a nice total. He reports the Erie gang is quite active. W8APQ is a prospective ORS. W8AAQ reports for the first time. He says W8DRA and W8DFB are active in his part of the section and that the Oil City fellows are working on a Naval Reserve unit. W8CLS is all set for the winter with a new transmitter and receiver. W8ASE reports some funny experiences with his M.O.P.A. set. W8DYL is building a new transmitter. W8CFR started up, but was dumped somewhat by an overload of work.

Traffic: W8CHC 396, W8GU 21, W8DLG 13, W8AVY 9, W8CFR 7, W8AGO 6, W8CUG 6, W8BNU 53, W8APQ 45, W8AAQ 12, W8CLS 4

WESTERN NEW YORK — SCM, John R. Blum, W8CKC — W8BIF is using a new M.O.P.A. This style of transmitter seems to be all the style down Jamestown way. W8ON, the Chautauque County Fair transmitter, handled over 200 messages — all on 7 mgs. W8AFG has gone back to college. W8CXH and W8CUT are on 28 megs. W8DME is Unit Commander, U.S.N.R. W8CVJ is studying aviation radio. W8BGV is president of F.L.T.S. W8AHK is back on the air again. Welcome, Jerry. W8IH has a new double-bouton mike. W8AYM is a new station. W8AMZ has a new Amateur Extra First ticket. W8CIL has a new T.P.T.G. W8AWM is a new traffic bound and wants schedules. W8APK has gone back to the second district. W8QB works dx on 14 megs. W8DII keeps several consistent schedules. We are glad to welcome W8ARX and his F.B. note back again. W8CPC worked his usual quantity of good DX. W8AFM was on the silent list this month. W8BHK has new Xtal controlled fifty watter. W8BJO has returned to the fold after being off the air all summer. W8TZ using M.O.P.A. instead of Hartley. W8BUP operated at W8ON. W8ABQ has a new a.c. receiver. We are glad to note that traffic is picking up in this section; also there is a great demand for schedules west. Any "9" wishing to swap traffic please write the SCM of Western N. Y. W8DSA is handling traffic in the Northern end of the State. W8DEJ, our YL operator, is working on 3900 kc. W8IH and W8CKC were operators at W1ESE — Eastern States Exposition at Springfield, Mass. We had a nice visit at Headquarters, met the gang and saw W1MK. If any of the Western N. Y. gang have any kick against Headquarters, it is our suggestion that they go down and see how the place is run. They will never kick again. There will be thirty O.R.S. certificates cancelled this month as per previous warning.

Traffic: W8BUP 118, W8TZ 22, W8BJO 6, W8BHK 7, W8CPC 36, W8ARX 7, W8DII 9, W8BIF 1, W8DME 16, W8CIL 7, W8CKC 8, W8DSA 5.

CENTRAL DIVISION

INDIANA — SCM, George Graue, W9BKJ — W9DDB is back at Purdue and is planning on changing to crystal control with a fifty watter as the PA. W9GIU is the able assistant. W9CKY has his new crystal rig near completion and wants several skeds. W9CKG and W9GIUG are new stations in Indianapolis. W9AEA changed to MOPA and is ready for DX. W9GGJ blew his filter condensers. W9FCX reports that most So. Bend hams have changed to 3500-ke. fone. W9CVX, an old timer and a previous ORS, wants to be reinstated. W9ALB, W9CLR and W9BXT are new hams at Seymour. W9AAO claims the trees are absorbing his output. W9GJS suggests a "V" machine for tuning up transmitters. Hi. W9DSC has deserted the 14- and 7-

mc. bands for 3.5 mc. W9EUP and W9FPQ are operating on 7 and 3.5 mc. W9YV-W9RW works U.S.N.R. regularly. W9EXW is thinking seriously of breaking into the com'l game. The gang at Connersville have left for school, excepting W9DZX, W9FCB, W9FBH and W9AIP, who are going to work double shifts to make up for the loss. W9AKJ wants some good reliable skeds for the winter months. Cummings, W9FQ, RM for dist. 2, wishes to know why the delay from the So. Bend bunch, and requests that all the hams write him their reports for forwarding to the SCM.

Traffic: W9GGJ 2, W9DSC 6, W9GJS 15, W9AIP 12, W9CKG 4, W9DHH 30, W9AKJ 16, W9AET 13, W9ETH 6, W9BHM 6, W9CVX 5, W9AHB 6, W9FBO 1, W9FCX 10, W9CEY 15, W9DDB 2.

MICHIGAN—SCM, Ken Couroy, W8DYH—It's a pleasure to report this: Michigan breaks her record again. A total of 2834 messages were handled! Our section was third last month—we're on our way—keep it up! Four stations make the BPL: W8AEQ, W8DFE, W8MV and W8DYH. W8DED tried hard but missed by ten. Don't worry about W8DED next month. W9OV is QRL getting that certain something into his sig. W8CJK says RF amplification is NG above 3.5 mc. (Below 80 meters), W9HK is trying to put pep into the Upper Michigan gang. FB, W8CLN is having the usual "fun" and fireworks—changed to fifty and more volts. It looks like "Stone-hearted Tate," W8FX, is getting to be a "softie"—Tsk! Tsk! Miss W9GJX sez she has to chop holes in the ice to go swimmin'. (Wear a fur-lined bathing suit, Helen.) W8BBX sez '45 is the best QRP tube—the '10 is on the shelf for good. W8BJ keeps skeds and handles a nice bunch of tlc. W8DFE says, "We're all set for what have you?" W8SS hooked two VKs in one AM! W8ACW handles his in ten days, then coasts the rest of the month. W8DA is getting into the A-A net. W8BJT had his call changed to W8FP. W8CSG blew his rectifier and is off temporarily. W8DDO "Rolled his own" plate transformer! BIG NEWS! Miss Marian Lemen, (Dexter, Mich.) is Michigan's latest YL op, call W8JH—QRG 3.5 band—CW exclusively. W8AJC, our OO, QRA also Dexter, claims he's QRL!—What do you make of that. Mr. Holmes? Robt. Hall is the student op at W8ZF. W8BR5 is in the transmitter-building game. He's good too. W8MV wonders, "How can they get so much trouble in one inch square?"—Crystal! W8DFS is all set for fall. W8TJ claims 5:30 to 7 a.m. E.S.T. is DX time on 7 mc. W8DVQ works mostly in the A-A net. W8AEQ is going to W9SO to study Radio Engineering. Sorry to lose you, Jack. Here's luck. W8BDI and W8ACB report but say nothing—cuss! Cuss! Let's have a little dirt with your tlc. total, OB. W8DKT challenges any CW-man to a boxing match—to be held on 28 mc. (W8DEN and Russian papers please copy!) W8CAT gets out of his back yard now—next-door neighbors—key-clicks! W8DMS has his CC perking on 3754 kc.—and how! W8CJ is knocking off DX. W8DEH handles his share with an 'OIA on 3.5 mc. FB. W8DJQ's chief op, Sheldon Drennon, left for school, so guess that station is on the racks from now on. W8BWJ is working both 7 and 14 mc. W8AKN, W8CSM, W8DKT and W8DYH are experimenting on 28 mc. W8BV hooked the Netherlands with a '10 tube. W8JD comes in life once more. W8DOV sends in his first report. W8AUT, W8ASO, W8CKZ, W8CU, W8DSF and W9EGF say QRU. W9CE says things are on the "up and up." W8BGY has that DX appeal. W9AXE is sked hunting. W8CFQ can't keep his filter together—he has 1 kw pushing at it. W8PG has the old fifty on 3.5 mc. and every thing looks rosey. Off-frequency phonies keep W8DAJ in church—cuss! Cuss! Repenting, W8CVX and W8DJU of Saginaw, are after tlc. W8HO, with W8AP at the sledge-hammer, piled up a nice bunch. We are sorry to lose W8AGJ. It may not be long, tho'—blondes are so deceitful! Your Route Mgrs., W8CAT and W8DED, will help you line up skeds, if you will write them. C'mon you fellows, let's make that R in ORS stand out. Non-reporting stations are requested to report. We are going places, but will get farther with your support.

Traffic: W8DYH 605, W8DFE 277, W8MV 261, W8AEQ 250, W8DED 190, W8DJQ 126, W8DEH 92, W8CAT 87, W8AGJ 75, W8JD 67, W8HJ 67, W8BGY 65, W8BBX 64, W8BJ 64, W8DDO 51, W8RP 50, W8AJC 48, W9HK 47, W8ACW 38, W8DMS 38, W8CJ 28, W8CLN 26, W8OV 25, W8AKN 24, W8BWJ 24, W8DAJ 21, W8CFQ 16, W9GJX 16, W8DVQ 14, W8SS 13, W8CP 9, W9AXE 9, W8CSG 8, W8BDI 6, W8DA 5, W9CE 5, W8BR5 4, W8CJK 4, W8BV 3, W8ACB 2, W8DOV 1, W8ZF 1.

ILLINOIS—SCM, Fred J. Hinds, W9APY—You

Illinois boys are now beginning to show what kind of material we are made of—keep up this good work for we are out to top the list this winter. W9ERU (Route Manager for Illinois) is on 3800 daily from 7 to 7:30 p.m. C.S.T. for Chicago traffic especially. Work with him, OM's. W9BNO is building a portable receiver. W9ERU wants all dope on Illinois skeds and those wanting skeds. W9DZG is again with us with two 852's in parallel and a 3500-ke. fone. W9DOX is doing well with A-A work. W9CZL reports the air dead for DX but traffic rolling along nicely. The old reliable 50 watter went "West" at W9QJ but all is going well again now. W9CFQ is doing nice work with his type '10 on 3.5 mc. He handled some WDEE traffic. An Xtal set will soon be installed at W9ANQ. W9BDW is our newest ORS. The Xtal at W9CNY will soon be going. W9FI is rebuilding the entire station for a busy season. A special 3.5-mc. set is being built at W9FPN for traffic this winter. W9DDE is getting back on the air. He took movies of the radio work and planes at the National Air Races at Curtis Field here last month. W9DXP has moved to Chicago from Iowa and will show us some real action. W9CYB has two "Bum Fiats" from contacts with poison plants. Sorry, OM. The fone set at W9DAX has fourteen tubes and the receiver has ten tubes. Hi. W9GHP has his 50 watter going nicely. He is the chief operator at W9XAO and finds the television work very interesting. W9FUL has been doing fine work on 14 mc. with booteleg types '10. A new 7-mc. transmitter is going at W9FVO. W9GJJ is going to rebuild for the winter. W9CKM is starting up for a busy traffic season. W9CUT has been having fun grinding a crystal for the new set. W9DZM has been doing great traffic work and reports a new station in his town in W9EFB. W9AMO has a new crystal banging away on KA traffic. There is a negative heterodyne frequency meter in use at W9BZO. W9MI reports DX picking up as well as traffic. The motor generator at W9AFB burned out but that did not keep AFB off the air. W9KB has rebuilt and is on with a 50 watter. W9DJ is studying and collecting crystal data. W9BR1 handled special traffic with California and made the BPL this month, as did W9DZM. Come on, fellows, more of you get in the BPL and make a big party. W9BRX had a regular schedule with the "Bow-doin'." WDEE, W9AFN is pounding away with both a Hertz and a Zepp with rectobulbs and a type '11. W9FPN has his MOPA on 28 mc.

Traffic: W9DZM 294, W9BR1 288, W9CIL 102, W9CZL 43, W9AMO 38, W9ACU 34, W9MI 33, W9FUL 27, W9QJ 26, W9AFN 19, W9CFQ 18, W9AFF 12, W9EMM 12, W9APY 11, W9BRX 10, W9BZO 10, W9BDW 9, W9KB 9, W9CUH 8, W9CNY 7, W9ANQ 6, W9AD 5, W9DOX 5, W9CKM 1, W9ERU 1, W9GJJ 1.

OHIO—SCM, Harry A. Tummonds, W8BAH—FB, gang, plenty of reports in and plenty to write about. Some FB totals were turned in for this month. W8BAC has a new 50-ft. pole and is out to make the BPL. W8APC, now located in Toledo, turns in a report which is FB for a change of QRA. W8ADS handled a college registration by radio. FB, OB. W8BKM has daily skeds with Erie and Cleveland. He also reports that W8CEL is on now. W8DWH is rebuilding. W8DHP burnt out his tube. Tuff luck, OB. W8AFP is now with G.E. at Erie, Pa. W8LI reports that he has been busy working on a new receiver. When it's finished look out for his traffic totals. W8RN is still operating on KFNA and wants the gang to write him care of S.S. Grand Island Marine, P.O. Detroit. W8OQ is getting started again and will be on 7200 kc. W8DBK has enrolled at U. of Dayton. He reports that W8BYR (phone) and W8DSN (CW) are now on the air from O.S.U. at Columbus. W8DVL is getting better results and reports with a new filter. W8ARW had a total of 15. Congrats, OB, on moving into your own home. W8BBH says he is building a new receiver. FB, OB. Expect you to double your total next month. W8CNM makes application for ORS, and also wants skeds with Canadian stations. W8AKA, Cleveland Amateur Radio Assn, reports that they are now on 7235 kc. with a new 250-watt job. Their new officers are W8DGP, Pres.; W8UC, Vice-Pres., and W8BS, Sec. and Treas. Their station is on every nite, ready for skeds and traffic, and to date have wkded all districts, 35 states and a total of over 250 stations. FB. W8CX will be an ORS by next report. W8BGX has just returned from Florida and has already lined up some skeds. FB, OB. Let's have a good total next month. W8BDU will also be an ORS by next report. Congrats, OB. W8BF has been doing some FB work on 14-mc. skeds with the Pacific coast. W8BF has also been appointed chief operator of W8CWA, Cleveland Airport Station. Some fine totals have

been coming through showing traffic handled on phone, and W8CWA, the Cleveland Wireless Assn, Inc. station at the Cleveland Airport, reports a total of 84. FB, gang. W8DBU reports that operators are on that station every night and that the club has adopted a policy of Rag chewing and traffic handling. They have applied for ORS. Would appreciate reports from other club stations in Ohio, too. We have been advised that complete data on procedure for handling traffic over phone will be included in the next issue of the Handbook. W8BAX is lining up some skeds for next month, also has two xmitters, two bugs, a mill and is all set for traffic. FB, OB. Double that total next month. W8DIH has been playing chess and checkers by radio lately. W8DDQ reports six licensed operators in Norwalk now. W8DPF is playing semi-pro football in Akron this year. W8BQF returned from a trip to Europe as op. W8DS is operating on the Great Lakes. W8CMB operates on 7184 kc. W8BYN reports that he will be off the air for awhile, and sends 73 to the gang. We all wish you best of luck at your location at Dayton, Howard, and hope to hear you on the air again soon. Sure glad to meet the gang at the Dayton Convention. The boys in Dayton did a good job. W8CWU, W8CVM and W8DTP of Alliance dropped in to see the SCM recently and were still talking about the Conv. Wish to thank the gang for the expression of best wishes and the prompt reports received to date. Now, let's all get busy and get together. "Put Ohio on Top." What's that? Yes, W8BAH is on the air too, and for regular skeds will be on W8CWA, phone, every Monday night. CUL. 73.

