

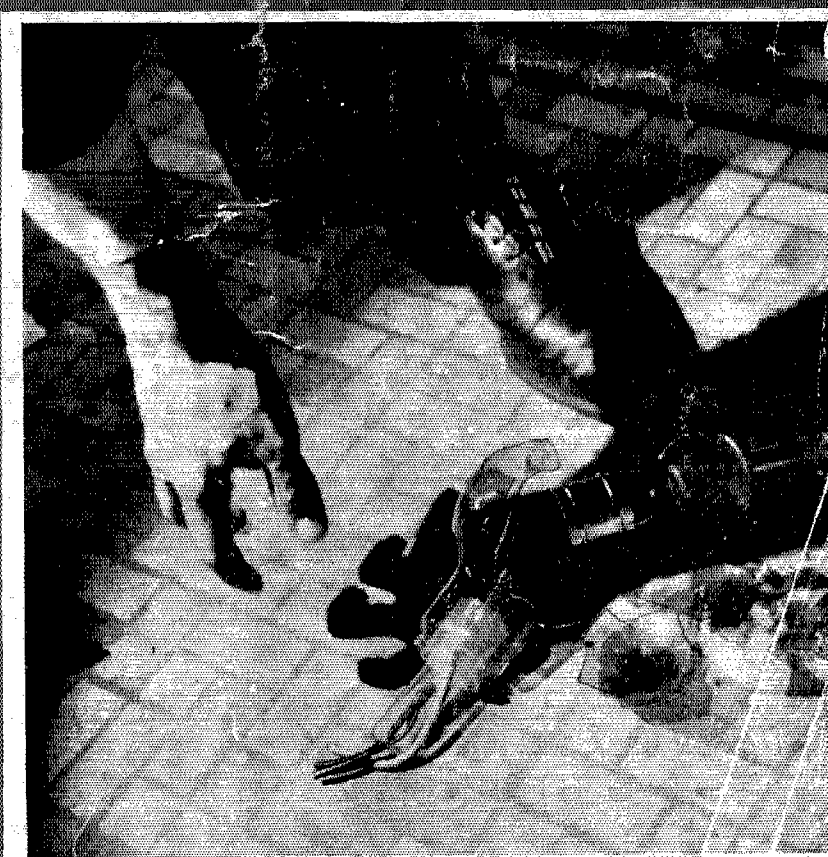
**QST**



devoted entirely to

# amateur radio

January  
1932  
25 cents



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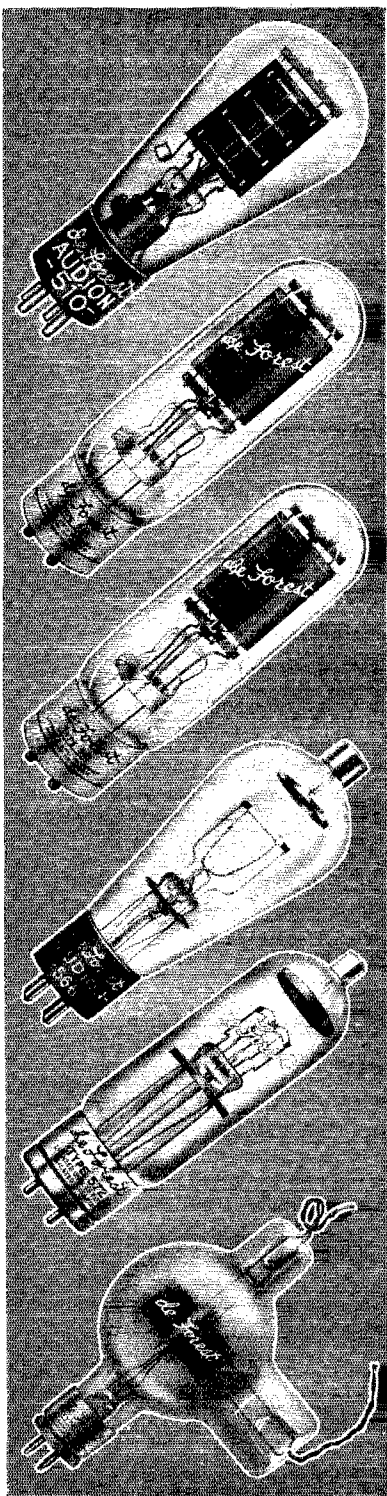
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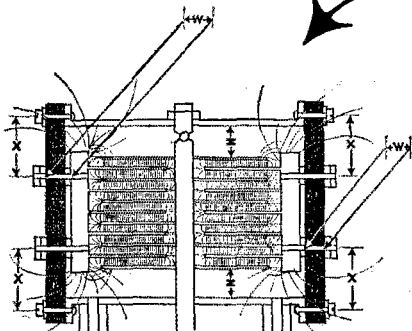
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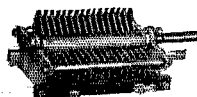
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## AMATEUR RADIO

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**JANUARY  
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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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# • EDITORIAL •

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WE RADIO amateurs are the champion "Just Supposers" of all time. Our entire structure has been built up by just supposing. By just supposing, we broke into "wireless" immediately Marconi showed that there was such a thing. By just supposing, we dug up what had to be done to make the useless two-hundred-meter wave useful. By just supposing, we discovered that a strong brotherly spirit could be created, out of which we built our A.R.R.L.

By just supposing, we found a way to use one hundred meters and work two-way across the Atlantic with certainty. By just supposing, we found there was a way to use forty meters and then twenty meters and then ten meters and then five meters. By just supposing, we were led to carefully pick over a lot of different men and finally select those whom it would pay to train. That we picked well is evidenced by pointing to our headquarters staff of to-day and to the men there who have given the best years of their lives to A.R.R.L. and amateur radio, and who know the business end of operating an amateur radio organization.

My own long years of experience as your president are an example of just supposing. I am a confirmed just-supposer. There isn't anything I would rather do than to sit down in a group of congenial radio hams and "just suppose" for an hour or so. It was doing just this with my son Ham and a gang of his friends, when they were mere lads, back in 1910, that got me into amateur wireless in the first place. Later on, it was just this that led Tuska and me to suggest the A.R.R.L. idea. It was just this that led me into becoming one of the pioneers in the automobile development in 1893, that led to the founding of my life's business, that led to the founding of The Amateur Cinema League several years ago, and to every worth-while thing I ever did.

Just suppose we were to keep up this just-supposing. Where is it likely to lead? Consider first where it is leading right now. There are more new amateurs being made than ever before in history. There are more licensed amateur stations than ever before in history. The Department of Commerce and the Federal Radio Commission have to spend more time on amateur radio matters than ever before in history. Our A.R.R.L. activities are greater than ever before in history. Headquarters is called upon to do more work in the way of service to members than ever before in history. The standing of amateur radio and our A.R.R.L. before our Government and the public at large is higher than ever before in history. The standing of amateur radio in foreign countries, heretofore all but hopeless, has begun to show the most encouraging signs in all history.

Now just suppose this steady advance is maintained; that the nations of the earth continue to get better and better acquainted with each other; that the fear of uprisings and revolutions grows less and nations gradually relax their absolute control of communications and permit their citizens to communicate freely with each other as we do in America. Isn't it possible that what we now call amateur radio may become really world-wide? That children in school will be taught to telegraph the way they are taught to read and write? That the day may come when almost everybody will be hooked up by citizen radio the way almost everybody in the U. S. A. is independently connected up by good roads and automobiles?

Just supposing such a day were to come! The pioneers who blazed the way and fought the battles to preserve amateur radio and our A.R.R.L. and our I.A.R.U. will have something coming to them from future generations of men.

H. P. M.

# Selectivity in Radiotelegraph Reception

## Audio and Radio Frequency Selectivity—The Application of Band-Pass and Low-Pass Filters—The Simplification of Their Design and Construction

By Ross A. Hull, Associate Editor

**A**MATEUR radio still fairly reeks with problems. There is, for example, the bewhiskered one about selectivity in the radiotelegraph receiver. It has been sitting around on the shelf for two dozen years at least and only on occasions has it been lifted down for examination. Historically, the nature of the problem has not always been the same. Before the days of tube transmission, the business of reducing interference was chiefly a matter of giving the transmitter a characteristic tone and then depending on the ear to sort it from unwanted signals and noise (remember those trick spark gaps and endless arguments about the "best note"?). But the selection of a single signal, when there were two or more similarly toned stations within a few hundred thousand cycles, was just a fond and quite nebulous hope.

Tube transmission and beat-note reception brought about quite a revolution in the realm of selectivity. Immediately, it became possible to separate stations a few thousand cycles apart. It seemed that nothing more in the way of selectivity could be desired. To a degree, this semblance of finality still appears to be accepted.

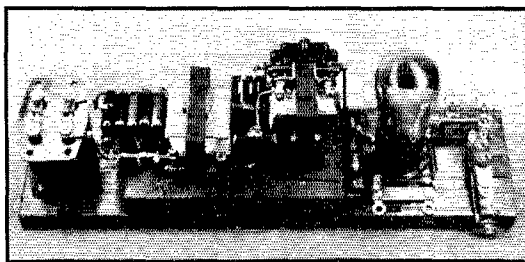
With the idea of retaining some degree of clarity in this discussion let us explain, first off, that selectivity, as it interests us at the moment, is that characteristic of a receiver which aids in the reception of one signal by reducing interference from the signals of other transmitters on adjacent frequencies. Its attainment in a "code" receiver and in a receiver designed for speech or music are two entirely different problems as we shall presently see. In the latter case, the receiver must accept a whole band of frequencies put out by the radiotelephone transmitter—a band of frequencies comprising the carrier and its modulation. At the same time, if the receiver is to be selective, it must reject all frequencies belonging to the outputs of other transmitters on adjacent

frequency channels. In practice this is accomplished by the use of several tuned circuits operating at radio frequency and designed to pass a band of frequencies about 10,000 cycles wide. The number of tuned circuits and their electrical quality influence the ability of the system to pass a well defined band of frequencies and to attenuate all others.

In the c.w. telegraph receiver we have a very different state of affairs. In this case, assuming that the transmitter is emitting an unmodulated signal, we are concerned with receiving a single frequency only, and any practicable degree of radio frequency selectivity could not prevent us from doing it. The actual signal produced in the phones is, of course, the beat-note produced by heterodyning between the oscillations of the detector (or local oscillator) and those received from the transmitter. The note itself is of a frequency equal to the difference between the frequency of the transmitter and that of the local oscillator. Because of this it will continue to be audible, as the receiver is tuned, until the difference frequency is beyond the limits of audibility or outside the band of frequencies passed by the

audio amplifier and 'phones. Actually this means that in a c.w. receiver which passes audio frequencies up to 5000 cycles the signal will be audible over a band extending 5000 cycles on each side of the point at which the local and received oscillations are of the same frequency—the point of "zero-beat." In such a receiver, receiving

an unmodulated signal, even the highest possible degree of radio frequency selectivity cannot reduce the spread over which the signal is audible. In the case of unwanted signals there would be some effect but it is certain that a sufficiently high order of radio frequency selectivity to prevent unwanted signals from reaching the detector and showing up in the output is utterly impractical in any known form of high-frequency receiver. We need



AN EXPERIMENTAL FORM OF BAND-FILTER UNIT

*Fitted out with an extra audio frequency amplifier, the unit is suitable for attachment on the output of any existing receiver. The band-pass filter proper comprises the apparatus on the raised portion of the base.*

selectivity measurable in cycles, not kilocycles; and radio frequency selectivity of that sort is a remote probability at present, to say the least! We can play all sorts of tricks, however, if we start working on the audio frequency end of the set.

Should we arrange the audio amplifier so that it passes only the frequencies below 1000 cycles, it would mean that a beat-note could be heard only for 1000 cycles on each side of zero-beat. Or if we fit out the audio end of the set with a filter which would pass only a narrow band of frequencies (a band-pass filter) the received oscillations would produce a signal only for that narrow band of frequencies on each side of zero-beat. The idea behind all this, of course, is that as we reduce the spread over which any one signal is heard we increase the apparent separation between any two or more adjacent stations. And "all this," as we have tried to show, is the general idea of audio selectivity, for the attainment of which a great many schemes have been suggested in past years. The object, to reiterate, is the suppression of unwanted and perhaps interfering audio frequencies which appear in the output of the detector; the method, to limit the band of frequencies to which the audio amplifier will respond.

#### THE ESSENTIAL FREQUENCIES

In receiving good quality c.w. signals only about one percent of the available audio frequencies are necessary or even useful. The rest of them serve chiefly to hinder the ear in its work of selecting the signal desired from those undesired. Because of this, it is really very strange that the principle of audio selectivity is so rarely used as an aid to interference reduction — particularly when we realize that the idea has been applied almost universally to broadcast reception. Notwithstanding the wide band of frequencies essential to good reproduction of music from the broadcast set, almost every receiver produced in the last few years has been fitted with either a fixed or adjustable low-pass filter in the audio system to lop off all frequencies above about 5000 cycles. In this way, interference from high frequency heterodyne "whistles" and from the high frequency components of other extraneous noises is greatly reduced. Consideration of the obvious and well recognized merit of that scheme should help anyone to understand why it must be possible to build a high degree of audio selectivity into the "ham" receiver. In it, the audio frequencies from about 500 to 1000 cycles are useful. A filter which would eliminate the rest of them surely should do some house-cleaning at any place on any amateur band.

The point is, of course, that it would and does. Bourne, Hatry, Chinn and a host of others have suggested ways and means, from time to time, and made pleas for their use. But nothing much in the way of popular adoption has ever come of it. Recognizing the splendid possibilities of the idea

in general, yet fully aware of and somewhat puzzled by the continued popularity of the "flat" receiver, we set out to learn something about it.

#### AUDIO FREQUENCY SELECTIVITY

First let it be said that any receiver has a degree of audio selectivity. Even the best of our audio amplifiers falls off toward the upper end of the audio spectrum. Our phones, too, contribute to the selectivity by attenuating both the high and low frequencies. Because of these things, the average amateur receiver actually "peaks" to a slight extent over the frequencies between about 500 and 1200 cycles. Change this state of affairs so that the audio system cuts off everything above 1000 cycles (and perhaps everything below 500 cycles) and the average amateur will set up an awful wail. "The set sounds dizzy"; "Signals are too hollow"; "Static seems funny"; "You can't hold anyone"; "That sound'd drive you crazy": those are the expressions of opinion one gets. Rarely have we found the observer who was willing to accustom himself to the new conditions to the point where he was willing to admit that a tremendous amount of annoying interference was eliminated and that under the new conditions he was able to copy a relatively weak "d.c." signal through a bunch of other and perhaps louder neighboring ones.

We, personally, can see no earthly reason why any c.w. receiver should respond to any audio frequency above about 1000 cycles, though we admit that the business of preventing it from so responding is not a very simple matter. Assuming for the moment that such drastic audio selectivity is too ambitious an objective, we fail to see why every single c.w. receiver in existence should not be fitted at least with a shunt condenser in the audio system — an equivalent of the "tone-control" in broadcast receiver practice. This gadget could well consist of a bank of condensers, with a maximum capacity of about .0007  $\mu$ fds., arranged so that a portion or all of it could be switched across the secondary of one of the audio transformers. Alternatively, it could consist of a larger bank with a maximum capacity of about .1  $\mu$ fds. shunted across the phones. Should this still be too complicated, the shunt condenser could be of one value and permanently connected in the circuit. Its effect, of course, will be to attenuate particularly the higher frequencies and to shave off some of the interference at the top end of the musical scale. But it represents only a half-hearted fling at audio selectivity.

A very much more effective scheme, and one which has attained some little popularity is the so-called "peaked" audio amplifier. In this case one or more of the audio amplifiers are arranged to "peak" at some convenient frequency. With such an amplifier a beat-note tuned to this particular frequency will be amplified to a much greater degree than beat-notes (produced by

other transmitters) on other frequencies. Audio selectivity obtained in this manner has been utilized by amateurs with considerable success and is used quite widely in commercial radiotelegraph work. There is no doubting the ability of such amplifiers to pick an otherwise unreadable signal out of some types of interference and to allow communication to be maintained. The approximate circuits of three well-known types of peaked audio amplifiers are shown in Fig. 1. At A is shown the type of amplifier which perhaps has had the widest usage in amateur circles.<sup>1</sup> In it a circuit,  $L_1C_1$ , tuned to 800 or 1000 cycles is placed in the plate circuit of a screen-grid audio amplifier. The result is particular amplification at the frequency to which the plate circuit is tuned. An arrangement employing an ordinary three-electrode amplifier tube is that shown at "B."<sup>2</sup> In this case, the tuned circuit again comprises  $L_1C_1$ . The value of the resistance  $R_1$ , ordinarily between 100 and 1000 ohms, plays an important part in determining the "sharpness" of the peak. With the lower resistance values an extraordinarily pronounced peak is made available. A further arrangement, much used in commercial c.w. receivers, is the tuned transformer indicated at "C."<sup>3</sup> The primary and secondary windings, iron-cored but with low mutual coupling, are fitted with condensers  $C_1$ ,  $C_2$ , which complete a pair of tuned circuits resonating at the desired peak frequency. To those amateurs who have never tried one of these schemes we can heartily prescribe an attempt. To those who have tried and abandoned them, we can hardly refrain from suggesting that a more patient attempt to become accustomed to the new sound of things would have brought its own reward.

At the same time (we must be unbiased about it) the black side of the peaked audio picture should be painted. The three arrangements shown in Fig. 1, and any other similar ones, all suffer from at least two prime afflictions. To begin with, they make the tuning of the receiver and the holding of most signals more difficult than it ordinarily is. Just as soon as the amplifier is arranged to give a pronounced peak,

it is immediately possible for the beat-note to fall off on either side as the transmitter or receiver frequency "creeps" or "flops" around. In the second place, all such amplifiers have a tendency to oscillate (if the decrement of the tuned circuit is small enough to give a really pronounced peak) and to produce "tails" on the received signals. Sudden crashes of static and similar noises also may start the tuned circuit off on a brief oscillation, with the result that these noises take on the characteristic tone of almost everything that gets through the amplifier. Considerable experiment and correlation of the opinions of others have led us to believe that while the ordinary "peaked" audio amplifier is of great practical value in lifting good steady "d.c." signals out of interference, there is a definite practicable limit to the degree of "peak" that can be used. Beyond the optimum point, it becomes difficult to hold even the average good signal and the general sound of both the signals and the interference

becomes so "pingy" that listening becomes an unpleasant task. But never let anyone tell you that the "peaked audio" receiver cannot be highly selective. Designed for the operation of a relay instead of phones, one famed commercial receiver employed two highly peaked stages of type shown at "A" in Fig. 1. Its actual selectivity was really something to write home about.

Well then, if one happens to be a sincere and serious amateur, eager to avoid flunking schedules and dropping contacts because of interference, what is there to do about it? To be frank, we still don't think we know. But at least there are some suggestions to be made.

If we examine on paper the performance of a very good peaked audio stage (the "B" scheme of Fig. 1 carried to its practicable limit) we arrive at a curve like that shown as "A" in Fig. 2. Actually, it represents the performance of the whole receiver in normal operation, the output being measured across the final amplifier. It shows very clearly that a pronounced peak exists at about 1000 cycles. If we fed the receiver with three equally high amplitude signals one after the other at 450 cycles, at 1000 cycles and at 3000 cycles, the middle one would be about 22 decibels higher in audibility than the others. Stated in another way, the 1000-cycle signal would be R9 and the others about R4. But the very sharp peak would not only make signals

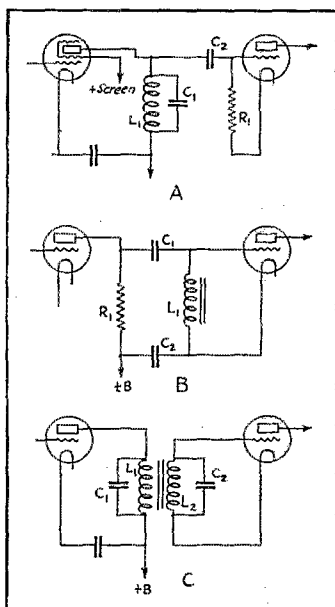


FIG. 1 — THREE WIDELY USED CIRCUITS SUITABLE FOR "PEAKED" AUDIO AMPLIFICATION

<sup>1</sup> Hull, "High-Frequency Receivers for the Coming Year," *QST*, November, 1928.

<sup>2</sup> Chinn, "A New Type of Peaked Audio Amplifier," *QST*, February, 1931.

<sup>3</sup> Hatry, "Practical Audio Filters," *QST*, May, 1928.

hard to hold but also would (and did) give all signals and most interference an unpleasant "ringy" tone. Obviously, an improvement might be expected if the peak itself could be made broader and at the same time the sides made steeper. This would give us some leeway in holding signals on the peak, possibly would avoid the "ringing" effect and certainly would reduce interference from adjoining beat-notes. The well-known band-pass filter, widely used in commercial communication work, has the desirable characteristics and could, we know, well do the work.

But the band-filter always has been something almost "tabu" in amateur circles. We, personally, had always been almost afraid of it. We believed it to be not only complicated and difficult to design but also impossible to build without access to inductance bridges, capacity bridges and the like. But now that we have built up a half-dozen of them and observed their effectiveness we can state emphatically that band-filters suitable for this sort of work are not only simple and inexpensive but quite readily built without laboratory equipment of any kind. It is quite possible by the application of a few simple stunts to build a filter with the performance shown at "C" in Fig. 2, the only components being some radio-store fixed condensers and a couple of home-brew chokes.

#### A BAND-PASS FILTER

Before we proceed to details of construction, let us see what the capabilities of such a filter are. From the measured performance of a complete receiver fitted with the filter (the curve "C" of Fig. 2) it is apparent that if the beat-notes from three similarly strong signals could be fed successively to the receiver on 525, 800 and 1250 cycles, the middle one would be approximately R9 if the others were R1 — a difference of about 40 decibels. The curve "C" is not, of course, a complete one. Actually, the attenuation of the side frequencies is very much greater than the 40 db. shown. It is just that the voltage ratio measurable on the vacuum-tube voltmeter used was limited to approximately 100 to 1, so allowing a measurement of just the upper portion of the peak. On paper, at first glance, this curve looks to be just about ideal. But how about the effect in a pair of phones?

Expecting, more or less, to hear a performance which would spell the end of our worries, we connected 'phones in place of the vacuum-tube voltmeter and went to work. Immediately, it became apparent that there was nothing "fishy" about the measured curve. The spread of any one signal on the dial was now a fraction of a degree on the dial instead of the several degrees occupied with the "flat" receiver. Good signals popped in and out so rapidly, as their beat-notes went through the passed band, that they were often missed entirely. Rotten a.c. signals had all the

weight taken out of them. The affair did seem to be ideal — except in the one respect that noises still took on a tonal character somewhat similar to that of the signals. Experiment with other similar filters designed to pass a wider band of frequencies gave the same effect but to a lesser degree. It seemed that the filter just picked out those component frequencies of the noises which lay in the passed band so giving all noises a char-

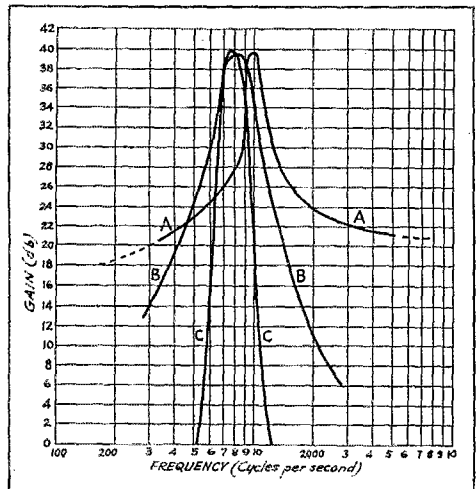


FIG. 2—THE MEASURED PERFORMANCE OF THREE SELECTIVE AUDIO AMPLIFIERS

Curve "A" is that of a receiver fitted with a good peaked audio stage. Curve "C" belongs to the band-pass filter described in this article. "B" shows the effect of using No. 36 wire instead of No. 28 in the inductances of the band filter.

acteristic sound. Even at its worst, however, the effect was not as serious as in the usual "peaked" amplifier.

After a half hour of listening we had become so used to the unusual sound of things that we no longer noticed it. At that stage we believe we could have copied any good signal of reasonable strength through any reasonably severe "ham" interference. In endeavoring to obtain the opinion of other operators on the usefulness of such a filter we found that their enthusiasm was approximately in inverse proportion to the number of years experience they had had with "flat" receivers. The "old-timers," generally speaking, did not like the sound of the thing and found difficulty in copying the weaker signals. The "not-so-old timers," with ears which had not become slaves to any one sound effect in a receiver, soon agreed that the hands, in effect, were opened up and that interference with a clean, steady, d.c. signal was something approaching an impossibility.

#### LOW-PASS

The obvious alternative approach to the subject was to build an effective low-pass filter —

a vigorous extension of the broadcast receiver "tone-control." To accomplish this, we built a variety of low-pass filters designed to give a sharp cut-off at around 900 or 1000 cycles. The performance of the final model is indicated in curve "B" of Fig. 3. The curve "A" of this figure was obtained from the receiver without the filter. With the filter, it is seen that frequencies above 800 cycles are attenuated to the tune of 40 db. as 1400 cycles is reached, while frequencies below 800 cycles are not attenuated to any serious extent. Putting this filter to work gave just about the result one would have expected. There was nothing "ringy" about either signals or noise and the general effect was just that of a very "mellow" receiver. Needless to say, all the higher beat-notes and a great deal of "background" noise were stripped out. Further, even the unsteady signals could be held within convenient beat-note limits without particular attention to fine tuning. Naturally, the selectivity of the complete receiver did not equal that of the set fitted with the band-pass filter since all the heavy lower beat-notes remained almost unchanged. Even so, it gave what we sincerely considered to be an improvement.

#### PRACTICAL FILTER DESIGN

It is quite certain that any who have read down to this point must be unusually earnest and sincere fellows. Because of that, we can now break off into a discussion of the practical aspects of simple filter design and construction without worrying about the reader's ability to follow us. So much material is available on the elements and complexities of electrical wave filters that it would be futile to attempt anything like a

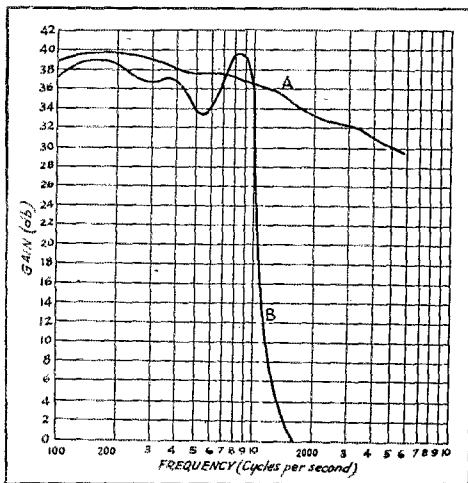


FIG. 3—CURVES SHOWING THE PERFORMANCE OF A TYPICAL "FLAT" RECEIVER ("A") AND THE SAME RECEIVER FITTED WITH A LOW-PASS FILTER ("B")

coverage of them at this time. In Fig. 4 is given the little filter circuit data which concern us in this instance. At "A" is shown one form of single-section low-pass filter comprising two identical inductances and a single condenser. At "B" is a similar filter extended to two sections. It will be noticed that the center inductance has twice the value of those terminating the filter. A typical three-section band-pass filter is indi-

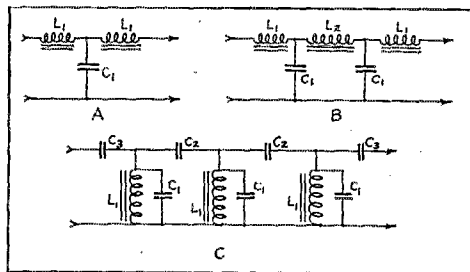


FIG. 4

cated at "C". In this case, the three circuits  $L_1$ ,  $C_1$  resonate at the same frequency and the coupling condensers  $C_2$  are of the same value. The terminal condensers  $C_3$ , however, have twice the capacity of  $C_2$ .

In these filters, if the cut-off frequencies or the band pass is to be well defined, it is essential that the constants of the components be strictly according to the design. It is quite absurd to wind up similar chokes on similar cores and expect them to provide a fully effective filter when used in conjunction with the ordinary condensers available at the local radio store. Probably that is why the amateur has regarded electrical filters with so much awe. Not having the necessary measuring instruments, knowing that few amateurs would have them, and feeling altogether shaky on the proposition, we set out to see if there was not some short-cut. As it happens, there was. By pulling a simple dynatron oscillator into service it was found possible to match inductances and capacities with a degree of accuracy considerably greater than that necessary. It was not possible, of course, to determine absolute values in this manner, but since we were not concerned with some precise band width or with its exact location in the spectrum there was no cause for concern.

To illustrate our procedure in planning and building a filter we will start off with a low-pass affair such as that shown in the circuit "B" of Fig. 4. The unknowns in a case like this include the capacity of the condensers  $C_1$ ; the inductance of  $L_2$  and the characteristic impedance of the filter. The latter concerns us since, if the filter is to work normally, it must be fed from and work into impedances of the same order as that of the filter. The value of the inductances  $L_1$  is found very simply. It is just half that of  $L_2$ .

First off, we dig out the necessary formulas. These serve the purpose:

$$L_2 = \frac{2Z}{2\pi f} \text{ and } C_1 = \frac{2}{2\pi f Z},$$

in which,  $Z$  is the characteristic impedance of the filter;  $f$  is the desired cut-off frequency;  $\pi$  is 3.1416;  $L_2$  is in henries and  $C_1$  in farads.

From these formulas we proceed to design a filter with the required cut-off frequency and impedance. Possibly it may be necessary to design the filter for a given value of inductance or capacity but even this involves no serious complications. In our own case, for example, the inductances were to be wound on old audio transformer cores with relatively little winding space. Computation had shown that a maximum inductance of 5 henries could be expected. Disregarding the exact value of impedance, the filter was then worked out with 5 henries for the middle inductance and some available value for the capacities. The actual values are: 5 henries for  $L_2$ ;  $2\frac{1}{2}$  henries for  $L_1$ ; .025  $\mu$ fd. for the two condensers  $C_1$ ; 14,000 ohms for the characteristic impedance and 900 cycles for the cut-off frequency.

At this point the inductances are designed — or perhaps merely estimated — from data available in *The Radio Amateur's Handbook*. It will be found that for 5 henries approximately 4140 turns of No. 30 enamelled wire will be necessary on a one-half inch square-section core. About 2925 turns will be needed for the  $2\frac{1}{2}$ -henry inductances. Wire finer than No. 30 is likely to introduce unnecessarily high resistance losses, whereas the heavier gauges would mean larger and probably special cores. Layer winding is not necessary unless the winding space is unusually small. A rough cardboard former fixed on a wooden mandrel held in a twist-drill makes it possible to spin the winding into place in a very short time.

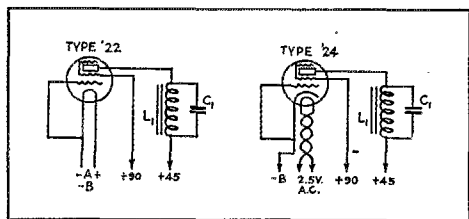


FIG. 5 — THE SIMPLE DYNATRON CIRCUIT USED FOR CHECKING CHOKE AND CONDENSER VALUES

With the windings completed and the cores assembled in place, we come to the part which has been so much of a problem in the past — the adjustment of inductance and capacity to the value required. It is the stage at which the

dynatron can be put to such good use. First, the relationship between inductance, capacity and frequency is dug out:

$$f = \frac{1000}{2\pi\sqrt{LC}}$$

Where,  $f$  is the frequency in cycles per second,  
 $L$  is the inductance in henries,  
 $C$  is the capacity in microfarads.

From this we determine the value of shunt capacity required to tune our inductances to 1000 cycles or some other convenient frequency. It is, as it happens, .01  $\mu$ fd. for the  $2\frac{1}{2}$ -henry inductance and .005  $\mu$ fd. for the 5-henry unit. Then, we obtain a condenser rated at this value and connect the  $LC$  combination in the plate circuit of a simple dynatron oscillator arranged as shown in Fig. 5. The circuits given for either a.c. or d.c. operation are self-explanatory. No by-pass condensers are necessary and the affair can be rigged up in quick time. When the dynatron is assembled, it will oscillate at a frequency so near to the resonant frequency of the  $LC$  circuit that we need not worry. By putting one tip of the cords of our head 'phones on the plate terminal of the tube we will be able to hear the oscillations and to adjust the inductance of the choke until the frequency is that called for in the formula just given. The adjustment might well be made against a 1000-cycle tuning fork (as it was in our case). Alternatively, the shunt capacity could be computed for some musical frequency available on a piano (even if it must be the neighbor's). Matching of the tone given by the dynatron and that of the tuning fork or piano requires, we suppose, some sort of an ear for music. It is, however, very simply accomplished by adjustment of the air-gap of the core or by tightening the screws with which the core is mounted. If others parallel our experience, they will be amazed at the variation in inductance resulting from extremely slight adjustments of the core. The impracticability of merely building chokes to a given design and getting the required inductance without some such means of adjustment will become strikingly evident.

In checking the smaller inductance we have been using a shunt capacity of .01  $\mu$ fd. It will be desirable that this capacity is made up of two similar .005  $\mu$ fd. condensers in parallel. And by "similar," we mean two condensers which both give the same frequency when connected across a given inductance in the dynatron circuit. Then, when we come to check the larger inductance, we can use one of the condensers only and so make sure that the larger choke really has twice the inductance of the smaller choke.

At this point we have three chokes, two of them being equal in inductance and each exactly half that of the larger one. Next we assemble the two capacities  $C_1$ , using several condensers

in parallel if necessary. We make sure that they are similar in value by connecting them in turn across one of the inductances in the dynatron, and varying them until they both give the same oscillation frequency. This may mean connecting an additional small condenser across one of the banks or merely a rearrangement of the individual condensers in each bank. Now, we can assemble the filter either on a "bread-board" or in an iron box and put it to work. One possible wiring arrangement of a unit comprising the filter, an extra audio output tube and a change-over switch from filter to "straight" resistance-coupled audio is that shown in Fig. 6. The switch may be a double-pole double-throw key switch.

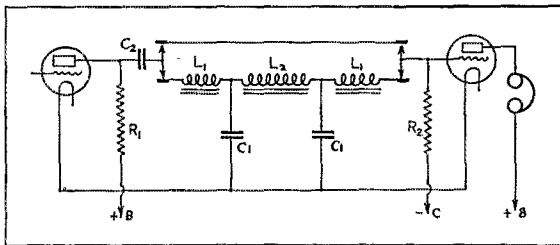


FIG. 6—COMPLETE WIRING OF A LOW-PASS FILTER UNIT FITTED WITH A SWITCH TO PROVIDE "FLAT" AMPLIFICATION FOR 'PHONE WORK

We have already mentioned that the load from which a filter of this type works and the load into which it works should both be approximately equal to the characteristic impedance of the filter. In practice, it is found that an exact match is far from essential. It is as well, though, to take some trouble to approach it. To get our required 14,000 odd ohms in the plate circuit of the input amplifier we should really have a step-up transformer from the 201-A or 227 unless we could use a tube of higher plate resistance. In our own work, we merely used a 100,000-ohm resistor for  $R_1$  of Fig. 6, slightly overbiased the tube and hoped for the best. Our hopes were fulfilled. We designed the filter to have an impedance of 14,000 odd ohms simply because condensers of .025  $\mu$ fd. happened to be available. If we had had larger condensers we could have used the figures for a 10,000-ohm filter: .035  $\mu$ fd. for  $C_1$ ; 3.54 henries for  $L_2$  and 1.77 henries for  $L_1$ . These inductances, wound on one-half inch section cores with No. 30 enamelled wire, would have approximately 3475 and 2450 turns, respectively.

Exactly the same sort of procedure is used in the case of the band-pass filter, though the computations happen to be a little more difficult. One version of the necessary formulas is this:

$$C_1 = \frac{f_1 \times 10^6}{\pi f_2 (f_2 - f_1) Z}$$

$$C_2 = \frac{(f_1 + f_2) 10^6}{4\pi f_1 f_2 Z}$$

$$L_1 = \frac{(f_2 - f_1) Z}{4\pi f_1 f_2}$$

Where,  $f_1$  and  $f_2$  are the lower and upper cut-off frequencies;  $Z$  is the characteristic impedance; the capacities are in microfarads; the inductance in henries. The capacity of  $C_2$ , of course, is twice that of  $C_1$ .

In a similar manner we work out the capacity needed to tune the inductances to 1000 cycles, or some other available frequency. Then we check the three inductances with a given condenser in the dynatron oscillator and adjust them until they are all equal in value. Next, we check all condensers across a given inductance to make sure that they are all of similar capacity. In this type of filter the really important thing is that all the  $L_1 C_1$  circuits should resonate at the same frequency. We can make very certain of it with the dynatron rig.