Traffic: W8CWA 84, W8BAC 73, W8RKM 34, W8ADS 16, W8ARW 15, W8CMM 11, W8CX 9, W8BDU 8, W8BAX 8, W8DBK 6, W8BBH 5, W8BF 5, W8DVL 4, W8APC 1, W8DIH 14, W8DPF 57, W8CMB 81.

KENTUCKY — SCM, J. B. Wathen, III. W9BAZ — W9JL wins the ORS pin given to the station with the highest total June 15th to Sept. 15th: total 409. Nice going, Fred. W9QX is falling in line with an a.c. receiver. W9AZ is working both 3.5 and 7 kc. Get him to arrange skeds for you. W9AUH is still pumping 'em out. W9ARU is building a W8AYO receiver. That "S" sure started sumping. W9FZV passes in news of B.G. bunch. W9FZL has a ham first grade. W9GAL is struggling for a commercial ticket. W9BAZ spends his evenings chasing mosquitoes with a vacuum sweeper. W9BAN will swap station photos with anyone. Send 'em along so he can fill up his album. W9AIN has a fine looking C.C. xmt'r, glass-enclosed. W9GGB is busy with school just now. Replacing "B" bats with tube rect. improved W9ALR's output. By the time this gets into print, we will know W9ELL's "surprise." Stations desiring to get in the A.A. net, write W9BAZ. Come on, fellows, get those reports in. Are there any YL or OW ops in this Section? R.S.V.P.

Traffic: W9JL 223, W9QX 24, W9AZY 17, W9AUH 11, W9ARU 4, W9BAZ 2, W9FZV 1, W9AJY 3, W9ELL 2.

WISCONSIN — SCM, C. N. Crapo, W9VD — W9GFL is back in school but keeps the air hot on 7000 kc. with two schedules. W9EBO got back on the air September 1st on 7000 kc. and will be on 14,000 soon. W9DTK is sending out Navy drills regularly. Many of the Wisconsin boys were on the Naval Reserve cruises this summer. W9OT reports that W9DVG, W9DHI and W9OT were shipmates for two weeks aboard NAPS. W9EPJ wants the gang to know that the Badger Amateur Radio Club holds meetings the first Sunday of each month at Menasha and invites all amateurs to attend. W9VD is operating regularly on 3740 and 7150 kc. W9EJX is a new 3500-ke. phone station at Neenah. W9EBD is going to send code practice for beginners on 1750 kc. again this winter. W9BPR is rebuilding. W9DV has rebuilt entirely and done away with remote control. W9FFX is a new ham at Neenah, having moved there from Chicago. W9FZY is selling out. W9FXG will be on with an MOFA very soon. W9FSS went on 25-day cruise on the U.S.S.C. 412 as R. adiomani 2c. W9BBB is back from Canada and reports that "10% sure is FB". Hi. The SCM is at new QRA — 2111 East Newton Ave., Milwaukee. All reports should be mailed there in the future.

Traffic: W9GFL 67, W9EBO 41, W9DTK 14, W9OT 7, W9EPJ 5, W9VD 6.

DAKOTA DIVISION

NORTHERN MINNESOTA — SCM, C. L. Jabs, W9BVH — W9GGQ is back on the air for the coming season and is looking for good schedules. W9EHI has little time to operate. W9CIY has his CC job going and is very pleased with it. W9BHH has a new fifty watter and

an 1100-volt generator. W9EGU has his station going and will handle traffic soon. W9BCT and W9EHO are inactive. W9AAN (W9IK) is teaching at Hewitt and will have a fone set on 1750 kc. W9ARE sends in a fine report on activities but failed to report his traffic. His new CC job works FB and traffic is good. W9FFL is busy at the Duluth Junior College and reports W9YK, under the direction of Prof. Cosandy, will be on with W9CKI, W9FAQ, and W9FFL as operators. He also reports a new station at Duluth, W9FVN. W9GKM will be on soon. W9GKO reports the A.R.A. Radio Club has organized a traffic department with six ops to handle traffic thru, from and to Duluth. FB. W9DOQ has his station going in Duluth and reports a very good turn-out for the A.R.A. Club meetings. The SCM visited W9EGU and W9FNJ at Henning. His schedule with W6CF is not going so good at present due to very poor radio condition. All signals on the 7-mc. band fade out completely around 10 p.m. W9ASW is back on the air after four years' inactivity. W9KS is op at WRHM and also pounds brass at home when time permits. Thanks, fellows, for the fine reports received this month. Let's try and put a star in our section next month.

Traffic: W9BVH 44, W9GGQ 10, W9EHI 5, W9CIY 4, W9BHH 3.

SOUTHERN MINNESOTA — SCM, J. C. Pehoushek, W9EFF — W9COS is beginning his regular schedule. W9DRG has been handling traffic and working dx. W9BN is on consistently, with five ops. W9AQH will handle less traffic as court has opened. W9EFK has turned PCL with a new Radiola Super. W9AIR had a very pleasant two weeks on the U.S.N.R. cruise. He says the local gang is taking on new life and promises lots of activity. W9BNN is back at the key for the winter session. He and W9CKU claim to have their preacher whistling code on the pulpit. W9CKU is installing remote control. W9EYS is a new ham in Southern Minn., living next to W9BNN. W9FLE is planning a fall hamfest. W9GHO has been out of town but will be active soon. W9DMA is going on 14 mc. W9AKN worked some dx but nm as he is starting the U. W9DBC has rebuilt his xmitter and will be on 14 mc. W9DSH visited the Duluth gang, Bob says W9CH is the new call at WRHM. W9DOP has been active on 14 mc. He also is attending the U. and is out for football. W9FPY is a new ham at Luverne. W9BXE has been busy with the Military Show at Fort Snelling. W9EIA BTW have their crystal control set working fine. W9DH is planning a 14-mc. low power rig. All ORS who do not report the month following the time this is in print will be cancelled.

Traffic: W9COS 177, W9DRG 82, W9BN 51, W9AQH 40, W9EFF 11, W9BNN 8, W9AIR 6.

SOUTH DAKOTA — SCM, Howard Cashman, W9DNS — W9DB reports alone this month. W9FOQ is reported working on an 860 job. W9DB keeps South Dakota in the Army. Traffic too tragic to be funny.

NORTH DAKOTA — SCM, Guy L. Ottinger, W9BVF — Business seems to be picking up some. Three stations handled some traffic this month. Every one interested in a N. Dak. QSO party write the SCM for details. W9DYA is going to be with us again this winter and wants to handle some traffic. W9DGS is looking for some good skeds. The SCM is getting the AARS work going. W9DOY is rebuilding and making an MOFA set now.

Traffic: W9BVF 70, W9DGS 8, W9DOY 3.

DELTA DIVISION

ARKANSAS — SCM, H. E. Veltz, W5ABI — We are glad to report that our reports are improving as well as our traffic totals. We had only three stations that handled traffic this last month. With the coming of cooler weather we expect to hear most of the gang back on the air. Little Rock has two new stations, W5RPE and W5RW. Welcome, OMs. They each have a 210 on 7 mc. W5BKB has a new a.c. receiver. W5BBI is the traffic leader this month. Congratulations, OMA W5SI has been on the Naval Reserve Cruise and expects to have an 852 on the air this winter. W5IQ and W5ABI have been doing some experimenting on 28 mc. W5BDB is working for an aviator's license and says he will be on more after he gets it. W5AQX is figuring on a new layout at his station. W5BDD is back after being off all summer. Beginning next month we will appoint the station handling the most traffic our Banner Station. Each month every station has a chance to win the title. BANNER STATION. The contest is to run for 12 months after which time the winner will be picked and his station will represent the best traffic handler in ARKANSAS. Such station shall

bear the title of Gold Medal Station. Now, gang, let's see who will win the title. Let's go.

Traffic: W5BBI 38, W5ABI 34, W5BKB 10.

TENNESSEE — SCM, James B. Witt, W4SP — The weather is FB now for our traffic work and we should have several more reports next month. I will expect reports from hams who have been off the air for the summer months. W4CW comes through with the best report this month. W4RP says that he will have all skeds going again soon. There are several ORS not reporting and some sections of the state not even heard from. Send in those reports, fellows, if you want Tenn. to have a good report.

Traffic: W4CW 72, W4AGW 39, W4AFM 26, W4RP 5.

HUDSON DIVISION

NEW YORK CITY AND LONG ISLAND — SCM, V. T. Kenney, W2BGO — Of 29 ORS we received 17 reports this month. Great! Your inactivity will earn a cancellation of that appointment, and that's as sure as QRN on 3.5- and QRM on the 7-mc. bands. You fellows who apply for ORS and then forget to report for three consecutive months will never get the appointment. Any wide-awake stations desiring ORS appointment are invited to send for the application blanks, but do not do so unless you intend to take care of the job conscientiously. Manhattan: W2BCB sits up late once in a while now. W2BDJ, after returning from the camp with the 27th Special Troops, is rebuilding and will use CC. W2CMJ is a new station and wants QSO's. Bronx: W2CYX leads his boro in traffic. W2FF receives most of his traffic from NNISC. W2AXG blew out his rectifier. W2AQQ promises to have a 50-watter pecking by the time this is in print. W2AET is studying journalism at N. Y. U. W2AII is also rebuilding. W2VG reports great results with his new Low C. Hartley. Aside from keeping nightly skeds with NJ2PA and CM8ST, W2APV is rebuilding and will have an MOPA perking on all bands. W2AFO has his troubles with man-made QRN. Brooklyn: W2ARQ leads the section in traffic with W2ATZ and W2APK tied for second place in Brooklyn. W2BEV is using a '01A until a '10 tube is available. W2BJF and W2ARE are building a station for the 165th Infantry, N.G.N.Y. A new club is being organized in Brooklyn meeting at W2BJF's shack on Friday nights. W2PF is back on the air. W2BRB can be heard on 14 mc. with both CW and fone. W2BZH has a MOPA and likes it very well. Long Island: Our L. I. RM is the only one to report from those parts and it's his 18th consecutive report. He tells us that W2AST is again active in Long Beach. W2AFO and W2AIQ, Official Observers, report many stations off frequency.

Traffic: Bronx — W2CYX 41, W2FF 40, W2AFO 16, W2AXG 11, W2AQQ 9, W2AET 8, W2BGO 5, W2AII 2, Manhattan — W2SC 35, Brooklyn — W2ARQ 44, W2APK 29, W2ATZ 29, W2BEV 10, W2BRB 8, W2BJF 6, Long Island — W2AVP 14.

EASTERN NEW YORK — SCM, H. J. Rosenthal, W2QU — Now that summer vacations are over the ORS are expected to report regularly if they want to retain their ORS designation. The Pioneer Radio Club took advantage of the dull summer period to get the club house all ready for intensive work in the fall and winter months. Receivers and transmitters there are in the pink of condition, and the club hopes for a WAC before many months. W2ACD starts the fall right by converting his 'phone to CW and piling up a good traffic total in the last few days of the month. W2ACB is looking for some good reliable schedules. W2LU is keeping 4 reliable skeds and leads the section in traffic this month. W2UO is away from home and is temporarily on the inactive list. Ex-3CKL has moved to Schenectady. What's your new call, OM? W2ACY is keeping a reliable sked with W6AJ. W2BJA spent a day of his vacation with W8ARX and operated the W8ARX 250-watt transmitter. W2BER spent part of his vacation getting a commercial ticket. W2BKN is one of five licensed hams working for the Youkers Light Co. He is considering starting a club. W2QN worked Italian 1AU on 14-mc. 'phone. W2AVS is nursing a pair of sore ears since testing out his a.c. 5G receiver. Evidently it has some kick. W2BWB is using the new 230 tubes for receiving and says they are twice as good as 199s. W2ANZ is attending M.I.T., but will pound brass at home on week-ends. W2CEX has applied for an ORS appointment. W2BSH spent his vacation climbing Mount Marcy and Greylock. W2FN and W2BIQ have just received their ORS appointments.