The first crack at an actual computation will reveal the uncomfortable fact that a band-pass filter with a characteristic impedance anywhere near 10,000 ohms is likely to require quite large capacities. Since these capacities really should be of the mica-dielectric type, we are immediately faced with the old cost factor. Here is an example:

A filter with an impedance of about 10,000 ohms (10,110 ohms to be exact), designed for cut-off frequencies of 700 and 900 cycles would require approximately .02  $\mu$ fd. for  $C_2$ , .1228  $\mu$ fd. for  $C_1$  and inductances of .2565 henries. Such condensers, in the reliable makes, are expensive — as any radio salesman will be able to explain. Fortunately, there is no particular reason why we could not use a filter with a much higher impedance. A step-up audio transformer for the input would serve to provide the necessary input circuit. Examination of the formulas will reveal that if we increase the impedance of the filter by a given factor we only need to divide the capacities and multiply the inductances by that factor to arrive at the new constants. A 40,000-ohm filter with the same cut-off frequencies as that just mentioned will therefore require .005  $\mu$ fd. for  $C_2$ , .0310  $\mu$ fd. for  $C_1$  and 1.026 henries for  $L_1$ . These values, by the way, are used in the band filter illustrated on the first page. The inductances are wound with 1800 turns of No. 28 enamelled wire on one-half inch section audio transformer cores (old-time General Radio transformers). The laminations of the cores are rearranged so that an air-gap is provided, the variation of which serves to bring the inductance to the exact value necessary.

The filter, together with an extra audio tube, is rigged on a small wooden base on which is also mounted the 1-to-2 ratio input transformer. Fed from a Type '01-A or '27 operated at 90 volts



"B" and coupled into the grid circuit of the extra audio stage fitted with a 50,000-ohm grid-leak, the impedance relationships are about right. No change-over switch is provided but there is no reason why one should not be fitted if desired in the manner shown in Fig. 6. The input transformer for this particular filter could be eliminated if the input were from a suitable high plate resistance tube. For instance, a Type '40 with a plate circuit resistor of about 150,000 ohms would do the work. That is just one of the countless variations which the experimenting amateur could work out for himself. The whole process of designing the filters, building them, and fitting them to the receiver is really a great deal simpler than we had thought it could be.

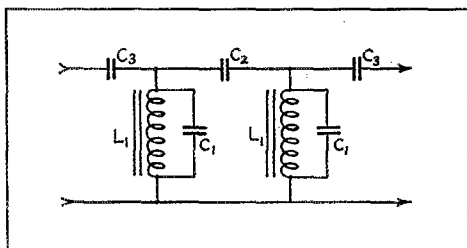


FIG. 7—A TYPICAL TWO-SECTION BAND-PASS FILTER

Results — yes, let us say just a few final words about them. With reasonably heavy wire in the inductances and with careful matching and proportioning of all components, any of the filters cannot help putting up a performance. Even with the simple two-section filters described, the receiver is given a surprising degree of real audio selectivity. All signals are attenuated to some degree in the filter, of course, and an extra audio stage is likely to be necessary; but the gain in receiver performance, to our way of thinking, should be worth all the trouble to any serious amateur. In outline, our general conclusions are these:

1. That a genuinely effective low-pass or band-pass filter can be built without special measuring equipment by any good amateur.
2. That such filters, for c.w. reception, actually give a high degree of audio frequency selectivity depending, of course, on the width of the band passed by the filter.
3. That this selectivity, though changing the "sound" of the receiver, can be of genuine service in reducing interference with clean, steady c.w. signals.
4. Because of the instability of many amateur transmitters and almost all amateur receivers, a very sharp band-pass filter is certain to introduce additional tuning difficulties. A vernier tuning condenser (so-called "beat-note" control) is quite essential in such cases.

5. The low-pass filter, since it does not seriously change the "sound" of the receiver, is likely to be favored by experienced operators though it cannot provide the selectivity available with a band-filter.

6. That from our own experience we can see the futility and absurdity of attempting to decide on the merit of any selective audio system without more than a mere two or three hours of listening.

7. Our final conclusion, in conclusion, is that selective audio systems will some day be a feature of all effective c.w. receivers, but that because of the mental inertia of the human species the general application of such systems must, alas, come gradually.

## Strays

### THE CALLBOOK APPEARS

The "List of Amateur Radio Stations of the United States," the well-known "government callbook," made its delayed appearance in middle December. We have grown, fellow citizens, there now being 22,739 of us, and this year's book is 58 pages bigger than last's, wherefore the Government has raised the ante—the price is now 35 cents. Seems they wanted to make it 40 cents even last year, but we get out with 35 this year because of the . . . we almost said depression.

This book is a good job and the price is right. We must support it or its publication will cease—costs the Government a lot of jack. Sort of a duty for every ham to order a copy. Superintendent of Documents, Government Printing Office, Washington. Stamps and checks not accepted.

The list of government and commercial stations is out too, and it's a pretty valuable thing. Frequencies of all the commercials, list of Naval stations sending time and weather, airways stations sending weather, and so on. Twenty cents, same source.

### CLASS B MODULATOR OUTPUT TRANSFORMER

The output transformer, as well as the input transformer, of the Class B modulator described in last month's *QST*, should be wound with No. 30 silk-enamel covered wire.

Clark C. Rodimon, W1SZ-W1BIZ, managing editor of *QST*, one time stickler for complete personal freedom, may be off the air once in a while from now on. "Roddy" and Miss Carol Roberts of West Hartford were married on November 26th.

— R. A. H.

Reprints of Parts I and II of the article "Passing the Government Examinations for Amateur Operator's License," appearing in October and November *QSTs*, respectively, may be obtained from the Circulation Department, *QST*, West Hartford, Connecticut, at 20 cents for both.

# The Japs Move

**L**AST winter amateur radio on this continent, particularly on the west coast, was plagued half to death by the activities of a whole flock of high-power Japanese commercial stations operating in the amateur bands, most of them with rasping whooping-cough notes and the approximate stability of a hundred-foot mast made out of 2x4. The League went to bat. Although it was a cinch that interference would result from these "registrations," the Washington Convention gives Japan or any other nation the right to operate stations on these frequencies if no interference with amateurs results, and so the interference had to be proved. It took some months to get an accumulation of good logs showing the actual disruption of amateur communication, and polish up a good case. Finally the papers were finished and filed with our Department of State with a request for relief.

Relief has come. The Japs have been moved out of our bands. Under date of November 13, 1931, the Department of State writes to the League:

With reference to your letter of May 7, 1931, you are informed that the American Embassy at Tokyo has reported the receipt of a note from the Japanese Foreign Office stating that certain changes have been made in the frequencies used by stations JYZ at Tokyo, JEW at Osaka, JBK at Kagoshima, JFB at Taihoku, and JTY at Toyohara, and that the several stations concerned have been instructed to pay even more attention to adjustment and to maintaining an exact frequency.

The Department hopes that with the changes effected in the Japanese stations, the interference occasioned to amateurs in the United States will cease.

Meanwhile the Canadian Section of the League through Canadian General Manager Reid, made similar representations to Commander C. P. Edwards, Director of Radio Service, Department of Marine, at Ottawa, and the latter kindly took up the cudgels on behalf of amateur radio. The Director General of Telegraphs of the Japanese ministry of communications replied to Commander Edwards as follows on September 29th:

With reference to your letter of the 7th April, 1931, I beg to inform you, though belated, that proper instructions have been issued to the stations concerned so as to change frequencies employed by them, and it is believed that no interference will take place between these stations and amateurs in future.

Probably the first complaint against the Japanese stations, however, was filed early in 1931 by Mr. I. S. Liner, our S.C.M. for the Philippines, at Manila, where the Jap QRM was creating havoc with amateur work. The Japanese Director General of Telegraphs replied to Mr. Liner on September 29th:

With reference to your letter of January 30, 1931, received through the courtesy of the Japanese Consulate General in Manila, I beg to advise you, though belated, that the frequencies used by the stations concerned have since been

changed and I believe no interference will take place between these stations and amateurs in future.

Wonder if the Japanese administration is amateur-conscious now! We'll bet they are. It shows what we can do when we pull together. These stations are now all supposed to be out of our bands. If anybody hears any of them, or any other foreign stations that don't belong there, A.R.R.L. would like to be advised. It is not sufficient just to log such signals. Interference with amateur work must be established. For instance, if you try to work some ham who is buried under the invader and can't do it because of his QRM, that's interference. Please report such instances to Headquarters, with date, time, frequency, call of interfering station, and details of the amateur communication which was interfered with. That gives us ammunition; we'll do the rest.

— K. B. W.

## Strays

Three of the supervisors of radio of the Radio Division, Department of Commerce, have now been given special assignments in addition to their normal supervisory duties. Each, however, is still the supervisor of radio at his home station and performs the duties of such while home. While away on special work, an assistant becomes the acting supervisor.

Supervisor Batcheller at New York is also traveling supervisor of radio; while he is away from New York, Assistant Supervisor Emory H. Lee becomes acting supervisor. Supervisor Edwards at Detroit has been appointed supervisor of development and production; in his absences Assistant Supervisor J. E. Brown is the acting supervisor. Supervisor Van Nostrand at Atlanta has been named technical assistant of the Radio Division, giving special attention to aviation; Associate Radio Inspector George Llewellyn is acting supervisor in his absences.

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W4ZV's copy of November *QST* arrived with a highly perfumed scent, believe it or not! He thought maybe we were making a bid for some YL business until he discovered that the postman had broken a bottle of perfume in his satchel.

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W2BZN-W8APK uses a somewhat different method from the "standard" for using a flashlight lamp and loop to check neutralization of an amplifier. After neutralizing approximately in the regular way the lamp is coupled to the tank of the preceding stage and the amplifier is keyed. The neutralizing condenser is then adjusted until the lamp shows no flicker as the amplifier plate circuit is opened and closed, indicating complete neutralization.

# "Madrid, 1932"

## What It's All About—U. S. A. Proposals Go to Berne—The Amateur Position Therein—A.R.R.L. Plans

By K. B. Warner, Secretary, A.R.R.L.

EVERY amateur, whether he possesses a lonesome 7½-watter or a majestic ether-scorcher, is at least vaguely aware that the expression "Madrid in 1932" possesses some peculiar significance to amateur radio. What's it all about? We propose to try our fine Spencerian hand at explaining it in this article.

To begin with, the proposals of the United States for changes in the existing Washington Convention and Regulations were forwarded to Berne this past summer, for publication with the proposals of other nations in the Madrid Book of Proposals, the volume which we have previously described as having approximately the heft of a Sears-Roebuck catalog. Thus *QST* is now free, for the first time, to talk about those proposals, and we shall quote them in full so far as they concern amateur radio. Briefly, it may be said that the United States will go to Madrid favoring retention of the present amateur frequency bands, and with no substantial changes in our operating regulations.

Naturally enough, this simple statement gives rise to a host of questions. How does it happen that the views of the United States for Madrid were formed at such an early stage? Did the League's representatives participate in the hearings which formulated these views? — and if so, what efforts were made to have our Government advocate an increase in amateur territory? Why doesn't the League, or why don't the amateurs of the world, send a picked amateur delegation to Madrid to plead the amateur cause, irrespective of any governmental views? . . . Normal questions, all of them; and it is the purpose of this article to answer them, to tell the whys and wherefores, to explain the Madrid conference and how we fit into the picture.

As a first step it is helpful to examine the set-up of these international conferences. Many amateurs seem to have the impression that at these meetings a sort of tribunal sits, hearing the cases of all who wish to appear before it, and that all that is necessary for successful amateur representation is to get up a good strong amateur delegation with a good case, go over there, and demand "justice." Unfortunately that is not the way those things are done. Instead, each government sends a picked delegation to represent it, and the conference is a meeting of these delegations, each casting the vote of its country on the questions

that arise. Private groups do not have a voice; neither commercials nor amateurs can send delegations; they couldn't get in. It is a conference of nations, and it is the delegations of governments that do business. By the very nature of the set-up, then, amateurs and commercial interests are represented by their respective governments, through whom their views are advanced, tempered as need be to accord with that government's policies. You can't go lick this thing yourself, by doing the obvious and forthright things that occur to a practical mind. You have to do it in the established old-world way of doing things after first learning in the painful school of experience just how you hitch up your gear to get the greatest radiation and punch.

These conferences are rather dreadfully impressive affairs, held in full accordance with diplomatic tradition. Not only are they as formal and as weighty as a disarmament conference: they are larger, even more complicated, and last longer. The usual delegation is made up of distinguished diplomats and statesmen, generals, admirals and other big-wigs. Some of them are museum pieces, some of them know their stuff. With them goes a group of aides, technical experts, translators, legal advisers, secretaries. When this galaxy of talent convenes it numbers perhaps four or five hundred persons, representing perhaps eighty-odd nations and colonial administrations. The meetings are held in a great hall, generally in a palace. The ruler or president of the host nation usually opens the conference, his minister of communications commonly presiding thereafter. The meetings last for weeks — nearly two months in the case of Washington, three months estimated for Madrid. Most of the talking and all of the printed documents are in the French language. Formal plenary sessions adopt complicated internal rules of orders, divide the work amongst numerous committees presided over by the ranking dignitaries present. Sub-sub-sub-committees may get down to hard labor and plain talk in long hours in smoke-filled committee rooms, but they are the creatures of an affair which is surrounded by the full panoply of diplomatic regalia and usage — big names, silk hats, spats, military decorations, red ribbons, brilliant dinners, international felicitations, and what your fertile fancy suggests. Not that they don't get things done; they do, — sometimes

mountainous things—but in the continental manner and by methods very different from those we are likely at first blush to imagine. That's why an "amateur committee" couldn't get anywhere; that's why we must speak through our Government; that's why A.R.R.L. has spent time and money training its officials to know how to go about getting things done at these shows.

The delegation of the United States at such an affair has a unique position. Almost every other administration in the world owns its communication system, operates it for revenue to the government, censors it for its security. The government is owner. Therefore, without outside assistance or comment it can establish its position for a world conference. In the United States, on the other hand, it is supposed to be a principle that the government "stays out of business," and our communication systems are private enterprises. Our Government decides for itself what it wants to do on administrative problems and on questions of national policy, but that is only part of the story of preparing itself for an international radio conference. As the only agency authorized to speak for American enterprises, it must also arrange to speak for the interests of the various communication activities which it has encouraged and on which it places its dependence—including amateur radio. To this end, the position of the United States at such an affair is worked out at a series of confabulatory meetings at Washington, to which are invited all interested parties and groups in this country—government, military, commercial and amateur. And as part of its duty of representing its authorized activities, our delegation at such a conference will give attentive ear to the representatives of non-government enterprises who, although not entitled to participate, will be present on the scene to advise and consult.

Obviously such preliminary and preparatory meetings as just mentioned must be held long in advance of the international conference. Generally all of the governments are required to send in their suggestions and comments sufficiently in advance to permit circulating them to the other governments some time before the assembly. When the proposals of other nations are thus made available, our Government holds another series of public conferences to examine them and formulate the United States view towards them. Finally a complete United States viewpoint is worked out, concerning both our own proposals and those of other governments, and in the long run that point of view, so far as it concerns operating matters, is derived and expressed by the actual operating agencies of the country—governmental, commercial, amateur. There may be some disagreement during the discussions but they end in a solid national plan. Carefully studied and mutually agreed upon at our home preparatory meetings, that plan forms the basis for the Department of State's instructions to our delegation

and becomes our working policy at an international conference.

Getting down to cases now, we find that the Spanish Government notified all the administrations in the Fall of 1930 of its call for the international conference in Madrid in September, 1932. It asked them to get up their proposals and send them to Berne by this past summer, so Berne could publish them and enable everyone to come

## Some Pointers . . . .

— *what an international radiotelegraph convention is?* It is an international agreement or treaty on radio communication, mutually negotiated by the nations of the world at an international conference, the provisions of which the nations agree to apply to the radio stations of their respective countries. Contrary to popular belief, the word "convention" does not refer to the meeting of delegates but to the covenant there drafted.

— *what "regulations annexed to the convention" are?* These are the detailed practical operating regulations relating to such things as frequency assignments to services, operator licensing, power, rates, hours, etc. They are drafted and signed at the same time as the convention itself and have the same effectiveness.

— *what is meant by the expression "Washington Convention & General Regulations"?* This is the current or existing treaty, which was negotiated at Washington in the autumn of 1927 and became effective the first of 1929.

— *what happens at Madrid in 1932?* By agreement at Washington in 1927, another international conference is to be held at Madrid in 1932, at which time the Washington Convention and its annexed regulations come up for revision.

to Madrid fully conversant with the proposals of everyone else.<sup>1</sup> Upon receiving this notice autumn before last, our Government called a series of meetings at Washington to draw up its proposals.

<sup>1</sup> The work of every nation in preparing for Madrid has been unusually difficult, for there will meet there not only a radio conference, seeking to redraft the radio convention, but also the international telegraph conference, revising the international telegraph convention, and there is a strong move on foot to merge the two conferences and draft a single convention on communications, embracing both branches. The United States is not a party to the telegraph convention; hopes that the merging will not occur; realizes that it may none the less happen. Thus the United States has had to prepare draft proposals both for the radio convention and its regulations and for the possible combined communi-

Government, military, commercial and amateur representatives were invited, committees formed, work started. A.R.R.L. was represented at substantially all these meetings by one or more of its officials, the secretary being a member of several committees dealing with subjects which interested us.

As the Washington meetings got into action it quickly became necessary for the League to

## Do You Know—?

— *what the Berne Bureau is?* It is the International Bureau of the Telegraph Union, located at Berne, Switzerland, a central agency or clearing house established by the current telegraph (not radio) convention. It functions similarly for radio, by provision in the radio convention, its expenses being prorated amongst the signatory administrations. It audits and collects international traffic accounts; it is here that frequency assignments are "registered"; it centralizes and publishes information; and it acts as a neutral secretariat in preparations for international conferences.

— *what "proposals" are?* They are formal propositions for a change in the provisions of an existing convention or its regulations, formulated by a government and sent to the Berne Bureau to be duplicated and distributed to all the other governments for study.

— *what the Madrid Book of Proposals is?* It is a document to be published late in 1931 by the Berne Bureau, consisting of all the proposals submitted by all the governments for the modification, at Madrid in the autumn of 1932, of the Washington covenant. It goes to all the administrations, to study in advance of the conference, so that each may know the views and suggestions of all the others.

formulate its own policies and decide what it wished to advocate for the amateur. Frequency bands were the important matter; the rest was

otions convention. The radio regulations of course are the same in both.

The dual nature of the Madrid meeting is responsible for a new idea in the radio group. Whereas the radio conventions have been redrafted frequently, the telegraph convention has existed without change since 1876, having been drafted that year in St. Petersburg — a date so long ago that that city has twice since changed its name. It is hoped now to be able to draft a radio convention that will similarly endure for a half century, creating stability in fundamental matters, and providing for less ponderous meetings at which the working regulations, including such things as frequency

easy. The international high-frequency bands were the important ones; the others were easy. Obviously our desire was for more territory. Any amateur's answer to the question whether he wishes wider bands is emphatically in the affirmative. We all do, and many of us have been hoping for a widening at Madrid. It became our job to try to sell the Government on backing an increase in the amateur bands and to ascertain definitely just what maximum would be backed. After some weeks of negotiation and sounding out sentiment it was definitely established that, while our country would firmly support the existing American bands, it was unwilling to ask for any increase, and any such proposal on our part would receive just about 100% opposition from government and commercial people alike. The commercials would oppose because they want more space too, with no chance of getting it. The Government would oppose because there is no other place to put the many commercial and government stations now operating throughout all the territory into which we would like to expand. In fact, what we bumped into was a unanimous feeling that there can't be any increases for anybody, with our Government deciding that the best thing to do about high-frequency allocations is to leave them as they are. There is, we know, considerable international sentiment in this same direction. The opinion is frequently expressed that if the whole allocation table is opened at Madrid there will be so many demands and so many difficulties that it will be hopeless of solution, and that the only thing to do will be to stick to the Washington table with trivial adjustments. We found our own Government, then, pretty well decided upon a *status-quo* program; and in fact the eventual proposals of the United States leave the great bulk of the Washington allocations unchanged, their chief suggestions for modification being in a partial segregation of the shared mobile-fixed bands, without increasing the allocations of any high-frequency service and without disturbing the now deeply-rooted station structure which has arisen all over the world since 1927.

The Headquarters reported this situation to the A.R.R.L. Board of Directors and asked for instructions. It couldn't act for the League of its own initiative in this important matter — only the Board could settle that. Time was short, a mail vote had to be taken. A majority of the directors thought the situation clearly indicated

allocations, can be more readily changed as progress demands. It is in fact suggested that the regulations be susceptible to amendment or interpretation by a mail vote of the administrations, canvassed by the Berne Bureau, without the necessity of holding an international meeting — provided at least two-thirds of the signatories cast a vote and provided that the vote is unanimously in favor of the proposed change or interpretation. The distinguishing characteristic of Madrid drafts, therefore, is likely to be a convention designed to endure without tampering, like a constitution, and annexed regulations capable of change without so much political pother, like rules of order.

we should base our stand on the present band widths. When, a little later, the Board held its annual meeting, after having studied this subject closely, many of the directors reported that membership sentiment in their divisions was in favor of widened bands — as of course it is almost everywhere. But as recorded in the account of the Board meeting, after again reviewing the entire situation and hearing officers' reports which must still be confidential, they voted unanimously to reaffirm their vote. The A.R.R.L. is a United States institution. It can't get the government of Esthonia or some other far-away place to speak for it. Much as the League desires to see our international bands expanded, it has had to reconcile itself to the idea of its Government proposing only the present band widths. It would be suicidal to plug at cross-purposes to our own Government. The United States is the chief spokesman for amateur radio before the other nations, and if its situation will not permit it to demand an increase for us, if its plans cannot contemplate any major shakeup of allocations, that matter just about ends there. The League's Madrid policy therefore became the present band widths, to be defended with the utmost vigor. It's something like the situation in *Alice in Wonderland*:

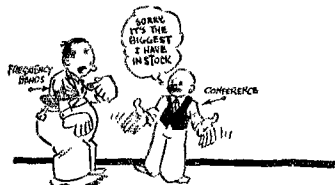
"Well, in our country," said Alice, still panting a little, "you'd generally get to somewhere else if you ran very fast for a long time, as we've been doing."

"A slow sort of country," said the Queen. "Now here, you see, it takes all the running you can do to keep in the same place."

And so League representatives appeared before the Washington committees, recited the past injustices to the amateur and his present congestion, showed that his present position warrants a demand for widening, stated the League's willingness to endorse a position which would not request that these bands be widened if that position were part of a view that these figures would be regarded as the irreducible minimum below which no shrinkage would be accepted under any circumstances, and predicated this endorsement on assurances of friendly support from government and all other United States interests. The League's request met with unanimous approval. Our Government will back us up wholly in this program. More than that, they agreed with us that all our bands ought to be exclusively amateur, and they have so proposed.

Our commercial interests have pledged themselves to similar support. I know that many of you fellows simply can't picture that, but I expect the pledges to be upheld. In the first place, most of the spokesmen for commercial companies are technicians who appreciate the amateur, know

there is room for him, and possibly are still amateurs themselves. Although I find no reason for believing so, I admit it is possible that their big bosses back at the home offices do regard us as "hereditary enemies" and spend much of their time coveting our bands and hoping some day to get them for themselves. But if that be true, it is also true that right now they have more channels bitten off than they can finance and operate, and they'd a whole lot rather see us keep the channels



than have them go to some competitor; and so they're for us — for quite a while yet. Or, if you prefer, attribute it to their realization of our political ability to take care of ourselves in this country and their unwillingness to monkey with the high voltage. Whatever the reason, the American commercial companies will support the existing American amateur bands as part of the United States proposals, in the same fashion that every American interest always supports every part of the agreed United States plan. And personally I believe that their Washington spokesmen are honestly for us.

When one considers how such a show as Madrid operates, certain great merits attach to the policy we have finally adopted for ourselves. That is a position which lends itself admirably to strategical defense. Any interest at Madrid which objects to it is immediately convicted of selfishness and an ulterior motive. It can be advantageously protected because it is logical, it is the *status quo*, it encroaches upon no one. To continue it kicks over no apple-carts, while to violate it is to disturb 35,000 existing stations. It will be solidly supported by our own Government against foreign points of views that may be astronomically removed from ours. It is, outstandingly, a *reasonable* demand, and as such it will gain many powerful supporters amongst delegations that would be quick to oppose an increase. It seems to possess, then, those qualities that we must have in a successful policy.

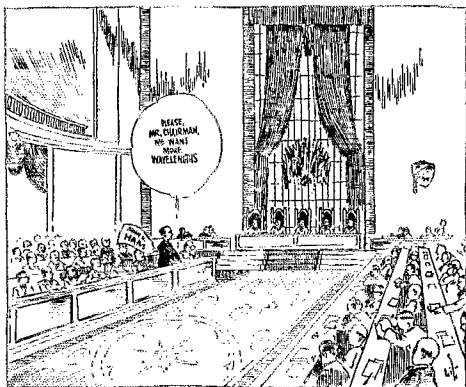
Let us now take a look at the actual wording of the U. S. Proposals so far as they concern us. The draft submitted by the United States is based on the 1927 document. That is, it does not present a complete new text in a new arrangement but consists of specific proposals for changes, deletions and additions in the 1927 wording, accompanied by explanations. With the aid of a copy of the 1927 Convention & General Regulations,

the reader may follow every proposed change.

The first place where a reference to the amateur occurs is right in Article 1 of the convention. This article consists of definitions, and the following is there proposed:

The term "amateur station" means a station used by an amateur, i.e., by a "duly authorized person interested in radio technique solely with a personal aim and without pecuniary interest.

This definition has been transferred from Article 1 of the General Regulations of Washington, since the term is used in the proposed definition of a fixed station and requires explaining right there. Amateurs are not again mentioned in the convention proposals. Having proposed defining an amateur station in the Convention, the U. S. proposes to eliminate the definition of the term "private experimental station" in Article 1 of the 1927 regulations. This was a double-barreled



"... UNFORTUNATELY, THAT IS NOT THE WAY THOSE THINGS ARE DONE"

definition, embracing both amateur stations and "private stations intended for experiments with a view to the development of radio technique or radio art." Although Great Britain calls its amateur stations "private experimental stations," the latter definition in this country coincides with that of commercial experimental stations which are separately provided for both as to regulations and frequency assignments and certainly aren't entitled to use the frequencies designated for amateur stations. It would be better, says the United States, to change the language throughout to talk about amateur stations, which is what is meant, and let each government make its own provisions for its commercial experimental stations — which they all do anyway.

Next mention comes in Article 5 of the Regulations, the well-known Paragraph 7 with its allocation of frequencies amongst the various services. Here the actual figures cited for amateur stations are just the same as exist in our licenses to-day (except the 400-mc. band — there is no international reservation above 60 mc.) but they are now all proposed as internationally exclusive amateur

bands. In the Washington Regulations, for example, our 1715–2000 and 3500–4000 kc. bands read "Mobile services, fixed services, amateurs," and only the so-called North American Agreement gives us those bands exclusively on this continent. The U. S. Proposals list both bands as assigned only to amateur stations, and say:

The growth of amateur services merits the exclusive assignment of this band. An attempt to share this band might result in interference problems exceedingly difficult to correct administratively.

"Forty" and "twenty" remain unchanged: amateurs. Again in the case of our 23–30 and 56–60 mc. bands, however, the Washington Regulations read "Amateur and experimental" and the U. S. now proposes that the assignments be made exclusively amateur. Concerning the whole region from 22,300 to 40,000 kc., including our "ten-meter" band, she says:

This band has recently come into greater use and it is now desirable to apportion it between stations in order to protect them from interference. These apportionments are approximately harmonics of lower frequency bands designated for the same classes of stations.

And opposite our "five-meter" provision:

This band is in harmonic relation to lower frequency bands and should be designated for the same class of stations.

No changes are recommended for Paragraph 18 of this same article, dealing with amateur allocation, which would remain as follows:

§18. (1) Each Administration may assign to amateur stations frequencies chosen from the bands allotted to amateurs in the allocation table (section 7 above).

(2) The maximum power which these stations may use shall be fixed by the Administration concerned, taking into account the technical qualifications of the operators and the conditions under which the stations must work.

(3) All the general rules fixed in the Convention and in these Regulations apply to amateur stations. In particular, the frequency of the waves emitted must be as constant and as free from harmonics as the state of the art permits.

(4) In the course of their transmission, these stations must transmit their call signals at frequent intervals.

The following article, Article 6, in the 1927 Regulations is entitled "Service of private experimental stations." In keeping with the practice explained in the discussion of definitions and because these regulations are intended only for amateur stations, it is proposed to change the title to "Operation of amateur stations," and make the text read as follows:

§1. The exchange of communications between amateur stations of different countries shall be forbidden or restricted to a stated extent if the government of one of the interested countries has given notice of its desire so to do.

§2. The communications must, unless the interested countries have entered into other agreements among themselves, be carried on in plain language.

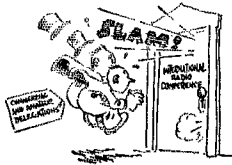
§3. In any amateur station authorized to carry on transmission any person operating the apparatus, either on his own account or for another, must have proved his ability to transmit text in International Morse Code signals and to read by ear texts thus transmitted. He can be replaced only by authorized persons possessing the same qualifications.

§4. Administrations shall take such measures as they deem necessary to verify the qualifications, from a technical point of view, of all persons handling the apparatus.

There is no change in Par. 4 above, and Par. 3 is the same as the old text except the substitution of "amateur" for "private experimental." The first two paragraphs are changes, however. The changes in Par. 1 are made to conform with the definition of "amateur" and to simplify the intent of the following paragraph, 2. Under the latter the United States notes:

Reason:—Simplification. Amateurs should be permitted to intercommunicate to an extent determined by each government concerned. Paragraph 1 of this Article gives each government complete liberty in this respect.

The primary A.R.R.L. reason for desiring a change in Article 6 is to overcome the awkward left-handed arrangement now provided, whereby amateurs are prohibited from handling a communication of any importance (internationally, to a foreign country) "unless the interested countries have entered into other agreements among themselves," that is, unless the amateurs have succeeded in moving their governments to negotiate special treaties just in their behalf. It is, as the United States says, sufficient to give each administration freedom to regulate its amateurs, and regard those amateurs as entitled to do the things not denied them.



The only other country whose proposals we know anything definite about at this writing is Canada. She has given us a real boost, made a proposal that is a proposal. Not having such a flock of commercials in the 7000 region as the United States, she has proposed that our "forty-meter" band be widened by sixty-seven percent, to read 7000 kc. to 7500 kc. She also proposes that the 1715-2000 kc. band be made exclusively amateur. Opposite each proposal she states:

In view of the number of Amateur Stations now in operation throughout the world, and especially on the North American Continent, the bands allotted to such stations are very greatly congested. The Canadian Administration considers the services of Amateur Stations to be of sufficient importance to warrant the changes proposed above.

So do we.

We won't know the proposals of other governments until the Book appears this winter. It will be public property and we shall report it fully, so far as it concerns amateurs, in *QST*. About then, too, there will be further meetings in Washington where the United States group will go over the text, decide what to do about it. We know, of course, that the present practice of quite a few European governments accords with the European regional agreement reported in *QST* for December, 1929, p. 24, wherein of the "eighty-

meter" band only one-fifth, from 3500 kc. to 3600 kc., is allowed amateurs, power is held to ten or fifty watts, government-calibrated frequency meters are required, etc. It is quite possible that one or more of those nations will advance the present European ideas as a world model. Of course the "eighty-meter" band is our life-blood, we fill its entire 500 kc. with the most intense sort of congested activity, and, particularly on this



continent, we simply must retain its entire width in order to endure.

Meanwhile there is much to do. Headquarters is in touch with all the other amateur societies of the world. A.R.R.L. officials are making a most careful study of all developments. At its annual meeting our Board, thankful that we have funds for special purposes, authorized special appropriations for Madrid and named two of the representatives it will send, so that they can commence the work of preparing themselves. There are still many plans to be made. We know that our own Government will do battle for us to the last gong. If in spite of that there is an unfavorable treaty, we must be prepared to secure reservations in its acceptance by this country—for Amateur Radio has a destiny and it must go on and on.

There's the story to date, fellows. Doesn't it give you a better insight than you had before into the complexities of these international matters, the reasons why things must be done in a certain fashion, and particularly the special knowledge that anyone must have before dealing with them? And don't you find that the record to date shows that the A.R.R.L. directors and staff are hard at work and doing the best possible job for Amateur Radio? I believe that every fair-minded amateur will.

## Strays

Unmounted filter condensers may be fixed up neatly by putting them in cocoa tins or some similar tin large enough to hold them. A piece of wood should be placed on the bottom of the tin for the condensers to rest on, and then melted paraffin is poured around the condensers until the tin is filled. The leads may be brought out through suitable holes in the cover, taking care to see that there is no possibility of insulation breakdown.

—WIAQW



# Electron-Coupled Oscillator Circuits

## Combining the Features of Oscillator and Buffer Amplifier

By J. B. Dow\*

IN a paper recently published in the *Proceedings of the Institute of Radio Engineers*,<sup>1</sup> the writer described several electron tube oscillator circuits having a high degree of frequency stability under such operating conditions as are usually encountered in practice. Reaction due to the influence of terminal apparatus upon frequency was reduced greatly in these circuits by the use of *electron coupling* between the frequency-determining portion and other parts of

compensating effects could be obtained whereby the change in frequency due to a 20 per cent change in supply voltage could be reduced to less than 3 cycles per million. The circuits are, therefore, markedly free from frequency modulation.

It is not the purpose of the present article to duplicate the information conveyed by the I.R.E. paper, but rather to present the latest developments in this family of oscillator circuits.

The new circuits differ from those previously described in that the inner anode serves both as an anode for the oscillation generator and as an electrostatic shield (screen grid) to remove the influence of the outer anode upon that portion of the electron stream between the filament and inner anode. The inner anode, therefore, must be maintained at substantially zero radio-frequency potential with respect to ground, which concurrently requires that the filament be allowed to assume such radio-frequency potentials as are dictated by its position in the circuit. The filament heating energy accordingly must be supplied through suitable choke coils, transformers or other means as indicated below.

Figs. 1, 2, 3 and 4 show several circuits differing in structure, but alike in so far as their general principles of operation are concerned. These circuits are recommended as master oscillators in preference to those covered by the I.R.E. paper for the reason that no neutralizing adjustments are necessary, and because any ordinary design of four-element tube appears to fit the requirements of the circuits.

The basic oscillator circuits shown in Figs. 1 and 2 are of the Hartley type. The circuit of Fig. 1 includes an ordinary four-element tube of the Type '24, '65 or '60 class. The screen grid serves also as an anode for the generator portion of the circuit and is tied to the shielding or to ground through blocking condenser  $C_6$ . The resonant circuit  $L_1C_1$  fixes the frequency of oscillation. The filament is fed by its connection to the heating source  $A$  through a conductor within the copper tubing which forms the inductance  $L_1$ . The copper tubing is itself used as the return conductor for the filament supply. This form of construction eliminates the need for supplying the filament heating energy through choke coils which at frequencies above 3000 kcs. become difficult to design because of the large size wire required.

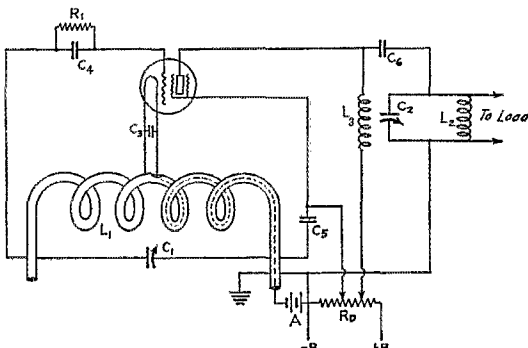


FIG. 1.—A HARTLEY VERSION OF THE ELECTRON-COUPLED OSCILLATOR, COMBINING THE OPERATING FEATURES OF AN OSCILLATOR AND BUFFER AMPLIFIER

The screen grid serves both as the anode of the oscillator circuit and as a shield, being at "ground" r.f. potential. This requires operation of the filament at r.f. potential above ground, accomplished by supplying filament power through the tank inductance from the low-potential end, one side of the circuit being the tank coil tubing and the other an insulated lead inside. Suggested circuit constants for this and the other figures are given in a separate table.

the circuits. The output portion of this family of circuits forms no essential part of the frequency-generating portion. This isolation of the two parts of the circuit makes it possible to reduce appreciably reaction due to variable loading conditions, which reaction is inherent with ordinary oscillator circuits because the conventional methods of coupling by capacitive, inductive or conductive means permit the constants of terminal apparatus to be transferred directly in the form of equivalences into the frequency-determining circuit.

The above-mentioned paper also showed how, by suitable choice of potentials for the two anodes,

\* Bureau of Engineering, Navy Department, Washington, D. C.

<sup>1</sup> Dow, "A Recent Development in Vacuum Tube Oscillator Circuits," *Proc. I.R.E.*, December, 1931.