Traffic: W2BSH 11, W2CEX 25, W2ANZ 7, W2ACB 1,

W2ACD 37, W2LU 98, X-W3CKL 12, W2ACY 3, W2BJA 1, W2BER 15, W2QN 7, W2QU 46.

NORTHERN NEW JERSEY — SCM, A. G. Wester, Jr., W2WR — All amateurs mourn at the passing on of W2AS, and our sincere sympathy goes out to his parents. Traffic work at W2JF has taken a jump, but he still complains that ORS ignore his letters. Let's give our new RM, W2JF, a helping hand, gang. W2AOS is now busy with U.S.N.R. skeds, which will swell his traffic total. W2CFQ is now a full-fledged ORS. W2APU reports conditions very poor for traffic. Skeds take care of poor conditions, OM. W2BPY had contact with XU5WA, the "Empress of Russia." W2BDF is now working for Colonial Airways, installing radios on airplanes at Port Newark. W2CJX is working with auxiliary equipment until his big set gets completed. W2CO is back on the air after a long silence and uses an MOPA. W2AMR has applied for an ORS as has W2CPD. W2CDQ is going full force with an xtal. W2BPG and W2AHL of Verona make their initial reports. They must keep the ether hot in that small town. W2BJZ has trouble clearing traffic. W2ZC is still doing fine international traffic work and handled messages going to King George and Premier Mussolini via the Oriental route, which extends from Shanghai-to-Paris. W2WR is installing xtal for 7 and 14 mc.

Traffic: W2JF 51, W2AOS 36, W2CFQ 10, W2APU 1, W2AGX 3, W2BPY 3, W2BDF 3, W2CJX 10, W2AMR 36, W2CDQ 18, W2BPG 8, W2AHL 20, W2BJZ 2.

MIDWEST DIVISION

NEBRASKA — SCM, S. C. Wallace, W9FAM — W9DI leads the traffic handlers. W9DFR is second. W9CPJ says lightning wrecked his transmitter. W9BEX has cancelled skeds as he is very busy. W9QY says radio punk on account of weather. W9DVR reports. W9DTH says he had a good time at convention in Topeka, Kans. W9EHW says traffic slow. W9BQR was also down to Topeka Convention and reports fine time. W9BQY wants West Nebraska sked. W9BYG has the fever at last since he got rid of the SCM ship. W9EEW says he is busy dispatching trains. W9FAA blew the old 50.

Traffic: W9DI 13, W9DFR 12, W9CPJ 6, W9BEX 5.

IOWA — SCM, H. W. Kerr, W9DZW — And now let's get down to tlc., gang! Vacations over; Navy net working and Army net warming up; let's have the traffic totals, fellows! W9BCL tops in tlc. this month, and is going after an ORS. W9ACL has two sets wkg and can QSY any band in ten seconds. W9FUD's QRA is now Bellevue, Nebr., where he is in Airways Radio Service. W9EJQ, our RM, is waiting for your skeds, gang! W9FZO qualifies as OO with a GE meter, new receiver, and new power supply putting a FB sig on the air. W9CKQ still keeps his VK5HG daily sked; has new monitor and is QRX for Std. Freq. transmissions. W9FFD mourns a fifty bottle, but is going again with xtal MOPA. W9FIF was hrd in New Zealand on 3500; tnx for tlc report, OM. W9FWG and W9DNZ report. Your SCM enjoyed the Kansas Convention very much; Iowa was represented by three others of the gang; we should have had more; the Kaw Valley Club makes one feel at home — keep this in mind gang and take in Topeka's next! Phil Konkle, W9YL, engr. of WOI, has left to go with RCA Victor; sorry to lose him; Mr. Huntsinger takes his place. W9EFH was calling on the Soo City gang and GP the first of the month. Come again, Chuck. W9EST plans to be on again as soon as he gets moved. W9DVS joins the gang at Iowa State. W9EVJ is at Waterloo with A. T. & T. and is on the air with 50-watter on 7000 kc. W9DXP sends 73 from Chicago and sez a new YL at his house since September 1st. W9DIB sez a German sthn gave him a report and noted he had relatives in Davenport. Listen for W9DIB, gang! Send your skeds, or wants for Iowa skeds to W9EJQ, our RM. Send tlc reports the 16th to W9DZW. Always glad to get them.

Traffic: W9BCL 44, W9DZW 33, W9ACL 25, W9EJQ 21, W9FZO 15, W9CKQ 11, W9FFD 4, W9FIF 4.

MISSOURI — SCM, L. B. Laizure, W9RR — A convention was staged in St. Louis on the 19th and 20th of September which was well attended considering the short notice; this afforded all a chance to meet a number of fellows we have worked but never met in person. It is proposed to hold another one next year. W9DXY rebuilt the works and is putting in xtal. W9AMR has been concentrating on foreign DX and sends in a list of 28 stations worked. W9FTA led in total traffic with 149 msg. W9ECI applied for ORS but has more trouble with power leaks. A meeting for Mr. Budlong of HQ was held in St. Louis on his way home from

the Topeka Convention, September 6th-7th. Forty-four hams were on hand for the St. Louis hamfest; about 25 were at a similar one held at W9ZD in Kansas City the night before. W9BEU says QRW with job so no tlc. In collaboration with W8BOR he built a SW xmttr for the endurance plane which worked successfully in spite of installation while the plane was in the air by fellows who are not radio men and operated by them afterward. This set was shown at the convention. W9ATX is a first-time reporter this month. FB, OM, W9ZK is still shut down mostly waiting for cooler WX, when operating can be done in comfort. Most of the Kansas City fellows forgot to report this time, so that the SCM cannot say much for them. W9DQN led in traffic while W9CFL was second with U.S.N.R. net traffic. A large delegation went from K. C. to the Topeka Convention as usual, sufficient to swing the liars contest in favor of W9DQN since popular vote decided the winner. The joke was on DQN, however, as he is a confirmed tlc man and the prize was a mike. His fall from grace is freely predicted. W9RR broke a record by not winning a prize at Topeka; however, a pair of 281's came home from St. Louis. W9ZK and W9DXY were among the long-distance visitors at Topeka, with several Nebraskans and Iowans present. Seven fellows signed up for the U.S.N.R. W9CFL diked off with a Thor power pot at Topeka, while W9DOE did the same at St. Louis, again proving it is hard to beat the U.S.N.R. when it comes to carrying off prizes. W9DLL of K. C. applied for a commission in the U.S.N.R. KWKC made an offer to buy the towers at W9RR, but no luck, W9RR would have probably sold his shirt in preference. W9BGO demitted as ORS this month to Oklahoma Section. His new QRA is Muskogee. W9EPX kept up his skeds with W9EPY, but moved to Columbia, Mo. The SCM got a long bill of complaint against power QRM put out in SW Mo. by the Mo. Utilities Co. HV line, which is all of 2300 volts (hi, hi). W9GHM-W9DZN reports again from the *S/S P. J. Hurley* where he pounds brass. W9GAR sent in a combined tlc report for all summer. W9ASV had his station damaged by lightning that came in off the power line. Following this his pole was blown down. W9BJA is trying to set up tlc skeds on 3.5 mc. for the season, but reports WX still bad for that band. W9ENF is putting up a new 3.5-mc. Zepp. W9CLQ has been playing the DX hams. W9BGN has rebuilt extensively for the coming season. W9DHN resigned as RM owing to QRM of going to college at Fayette, Mo. W9EYB of Festus is also at the same school, so owl boiling will probably be in order. W9DCD sent in a report that was so long his antenna fell down while he was writing it. W9AWE had the misfortune to lose a large stock of boat motors when his boathouse burned. All hands are impatiently awaiting the conclusion of the contest for Midwest Director to fill the present vacancy. 73.

Traffic: W9AMR 3, W9FTA 149, W9ECI 29, W9ATX 12, W9DQN 21, W9ENF 4, W9DHN 6, W9ASV 19, W9BJA 31, W9GAR 29, W9EPX 9, W9CFL 68.

KANSAS — SCM, J. H. Amis, W9CET — W9GHI is going strong with a 203A and is lining up a nice bunch of skeds. W9FLG is installing Xtal but will be on again soon. W9EEM is helping the SCM build a lattice mast. W9EVT and W9BHR are building a new rig for the Gov. net. W9DEB is busy getting the Topeka U.S.N.R. unit going. A UV211 has replaced the type '10 at W9BGL with lots better results. W9BTG is going to school at Manhattan and has an xmitter on the air. W9HL hopes to have some skeds and more traffic later. W9ESL lost two 866's and a couple of filter condensers. A new xmitter is under way at W9CKV. W9CHX is on with Xtal on 7118 kc. and would like to have some skeds. W9EBF joins us from the Nebr. Section and is in school at Lawrence. W9FIG and W9FUG are working on 56 mc. W9BSD will be on soon with Xtal. The KVRC is holding meetings the second and fourth Friday, 8:00 p.m., at the Topeka Chamber of Commerce. All hams are invited to attend. Your SCM would like to have more reports and larger tlc totals. Fall is here, gang, so let's all get busy.

Traffic: W9CET 37, W9GHI 6, W9HI 2, W9FLG 22.

NEW ENGLAND DIVISION

WESTERN MASSACHUSETTS — SCM, Leo R. Pelouquin, W1JV — With the evenings getting longer, radio activities in this section are on the upgrade. However, the SCM is not at all satisfied with the way ORS are reporting and unless every certificate holder reports regularly, the SCM will be obliged to make cancellations. Most of the boys are rebuilding and that can mean

but one thing, that every one is anxious to get back at their keys and receivers. Let's go, boys, and good luck. W1APL is on with a new 50-wattor on 14,000 kc. at his new location. W1ADO has been busy at Station WORC, pounding brass on the Morse wire. W1ASY has just been appointed ORS. Congratulations, OM. W1AFU is doing good traffic work and is working on all bands. W1BVR is on regularly and keeps at least two schedules each week. W1BNL is at his new QRA and will be looking for schedules after Oct. 1st. W1NS introduced a new ham recently, W1AJN, and took him on a trip to Springfield, Northampton and WIMK, where, I am sure, he was welcomed by the gang. W1CTF says it won't be long now before he will be sitting at his key five hrs. a night. Hi. W1BZJ is building a new set using a 50-wattor. W1BKQ, the Worcester Radio Assn., will reopen Oct. 1st, meetings every Thursday evening. Every one is welcome.

Traffic: W1BVR 7, W1AFU 31, W1ASY 6, W1APL 10, W1JV 4, W1BEG 8.

MAINE — SCM, G. C. Brown, W1AQL — Well, gang, out of nineteen ORS seven reported this month. What is the trouble with the rest of the bunch? It does not matter whether you handle traffic or not. Send in the dope on what is going on in your part of the State. There are a few of the gang who will lose their ORS ticket soon, if there aren't some reports within the next two months. Let's get going, fellows, and put the Maine Section on the map again. What say? Now that the SCM has got that off his chest, it is fitting and proper that a word be said about the Convention. The Portland gang sure put on a fine time and deserve a lot of credit. Those that were unable to attend sure missed out on a real Ham get-together. Next year we will all shake hands at Auburn and when the time arrives, let's all plan to go and help McShane, WIQY, put over the usual fine Convention. The Queen City boys received a pleasant surprise recently, in the form of a visit from Fred J. Elser, KA3AA. Readers of *QST* will, no doubt, recall Mr. Elser's article in *QST*, relative to his trip thru Europe in a Ford coupe, in which he carried a short wave station, Phil Gould, W1ALZ, took advantage of Headquarters' fine offer to attend the Eastern States Exposition at Springfield, Mass., and gave his assistance in running the Amateur Station. W1ESE, W1AFA is high man this month. FB, Bob, keep it up. W1BE, best at the key, is a close second. W1AHY reports that he has returned from his summer home at Peaks Island and wants some good schedules for this fall and winter. W1APU says that the Oldtown Wireless Club, of pre-war fame is to be reorganized. FB, OM, Mr. and Mrs. W1AJC report having schedule with RX1AA and handling traffic to and from his wife, who is vacationing in Maine. FB, W1OG, Belfast, wants a few schedules for this winter. W1BLI has received his ORS ticket and is looking for traffic. W1AUR reports very little activity from his station this summer. W1ANH says that he is looking for five Maine stations who are interested in scheduled traffic. There is your chance, gang. Drop Harry a line. WIQH is building an MOPA to be used on the 14,000 and 7000 bands. FB, Ben, W1KQ has returned from Northeast Harbor and will be on the air ready for traffic this fall. Jack Pierce, formerly of W1EB, was in town recently and had a rag chew with some of the gang.

Traffic: W1AFA 61, W1BE 62, W1FQ 30, W1QH 27, Mrs. AJC 22, W1AJC 12, W1BLI 20, W1OG 19, W1AQL 9.