The inductance  $L_1$  and capacity  $C_1$  should have the usual values for the frequency at which operation is desired. For best results, that portion of the inductance  $L_1$  between the grid and filament must be somewhat larger than that included between the screen and filament. A by-pass capacity  $C_3$  is

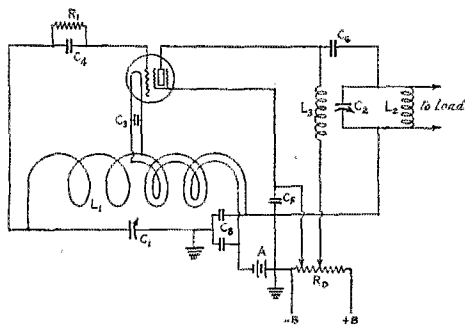


FIG. 2.—ANOTHER HARTLEY ARRANGEMENT IN WHICH THE INDUCTANCE UTILIZES TWO PARALLEL WIRES FOR FEEDING THE FILAMENT  
Recommended circuit constants for Figs. 1, 2, 3 and 4  
 $L_1C_1$  1750 to 4000 kc.,  $L_2C_2$  3500 to 8000 kc.

$L_1$ , $L_2$ and $L_3$ are usual for particular frequency employed			
Type tube	'24	'65	'60
$R_1$	100,000	100,000	50,000
$C_1$	200 $\mu\text{fd.}$ max. to 500 $\mu\text{fd.}$ max.		
$C_2$	100 $\mu\text{fd.}$ max. to 250 $\mu\text{fd.}$ max.		
$C_3$	0.01 $\mu\text{fd.}$ or larger		
$C_4$	200 $\mu\text{fd.}$ or larger	$C_7$	100 $\mu\text{fd.}$ or larger
$C_5$	0.01 $\mu\text{fd.}$ or larger	$C_8$	0.01 $\mu\text{fd.}$ or larger
$C_6$	100 $\mu\text{fd.}$ or larger	$C_9$	0.01 $\mu\text{fd.}$ or larger

placed across the filament as shown. The grid is biased by the leak  $R_1$  across grid condenser  $C_4$ . It generally has been found that best operation is obtained with values of leak resistance considerably higher than are customary in ordinary circuits.

The output or work circuit  $L_2C_2$  is connected between the outer anode (regular plate) and ground, and may be tuned either to the fundamental frequency or a harmonically related one. Circuit  $L_2C_2$  forms no essential part of the oscillation generator, and its adjustment is merely one of tuning to obtain resonance. In this respect, it behaves very much like the usual tuned plate circuit of an amplifier and the dip of a d.c. milliammeter indicating the average current to the outer anode may be used for making the resonance adjustment.

It will be noted that the inner anode potential is supplied across blocking condenser  $C_5$ , whereas the outer anode potential is supplied through radio-frequency choke coil  $L_2$ . Where high precision as to frequency stability is desired, it is advantageous to make condenser  $C_5$  as small as practicably consistent with the required output.

Fig. 2 shows a modified form of circuit in which inductance  $L_1$  is made of two parallel-wound wires for feeding the filament. Fig. 3 is a further modified form of circuit in which the basic oscillator circuit is of the tuned-plate type.

Fig. 4 shows the Colpitts form of circuit. In this case, the filament must be energized through suitable choke coils or preferably through the medium of a special filament transformer having a low distributed capacity between the secondary and other parts of the transformer. In Fig. 4, that portion of capacity  $C_1$  between grid and filament should be smaller than that between the inner anode and filament. A capacity ratio of 1 to 3 is desirable. The LC ratio in circuit  $L_2C_2$  preferably should be rather high for best results, and every effort should be made to shield this circuit both electrostatically and magnetically from circuit  $L_1C_1$  to prevent back-coupling.

The circuits illustrated are arranged for full d.c. operation. Alternating current may be employed for filament heating, of course, and this is recommended. The grid-leak return to filament in this case should be made to the center tap of filament transformer to prevent hum.<sup>2</sup>

#### FREQUENCY STABILITY

Both anodes should be supplied from a common power supply either through the intermediary of a voltage divider as shown or through appropriate series resistors. When the proper values of inner and outer anode voltages are chosen, compensating effects are obtained whereby the common supply potential may be varied as much as 50 per cent without affecting the frequency more than 10 to 15 cycles per million. Mr. R. B. Meyer has called my attention to the fact that the best compensating effect is obtained when the load represented by output circuit  $L_2C_2$  is tuned exactly to resonance or is

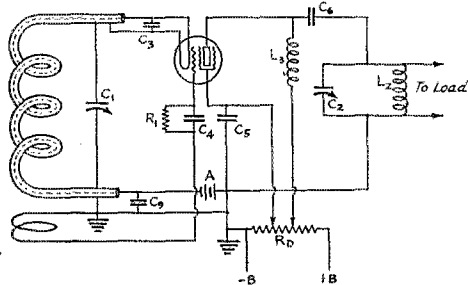


FIG. 3.—A TUNED PLATE MODIFICATION  
One filament supply lead is an insulated conductor inside the copper-tubing tank inductor which serves as the other side of the filament circuit.

made slightly capacitive. His work was done with a circuit of the type illustrated in Fig. 4 and his results are illustrated roughly in Fig. 5. Curve A shows the effect upon frequency caused by varying the outer anode potential, meanwhile keeping the inner anode potential constant. Curve A is

<sup>2</sup> The filament circuit can be simplified considerably when heater type tubes are used, as will be shown in another article in a coming issue. — Editor.

substantially independent of the tuning of  $L_2C_2$ . Curve B shows the effect of varying the inner anode potential, meanwhile keeping the outer anode potential constant. Curve B illustrates the

future date it is hoped that the actual experimental data may be shown in detail.

The following data are listed to indicate the degree of performance which may be expected from a well-designed transmitter employing a 'Type '60 75-watt tube as a master oscillator, a similar tube as an intermediate amplifier and a Type '61 500-watt tube as a power amplifier. The grids of the intermediate and power amplifiers were biased to cut-off so that no plate current flowed when the excitation was of zero value. The circuit of Fig. 4 was employed. The output circuit  $L_2C_2$  in this case was tuned to approximately 3500 kc., which was double the fundamental frequency of oscillation determined by circuit  $L_1C_1$ .

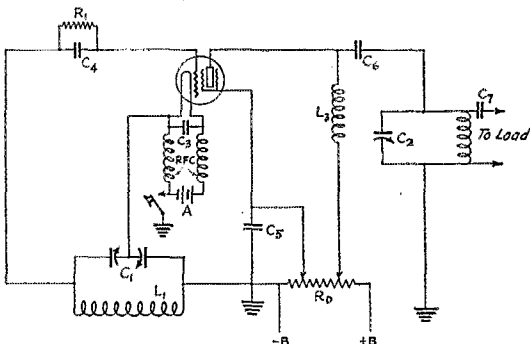


FIG. 4.— THE ELECTRON-COUPLED OSCILLATOR IN A COLPITTS FORM

The portion of  $C_1$  between grid and filament should be about one-third as large as that between filament and anode. Filament power is supplied through r.f. chokes in this arrangement.

condition existing when circuit  $L_2C_2$  is tuned to resonance. Obviously, it is desirable that the slopes of curves A and B be equal and opposite so that the changes in frequency due to changes in line voltage shall be compensated exactly.

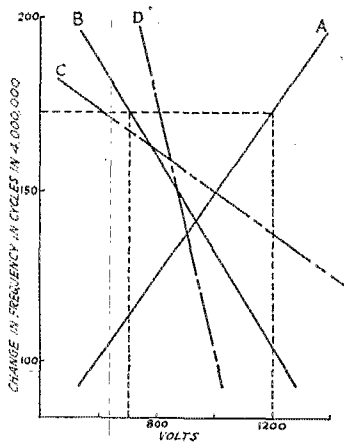


FIG. 5.— ILLUSTRATING THE COMPENSATING EFFECT OF ANODE SUPPLY VOLTAGES

"A" shows the effect on frequency when the outer anode (plate) voltage is varied with the inner anode (screen-grid) voltage constant. "B" shows the effect when the inner anode voltage is varied with the outer anode voltage constant. "C" shows how "B" is changed with the capacity of  $C_2$  slightly greater than the resonance value and "D" with this capacity slightly reduced from the resonance value.

Curve C shows how the slope of curve B may be changed by increasing the value of  $C_2$  slightly from its value when circuit  $L_2C_2$  is resonant. Curve D shows the effect of decreasing capacity  $C_2$ . Fig. 5 is illustrative only, although at some

#### CIRCUIT DATA

Inner anode potential.....	700 volts
Inner anode current (d.c.).....	15 ma.
Outer anode potential.....	1200 volts
Outer anode current (d.c.).....	50 ma.

- (a) Change in frequency due to 20 per cent change in line voltage is approximately 0.001 per cent (35 cycles at 3500 kc.).
- (b) Change in frequency due to tuning capacity  $C_2$  through resonance is approximately 0.004 per cent (140 cycles at 3500 kc.). Detuning resonant circuit of intermediate amplifier changes frequency approximately 0.001 per cent (35 cycles at 3500 kc.). Detuning resonant circuit of power amplifier changes frequency approximately 0.0005 per cent (17.5 cycles at 3500 kc.).
- (c) Gradual change in frequency due to heating and cooling of tube and circuit during keying is approximately 0.002 per cent (70 cycles at 3500 kc.).
- (d) Change in frequency per degree Centigrade change in ambient temperature is approximately 0.005 per cent (175 cycles at 3500 kc.) without temperature control of master oscillator tube or circuit. This may be reduced to 0.002 per cent (70 cycles at 3500 kc.) or less by temperate control of circuit  $L_1C_1$ .

While an effort has been made to indicate briefly the general features of this interesting family of circuits, much investigating yet remains to be done before a full understanding of the circuits is had. Among the interesting phenomena which have been observed is that, with certain values of inner and outer anode potential, the inner anode current reverses even when a potential of over 500 volts is applied with respect to the filament. The question arises as to whether this is not due to secondary emission from the inner anode and whether the pulses of outer anode current which determine the radio frequency output in circuit  $L_2C_2$  are not due to this apparent secondary emission. In such a case, the inner anode would become, in effect, a cathode with respect to the outer anode.

## Strays

W9HTI had some trouble with sparking tank condensers, and cured it by giving the plates a thin coat of clear lacquer. This increased the breakdown voltage without materially affecting the capacity.

# Navy Day—1931

By E. L. Battey, Assistant Communications Manager

ON October 27, 1931, it was the privilege of the radio amateurs of the United States to participate in the annual ceremonies of Navy Day for the seventh consecutive year, and to suitably show their respect for the U. S. Navy.

Each year the American Radio Relay League as the representative of the American amateur is invited to take part in the nation-wide celebration of Navy Day. In 1931 as in past years the A.R.R.L. conducted a Navy Day receiving competition for the amateur radio operators of the United States and possessions. Messages from the Secretary of the Navy were transmitted from naval stations NAA (Arlington) and NPG (San Francisco), and a message from the President of the A.R.R.L. was transmitted in person by him from the League headquarters station W1MK (Hartford). The message from NAA was transmitted on 4205, 8410 and 12615 kc. at 7:30 p.m. E.S.T., from NPG on 4385 and 8770 kc. at 7:30 p.m. P.S.T. and from W1MK on 3960 and 7002 kc. at 9:30 p.m. E.S.T.

The Secretary of the Navy awarded twenty-five letters of congratulation to the operators in each Naval District showing the greatest proficiency in copying the messages from NAA, NPG and W1MK. All amateurs submitting copies of the messages are listed on the "Navy Day Honor Roll" elsewhere in this article, in the order of their rating as determined by the judges.

Concurrent with the growth of the United States Naval Communication Reserve is the increase in interest of the radio amateurs in Navy Day activities. This increase may be chronicled by noting the number of participants from year to year in the A.R.R.L. Navy Day competition. In 1925 when the A.R.R.L. first participated in Navy Day activities only 40 amateurs submitted copies of the messages transmitted; in 1926, 41 copied the messages; in 1927, 129; in 1928, 240; in 1929, 254; in 1930, 285; and in 1931 the number of contestants reached a record figure of 406. 406 amateurs submitted 837 copies of the messages sent from NAA, NPG and W1MK.

The system of grading copies was practically identical to that used in 1930. Participants were classified first by Naval Districts. In this way each amateur was competing only with all other amateurs in the same district. All participants are listed on the Honor Roll in accordance with their rating as compared to other participants in that district only. Copies from each of the eleven Naval Districts were graded separately. Participants who copied all three of the transmitting stations were given extra credit both for perform-

ance and interest shown. Likewise, those who copied two stations were given a higher rating than those copying but one. Entries were all graded according to the number of perfect copies submitted and the number of errors made.

Participants in localities outside of the forty-eight states have been attached to the Naval District nearest them for purposes of the contest. VE2CA, VE2BE and VE2CL are attached to the First Naval District, VE3AD and VE3ZZ to the Third, K4RK, CM8UF, VP2PA and K4RJ to the Seventh, and K6BUC-CFQ to the Eleventh.

At least one of the Navy Day messages to amateurs was copied in 42 states and the District of Columbia and in 6 outside territories. All three stations (NAA, NPG and W1MK) were copied in Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Maryland, North Carolina, Florida, Tennessee, Arkansas, Texas, Ohio, Indiana, Kentucky, Michigan, Wisconsin, Illinois, Minnesota, Iowa, Missouri, Kansas, Nebraska, South Dakota, North Dakota, California, Arizona, Nevada, Colorado, Idaho, Washington, Oregon, District of Columbia, Quebec, Porto Rico and Hawaii. Two stations (NAA and W1MK) only were copied in Vermont, Delaware, Virginia, West Virginia, Louisiana and Ontario. One station (W1MK) only was copied in Alabama and Cuba; one only (NAA) in South Carolina and Jamaica, B.W.I.; and one only (NPG) in Utah. No copies of any stations were received from Georgia, Mississippi, Oklahoma, New Mexico, Montana or Wyoming. Two participants sent in copies but failed to give their calls or addresses so no credit can be given. It will be observed that the messages were copied in every section of the country but more than that, W6QA writes, "You will notice my station is situated in the Imperial Valley of California. The city of Brawley is 118 feet below the level of the sea, and I believe my station to be the 'lowest radio station in the world'. Hi." The messages from all three stations were copied at sea by Theodore Fisher, R. O. KDMC, aboard the S.S. *Beaconstar* approximately 1600 miles S.E. of San Pedro, California. W9CNY used two receivers with a split headset to copy W1MK. He received the best signal on 3960 kc., the 7002 receiver being merely a precautionary measure.

Of the 406 participants, 141 copied the messages from all three stations, 149 copied two stations, and 116 copied one station only. 334 operators copied W1MK, 309 copied NAA and 194 copied NPG. The messages from NAA and

NPG were transmitted at approximately 17 w.p.m. and from W1MK at approximately 12 w.p.m.

The twenty-five letters of congratulation from the Secretary of the Navy have been distributed through the eleven Naval Districts in proportion to the number of participants in each district. The Ninth Naval District having the greatest number of participants received seven letters, the Third District with next highest, five letters, and so on. The twenty-five high operators are listed on the Honor Roll in the order of their accomplishments.

Only two of the 460 participants, C. F. Clark, W4BG, and George Grammer, W1DF, made letter-perfect copies of the transmissions from all three stations. W4BG heads the list of the twenty-five operators to receive letters from Secretary Adams. W1DF would be second of the twenty-five high and also would receive a letter from Secretary Adams were it not for the fact that an A.R.R.L. Board ruling prohibits members of the Headquarters staff from accepting a prize in any contest sponsored by the League.

We need not go into great detail regarding difficulties encountered during the competition. Any amateur knows of the hundred and one types of interference which are ever ready to ruin his reception when an important dispatch is coming through. We might mention, however, a new kind of aggravation experienced by W6UO. He writes, "Just as I was getting set for NPG, one of my kids came rushing in saying there was a dog out in the yard with rabies. I had to QRT long enough to grab my automatic and put the quietus on the dog. I got back in time to get the last part of the message." Those who copied W1MK on 7002 kc. will doubtless recall the interference caused by a few selfish or thoughtless hams who refused to stand by long enough to enable President Maxim to get his message through. Let us quote from letters received regarding this interference. W6BP writes: "Unable to copy W1MK, who was R8 here, through W5 — who jammed W1MK during the whole broadcast. Certainly is a shame certain 'lids' have to blaze away during a QST. It would be wonderful if all hams would observe a silent period while W1MK is sending an important message like the Navy Day message." W1VV reports, "During the latter part of the transmission from W1MK con-

siderable interference was experienced from W1 — and W1 —. But for this QRM solid copy could have been obtained." These are but two of the many complaints received relative to the careless operation of a certain few amateurs.

The pleasure of copying the Navy Day messages is attested by any amateur who has ever done so, and the additional "kick" of copying President Maxim's own personal sending makes Navy Day something to look forward to. This typical quotation relative to the enjoyment of Navy Day participation is from a letter from W9COS: "This is most enjoyable work, and I am pleased to hear the 'fist' of our President at the Headquarters key at least once a



H. P. MAXIM, PRESIDENT, A.R.R.L., AT W1MK

year. Truly, he sets a fine standard for us to follow; his key work is admirable."

The texts of the Navy Day messages from NPG and W1MK are printed after the Honor Roll. These are for the information of those interested and not for checking purposes. They are not "as transmitted," all errors having been corrected. The message from NAA was a paraphrase of the transmission from NPG.

And now the Honor Roll, with the twenty-five high listed first in the order of their proficiency. All amateurs listed on the Honor Roll should feel that they have done their bit to express "amateur radio's" appreciation of our United States Navy.

#### 1931 NAVY DAY HONOR ROLL

- W4BB, C. F. Clark, Jacksonville, Florida (7th Naval District)
- W2CL, Harry F. Washburn, Mount Vernon, N. Y. (3rd Naval District)
- W1BML, Curtis G. Docherty, Providence, R. I. (1st Naval District)
- W8CFR, Robert M. Lloyd, Emsworth, Pittsburgh, Pa. (4th Naval District)
- W1NK, Robert E. Coleman, Revere, Mass. (1st Naval District)
- W3UX, Davis B. Stout, Berwyn, Pa. (4th Naval District)
- W8BKM, Wilburt C. Gross, Conneaut, Ohio (9th Naval District)
- W8AXV, Joseph H. Pitzer, Cleveland, Ohio (9th Naval District)
- W9HUK, Leon Kochevar, Chisholm, Minn. (9th Naval District)

W9FQ, W. H. Cummings, Valparaiso, Indiana (9th Naval District)  
 W9GOF, D. E. Maxham, Mishawaka, Indiana (9th Naval District)  
 W1CU, Ralph J. Renton, Quincy, Mass. (1st Naval District)  
 W8APQ, M. L. Croft, Martinsburg, Pa. (4th Naval District)  
 W2BBU, Edgar C. Powell, Ridgely Park, N. J. (3rd Naval District)  
 W8SS, Kenneth E. Stecker, Detroit, Mich. (9th Naval District)  
 W2AOJ, Scott A. Magness, West Hempstead, N. Y. (3rd Naval District)  
 W9GGB, Henry B. Davis, Danville, Kentucky (9th Naval District)  
 W5ZZT-AHL, Leavenworth Wheeler, Jr., Yuma, Arizona (11th Naval District)  
 W8ABX, John J. Long, Jr., Brighton, N. Y. (3rd Naval District)  
 W2OP, M. S. Mead, Schenectady, N. Y. (3rd Naval District)  
 W4RO, R. F. King, Morristown, Tenn. (8th Naval District)  
 W3BIL, H. E. Warner, Baltimore, Maryland (5th Naval District)  
 W6BAJ, Parley N. James, Holmes Harbor, Wash. (13th Naval District)  
 W9CDE, M. O. Davis, La Junta, Colorado (12th Naval District)  
 W6UO, C. B. Newcombe, Yerington, Nevada (12th Naval District)

The remaining 381 participants on the Honor Roll are as follows, being classified by Naval Districts and listed under their respective districts in the order of high scores:

*First Naval District:* W1IR, W1RW, W1ATO, VE2CA, W1ASU, W1APK, W1AGA, W1ABQ, W1CAB, W1VU, W1AXH, W1CGN, W1BNM, W1AIO, W1AXL, W1ATX, W1WU, W1BYR, W1BAB, W1BPN, W1CTF, W1NS-CWD, VE2BE, A. F. Hiltferty, W1MT, W1DR, W1APU, W1BD, W1ATF, W1AFO, W1COV, W1BEU, W1VE, Geo. F. Crocker, Jr., W1CRS, W1AUA, W1GSE, W1BEG, W1AFP, W1CSR, W1BWS, W1BFK, W1AJD, W1CCD, W1AZN, W1BGW, W1AMI, VE2CL, W1IJ, W1BLA, W1CKI. *Third Naval District:* W1DF, W. E. Preisch, W2QU, W2BJA, W2JE, W8EWT, W2LA, W1AHC, W2ACY, W3AWV, W2ADI, W2BOP, W2AZY, W8CYG, W2CCD-KW, R. D. Reed, W2CRZ, W1AMQ, W2BJX, W2CJY, W8AHC, W1AVS, John J. Orysik, W2BED, W2BP, W8OA, W2DFU, W2APV, W1BDI, W8DME, W2AUS, W1ASP, W8PU, W8AYM, W1BHM, W8BKZ, W2ARO, W8BLH, W8FMG, W2ACD, W2AA, W2ABP, W2ANV, W2COG, W2AIQ-AFP, W8ERZ, W2BAQ, W8CSW, W2AUP, W2BTO, W8ANQ, W2BER, W2UV, W8AMZ, W2BVB, W2WP, W2CGD, W8BFG, W1QU, W8ATA, VE3AD, W2AOY, W1CTO, A. A. Cimildoro, W2ATZ, W2BST, W2BYC, W1APW, Frank W. Ballard, W8CDK, W8BHU-ZZE, W2CDQ-DEJ, W2BZZ, W2CFY, W2CSQ, VE3ZZ, W2OQ. *Fourth Naval District:* W8RQ, W3BHU, W8DYO, W3AKU, W3BBK, W8CRE, W3QV, W3EV, W8DGW, W3ADE, W3AGK, W8CEO, W8CDT, W3AJ, W8DLG, W8CPE, W8BRP, W3CL, W8AJE, W8KD, W3LZ, W8HC, W3ANZ, W8DZP, W3AWI, W3MG, Stewart H. Resch, W8CJF, W8VD, W3BER, Franklin Mousley, W3BTS, S. G. Bassler, W8BIB, W3BFH, W8AVY, W3QL, W8BWP, W8AYH, W8AFE, W8AIT, W8DVZ. *Fifth Naval District:* W3ZZA, W4DW, W8HD,

W3AKG, W3WO, W3BAI, W3NT, W3BWT, W3CFL, W3FJ, W8DPQ, W8BWK-FJS, W3CAB, L. C. Hull, W3IL, W3PN, W4HM, W3ZU, W3BPR, Percy Smith, Ethelbert Seward. *Sixth Naval District:* W4AHG. *Seventh Naval District:* W4AS, K4RK, W4OK, W4AJK, W4AEM, W4HC, W4AKV, WANN, W4OY, CM8UF, VP2PA, K4RJ, W4KY, W4QY, W4AHE. *Eighth Naval District:* W5FM, W5IQ, W5KC, W5CCJ, W5ACY, W5AZS, Francis Wm. Taylor, W5BII, W4MS, W4KP, W5ZC. *Ninth Naval District:* W8CHO, W8ERU, W9FNQ, W9DGS, W8BTT, W9COB, W9CNY, W9CDA, W9HED, W8CSG, W9ANT, W9BRA, W8BXJ, W9CCB, W9CTZ, W9BRX, W8CEI, W9ELL, W9CTW, W9AZO, W9AIR, W9DKH, W9COS, W9EAW, W9FXV, W9OFL, W9RR, Ross F. Collins, W8BMM, W9NP, W9BDF, W9EQT, W8DCE, W9CER, Willis Hudgins W9BNT, W9AHH, W8DFR, W9FXE, W9HBQ, W8GP, W9EYL, W9UC-BJX, A. S. Kripinsky, John Berg, Jr., W9DRM, W9AQL, W9FUE, W8ALQ, Carl Drumm, W8DMS, W9ECZ, W9FLI, W8HS, W8CST, W9BBM, W9DEB, W9BUB, W8CSR, W9CWR, W9CUH, W9GIV, W9GFL-DMM, W9HAA, W9CWB, W8EVC, W9BWW, W8DBP, W9CNP, W9HL-PLL, W8CLL, W8BYD, W8CAT, W9HNV, W9EGI, W9EIV, W9ESL, W9ACN, W9EDQ, W9FFD, W9ALW, W8BBH, W8BAH, W9GBI, W9DFR, Louis R. Clements, W9OX, Blair Weicht, W9AQX, W9AIV, W8DYK, W9GMU, W8PP, W. A. Hayward, W9DZN, W9FCW, W8EGI, W8SWG, W9EPJ, W8MM, W9EGG, W9AIJ, W8DM, W8BMX, W8EFW, W8WO, W9GBJ, George Deakin, W9BNN, B. J. Patterson. *Eleventh Naval District:* Theodore Fisher KDMC, K6BUC-CFQ, W6BUX, W6QA, W6ACL, W6NF (Bogue, Dewes, Settle), Edward S. Babcock, W6CIX, W6AKW, W6TE, W6ADH, W6VY, W6AUY, W6BP, W6LN, W6BXV, W8UO, W6BGF-BPA. *Twelfth Naval District:* W6BET, W6NL-NAC, W6BIV, W6BZU, W6COJ, W9EAM, W6DJQ, W6CIS, W6B-NK, Philip G. Lasky, KDYL, W6DSR, W6BIP, W6BTX, W6ADA, W6UL, W6BPC, W6BMW, W6BAJ, W6CGJ. *Thirteenth Naval District:* W7LD, Don Hamrick, W7AFP, W7AMV, W7BB, W7BKE, W7AIG, W7KZ, W7AJ, W7TK, W7QD, W7ACH, W7ATN, W7ACP, W7AFT, W7AEA.

#### 1931 NAVY DAY BROADCASTS

From NPG:

All Amateur Radio Operators of the United States and Insular Possessions:

On this Navy Day it is again my pleasure to extend to all amateur radio operators of the United States the best wishes of the Navy Department. The splendid service you have rendered in time of emergency when other communication channels have failed is well known and I know that you stand ready should the need again arise for such patriotic service. The Naval Communication Reserve in which every state of the Union is represented is now composed of about three thousand seven hundred officers and men many of whom are operators and owners of amateur radio stations. I would take this opportunity to express in particular my keen appreciation of your support and patriotic interest which has been largely responsible for the building up of this valuable organization. That this interest in the Navy and Naval Reserve on the part of the radio amateur will always continue is my hope and that of the entire Navy Department.

C. F. ADAMS, Secretary of the Navy.

From W1MK:

To the Radio Amateurs of the United States:

The President of the United States sets aside one day in the year to be known as Navy Day. On this day every real American should pause in his daily routine and give thought to the U. S. Navy, what it has done in the past for every one of us and what we may always count upon it to do for us in the future. It has been the custom for the Director of Naval Communications to invite the President of the A.R.R.L. to participate in the ceremonies of Navy Day and to send an appropriate telegraphic message to the radio amateurs of the country. It affords me as President of the A.R.R.L. the keenest satisfaction to take the key of the A.R.R.L. Headquarters station personally and to transmit

(Continued on page 31)

# Concerning Inventions and Patents

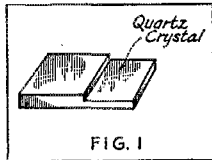
By Ben J. Chromy, W3AGE\*

**O**FTEN the amateur experimenter is confronted with the problem of whether or not some thing that he conceives contains patentable novelty or is new in the patent sense, and, if so, whether he should proceed to have it patented. This article was written for the purpose of clearing up some of the more frequent problems involving patents.

The first problem that naturally occurs is just what is invention and how is one to know when he has made a patentable invention? Inasmuch as there does not appear to be any clear-cut definition of what constitutes invention, probably the best way to formulate an idea of its nature is to consider some illustrations of what has been held to be invention.

Since most amateurs are very much interested in piezo-electric crystals, our examples illustrating points which it is desired to make clear have been taken from a large number of crystal patents.

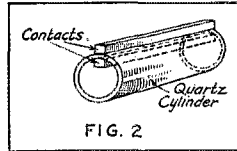
From descriptions found in literature it is apparent that the crystal slab used by the Curies in their piezo-electric crystal experiments was of the zero angle cut; that is, the X-axis in a crystal oscillating along this axis was parallel to the thickness dimension. Crystals cut in this same



general way were used by B. Galatzin, W. G. Cady, M. I. Pupin and others in their experiments. After the crystal resonator experiments of Cady it was found by Taylor that by making all of the sides of a zero angle crystal multiples of a whole number that the crystal was capable of much freer oscillation; that is, it was what might be said to be more efficient. Previous experiments of others did not disclose this to be true; in fact, no one appeared to be interested in making the crystal's operation easier. This change is very slight, but it appears to be sufficient to produce a crystal that is easily brought into oscillation instead of one that is "sluggish" and does not readily step into oscillation.

In considering the patentability of the crystal cut with its sides being multiples of a whole number, the "prior art" that had to be considered was the crystal in which the sides were cut at random without being multiples of any number or of the thickness of the crystal. Another patent granted for a crystal shows a crystal cut in step formation as illustrated in Fig. 1. This is done to

produce a slab that will oscillate when excited in the proper circuit at two slightly displaced frequencies, the result of which is a low beat



frequency. In practice the difference in the thicknesses would be difficult of perception, since it naturally has to be very small. Another very interesting crystal patent was recently issued; this patent discloses a crystal cut in the form of a tube or annulus as illustrated in Fig. 2. The contacting electrodes are placed one within the ring and one outside opposite the inner electrode as shown. It is claimed that a crystal cut in the form of an annulus oscillates circumferentially and, therefore, considering a given frequency is more massive than the flat plate type now used. Crystals cut in this fashion could, therefore, be ground to higher frequencies.

From these examples it is seen that patentable novelty does not necessarily have to be founded upon any radical change, but that a small change is sufficient if the result produced is different. The result must be generally different in character and not merely in degree; for instance, if the step-formed crystal used as an example were taken and three steps were provided to it instead of two steps as disclosed in the patent, this ordinarily would produce a result differing only in degree. If it could be shown, however, that the crystal having the three-step form operated in some unique way not to produce just a beat frequency, then the result of providing three steps instead of two would cease to be merely a difference in degree and would, of course, become a difference in character.

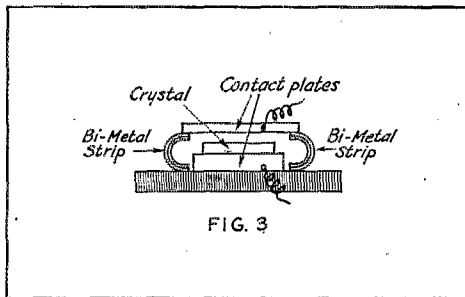
## COMBINATIONS

Thus far attention has been directed only to inventions having only a single element. Our attention is next directed to the so-called combinations which are made up of two or more elements functioning together to do some one thing. This is best illustrated by a radio set which in its present-day form consists of several elements; that is, the tubes, the sockets, transformers, etc., all functioning together to do one thing, namely, to reproduce electromagnetic waves modulated in accordance with music or voice as sound waves. In the examples taken from the piezo-electric crystals only one element functioning to do work could be enumerated; that is, the crystal itself.

\* Patent Attorney, Nat'l Press Bldg., Washington, D. C.

A combination in order to be patentable does not have to consist of novel elements; it may be made up entirely of elements well known. This is perhaps best illustrated in the case of one of the tuned amplifier patents which used amplifier tubes, air core transformers, air dielectric condensers, batteries and a pair of telephones. All of these units were well known in the telephone and radio arts before the invention of this amplifier, yet they were never before placed into the same relationship with respect to each other to form a tuned amplifier. That particular relationship or combination was, therefore, novel, even though all of the elements composing it were old.

Normally the piezo-electric crystal holder consists of a pair of plates for contacting with the surfaces of the crystal and a housing for retaining the crystal and the plates in place. These constitute the elements or component parts of a simple crystal holder. Several years ago it was

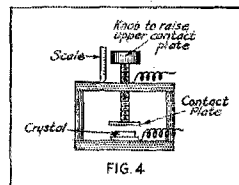


found that the frequency of a crystal changed when one of the contact plates was moved away from it a small distance. Several patents were granted on crystal holder combinations in which one of the contact plates was movable with respect to the crystal. Some of these will be discussed because they well illustrate the point of law dealt with here. One arrangement of the apparatus for moving a contact plate with respect to a crystal surface employs bi-metal strips which change their shape with changes in temperature, and in that way either raise or lower the contact plate with respect to the crystal, as shown in Fig. 3. This type of holder was presumably designed to compensate for the frequency shift taking place in a crystal due to changes in temperature, by varying the spacing between a contact plate and the crystal. The structure of this crystal holder clearly departs from that of previously known holders, inasmuch as it has, in addition to the housing and the contact plates which cooperate with surfaces of the crystal, the bi-metal strips which cooperate with one of the contact plates and govern the spacing between it and the crystal. These bi-metal strips have a distinct function to perform in the crystal holder and, therefore, a holder employing them clearly consists of a new combination.

Now, if these bi-metal strips were employed also as connectors between a contact plate of the holder and a bindingpost they would have an additional function; that is, the transmitting of electric current to and away from the crystal. This would not subtract from the novelty of the device, since the bi-metal strips would still operate to regulate the spacing between a contact plate and the crystal.

It is often remarked that merely rearranging the parts of a device constitutes patentable novelty. The answer to this question cannot be in the form of "yes" or "no," but must be governed by the manner in which the parts are rearranged. If the rearrangement involves merely the changing of the position of certain screws, then it obviously would not involve invention unless there resulted a change in the function of one or more of the parts of the device. It is, offhand, hardly conceivable how merely rearranging the positions of certain screws of a device could bring about sufficient change in the function of one or more of the parts of a device. Often, in order to measure whether or not the change has been sufficient, the hypothetical question is asked, whether an ordinary worker, familiar with machines of the class involved, would make such a change in the ordinary everyday course of work without hesitation. This method of solving the problem is, however, very unsatisfactory and erratic, and is used only in rare cases. The best way that thus far seems to have been evolved is to strip the problem of its technicalities and consider it in its simplified form as illustrated in the cases previously discussed.

Another example of a crystal holder recently patented is illustrated in Fig. 4. This holder is provided with a movable upper contact and a graduated scale, the purpose of the graduated scale being to determine spacing of the plate from



the crystal and the frequency variation produced by the spacing. It is, of course, quite customary to provide graduated scales to instruments, but this scale has a function different from that of any prior

scale, inasmuch as it interprets the spacing necessary between a crystal and a contact plate to produce a certain frequency change.

Other examples involving the problem of the determination of invention in a more complicated manner could be cited. Usually, however, the difficulty does not lie in the actual determination, but in the stripping and paring of the surrounding obstacles that clothe the actual problem in an atmosphere full of technicalities. It is for this reason that in most cases the inventor should retain the services of a qualified patent attorney.



Care should be taken to select an attorney qualified in radio, if the invention is of such a nature, and not an attorney who knows nothing about radio. It is doubtful whether or not a person not skilled in radio can properly attack a problem involving radio apparatus, strip it of its complications and present a clear-cut argument before the Patent Office properly showing the novel features of the apparatus in a way that the inventor is entitled to have them presented.

#### APPLYING FOR A PATENT

The next point of interest after the consideration of invention naturally is the filing of an application for patent. After the invention has been considered and found to be of sufficient merit to warrant patenting, the inventor should have a search made through the files of the Patent Office to determine whether a similar invention had not already been patented. Here again, unless the inventor is skilled in the handling of patents, he should not entrust his case to the care of persons not competent to handle it. A great deal depends upon the manner in which this search is made. If it is improperly made, patents very pertinent to the invention may not be located, with the consequence that the inventor erroneously labors under the belief that the patent issued to him is broader in scope than it actually is. The cost of this search is usually ten dollars. Where it is unusually involved and requires considerable time the cost would, of course, be more.

After the preliminary search is made and it is found that the invention has not been patented, the application for patent should be filed in the Patent Office without great delay. Often inventors carry their inventions in their head without making any sketches of them or experimenting with them for long periods of time. Such delay as this is not looked upon with favor by the patent tribunals, especially where another inventor who conceived the idea later had filed an application for patent without delay. The patent laws of the United States grant an inventor the exclusive right to make, use and/or sell his invention for seventeen years after his patent is granted. This monopoly is given to the inventor to dispose of or use, as he desires, on the theory that the inventor is contributing valuable information to society and should be protected. In consideration for this protection the inventor must fully disclose the nature of his invention without unusual delay, after it is made. After the seventeen-year term of the patent has elapsed the invention becomes public property, so to speak, in that any one may make, use or sell it.

The actual preparation of the specification, drawings and claims of a patent application is rather involved and no lengthy description of it can be given in an article of this nature. In general, the specification should completely disclose

the invention. The inventor should read it very thoroughly after receiving it from his attorney to see that his invention has been properly described.

A mistake is often made by experimenters when they do not explain their inventions to any of their friends. Time should not be wasted in explaining valuable ideas to persons that are not versed in the same line of work, however, but one or two trustworthy friends that understand the technical meaning of the invention should be chosen. A diagram of the invention should be made and dated and signed by both the inventor and his friends on the day on which the explanation of the invention took place, in order to complete the record of the invention. Records such as these should be made from time to time until the invention is sufficiently developed.