CONNECTICUT — SCM, Frederick Ells, Jr., W1CTI — Hartford: W1MK is still pushing out tons of traffic and makes the BPL both ways. W1UE promises to be on the air before this is in print. W1ASD has been working on his portable and expects to have a good signal at W1JN this year. Waterbury: W1BBU has been appointed ORS and is on 3560 kc. looking for traffic. W1HD is back on the air with crystal control and needs some reliable schedules. Look for him on 3695 and 7235 kc. Windsor: W1AOI is on the air and has a schedule with W1CTI. Milford: W1AMQ visited the second district over a week end and is thinking seriously of xtal. W1HQ is rebuilding after blowing power supply. He paid a visit to the Bridgeport Radio Club. Norwalk: W1CTI returned from vacation and managed to find plenty of traffic in two weeks. W1BWM says his frequency meter doesn't agree with W1AXV. What happened to W1NE and W1BC? New Haven: W1BFM says he will be on the air again shortly after the summer lay-off. W1TD had trouble with his sky wire but has it all fixed now. W1BVW says QRL with a YL in Devan. W1AMG wants to hear from all those in the four southern counties interested in U.S.N.R. work. W1BQH-W1BI says school QRM keeps

him inactive. Middletown: W1AJB has a nice total and a good d.c. note. Where is W1CTB? Let's have a line from you and the rest of the gang on the 16th. Bridgeport: W1ZL reports that 28-mc. experimentation will be carried on at his station this year. Let's hear from W1BM and the rest of the Bridgeport bunch. Wallingford: W1CER sends in his first report, which is greatly appreciated. Welcome, OM! Danbury: W1ADW is the proud owner of a commercial ticket and has a wicked signal on 3500-ke. band. What has happened to W1OS. Reports would be appreciated! Newtown: W1VB is still pounding out. FB. The SCM would like to hear from any stations in the following cities: Stamford, Greenwich, Bristol, New Britain, New London and Torrington. Remember, deliveries are what count in the contest — QSP or deliver within forty-eight hours. We predict that the winning station will be the one who keeps regular, reliable schedules. Get busy and give the SCMs some competition. See you all on 3500 kc. — CTNITE — 15th of every month after 7 p.m.

Traffic: W1MK 395, W1CTI 43, W1AJB 35, W1AMG 15, W1AMQ 11, W1HQ 4, W1ASD 2, W1BBU 4, W1BVW 5, W1CER 2, W1HD 11.

EASTERN MASSACHUSETTS — SCM, Miles W. Weeks, W1WV — An unusual number of new stations have started reporting and the increased activity is most gratifying. At Norwood, two new stations, W1ATX and W1CAW start reporting. W1CQN is rebuilding. W1CCP has a new antenna and has improved his note after some Xmttr changes. W1ASI was able to get early news of the German planes via VE1AX. W1BKR is on with a new Mops. W1ABG took a N.Y.C. message from Newfoundland bound for Springfield, Mass. Hi. He has a new sked with W1ATA. W1WU has started up again on 3500 with some new skeds. W1LQ is on 3950 kc. and handled tlc from RX1AA. W1BXB was on a U.S.N.R. cruise. W1CRA says W1AJF will be spelling him until he gets well set at Harvard. While on his vacation, W1AAT visited VE2BB, VE2AP and Mr. and Mrs. W1AJC. W1AZE worked four continents on 14,000 kc. fone this month. Using plug-in Xmttr coils, W1KH can now QSY any of three bands in 20 seconds. He was QSO Brazil to show it had not affected his efficiency. W1WV was QSO Europe, Africa and the West Coast on 14,000 but is more interested in getting tlc skeds with S. Mass., R. I. and Conn. on 3500. W1LM reports tlc. W1BZQ is rebuilding for more tlc on 7000. W1AMB has moved to South Boston and starts reporting tlc. W1ACD also has ORS ambitions and a little tlc to report. He was QSO HAF5C on 7000. W1PS also submits his initial report. W1AVA sends in a good tlc report. W1ADK has moved and will have remote control in his new location. He and W1ANK will soon have their ORS appointments. W1BCF reports he has not moved to Detroit as previously reported but is still looking for tlc at Attleboro. W1ACH is the only one to make BPL this month. W1CHR has moved his station from his summer QRA at Nonquitt back to Brookline and looks forward to a busy tlc season. W1KY will soon have her station moved to the new Club quarters of the E.M.A.R.A. at 48 Lake View Ave., Cambridge, which will also house the new Club station. Visitors to Boston and vicinity are urged to drop in any evening. Official Observers in this Section are reminded that the SCM has received no reports from them for some time. Are you still "observing" or don't you hear any off-frequency stations now? Numerous complaints have been received of fone stations operating in the 3500-ke. band as much as 100 kc. outside of the allotted fone band. This form of unnecessary QRМ is particularly irritating and aside from being illegal shows poor sportsmanship when it is realized how many CW signals are blotted out by one such fone carrier.

Traffic: W1WV 152, W1CRA 149, W1BXB 127, W1ACH 121, W1ABG 110, W1BZQ 49, W1KX 48, W1AVA 35, W1CHR 34, W1AAT 33, W1AZE 31, W1CCP 26, W1LQ 17, W1BCF 12, W1AMB 11, W1PS 10, W1ATX 9, W1LM 8, W1CQN 7, W1AGS 6, W1ACD 6, W1CAW 5, W1WU 4, W1ASI 1.

VERMONT — SCM, Clayton Paulette, W1IT — Hello, gang. Here I am again after a very pleasant summer at Camp. Very glad to be back. Have got the old set dusted off and will be on the air fairly regularly from now on. We now have a very lively station in W1ATF, Harry Page, located at Hinesburg. He has been reporting regularly all summer. Keep it up. W1BD reports that he has been appointed N.C.S. of Vt. Army-Amateur Net. FB, OM. We are all with you 100%. W1BJP reports to say he has had tough luck as he burned out all tubes, chokes, voltmeter and two rheostats in his receiver on account of short circuit in tuning condenser.

Traffic: W1BJP 7, W1ATF 14.

NEW HAMPSHIRE — SCM, V. W. Hodge, W1ATJ — W1BFT and W1NZ are at N.H.U. where BFT has an MOPA on all bands. W1BJF is putting up a new mast and will have a new Hertz. W1AUU has been trouble shooting for the ECLS. W1CDDT ought to put out a mean sig with his new 250. xtal controlled. Congratulations to W1APK, who was married Sept. 10th. W1IP has been having transmitter trouble on 14,000. He says he will be going on 3500 soon and keeping his old traffic skeds again. W1MB is back on the air with a 210. W1BIS is trying a super-het on high frequencies. W1BAC says he has had trouble with his filter system but is still trying for that PDC note. W1NZ is using a 171 with 235 volts B hatt and gets good reports. W1UN spent a couple of weeks on the West Coast.

Traffic: W1P 23, W1APK 16, W1NZ 7, W1BFT 4, W1BAC 4, W1AUU 1, W1BJF 32.

NORTHWESTERN DIVISION

IDAHO — SCM, Oscar E. Johnson, W7AKZ — W7AFT reports two skeds which help his tlc total. Between "fighting" his Mesny burning out R.F. meters and worrying about rectifier tubes W7AT is having a "wonderful" time. W7ATX is a new ham in Coeur d'Alene. W7ACD says new a.c. tuner vy fb and that he is still on 3.5, 7, and 14 mc. W7FB continues to work on 7 and 14 mc. A deceased 210 is keeping W7AW off the air for a short time. W7AIH has his xtal on 14 mc. W7ACP is keeping 3 skeds. Dame rumor tells us that W7AFN has taken the "fatal step." What about it, OM? W7ALW works his fone on 3.5 and can now boast a commercial second ticket. W7AJQ has moved to Seattle where he will attend the U. of W. W7ACN paid a visit to W7ACD. W7AGH is having a lot of trouble with xmitters but is rebuilding again. W7AKZ has 50-watt xtal on 7 mc.

OREGON — SCM, Wilbur S. Claypool, W7UN — W7AMF reports listening all day for the Bromley trans-pacific flyers. W7AHS was his guest during the month. Coos Bay hams all have a.c. revrs working or under construction. W7WL has one which he thinks the world of. W7IF gets a nice bunch of tlc. W7ZD raised his first ZL station this month. W7APE sent in his first report. W7MV is having tuff time with his crystal grinding. Any one wishing to trade stn fotos should see W7QY, who just had some new ones made. W7AMQ boasts of a VK qso this month. W7AHX has two xmitters on now and is all set for coming season. He rounded up a lot of news from the Eugene vicinity. W7AHZ moved to a qra with no pwr leaks. FB. W7AHA is back on agn and will show a large report next time. W7UJ is using Push Pull. W7AAR is going to attend Oregon State College. W7PE repts one delivery. The SCM is back on air agn and has an 80-foot mast now. Many of the old reliables forgot to report. Wotsa matter? W7AP spent his vacation with the SCM. W7AJW is contemplating on moving the shack off the battleship. Let's all boost for Oregon in tlc totals. "ON TO OREGON!"

Traffic: W7AMF 34, W7WL 33, W7IF 32, W7ZD 27, W7APE 26, W7AMV 18, W7QY 16, W7AMQ 8, W7AHX 22, W7PI 2, W7AHZ 8, W7AHA 2, W7PE 1, W7UN 12.

WASHINGTON — SCM, Eugene A. Piety, W7ACS — W7AAE comes through with flying colors and breaks a hundred for the traffic lead this month. Every one reports that the wx is getting much better for radio and the traffic is increasing. Fine, let's have a few more reports now. W7QF sends in his application for ORS and says that he is rebuilding his 250 to crystal control. W7OV is now Route Manager for Western Washington. All you fellows who are interested in good skeds write to him and he will line you up. W7APR reports for the first time. W7KZ and W7AIT keep Olympia on the air and relay quite a few messages. W7BR is finally settled and promises to report faithfully from now on. W7GR in his first report says that all of his messages are handled on fone. W7RT takes second place by virtue of a W6 sked. W7BB's traffic has fallen off due to YLitis. Tuff! W7AG thinks he will have to move due to a 66-k.w. line in front of his shack. W7AQM also reports for the first time. The conditions in Everett are much better now according to W7TK. W7AEV would like to see more hams on 3.5 kc. where there is no interference. (?) W7BA merely reports messages. W7KT has his new comm. ticket after some intensive study. W7FJ is now ORS but forgets to report. Now that wx is getting better let's hear more regularly from you, fellows.

Traffic: W7AAE 102, W7RT 70, W7KZ 58, W7OV 44, W7TX 39, W7QF 32, W7AQM 30, W7BA 20, W7BB 14,

W7TK 14, W7GR 12, W7AG-SL 10, W7AIT 10, W7KT 6, W7BR 6, W7ACS 2, W7APR 1.

MONTANA — SCM, O. W. Viers, W7AAT — W7AAW and W7ASQ are the only stations reporting this month. W9CAA of Denver, the SCM of Colorado, is now in Helena signing W7ASQ. There are many stations in this section that can qualify for ORS if they will only take time to do it. We must have more monthly reports or we will have a small sectional report each month and there is no reason for it. What say, gang — why not liven up?

Traffic: W7AAW 20, W7ASQ 2.

PACIFIC DIVISION

SANTA CLARA VALLEY — SCM, F. J. Quemont. W6NX — The prospects of very successful traffic handling during the coming season appear good as the old reliables get down to schedules. With W6AMM back in the PI circuit and W6BYY lining up transpacific skeds, the message totals for the section should soar to new heights. W6HM is back on the air after a sojourn in British Columbia. W6UY and W6YG should make the BPL each month now that school has started. W6YG wants traffic skeds with the East Coast on 14 mc. W6YU has a new filter and antenna system designed for day-time operation. W6ALW is back on 7 mc. ready for traffic. To W6BMW goes the honor of reporting without a break for over three years; and each report contains traffic. W6DCP reports things picking up in Santa Cruz with the Club's transmitter at last on the air. W6EGV and W6CEO are some of the newer hams on the air getting into the traffic handling game. If all the stations of the Section report next month, a nice traffic sum should be realized. Please do your part.

Traffic: W6AMM 82, W6YG 49, W6ALW 38, W6BMW 22, W6DCP 12, W6EGV 12, W6CEO 2, W6YU 58.

LOS ANGELES — SCM, B. E. Sandham, W6EQF — This section's message total this month is 5791. This is the highest total this section has ever had, as far as records go, and is probably higher than the totals of any other section heretofore. Odd as it seems, our totals during the vacation months have all been high when normally they should be low. Those at home fill in the gaps left by those in the mountains and at the seashore and the SCM surely appreciates it. The A.R.R.C. sponsored an attractive booth in the Los Angeles Radio Show where 2408 messages were filed, 186 being transmitted from the xmtr at the show and the balance by other local stations. The Long Beach Club sponsored the quarterly banquet with 147 in attendance. Stunts were exhibited by most of the clubs and valuable prizes raffled. The South Bay club challenged the A.R.R.C. to a DX contest ending at the next banquet in December. The Pasadena Club meets every second Thursday with large attendance. A permanent meeting place is being sought. The Tri-County Club is still functioning but neglects to furnish the SCM with news for the report. The Bakersfield Club is functioning 100 per cent and preparing for fall dx and traffic. Other clubs please forward your activity news to the SCM. J3CR from Osaka, Japan, was a visitor in Southern California and called upon the SCM and other local hams through the courtesy of W6CXW who conducted him over the territory. W6QP is the high individual traffic man again with his PI sked. He guides the destinies of KNX xmtr thru the day and pounds brass all night hibernating. I guess, in the winter for lost sleep, W6AOA was second high man with show traffic. W6EKE has show tlc all over the house and is just getting cleared. W6ABR handled K6 tlc for show and has new MOPA with xtal reports as well as new ac revr. W6ETJ, chief Route Manager, was operator in charge at show and handled plenty at home. W6TE is QRL college but made the BPL. W6EGH handled all VK and ZL show tlc and was QSO Germany and France. W6ESA handled eastern show tlc and had unique experience which is being sent in as a traffic brief. W6EOG is installing 552 and experimenting on 56 mc. W6DEP is high Long Beach man in tlc. W6BXL returns from east where he was QSO many Europeans. W6CWT makes good start with tlc as new ORS. W6WO changed from Hartley to T.P.T.G. with two 852's. W6OJ is using new push-pull xmtr per Handbook and also turns in large total. W6AEO is heavy on traffic and will be new ORS soon. W6DLI sends in his usual large total of PI tlc, and his fone was heard in New Zealand. W6AGR has large PI total and is another consistent tlc handler. W6RF is the portable call of the A.R.R.C. W6AKW is still waiting for KAIAF to get back on the air for skeds, and is Army net control station. All you fellows craving traffic can get it on this net on Monday nights by contacting AKW.