After the experimenter has completed the routine of making his notes and has satisfied himself of the merits of his invention, he may desire to determine whether or not he should get a patent or whether he should continue his experiments further and wait until he has perfected the minor details of the invention to high degree before getting a patent. If the invention is of such a nature that the experimenter is not fully equipped to carry on the experiments to perfection, but is convinced that the invention will work and has advantages over existing apparatus, then he should avoid all possible delay in obtaining a patent. If, however, the experimenter can perfect the invention readily by making a working model he should do so with the least possible delay, simultaneously keeping notes of his experiments, and file his application for patent as soon as the invention is perfected in the form of a working model. This working model should, of course, be operated in the presence of witnesses.

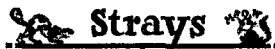
It is not necessary to make a model of the invention in every case. It is, however, necessary that the invention operate in accordance with fundamental physical laws.

### Navy Day—1931

*(Continued from page 28)*

this QST to my fellow amateurs. To carry out the "Lest We Forget" spirit of Navy Day let us declare fifteen seconds of silence, during which every one of us shall pause and give thought to our country, our flag, and our U. S. Navy. . . . And now let us all agree to continue in our daily lives the splendid patriotic spirit of Navy Day and the traditions of amateur radio. In closing remember that the Secretary of the Navy will send a letter of congratulation to those operators in each Naval District showing the greatest proficiency in copying Navy Day broadcast from NAA, NPG and W1MK.

HIRAM PERCY MAXIM,  
Lieut. Commander, U.S.N.R.  
President of A.R.R.L.



C. W. Ham is a professor in the Engineering School of the University of Illinois. W9CSB<sup>1</sup> is responsible for the information.

# 56-Mc. Band Marching Ahead

## Beginners and Old-Timers Alike Report Wide Success

**I**F 56-mc. signals acted in the manner of 7-mc. signals, the air in this part of the world would be seriously cluttered with amateur 'phone conversations. Looking from this point of vantage it seems that there are about as many amateur 'phone stations on 56 mc. as on any other band. Interference is not the order of the day simply because of the limited range of 56-mc. transmissions. Perhaps we can afford to smile when we realize that this same limited range of transmission was, in the opinion of many, the one factor which would prevent 56 mc. from becoming a useful amateur band — ever.

Since the recent publication in *QST* of articles describing practical "five-meter" equipment<sup>1</sup> we have received by word of mouth, by radio and by mail, reports of amateur activity on this band all over the country. Some of the letters contained concrete reports of work accomplished and for this reason we quote from them.

### DOWN EAST

One of the first reports was from Frank Hales, W1BBU, of Waterbury, Conn. W1HD of that city had been on the air since June of 1931 with a simple transmitter and autodyne receiver. With similar equipment at W1BBU, several fair QSO's were had over the one mile that separated the stations. In July, the receivers were displaced with super-regenerative rigs and headphones gave way to loud-speakers. With W1BHV, about three miles off, these stations have been on the air solidly during the last few months and a great deal of excellent work has been accomplished.

### IN ILLINOIS AND POINTS NORTH

Another early report was from H. Knaack, W9GHG, Lake Bluff, Ill. His gear comprised a breadboard push-pull transmitter with Type '10's and a super-regenerative receiver. No difficulty was had in putting the station on the air. Transmitter operation at 500 volts and 100 milliamperes was found to be quite practical. Knaack expressed the usual fear that his simple filter would leave a heavy hum on the carrier but soon found his 6 "mikes" and 60 henries to be ample. As most of the "five meter" workers will know by this, the wretched note usually obtained from a self-excited transmitter as heard in an oscillating autodyne receiver results chiefly from severe frequency modulation. When heard with a non-oscillating and broadly tuning super-regenerative receiver, this modulation is almost inaudible. Amplitude modulation alone is heard.

Next in order is a report from William Rasikas,

<sup>1</sup> Particularly *QST* of July and August, 1931.

W8AUB, Grand Rapids, Michigan. With just two weeks of time available, Rasikas put together a breadboard Type '10 transmitter and a super-regenerative receiver with which he worked W8KA, W8BPS and W8DWM right off the jump. During the few days following, he worked W9XM, W8BKX. Signal strength was considered most unsatisfactory and in the limited time it was impossible to overcome certain receiver difficulties. It is almost certain, however, that the trouble resulted from an excessively high frequency in the interruption oscillator.

### OUT IN WESTERN CANADA

Next comes a report of splendid success from B. W. Naylor, VE5BI, Vancouver, B. C. Naylor's idea was to put in equipment which would allow reliable 'phone work with VE5AM yet avoiding a contribution to the interference on the lower frequency bands. One of the transmitters is a breadboard Type '10, the other uses Type '12-A's. The output end of a broadcast receiver was used as modulator at one station, a pair of Type '12-A's at the other. Super-regenerative receivers were put to work after simple autodyne sets had been given a chance to show their effectiveness — and had failed. Receiver plate supply voltages higher than 45 were found unnecessary and these were obtained from "eliminators." Results have been completely satisfactory and very much above the expectations of either of the amateurs concerned.

### AND AGAIN IN MICHIGAN

Mr. C. H. Vincent, W8RD-W8ZZO, Utica, Michigan, at this stage forwarded the first of what was to prove a series of reports. In characteristic fashion, W8RD had set out on an intensive program of experiment and development. First concerns were over the poor note quality as heard with an autodyne and an inability to get the portable type transmitter to operate as well as the breadboard type. "Incidentally," W8RD wrote, "the outfit seems quite sensitive to antenna adjustment but strange to say the note is just as good when tuned to absolute resonance whereas with the radiating system six or eight inches too long it will become very ragged and go all to pieces, sounding much like a poorly adjusted spark coil."

Not more than a few days later, Vincent's second letter brought the news that C. S. Stark, W8MS, had finished a super-regenerative receiver; that short-range tests had been made with excellent success; that W8RD had demonstrated the equipment at the Ypsilanti Hamfest; that

interest in the vicinity was climbing rapidly, and that plans had been made for some aircraft tests.

#### EAST AGAIN

But let us leave Utica for the moment to see what happened at Palisades, N. J. Everett Kimmel, W2ACN, of that town had visited Headquarters during the summer and had seen the "five-meter" gear in the works. On his return home, he says, "I built a rig more or less like the original, gathered together my old standbys on 10 meters, W2JN and W2NM, made a schedule with them — and we were off. We had a few headaches trying to receive each other until we all had super-regenerative receivers but ever since the first night of the first schedule some two months back we have always been in contact although we are separated about 11 miles over several ridges.

"From the three of us," Everett continues, "the thing grew like a snowball rolling downhill. At the present writing there are at least 14 stations with 'five-meter' phones here in Northern New Jersey duplexing each night like 'nobody's business.' And it's all loud-speaker reception too! We all agree that nothing we can remember has given us so much real fun and such an opportunity to experiment as this work." The maximum range obtained in tests with an automobile receiver, W2ACN states, was 44 miles.

#### EVEN UTAH

Now listen to this one! Dick Anderson, W6AFN, Salt Lake City, Utah, is a new "Ham." His very first contact was with W6EWW on 56 mc. "The antenna," Anderson writes, "was a piece of bell wire 8 feet long hooked to the antenna condenser and an insulator on a stick. The quality of both 'phone and i.c.w. was perfect. Several times no signals could be heard until the antenna was held horizontally a foot from the ground. Raising the antenna or moving it from this position killed the signal. In most instances, however, the vertical antenna worked FB."

From Summit, N. J., D. A. Griffin, W2AOE, writes of experimental work accomplished in comparing different types of antennas. "Now using a vertical Marconi 28 feet long," he says. "This is fed 12 feet from ground with 12-foot feeders. Signals are much better than with other types tried and I can now put a good signal over three ranges of hills to a distance of 10 miles." Griffin not only puts the signals over the three ridges but with the vertical antenna puts them into the hollows between the ridges.

Another serious worker whose example is being followed by many amateurs in his neighborhood is H. W. Dreyer, W1ANC, at Bristol, Conn. The receiver is a super-regenerative in the QST manner. The transmitter, Dreyer says, "is a sort of push-pull Hartley using Type '10 tubes. The tank inductance is of copper tubing but the plate

coil is a rubber insulated wire inside of the tubing, the plate power being fed to the center of this coil without any choke or by-pass condenser." For modulation, the output end of a BC set with Type '45's is used. The transmitter itself is in the attic, the power supply in the cellar and the modulator is in the living room. Unfortunately, Dreyer's location is a poor one. Hills surround it on three sides. In the one clear direction, however, R9 signals can be heard at a distance of six miles. W1VK and W1CDN are reported to be hammering away in the same locality.

#### MORE FROM UTICA

But let us get back to Utica, Michigan, where W8RD-W8ZZO has had so much to do with the formation of one of the most enthusiastic of all the "five-meter" groups. In later reports from Vincent it appears that the leaders in the group include Mr. C. S. Stark, W8MS; Mr. H. B. Joy, W8LO; W8AYV; W8BMM; W8DDX. Mr. C. H. Wesser, W8ND, is working with these amateurs towards the formation of a "five-meter club." In one of W8RD's letters we find mention of his recent results. On the subject of antennas, this observation is of considerable interest. "The first antenna (a quarter-wave)" W8RD says, "was almost a total failure and was quickly changed to a half-wave vertical Zeppelin. Shortly after starting tests with Mr. Joy (14 miles away) I disconnected the dead ended feeder at the transmitter and attached one end of my regular transmitting doublet. This wire is approximately two hundred feet long, thirty-eight feet high at its inner end and fifty-two feet at the outer end. Immediately upon hooking this up, Mr. Joy reported signals increased one thousand percent and a personal check which I have since made shows a tremendous improvement. Naturally I tried using the other half of the doublet in place of the vertical pole but this proved to be NG."

In addition to building a couple of transmitters and three receivers, Vincent has made a great many automobile surveys of signals in the neighborhood and has already accomplished reception in a 'plane at 50 miles from the transmitters. (More on this promised.) His comments after one of the automobile trips are of value. "Half of the driving was on a road particularly noted for fading on the broadcast frequencies but any fading present in this case was so slight that it could only be described as a gradual weakening of the signal. *Absolutely no fading or decrease in signal strength was noticed when passing through steel arch bridges which kill broadcast signals entirely!*"

#### CLUB ACTIVITIES

Our hunch that 56 mc. offered an ideal field for club promotion is borne out by reports from New Jersey, famous for its long-established amateur

(Continued on page 90)

# Canada-U. S. A. Contact Contest

January 15th (6 p.m., Friday) to January 17th (Midnight, Sunday)

**T**HREE big evenings of operating fun for U. S. and Canadian hams! Those who have taken part in such contests before write us in such terms as, "The most enjoyable and fascinating activity I ever entered." "An unqualified success." "Congrats on the FB contest." "I was surprised at the friendliness of all the contestants." "Enjoyed it very much and believe it one good way to make records and get acquainted at the same time." "Great sport, may we have more of it." January is almost here as we write, and we're all set for a big W/VE QSO Party.

How many Canadian stations can be worked by an individual U. S. amateur operator in the period of the contest? How many U. S. stations can be contacted by an individual Canadian amateur operator in the stipulated time? And how many U. S. (or Canadian, as the case may be) A.R.R.L. Sections<sup>1</sup> can these individuals in each country chalk up to their credit as worked? Who will be first to work "all Canadian districts" and likewise "all U. S. A. districts" in the shortest elapsed time from the start of the party? The "contact contest" will decide, and also provide other desirable objectives. There will be full opportunity to exchange traffic, rag-chew, arrange schedules for the future where mutually desired, etc., and participants who get the spirit of the contest can hardly fail to have a good time. The party should be followed by a general and profitable good-will exchange of QSLs between amateurs of our two countries working together under the A.R.R.L. banner, and such QSL-exchange will further commemorate an enjoyable contact-party for a long time to come.

Quoting from an exchange of letters with one of Ontario's progressive Route Managers (VE3GT) on the subject of this proposed W/VE contest, "It will give many W's a chance to work all VE districts (which is not so easy to do). To many new W's on the air this fall it will give an opportunity for that *first* VE contact. It will give all Canadian stations something they have been looking for and they all will get into the swim of organized A.R.R.L. activity. It will bring us closer to our amateur friends across the border. Then, too, I hope it will help to dispel some of the mistaken illusions about Canada. We *don't* have snow all the year 'round and hunt polar bears in the summer time for amusement. Our country *isn't* north of the Arctic circle for the most part. Much of Ontario is south of hundreds of square miles of the U. S. A. I've had eastern

<sup>1</sup> See page 5 this QST for a complete list of all U. S. and Canadian A.R.R.L. Sections.

amateurs refuse to give me messages to QSP to the west coast on the grounds I was 'way up north' and only good for traffic to MacMillan or the Mounties. That idea is wrong and there are a lot of VE's who can make a fast QSP on schedules this season for messages going in any direction, and more especially can we in central Canada handle east-west amateur traffic to good advantage."

Here are the simple rules for the contact contest.

## WHEN?

Starts — Friday January 15, 6 p.m. (1800) local time.

Ends — Sunday January 17, midnight (2400) local time.

Duration — 54 hours.

## FREQUENCIES

Any or all amateur frequency bands may be used.

## GENERAL CALL

CQ VE/W CQ VE/W CQ VE/W DE  
W/VE ---- W/VE ---- W/VE ----  
(repeated not more than 3 X 3) K.

## SCORING

Both Canadian and U. S. A. operators count:

1 point, for each station (in the *other* country) worked.<sup>2</sup>

2 points, for handling any amateur traffic (in regulation A.R.R.L. form) regardless of the number of such communications exchanged.

To keep track of the score and make a report to be submitted to A.R.R.L. for credit in the QST account of this activity, rule 8" x 11" paper into five vertical columns, recording in each (left to right):

- (1) The date and time of QSO.
- (2) The call signal of the station contacted.
- (3) The A.R.R.L. designation of the Section<sup>1</sup> worked.
- (4) The number of messages<sup>3</sup> originated, delivered, or relayed during this QSO, if any were handled.
- (5) The points for each station worked, three points if a single message or more was

<sup>2</sup> Second QSOs with a station that has already been worked do not increase the score in any fashion, unless during such QSO traffic-handling is added, where no traffic was previously handled. In such a case the two points may be added, and special notation entered in the report.

<sup>3</sup> Participants can "make up" suitable messages if there are none on the hook to QSP — but write them out *before* QSO where practical, make them interesting, avoid "rubber stamp" or stereotyped "standard" texts, etc. Such messages will add to regular A.R.R.L. totals reported for the message months ending midnight January 15th, and midnight February 15th.

handled, one point for contacts without traffic.

The name of the Section<sup>1</sup> worked can be put in after the contest is all over if you forget to get this information during the QSO by examining the address given in the call book, the Divisional reports section of *QST*, etc. As soon as the contest is ended add the fifth column to get the total number of points. Next examine the tabulation and check the number of *different* VE or W Sections worked. *Multiply* your claimed score by the total number of Sections in the other country

Date and Time (local)	VE or W Station Worked	Section	Traffic	Points
Jan. 15				
6.02 p.m.	VE3GT	Ontario	2R 1D	3
6.09 p.m.	VE2BE	Quebec	---	1
				4
				×2 Sections
				8
				×9
				72 Total Score

FORM FOR REPORTS TO A.R.R.L. ON W/VE CONTEST SHOWING HOW SCORES ARE COMPUTED

that were contacted during the whole contest. To get all scores on the same basis United States participants will, in addition, multiply this result by 9, because there are approximately nine times as many U. S. A. sections as Canadian Sections<sup>1</sup> to be worked. It will be interesting to keep a blank piece of paper handy during the contest to make a constant check on the score as it grows to ever-increasing proportions when Sections are added. Since all scores will be on about the same basis numerically it will be interesting to compare notes with the stations worked. From the reports submitted we shall determine the winner for each *different* A.R.R.L. Section as well as the chap with the biggest score in each country, for after all distances and conditions of operation vary greatly with each locality, and the chap in the Southern Texas Section who wins will be demonstrating his proficiency over all other participating Southern Texas stations.

#### REPORTS

Reports should be submitted as soon as possible after the contest is over. Messages handled should be kept on file for call if necessary in the case of winners, but it is not necessary to send them in — the simple tabulation or list of QSOs and computation of points claimed is sufficient. February 17, 1932, will be the last date on which entries will be accepted. Mail all reports, in the form indicated, to A.R.R.L. Communications Depart-

<sup>1</sup> See page 5 this *QST* for a complete list of all U. S. and Canadian A.R.R.L. Sections.

ment, 38 La Salle Road, West Hartford, Conn. Send in *your* report, great or small, to add to your Section's standing, as well as to credit you individually.

The score sheet submitted shall list the names of all operators at a participating station during the contest. Final scores will be divided by the *number* of operators of the station.

— F. E. H.

## Book Review

*Me and Little Radio NRH*, by Amando Céspedes Marin. Published by the author, Heredia, Costa Rica. 272 pages, 68 illustrations. Price, paper covers, \$2.50; leather bound, \$3.50.

Picturesquely described on its title page as "a lively, queer and interesting story of the smallest radio station on earth," Señor Céspedes' little book is as unique in the field of radio literature as is little *NRH* among the radio stations of the world. It is the humanly log of the beginnings and development of a little local broadcasting station that grew to world-wide affection and fame, not by elaborate and high-flying technology but through the perseverance and friendly personality of its one-man staff. This appealing personality is with you as you read. He writes as he speaks. You do not mind lapses from the artificiality of language — not if you, too, are an amateur who has experienced all those first thrills of the game and, perhaps, has something of Señor Céspedes' outlook for the future.

— J. J. L.

## Fuses for Radio Use

AMONG the recent developments of interest to the amateur, particularly the transmitting amateur, is the marketing of a line of fuses for use in all types of radio circuits, known under the trade name of "Littelfuses." They are available in current-carrying capacities between 10 milliamperes and 2 amperes and in both low- and high-voltage ratings.

The low-voltage Littelfuses resemble glass-enclosed type grid-leaks, and are particularly useful for protecting milliammeters, low-range ammeters, voltmeters, etc., of both a.c. and d.c. types. Several forms of mountings are available, including grid-leak type mountings, clips to which flexible wires may be attached, and a connector plug similar to those used on lighting circuits but in which provision is made for inserting fuses.

The high-voltage fuses are made in 1000-, 5000- and 10,000-volt ratings, varying in length from three to ten inches. This gives the large "break" length necessary in high-voltage circuits. Porcelain mounting blocks are furnished for this type of fuse, or regular fuse clips mounted on a suitable insulating base may be used. The high-voltage fuses are designed to protect rectifier and transmitting tubes from overloads.

Littelfuses are manufactured by the Littelfuse Laboratories, 1772 Wilson Avenue, Chicago.

# Amateur Regulations Are Revised

## Commission Codifies All Its Orders and Regulations—Amateur Changes Trivial

FOR some months past the Federal Radio Commission has been engaged in rearranging and codifying its very numerous general orders and regulations. So many cancellations, postponements, amendments and cross-references had accumulated that it was difficult to determine just what the status was of many features of regulation. A new publication, to be known as the regulations of the commission, has therefore been prepared, to present in one printed book all of the commission's rules governing stations of all classes and similarly governing procedure before the commission. The book is to be available some time in January and we shall report price, source and this-and-that as soon as particulars are available.

On February 1, 1932, this new book will replace and cancel every existing order and regulation of the commission. It contains, of course, complete amateur regulations. They have been thoroughly rephrased and rearranged from their old text, to fit the scheme of the new book, and they are not 100% complete in themselves in that some general definitions, such as that of a portable station, for example, apply also to the amateur section. They represent *no change* from our old regulations, however, except in the following two details:

(1) In addition to other data required to be logged at each transmission, the name of the person operating the transmitter must be logged. See Par. 386 (b).

(2) 'Phone stations are now permitted to transmit music for short test periods for bona fide experimental work (Par. 372), although of course the usual prohibition against the broadcasting of entertainment remains (Par. 371).

We now quote the full text of the new amateur regulations, earnestly recommending that every amateur read them carefully.

### AMATEUR SERVICE

361. The term "amateur service" means a radiocommunication or experimental service carried on by amateur stations solely with a personal aim and without pecuniary interest.

362. The term "amateur station" means all of the transmitting apparatus, either fixed or portable, used for amateur service at one location and under the control of the licensee.

363. The term "amateur" when used without further descriptive words means a person interested in radio technique solely with a personal aim and without pecuniary interest.

364. The term "amateur radio operator" means a person holding a valid license from the

Secretary of Commerce as a radio operator who is authorized under the regulations of the Secretary of Commerce to operate amateur radio stations.

365. The term "amateur radiocommunication" means radiocommunication between amateur radio stations solely with a personal aim and without pecuniary interest.

366. Amateur station licenses, in general, shall be issued only to amateur radio operators but may be issued to persons who are radio amateurs as defined herein, provided affirmative evidence is presented to show that the station, when licensed, will be operated by a licensed radio operator.

367. Amateur radio station licenses shall not be issued to corporations or associations: *Provided, however,* That in the case of a bona fide amateur radio society, a license may be issued to an authorized official of such society as trustee thereof.

368. Licenses for amateur mobile stations will not be granted.

369. In all cases of remotely controlled amateur transmitters, the location of the station shall be that of the control point except that where such control point is more than 5 miles from the radiating antenna, the location shall be that of the radiating antenna.

370. Amateur stations shall be used only for amateur service except that in emergencies or for testing purposes they may be used also for communication with commercial or Government radio stations and for communication with mobile stations and stations of expeditions which do not have general public service licenses and which may have difficulty in communicating with commercial or Government stations.

371. Amateur stations shall not be used for broadcasting any form of entertainment.

372. Amateur stations may be used for the transmission of music for test purposes of short duration in connection with the development of experimental radiotelephone equipment.

373. Amateur radio stations shall not be used to transmit or receive messages for hire, nor for communication for material compensation, direct or indirect, paid or promised.

374. The following bands of frequencies are allocated exclusively for use by amateur stations:

1,715 to 2,000	28,000 to 30,000
3,500 to 4,000	56,000 to 60,000
7,000 to 7,300	400,000 to 401,000
14,000 to 14,400	

375. All bands of frequencies so assigned may be used for radiotelegraphy, type A-1 emission and also for type A-2 emission to the extent hereinafter provided. (See paragraph 382.)

376. The following bands of frequencies are allocated for use by amateur stations using radiotelephony, type A-3 emission:

- 1,715 to 2,000 kilocycles.
- 3,500 to 3,550 kilocycles.
- 56,000 to 60,000 kilocycles.

377. Provided the station shall be operated by a person who holds an operator's license of a grade approved by the Secretary of Commerce for unlimited radiotelephone amateur operation and, upon application, an amateur radio station may also be licensed to use radiotelephony in the following band of frequencies:

- 14,100 to 14,300.

378. The following bands of frequencies are allocated for use by amateur stations for television, facsimile, and picture transmission:

- 1,715 to 2,000 kilocycles.
- 56,000 to 60,000 kilocycles.

379. Licensees of amateur stations shall be permitted to use any frequency within the service bands above assigned.

380. An amateur radio station shall not be located upon premises controlled by an alien.

381. The frequency of the waves emitted by amateur radio stations shall be as constant and as free from harmonics as the state of the art permits. For this purpose, amateur transmitters shall employ circuits loosely coupled to the radiating system or devices that will produce equivalent effects to minimize keying impacts and harmonics. Conductive coupling to the radiating antenna, even though loose, is not permitted, but this restriction does not prohibit the use of transmission-line feeder systems.

382. Licensees of amateur stations shall use adequately filtered direct-current power supply for the transmitting equipment or arrangements that produce equivalent effects to minimize frequency modulation and prevent the emission of broad signals. For example, the use of unrectified alternating-current power supply for the amplifier stages of oscillator-amplifier transmitters, so arranged that variations in plate voltage of this supply can not affect the frequency of the oscillator, will be considered satisfactory.

383. Licensees of amateur stations are authorized to use a maximum power input of one kilowatt to the plate circuit of the final amplifier stage of an oscillator-amplifier transmitter or to the plate circuit of an oscillator transmitter.

384. An operator of an amateur station shall transmit its assigned call at least once during each 15 minutes of operation and at the end of each transmission.

385. In the event that the operation of an amateur radio station causes general interference to the reception of broadcast programs with receivers of modern design, that amateur station shall not operate during the hours from 8 o'clock

p. m. to 10.30 p. m., local time, and on Sundays from 10.30 a. m. until 1 p. m., local time, upon such frequency or frequencies as cause such interference.

386. Each licensee of an amateur station shall keep an accurate log of station operation, in which shall be recorded:

- (a) The date and time of each transmission.
- (b) The name of the person manipulating the transmitting key of a radiotelegraph transmitter or the name of the person operating a transmitter of any other type with statement as to nature of transmission.
- (c) The station called.
- (d) The input power to the oscillator, or to the final amplifier stage where an oscillator-amplifier transmitter is employed.
- (e) The frequency band used.

This information shall be made available upon request by authorized Government representatives.

387. The licensee of a portable amateur station shall give to the supervisor of radio in the district where application was filed for said portable station license advance notice of all locations in which the station will be operated.

## Strays



SCM WALWORTH, K6CIB, IN A PLAYFUL MOOD

*His dress may be a bit "hula hula," but if you had bought a couple of tubes the price of those pictured, you might have had to dress like that, too! Just to ease your mind, Walworth didn't really smash 'em.*

W9HWM turned on his receiver after finishing reading the description of portable W6ZZA in October *QST*, and, without touching the dials, heard W6ZZA calling CQ, much to his surprise. A call brought about W9HWM's first W6 QSO. Maybe there's something in this business of "materialization of thought"!

# Frequency Measuring Test Results

By F. E. Handy, Communications Manager, A.R.R.L.

**T**HE first A.R.R.L. Frequency Measuring Test was carried through right on schedule on the evenings of October 24th and 31st closely in keeping with the advance announcement and fully in accord with the best traditions of the A.R.R.L. for a shipshape job. The advance organization of this test involved the lining up of sixteen transmitting stations, practically all temperature-controlled for sending transmissions of constant but unknown frequency in the 3.5- and 7-mc. bands. The unknown frequencies were transmitted alternately on the two bands between nine p.m. and one a.m. E.S.T. on both the above dates, and the signals picked up and measured by all participating amateurs — and also, measured simultaneously through the full cooperation of the government monitoring stations of the Radio Division, U. S. Department of Commerce. The splendid and regular every-Friday calibration service of the A.R.R.L. Standard Frequency Stations W1XP, W9XAN and W6XK should be mentioned here, since this made possible the accurate calibration and regular checking of frequency standards and meters for some time in advance of the contest.

Radio conditions were somewhat erratic on both nights of the test. The transmitting stations, in view of their wide geographical distribution, so successfully covered the whole country that we dare say — in spite of the conditions — that no amateur making a conscientious effort could fail to pick up at least the required minimum number of two of the test transmissions from any locality in the U. S. A. and Canada.

Several reporters commented on the unfavorable "skip" effects during the test and one report was received stating that the transmissions could not be picked up at all. Radio reports from Australia and New Zealand indicated that the signals were listened for but unheard across the water, due perhaps to conditions, or more to the fact that the time was arranged to facilitate measurements by the body of North American amateurs and was not therefore just right for foreign participation. Measurements were made in Great Britain, however, both G5BY and G6PF placing well up in the list of certificate winners.

In spite of the large amount of advance preparation and publicity and the great effort made by all the agencies cooperating in putting the transmitting and official-measuring end of the test over in 100% style, the participation was disappointingly small. Of the thousands on thousands of active amateurs in the U. S. A. but 213 took active part and submitted entries. Six reports from Canada and two from Great Britain

were received. This is either a sad commentary on the low degree of frequency-consciousness of individual North American amateurs, or a reflection of the discouragingly poor conditions which may have caused many observers to turn off their receivers after covering two or three schedules with no luck. The many very excellent and complete reports received from those who took part, together with current complaints from A.R.R.L. Official Observers that too many amateurs are found nightly as far as 100 kc. outside the 7- and 14-mc. bands, tend to confirm our first conclusion. At any rate, this relatively small number of reports is bound to be more or less discouraging and disappointing to those who unselfishly devoted a lot of time and effort in order that a serviceable, interesting and thoroughly valuable contribution to amateur radio might result.

One hundred and forty-four of those who took part won certificates by measuring frequencies with an average accuracy of 99.900% or better. These men have every reason to feel proud of their achievement and proficiency. It gives us sincere pleasure to issue these merit certificate awards as a permanent record and token of capability in practical frequency measurement. The accuracy attained by the individuals not receiving certificates, while not quite as high, was entirely commendable. The majority of participants used dynatron-type frequency meters, similar to those which have been described repeatedly in *QST*. Several observers, including the "winner" of the test, Boyd Phelps, W2BP, used constant-temperature quartz oscillator standards, in connection with receiver calibrations accurately checked at the moment of measurement to attain a high degree of accuracy. It will be noted that both the "high" man for the U. S. A. and Canada's representative, John C. Stadler, VE2AP, who took second place in the list of winners using a regulation "dynatron" meter, made more than the required minimum number of measurements. It is now our honor to present the complete list of certificate winners and others taking part in this test. Hats off to the winners!

## CERTIFICATE WINNERS

	Number of Measurements	% Accuracy
Boyd Phelps, W2BP, Box 247, Hicksville, L. I., N. Y.	(9)	99.999
John C. Stadler, VE2AP, West- mount, P. Q., Canada	(4)	99.99+
Charles S. Hollenbeck, W2BQK, 860 West 181st St., N. Y. C.	(2)	99.890



George Collier, W9CWI, Anoka, Minn. (2) 99.990

Robert F. Miller, Akron, Ohio (3) 99.989

Miles Weeks, W1WV, Chestnut Hill (Boston) Mass. (4) 99.987

Dr. S. J. Blum, W9GVT, Kansas City, Mo. (14) 99.985

O. R. Putnam, W9AKJ, Elkhart, Ind. (7) 99.984

C. G. Docherty, W1BML, Providence, R. I. (9) 99.984

Hilton L. O'Heffernan, G5BY, Croyden, England (5) 99.984

T. G. Bennett, W9ATY, Chicago, Ill. (5) 99.984

Orris Grissom, W6DYL, El Monte, Calif. (11) 99.983

Robert LaRue, W6ALU-W6CDU, Phoenix, Ariz. (8) 99.983

J. Blinford Thompson, Portsmouth, Va. (21) 99.982

Geo. W. Ewing, W8GM, San Bernardino, Calif. (2) 99.982

E. A. Hubbell, W9ERU, Rockford, Ill. (7) 99.982

C. H. Vincent, W8RD, Utica, Mich. (9) 99.981

Edward M. Glaser, W2BRB, Brooklyn, N. Y. (14) 99.981

Leavenworth Wheeler, W5AHL-W5ZZT, Yuma, Ariz. (11) 99.980

99.97% -- W3ZX, W0EDQ, W1CAW, WYKO, W9GFU, VE5AM, W9DRD, W9BHH & W9EIQ, Jerome B. Abernathy, W2LV, W7ANI-W7BED, W3ZK, W3KT, W9FHH, W7KH, W8AHP, W9BRX, W6ADA, VE8HM, W8BLH, W6ZQ, G6PF, W1ZB, W1FL, W2CL, W0GX1, W7ME, W1AGA, W9GOF.

99.96% -- W9EGG, W2AHN, W9OX, W8DJQ, W1KH, W2KG, W2BJA, W9HA-EHD, W3ZU, W8CIO, W9EDV, W8ADE, W9JB-W9FXP, W2AOE, W9EYL, W2BWP, W9DSC, W3UR & W8BNQ.

99.95% -- W1AOX, W9ALO, John D. Hertz ex 7JH-7ZB-7PG-7AC1, W9CER, W6BTO, W9GY, W3AKU, W6YAY-W6FDF, W2AIG, W9HEN, W2BO, W6PW, VE5BL, W6ACL, W9ESL, W9DB, W1AGY, W8KR, W5BML, W7AN, W9AMO, R. W. Woodward -- (Pre-War 1VW).

99.94% -- W9HJC, W3BSE, W1BWO, W1BPI, W3UX, W2EB, W9GPF, W2BJX, W7ALM, W4PM, W2AJD, W8AFM, W3OO, W2GTA, W8AW-W8DXS, W1BVY (H. Fisk W1DR & I. Creaser W1BSJ), W8BHK, W1ATF, W9FFD.

99.93% -- W8DMS, W9AJ, W8BRJ, W9FXE, W8BQV, W1BD, W8ALQ, W3BFL, W2RD, W1AXN, W8BMM, W2AKO, W9ECZ, W9GMU, W6CUH.

99.92% -- W8LU, W8ABX, W8BTF, W6DEG, W9BEF, W8BQA, W8CWO, W9BNN, W9ANA, W8DGW, W7QD.

99.91% -- W2AZV, W8GP, W2US, W9BKX, W7LD, VE2AV, W2VH, W8CPE, W8WG.

99.90% -- W8CEO, W2OP-WLNS.

HONOR ROLL OF OTHER PARTICIPANTS

99.89% -- W6BMS, W8AYO, W5AEV, W3CC, W9DGS, W9GV. 99.88% -- W1AWN, W2CVV, W8YA. 99.87% -- W9ESA, W2SZ, W9CIS, W9AEN, W2YZ, W8AFR. 99.86% -- W9AGQ, W2DBH, W6CQF, W2FF. 99.85% -- W8DXI, W9BRA, W3VX, W5ASQ. 99.84% -- W8DME, W9EJQ. 99.83% -- W9AUB, W7PE. 99.82% -- W9AFN, W1APK, W6AVO, W6OM. 99.81% -- W9FYC, W9GKT. 99.80% -- W3MG. 99.79% -- W2BWR, W9HMS, W1CNE. 99.78% -- W4KP, W9BJA. 99.77% -- W3MQ. 99.76% -- W8AEJ. 99.75% -- W8BR, W2BBU, W5BTL. 99.74% -- W8BMF. 99.73% -- W3ATF, W. P. Corbett (Fullerton).

<sup>1</sup> An exception to our statement regarding certificate-winners. Mr. Meserve as a member of the Headquarters staff is entitled under an A.R.R.L. Board ruling to participate but cannot receive a certificate award.

Calif.), 99.72% -- W6BIV, W8CUG. 99.70% -- W7GW, 99.65% -- W9HO, W3MC. 99.64% -- W8FA, W3BRY. 99.63% -- W9EIV. 99.61% -- W8DRK. 99.59% -- Van T. Wood (Indianapolis). 99.58% -- W2LB. 99.55% -- W5VQ. 99.52% -- W9VD. 99.51% -- W9ENF, W9DZN. 99.38% -- W1AUQ, W8ZM. 99.35% -- W2BWN, W1AGF. 99.18% -- VE3GT, W5BOE. 99.13% -- W9CWW. 99.12% -- W7AHO. 99.08% -- W8DHH. 99.04% -- W1DBW, 99.03% -- W3BVX. 93.5% -- W1RG.

Approximately 65% of those taking part won the coveted certificates. Of the A.R.R.L. Official Observers who took part, as required, about 80% (35) won certificates. At this writing the names of Observers not taking part are being transmitted to Section Managers for cancellation of appointments, and we recommend the above list of certificate winners for the hearty consideration of S.C.M.s in making new appointments to fill these vacancies and create a newly active, bigger and better Observers' organization. One of the constructive results of the test which should benefit our work in months to come is this opportunity to revise and improve the Official Observing system. Observers who were on the job unananimously declared the test a success and welcomed the chance to check the accuracy of their calibrations, and like other participants, many would like to see the test repeated at a future date.

For the benefit of all who reported we are listing herewith the "official measurements" made by the monitoring stations, and coordinated at Washington through the very complete cooperation of the Director of Radio, Mr. W. D. Terrell. The Radio Division, U. S. Department of Commerce, monitoring stations in each Federal Inspection District, in addition to making extremely accurate official measurements during the test transmissions, cooperated with the A.R.R.L. transmitting stations in making advance frequency checks. All this meant a very great deal of voluntary overtime work by Radio Division personnel in the interest of our A.R.R.L. test, and we wish to make public acknowledgment here of our appreciation of the special courtesies extended by the Hingham, Mass. monitoring station to us, and similarly to the station personnel elsewhere who contributed in the same fashion to a successful test.