W6EQF's fifty-watter works much better out of the socket now and he is after new one. W6BCK handled K6 show tlc and says dx is picking up. W6HT, President of the Long Beach Club has good tlc report. W6CIX returns from vacation and starts after traffic. W6ZBJ is QRL Y.M.C.A. at Santa Barbara but sends in his total. W6EAF is holding code class and boosts tlc at same time. W6LN is on air again at new QRA. W6VH is coming back after long absence. W6BGF is on week-ends only. W6EPH reports tlc and is QRL school. W6EAU has rebuilt and ready for fall dx and tlc. W6CZT has U.S.N.R. skeds. W6CUH is now temperature control xtal and worked ZS and eight other countries in one night. W6DZI switches from Hartley to T.P.T.G. and reports W6BJX is married and on his honeymoon in New York. The section congratulates him heartily. W6EXK has finished school so lots of ham radio now. W6BBO has new crystal and will have fb note on 7144 kcs. W6ID is still experimenting with his revr. W6AM has his xmtr at new QRA now with 90 foot feeders in his Zepp. W6OF has returned from his vacation and is moving to Riverside. W6ASM blew four miles and two 281's, so the soup goes back into service. W6AIX is on 7 mc. with fifty-watter and 3.5 mc. with 852. W6DZK sends in his last report before returning to college. W6EQD returns to school so not much radio for awhile. W6DLN says the South Bay Club is going to the convention 100%. W6ACL had difficulty spreading band on ac revr. W6FT is putting in xtal and will be on after September looking for tlc. W6EB toured the western states on vacations, working his brother W6EA from cities enroute. W6EA was heard by AUBAN. The following make the BPL this month, W6QP, W6EKE, W6AOA, W6ABR, W6ETJ, W6TE, W6EGH, W6BXL, W6ESA, W6EOG, W6DEP, W6OJ, W6AGR and W6EQF. That is certainly FB, fellows. W6DLV reports on Riverside activities. Plans have been made to make the Riverside Amateur Radio Club a much more interesting organization. W6AZY is President of this club. W6CFN is U.S.N.R. Commanding Officer, Riverside District. W6CUT and W6BAU are building new 50-w. xtal outfit. W6DLV is trying fone. W6FBE is planning a tour about the country with a portable transmitter to find the good locations and dead spots.

Traffic: W6QP 821, W6EKE 509, W6AOA 533, W6ABR 301, W6ETJ 318, W6TE 322, W6EGH 327, W6BXL 226, W6ESA 296, W6EOG 279, W6DEP 232, W6CWT 102, W6WO 107, W6OJ 119, W6AEO 120, W6DLI 120, W6AGR 180, W6RF 190, W6AKW 52, W6EQF 69, W6EAF 40, W6BCK 47, W6HT 46, W6CIX 43, W6ZBJ 42, W6LN 38, W6BGF 38, W6EPH 36, W6EAU 30, W6CZT 28, W6CUH 28, W6DZI 21, W6EEP 17, W6MK 14, W6CHW 14, W6EXK 13, W6BBO 11, W6ID 11, W6AZL 7, W6AM 7, W6OF 7, W6ASM 5, W6ALK 5, W6DZK 5, W6EQD 4, W6DLN 4, W6FJ 4, W6AKD 2, W6ACL 1.

EAST BAY — SCM, J. Walter Frates, W6CZR-W6GB — The section is back in its old form in getting the traffic in large figures due to some work by W6AQ, the CRM. W6AQ and some of the gang from the Oakland Radio Club established a station at the recent California Flower Festival at San Leandro and the traffic just rolled in. They started a new wrinkle in section booths by having a fone transmitter there and putting some of the high power local 3500kc. fones on the loud speaker for the patrons. That sold the public more than any pile of CW apparatus. The station was operated under the portable call of W6AQ as Houston has just been assigned W6ZM as a permanent call. W6DWI in Berkeley came within 800 messages of the total of the booth station, making a fine individual mark. W6ZX, just back on the air and a new ORS, complained that the traffic he handled almost kicked a hole in the floor when he dropped it. W6ALX handled considerable traffic as well as trying to establish a code class at San Quentin for convicts interested in ham work. W6BIW declares that school is still taking up a lot of his time. He still manages to handle a couple of skeds. W6BBJ besides putting out a FB fone signal on the 3500-kc. band, has been handling considerable traffic. W6BYS has done a lot — he handled considerable traffic, blew his 250-watter, had the mumps, bought a Chevy, and is now building a 250 watt xtal job. W6RJ has been dividing his time between the East Bay and the Seventh District. He is carrying a portable with him on his jaunts north. W6CIG, a new man to report, makes his debut in traffic circles with a FB total. W6BI says he is having a week's vacation at home so there is considerable rebuilding work as well as getting ready for a lot of traffic work. W6BZU out at Concord is still pounding the freaks out of the frequencies. HI. W6DQH is also making his bow with the traffic handlers this month.

W6CGM says he is getting the junk rigged up again, and is planning a 100-watt push-pull job. W6BMS has promised to handle some traffic next month. W6EBM left a mikeliformer on the train and wants to sue the company for it. W6CZN has applied for an ORS and is working on a new a.c. receiver. W6AUT has been deer hunting and consequently is not on very much. W6AMW reports from Gardiner, Maine, that the station is off as he has been assigned to the Marine Barracks at Philadelphia. W6BSB has reported from Hurry Inlet, Scoresby Sound, Greenland, that the Second Roumanian Arctic Expedition, CVH and XORC, is all ready to hit the air. W9CKF from Phillips, So. Dakota, spent a few days with the SCM and visited some of the local stations. W6LP has just gotten back on KDUY from the Orient and reports that the Hong Kong gang are going strong and want to work west coast hams early in the morning. He visited KA1PW while in Manila. The Oakland Radio Club has moved its clubrooms to 2044 Franklin St., Oakland, and has invited all visiting hams to call. The hamfest held by the club at the California Hotel was a great success. Howard Mason of the Byrd Antarctic Expedition gave a fine talk on the radio work of the expedition. W6ASJ has joined the Oakland Public schools and is teaching a class in receiving design at the Central Trade School in the evening. W6GQ is back with a 7½-watt transmitter after experimenting for a couple of days with a 50-watt. W6EDK is on temporarily from his new home in Oakland but expects to leave soon for the Orient. W6AWF is bound for China as one of the operators on the S.S. *President Monroe*. W6FK of San Francisco visited the local gang recently and described his recent contact on 7 mc. with ZS5U in South Africa, one of the first west coast contacts in some time.

Traffic: W6AQ 1814, W6DWI 1017, W6ZX 381, W6ALX 227, W6BIW 162, W6BBJ 110, W6BYS 66, W6RJ 48, W6CIG 27, W6BI 12, W6BZU 8, W6DQH 5.

HAWAII — SCM, L. A. Walworth, K6CIB — Hawaii held its first Hawaiian Section Convention on Aug. 8th and 9th with about 90 present. The boys had a good time and declared the event a great success and well worth while. August is the busiest month of the year in Hawaii with all Pineapple canneries running day and night. Several of the amateurs are employed in the Pineapple industry and ham activities are almost paralyzed since the Convention as a result of the rush of our second industry. K6DYC printed a handsome QRA book of Hawaiian hams which was sent free to all the gang. Many of the Honolulu hams made up a purse and are rewarding DYC with 500 two-color QSL cards for station K6YAJ, of which DYC is faculty advisor in Iahaiansula Tech. High School. The operators of K6EWB are still on Army Hospital report and our banner traffic station is still silent though it is hoped for only a brief time longer. Hawaii held the second place in the U. S. in traffic for three consecutive months and has been joking the Los Angeles gang about taking the Traffic Banner from them some time. L. A. took this quite seriously and their 52 ORS pushed the totals to 4400 last month. Hi, but Hawaii's 14 ORS have a job ahead now that looks big enough to discourage any one but a Ham. McKinley High School of Honolulu opened Sept. 2nd and the Radio Club there. K6YAL, is busy getting a 75-watt on 14 mc. and an 3.5-mc. fone for Inter-Island traffic. The 14 mc. station will operate most of the time during the school week between 8:00 a.m. and 3:00 p.m. Give them a buzz and be sure to QSL all completed QSO's. You will get a nobby QSL card in return for your QSO. K6COG has just installed two R3 Rectobulbs which he swears by — not at. K6CMP, the shortest ham in Hawaii, says he is growing his transmitter from a 210 into a 50, so big things can come from small packages. The traffic report this month from 16 stations follows, with K6CDD making the BPL.

Traffic: K6CDD 345, K6ALM 75, K6DPG 70, K6COG 42, K6BVP 28, K6AJA 24, K6CMP 24, K6EST 16, K6ERH 15, K6ACR 14, K6DQJ 8, K6DYC 6, K6CMC 6, K6ERO 3, K6EXP 3, K6CIB 2.

SAN FRANCISCO — SCM, C. F. Bane, W6WB — Conditions have improved somewhat over the previous month and our old reliables are once more entering into rather spirited competition. W6ERK leads off and makes the BPL on deliveries. Good to see George back in the running. W6BP has informed us that a certain YL induced him to start handling traffic once again; at any rate, his report is a considerable improvement over the previous month. W6DFR finally received his ORS certificate and lives right up to it with a sweet total. We are very glad to announce that there has been a new radio club formed in

S. F. We understand that this club is to be devoted to the development of new men who are attempting to get started on the air. They have adequate facilities for code practice, both fast and slow and welcome visitors at any of their meetings. The name is San Francisco Amateurs. W6DZZ was going strong with his Philippine skeds until he blew up his fifty-watt and power supply. Sure tough luck. OB!! W6WN reports for the third consecutive time which proves that Art is back to stay. However, he says that Pee Wee golf is a bad influence. Hi! Somebody ask W6ATI how to hit ducks from the wharf. Hi! Bob reports as usual. W6PW found little time to handle much traffic being extremely busy with several affairs for the radio club. We are glad to have two new reporters this time; namely W6ABB and W6CAL. We certainly hope that they will continue to report right along. W6ABB is quite active in the new radio club. W6CAL is a new fellow. Let's hear from you, OM. W6EKC has been pursuing the elusive DX and as a consequence hasn't much to report. He says the 3500-ke. band has fallen under the table and it is very difficult to work anything other than locals. W6ETR is still procrastinating over his new xtal layout. It certainly should be good after all this time. W6DK reports little activity; neither DX nor traffic. By the time you read this our Route Managers Traffic Contest should be well under way. Already we have received a number of entries and the competition is most keen. The first prize is to be a 3590-ke. xtal, the prize going to the station handling the most traffic over a three months period. There will also be a second prize; not as yet decided upon.

Traffic: W6ERK 123, W6BIP 105, W6DFR 71, W6CAL 26, W6DZZ 41, W6WN 18, W6PW 15, W6ABB 13, W6EKC 12, W6ETR 12, W6ATI 4, W6WB 4, W6DK 1.

NEVADA — SCM, Keston, L. Ramsey, W6EAD — W6AJP leads in messages this month. Most of the fellows are rebuilding. W6CRF is building a 3500-ke. crystal-controlled 'phone. W6EAD has a 3646-ke. crystal. W6CDZ is building a 3500-ke. 'phone. W6ATN and W6BAY are back to University of Nevada again and are ready to go on the air with a 210. The Nevada Amateur Radio Assn. had its regular meeting this month and has created a lot of interest among prospective hams, there being more new fellows than regular members at the meeting. All active hams in Nevada please get in touch with your SCM.

Traffic: W6AJP 16, W6CDZ 12.

SAN DIEGO — SCM, H. A. Ambler, W6EOP — Our old stand-by, W6ACJ, is back with us now and leads the section for the month. He says the east coast tle is going through in fine shape. W6AXV found time to handle a few and says he will be going strong again soon. W6DNS, after a good long rest, is on again and worked lots of DX and also handled some tlc. W6BGL has an early morning fone sked with W6EFD of EICentro and says it works FB. W6ADC reports a new Ford, new YL, college, etc., keeps him away from the key. W6EOS has had luck and broke his new xtal. He is using a couple of 50s in push-pull and says he got a good report from Chile. W6RAM worked east coast and says he is very QRL work but is getting a 50-watt ready and will have it going soon. W6EPF is still on 7 mc. but expects to have a fone set going soon. W6AEP has about finished his new set and will be on regularly now. W6BAS is very busy working and grinding xtals. The Pat Club is having their second banquet the 27th of Sept. and expect a good bunch from out of town. W6DNW is now on fone and says FB. W6DAI has a new xtal-controlled fone on the air now and says nothing like it. Hi hi. Several new hams have applied for ORS ticket and expect to soon be handling TFC.

Traffic: W6ACJ 145, W6AXV 39, W6DNS 36, W6BGL 14, W6ADC 11, W6EOS 10, W6BAM 10, W6CTP 6, W6EPF 5, W6EOP 4, W6AEP 3.

PHILIPPINES — Acting SCM, John R. Schultz, KA1JR — Received letter from Asst. CM E. L. Batteny stating that PI reports are filed too late to reach the printing press on time, so, gang, please hand in your reports earlier if you want to show up in QST. KA1HR leads in tlc this month. A 500-watt M.O.P.A. xmitter is under construction. KA1ZA is using Heintz & Kaufman portable xmitter. KA1PW works nightly and puzzles KA hams with his FB note. KA1HC is busy and has no time to ham. KA1XA is now using a bug. KA1EL is active but QRM by power leaks from MG near by. KA4HW prefers DXing to tlc handling. KA9PB's slogan is "early to rise and early to bed." KA1SU is a new stn using 50-watt CC xmitter. KA1RC is back on the air and active in tlc. KA1CE has a new op. Welcome, OM. KA1AW is homeward bound for States. We shall miss you very much, OM, and the gang wishes you "bon voyage."