F.M.T. TRANSMITTING STATIONS

Station	Frequency (k.c.)*	Nr. Meas.	Output Stage	Input Watts to Final Stage
OCTOBER 24TH				
W3ZF	3648.30	144	—	350
W1AXV	3920.61	143	1 '61	900
W8DMS	3628.531	118	1 '11	143
W9FFD	3630.954	76	1 '03A	155
W8GU	3500-band	46	1 '52	250
W6AM	3603.518	41	Water cooled	1000
W6CUH	3630.095	39	2 '52a	945
W9DFR	3589.712	25	2 '10a	94
		632		
W1AXV	7174.788	101	1 '61	900
W1MK	7279.784	90	1 '61	475
W6CIS	7259.220	30	2 '11a	200

W9UZ	7166.45	27	2 '04As	371
W8DGS	7000-band	21	1 '03A	150
W9GY	7048.85	7	2 '10s	140
		276		
OCTOBER 31ST				
W2AHN	3922.6	73	1 '11D	110
W1ASY	3725.4	69	1 '60	384
W8DMS	3638.920	48	1 '11	176.9
W6AM	3613.902	36	Water cooled	1000
W6CUH	3599.572	28	2 '52s	1000
W9DFR	3610.974	17	2 '10s	94
W9FFD	3500-band	8	1 '03A	150
W8GU	3500-band	2	1 '52	150
		281		
W1AXV	7245.380	61	1 '61	900
W1MK	7129.88	49	1 '61	475
W9BRX	7209.569	13	1 '11	204
W6CIS	7256.968	12	2 '11s	200
W8DGS	7147.472	9	1 '03A	150
W9GY	7088.452	9	2 '10s	140
W9UZ	7180.55	9	2 '04As	410
W6CIS	7147.592	7	2 '11s	180
(for EGH)				
		169		

\* Several different Radio Division measurements were supplied on practically every transmitting station at times indicated during the measurement periods. Space does not permit us to include the full list of all these "official" frequencies used in checking. The single frequency shown is close to the average-reading for the station indicated, deviations due to drift being very slight in any case. Where only a band-indication is shown official measurements could not be supplied, so the checking committee has to disregard the measurements on these stations in "averaging." However, due to the large number of measurements made by the average participant, this did not work a hardship in a single case.

Each submitted measurement was compared closely with the official measurement made at the nearest time indicated, subtraction giving the error in measurement, and subsequent division the percentage error. These percentages were computed for each measurement and added, and the result divided by the number of measurements made to give a true average error. This, subtracted from 100 gave the accuracy rating for each paper entered.

The transmitting stations were required to be crystal-controlled temperature-controlled and to observe special precautions to facilitate accurate measurements. These stations did their part to perfection. The coverage of each station as indicated by the number of individual reports of measurements on its transmissions has been tabulated with approximate date on the power used to facilitate comparisons. The several detailed government measurements show the amount of frequency drift of each station which was small in all cases. Naturally the first stations scheduled received the most "patronage" by eager participants, some of whom abandoned the taking of measurements after three or four readings (all required) had been made. For this reason the "number of measurements" is by no means an infallible indication of coverage. 913 transmissions were measured using 3.5-mc. stations; 445 using 7-mc. stations; total, 1358 measurements. Interest was highest the first

week, or conditions were best then as evidenced by 908 measurements made on October 24th, and but 450 measurements made by participants on October 31st. Unfortunately W6EGH and W7AAT were forced by circumstances to drop out of the line-up, so but 14 stations transmitted on the first date. By the next Saturday arrangements had been made for W6CIS to cover EGH's schedule, and W9BRX to take over AAT's schedule, so the full 16 schedules were sent the second week.

To insure crystals of absolutely "unknown" frequency and of known reliable characteristics, cooperation was accepted from the following manufacturers, who offered and furnished crystals to be used at the several F.M.T. transmitting stations:

American Piezo Supply Company, Kansas City, Kans.

Biley Piezo-Electric Company, Erie, Penna.

Herbert Hollister, Merriam, Kans.

Precision Piezo Service, Baton Rouge, La.

Scientific Radio Service, Mount Ranier, Md.

Stations reporting on the first week's test reported great difficulty in making certain measurements due to interference and non-cooperation from hundreds of "haphazard" operators who thoughtlessly tested or CQed during the hours when these tests were in progress. In accordance with one suggestion received a "QST" was sent from W1MK, and another Hartford station, several times before the tests of October 31st began, asking improved cooperation on this score. It is not known how much good this accomplished, and such procedure would of course have been unnecessary if the F.M.T. arrangements had been accorded the respect we believe the attempt deserved. Here are a few typical comments, "I want to put in my kick against the selfish hams who sent throughout the test. One local with bad clicks gave me so much trouble I phoned him, and he promised to QRT on the 7 mc. half-hours, but he was back on within the same hour transmitting merrily on in spite of his promise. It is this type of ham who expects everything of the other fellow, but who contributes nothing himself that adds much pain to this glorious hobby. In spite of it all I hope you will give us another test shortly. These tests give the sort of stimulation that is needed, promoting interest in this most-important ability so necessary to every amateur — that of accurate frequency measurement, to guarantee 100% on-frequency operation by our whole great body of amateurs."

### Strays

W6BQC says that H. C. Hartley and L. C. Hartley are brothers in his home town of Wasco, Calif. And here we've been thinking they would n't associate with each other!

# International Goodwill Tests

February 21st-26th, March 11th-16th

**A**MATEURS of the *WORLD*—*Attention.* Here's something *new* in international tests. New records!!! DX! *New DX!!!!* An equal opportunity for every single solitary amateur wherever he sticks up a sky wire in the whole wide world!

Here is a very simple test which is capable of producing rich rewards in terms of "calls heard." What amateur doesn't wish to be heard in the far places—and yet what difficulties in the way of insurmountable QRM normally block reception locally. Here's a *TEST* outstanding *par excellence!* Great benefits will accrue to many individuals even if it is but moderately successful. It requires and deserves the utmost in unselfish amateur coöperation, and the results are guaranteed to be worth it. Don't you want to make new records for YOUR station. These tests should help you to do that. The results will show which stations get through to foreign countries in the best shape as indicated by the number of reports we get on your station from each country.

Rotated listening periods for amateurs in every continent have been worked out in accordance with the accompanying table. There are two tests of six days each, so poor radio conditions during either period will have little chance of spoiling the results. Each of the six-day tests has the **FIRST THREE DAYS** divided into **FOUR**

in which time the listening periods cover each one of the 24 hours of one whole day. The time is split up. Two hours listening are followed by four hours for transmitting "*TEST*" and *signing call signals carefully and often.* While *two continents* are always shut down (listening) in accordance with our table, the amateurs of *four continents* are always free to transmit. To stand the greatest chance of being heard in remote places amateurs should, of course, transmit as much as possible during the four hours *between listening periods.* We hope that every ham will get the brass-pounding urge out of his system sufficiently in these periods so that *all temptation to spoil test results for other amateurs by going on the air in a listening period for any purpose whatsoever will be avoided.* We here point out that new two-way QSO's with hitherto *unheard continents* should result from the test if it works out properly. Possibly stations logged in the local quiet period for our continent can be called and worked in the *following* four-hour transmitting period, providing operators do stop occasionally in the transmitting periods to see if any DX is calling them. We also suggest that dial settings of DX stations be carefully logged and that special attempts be made to work the newly found DX (made known in the "first three day" listening periods of these February-March tests) during the *LAST three days*

		TIME AND DAY CONVERSION TABLE																								
Longitude	Place	TODAY												TOMORROW												
<b>EAST</b>	180 Fiji Islands	12	13	14	15	16	17	18	19	20	21	22	23	24	1	2	3	4	5	6	7	8	9	10	11	12
	165 New Zealand (*)	11	12	13	14	15	16	17	18	19	20	21	22	23	1	2	3	4	5	6	7	8	9	10	11	12
	150 Australia, east	10	11	12	13	14	15	16	17	18	19	20	21	22	1	2	3	4	5	6	7	8	9	10	11	12
	135 Japan	9	10	11	12	13	14	15	16	17	18	19	20	21	1	2	3	4	5	6	7	8	9	10	11	12
	120 China, Philippines	8	9	10	11	12	13	14	15	16	17	18	19	20	1	2	3	4	5	6	7	8	9	10	11	12
	105 Indo China, Straits Settlements	7	8	9	10	11	12	13	14	15	16	17	18	19	1	2	3	4	5	6	7	8	9	10	11	12
	90 Calcutta (**)	6	7	8	9	10	11	12	13	14	15	16	17	18	1	2	3	4	5	6	7	8	9	10	11	12
	75 Mauritius, Seychelles	5	6	7	8	9	10	11	12	13	14	15	16	17	1	2	3	4	5	6	7	8	9	10	11	12
	60 Aden, Somaliland, Madagascar	4	5	6	7	8	9	10	11	12	13	14	15	16	1	2	3	4	5	6	7	8	9	10	11	12
	45 South Africa	3	4	5	6	7	8	9	10	11	12	13	14	15	1	2	3	4	5	6	7	8	9	10	11	12
	30 Germany, Italy, Norway, Sweden	2	3	4	5	6	7	8	9	10	11	12	13	14	1	2	3	4	5	6	7	8	9	10	11	12
	15 England, France, G.M.T.	1	2	3	4	5	6	7	8	9	10	11	12	13	1	2	3	4	5	6	7	8	9	10	11	12
	0	0	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
	15	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
	30	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
	45	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	1	2
	60 Argentina, Porto Rico	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	1
	75 Washington, D. C., E.S.T.	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12
	90 Chicago, C.S.T.	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12
	105 Denver, M.S.T.	17	18	19	20	21	22	23	24	25	26	27	28	29	1	2	3	4	5	6	7	8	9	10	11	12
	120 San Francisco, P.S.T.	16	17	18	19	20	21	22	23	24	25	26	27	28	1	2	3	4	5	6	7	8	9	10	11	12
	135	15	16	17	18	19	20	21	22	23	24	25	26	27	1	2	3	4	5	6	7	8	9	10	11	12
	150	14	15	16	17	18	19	20	21	22	23	24	25	26	1	2	3	4	5	6	7	8	9	10	11	12
	165 Alaska	13	14	15	16	17	18	19	20	21	22	23	24	25	1	2	3	4	5	6	7	8	9	10	11	12
	180 Samoa, Hawaii (***)	12	13	14	15	16	17	18	19	20	21	22	23	24	1	2	3	4	5	6	7	8	9	10	11	12
<b>WEST</b>	180	12	13	14	15	16	17	18	19	20	21	22	23	24	1	2	3	4	5	6	7	8	9	10	11	12

NOTES:—(\*) Add one-half hour for New Zealand Time.  
 (\*\*\*) Calcutta local time. Subtract one-half hour for India Standard Time.  
 (\*\*\*) Subtract one-half hour for Hawaiian Standard Time.

NOTES:—0 is midnight, 1 is 1.00 A.M., etc. 12 is noon, 13 is 1.00 P.M., 15 is 3.00 P.M., etc.  
 Read the figure column vertically, thus—when it is 12 noon on Monday in New York E.S.T., it is 3.00 A.M. on Tuesday in Melbourne, Australia.  
 Or again: 11.00 P.M. on Sunday in San Francisco is 6.50 P.M. on Monday in New Zealand and 5.00 P.M. in Australia.  
 The hours of darkness—6 P.M. to 6 A.M. are shaded

hour transmitting and two hour listening periods, while the **LAST THREE DAYS** are set apart for attempts at *two way communication* with DX stations previously logged. Note that it is necessary to convert<sup>1</sup> the time in the table, which is **GREENWICH MERIDIAN TIME** to your local time.

As arranged, the tests take **THREE** whole days,

of each test.<sup>2</sup> That is, make special attempts at international two-way DX on Feb. 24th, 25th, 26th following the test of Feb. 21st, 22nd, 23rd —

<sup>1</sup> See "Time Conversion" in any edition of *The Radio Amateur's Handbook*, also the chart of time conversion herewith.

and on March 14th, 15th, 16th following the test of March 11th, 12th, 13th.

Every amateur should bear in mind that these are INTERNATIONAL GOODWILL TESTS which the A.R.R.L. is sponsoring. In taking part YOU expect to get new QSL cards, from new countries, to make new DX records for your station. In turn, you must (similarly) strive to do your very utmost to make

signal into any specific corner of the world you wish to reach, as usual, of course. A word of caution — keep *inside* all amateur frequency bands at all times. Don't transmit without first checking *frequency*. Participants and Official Observers will (as usual) report any stations heard outside the bands, and the number of such reports from different sources will be

	Africa	Asia	Europe	North America	Oceania	South America
February 21 and March 11	0000-0200 0600-0800 1200-1400 1800-2000	0100-0300 0700-0900 1300-1500 1900-2100	0200-0400 0800-1000 1400-1600 2000-2200	0300-0500 0900-1100 1500-1700 2100-2300	0400-0600 1000-1200 1600-1800 2200-2400	0500-0700 1100-1300 1700-1900 2300-0100
February 22 and March 12	0400-0600 1000-1200 1600-1800 2200-2400	0500-0700 1100-1300 1700-1900 2300-0100	0600-0800 1200-1400 1800-2000 2400-0200	0700-0900 1300-1500 1900-2100 0100-0300	0800-1000 1400-1600 2000-2200 0200-0400	0900-1100 1500-1700 2100-2300 0300-0500
February 23 and March 13	0200-0400 0800-1000 1400-1600 2000-2200	0300-0500 0900-1100 1500-1700 2100-2300	0400-0600 1000-1200 1600-1800 2200-2400	0500-0700 1100-1300 1700-1900 2300-0100	0600-0800 1200-1400 1800-2000 2400-0200	0700-0900 1300-1500 1900-2100 0100-0300

LISTENING PERIODS FOR EACH CONTINENT  
(Greenwich Time)

Transmissions will be made in the four hours between each listening period; i.e., at any time except in the periods given above, for your continent.

new DX records for amateurs in other foreign lands. For every bit of unusual reception *post QSL cards* direct to the amateurs heard, at the same time you mail your report to A.R.R.L. In this report *include all stations heard and worked in other continents. List stations by frequency bands in alphabetical-numerical order for each country, including the time heard* so we can pass along the data to assist other amateurs in their DX work via QST.

Listen and send on ANY OR ALL the amateur bands, following the schedule for your continent closely. Don't overlook 3.5-mc. and 1.7-mc. bands — there's the big chance to make and break records, in our opinion, W2BNJ reports overhearing G2AY and W1AUY in two-way communication on the 1.7-mc. (160-meter) band about 0700 November 29th. 3000-mile coast-to-coast 3500-kc. contacts both on 'phone and c.w. are nightly occurrences at this writing, not to mention the quantity of reports on 3500-kc. W/VE signals from VK's and ZL's that pass through A.R.R.L. Headquarters these days. You can divide your time between certain bands in any way you wish, or stick to one band for both six day periods, or use one band and one transmitter the first six day test, and another band and transmitter for the second test. All those details are up to you. Choice of band for the time-of-day will be important for putting a

examined, and stations using such unfair methods as off-frequency operation to make records will be deleted from the final official reports.

QST will report those submitting the *BEST* properly arranged representative lists of calls heard (include stations worked in parenthesis). Results will be tabulated into lists by *continents* and *countries* showing not only the amateur stations heard in *any and every other country*, but including the *number of times* each station in the list was represented in reports from a particular country as "heard or worked." A great volume of reports should be submitted, and to assist in the task of compilation it is especially requested that lists be neatly tabulated by *frequency bands, by continents, and by countries* with the calls in alphabetical-numerical order in each section of the list. These lists should be of the highest interest to every amateur who transmits, and every station owner expecting to be listed should cooperate, not only by keeping *quiet* during local two-hour listening periods, but also by submitting a complete list of amateur stations heard and worked in *OTHER* continents, direct *by mail* to A.R.R.L.

We shall welcome all foreign reports of W-VE stations heard *by amateur radio* after the conclusion of each six-day test, so we may send early information on results to members in this continent through WIMK and the OBS system. In return we shall be glad to send early results *by amateur radio* to societies in other countries through the same channels, where schedules have been made for the reply. Of course complete consolidation of mail reports for QST will take a

<sup>2</sup> WIMK will abandon all regular schedules for the six days of each test period, except that on Feb. 24th, 25th, 26th and March 14th, 15th, 16th "QST" will be addressed to A.R.R.L. members on the usual frequencies at the usual time.

longer time for preparation — but this will be well worth waiting for!

We repeat, to be fully successful these tests must receive the FULL cooperation of every ham worthy of the name of amateur. Nothing but the direct sort of emergency amateur communication work should justify transmitting during listening periods for ANY reason. There will be the WOFFHONG and a BLACK LIST for amateurs who disregard the general interest and are generally reported by participants as non-cooperating. Please, gang, start talking-up these tests over the air RIGHT NOW, to every ham you work, and especially amateurs in foreign countries. Tell them about the test; ask their full cooperation in abiding by the listening periods for their continent, and invite them to TRANSMIT in the sending period, and LISTEN and REPORT RESULTS in terms of DX HEARD in the listening periods. The periods have been adjusted or rotated so that amateurs of EVERY continent have an equal chance to be heard in EVERY OTHER CONTINENT.

DON'T MISS OUT. PLAN TO TAKE PART. IT MATTERS NOT WHETHER YOU LIVE IN SIBERIA, AUSTRALIA, OR INDIA, OR AT THE NORTH POLE, OR THE EQUATOR. THIS TEST IS FOR ALL HAMS, WITH EQUAL VALUE TO EVERY ONE REGARDLESS OF RACE OR NATIONALITY. THE OLDEST HAM CAN MAKE HIMSELF SOME NEW RECORDS. THE NEWEST HAM CAN DUPLICATE OLD RECORDS AND QUITE LIKELY ADD NEW ONES. TALK IT UP OVER THE AIR. FOLLOW THE SCHEDULE EXACTLY. TRANSMIT. LISTEN. SEND QSLs. REPORT FULLY ON CALLS HEARD AND WORKED ON THESE TWELVE DAYS (SEPARATE REPORTS FOR EACH SIX DAY PERIOD, PLEASE) TO A.R.R.L., 38 LA SALLE ROAD, WEST HARTFORD, CONN., U.S.A.

— F. E. H.

## How Many Do You Recognize?

WE ARE grateful to Mr. J. E. Hall, W9ASJ, for digging into his log book and unearthing the following list of archaic calls heard and worked back in 1921. Some of these calls have been retained by their original owners and still can be heard on the air; other owners are still operating but have different call signs; while the majority will be using these calls but by process of recent acquisition.

This list is being presented just as it was received and we hope many an old timer will enjoy browsing through these lines.

### CALLS HEARD AND WORKED

9ASJ, SEYMOUR, INDIANA

(October, 1921)

(1AZK) (2BK) (3AQR) 3UQ (4AS) 4BE (4BQ) 4BY (4CX) (4DH) (4DQ) (4FD) (4FJ) 4GL cw 4GN (5BM) 5DA cw & spk (5EK) 5ER 5FJ 5FO (5FV) 5HK 5JR 5KP 5QA 5RZ 5TV (5XA)

(5XK) 5ZAB 5ZL (8AL) 8BM 8BO 8CI 8DE cw (8EA) 8EF (8FI) (8FT) 8HN 8HV 8II (8IN) (8IQ) cw (8OI) 8ON 8RN (8RQ) 8SP (8TK) (8TT) (8TZ) (8UC) 8VF (8WA) 8XE 8XK mod cw 8YN 8ZA 8ZN 8AAZ (8ACF) 8ACP cw (8ADO) 8AEZ (8AFB) (8AFD) 8AFS 8AGK 8AIC (8AJV) 8AJW (8AMB) 8AMP (8ANB) (8ANY) (8AOI) 8AOV (8APA) (8AQV) (8ARD) (8ASZ) (8AYN) (8AYS) 8BBU (8BCO) 8BCX 8BEN 8BEP 8BGT 8BHV 8BOX cw 8BSY (8BVA) 9AF 9BY (9CP) 9EE 9EL (9ET) (9FS) (9GX) (9HM) 9HR 9IY 9JH (9KM) (9LK) (9LQ) 9MC (9ME) 9NH 9NQ (9OX) 9PD (9PS) 9QH 9QR (9TL) 9TV 9UH (9UU) (9VK) (9VL) (9VV) (9VZ) 9XI 9YB 9ZN 9AAW 9ABL 9AEG 9AEN 9AFX 9AGR 9AIK 9AIO (9AIR) (9AIU) (9ALP) (9AMO) (9AQM) 9ARZ 9ASE 9ATN 9AWU 9AWZ 9AYH 9AYW (9AZA) 9AZE 9BBS 9BDE 9BDS (9BDU) 9DEK 9DEY 9DJX 9DRJ 9DTJ 9DTQ 9DUG (9DVB) 9DWC 9DWP 9DYU (9DQQ)

(November, 1921)

1AFV cw 1RU cw 1ARY 1AW 2AWL (2BM) (2BK) 2WP cw (3AQR) 3ACE 3BP 3EB 3DM 3BFU 3XF 3ZO (4AS) (4EA) (4AL) (4BQ) (4GN) (4DH) (4AU) 4CD cw (4CX) 4FD 5DA cw & spk 5LW 5IS 5JD 5QS 5FV 5TT 5PX (5ER) (5BM) (5IR) 5JR 5QI 5HK 5EK 5XJ (5XA) 5ZL (5ZAB) 5ZAM 5ARD (5AYC) (5ASZ) (5AIZ) 5AWU (5ACF) 5AVH cw (5AQV) (5ATU) 5APP (5AKV) 5AFG (5AXQ) 8DE cw (8EA) (8FI) 8CP 8EZ 8GG 8OI 8LI (8RQ) 8JQ (8ANY) 8AJT (8SP) (8TT) (8AOI) (8VL) 8HG (8WA) 8XE 8ZN 8XK cw 8WY 8MZ (8FT) (8YN) 8BUC (8BDY) 8BOZ (8BEN) (8YM) (8WD) 8BXX 8BDL 8BRL 9AMC 9AZE 9AWU (9ALP) 9AUC (9APS) (9AMT) (9AIR) (9AWX) (9AIU) (9ASL) (9AAW) (9AOU) (9AWZ) (9AMO) (9AGR) (9ACN) (9AQE) 9AEY (9AEG) 9AMA 9ANU (9AJH) 9ANT 9AYW 9AMB cw 9AIP 9AKA 9AVE 9AFX (9AZJ) (9AYH) 9AYI 9AFF 9AF 9AU (9KO) (9OP) 9HM 9HI 9HR 9ME 9MC 9NQ 9OI (9OX) 9PL 9PS 9FS (9LF) 9TL 9IY (9UG) (9UH) (9UU) 9UL (9UZ) 9LZ (9LQ) 9QR (9TO) (9GP) 9WU 9LW 9YO (9TR) 9ZH (9ZJ) 9ZN (9BDE) 9BFM (9BCX) (9DUG) 9DCT 9DXE 9DWJ cw & fone 9DSD 9DSN (9DVE) 9DQR 9DAB 9DBH (9DQQ) 9DEK 9DWB (NZO) icw.

## ~~Strays~~

When using a low-range d.c. milliammeter in series with a crystal detector and pick-up coil for neutralizing, as suggested in the September Experimenters' Section, the sensitivity of the device may be increased considerably by shunting a .001 or .002 by-pass condenser across the milliammeter. The condenser serves the same purpose as the 'phone condensers we used to use with crystal receivers. — W6CMQ

# AMATEUR RADIO STATIONS

## W5OW Fort Sam Houston, Texas

W5OW-WLJ is the Army Amateur Net Control Station of the 8th Corps Area. This station was formerly W5AIN, well known in amateur circles with its 500-cycle note. In the early part of April, 1931, new equipment was installed, and the new call W5OW was acquired. It was felt that the new equipment was needed to take care of growing needs of the Army Amateurs of Texas, Oklahoma, Colorado, New Mexico, and Arizona, which comprise the 8th Corps Area. The station is maintained and operated by the Second Signal Company, which formerly was part of the 1st Field Signal Battalion during the world war. After the war the Second Signal Company was formed and assigned to the famous 2nd Division at Fort Sam Houston.

The transmitter is a Westinghouse Model 3655-B, rated at 200 watts output. It is an oscillator-amplifier job, using an 860 oscillator to feed two 860's as power amplifiers. A fourth 860 is used as an audio oscillator to supply tone modulation when desired. The transmitter will operate on all frequencies between 17,150 kc. and 2000 kc. The plate and filament power are supplied by a motor-generator set consisting of a 2-hp. 110-volt d.c. motor and a 1-kw. 2000-volt d.c. generator. The latter is also equipped with a winding which supplies a.c. for the filaments of the tubes.

The smaller cabinet to the left of the 200-watt transmitter contains equipment for using crystal control with the 3655-B. It contains an 860 used as a crystal oscillator and a second 860 for frequency doubling. The output of the driver is fed to the 860 which acts as an oscillator in the transmitter proper. The crystal is temperature controlled.

The transmitter is operated on 7150 kilocycles every night from 6 to 12:00 p.m., and also Sunday afternoons. Schedules are held with about fifteen members of the Army Amateur system. When

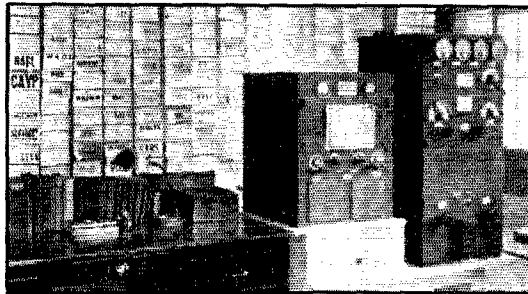
using the call WLJ the transmitter is crystal controlled on 6990 kc.

The receiver is a d.c. Super-Wasp with the tuning condensers cut down to three plates. Midget condensers are used in parallel to spread the band over as much of the dial as possible.

The monitor beside the receiver was constructed in the radio laboratory of the 2nd Signal Company. The wavemeter is General Radio No. 588. The desk to the left of the transmitter is the Assistant Corps Area Liaison agent's.

There is an operating staff of about twenty men at W5OW. With all the new equipment and the cooperation of all the members, the

gang is looking forward to a busy season.



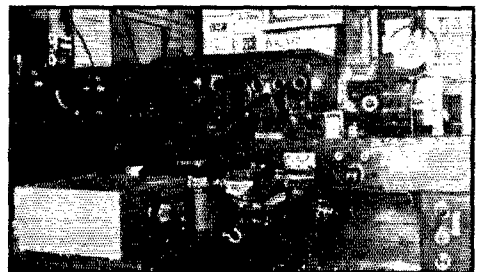
THE TRANSMITTER AT W5OW-WLJ

*This is a commercial outfit which can be operated either crystal controlled or as a self-controlled m.o.p.a. It has a nominal rating of 200 watts output.*

## VK2JZ

VK2JZ, Singleton, N.S.W., first saw the light of day on the 5th of May, 1929. After experiencing the usual trials and tribulations of the beginner, the station is now what can be considered an up-to-date and efficient amateur station.

Three transmitters are used. The first is a

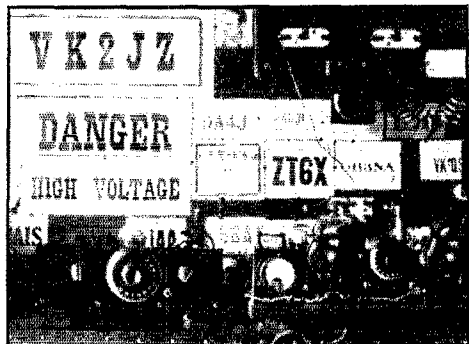


THE OPERATING POSITION AT VK2JZ

*On the shelf above the table are the short-wave transmitter, modulator unit, short-wave receiver, 245-meter transmitter, two-stage amplifier and condenser microphone. The monitor and frequency meter are on the table.*

crystal-controlled rig using a UX-112 as crystal oscillator, UX-210 as frequency doubler, and an

RV-218 as the final amplifier. Power input to the last stage is 40 watts on c.w. and 25 on telephony. The Telefunken system of modulation is used on this transmitter, the output of the speech amplifier being plugged into the grid circuit of the final amplifier by means of a jack and plug, which au-



ANOTHER VIEW OF VK2JZ

Showing the rectifier, crystal oscillator unit, frequency doubler and final amplifier of the short-wave transmitter. The panel on the wall contains the antenna switching and tuning equipment.

tomatically cuts out the grid leak. The quality and strength of the 'phone are reported excellent. Although the fundamental frequency of the crystal is in the 3.5-mc. band, the transmitter works efficiently on the 3.5-, 7- and 14-mc. bands with only the three tubes.

The second transmitter is also crystal-controlled and works exclusively on 245 meters. A UX-201-A as crystal oscillator, UX-201-A as final amplifier and a third UX-201-A as modulator are used in this set. A four-tube amplifier and condenser microphone are used both with this and the short-wave transmitter. This set is used only to supply the BCL's around the district with a short programme every morning. The power input to final tube never exceeds 8 watts.

Last but not least is the t.p.t.g. single-control transmitter described in *QST* some time ago. This is an excellent little set, and five continents have been worked with it within a week. It is used exclusively on the 14-mc. band.

The main power supply consists of 750 volts a.c. stepped up from the 240-volt a.c. mains and rectified through 2 UX-281's in a full-wave circuit. Two hefty chokes and 8  $\mu$ d. of condensers comprise the filter. The power supply for the crystal oscillator is 350 volts a.c. each side of a UX-280, smoothed by a 25-henry choke and 8  $\mu$ d. of condensers. This power supply, by means of a d.p.d.t. switch, also supplies the high voltage for the 245-meter rig. The main power supply, by means of another d.p.d.t. switch, supplies the t.p.t.g. transmitter. Since the secondary voltage of the main high-voltage transformer can be varied the load on the single UX-210 is not excessive.

Further d.p.d.t. switches change the key and filament supplies from one transmitter to another. Any of the three transmitters can be put on the air in about 60 seconds.

Two receivers, two monitors, two battery chargers, wavemeter, etc., comprise the rest of the gear. Both receivers are of the O-V-2 type and are the short-wave and BCL sets.

Three antennas are used and by means of an elaborate tuning board all three can be used on the receivers and the transmitters. They are a full-wave 14-mc. Zepp, a half-wave voltage fed Hertz and a 30-foot 4-wire cage.

VK2JZ has worked 39 countries in all parts of the world and holds a W.A.C. certificate. Both JIEC and J3DD report the 'phone R6. VK2JZ always QSL's, and, if by any chance any station worked has not a card, a reminder will send one on its way.

## Strays

The answer to the question propounded by W1ZI on page 34 of October *QST* is "Yes." W8CNCM had one some time ago when he was experimenting with photo-electric cells. HII

According to W6LQ, the frequency 13,960 kc. is assigned to WML, not WKI, as stated in October *QST*. Confusion might arise if WML and WKI are simultaneously keyed, in which case both calls would be signed.

Here's a "moving" picture:

Place — any place: Scene — sink, bathtub, baby's bath, etc.; Setting — one ham, one nice shiny aluminum panel (new), one large pan full of very peppy lye solution, one pan full of nice clean aqua pura, one pair of pliers, three test tubes filled with ambition and action.

Camera! Ham grasps pliers by handle end; these in turn grasp aluminum panel; panel is soused in lye solution, which completely covers it. More action; ham coughs when a snoot full of fumes leaks into olfactory organs (proboscis). Plenty of action ducking for thirty to forty-five seconds while panel is flipped around in solution. Ham now whips panel from lye and slaps it speedily and without pause into waiting arms of aqua pura standing nearby. Close embrace lasting three or four minutes, followed by further caresses of running water. Panel is dried with cleanest dish towel in kitchen. Ham gives panel once over and finds it now has nice dull dipped finish. Cut!

And that, dear children, is a quick and painless way of "curing" aluminum panels. —W1UT

W4RO, R. F. King, recently worked W4ALL, George King, and immediately afterward hooked W9GBR, R. M. King. He spent the rest of the afternoon in a vain effort to draw a couple of Jacks for a full house!

# EXPERIMENTERS' SECTION

## A Handy Power Pack

By Leonard B. Gallup \*

THE amateur who likes to experiment with various types of receivers, "trick" oscillators such as the Barkhausen-Kurz, small amplifiers and any other set-up which requires a maximum plate voltage of about 300, will find

All parts are mounted in a metal can 10×10×5 inches (the can used was one of those large high-voltage condenser cans). One side of the can is chopped out and a bakelite panel mounted instead. All the controls and binding posts are mounted on this panel.

All in all this makes a neat looking, compact substitute for the usual pile of junk that the amateur uses for a "B" supply and can be tucked away, once the voltages are set, and the leads brought out through a cable to the receiver.

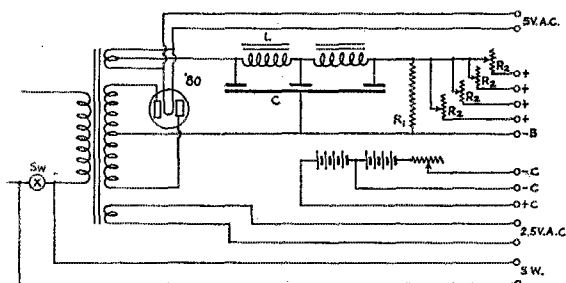


FIG. 1—"B" POWER PACK WITH ADJUSTABLE VOLTAGES

T—Transformer of the type used in broadcast receivers; filament windings of 2.5 and 5 volts, plate winding 300-350 volts each side of center-tap.

C—Three-section electrolytic condenser, 8µfd. each section.

L—Double-section 30-henry choke.

R<sub>1</sub>—15,000-ohm bleeder resistance.

R<sub>2</sub>—50,000-ohm variable resistor (Bradleystat E-5).

(this small unit a most useful addition to his equipment. It uses a Type '80 rectifier tube, a General Electric double choke, Mershon electrolytic condenser, and an Electrad 15,000-ohm tubular resistor across the line to hold the voltage constant. The transformer used is a Thordarson.

As shown in Fig. 1, the hook-up is that of a standard full-wave rectifier type power pack up to the bleeder resistance. The four Bradleystats are of the E-5 type, 50,000 ohms each, enabling one to obtain unusually wide variations of voltages.

Provision is made for the incorporation of a "C" battery in the can. A "C" battery was deemed advisable since most of the a.c. hum picked up in a receiver comes from the grid circuit, and the use of battery bias will do a lot toward eliminating this. The high tap of this battery is also shot through a Bradleystat of the same value so that one may find the best working bias.

The filament leads from the transformer, 5 and 2½ volts, are brought out to binding posts on the panel as are also the switch leads from the transformer primary, making it convenient to turn the pack on and off from the set.

\*9 Chestnut Street, Albany, New York.

### SERIES FEED

D. A. Griffin, W2AOE, Summit, N. J., has been using the circuit shown in Fig. 2 for frequency multiplication with very good results. Its chief feature is that series feed is used for both grid and plate without inductive coupling between stages, thus eliminating the necessity for any r.f. chokes in either circuit. The inductance is split into two parts, one half being in the plate circuit of one tube and the second in the grid circuit of the following tube. The tuning condenser is across the whole coil. The inner ends of the coil (those connected to the by-pass condenser) are at ground potential, and the plate and grid voltages are fed in at these points.

W2AOE has been using this scheme with pentodes as frequency multipliers and states that a single pentode quadrupler working directly from a 3.5-mc. crystal oscillator has ample output to swing a neutralized Type '10 amplifier on 14 mc. The '10 is used to excite a Type '52 on the same frequency. The variable grid resistors allow adjustment of the bias to obtain maximum output when doubling frequency. Although not shown in this skeleton diagram, some fixed bias is also used.

A letter from Stacy W. Norman, W7OK, points out that a similar circuit is used in some of the Western Electric aircraft transmitters in the doubling stages. The only point of difference is that two by-pass condensers in series are used between the two inner ends of the coil, the mid-connection between them being grounded.

Since both ends of the tuning condenser are at high r.f. potential, the use of a split-stator condenser would be advisable to eliminate hand capacity. The rotor could be grounded in the usual manner. We might also point out that neutralization of the amplifier or doubler can be



accomplished very easily by connecting the neutralizing condenser between the plates of the two tubes. Since the r.f. voltages at the plate of

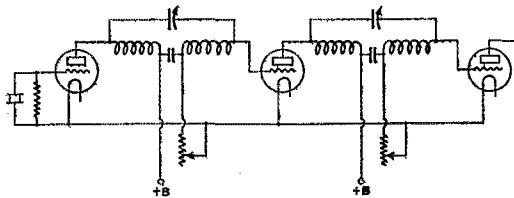


FIG. 2

the driver and the grid of the amplifier are 180 degrees out of phase, the correct phase relationship for neutralization will be secured by this simple method of connection.

### Another Method of Getting High Voltage From the '80

By Frank M. Davis, W9FVM-W9CON

I noticed in the Experimenters' Section of September *QST* VE4EA's article concerning the Type '80 tube for rectifying high plate voltages. I wish to present another method of accomplishing the same result which has been in use here for several months and has been very satisfactory. Reference to the diagram, Fig. 3, will show that two transformer and rectifier systems are con-

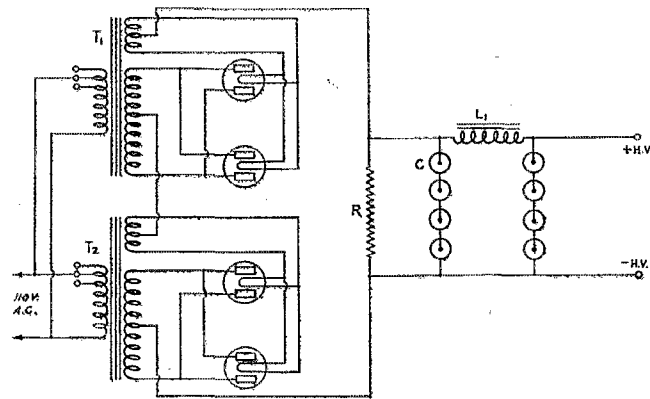


FIG. 3

nected in series, and the output of both is then filtered as a whole. This power supply has been used at various times to put 800 volts at 220 ma. on two Type '10 tubes in push-pull, and later to put 1000 volts at 175 ma. on the plate of a 50-watter.