KA1CM is handling skeds from KA1DJ. KA1DJ is rebuilding to 500 watts. KA1AC worked at KAA. KA1JR is now a half-KW sta.

Traffic: KA1HR 760, KA1AW 36, KA1JR 44.

ROANOKE DIVISION

WEST VIRGINIA — SCM, D. B. Morris, W8JM — Well, gang, the fall season is now in full swing, so why not get on the air and report your activity to me? Let's all help to make this a banner year for West Virginia. We can, if we will try. Remember, skeds mean messages, messages mean leadership. What say, gang? WSDPO besides working "VK" on 7 mc. sends in a big string of off-frequency stations. No West Virginia hams were included. Congrats, gang. W8BCN is now proud possessor of a two-letter call, W8QR. W8JM is getting parts together for a 3500-ke. MOPA xmitter. All traffic hounds, please note. W8DNN started something when he came to Fairmont on his motorcycle. Now Morgan of ex-W8ACZ has one, and has almost killed your SCM on several occasions. I expect a good many wish he had. (Hi)-(Hi). W8TI is attending W. V. U. and operating W8ZZD at the University. W8AYI and W8TI are brothers, and both passed the "commercial" test recently. W8AKQ informs the SCM that he is traffic manager of the R.R.O.L., a league composed of railroad "Morse" operators. W8HD sez "Behind on work after returning from Europe, so not much traffic." W8BWK reports that all the gang at Wheeling received notice to come to Pittsburgh for license exams. Luck to you. W8HOK keeps a weekly phone sked with W8CWA at Cleveland Airport, and reports that W8DMU, W8DNN and W8LT were visitors. W8AWT has an MOPA at Ann Arbor, Mich., in hopes of contacting his "pal," W8BOK in Clarksburg. The SCM had the pleasure of meeting W8DNN, W8ATE, W8CVK, W8AWT and W8DRL recently. All hams who are on the air and handling traffic, please report to the SCM on the 16th of the month. We need messages to boost West Virginia. Please report! All "hams" who are not ORS and feel that they can qualify, please get in touch with me and I'll see what I can do for you. Appointment position as Official Broadcast Station is also open to anyone who can qualify.

Traffic: W8BOK 45, W8JM 45, W8QR 20, W8DNN 21, W8SP 4, W8DPO 12, W8BWK 7, W8AWT 6, W8DRL 5, W8CVK 4, W8HOK 2, W8TI 2, W8AYI 2, W8ATE 1, W8DMU 1.

VIRGINIA — SCM, J. F. Wohlford, W3CA — The report this month is short on account of about all the active stations going to the first Virginia convention held in this state. Those who did not get there missed a real treat. W3CXM attended the convention and gave several very interesting talks. Should any of you fellows desire to join the Army Net, address Captain Baldwin, who will take care of you. W3CNM is very anxious for skeds with hams in this section. W3HY reports from Great Lakes Naval Training Station that he is returning to school at Danville and will resume work from his station there. W3CFL, ex-W8CFL, is also a newcomer in our section, and we welcome him. From the first report received, it appears this will be a real ham station with good traffic reports. W4FX and W4DP called to see your SCM while he was at convention. Sorry you fellows could not get over to the blowout at Richmond. Try it again next year or sooner. Those of you in this section who are interested in the U. S. Naval Reserve should apply to Lieutenant Wilson, U.S.N.R., Norfolk, Va., for information. The SCM would like to say that all reports should be in his hands not later than the 18th of each month. Those hams in this section handling traffic on 'phone should so state and send in the dope with the regular traffic reports. There is no restriction as to how you handle traffic just so long as it is handled properly and the report is sent in. We must boost our traffic handling, and now is the time to get started on it. We hope to have a great, big report next month. W3FJ is recovering from the Roanoke Convention.

Traffic: W3CXM 220, W3CFL 20, W3FJ 29.

NORTH CAROLINA — SCM, H. L. Caveness, W4DW — W4LY checks in with a long letter this month, in which he says amongst other things, that there is not much done in the way of traffic handling by the 25 or so Asheville stations. The most active stations at present are W4BC, W4HJ, W4LY, W4NJ, and W4TO. W4EJ applied too much voltage to his crystal with disastrous results. W4TO is working a type '10 crystal set and got a VK this month. W4LY got five continents in the DX contest, using a 50-watt Hartley in the 14-mc. band. He worked four continents on Labor Day. W4AEW, like the rest of us, has been making

some changes in his rig and has not been on the air much lately. W4ZB is high score man again this month. He reports handling messages for the Dickey Expedition, also some flood messages, and working Asia. He attended the Ham Convention in Richmond, visiting some in Greensboro, High Point, and elsewhere on the way. W4TS drops in the word that he has been too busy with other more vital affairs of life, to handle any traffic this month. W4JR is heard consistently on 3848 kc. with his crystal, and sends in a fair report for the month. He is one of the few AA stations in North Carolina which can be depended on for drill every Monday night. W4TN has returned to the University of N. C. to take up the study of law, and will be heard occasionally at the key of W4WE. W4AHH informs us indirectly that the reason we have had no reports from him for the past two months is that he has just taken unto himself a wife. Congratulations; and here's hoping that we will soon hear the YL congratulating at W4AHH. W4UI is getting good results with two type '10s in an MOPA. W4OC and W4DW spent a few days with WIAOF in September, and while there visited A.R.R.L. Headquarters, and General Electric in Schenectady. They looked up Grenlie in New York, and Hansen in Washington, two of the radio operators of the Byrd Expedition, and had long chats with them. W4EG has recently been very much thrilled at working some sixes and sevens early in the evening with his MOPA, using two type '10s and a single wire Hertz antenna on 7000-ke. band. W4PP and W4CC are heard on AA drills on Monday nights. W4RX with a couple of other Monroe hams stopped by to see W4DW while on their way home from the Richmond Convention. They reported a wonderful time and a very successful convention in every respect. W4ABV sends in the information that he must ask that his ORS certificate be cancelled as he is now a commercial operator and has sailed for Buenos Aires, S. A. He took a short wave receiver with him so as to keep in touch with ham radio in his off hours. He signed his card W4ABV-RXT.

Traffic: W4ZB 101, W4AWE 24, W4DW 16, W4JR 15, W4RX 11, W4EG 4, W4UI 2.

ROCKY MOUNTAIN DIVISION

UTAH-WYOMING — Acting SCM, C. R. Miller, W6DPJ — Activity in this section seems to be increasing now that fall is here, and Wyoming promises to come to the front at last. FB, fellows. Keep it up, W7AAG, in Ft. Warren, takes honors this month, and reports W7ATL lining up some skeds for traffic this winter. W6CNX is leaving to attend school in California. W7HX is keeping several skeds, and is still doing good work as OO. W7AAH is now an ORS. He and W7ALI had a fine vacation. W6BTX is back again, and is on regularly with a new set. W6EKF is very busy at KLO. W6DPJ is off temporarily.

Traffic: W7AAG 41, W6CNX 21, W7HX 15, W7AAH 11, W6BTX 9, W6EKF 4, W6DPJ 3.

COLORADO — SCM, C. R. Stedman, W9CAA — The Denver gang came through with quite a bit of traffic as a result of the Radio Show there. The bulk of the traffic was handled by W9ESA, W9AAB, W9ZE and W9FBK, the latter station being the station set up at the radio show. W9BQO and W9ZE are being added to the list of ORS in Colorado. W9CHK will probably consolidate with W9BQO. W9CSR handled no traffic, but may before the next report providing College life doesn't consume too much time. W9EFP has been busy with the fall harvest, but now that it is over will be ready for some Hamming. W9CDE is back with us again, but not on much these days. W9APZ is a new comer at Yuma, but is right there with the ham spirit. W9DQD is on 7000 and 14,000 kc. doing good work. W9AOD is another new ham, being located at Colorado Springs and working on 7000 kc. W9ECP is in Boulder now. W9GBQ is doing a little work on the air. W9BTO is still having trouble with filter condensers and is going to try electrolytic condensers for a change. W9CXG is on 7000 kc. now. QRA Burlington, Colo.

Traffic: W9FBK 64, W9ESA 46, W9DQD 29, W9AAB 24, W9ZE 20, W9GBQ 4, W9AOD 3, W9EFP 3.

SOUTHEASTERN DIVISION

ALABAMA — SCM, Robert Troy, Jr., W4AHP — W4KP, a new man, leads the state in traffic. FB, OM. W4AAQ is busy at WSFA, so hasn't been on much. The SCM was very pleased by visits from W4FY, W4QM, and W4HB. W4AJR is working everybody between school QRM. W4AKB has rebuilt his outfit and made a very fine job of it. W4ZX is having trouble with antennas.

We hear W4AEZ operating quite regularly but no report. How about it, OM? W4AHY has gone to the radio school at Ft. Monmouth. W4CY is promising to get on the air. W4AHP is off the air pending the arrival of a "B" eliminator. The batteries went west, and didn't return. W4LM is holding up the Birmingham end of the A-A net in fine shape. We received a fine report from W4DS. Some more of you fellows wake up and let me hear from you. W4TI seems to have QRM from something. Hi. W4CB was bitten by the YL bug. Another good ham gone wrong. Hi! *By the time you read this the SCM will be checking your frequency with an accurate meter. So as Floyd Gibbons would say: Watch your frequency!*

Traffic: W4CB 2, W4KP 45, W4AJR 12, W4AHP 17.
 FLORIDA — SCM, Harvey Chafin, W4AII-W4PAW — W4JO in Miami leads the section with a good total of 46 msgs. He had 550 volts of Burgess batteries all ready for U.S.N.R. emergency work during the recent hurricane. W4ACM, the reserve station at Tampa, is second in line this month. The SCM and W4OZ handle the key most of the time. Mr. Robbins of the U.S.N.R. station W4ALF sends in a fine report this time. W4PI reports that he is going away to the Bliss Electrical School and will not be on the air any more this year. He worked 70 stations this month with a single 210. W4SK reports two new stations in St. Pete., W4NU and W4LF. The latter one is the beginning of a branch or unit of the Tampa unit of the U.S.N.R. B08-W4BU is a station in Jax. and is the Hdq. Company, 124th Inf. of the Field National Guards. It is operated by Sgt. H. E. Heller, and W4ER. W4QL is back from his vacation and is getting into shape for the fall and winter. W4IH has just enlisted in the U.S.N.R. at West Palm Beach. He operates his own station at Boca Raton and sometimes W4ALF. W4KM handled traffic to W5AIN for the Marines. The following hams were present at the lam fest at Pensacola on Labor Day, W4QR, W4ACB, W4RK, W4ADV, W4HQ, W4VR, W4ALJ, W4MX, W4PN, W4FV, and W4MS. W4MX and W4ALJ are back on the air and want reports from you, fellows. W4QK is a new ham and will be on shortly. W4VR is still busy with his aeroplane and YLs. W4FV is tuning his set up for a big winter. W4PN is planning a portable transmitter as his work carries him over west Florida and southern Alabama. W4MS is on the air with a 250 set now and has a little dope on 28 mc. that he will give the gang soon. The XYL at W4MS is building a low power set to be used by her at Century. The house current is 220 d.c. Hi. FB for low power. W4QN has just built Parsons Chemical Rectifier as described in July QST and says it is sure FB. W4QN reports that W4SG is a new ham in Tampa at the *Tampa Tribune*. He is on the air every morning from 2 till 5 o'clock. W4ALH says t/c seems to be a thing of the past to him as he cannot find any one who has any. W4AGP reports a few msgs this time. The Jacksonville Amateur Radio Operators Club's officers are W4MF, President; W4UL, Vice-President; and W4RU, Sec. and Treas. W4ZV is so busy playing football that he cannot find much time to operate. W4QV is working on 14, 7 and 3.5 mc. W4ZU is also playing football but finds time to pound brass on the side. W4ZV had better follow W4ZU. Hi. W4IK over in Plant City is applying for his license to be transferred from North Carolina. W4NC is a new station in Jacksonville. I sure would appreciate it if all the new stations would make out a report and send it in to me on the 15th of the month. W4AGN has a new d.c. note on his 75-watt and is getting out well on the 14-, 7- and 3.5-mc. bands. W4TQ is a new ham using a 112 tube with 150 volts of "B" batteries. He is a seaman in the U.S.N.R. W4GD is trying phone. By the way, I would like to hear from you 'phone men up at Jax., Sanford, and Deland. I hear you fellows quite often and would like to have you report so the rest of the gang can know just what you are doing with your 'phone sets. W4ABL is still at the U. of F. and at WRUF also. The Gator Radio Club is meeting about the last of October and I expect to have more dope from them by my next report. W4FM has been working quite a bit of DX on 14 mc. lately. What is the matter with you fellows over at Clearwater? I don't ever hear from you any more. W4AIJ has moved to Atlanta to attend Ga. Tech. He is installing his set up there and would like to hear from some of the gang by radio. W4TK has been on his vacation. He says he caught a few tarpon and sailfish. Hereafter some of the stations reporting the activities of their stations later than the 15th of the month will not see their reports listed in this column because the reports must be in to me so I can make out my report for Headquarters. Come on, gang, and

let's have the best rite-up of any of the sections. Best of luck and DX until next month.