$T_1$  and  $T_2$  are both transformers giving 400 volts each side of the center tap on the high voltage winding and rated at 350 ma. The filament windings are 5 volts. The taps on the primaries are used to control the output voltage.

These particular transformers have an electrostatic shield, which, when grounded, proved to help greatly in clearing up the note from the transmitter. The tubes are Type '80's. The two tubes in parallel, in addition to supplying more current, give a lower voltage drop through the rectifier and improve the regulation.  $L_1$  is a 30-henry 200-ma. choke. The filter condensers are 8- $\mu$ fd. electrolytics. The bleeder resistor,  $R$ , is 50,000 ohms. The actual measured output of this power supply with the primary taps set to give highest voltage is 1050 volts at 200 ma. The rating of the tubes is not exceeded with the primary taps set to correspond with the line voltage, and the tubes seem to have a long life. Mine have been used about 800 hours and still test OK.

### AN INDUCTANCE CLIP

After years of trimming and bending the ordinary type of small clip in an effort to make it

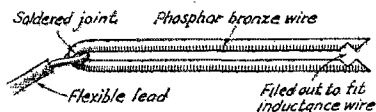


FIG. 4

serve as a decent terminal for the leads which must be tapped onto small wire wound inductances, I decided to do something about it.

Accordingly, a bit of No. 19 phosphor bronze spring wire was bent into the shape of a short hairpin as indicated in the illustration, Fig. 4. Before the free ends are brought too close together, they are filed as shown so that when they are brought together a notch will be provided for the inductance wire to rest in. The flexible wire lead is then soldered to the tail end of the gadget, and at last we have a clip which will permit us to contact our wire wound inductances without shorting out the turn on either side of the one we want. A piece of spaghetti tubing should be slipped over the rear end of the clip to hide the soldered joint and provide insulation.

Possibly the same clip, made of heavier wire, would do for copper tubing coils also.

— Herbert Hollister, W9DRD

### USING LOW-RANGE VOLTMETERS AS MILLIAMMETERS

Occasionally a milliammeter is required when there is none available. The small d.c. voltmeters having a range of 0-10 volts and a resistance of

about 50 ohms per volt make very effective substitutes.

Referring to Fig. 5A, such a voltmeter is connected in the conventional way in series with the rest of the circuit. The meter will pass 20 ma. when the needle indicates 10 volts, and since

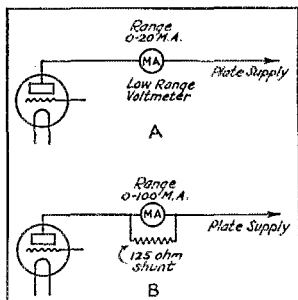


FIG. 5

the scale is laid off in equal divisions, multiplying the voltmeter reading by 2 gives the current in milliamperes. It is true that this scheme involves adding resistance to the circuit, but the voltage drop across the meter will never be greater than the maximum reading of the meter, which is very small, assuming that the current is never over 20 ma.

In Fig. 5B, a shunt resistor of 125 ohms extends the current-carrying capacity of the meter for use in a circuit carrying 100 ma. In this case the voltmeter reading is multiplied by 10 instead of 2.

If the resistance of the voltmeter is not known, it may be determined by placing it across a suitable battery and noting the reading. Then if resistance is added in series with the voltmeter until the voltmeter reading is only one half the previous reading, the series resistor will have the same value as the internal resistance of the voltmeter. The meter could also be calibrated by placing it in series with a standard milliammeter.

— Donald B. Bradshaw, W11B

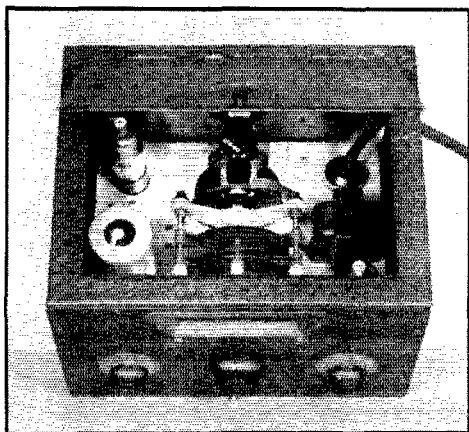
## New Amateur-Band Receiver

THE appearance and something of the internal arrangement of a new receiver especially designed for amateur use is shown in the accompanying photograph. It is designed for use with the new "automobile" tubes (6-volt d.c. heater type), and employs a Type '36 aperiodic input r.f. amplifier, '36 screen-grid detector, and '37 pentode audio output amplifier. While normally intended to operate from a 6-volt storage battery for filament power and 135 volts of "B" batteries for the plates, it is possible to use a.c. on the filaments and a "B" eliminator on the plates if desired. Alternatively, a few minor changes in the wiring will allow the use of 2.5-volt heater tubes, in which case a '27 replaces the

pentode in the audio stage for headphone reception.

Among the features which will be of particular interest to amateurs are the "full-vision" dial—the entire scale is visible at all times, thus making it possible at a glance to locate a station in relation to others—the volume control calibrated in the "R" audibility system, and the practically full-scale spread of the 3500-kc. band with spread on the other bands in proportion to their size. This band-spreading is accomplished by changing the maximum-minimum capacity ratio of the tuning condenser for the different coils by adjustment of a "tank" section in parallel with the tuning section of the condenser.

The receiver is normally furnished with coils for the 3500-, 7000- and 14,000-kc. bands, but additional coils to cover the short-wave broadcast bands also may be obtained. All coils are wound on low-loss "skeleton" forms in which the turns are fitted into slotted bakelite ribs, most of the dielectric in the field of the coil being air. The



band-spread of each receiver is individually adjusted, calibration charts being furnished. The case is made of sheet iron, with welded joints, and has a heavy crackle finish with high lustre.

The receiver is a product of the Radio Engineering Laboratories, Long Island City, New York.

## Strays

Remember the hand-made linoleum cuts that were quite the thing for greeting cards a year or so ago? W6DRF recommends the idea to the ham who wants to get up an unusual QSL card.

W3CAB says that with the present low price of copper many interests seeking radio channels should establish wire lines. 'Twould save the F.R.C. a lot of worry.

# THE COMMUNICATIONS DEPARTMENT

F. E. Handy, Communications Manager

E. L. Battey, Asst. Coms. Manager

## O.R.S.-QSO Party

Coming, January 23rd-24th

IN OUR next issue we will report the results of our exclusive all-O.R.S. Party which opened the active operating season last October. This will announce a January O.R.S.-QSO Party. A word of explanation may be in order to the uninitiated. These get-togethers are *not* for all amateurs, as is the case with our VE/W contest, but are especially for the benefit of the 1063 (approximately) ultra-reliables, operators whose stations SCMs have appointed *Official Relay Stations*. These stations constitute the backbone of A.R.R.L. field organization in the sixty-nine A.R.R.L. Sections. Good notes on the part of practically every participating station, and the best of fine operating by experienced amateurs makes these O.R.S. gatherings more than ordinarily pleasurable.

The O.R.S. get-togethers help reliable stations and operators everywhere to get acquainted with each other, thus assisting in routing traffic over the most reliable channels, improving deliveries, and speeding up message handling, especially since new schedules are arranged on these occasions where mutually desired. In addition, every O.R.S. is guaranteed a good time generally, and an opportunity to test the range and operating efficiency of his station. The only reason all members have not heard about the O.R.S. Parties before is that the announcement of previous affairs has been made exclusively in the quarterly bulletin mailed regularly to every active reporting appointee in the line-up. Interested members not now holding O.R.S. appointment can secure full details from their Section Manager (address page 5, *QST*), and when properly appointed will receive a warm welcome at these affairs.

The January O.R.S.-QSO Party will start at 6 p.m. (1800), Saturday, January 23rd, closing at midnight (2400), January 24th, Sunday night. Thirty hours, including two evenings of operation, are provided. The time indicated is your local time. As the previous party proved, there were plenty of O.R.S. on deck. No O.R.S. will want to miss this chance to clear the hook and work some new stations.

Any frequency bands may be used. Choose the one most suitable to make your work successful. The general call, sent not more than 3 X 3, is CQ ORS CQ ORS CQ ORS de W/VE . . W/VE . . W/VE . . K. When working and signing, every O.R.S. will follow his call sign with "ORS." In fact this procedure may be adopted for all regular O.R.S. operation shortly, since it enables reliable traffic stations to get in touch with each other quickly at any time.

Scoring: O.R.S. count two points for each O.R.S.\* worked.

One point for each O.R.S. heard.

One additional point for handling any traffic when in contact with an O.R.S. (regardless of the number of messages handled).

At the conclusion of the "party" each O.R.S. adds his list of points and multiplies the total by the number of A.R.R.L. Sections in which O.R.S. have been worked (hearing a station does not add to the list of Sections) to get the "grand total."

<sup>1</sup> Or drop a postal to A.R.R.L. Headquarters asking for the latest R. and R. with a full explanation of all the O.R.S. appointment entails, as well as a convenient application form to send the S.C.M. on the reverse, and other information essential to amateur station operation.

<sup>2</sup> O.R.S. have been provided with a complete mimeographed list of appointees to assist in keeping score, and this will be revised and reissued with the January O.R.S. Bulletin.

The score sheet submitted shall list the names of all operators at the station during the contest period, and the final score shall be divided by the number of operators of the station during such period.

Reports: O.R.S. will report all their scores direct to Headquarters at the end of the contest, on January 25th, so the leading stations and W or VE Sections showing greatest activity can be announced at an early date.

A parting word, be on deck Saturday and Sunday, January 23rd and 24th, if your station holds a valid O.R.S. appointment on those dates. If your appointment is a new one, as yet unlisted, you can so inform stations you work and the facts will be checked up against Headquarters records when the scores are examined and verified finally. Don't forget the dates — mark the calendar if necessary.

— F. E. H.

## How to Put on a Hamfest

By Ralph Stephenson\*

We invite contributions on every phase of amateur communication activity. New ideas and viewpoints, criticisms of and remedies for conditions, hints on DX, suggestions concerning radio club organization, information on interference elimination, exceptional two-way communication work covering emergencies, athletic games and trips, timely attention to operating practice, commentary on the place of radio-telephony, experimenting or development work in present-day amateur radio, data on low-power possibilities, 1750-ke. operation, etc., all are needed. There is plenty of romance and real accomplishment in amateur work. Read this contribution and the one presented last month. Then give us some real operating stories or the benefit of your views on different subjects.

In addition to publication of the best articles in *QST*, the author whose article appears to have greatest value of those received for consideration, has his choice of (1) a copy of *The Radio Amateur's Handbook* bound in leather cloth, (2) six pads of message blanks, or (3) six of the new type A.R.R.L. log books. This offer will continue until further notice. The article presented herewith is the prize-winning article for this month.

— Communications Manager.

THE Detroit gang have put over another big hamfest, the Daddy of them all. At the August meeting of the Detroit Amateur Radio Association, it was voted to have a "Fall" hamfest. Mr. J. O. Ellison, W8COW, was named as chairman of the hamfest committee, to be assisted by W8CEP, W8AM, W8GA, W8LU, W8FX, W8BJ, W8CAT (Club Secretary) and W8DMS. It was decided by the committee to try to get the use of the Michigan National Guard Armory at Ypsilanti and permission was readily

\* W8DMS, Section Communications Manager for Michigan, 8840 Monica Ave., Detroit, Mich.

granted by Lieutenant Colonel Glen B. Arnold, Signal Corps, commanding officer of the Ypsilanti Post. Six hundred fifty advance notice cards were mailed out to licensed operators of Michigan, Northwestern Ohio and Northern Indiana. On Monday, October 5th, 700 mimeographed letters giving the tentative program were sent to the same list, and additional ones sent to those who wrote in requesting information. These inquiries were the result of the notice in the SCM report in October QST.

The Supervisor of Radio kindly loaned us an up-to-date list of licensed Eighth District amateurs and a mimeographed copy was made of this list at the time of mailing the first notices.

Arrangements were made with the Supervisor of Radio to give examinations to operators with temporary licenses and to others desiring their amateur licenses. About twenty took advantage of this. Mr. Ernest Peterkin assisted by Mr. Smith of the R. I.'s office did the work. They brought with them the field test car of the local office. This car was run onto the floor of the armory for display and inspection.

A number of prizes were awarded, the list totaling some seventy items, part of which were donated by manufacturers or dealers and the balance furnished by the committee.

Mr. C. H. Vincent, W8RD, had a complete 5-meter phone transmitter and receiver which was set up and operated perfectly. He gave a talk on his experiments with the higher frequencies. Signals from the transmitter which was located in an automobile were picked up in the armory and put through the public address system so that everyone in the room could hear them. Mr. Charles Gault, W8ZO, installed the public address system. Mr. L. N. Holland, Electrical Engineering Department of the University of Michigan, talked on A, B, and C amplification.

Following Mr. Holland, SCM Stephenson, W8DMS, spoke to the gang in regard to routine matters, and brought up the subject of the frequency measuring contest.

During lulls in the program, music was furnished by a number of hams who had brought their musical instruments with them. After the speaking program, the drawings for prizes took place. There were six prizes awarded on registration numbers, the winner of the first prize having his choice of any one of the six, second winner his choice of the remaining five, etc.

Hot dogs, cheese sandwiches, fried cakes, coffee and milk, and pickles were served, lunch counter style. Tickets entitling the holder to one dog, or cup of coffee, etc., were sold at the rate of six for a quarter. Each purchaser was told to write his call or name on each ticket before buying food. The gang consumed 100 pounds of dogs, 70 dozen buns, and ten pounds of coffee and 30 dozen fried cakes in addition to other miscellaneous articles. After the registration drawing, all the remaining prizes were displayed and drawing of food tickets was started, the winner of the first making his selection, etc., etc. In this way the winners did not receive something they could not use and everybody seemed satisfied.

After the drawings were finished, the auction sale of equipment brought in was started and this continued until well after 8 p.m. Everything from a worn out rheostat to complete receivers, power supplies and even a typewriter was auctioned.

Letters of acknowledgment and thanks are being prepared to go to each concern donating prizes and will be sent out this week.

The total registration at this hamfest, exclusive of the nine committee members was 258. The committee made up a prize for the committee member guessing the closest to the total registrations, this guess being made a week before the hamfest and before the program letter was sent out. Their average guess was 259, and W8DMS happened to be the lucky one to win the year's subscription to QST, with a guess of 266.

A few notes on our experience in the way of costs, estimating, etc., may be of some use. We have found that we get about 30 percent of those circularized to attend and that our maximum distance for coverage is about 100 miles. For our estimate of food, we took the average, and figured about three dogs per person. There are eight of these to the

pound so we bought 100 pounds. Buns were the same and we had 70 dozen which just about came out even with the dogs. In addition we had 10 pounds of cheese, 5 loaves white bread, 5 rye bread and 2 pounds of butter. Two gallons of dill pickles and 2 of sweet pickles were cut up and left on the counter and 6 quarts of mustard was also used in the same way. We used 10 pounds of coffee; 19 cases of milk, each containing 24 half-pint bottles, were also consumed. All items were sold for one of the "six for a quarter" tickets which meant  $4\frac{1}{2}$  cents each and this figure is barely over the actual costs, so by the time we paid a cook and three helpers in the kitchen and three waitresses for their work, the sale of food represented a loss, but this loss was taken care of from the registration fund. The registration fee was 50 cents and after all expenses such as gasoline, postage, prizes purchased (\$15.99), ribbons for badges, etc., help in the kitchen, and for cleaning up, we had remaining about \$35 clear. The prizes purchased were mainly to increase the total number so more fellows would participate.

Such a meeting meant a lot of work to everybody but every one connected with it pitched in and worked hard. We have accomplished something worth while.

## Unlicensed Canadian Station Apprehended and Penalized

THE Department of Marine, which is charged with the administration of Radio in Canada, has, in view of the increasing number of unlicensed amateur transmitting stations established, found it necessary to adopt more drastic measures to ensure the observance of the Radio Act and Regulations issued thereunder.

*In future all equipment found installed at unlawfully established amateur stations will be seized, and proceedings instituted against the offenders.*

On November 17, 1931, in pursuance of this policy, court action was taken against E. A. Goodier, of Barriefield, Ontario, for establishing and operating an unlicensed transmitter, which prior to detection had caused considerable interference to broadcast reception. All equipment was seized, and Goodier was summarily convicted and fined \$10.00 and costs. Later, upon the recommendation of the Department the Magistrate allowed the seized apparatus returned to the defendant.

Section 12 of the Radio Act (Dominion of Canada) provides that "every one who establishes a radiotelegraph station or installs or works any radiotelegraph apparatus in violation of the provisions of this Act, or of any regulation made hereunder, shall be liable on summary conviction to a penalty not exceeding fifty dollars, and on conviction on indictment to a fine not exceeding five hundred dollars and to imprisonment for a term not exceeding twelve months, and in either case shall be liable to forfeit to His Majesty, any radiotelegraph apparatus installed or worked without a license."

The Department feels obliged to recommend that the full penalty be imposed by the courts in any future cases as may be necessary, that such examples may act as a deterrent to any such unlicensed operation. Canadian amateurs, and particularly those ambitious to become Canadian amateurs have their attention specifically called to the first two paragraphs above, setting forth the policy of the Department. In both Canada and the U. S. A. heavy penalties are provided and enforced for non-observance of the radio laws and regulations made thereunder; in both countries licenses are easy to obtain through the prescribed channels; it follows that there is no excuse for the operation of any station without a license. Beginners will do well to be sure that they comply fully with the moderate requirements, in order to avoid possible trouble of this nature which may spoil an otherwise bright amateur future.

## Traffic Briefs

Attention! Pacific Coast Hams! San Joaquin Valley Section Hamfest will be held Saturday, January 9th, at 6:30 p.m., in the Union on the Fresno State College Campus,

Fresno, Calif. Lots of entertainment and good dinner for only 60 cents. All hams invited and guaranteed a good time. Overnight accommodations furnished free for hams. For reservations write to Fresno State College Radio Club, Fresno, Calif.

### 28-MC. TESTS

The R.S.G.B.-B.E.R.U. announces a series of 28-mc. tests for the following week-ends: January 23rd-24th, January 30th-31st, March 19th-20th and March 26th-27th. Hours of operation will be from 1200 GMT on each of the Saturdays to 2400 GMT on Sundays. All A.R.R.L. members are requested to keep a watch for British stations on 28 mc. on those dates and report any stations heard or worked direct to the A.R.R.L. and R.S.G.B. We urge W/VE 28-mc.

## Traffic Summaries

(OCTOBER-NOVEMBER)

	M.P.S.	Total
Central led by Ohio (219.5 m.p.s.) (14,439)	120.2	28,608
Atlantic led by Western New York (163.6) (8765)	94.6	11,043
Ontario	95.5	1496
Ronoke led by Virginia (107.4) (3439)	77.4	1181
Dakota led by South Dakota (79.2) (1030)	76.1	3273
Pacific led by Santa Clara (109.2) (1529)	58.3	8337
Hudson led by New York City and Long Island (82.9) (1637)	51.2	3328
Midwest led by Nebraska (114.1) (1940)	48.8	5638
Delta led by Tennessee (44.3) (268)	45.1	1343
West Gulf led by Oklahoma (63.3) (812)	43.0	2150
New England led by Maine (68.9) (1798)	38.2	4792
Southeastern led by Eastern Florida (47.4) (1139)	36.7	2366
Maritime	34.4	69
Rocky Mountain led by Colorado (36.1) (361)	29.1	583
Northwestern led by Idaho (33.1) (195)	27.4	1455
Quebec	26.3	290
Vanatta led by British Columbia (15.5) (124)	15.5	124
Prairie led by Manitoba (5.0) (10)	3.0	13
1163 stations originated 17,823; delivered 15,069; relayed 46,263; total 79,144 (84.4% del.) (68.0 m.p.s.).		

We're pleased to announce a sizeable increase in deliveries to 84.4% with the October-November report. This is encouraging indeed since for the previous several months delivery percentage had been steadily on the decline. If each and every amateur will "relay or deliver every message within 48 hours" and absolutely refuse to accept any traffic he is not certain he can handle, our deliveries will remain high, and our traffic handling system will improve throughout.

Starting this month the award of the Banner is based on the "messages per reporting station handling traffic" within each Section, rather than on the total amount of traffic handled. Likewise, the standing of each Division is determined by the "messages per station" (M.P.S.) within the entire Division. On this new basis OHIO wins the Banner (as usual) with 219.5 m.p.s. and the Central Division is in first place with 120.2 M.P.S. Incidentally, Ohio also leads on a "volumetric" basis with her total of 14,439.

Remember that a Section must have at least six stations reporting traffic eligible for Banner awards. This prohibits a Section with one or two high stations from unfairly taking the Banner. Send your SCM a report of your traffic handled and other activities each month on the 16th and help him in every way possible to make your Section a leader.

The above Summaries show the relative standing of all Divisions on a basis of Messages Per Reporting Station Handling Traffic, and the leading Section in each Division on the same basis for the October-November reporting month. The M.P.S. for each leading Section is shown in parenthesis, followed by the total for the Section (also in parenthesis). The M.P.S. for each Division is also shown, followed by the total number of messages handled within the Division.

## Official Broadcasting Stations

(CHANGES AND ADDITIONS)  
(Local Standard Time)

W1ABG	3600 kc. Sun., 3:00 p.m., Wed., 7:15 p.m.; Mon., Fri., 7:00 p.m.
W1BEZ	3885 (cc) Sat., 4:00 p.m., Tues., Fri., 1:00 a.m. Also odd times during week
W300	14,200 (phone) Mon., Wed., Fri., 6:00 p.m.
W4KX	3510 kc. Tues., Thurs., Sun., 6:00 a.m.
W6ACL	7105 kc. Every night except Sat. and Sun., 5:00 p.m.
W6EJC	7190 kc. Wed., 7:30 p.m.
W7AYH	7250 kc. Sun., 2:30 a.m.
	3625 kc. Sun., 3:00 p.m. Rest of schedule unchanged.
W7FL	3950 kc. Tues., Thurs., 6:30 p.m.
	8500 kc. (phone) Mon., Wed., Fri., 6:30 p.m.
W8EQO	7050 kc. Tues., Fri., 6:00 p.m., Sun., 8:30 a.m.
W9CBB	7025 kc. Mon., Fri., 7:00 p.m.; Sun., 11:00 a.m.
W9DOE	7124.05 kc. (cc) Daily, Noon.
W9FJC	3985 kc. Mon., 8:45 p.m.
W9FK	7124 kc. Fri., 8:15 p.m.
W9IK	1770 kc. (cc) (phone) Tues., Thurs., 8:15 p.m.

experimenters and those in every other country of the world to likewise concentrate 28-mc. operations in these periods, and report fully on results, to advance common use and knowledge of this band. Here's to many successful 28-mc. two-way contacts in this test.

Due to the undependable characteristics of 14 mc., W1MK's Operating Schedule as outlined in November, 1931, QST (page 43) has been modified. When conditions on 14 mc. are unfavorable for QSOs at the time W1MK has General Operation on this band, "RP" will operate on another of W1MK's announced frequencies.

## BRASS POUNDERS' LEAGUE

Call	Orig.	Del.	Rel.	Total
W8BYD	774	413	1027	2214
W8AXV	487	238	1346	2071
W8FP	124	147	1313	1584
K4IHR	270	362	892	1534
W8BON	509	306	860	1275
W8BAH	527	394	288	1209
W8DDS	210	346	648	1204
W8DES	214	224	568	1006
W8BJO	281	118	576	975
W8CXL	115	128	721	964
W9FRJ	33	47	652	731
VE8GT	151	168	402	721
W8DFE	85	75	550	710
W8BWT	140	153	363	656
W6VQ	32	27	692	651
W8ALU	132	190	320	642
W8CGS	128	74	430	630
W8EEW	197	108	242	607
W8BBH	109	201	294	604
W9BNT	211	149	236	596
W9BFP	106	55	426	587
W9DIL	65	17	495	565
W8DBX	45	41	470	556
W3AGE	37	24	492	553
W8AAJ	150	121	242	513
W9CTP	46	4	453	503
W9FLG	76	118	246	436
W1MK	108	102	191	401
W2SC	46	110	281	396
W8DFR	60	146	180	386
W6EYF	161	192	4	357
K6BOE	175	100	50	325
W8EGT	152	110	60	322
W8CUW	32	103	131	315
W9NP	21	258	22	301
W7BB	31	174	86	291
W6AMM	189	143	2	284
W4AEM	77	117	60	254
W9CAI	18	107	60	245
W8HT	68	118	24	210
W9CVT	11	111	87	209
W9BGW	20	103	50	173
W6YAU	33	115	—	143

Month of October 16-November 15 above. Deliveries count! Note the stations responsible for over one hundred deliveries.

A total of 500 or more bona fide messages handled and counted in accordance with A.R.R.L. practice, or just 100 or more deliveries will put you in line for a place in the B. P. L. Why not make more schedules with the reliable stations you hear and take steps to handle the traffic that will qualify you for B.P.L. membership also?

## DIVISIONAL REPORTS

### ATLANTIC DIVISION

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Harry Ginsberg, W8NY — Things sure look brighter, gang. Twenty-two out of 26 ORS reported; 16 handled traffic. Five new ORS, W8AVD, W3BGI, W3AMI, W8HT and W3ADO, reported; four of 'em report traffic. That's the spirit! Come on, all you non-ORS — send in a report, traffic or no traffic! W3EN, Army Amateur Net Control, Fort Howard, Md., is a welcome addition to the ORS gang. So is our local W3BOE. Fellows, traffic deliveries are falling way off. It's up to every one of us to observe the 48-hour limit for relaying and delivering any message. Don't treat any message as though it were something too hot to hold on to, and can be given to anyone at all; be sure the operator on the other end really has it OK. Within reasonable distances, mail 'em as deliveries inside the 48-hour limits if you can't get a sure relay in that time. For long distances, don't hold a message longer than one half the time it would take through the mails. We have got to boost deliveries or accept the "Black-eye" of complete unreliability.

ity. Who wants this "Black-eye"? Maryland: W3HT, non-ORS, leads the Maryland gang. W3BEG is organizing a network to relay National Geographic traffic from Shanghai to Washington, D. C. W3ZK runs a sure-fire schedule every night at midnight to Phila. via K4RK on 7 mc. W3BOE reports for first time as ORS. W3AVD is out for ORS. W3BGI, 4204 Roland Ave., Baltimore, Md., reports QRL with hospital. W3A00 was off nearly all month with an ailing power supply. W3AHG replaced his filter. W3AFF says QRN is very troublesome. W3DG promises to do better. W3BBW is going on 3500 kc. with crystal. W3VJ is organizing a traffic loop on the Eastern Shore to function soon. W3LA was busy with television up in New Jersey. W3BAT is still waiting for his new license. W3AMI has new rig going. W3NY is busy with school and SCM work. W3ADO is getting organized; W9DSU pounds brass at the Naval Academy also. District of Columbia: W3CXL leads with a peach of a total. W3BWT follows closely in spite of a prolonged spell of illness. W3ASO still pounds 'em out as an old reliable. W3PN is plenty busy with pictures. W3IL does quite a bit of rag-chewing. W3AKR will have to build himself a room when he moves to his new QRA. W3PM is back in the line-up. W3OZ has the assistance of W9FQQ to pound out some real traffic. Delaware: W3HC attended the ham-fest in Allentown. W3AJH has at last gotten a nice YL: HI.

Traffic: W3CXL 964, W3BWT 656, W3HT 61, W3BEG 42, W3ZK 31, W3ASO 28, W3PN 28, W3BOE 16, W3IL 14, W3HC 12, W3AVD 11, W3BGI 8, W3A00 8, W3NY 7, W3AHG 7, W3AKR 6, W3OZ 5, W3AJH 4, W3AFF 3, W3ADO 2.

SOUTHERN NEW JERSEY — SCM, Robert Adams, 3rd, W3SM — W3ZI is handling Army-Amateur messages. W3UT is working New Zealand on 7 mc. W3BDO is still rebuilding at his new QRA. W3AWJ has a new Zepp. New members of the Atlantic County Radio Club are W3CBR, W3CCP and W3CCT. W3BSC is busy with school. W3ASG is helping to organize the Cumberland County Radio Club. W3QL was off the air three weeks. W3ARV kept ten schedules, and has highest total in Section. W3JL reports the Morris County Radio Club is planning a banquet. W3ATA is rebuilding. W3PC is working for ORS. New ORS appointments this month were W3BFH and W3AEJ. W3SY is building an MOPA. W3SM is working New Zealand regularly on 7 mc. W3AEJ can be heard regularly on 3.5 mc. W3KW is back from the seashore.

Traffic: W3AEJ 17, W3QL 153, W3ZI 43, W3KW 34, W3BSC 4, W3SM 96, W3UT 16, W3PC 38, W3ARV 281, W3AS 18, W3JL 37, W3BFH 20, W3ACJ 13, W3AWT 9.

EASTERN PENNSYLVANIA — SCM, Jack Wagenseller, W3GS — Our new RM, W3MC, takes the prize offered by the SCM for the highest traffic total each month. W3MG runs a close second with his usual FB high score. W8AFV, an old-timer, is now back in the game. W3AFE sends in a nice total. Our YL ORS, W3AKB, continues her good work. No sigs were heard on 1.6 or 28 mc. by W3VB. The Chester Radio Club, W3BKQ, sends in another nice report. W3QP plans to be in the new U.S. network which is being formed. W3AFG was heard in Germany with 22 watts input. Glad to hear from W3OP again. W3AAD and W3NA in Quakertown are experiencing heavy QRM from YLs. W3BTP is a prospective ORS. W3BES reports again. W3ATN reports for first time. At last W8VD is back with us. W8EU has been very much pressed for time. Look at the total W3AHD sends in for his first report. W3BBK says traffic very plentiful. W3BET finally got into high gear again, and he spread the disease to W3AIZ, who reports for the first time. W3UX should be congratulated on his consistently fine work. W8FCB has earned an ORS certificate. W3AQN is still busy with Red Cross traffic. W3CAL, a new ham, reports via W3AQN. W3ZF is working plenty on 1750-kc. band with excellent reports. W3EV is certainly stepping out. W8CWO has built a new crystal outfit. W3BOL has been experimenting with 28 mc. W8CFI at Bucknell University sends in a better report every month. At last W3OK has made his MOPA do its stuff. W3NF wants more traffic. W3ADE has a bad location since he moved. W3AVI is very QRL operating at a BC station. W3ANZ may desire to be an ORS yet. Dickinson College, W3YC, reports for first time. W8DPQ is in line for an ORS.

W3GS is rebuilding his transmitter. When this is completed, he will be on the air from Phila. using portable call W3BF. Let's have more reports, OMs. We like big reports, but even the little ones are welcome. Who will get the prize next month?

Traffic: W3AFE 79, W3AVI 12, W3MC 392, W3ADE 16, W8DPQ 10, W3YC 62, W3AKB 252, W3MG 388, W3NF 152, W3OK 138, W8CFI 159, W3BOL 11, W8CWO 47, W8EV 127, W3AQN 11, W8FCB 26, W3VB 30, W3UX 109, W3AIZ 99, W3BET 115, W3BBK 163, W3AHD 93, W8EU 2, W8AT 8, W8VD 72, W3ATN 27, W3BES 12, W3BTP 8, W8AFV 31, W3ANZ 10, W3NA 23, W3AAD 90, W3OP 7, W3AFG 14, W3QP 25, W3BKQ 39, W3CS 40, W3ZF 218, W3CAL 7.

WESTERN PENNSYLVANIA — SCM, R. M. Lloyd, W8CFR — W8KD not only leads the Section in traffic, but he copped the first log books in the section traffic contest with his 57 deliveries. W8CUG, the RM, has a bunch of schedules and is trying to line up our ORS for better traffic totals. We're glad to hear from W8YA again. W8DLG is back with his old rig. W8BIB sends in his first report. W8DZP is making schedules. W8EDG reports for W8ELG and W8DVA. W8CPE has a new receiver. W8CMP can't find a vernier dial to suit his TNT-Dynatron! W8APQ reports W8EIM has made the leap — married! W8BUC keeps schedules between his dashes to Butler. W8DVG is still with us. W8CQA visited Jamestown. W8AVY has a new keying system. W8EYZ and W8AYH are both U.S.N.R. men. W8CTE worked YNU. W8DLV has an MOPA. W8FGO is working on 14 mc. W8CEO is on from his new QRA. W8CXE has installed crystal. W8EEC has a new outfit going. W8ASE says W8AG and W8DZV are active, and that W8CEE, W8VI, and W8DOQ are rebuilding. W8CFR is building a new receiver.

Traffic: W8KD 448, W8CUG 216, W8YA 127, W8DLG 103, W8DZP 93, W8BIB 87, W8DZA 80, W8EDG 80, W8CPE 37, W8CMP 35, W8APQ 27, W8BUC 23, W8DVG 18, W8CQA 16, W8DUT 16, W8AVY 15, W8EYZ 12, W8CTE 10, W8AYH 6, W8DLV 7, W8CFR 6.

WESTERN NEW YORK — SCM, Don Farrell, W8DSP — W8DES is leading man with W8BJO and W8DBX as runners up. They all make the BPL together with W8ON. FB. W8AFM is doing considerable work on receivers. W8AYU is building new push-pull amplifier and also working DX. W8DSS still pushing a nice bunch of traffic. W8AFY wants ORS. W8DSA is ready to make skeds. W8DEJ, our YL op, sure going FB with crystal control. W8DSP using '52 on 7000 kc. and push-pull '48s on 3500 kc. W8BHK very QRL. The Jamestown Amateur Radio Association is very active, as their report indicates. W8DMJ reports good traffic total. W8DME, W8CVJ, W8BCN, and W8BZP are putting code lessons on the air via W8MBO. W8EUY reports for the Ripley gang. W8EWF is rebuilding. W8EXG is on only part time. W8EUY has a new 50-watt MOPA about completed. W8BFF reports that the Elmira Amateur Radio Association members are going to report their traffic each month to help swell totals. W8AWM is still operating at W8ON. W8BLH has been QRL with overtime work. W8GIL is organizing an Esperanto Relay Network with W7AVE as the western end to popularize the international language, Esperanto. W8DHQ is handling lots of traffic with Troy, N. Y. I want to use this medium to thank all the gang for electing me their SCM and want to assure you I will do my best to fulfil the position. W8AKC is interested in traffic handling. W8AGS is going FB and wants ORS. W8DHU is putting Glens Falls on the map. W8CLP and W8EIJ are two new hams in Glens Falls. W8CYG keeps a bunch of skeds and also works DX. W8QL has a FB traffic total and is on 1750-kc. band part time. W8BWW is putting a new hardwood floor in his shack. HI. W8EWT keeps skeds and wants ORS. W8DXF expects to handle a bunch of traffic. W2CIZ is now working at the Finch Farm, Denver, N. Y., and is working his portable, W2ZZW, in his spare time. Let's go, gang, and put our Section on the map.

Traffic: W8DES 1008, W8BJO 975, W8ON 210, W8DMJ 70, W8DME 33, W8EUY 10, W8BFF 16, W8DBX 556, W2ZZW 3, W8AFY 3, W8DSP 29, W8AFM 11, W8BHK 19, W8DHQ 21, W8AKC 10, W8AGS 72, W8DHU 55, W8DSS 228, W8DXF 20, W8EWT 28, W8BWW 143, W8QL 192, W8CYG 55.

CENTRAL DIVISION

**KENTUCKY** — SCM, J. B. Wathen, III, W9BAZ — Total dropped to 1094. Not enough of you handling traffic. W9EDQ now has '10s push-pull TNT. W9BWJ is building a 1750-kc. transmitter. W9BAZ acquired a good dynatron. I'm no fiction-writer, W9CNE; put something on your card. W9DKD is doing all the brass-pounding at W9JL. Will someone give W9BAN a schedule and make him keep it? W9AUH is doing extensive experimenting. Since 7 and 14 mc. are so poor, why not try 3.5 mc., W9DDQ? Due to heavy school work, W9GGB may have to give up ORS. W9EQO is busy teaching the OW difference between a dot and a dash. W9ARU gives us a good report. W9HCO is getting good results. W9FZY has new AC receiver. W9CXZ makes his first report a good one. Between studies, W9ABV squeezes in a little time with his outfit. W9CDA hasn't completed rebuilding. W9LH has a '52 working on 7060. W9ERRI spends all his time building transmitters for the Nat. Guard. W9AEN is back disturbing the ether. W9EYW almost ready; same for W9CML. W9BPB makes good crystal holders for \$6.50 each. W9QT is busy putting in 1-KW water-cooled tube. New ORS — W9EQO. With Kentucky 'phones: — W9BGV pounds through. W9EDV has WE211-E in last stage now. W9ETT has 100 W MOPA going. Reports both W9CEK and W9HDZ active. How would you like to have a 'phone R.M.? Send me your recommendations. Everybody be on for monthly KY QSO PARTY 14th.

Traffic: W9EDQ 343, W9BWJ 330, W9BAZ 204, W9OX 46, W9CNE 38, W9JL 34, W9BAN 16, W9AUH 14, W9DDQ 14, W9GGB 14, W9EQO 12, W9ARU 9, W9HCO 8, W9FZY 6, W9CXZ 5, W9ABV 1.

**ILLINOIS** — SCM, F. J. Hinds, W9APY (W9WR). RM, E. A. Hubbell, W9ERU — If you haven't received your QTC yet, write W9APY. Splendid report this month, fellows, but not good enough yet. Originate better traffic and let's get going here. W9BYZ has a new 7-mc. Zepp and 3.5-mc. Marconi antenna. W9CKM is out for good traffic stations. W9BRX took the place of W7AAT in the frequency measuring contest. W9BYZ handled an emergency message requesting medicine from a doctor. Every time W9GDI lets out a directional CQ he gets answers from the opposite direction. W9ACU now has three transmitters working. W9DJG is building an MOPA. W9CUX and W9ENH had to wait for license renewals. W9NN is now on 7000. W9KB is not doing much on low power now. W9AFN received a report from Europe giving him R-9. W9HSG is a new traffic man. W9ACE copied the Armistice Day A.A.R.S. message. W9AYB is doing nice work on the 1750-kc. band. W9JO is installing '66s. W9CUH reports 42 members in the Waukegan Radio Club, including two YLs. W9AIC says, "The MOPA works." W9DDE says, "Watch my smoke next month." Even though a couple of houses have to be moved, W9DZG is going to have a Zepp. W9DZU will have a '10 going soon. W9FXE says his 7-mc. Zepp works better on 3.5 mc. than the 3.5-mc. single wire-fed Hertz. Farm QRM is now all over at W9AD. From the totals of W9HZB he is going to be one of our best traffic men. W9EKM is a new man. W9FCW did fine work on the Navy Day and Armistice Day programs. W9FPN is QRL college work. W9CZL thinks he is going to get a 100-watt push-pull Christmas present. W9DYG is sporting a new monitor. W9VS is doing fine traffic work. W9ATS has a new receiver. W9DGZ has an additional call in W9IU. W9GMT has worked 13 stations, and received cards from 6 so far. W9FZN is to be a W-3 soon. W9HG has to scrap the fine panel due to a smaller QRA. W9IN has a new super-regenerative receiver. W9AAV is testing out low powered transmitters. W9ANQ is rebuilding. W9BBR has gone to 'phone party for a change. W9CNC works both 'phone and CW. W9CGW is experimenting. W9DEU convinced the OW a transmitter in the basement kept him out of her sight too much, so she is now letting him move back upstairs. Hi. W9EPK is reading QSTs and will soon build something worthwhile as a transmitter. W9HPJ has a 2nd commercial now. W9EGY is busy with public address work. An old-timer is back with us in W9EYL. W9GYK is one of the best 'phone stations in Illinois. W9ETU worked ZLIAR. W9CTP is rebuilding to

a push-pull crystal. Most of W9CYT's traffic was Army-Amateur. W9HOY is rebuilding into crystal. W9CGV promises us some fine totals. W9ABS and the boys in Quincy had an Army-Amateur booth in the Radio Show, and did fine traffic work. W9FRA tried to make his total into four figures this month. W9ERU has a dandy crystal outfit going. W9FYZ says the effects of a few good schedules are quite noticeable on traffic totals. New Zepp at W9FYZ. Special traffic honors are due this month to W9FRA and W9CTP. Also to W9ABS, W9AMO, W9GAI, W9FCW, W9CYT and W9ACU. All were over 200. W9GAI and W9DDE are now A.A.R.S. W9DOU is proud possessor of a National ACSW3. W9FLH says there seems to be many new hams on the 3.5-mc. band who are not yet quite ready to QSP. Hi. W9GFU knocked down a couple of QSOs with VK3GJ. W9FGD is trying for a 2nd commercial ticket. We have three fine new stations in W9DLY, W9DPD and W9DPS.

Traffic: W9FRA 731, W9CTP 503, W9ABS 347, W9AMO 294, W9GAI 245, W9FCW 213, W9CYT 209, W9ACU 205, W9WJ 193, W9ERU 191, W9ATS 145, W9EKM 135, W9ALA 118, W9QI 118, W9FXE 115, W9DDE 111, W9FO 101, W9APY 71, W9VS 54, W9HSG 48, W9HZB 48, W9FYZ 40, W9GFU 40, W9CZL 30, W9DKF 29, W9AIC 26, W9CUX 26, W9CUH 25, W9FLH 23, W9BYZ 22, W9DIG 22, W9AFN 20, W9FI 19, W9DBE 18, W9BVP 14, W9DYG 12, W9NN 12, W9BTU 11, W9BIR 10, W9AD 9, W9ACE 9, W9AYB 9, W9CGV 9, W9CKM 9, W9WR 9, W9GYO 8, W9PK 8, W9DZU 6, W9KB 6, W9FTX 5, W9JO 5, W9BRX 4, W9DZG 4, W9FPN 3, W9BSR 2, W9HOY 2, W9DOU 1, W9FGD 1, W9GDI 1.

**INDIANA** — SCM, George H. Graue, W9BKJ — W9GYB and W9FKE are newly appointed ORS. W9HUI has worked all districts on 3.5 mc. W9DDB has portable, W9FGJ. W9EGE is remodeling shack. W9AXH is now using mercury arc. W9DEJ expects to give 1750 kc. a try. W9YB hopes for big traffic totals this winter. W9QG is doing most of his operating from W9YB. W9FUT is still hoping for crystal control. W9TE is the new A.A.R.S. NC. W9ABW has joined up with A.A.R.S. W9GLF reports for the first time. W9FHB is having trouble with crystal. W9FVB is making new receiver. W9EZR is a new station in Richmond. W9ALP's '04A is still covered with cobwebs. W9EJT is a new ham at Bloomington. W9BHM is putting in a modern 'phone rig. W9HTP is being bothered with BC harmonics. W9BOS and W9HUO have applied for ORS. W9AKJ is putting in temperature control. W9AEB wants to change over to crystal. W9YV will soon have a 50-watt crystal job. W9HHI is spending a good share of his time helping a new ham get started. W9GJG is still trying to neutralize the CC rig. Ex9CCL is all set to make a come back. W9DHM is making things buzz on 14 mc. W9EXL says new location n.g. for DX. W9CKY is changing to TPTG using an '04A. W9HOL is closed for the winter. W9GOF, W9GNR, W9CWE and W9CUB will soon be calling CQ. W9GOE has a new 'phone nearly ready to perk. W9HPQ has a new Hertz antenna. W9AGG is a new station in Bloomington. W9BWI has QSY to 1750 kc. and is transmitting television pictures. W9BKJ finally got under way to rebuild. W9AET blew his filter condensers. Ft. Wayne Radio Club membership has increased 50% due to newspaper publicity. The Indianapolis Club isn't over the effects of the recent hamfest.

Traffic: W9TE 102, W9BKJ 71, W9FUT 67, W9QG 59, W9YB 54, W9DEJ 39, W9ABW 30, W9GJS 35, W9FKE 15, W9EOC 15, W9GLF 12, W9EGE 10, W9AXH 10, W9ALP 7, W9FHB 5, W9FYR 4, W9GYB 3, W9HUI 6, W9YV 3.

**MICHIGAN** — SCM, Ralph J. Stephenson, W8DMS — W8FP again leads the field. W8EGI, our newest ORS, makes the BPL on deliveries. W8DFE's signals can be heard anytime as can W9HK's. W8PQ also sticks his head up near the top of the list. W8DYH will soon have 2nd op. as the OW??? W8DZ is still interested in traffic. W8DU, ex-Ohio RM, is now in Detroit and is new ORS. Welcome. W8FX and W8DYH have the three D.A.R.A. traffic nets nearly organized. Upper Michigan is also looking up, with 12 reporting stations. Fifty-four Michigan stations reported

this month. WSAKN is QRMed by power leak. W8DED offers a prize of 50 message delivery cards or two 7 x 11 station cards to high scoring station. W8CUX will announce traffic handling prize next month. The Detroit traffic gang will QSP anything, anywhere, anytime. Our old friend WYE, Selbridge Field, is back again with call W8KY. W9GJX visited Detroit and brought the RM report in person. W8BMG is doing fine work in coaching and encouraging new traffic men. A lot of ORS certificates expire this month and only three have been sent in for renewal. W8AYO is after ORS. W9HK promises to build the SCM a new receiver. MIM. W8DCT wants to get Mich. A.A. state net down on 1750 kc. W9CWR reports for himself and W9ADV. W9VL sends W9BBP's report along with his own. W8AM has been incapacitated. Annual election of D.A.R.A. resulted in W8GP being elected President and W8CAT re-elected Sec'y-Treasurer. Several new Mich. stations now active: W8CPH, W8CKW, W8FLJ, W8BSG, W9HLW, W8BDP, W8FNJ, W8DOS, W8EMD and W8EGX. W8DZ has new 3.5 mc. Zopp. W8WR rebuilt successfully. W8DFE remarks on great number of AC notes still to be heard. W9EGF is handicapped by poor receiving conditions. W8AYO divides time between CW and 'phone. W9EXT promises to report monthly. W8WB has his home-ground crystal perking. W8AIZ has PP outfit putting out. W8EBB is awaiting license renewal. W8CPH reports through W8BMG. W8DFS is working up some nice schedules. W8JX is settled in new QRA. W8BTK is on with crystal. W8PY took his '52 apart and couldn't get it together again. W8DYK tried 3.5 mc. after four years on 14 mc. W9CE, W9CSI and W9GKI all report. Thanks, OMs. W8CAT went back to CW. W8JZ is using crystal with four stages r.f. ending with a pair of '04-As in P.P. W8DGS and W8DMS frequency transmissions went through without a hitch. We need more reporting stations. If you QSO a Mich. amateur and know he doesn't report, ask him to give it to you and shoot it along. Drop any of the RMs a card for good schedules. Mich. RMs are W8DYH, W8FX, W8FP, W8BMG and W9GJX.

Traffic: W8PP 1584, W8DFE 710, W8PQ 477, W9HK 465, W8DYH 464, W8BMG 362, W8EGI 322, W8AM 273, W8CLL 210, W8EHZ 161, W8BTK 154, W8FX 148, W8DED 114, W9YX 101, W8DFS 66, W9CWR 68, W8BMZ 64, W8CFZ 58, W8DZ 55, W9GJX 47, W8DMS 44, W9VL 44, W8AW 43, W8AKN 42, W8HN 38, W8DOV 38, W8DEH 35, W8DCT 32, W8WR 32, W8JX 26, W8EVC 24, W9EXT 22, W9EGF 21, W8AIZ 20, W8CST 19, W8CAT 18, W8CWE 16, W8KY 11, W8CPH 11, W8RP 10, W8CKZ 8, W8BDP 8, W8PY 6, W8WBW 6, W8AYO 6, W8DU 5, W8DVQ 4, W9BBP 4, W8EFH 4, W8DYK 4, W9ADV 3, W9CSI 46, W9GKI 6, W9CE 27.

OHIO — SCM, Harry A. Tummonds, W8BAH — Time marches on, and so does the Ohio gang, after taking time out to report a 14,489 total this month and maintaining the keynote of the Section, which is cooperation, regular schedules, regular reports, rapid deliveries, service and good traffic. In the BPL we find W8BYD, W8AXV, W8DDS, W8EEW, W8CUW, W8BON, W8DFR, W8BBE, W8CGS and W8BAH. A word to those reading this report who are not now ORS or handling traffic and reporting. We want you to report; we don't care what your total is, large or small, it will be welcome. District No. 1: Ohio welcomed W8BYD last month; and he comes right back at us and leads the Section. W8BOT reports his father, in the hospital, is keeping in touch with his home by radio. W8EGO now holds Official Broadcast appointment. W8FGJ coupled another stage of audio to his receiver. W8DYG is busy as Secretary of Garfield Heights Short Wave Association. W8CCK says nothing new. W8BAC had his ORS ticket renewed. W8EEW is only ORS in Lakewood. W8EBY says nice DX on 7 mc. Fell down cellar stairs with rig, says W8AGF. W8EBT says hello gang, from Str. Wickwire Jr. 250-watter on 7 mc., reports W8CIY. W8EIL doesn't say a word. W8HT says best DX was F8BS. Out-of-town work kept me out of BPL, reports W8BMX. Looks like Ohio will hit 20,000 for Dec.-Jan. report, says W8DDS, General Ohio RM. W8CIO took an active part in frequency measuring contest. Still on KKUI and no word about laying up yet, reports W8RN. W8DVL says "Between a case of 'Blonditis' and rebuilding the total is one that I am thoroughly

ashamed of." W8AXV reports another expedition worked. After increasing total 1300%, W8EXA is slipping. W8EQU has schedule with W8BMX. W8FFM is a new reporter from Lakewood. W8FEJ reports Cleveland Heights High School Amateur Radio Club going FB. W8OUV operates on 7150. "Intend to report from now on," says W8BON, a new reporter. W8UC reports 5 VK's for DX. W8EFP says, fooling around with low power rig on 3.5 mc. Another new reporter, W8AKY, with some good DX for a 4500 mile QSO. District No. 2: W8BKM, RM, will have a crystal on 3750 by next report. At last, traffic report from W8BCI. W8CEI reports traffic. District No. 3: W8BIT leads the district and reports W8FCD and W8ELE as new hams in Grand Rapids, Ohio. W8CBB schedules W8BTT every Sunday. W8APC, RM, is rebuilding again. W8JR wants more dope on American Legion Net. Who can help him? District No. 4: We are sure glad to hear that RM W8MH is back again. New reporter from Lima, W8FBC, sends in a nice letter. W8OQ had his ORS certificate renewed. We appreciate the regular reports from W8ET. "Will be back and on the air for next report," says W8QQ. W8QC says 73. W8EEQ worked all districts with his type '45 tube. District No. 5: W8DFR, RM, heads his district, and reports plenty of activity. Traffic report from 147 E. South St., Akron. What's the call, OM? "Absence makes the heart grow fonder," says W8LL and will be off the air for awhile. Fine report from former RM W8NP. W8BSR reports crystal finally went west. W8DVE says pretty busy. W8EFN is busy on American Legion net. "73 hams in Akron District now," says W8BZL, President of the Buckeye Short Wave Association. District No. 6: W8CNM, RM, leads district. We hear W8ARW on 'phone in Cleveland. W8ARP is a new reporter from Delaware. Another new reporter from Columbus, W8FJN. And here is another new one, W8ALZ of West Milton. We thought W8CNM led the district, but he has to beat W8BBH first. W8GZ says, "AARS," which means "busy." W8CXF of Utica, Ohio, has applied for ORS in this district. District No. 7: We're still asking for ORS in this district. W8CKX leads the district by one point. "Been sick, transmitter blew up," says W8VP. District No. 8: W8CGS wants dope on dimensions of new Akron Zep. W8FA reports. W8ENH reports W8FET as new ham in Dayton. A new reporter from Hamilton, W8FMJ, applies for ORS. W8EDY is a new 'phone reporter. W8CUL, 'phone RM, has some fine 'phone schedules. Good news, gang, a report from Cincinnati from W8ALQ, an old-timer. District No. 9: W8HH reports. W8BAH is getting set for those Merry Xmas messages. There is a new radio club at West Technical High School, Cleveland. Cleveland Amateur Traffic Association reports affiliation papers received from the A.R.R.L. The new Buckeye net in Ohio is working daily with W8AXV, W8FP, W8BBE, W8CGS as regular members and W8DYH, W8DDS, W8CNM, W8BAH feeding the net, which covers all points east and west daily. Another new Ohio net being organized by the SCM is the Canal Zone net which will follow the Ohio Canal route. 43 out of 51 Ohio ORS reported, and 29 non-ORS reported for total of 72 reports and average of 200.1 messages per station reporting. Let's see one hundred reports next time, gang. You got the 10,000 for me, now I want some more reporters. All the breaks and the best of luck for the holiday season.

Traffic: W8BYD 2214, W8AXV 2071, W8BON 1275, W8BAH 1209, W8DDS 1204, W8CGS 630, W8EEW 607, W8BBH 604, W8CNM 430, W8CUL 410, W8DFR 386, W8TH 347, W8CKX 340, W8CUW 316, W8CIO 267, W8BMX 258, W8VP 239, W8DVL 229, W8EFN 157, W8BKM 131, W8FGJ 101, W8DYG 92, W8DVL 89, W8EDY 84, W8BOT 73, W8FJN 61, W8BTT 57, W8EGO 51, W8CCK 47, W8FFM 45, W8AKY 44, W8EQU 41, W8EEQ 30, W8GZ 29, W8FBC 25, W8BZL 23, W8CSB 21, W8NP 21, W8MH 20, W8APC 18, W8EXA 17, W8BAC 16, W8AGF 16, W8UC 15, W8EY 14, W8ALQ 13, W8ARW 11, W8CXF 11, W8ARP 7, W8BSR 7, W8CEI 7, W8HH 6, W8CIY 6, W8EIL 6, W8DCJ 6, W8FA 5, W8ENH 4. No call, see report 4, W8HT 4, W8FEJ 3, W8ALZ 3, W8JR 3, W8OQ 3, W8EFP 2, W8BCI 2, W8QC 2.

WISCONSIN — SCM, C. N. Crapo, W9VD — W9GFL is going strong again. W9AFF at Sparta has schedules with



W9EPJ, W9ARE, W9BPQ, W9HED and W9HHW. W9DKH worked Philadelphia and Delphos, Kansas, on 1750 kc. W9FSS schedules W9EPJ and W9DTK. W9HFH expects to have a new 'QSA on the air soon. W9DCT worked 21 VKs and a lot of ZLs this month. W9EBO reports that the Burlington Amateur Radio Club now has a membership of 33. W9EGP reported via radio. W9AN sent application for ORS. W9EHD has a 4000v. transformer finished to go into his 1000-watt transmitter. W9FGX keeps the Army traffic moving. W9DTK says the Navy is trying hard to keep up with the Army. W9GYL is working 'phone. W9DLQ is rebuilding his crystal job. W9ABM works W9FGX and W9EGP Mondays at 6:30 p.m. Ex-W9AWZ at Barron will be with us again soon. W9IIMS will be on 1750 kc. this winter. W9FAW is building new MOPA. W9CFP will have crystal on 3565 soon. W9BZX is new call of U. A. Weiler, Burlington. W9ZY is putting in new crystal transmitter shortly. W9ANJ reported via RM W9AZN. W9GPQ works W9BN, W9ARE, W9AN and W9EPJ daily. W9EGZ at Muscoda keeps daily schedule with W9EPI. W9DIT at Eau Claire also schedules W9EPI. W9EOX reports for W9DBA, who will be on the air soon. W9FAV states that the BARC is holding regular meetings. W9GCQ is working out FB with his new MOPA. W9BLB is on 3615 and 3650 crystal, Monday nights. W9VD has his frequency meter finally calibrated. W9HENY is new ham at Green Bay.

Traffic: W9GFL 384, W9FAA (W9AFF?) 206, W9ZY 64, W9ANJ 17, W9GPQ 48, W9EGZ 6, W9DIT 57, W9EOX 9, W9EBO 40, W9DKH 130, W9HFH 8, W9FSS 10, W9EGP 9, W9AN 24, W9EHD 18, W9FGX 41, W9DTK 29, W9GYL 28, W9DLQ 24, W9ABM 6, W9HMS 1, W9FAW 1, W9CFP 6, W9VD 22.

#### DAKOTA DIVISION

**N**ORTHERN MINNESOTA -- SCM, Ray Weihe, W9CTW -- Another non-ORS leads the Section and wins the Handbook for this month. This also means that a lot of ORS are in line for cancellation. Please read your certificates over carefully. W9ARE takes the high honors this month, and works 'phone on 3.5 mc. for his totals with 5 schedules. W9BRA is the Naval Reserve station. He reports WIBIG now in this Section with the call W9EFFF at Moorhead. W9HLE is now on 14 mgs., and likes it FB. Jensen is back on the air at Dilworth, and reports lots of activity. W9BVH is busy grinding crystals and rebuilding. W9BVI is doing nice low-power work. W9CTW blew his plate transformer. W9BBL reports new ham in St. Paul. W9BAR, W9GKO sends in a fine report for Duluth. W9FNQ has little time for radio. W9BYM says nil. W9CGQ is back on the air again. W9HDN sends in an ORS application. W9HHH is trying to get good antenna. W9GKM is busy at college. W9EGU is back on the air, with a new layout. Please look over your ORS tickets and see if it has expired. If it has and you think you deserve a renewal, send it to your SCM for endorsement. W9EQZ reported by radio direct to HQs.

Traffic: W9ARE 225, W9BRA 87, W9HLE 23, Jensen 22, W9BVH 12, W9BVI 7, W9CTW 7, W9GKO 9, W9FNQ 3, W9BYM 8, W9HDN 2, W9CGQ 1, W9HHH 1, W9EQZ 24.

**NORTH DAKOTA** -- SCM, Guy L. Ottinger, W9BYF -- The hams of Fargo have organized the F.A.R.C. W9IK and W9DYA have crystal-controlled 'phones on 1770 and 1980 kc. respectively. W9EGI is Unit Commander, U.S.N.R., now. W9BAY is a newly appointed ORS. There are three more prospective ORS in the state now. W9HJC, W9DFI, and W9FMC. W9CRL is the AARS DNCS. W9EGI wins the 100 QSL cards given by the RM. W9DGS keeps 7 schedules. W9BYF is completing his 3500-kc. 'phone. Let's have 100% reporting in the state, gang.

Traffic: W9DGS 238, W9EGI 91, W9HJC 46, W9BYF 26, W9IK 14, W9DFI 9, W9DYA 2.

**SOUTHERN MINNESOTA** -- Acting SCM, Vic Schleuder, W9BXX -- W9FCS is a new station at St. Charles. W9BEZ called on W9FMB to arrange tests. W9BKK and W9HCW visited W9EJR and W9BXX. W9EPD has joined the AA net. W9HOP is finishing his new 7-mc. crystal rig. W9HEX is trying 'phone. W9EKU is grinding crystals. W9FAE is trying a high-power holiday. W9DHP is off the air on account of school. W9BBV is busy at U. of M.

W9DRG will be on with a new 150-watt crystal job. W9BN is adding new schedule. W9GHP will be on soon with PP-TFTG. W9HXR is handling much traffic. W9FNK has new MOPA. W9GUX has not found 7-meg. band to his liking this fall. W9FJK has moved to 2825 29th Ave. S., Mpls. W9EPJ has new 'QSA in his rig. W9EAT has installed a condenser mike. W9COS unable to reopen P.I. contact so far this fall. W9BNN is an AA station now. Minneapolis is again organizing an Amateur Radio Club. All those interested should communicate with W9HFF. W9BEX, the State Net Control Army-Amateur, wants more of the good traffic stations to get into AA work.

Traffic: W9EPJ 537, W9BN 381, W9BNN 163, W9BXX 71, W9HXR 50, W9DRG 32, W9HFF 21, W9FJK 15, W9LS 13, W9CKU 11, W9EAT 11, W9BKK 8, W9FNK 8, W9COS 7, W9FFY 6, W9DGH 3, W9DGE 2, W9EPD 1, W9FCS 1.

**SOUTH DAKOTA** -- Acting SCM, Stanway Gough, W9DNS -- The busiest ham in the state is our new RM, W9DKL. He kept seven schedules to make the BPL with the highest message total reported from this Section for a long time. W9FLI has installed crystal and helped W9HSP get his 'phone on the air. W9CFU and W9HAF both work for U. S. Weather Bureau. W9LHW and W9BLZ are new ORS. W9RLZ is a new call held by Ex-9DES-W9BES-W9DQS, who will be remembered as the first U. S. ham to contact Australia on 28 mc. W9AQB doesn't like 3.5 mc. W9DKJ is on 'phone and CW. W9DIY and W9NM have had their licenses reinstated. W9DB visited W9BJV and W9FNM. W9TI works Penna. on 1750-kc. 'phone.

Traffic: W9DKL 565, W9FLI 149, W9EHT 128, W9HHW 79, W9DNS 45, W9BLZ 36, W9ALO 4, W9HSH 3, W9CFU 2, W9HJT 2, W9DTZ 1, W9DB 14, W9AQB 2.

#### DELTA DIVISION

**ARKANSAS** -- SCM, Henry E. Velte, W5ABI -- As usual W5BMI is our star traffic handler. W5IQ is kept busy with Army-Amateur activities. W5BDD is going to higher power. W5BPE is using a '52 tube. W5BED (W5BED) is using a type '10 tube. W5BKB is awaiting his license due to change of address. W5HN says he has his shack all cleaned up now. W5BRI had the misfortune of burning out his Mg. W5AGB is using a type '45 tube. W5ADT passed his second-class commercial exams OK. W5AKB is using a type '10 tube in TPTG. W5BJR hands in a traffic total. W5BDR is building a new receiver. W5BDB has sold his receiver. W5CCN is a new station at Texarkana. The SCM has again changed address. Please mail all reports to 4017 West 10th St., Little Rock, Ark. Some of the ORS are forgetting that their certificates must be renewed each year. Please send them in when the date shows that they have been issued for a year. Come on, gang, let's have a report from every station in the state.

Traffic: W5BMI 214, W5IQ 109, W5AKB 28, W5BJR 18, W5BED 17.

**MISSISSIPPI** -- SCM, William G. Bodker, W5AZV -- Our Banner traffic station this month is W5ANX, who has just been appointed ORS. W5AWP has installed a temperature-control box for his 3.5-mc. crystal 'phone. W5AZV, W5BNW and W5VJ now have 3.5-mc. 'phones. Two other new 'phone stations are W5AAY of Meridian and W5XY of Westpoint. W5ANI reports DX conditions very erratic during October. W5HA says that W5AUB, also of Tupelo, has a 500-watt crystal rig in the process of construction. The RM from New Orleans paid a visit to Jackson a few weeks ago holding examinations at the residence of W5VJ. Traffic: W5ANX 153, W5AZV 38, W5AWP 24.

**TENNESSEE** -- SCM, James B. Witt, W4SP -- W4OI sends in the best report this month and is our new ORS for West Tennessee. The SCM would like to have some reports from the gang, especially from Nashville, Chattanooga, Cleveland and Bristol. There are a number of good 'phone stations handling traffic which fail to report to SCM. Send in those reports and let's take up a little more space in QST.

Traffic: W4OI 109, W4AAD 71, W4AFM 71, W4CQW 11, W4RO 10, W4SP 3.

**LOUISIANA** -- SCM, Frank Watts, Jr., W5WF -- With

the return of cold weather always comes awakened enthusiasm. Many thanks, gang, for the nice reports. Minden: W5CBT and W5CDQ are on the air at Minden. W5BLR reports working LU. Shreveport: W5VT was the station at the Louisiana State Fair Grounds. An unofficial hamfest was held here, those in attendance being W5AFJ, W5BKL, W5BBF, W5BLN, W5BYQ, W5BJA, W5BYV, W5WF, W5ASJ, W5JK and the second op at W5WF. W5BYV has the 'phone fever. W5BYQ is again on the air. W5BJA (Big Bad Bill) makes a weak splutter now and then. W5RR now sports a new Comm. 2nd. W5NF's second op is the proud owner of an Amateur Extra First Ticket. W5WI had a blow-out. W5AUQ will be on shortly. W5ARW has been taking his vacation. W5WF is rebuilding. W5AEN is the new call of Doc Scott. New Orleans: W5BPN says the traffic biz. is dull there. W5ACA and W5ACV, new stations, are planning on lots of traffic during Mardi Gras. W5BPL keeps a schedule with Miss. on 'phone. W5HR, W5GJ and W5BPL are doing nice traffic work on 'phone. Plaquemine: W5ACY reports W5AAT, an old ham with a new call, is on the air there. W5KC has almost turned DX hound. Natchitoches: W5ED works three bands and has a separate outfit for each band. FB. We hear W5AII growling away on 3.5-mc. 'phone now and then. Alexandria: W5BFP is on 7 mc. with a new CC rig. W5ANG is going to do things in a big way with '52s. W5AXD says now that it's getting cooler the YLs are not so much attraction. W5AXU reports traffic handled on 'phone. W5LS at Kennonwood sure does give the boys fits with his 14-mc. 'phone. W5AKI at Oil City is going strong on 1750-ke. 'phone. W5VC at Trees is also working 'phone on 1750 kc. Guess the Monroe gang have died; never hear from them much any more. W5AKT is a new station at Epss. Don't forget the renewals on your ORS appointments, gang.

Traffic: W5WF 169, W5EB 30, W5AXU 18, W5BPN 6, W5KC 12, W5ACY 16, W5AKT 10, W5AOZ 2, W5BPL 33, W5HR 35, W5BYQ 8, W5BJA 54, W5BYV 10, W5VT 78.

#### HUDSON DIVISION

**E**ASTERN NEW YORK — SCM, R. E. Haight, W2LU — RM-W2BJA leads the Section due to FB schedules. W2BZZ reports nice total. W2CTC is a new ORS. W2DEL enjoys working break-in. W2BLU worked 5th dist. with 2 '01As on 3.5 mc. W2CQH steps into the traffic game with thanks to W2UL. W2UL has been appointed OBS. W2ANV copied Armistice and Navy Day messages. W2ACD reports hot battle with weather conditions. W2BNA's new portable call is W2ZZAQ. W2BER was QSO Wales on 14 mc. W2ACY tries new one on TNT '10s push-pull. W2CGO handles FB DX traffic on 14 mc. W2BKM, popular WGY announcer, is pounding brass on 3.5 mc. W2BXP is new station on 3.5 mc. W2BDB is Alt. Net Contr. Sta. of Lower Hudson Dist. of AA. W2BSH is proud Daddy of new YL. W2CTA QSOs VP2PA on schedule. W2CL reports schedules with VK5HG and ZL3CC. W2BTW tries his stuff on 7 mc. W2BJX has his ups and downs with BCLs. W2OP plans to get E. N. Y. Sect. AA net on 1750-ke. band. W2CJP steps out on 7 mc. W2CBX is QRL at college. W2AJD schedules VK5HG. W2QU is active with VCR flying. W2ACB is still kept away from his transmitter. Come on, boys, let's keep up the traffic totals and lead the Division. W2RD is back on the air at new QRA. W2BYR is new ORS on 7 mc. W2AVS reports two active stations in Pleasantville, one of which is W2BJJ.

Traffic: W2BJA 220, W2LU 163, W2BZZ 137, W2CTC 84, W2DEL 68, W2BLU 65, W2CQH 43, W2UL44, W2ANV 29, W2ACD 22, W2BNA 20, W2BER 18, W2ACY 14, W2CGO 9, W2BKM 8, W2BDB 8, W2CTA 7, W2CL 6, W2BTW 4, W2BSH 7, W2BJX 4, W2OP 3, W2BXP 8, W2RD 73, W2AVS 17.

**NEW YORK CITY AND LONG ISLAND** — Acting SCM, W. J. Warringer, W2BPQ — Following station ORS appointment certificates expired. If you fellows want to continue in this capacity, send them in for re-indorsement: W2AVP, W2AVK, W2AET, W2BNL, W2BDJ, W2APV, W2AZV, W2BIV, W2AFO, W2BEV, W2CCD, W2CYX, W2BXW, W2APK, W2CHEY, W2LB, W2AIQ. This leaves us with only 13 ORS. The Bronx Radio Club has been reorganized with W2AMJ, President, W2BBC, Secretary, and W2FZ, Treasurer. Meetings every Friday at 740 Pros-

pect Ave., Bronx. The Manhattan Radio Club W2BDJ, President, W2AOU, Secretary-Treasurer, W2ADI and W2AOJ Tech. Committees have been assigned call W2CFC for use at club room in Armory at 168th St. and Broadway. Also every Friday, Long Island: Only half the stations reporting are handling traffic. Wassa matter, gang? W2AUS leads the pack due to AA schedules and one with W5VQ. W2KG is runner-up. They have transmitter on 1991 kc. W2BDN handled 123. W2AIQ has 19 schedules weekly. W2BVB is now a second-class comm. op. W2BST reports that his sister is now W2ML. Greetings, sister. W2BTE averages 30 msg. per month. W2OB is all set for winter. W2AGL sends his report via W2AUS. W2NO-AVP is still playing reporter along with W2AUS. Here's what they have to say: W2TO sold all his stuff. W2WT QSOs the world. W2RK is knocking them dead on 7 mc. W2AF is using low-power rig. W2AKL and W2BNW are operating in N. Y. W2AST is building bigger 'phone. W2CJA got 14-mc. crystal. W2AXV is oping in Brooklyn. W2CBA is using low power, 220 volts. W2CEI is new ham made by W2NO. W2DIV is op. at WNYC. W2LR is Unit Commander for Suffolk County U.S.N.R. W2HO wants ORS meeting held. W2DIS is a new ham — in Corona. W2US is all set for busy season as OO. W2BFG is now an ORS. W2ATO is knocking off the DX. W2CTO blew his '52. W2DHC got kicked off the air by his landlord. W2DEB worked his first ZL and VK. W2CTR has a nice sister, Hi. Manhattan: W2SC was one of the few stations to send in their ORS certificate for re-indorsement. W2BDJ is busy with Night School and Manhattan Radio Club. W2CWP got new job. W2AOU is still blowing things up. Brooklyn: W2CHT, a newcomer, leads with 63 messages. W2PF is not on often due to college work. W2DBQ is a new ORS and member of CWC. W2CCD has a crystal with '04A in last stage. W2AZV says DX on 3500 kc. is FB. W2BRB is on 14 mc. most of the time. W2BEV is putting in a 50-watter. W2BO is another of the few to send in ORS certificates. W2AEN applies for ORS. Bronx: W2BGO just missed working all districts on 3500 kc. in one evening. No fours heard. W2CYX is still working for U.S.N.R. W2EF has a new 50-watt crystal 14-mc. set with plug in crystal. W2AQQ reports after his ORS cancelled. W2CBB recommends W2ALY for ORS. W2BBC is an OO again. W2AXG is now attending Texas Univ. and operating W5AI. Bronx Radio Club members are hard at work to get W2FZ on the air. XW2ANE, now W2CAP, is merrily pounding away on 3500 kc. W2APV is still going. W2APX shows up after a silence of over a year. W2LW and W2VG resigned their ORS. W2BQG, an old-timer, is back on the air. W2CFZ is active. W2CQK is a new man. W2AES is back at old location. Staten Island: W2WP had great time at Bloomfield Club's banquet. W2DHK is looking for ORS. W2ADE has new MOPA. W2BVU has gone to sea. W2ACZ is on 'phone.

Traffic: Long Island — W2AUS 194, W2KG 185, W2BDN 123, W2AIQ 103, W2BVB 71, W2BST 37, W2BTE 29, W2OB 29, W2AGL 16, W2AVP-NO 10, W2BFG 35. Manhattan — W2SC 396. Staten Island — W2WP 82, W2DHK 15. Brooklyn — W2CHT 63, W2PF 44, W2DBQ 27, W2CCD 17, W2AZV 14, W2BRB 6, W2BEV 4. Bronx — W2BGO 46, W2CYX 35, W2RF 24, W2AQQ 17, W2CBB 15.

**NORTHERN NEW JERSEY** — SCM, A. G. Wester, Jr., W2WR — Our Section suffers a big loss with the resignation of W2MQ, who is leaving for the West. W2WR has joined the unemployed army. W2CWK and a gang from New Brunswick attended the Bloomfield Radio Club hamfest. Bloomfield had over 200 at their annual hamfest. W2AIF expects to open up on 56 mc. W2CJX is putting more time in on the lower frequencies. W2BPJ has taken up gliding. W2AMR is back on after a long silence. W2AGX maintains a fine schedule with Europe on 23 mc. W2CDQ is still QRL college. W2LV took time out to do some observing. W2CNL has been appointed ORS. W2AXU is another busy at college. W2ALD works hard in the U.S.N.R. and at WOR. W2DHU is a newcomer. W2AGO is putting out real DC signals. W2AKW worked Morocco. W2ASH has deserted the 'phone ranks. W2AGO cured some BCLs with choke coils in their antennas. W2COMY is back from the hospital. W2AUP always handles a fine amount of traffic.

W2COG is chief opr. at W2BJS. W2BMP at Fort Monmouth has two sets in operation, and will be a fine traffic station. W2DFM sent in a very detailed traffic report. The Raritan Valley Radio Club meets regularly on the second Tuesday of each month in the Engineering Building at Rutgers University. Code classes are held every Thursday same location at 8:00 p.m. under guidance of W2CAH, ex2BME, for both beginners and those interested in attaining higher speeds.

Traffic: W2CWX 19, W2AIF 26, W2CJX 20, W2MQ 154, W2BPY 112, W2AOS 20, W2AMR 46, W2AGX 5, W2CNL 9, W2AXU 1, W2ALD 34, W2AUP 78, W2COG 38, W2BMP 27, W2DFM 16.