Traffic: W4JO 46, W4ACM 44, W4ALF 30, W4PI 31, W4SK 26, W4BU 18, W4QL 13, W4KM 9, W4IH 7, W4MS 9, W4QN 8, W4ALH 5, W4AGP 8, W4QV 3, W4ZV 1, W4AEM 5, W4FM 3.

WEST GULF DIVISION

O KLAHOMA — SCM, Wm. J. Gentry, W5GF — W5GF is going on with 250 watts soon. W5ABO is perking well on fone now. W5AAV is always building receivers. I wonder if he ever transmits. Hi. W5MM is rebuilding with about 500 watts xtal. FB, OM. W5ASQ is perking FB now and is open for skeds. Note: QRA Ponca City, now. W5VQ is the best relay station for ages now. Vy FB, OMS. W5CB is on again now that the hot weather is over. Hi. W5AFH is trying a little fone work now. W5QL is a FB 14,000-ke. fone station, too. Glad to welcome W5BQW from Mo. FB, OM, on your t/c. W5AYF is working some now and then. W5ALP has a fair t/c. report. W5OJ is a good t/c. station and is doing FB work. Glad to see W5AMC going so well. W5APG is a Jr. Grade Lieut. in the Naval Reserve NW, FB, OM. Like to see more work in Naval Reserve. Oms. Glad to get W5BMU's report. FB, OM. DX seems to be fair now with the gang. W5BIW is back on the air after laying off for the summer. Hi. FB, OM. Now, gang, let's get busy with this traffic and keep leading the division. What say?

Traffic: W5VQ 250, W5BQW 39, W5OJ 31, W5ALP 40, W5AMC 26, W5ASQ 26, W5BMU 15, W5CB 9, W5AYF 6, W5GF 2.

SOUTHERN TEXAS — SCM, H. C. Sherrod, Jr., W5ZG-W5VY — Things are picking up and, to judge from the increased activity, winter is rapidly approaching. Houston: W5BHO, Calk, the old reliable, reports as usual. The gang there are favoring low-powered fone in the 1750-ke. band. W5BKW reports rebuilding and no traffic handled. W5ASM is working fone in the 1750- and 3500-ke. bands and cw in the 7000-ke. band. W5BOC reports traffic heavy, and is working all states regularly. FB, OM. He surely helped the traffic total. This Houston gang is surely a live bunch! Tennant, W5TD (whose crystal-controlled signal is heard regularly on 7125 kcs.) sends in a nice report. He is on regularly, and those having traffic for Houston, should give him a call. W5EI, Ward, our Route Manager, has been somewhat inconvenienced by a pair of soft 281's and a bankroll in the same condition. Nevertheless, he is keeping schedules with W8AYH and W5BLD. Keep it up. That's what we need. W5BQE is a new ham in Houston. W5PK, DeBardleben, will be on shortly as he is working on a station between times at KTLC, Bay City: At W5ABH, Williams is the sole reporter. He has been off on account of shot filter condensers, but is contemplating an early return. Stay in there, OM, as we need every station in this section. Kerrville: McKnight, W5MT, not only reported by radio but sent a written report special delivery also. The Schreiner Institute has an active radio club with a station on the air using the call W5ZB. As there are four operators available there is plenty of traffic in prospect at this point. W5BKZ is rebuilding and will have two 250-watt tubes as power amplifiers. He will use a UX-210 oscillator. W5BKE is also rebuilding, but is on, nevertheless, and handling traffic. Send me a report, OM. W5ZB is looking for schedules in order to move student traffic. Those interested in traffic handling should get in touch with him. (Get in touch with W5EI, Route Manager, as he might be able to help you out, fellows.) For all of this dope on Kerrville the SCM is indebted to McKnight, W5MT. There seems to be lots of activity over in the vicinity of Kerrville, and the SCM is looking for more reports from the gang in the coming months. This is imperative if we are to make our section lead as it should. San Antonio: No reports from this city. W5AJS and W5AHA are heard occasionally. W5JC is also on intermittently, but no report from him either. Please drop a line to the SCM, fellows, so it will reach me before the 20th of the month. It will surely be a help to me in getting these reports out. Flatonia: W5AJD is seldom heard these days. What's the matter, Frank? Drop us a line and let us know what's doing over your way. Corpus Christi: W5AB reports being heard by FMR485 in Africa. He is on 7290 kilocycles and handling traffic regularly. Mighty glad to hear from Corpus, OM, and hope you can get more of the gang to report next month. Beaumont: W5AZ threatened to report. That's all. White. W5AFG, is still busy with the new fone set. Drop a card in the mail, Doc., and let us know how the

outfit is coming along. Port Arthur: W5AZS is heard on occasionally, and handles some traffic. Galveston: W5BQJ, Paul Weakley, is a newcomer in our midst. He is getting out well with one UX-210 and two UX-281's for power supply. W5AVC, Berg (Ex-KFR-5), is on regularly and is handling quite a bit of traffic. He certainly represents Galveston well, his consistency being admirable. If you fellows have any traffic for him listen on 7270 kilocycles and give him a call. There will be at least one more new station on the island by next month and for ham radio prospects this city looks better than it has in years. W5AUX is still working on the new crystal rig. However, it won't be long now before it's working. W5ZG-W5VY is working regularly on 7130 kilocycles and welcomes any traffic. Just a line to you fellows about reporting. It's awfully hard to get out this monthly report when most of it has to be gleaned from one's memory of the past operating month. A few words on a form 1 card would surely help if dropped in a mail box about the 15th of each month. There is no lack of good stations in this section, nor is there any lack of real honest-to-goodness operators, but when it comes to reporting there is surely a lack of ambition. We are all interested in the A.R.R.L., not only its activity, but also its progress, and the best way to coordinate is to keep the SCM advised as to just what you have done each month so this information can be incorporated in the monthly report. All of us are interested in what the other fellow is doing and the only way we all can find out is to drop a line to the SCM. Now a word about organization: In this section there is no real organization of any kind. Each station works for himself and, with the exception of a very few, there are no schedules kept. Why not organize a net comprising stations in each city where there are those interested? This arrangement could be made to function once each week, for example, and would not only provide a better outlet for traffic but would aid many of us in improving our operating standards. Think it over, OMs, and if you are interested and DEPENDABLE drop a card to W5EI in Houston. As yet there have been no applicants for the Official Broadcasting Station appointments proposed in this section. Two reliable stations are wanted, one in or near San Antonio and the other in Houston. This is a means that will serve to keep all members posted on the up-to-the-minute news of the League and is to the advantage of every member to consider.

Traffic: W5BOC 78, W5ZG 45, W5TD 36, W5EI 10, W5AB 9, W5ABH 1.

NORTHERN TEXAS — SCM, Roy Lee Taylor, W5RJ — W5BAM and W5HY tied this month. Gene reports conditions getting better in Dallas. W5HY says we need more traffic stations and less "gab." W5RJ is proud possessor of a seven-pound rig, so not much radio. Hi! W5ASP, our Route Manager in Wichita Falls, wants skeds all over Texas. Write him, boys. W5AAE is working on 3500 kc. with "rotten" plate supply but hopes to have mg going soon. W5JV is still trying to get his xtal set going. W5BIP reports traffic poor down his way. W5ARV received a QSA 5 R6 report from LU the first day on with filter. W5RH requests the gang to look for him under the call of W5RH instead of W5BBF as heretofore. W5BBF is now his portable call. W5LY is rebuilding, hence, no tic. W5BJN, W5BQN, and W5BQT are all new stations in Fort Worth and we hope to have some tic reports from them soon. W5BG's ORS is cancelled by request due to inactivity. W5ATZ's ORS is also cancelled by request on account of college work. W5BAT's OBS is cancelled due to inactivity. We are badly in need of several live-wire ORS, also OBS. Let me hear from you, fellows, if interested.

NORTH TEXAS RADIO ASSOCIATION IS ORGANIZED

The third meeting of the North Texas Radio Association was held in Fort Worth, Texas, on September 21, 1930, at 2 p. m. in the Recreational Building. Eighty-one members of the Association were present. Talks on antennas and traffic handling were given by Mr. Mashburn of KKJ and Mr. Haling of W5HY, respectively. Various contests with some excellent prizes, not to speak of plenty of ice cream and pop that was furnished by the local Association of Commerce, tended to create a friendly spirit among those present.

A permanent organization was formed at this meeting. The following officers were elected by unanimous vote: Roy L. Taylor, W5RJ, 1500 St. Louis Ave., Ft. Worth, President; Frank M. Corlett, W5ZC, 2515 Catherine St., Dallas, Vice-President; and Will A. Shaw, W5ARV, 1215 St. Louis Ave., Ft. Worth, Secretary.

The next meeting is scheduled to be held in Dallas, Texas,

early in January. The exact date will be announced later. A cordial invitation is extended to all amateurs to attend this meeting. These meetings are not to conflict in any way with the annual West Gulf Division Conventions.

Information regarding these meetings will be gladly given by any of the above officers of the organization.

Traffic: W5BAM 52, W5HY 52, W5RJ 21, W5ASP 15, W5AAE 14, W5JV 11, W5BIP 10, W5ARV 6, W5RH 3.

NEW MEXICO — SCM, Leavenworth Wheeler, Jr., W5AHI — W5AJL did all his work with a low-power 14-mc. rig this month. W5EF continues punching holes in our rarefied atmosphere — what variety of rock do you use in that crusher, OM? Hi. We welcome to our midst W5BQE at Las Vegas. W5ND reports several new prospects in that dead "burg." Hi! The SCM was favored with a visit by W5AJL, W5AOD, and W5AOU. Four daily skeds and the traffic from the radio shows put W5AHI over the top again.

Traffic: W5AHI 278, W5AJL 29.

CANADA

I have just received a letter from the Radio Department at Ottawa in answer to a number of letters to them complaining of the interference in our bands from Mexican station XDA. Most amateurs were of the opinion that Mexico was not a signatory to the International Radio Telegraph Convention, Washington 1927, and that it would be useless for us to make a complaint. However the Dept. now informs us that Mexico ratified the convention on the 28th of March 1929 and that they will go into the matter further with a view to taking such steps as may be considered necessary to stop the above interference.

Now that daylight saving is over for another year and the long evenings and real radio weather with us let's get back to the shack, roll up our sleeves and go to work telling the world what a wonderful game this amateur radio of ours is.

Don't forget Wednesday nights for Canadian contacts.

CANADIAN GENERAL MANAGER

Alex Reid, VE2BE

QUEBEC DIVISION

QUEBEC — SCM — Alphy Blais, VE2AC — The amateurs have been roaming along this month.

VE2AA visited VE2AC, VE2BE, VE2CA. The SCM dropped in on VE2BE and had tea at VE2CA. The XYL is as good a cook as she is a brasspound. VE2CL got his dope on reporting that evening. VE2AP has been going around helping the "hams" in need. VE2BB had a few "W" visitors and came himself to greet VE2CA. VE2BH is going to Toronto and will be working with a new call. Sorry to lose you, OM, VE2BB is quite satisfied with his AC receiver. VE2BD is hamming around with the YL's. VE2AP is quite alive working on CW and phone on 14 mc. He uses C.C. Alex, VE2BE, has a Zepp at last; so has VE2AC, VE2CL and VE2CA reinstalled his. XYL at VE2CA worked XYL W8CNO and they kept going chewing the rag two hours running. Now, can you beat that? DX has just been picking up. VE2AP worked several "G" hams. VE2AC worked LU, PY and NJ. Traffic has picked up somewhat. Let's get going this fall and make this season more successful than ever. Say, boys, give a hand to the new fellows just come in with us. VE2AA is going to England soon. VE2AC goes to Washington next month.

Traffic: VE2AP 19, VE2CA 23, VE2BB 15, VE2BE 14, VE2AC 7.

MARITIME DIVISION

NOVA SCOTIA — Acting SCM, A. M. Crowell, VE1DQ — VE1CC has at last got his M.O.P.A. to perk and says it is very FB. VE1AS has changed to T.G.T.P. push-pull and thinks it much better than his old push-pull Hartley. VE1DA has been getting xtal reports on his 7000-ke. sigs. VE1DM and VE1BR are still pounding away as usual. VE1AB is settled at last and is using a gas engine to drive his gen. (VE1DQ is also playing with a portable which uses gas engine for prime mover. Hi!) VE1DR reports things very slack but should soon perk up with better wx coming on. Many of the boys are trying out

newly rebuilt xmitters and getting ready for a big winter of DX. Labrador: NE8AZS at Battle Harbour, Labrador, will be on the air sometime in November or December. Watch for NE8AZS on about 8330 kc. (36 meters) and 7890 kc. (38 meters).

ONTARIO DIVISION

ONTARIO—SCM, E. C. Thompson, VE3FC—Central District: VE3BC is back with a vengeance and says that he hasn't started yet. VE3FO has decided that school work cannot bear interference and has presented his complete station to VE3BC, so watch your records, gang. VE9AL is keeping regular schedules as usual and constructing a new receiver, a shortwave super, no less. He is also preparing to put a new 'phone set on the 14-mc. band. VE3GT has been doing excellent work in the way of schedules with one of the Ft. William gang, and says that he is open to sked any station that handles Canadian traffic. VE3AD is back from Muskoka, where he and VE3CR had a very good time working everything in sight. VE3DA is back again in harness on 3750 kc. and will welcome traffic schedules. He states that VE3NV, VE3EZ, and VE3BI are also now in action in Belleville. Welcome, fellows. Let's hear more from and of you. VE3GK is still rebuilding but keeps using 3550 kc. nevertheless. GK also enjoyed several contacts during the month. VE3DW says that the 201A is still doing well, and that the locals are beginning to be heard on 7 mc. once again. He also has three potential amateurs learning the code, and a push-pull transmitter is in course of construction. Southern District: Members of the Southern Ontario Radio Association held a picnic together with OWs, YLs and families at Kingsville Park on Sept. 7th. The following hams were present: VE3DG, VE3XL, VE3TM, VE3OC, VE3AA, VE3XA, VE3EC, and VE3FB. They all showed their youth by playing no less than fifteen innings of softball. Some of the fellows had such a good time that they wanted to hold a picnic every week! Northern District: G. V. Lawrence, VE3ET, Acting SCM—With the advent of good weather, activity in this district, rather than increasing, seems to be on the wane. What's the matter, gang? VE3HA did good work this month but we are unable to list his total as his traffic report is tied up somewhere in the mails. VE3BD says there isn't much doing up his way but he is getting ready to take part in the Trans-Continental Chain which we hope to put across this winter. VE3ET is on 7200 kc. occasionally. VE3HA is an ORS prospect.

Traffic: VE3BC 42, VE9AL 18, VE3GT 16, VE3AD 8, VE3DA 3, VE3GK 3, VE3DW 3.

PRAIRIE DIVISION

MANITOBA—SCM, A. V. Chase, VE4HR—Much rebuilding is being done by the gang in preparation for the winter activities. VE4DK is back from the East. He has remodelled his transmitter and receiver, and is now attacking the antenna system. VE4FV has been operating his Ultraudon during vacation in Winnipeg. He worked nearly all Canadian and U. S. A. districts, using a 201A. VE4GQ has fixed up his garage to accommodate a newly built M.O.P.A. Three operators will be available to keep the station running, and much traffic is expected to be handled by them. VE4DJ, on vacation in the West, spent a most enjoyable time in Calgary with the gang. VE4BU is arranging schedules. VE4FP submitted his first report.

Traffic: VE4DJ 11, VE4BU 6, VE4HR 1.

SASKATCHEWAN—SCM, W. J. Pickering, VE4FC—Only one station out of all those in Saskatchewan reported this month. What's the matter, fellows. Aren't you doing anything that you think the rest of the gang would be interested in. If you are, let's have it, especially traffic reports. Why not try and make this winter's activities the best yet. VE4BB has had quite a number visiting him; VE4BL, VE4E and VE4CN. He also called on VE4GR. Three new stations are on the air at Rosetown and two in the making at Biggar.

Traffic: VE4BB 3.

VANALTA DIVISION

BRITISH COLUMBIA—SCM, J. K. Cavalsky, VE5AL—Looks very much like the gang had too much convention in Victoria and haven't recovered in time to get in a report. VE5CC and VE5CK are two new hams in Vancouver and we understand there are some more coming up. VE5AG has arrived back in town but has trouble with his xmitter. VE5AC is getting out from his new location and handled some traffic. VE5AL is remodeling for

the fall session so hasn't been on very much lately. VE5DD has been on vacation and is now getting his heap ready to go again. VE5EP is still playing with his set. VE9AJ blew the lone rectifier tube. VE5AN and VE5CW brought home the bacon from Victoria. VE5BM is busy but still holds down his sked. VE5GT says things are bad in Prince Rupert and he has a hard time raising anyone in B.C. VE5CY has moved from his old home. VE5DX and VE5CM are back again. VE5CO would like to know how to eliminate the arc light arm in Victoria. VE5DU is practicing on his home made bug. VE5EC is boasting about his first ZL worked. VE5CB is sporting a new receiver. VE5HR is looking for more power. VE5HK and VE5EA are back on the air. VE5CJ has returned from the East. VE5DQ is on 3500 with low power and it looks like he is going to have plenty of company before the winter is over.

Traffic: VE5AC 7, VE5BM 5, VE5AL 2, VE5EC 14, VE5CO 2, VE5GT 5.

LATE AND ADDITIONAL REPORTS

W1AWE reports direct to HQs that he is busy at this season as a radio service manager, but expects to have new set on the air shortly. W8ON reported traffic handled too late for inclusion in Western New York report.

Traffic: W8ON 144.

Traffic Briefs

Uda B. Ross, W2UD, is now in charge of Western Electric sound movie work in Peru. His headquarters are at Lima and he has a 10-watt push-pull transmitter on the 14-mc. band under the call OA4W. He is anxious to QSO the states, especially New York. His QRA is care of American Commercial Attaché, Lima, Peru. Give OA4W a call, if you hear him, fellows.

W8APQ says he is ORS—"the Only Radio Station around Martinsburg, Pa." Hi.

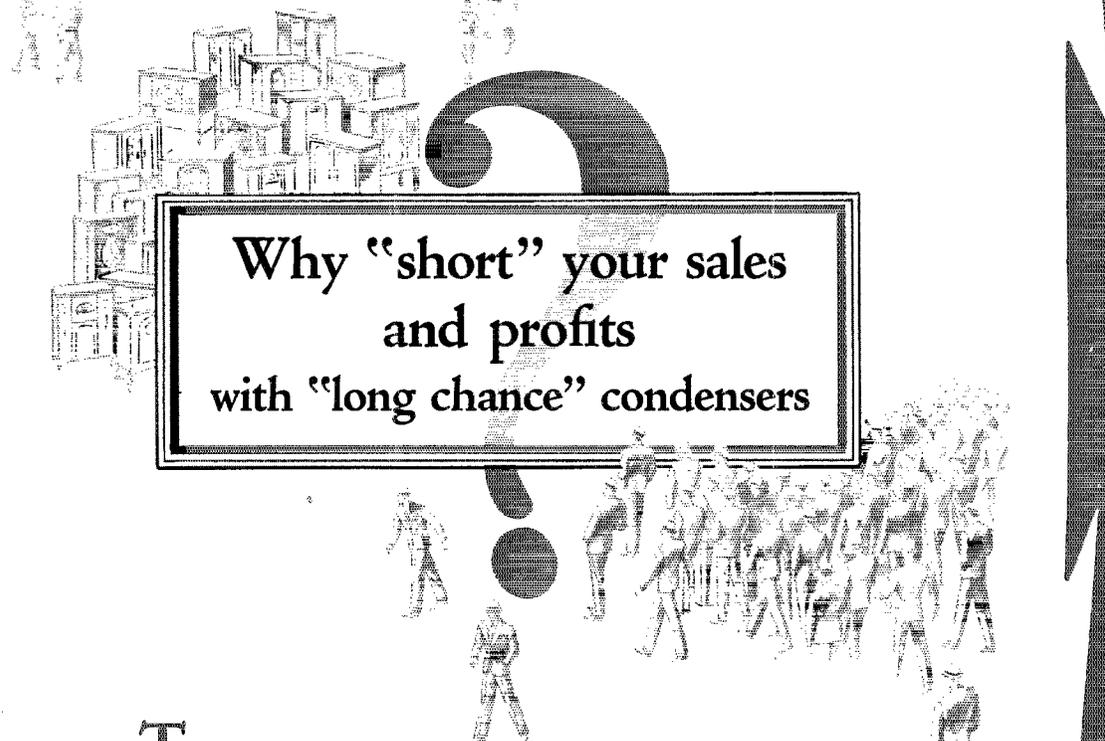
It has been called to our attention that Willis Hudlin's (star pitcher of the Cleveland team, American League) call letters are W8BSG, not W8BGS as stated on page II, C. D. September QST. We stand corrected on this!

QSO ENDURANCE CONTESTS

Something entirely new! The "endurance contest craze" has hit this country pretty hard. We read in the newspapers daily about "dancing," "airplane," "tree-sitting" (hi), and many other kinds of endurance competitions but up to the time of receipt of a letter from W2AMT we hadn't thought of "QSO Endurance Contests."

The idea of the "QSO Endurance Contests" was hit upon late one night while W2AMT was working W4ABS. Both W2AMT and W4ABS had lots of time on their hands, and had no necessity for worrying about lost sleep, so they decided to try to maintain contact for as long a time as was possible, or rather to make an "endurance" record. Perfect contact was maintained for three hours and forty-two minutes, at the end of which time atmospheric conditions became very contrary, and inside of ten minutes both stations had faded completely out.

W2AMT and W4ABS challenge any one to break their present record of three hours and forty-two minutes. We shall be glad to hear from contestants, but must request that the following rules be complied with. Each amateur must submit an accurate excerpt from his station log covering the QSO. Suitable notations must be made in the log at least once every half-hour. The QSO may be counted only for the time that both stations are readable. Should either station go out of audibility the QSO must be called "ended." Log excerpts must be mailed to QSO Endurance Contest Manager, Communications Department, A.R.R.L., Hartford, Conn. Unless logs are received from both stations in question and unless these logs agree, no credit can be given. How does it sound, fellows? For the present we will consider that W2AMT and W4ABS hold the record. When their record is broken we shall announce the standing of the new record-holders in QST. Let's get started with these QSO Endurance Contests and see who can successfully challenge the W2AMT-W4ABS combination.



Why "short" your sales and profits with "long chance" condensers

THE period in the life of any receiver, of greatest importance to its manufacturer, is *after it is sold!* The manufacturer is not merely selling an item of merchandise—he is really selling a *service*. If that service is imperfect—subject to interruptions—it is a direct reflection on the integrity or ability of the individual or firm who built the set. As such it cannot help but injure their business and standing in the trade.

Set builders and manufacturers who expect to profit from the sale of products turned out on a *price* basis, alone, are not only laying up future trouble for themselves—but for their distributors—and for their dealers as well. Short cuts to quality are too apt to develop into short circuits! Every musical note, every

syllable of speech that a set reproduces is affected by the quality of the fixed condensers. They must store, transfer, or stock electrical energy with unfailing accuracy and minimum loss. Why risk reassembly and service losses by using "long chance" condensers with uncertain dependability? Sangamo Fixed Condensers are accurate—and *stay* accurate! Sangamo standards of precision have made it possible for manufacturers and custom set builders to eliminate condenser troubles. The standard line of Sangamo Fixed Condensers leaves the factory tested to maximum variation of 10%. The reliability of these ratings is attested to

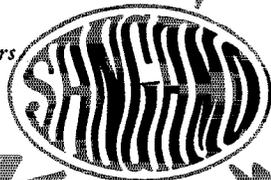
by a number of nationally known radio manufacturers. Sangamo is equally reliable as a source of supply.



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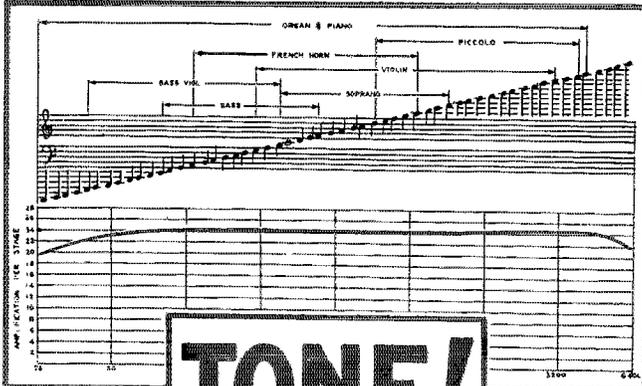
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Nothing takes the place of TONE QUALITY in a radio receiving set



TONE!

Curve of Type "A" or Sangamo Straight Audio Transformer showing uniformity of amplification at all audible frequencies.

Sangamo Transformers in the "audio end" insure true tone!

"X" Line Transformers

Type AX straight audio amplification. List price.....\$6.00

Type BX Push-pull Input unit. List price.....\$6.50

Type CX-171 Push-pull Output Transformer, for 171 or 250 power output tubes for cone speaker. List price.....\$6.50

Type DX, same as CX except for 210 and 112 power tubes. List price.....\$6.50

Type HX Push-pull Output for 171 or 250 Power Output tubes to match the impedance of moving coil of Dynamic loud speakers. List price.....\$6.50

Type GX, same as HX except for 210 and 112 power tubes. List price.\$6.50

Type E Output Choke to match impedance of the various type power tubes. List price.....\$5.00

"A" Line Transformers

Similar to X Line but with special core metal to give greater amplification at low frequencies.

Type A straight audio amplification. List price.....\$10.00

Type B Push-pull Input Transformer for all tubes. List price.....\$12.00

Type C-171 Push-pull Output, for 171 or 250 type power tubes with cone speaker.....\$12.00

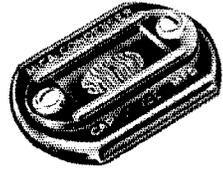
Type D-210, same as C except for 210 and 112 power tubes.....\$12.00

Type H-171, Push-pull Output for 171 or 250 power tubes for Dynamic Speaker. List price.....\$12.00

Type G-210, same as type H except for 210 and 112 tubes.....\$12.00

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The Sangamo Type "A" Condenser



Every sound characteristic is affected by the quality of the fixed condensers in a set. Sangamo builds accurate mica condensers, molded within an overall enclosure of genuine bakelite with only the terminals brought outside. Moisture, heat, shocks or jars will not alter their characteristics nor affect operation after the set leaves the factory.

Sangamo "Illini" Condensers



"Illini" Condensers are standard with those manufacturers who insist on ratings being actually what the specifications call for. Manufactured by exclusively designed equipment, held to the tolerances your engineering department demands, Sangamo Condensers will reduce to a negligible quantity inspection department rejects and "reassembly" losses in profit.

Sangamo High Voltage Condensers

Tested at 5000 volts D. C. and 3500 A. C. and built to Sangamo standards, known throughout the radio world, amateurs, commercial men and manufacturers have learned to depend on Sangamo High Voltage Condensers. Accurately rated and adequately tested—these condensers offer the maximum protection in high voltage, high frequency circuits.

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