#### MIDWEST DIVISION

**IOWA** — SCM, Geo. D. Hansen, W9FFD; R. P. Griffith, RM — Going up! Well I guess, things are beginning to pop! The RM again leads the field with a nice fat total and the boys have, generally, followed suit. FB, gang, keep coming. W9FFD is second with a fair total. W9BPG, new ORS No. 13, reports he is on 3.5 and 1.7 mc. W9ACL is busy on Monday nights with the A.A.R.S. W9EIV was recently appointed 4th Ia. DNC in the A.A.R.S. W9FYC with this report is appointed ORS No. 19. W9IO, the University Club station, sends in good total. W9YA is on 'phone. W9EFU sends in request for application for ORS. W9FZO is on 14 and 7 mc. W9DZW — GP reports business picking up. If you don't think he is busy, pay him a visit and try to follow him around the shop; W9FFD and W9DFZ tried it recently and failed. Hi. And say, fellows, didn't some of you forget to send a message of congrats to Mr. Kerr on his recent election as our Midwest Director? W9DFZ reports traffic better. W9DNZ comes out from the unknown to report. W9FLK gets on occasionally. W9ANO reports via radio. W9GWT handled important police message. W9IYU is a first reporter from D.M. W9BCA is back again. W9BJP reports schedules in all directions. W9CFB reports not much traffic on 14 mc. W9BWF has daily schedules now. W9AWY, new ORS No. 17, has been on the sick list. W9CWG says OK now and Lt. Roberts has nothing on him, for his household has recently been blessed with the arrival of a new junior operator. GREAT, OM! W9DIB notes conditions are faltering on 7 mc. W9CPT is a first reporter. W9AHX is busy getting a new MOPA on the air. W9AYC is looking forward to increased activities. All in all, fellows, things are looking much better. The message per station average has increased, but we can do better. Let's GO!

Traffic: W9EJQ 321, W9FFD 145, W9BPG 89, W9ACL 77, W9EIV 71, W9FYC 53, W9IO 51, W9EFU 49, W9FZO 48, W9DZW 39, W9DFZ 29, W9DNZ 25, W9ELK 24, W9ANO 19, W9GWT 18, W9EIV 18, W9BCA 17, W9BJP 17, W9CFB 15, W9BWF 15, W9AWY 14, W9CWG 13, W9DIB 6, W9CPT 6, W9AHX 4, W9AYC 1.

**NEBRASKA** — SCM, S. C. Wallace, W9FAM — W9BNT tops the list this month. W9DMY is holding second place. He had a booth at the Hebron High School carnival. W9DI — look where the new RM is, fellers. Better watch him. Send him your dope on schedules. W9FAM finally busted loose. W9DGL says traffic picking up. W9EYE is doing some FB work. W9FUW is working all bands. W9DFR says Standard-Frequency tests went off FB. W9EHW is rearing for some traffic. W9EEW is all rebuilt and ready for the season. W9BQR is still at it. W9BHN says QRL. W9DTH moved and been too busy to be on air. W9EWO doing fine. How about an ORS certificate, OM? W9HNP reports. W9DHA is getting in the harness. W9HTU says business picking up. W9FXQ has class hams. W9DZK is getting back in the collar. W9EDI is doing some nice work.

Traffic: W9BNT 536, W9DMY 318, W9DI 294, W9FAM 207, W9DGL 128, W9EYE 83, W9FUW 26, W9DFR 23, W9EHW 18, W9EEW 15, W9BQR 2, W9EWO 127, W9HNP 1, W9DHA 34, W9HTU 7, W9DZK 5, W9EDI 66.

**KANSAS** — SCM, J. H. Amis, W9CET — The two RMs, W9FLG and W9CFN, lead the section in traffic. W9FLG wants schedules with all ORS for Sunday on 3500 kc. W9ESL fails to give the SCM any news. W9CXW has a new 4-tube AC SG receiver. W9BGL reports 20 in the Radio Club at K.U. W9AWP reports for W9HWW, the station of

HQ. Co. 137th Inf. W9CET plans to get on 7000 again soon. W9JA is busy with college. W9FRU has been working some DX. W9APF has been visiting hams in western Kansas. W9FMX is busy getting the new Sunflower Radio Club going. W9FRC is thinking of converting his TNT to MOPA. W9BJJ is on in Topeka. W9DNG is in Berlin, Germany, on 14,000 signing D4ADC, and would like to work his old friends. All ORS appointments are automatically cancelled unless you send them in for the SCM's endorsement.

Traffic: W9FLG 435, W9CFN 213, W9ESL 59, W9CXW 54, W9BGL 2, W9HWW 7, W9AWP 9, W9FRU 5, W9APF 4, W9FMX 28, W9DKI 32, W9FRC 116, W9NI 32, W9DVQ 35.

**MISSOURI** — SCM, L. B. Lazure, W9RR — St. Louis: W9GDU has a new rig. W9GHH is active. W9DOE had frequency check by RL as 7124.05 kc. and is a new OBS. W9GHW is sporting a new plane. W9EKY is running a high-power rig. W9DOE says 7 mc. pretty dead at his place. W9HVI is handling traffic regularly. W9EIV sent in a blanket report as follows: W9HWE is a traffic station with new MOPA rig; W9BSH is a new ham; W9HVC changed from 'phone to CW; W9GCH is hitting the west coast regularly; W9HWD was tied up by school QRM; W9HEL is trying to get going; W9HVJ resolved to quit testing power with his fingers. W9PW handled traffic from American Legion convention. W9DZN is rebuilding transmitter. W9DYJ moved and is busy setting up the junk again; W9DUD is handling traffic again. Dec. 27th is the date for St. Louis hamfest — Fairgrounds Hotel — be there!! W9FBF visited in St. Louis — also W9FSL, the other half of the YL aggregation of Jamestown. W9DUD did the honors of St. Louis for the visitors — and W9DGI and W9CRY lent a hand. W9BEU says business has gone to pot. W9ZK is still QRT after theft of his equipment. W9FBR has skip trouble in A-A schedules. State News: W9FJV still blames the SCM for being stuck 10 days in KC last spring when snow blocked road home — we didn't do nothing! W9DGD schedules W9AWE daily for traffic. W9AWE — BIU is handling more traffic these days on 1750-kc. 'phone — he's a Spanish War Vet. W9CDU sent in general dope; W9CDU registers a kick at hams' failure to occupy bands fully. W9HLP is on 3.5 mc. getting started. W9EFR is away in school; W9CZI moved and just got back on again; W9EOG and W9FCB are away in school; W9BWB will be trying 56 mc. soon. W9DOB is a new ham. W9GKJ is home from hospital. W9BRN rebuilt the works. W9AEI and W9GOY work 3.5-mc. 'phones. W9CDF registers rage at QRM. W9EPX is trying low power crystal CW. The SCM has a request from five would-be hams in the big house at Jeff City for donations of old d.c. receiving parts — and will forward anything the gang wish to give. W9GZY is on for traffic. W9GOM, W9HCH and W9ABC are A-A actives. W9DWF has a pair of '52s in PP, but is building high-power 'phone with W9CTG. W9DWF teaches class at U.S.N.R. meetings Friday nights. W9BGN built a new transmitter on the plan of W1XP. W9FHT is trying to sell out. W9PR is on for unit U.S.N.R. schedules. W9DEX is boosting for the Army 'phone net. W9CTG signed up as CRM in U.S.N.R. W9ECH is on for traffic on 3.5 and 7 mc. W9GEF is working 'phone at present. W9DWK and W9BDS have returned to life. W9FBT is a new station. W9GXT is a new reporter. W9GFV sold out. W9GAR is trying to sell out and start over again. W9CRM is still QRL with job. W9BJA, RM, is working on all-RM net. W9CJB combined 7-14 mc. traffic and DX work. W9CJD moved to Cuba, Mo. W9EYG — HCP is moving soon to Rolla, for School of Mines; will use portable W9HCP there. W9BGW says traffic slumped somewhat. W9HNM boosted his totals. W9ALJ had bad QRM from another busted bank case. W9DHN is rebuilding at school QRA-Fayette. W9GCL is in the army now — at WVC. W9FYM got a few messages between business QRM. W9BAU sent in Sedalia dope: W9GCF is at Ga. Tech; W9CNU at Fayette; W9BTD at Fulton; W9GNQ at Warrensburg — all in school; W9BAU renewed license and applied for ORS. W9EUV keeps regular schedules in A-A Owl Net, with W9CPT, W9EEW, W9EYE and W9HL. W9FSL schedules W9BNU four days a week. W9FSU is a new Marcelline ham; W9CDU got on late, but in time to handle traffic for report. W9ENF schedules W9BJA in A-A Net. W9GLQ is a new Joplin station.

W9EUB is trying to split attention between traffic and DX on 7 mc. W9ASV returned home from the hospital. W9BUE is laid up with throat infection. W9BZY is a new A-A station. W9DHF grabbed A-A messages regularly. W9HUI is on for traffic. W9DQS is using two 'phone rigs for 1760 and 3500. W9FKF is hitting the ball with the A-A net. W9CZY moved. W9DMO keeps Sunday 'phone schedule with W9BLR for A-A net. W9EMF is trying to beat skip in keeping schedules. W9CHE was QRT awaiting on license. W9FKF is open for traffic and schedules. Kansas City: W9FHF moved to KC from Independence. W9CVT found time for a few messages. W9FCF ditto; W9FPI is putting in a pair of 212D's for traffic. W9FIO snagged a few messages on 7 mc. W9ENU had visitors — W2TP and W2GE. W9BVN handled over 100 messages. W9CVP hit the frequency tests. W9EMH is out of town on traveling job. W9HOD, W9GSV and W9ELS are all U.S.N.R. stations. Ex-W9DCL is now W9DPJ. W9FLT ran up a few A-A net 'phone schedules. W9EQC got under the wire with some traffic. W9CRH rebuilt. W9HRX says QRL school. W9DQN got on again in new QRA. W9AQX is bearing down on that U.S.N.R. unit at Parkville. W9FHV kept schedules with W9GCB and W4ASM. W9BMA started a QSL card business. W9AOG schedules W9BAU and W9FCF. W9GBA and W9EPV are in Liberty at Wm. Jewell College; working W9ANG, the college station. W9AKZ is rebuilding for 14 mc. W9CVZ is a new station. W9GBB and W9DPF ditto. W9GUR is another new one; W9DFT at Boonville is reported keeping schedules with W9CRH. W9CFL was QRL with U.S.N.R. schedules. Three days of rain found W9RR with a leaky roof, and now the weather is too cold to fix the roof. Hi!

Traffic: W9GDU 2, W9DCE 34, W9HVJ 10, W9HWE 12, W9PW 23, W9DUD 10, W9BC 3, W9EUB 6, W9ENF 11, W9CDU 7, W9FSL 63, W9EYV 16, W9BAU 60, W9FYM 7, W9AJL 12, W9HNM 29, W9BGW 173, W9EYG 3, W9CJL 12, W9BJA 71, W9GXT 14, W9ECE 9, W9GZY 5, W9RIU 14, W9AW 6, W9DCD 33, W9EJV 55, W9FBR 7, W9BZY 10, W9DMO 3, W9FKF 3, W9HUI 4, W9GOM 15, W9DHF 5, W9DHX 7, W9AOG 9, W9BMA 47, W9DQN 6, W9RHV 39, W9DPJ 10, W9AQX 14, W9FHF 14, W9FCF 5, W9CVT 4, W9FPI 30, W9FIO 14, W9ENU 12, W9BVN 108, W9FLT 13, W9FNO 31, W9HOD 10, W9GVS 3, W9ELS 6, W9CRH 3, W9EQC 3, W9CFL 5, W9RR 29, W9ZZ 23, W9NP 301.

#### NEW ENGLAND DIVISION

VERMONT — SCM, Roy L. Gale, WIBD — Activity is increasing everywhere. WIAD and WIBN are Navy Net stations, AD holding the rank of Ensign. WIBJP, WIIT, WIAD, and WIBAS held a hamfest at WICGX's. WIBD listened to his own note via 'phone from WIBDX's shack. WIATF is our new and only RM. All others have been cancelled. WIAXN joins the Army-Amateur Net as an emergency station. W1BRJ uses a pair of '10s in TPTG. W1CGV is the call of Vernon and Melyin Hook of Chelsea. W1CGT, Allan Miller, is a new ham in North Ferrisburg. WIBNS is QRL school. W1DER is our first and only YL op. W1OI is using '45s in push-pull now. W1AOA has a new '03-A and '66s. W1CCF is in Essex Jct. with portable W1DGY. WIBMS is returning to Engineering College.

Traffic: WIATF 113, W1CGX 44, W1BD 44, WIAXN 29, WIBNS 16, W1CGV 9, W1BCK 5, W1BAS 3.

EASTERN MASSACHUSETTS — SCM, Joseph A. Mullen, WIASI — We have reporting this month a number of new hams among them being W1CAE, W1BSD, W1CFI, W1BOE, W1MX and W1VS. The SCM is still plowing around looking for daylight in the heap of letters that have come in with requests for information and suggestions for improving the section. Thanks, fellows. W1ABG, the new RM, has just received his station license for the new QRA. W1WU is battling a bad power leak. W1LQ is all set again for a big season. W1KH has been elected President of the EMARA. W1WV can relax now that he has worked all nine U.S. districts on all three bands. W1AGA reports general blow up of his schedules. W1BNJ is DXing. W1LM is in the same boat as W1AGA. W1CAW is CQing for a job. W1AFP takes traffic honors again this month. W1CHR is rowing W1LM's boat. W1CQN says Army schedules are all that

survived this schedule depression. W1ME is busy with DX. W1BGW is installing a pair of '66s. W1AKY continues his code lessons. See QST for schedules. W1BFR is hanging in the breeze awaiting FCC action on his change of QRA. W1MX is beginning to get uneasy for good schedules. All ORS please try to copy the OB stations at least one night a week.

Traffic: W1AFP 125, W1BSD 65, W1KH 41, W1BGW 43, W1CHR 40, W1LM 36, W1BOE 27, W1ME 25, W1CAW 23, W1WV 22, W1CFI 19, W1AGA 16, W1ASI 14, W1VS 11, W1BFR 9, W1CAE 3, W1CQN 6, W1AK 1, W1ABG 1, W1LQ 20.

NEW HAMPSHIRE — SCM, V. W. Hodge, WIATJ — W1AUY has been improving his 'phone outfit. W1IP says conditions have been poor for traffic. Ten of the gang had a swell hamfest at W1ANS recently. W1AEP says his new all-AC receiver is FB. W1BGL is interested in the Naval Reserve. W1APK has worked California on 'phone. He and W1BEJ called on the SCM. W1BFT has gone 'phone with a big tube in final stage. W1BVJ handled a bunch of traffic. W1BAB reports W1CUN and W1BNS called there. W1ANP has moved to Berlin. W1GMS is a new ham. W1HG is building a new pentode crystal transmitter. Rumors are heard of a 500-wattier up in the mountains at W1UN. W1BAC reports no traffic. The SCM has moved his BCL service shop into larger quarters. W1CLT worked a ZL on 7 mc. with 280 volts "B" batteries on plate of a type '45.

Traffic: W1IP 225, W1BVJ 54, W1APK 6, W1BAB 3, W1AEP 2, W1GLT 4.

WESTERN MASSACHUSETTS — SCM, Leo R. Pelouquin, W1VJ — A Happy New Year to everyone. The SCM wishes to thank the gang for the fine cooperation given him during the past year. W1ASY leads the Section in traffic. Can't someone beat that guy? Hi. W1CPC is in mid-season form. W1AIF now sports a portable call, W1DGW. W1BPN keeps a nightly schedule with W8YA. W1AMI is back with us. W1BWY is completing the crystal-control outfit. W1OF has been appointed ORS. W1CDS, W1AVW, W1ABW and W1AFI have passed their exams and are now full-fledged members of the U.S.N.R. under W1ASU, the Commanding Officer in this Section. W1BVR keeps seven schedules each week. W1BVP has rebuilt his outfit to four-stage crystal control. W1BVX has rebuilt his outfit from rectifier to antenna. W1BNL is now using a '65 for power amp. W1APL says traffic slow. (Page W1ASY for a schedule.) W1AUJ is having trouble keeping the A.C. out of his note. W1BSJ is building a crystal-controlled outfit. W1AJD compliments our RM for his good work.

Traffic: W1ASY 102, W1CPC 74, W1AIF 41, W1BPN 37, W1AMI 26, W1BVP 22, W1OF 21, W1CDS 20, W1BVR 19, W1BVP 21, W1BVX 16, W1BNL 14, W1APL 12, W1AJD 9, W1AUJ 6, W1BSJ 3.

CONNECTICUT — SCM, Fred A. Ellis, Jr., W1CTI — W1MK made BPL. "RP" says, "Come down to 1750 kc. and QSO W1MK on 1850 kc." W1BEO has a nice total. W1AFB made 920 points in ORS party. W1CJD is back on the air again. W1BHQ asks for an ORS. W1HD blew up his rectifier. He says W1BBU is very QRL work and YL. W1AOK reports his traffic. W1CTI is back on the air and keeping schedules in the early a.m. W1AVB is teaching code. FB. W1BHM has a Nov. 1931 QST crystal set on 3595.5 kc. W1APJ is active on 3500 kc. W1BWW is active in Army Amateur work. W1ASF has a new dynatron. The ops at W1YU have been busy rebuilding. W1BNB changed his receiver to AC. W1QV says the New London Club has a local QSO every Sunday a.m. W1BCG gets out with a bang on his flea power set, an '01A with 1.76 watts input. W1BFS says Mystic Amateur Radio Club has twelve members and reports W1CVL a new station there. W1CNU has been busy at W1CBA. W1AQF is on 7 mc. daily. W1BAX applies for ORS. W1ANN is back on the air. Welcome! W1TD is having a hard job on 8.5 mc. W1AMC is about set to open up in Stamford. W1FL is back on 3825-kc. crystal. W1GDR reaches out well on 7 mc. WIADJ will be on 3.5 mc. soon with a new outfit. The Connecticut Brass Pounders Association — W1CBA have a new National AC SW3 with power pack. Come on, gang, traffic should show an increase not a decrease. Each and every station in Connecticut, whether or not ORS, is urged to report to the SCM on the 16th of every

month. Let's get back to the first place in New England where we belong.

Traffic: W1MK 401, W1BEO 173, W1AFB 159, W1CJD 94, W1BHQ 81, W1HD 87, W1AOK 46, W1CTI 44, W1AVB 36, W1BHM 33, W1APJ 30, W1BVV 18, W1ASP 18, W1YU 16, W1BNB 11, W1QV 8, W1BCG 6, W1BFS 6, W1CNU 5, W1AQF 3, W1BAX 3, W1ES 39.

MAINE — SCM, John W. Singleton, W1CDX — W1GFG leads the list this month. W1CPT is right after old man traffic. W1ATO is very busy with his duties of Commander Section 1, U.S.N.R. W1CDX is bothered with power leaks, and how. W1BEZ is active in the Army Amateur net. W1BOF is RM District three. W1BEU says conditions have been very bad. W1BLI has applied for Army Amateur Radio Station appointment. W1BOZ is keeping some good schedules. W1CEQ has a new transmitter and receiver. W1CRP-W1BWS and W1BZS send in their first reports. Welcome, OMs. W1BWB says the Army Amateur net is FB. W1AFA reports a few. W1BWS has a nice signal now. W1AQW says that W1BOR of Lancaster, N. H., has a portable outfit, W1DHM, at Rangeley. W1IR is studying hard. W1AQL says skip distance is holding things up a bit. W1KQ is attending U. of M. W1BWO and W1CLO report. W1QH smashed up his "Chevie"; "stew bad," says he. The following companies have donated prizes for the Maine Section traffic contest: Uncle Dave Radio Shop; American Sales Co., and Harrison Radio Company "Royal." Don't forget the "All Maine QSO Party" on the 16th of every month, gang.

Traffic: W1GFG 267, W1CPT 228, W1ATO 220, W1CDX 204, W1BEZ 197, W1BOF 141, W1BEO 132, W1BLI 117, W1BOZ 87, W1CEQ 48, W1CRP 29, W1BWO 20, W1AFA 17, W1BWS 17, W1AQW 16, W1APJ 16, W1IR 12, W1BWI 5, W1AQL 4, W1KQ 3, W1BWO 3, W1QH 2, W1BZS 3, W1BTG 2, W1BZS 2, W1BWP 1, W1CLO 8.

RHODE ISLAND — SCM, N. H. Miller, W1AWE — W1BUX is working VKs easily. W1MO says DX is very poor, W1CAB is up to his neck, with U.S.N.R. work. W1OU passed away on Nov. 5th after a long illness. W1BLJ has a YL 2nd operator. W1AFM is rather inactive in ham radio. W1AQV let his license expire. W1AFO has a new 50-watt 'phone. W1BMU has YL fever. W1CMG, W1LD and W1BCR, all chew the rag on 'phone. W1BES gets out well with his 500-watt 'phone. W1TQ is on again with 'phone. W1GV manages to get on air once in a while. W1BGM has a new monitor. W1ATM handled a few important messages. W1AWE had the pleasure of meeting W6DMJ in person at his station, and will be a married man when this goes to print. W1EX and W1FU are on with the Reserve. W1CPV handled a few this month. W1BOY is building a new transmitter. W1ASZ is building a new AO receiver. W1BTP, Pawtucket High School, is now using 'phone. W1BDZ and W1DFD are new hams in Pawtucket. W1BLY still holds up the reputation of Woonsocket, W1MG and W1BQD in Newport have been quite busy with other matters.

Traffic: W1CAB 41, W1AWE 21, W1ATM 19, W1GV 17, W1CPV 11, W1BLJ 6, W1BUX 5, W1MO 4, W1ASZ 4, W1BGM 4, W1BOY 3.

#### NORTHWESTERN DIVISION

ALASKA — SCM, W. B. Wilson, W1WDN — Endeavors are under way to line up one station in Southeastern Alaska and one in Southwestern Alaska with the Navy Amateur chain at W6NK-NDH. Hope to have at least one ORS appointment for next month's period. K7FF reports daily schedule with K7BLI. Mail service very poor this winter, so reports slow in arriving.

Traffic: K7BLI 128, K7FF 40.

MONTANA — SCM, O. W. Viers, W7AAT — W7ASQ is our star traffic station this month and reports W7BIZ as a new 7-mc. station in Helena. W7AHF has a double handful of REAL schedules! If more of the gang would arrange some good schedules their traffic totals would be larger. W7HP is chief operator at the Montana College station, W7XB. W7CU has been busy at the garage. The following non-ORS stations reported and the SCM wishes to thank each and every one. W7AOD will soon have another new transmitter. W7BGM and W7AQN are new Missoula stations. W7BII will soon have a new pair of '11Ds on. W7ASB is now in

Pony. W7BBS wants ORS and OBS. W7AVL is ex-VE4FV. W7BFA sends in his usual report. W7BDJ is rebuilding his shack. W7BGC is building a new AC Pentode receiver. W7BFX is an operator in the generating station on the Electrified Milwaukee R. R. at Josephine. W7AKO is busy building new crystal-controlled set. W7AAT finds receiving conditions very poor. Remember, gang, our slogan is going to be "A report from every Montana station" from now on. Let's handle more traffic, too!

Traffic: W7ASQ 35, W7AAT 28, W7AHF 13, W7CU 5, W7BFA 4, W7BBS 1, W7BGC 6, W7AVL 17.

OREGON — SCM, Dr. Dolph L. Craig, W7ALO — Many new applications for ORS are being received. Remember, gang, an ORS appointment is primarily for traffic stations. To receive an appointment or continue your old appointment you must keep on your toes, as only those who demonstrate their interest will be eligible. W7AME reports a new Ashland ham, W7BKC. W7SY has requested ORS. W7AMF reports, W7AYN wants ORS. W7AJX reports for the OW. W7WR had his ORS renewed, W7ZD says no DX, but a few ZL and VKs. HI. W7ED reports from the hospital. W7PE now has a push-pull. W7AVT wants to be an ORS. W7QY is Section Control for Navy Net. W7ALM and W7ALO are rebuilding. W7ACH, our RM, is busy fixing schedules. W7AWH has a FB '60 crystal rig perking. W7EN is rebuilding to CC. W7EO visited the SCM. W7AWI is on 3.5 mc. every night. W7GE made a fine score in Army QSO contest.

Traffic: W7QY 79, W7AME 71, W7ED 37, W7WR 35, W7AMF 34, W7SY 31, W7AHJ 17, W7AYN 11, W7ZD 17, W7GE 17, W7AVT 13, W7PE 6, W7EN 4, W7ALO 3.

IDAHO — SCM, Oscar E. Johnson, W7AKZ — W7AFT will soon have power all the time, and will then set out to show the rest of us up. W7ACP is leaving for school at San Francisco. W7AFN is building a new rig. W7KG is busy with the A.A.R.S. net. W7BKF piles up a nice traffic total on a twice-a-week schedule. W7BME, W7BMQ, and W7BNA are new hams in Boise. Why not drop the SCM a few lines and let him know how you're getting along? W7AT has a new crystal rig — almost. W7AKZ and W7AJQ are busy deer hunting. W7ALW has a swell new 'phone outfit. W7QD is going strong.

Traffic: W7KG 10, W7BKF 84, W7ACP 42, W7AYH 9, W7AT 30, W7AKZ 24.

WASHINGTON — SCM, Eugene A. Piety, W7ACS — W7BB is high traffic man, making BPL on deliveries. FB. W7AG-SL is on both 'phone and CW handling traffic. W7TX continues his splendid Alaskan work. W7AGE reports for first time and is interested in traffic work. W7QI is installing 100 watts crystal-controlled. W7RT is right on the job. W7ADS reports for the Yakima gang. W7AYO is out to lead the 7th district. W7AQ, the club station is on air every night. W7ANT is on 'phone. W7BGE wants to see Washington report in QST every month. Most of W7ACB's total is deliveries. W7FB has a pair of '04As. W7ID is busy with A-A work. W7MB is teaching at Y school. W7JZ is operating W7EA at Ballard High School. W7AEA, W7AIU, W7DL, W7JF, W7ARW, W7AEV and W7APS report from Seattle. W7BID makes a bid for ORS appointment. W7WY is bothered with dead spell. W7FJ holds one schedule. W7AVM has his crystal going. W7AVN continues A-A and U.S.N.R. work. Someone broke into W7AAE's and stole his transmitting and amplifying equipment.

Traffic: W7BB 291, W7AG-SL 47, W7TX 32, W7AGE 25, W7QI 24, W7RT 19, W7ANF 16, W7AYO 8, W7AQ 3, W7ADS 3, W7ACB 43, W7AIU 16, W7WY 11, W7DL 10, W7AAE 10, W7JF 7, W7AEA 7, W7ARW 6, W7AVM 6, W7FJ 6, W7AVN 6, W7AEV 4, W7APS 4.

#### PACIFIC DIVISION

SACRAMENTO VALLEY — SCM, Paul S. Farrelle, W6AXM — W6QT and W6EJC are both using 56 mc. 'phone. W6DKW has his troubles with BCLs. W6AFU and W6AAC are new ORS. W6AIM is the highest reporting station in the section, with W6CMA running a close second. W6DUL, W6CAW and W6DVE are new men in this section. W6EOU is back again. W6EPM is having trouble with his bug. W6AID has a MOPA working on 7000 kc. W6UM is heard now and then. W6EOC is still sending the Official

Broadcasts on 3500-ka. 'phone. W6BYB has an '04A working on 7000 kc. W6DON is building a rig that looks like NFG. W6ADS is having a great time working DX. W6EMK puts an awful punch into the KA stations. W6AXM was in the hospital for a month, so that was the reason that there wasn't any report in last month's QST.

Traffic: W6AXM 44, W6AIM 15, W6CMA 8, W6AFU 7. (Sept.-Oct. W6AIM 20, W6AFU 23.)

LOS ANGELES — SCM, H. E. Nahmens, W6HT — W6CFN-W6NF is high point man this month. W6CVZ is also right at the top. Installation of two '52s in push-pull kept W6YAU off air two weeks. W6DEP was QSO ZS5U two nights in succession. W6ETJ also worked ZS5U and has a lot of good schedules clicking like clockwork. W6BLS looks like good material for an ORS. W6CXW was QSO NY1AA for his 31st country. W6TE doesn't have to go outside his shack to turn around since he installed new remote control desk. W6EBK is now an ORS. W6CVF is on the lookout for more schedules. W6AM transmitted signals for both frequency tests. W6CVV installed crystal control at last. W6DLI rebuilding to crystal control for both 'phone and CW. W6ALQ has been appointed Route Manager for San Luis Obispo county! Give him your support, gang, and he'll keep things popping up there. W6ACL has been handling trans-pacific traffic. W6AVJ is now using push pull modulation. W6DXC is newest ham in San Bernardino. W6RZ craves to be an ORS. W6EEA sends in first report. W6WO enjoyed last ORS QSO party. W6DVA slips us word that Vin Berry, W6DHM, is on tanker KFDM for Europe. W6EFQ worked ZL with '12A tube. W6EVV rebuilt transmitter to crystal control. W6DGL is working on all bands with '47 pentodes crystal controlled. W6CZT swapped his brand new crystal job. W6DYH is building a 3.5-mc. 'phone job for W6AKD using grid modulation. W6DWW had to call the OW to hook antenna on his new "peewee" National DC3 because his mits were too big. W6EVE worked his first VK. One of the bottles at W6TN broke its back "doubling." W6DSP is back on 'phone. W6ESA is still badly handicapped by power leak. W6EZX is getting things arranged at new QRA. Greater and smoother output resulted from installation of larger filter in W6ZZA. Seems strange to see W6BCK and W6EGH so far down in the list but their new jobs don't give them much time for brass-pounding. W6BVZ voices the popular question this month, "Where's all the traffic?" School keeps W6CGP away from the heap. W6MA holds a daily schedule with the OM, W6ZZA, when he is on trips. W6BVC reports a new ham, W6CSO, in Wilmington. W6DZI is preparing for civil service exam. W6DNA has been experimenting with low power 'phone. Recent earthquake brought down one of the masts at W6EGW. As soon as W6VH can get up a sky wire he will start pounding out traffic again. W6AZL just returned from vacation. W6HT attended a meeting of practically every active club in the Section during the past two months. W6BUX is busy cutting and grinding crystals. Both W6BGF and W6DOZ expect to get going good after Thanksgiving. W6EPL sends in his first report. W6VO is still trying to get his heap to perk. W6FEW promises to make skeds and handle lots of traffic if appointed ORS. The new officers of the ARA of Long Beach are: W6EKS, President; W6HT, Vice-President; W6VH, Secretary, and W6EQW, Treasurer. Interesting meetings are held every Friday night in the City Hall. The A.R.R.C. is now meeting at members' homes every Wednesday night. The San Bernardino Radio Club is made up of a real bunch of hams. You can always rely on an interesting meeting at the Pasadena Short Wave Club. Club secretaries: Don't fail to send the SCM information concerning your club's activities, on or before the 16th of each month. Due to a relapse from the intense activity of the past few months and a general rebuilding throughout the section, the total this month is extremely small. This, however, only indicates that the section is preparing for an unusually active winter. We're headed for the top! Let's go, gang!! 73 and sincere wishes for a Happy New Year.

Traffic: W6CFN 308, W6CVZ 205, W6YAU 143, W6DEP 130, W6ETJ 101, W6EQW 58, W6BLS 58, W6CXW 43, W6AKW 42, W6TE 41, W6EZN 36, W6EBK 35, W6CVF 34, W6AM 22, W6CVV 22, W6DLI 20, W6ALQ 19,

W6ACL 19, W6AVJ 18, W6DXC 16, W6RZ 15, W6EEA 15, W6WO 15, W6DVA 14, W6EVV 14, W6DGL 14, W6FDE 13, W6CZT 10, W6ON 9, W6BPU 8, W6AKD 8, W6DWW 8, W6EVE 8, W6HT 8, W6TN 7, W6DSP 7, W6ESA 7, W6EZX 7, W6ZZA 8, W6BCK 5, W6BVZ 5, W6EGH 4, W6CGP 4, W6MA 3, W6BVC 2, W6DZI 1, W6DNA 1.

EAST BAY — SCM, J. Walter Frates, W6CZR — W6ATJ did it again! He topped the Section in the total amount of traffic handled during the month. W6BPC, the old reliable at Vallejo has come to life again. W6RJ is still working in both the 3500 and 7000 kc. bands. W6CYD landed up among the leaders in traffic this month. W6BTZ 'phoned in a sizeable total this month. W6BBJ, who spends 90 percent of his time on the air using 'phone, didn't let it bother him in the traffic line because he handled quite a number of messages. W6ALX's traffic total fell low because he has been seriously ill. W6AF reports working KGEK in the harbor of Sydney. W6PB worked PY1FF and LU1EZ. W6DLT reports things very quiet at his station. W6BTW informs us that he is changing the entire station over. W6ZM handled a few messages this month and was busy with RM bulletin.. W6BGR sends in a fine list of calls heard. W6EJA is now with W6CK, the Admiral Watson. W6BIG is a new ham in Richmond. W6EDO announces that he has gotten the new transmitter on the air. W6CDA has been on 14 mc. recently. W6AOH hasn't been doing much because his '03A went west. W6EDR says that his crystal refuses to stay oscillating. W6BI says the U.S.N.R. schedules are keeping him tied up so that he can't handle any ham traffic. W6BMS announces that the depression model transmitter is finished. Well, so long and 73, gang. It won't be long now. HL.

Traffic: W6ATJ 259, W6BPC 52, W6RJ 42, W6CYD 34, W6BTZ 27, W6BBJ 22, W6ALX 21, W6AF 21, W6BPB 20, W6DLT 19, W6BTW 18, W6ZM 16, W6BGR 16, W6EJA 8, W6EDO 4, W6CDA 4, W6AOH 3.

SAN FRANCISCO — SCM, C. F. Bane, W6WB — W6DHE has been appointed RM for the northern part of the section. W6EKC reports as usual. W6DFR sends in a splendid total. We understand W6MV is getting ready to come on with his new rig — a W6PW product. W6CAL is doing big work on 28 mc. along with yours truly. Why not get down on Sundays and have a big local get-together? W6ZS is now living in Marin County. W6CIS is about ready to get on with new crystal transmitter. W6BNA says traffic is darn hard to get. W6DJI reports for first time. W6DZZ, RM, says lots of new men in town. W6UL reports way ahead of time. The fifteenth to the fifteenth, OM. W6ADK says things in general are very bad. W6BVL drops way down this time. We're all glad to welcome Art Kellogg, W6DBD, back home after his long absence. KAICE was a guest of W6DZZ while passing through on his way home. W6ETR is now WAC. W6IU says not much traffic on 14 mc.

Traffic: W6DHE 322, W6EKC 198, W6DFR 111, W6CAL 41, W6CIS 26, W6BNA 14, W6DJI 12, W6DZZ 11, W6ADK 11, W6BVL 7, W6IU 4, W6WB 8, W6UL 8.

SAN DIEGO — SCM, H. A. Ambler, W6EOP — W6CTP leads the section this month with schedule with K6AUQ. W6BKX turned in a nice total. W6BGL tried 1750 kc. and says FB. W6AXN worked VS3AN. W6CTR was on 1750 kc. 'phone and says FB. W6BAM reports two new hams, W6BUL in Costa Mesa and W6BLZ in Laguna Beach. W6AMO worked VK, ZL and J using a '45. W6EPW reports that the Radio Club is progressing. W6EOH is rebuilding. W6EPF and W6EOP tried to work the gang on RMNITE but failed to hook up.

Traffic: W6CTP 34, W6BKX 21, W6BGL 11, W6EOP 10, W6AXN 9, W6CTR 8, W6BAM 8, W6AMO 7, W6EPW 6, W6AKY 2.

NEVADA — SCM, Keston L. Ramsey, W6EAD — W6AJP is high this month. W6YAR, the University of Nevada station, is on the air with a crystal rig. W6CRF is working on his 100-watt 'phone job. W6UO is busy with Army Amateur work. W6BYR is increasing power on his 'phone. W6EAD is on with a new transmitter using W6CRF's 'phone crystal and doubling to 7 mc.

Traffic: W6AJP 115, W6YAR 34, W6CRF 33, W6UO 10.

(Continued on page 14)

# • I. A. R. U. NEWS •

Devoted to the interests and activities of the

## INTERNATIONAL AMATEUR RADIO UNION

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LET'S see what has been happening on 3500 kc. since our last discussion of this band. A two-way 'phone QSO between the antipodes and the United States! J. C. Mills, ZL2BE, and Wally Bowles, W6BHM, were the contactors. The power at W6BHM consisted merely of that obtained from a single type '10 with the customary '50 modulator and associated amplifiers. Bowles says, "I often wonder why there aren't more fellows on early in the morning. Nearly every morning between 4 and 6:30 P.S.T. (1200 to 1430 G.C.T.), one hears quite a few VK's and ZL's pounding away."

Here's a representative case of what numerous consistent stations are doing on this band in the way of DX. Thomas Millsbaugh, W2CSC, writes that he has received cards confirming reception of his signals in Siberia, Australia, New Zealand, Holland and Germany. The first week of October at his station brought seven contacts with the west coast (averaging three thousand miles . . . and that QRM!), all on 3.5 mc. For further instances of similar work, see Calls Heard in most any issue.

Many old-timers among Belgian amateurs are going down to 3500 kc., leaving the cluttered-up 7-mc. band to the 'phone stations and beginners. What a reversal of olden days! Swiss hams are finding their national relay tests in this band too easy. Artificial difficulties have to be added frequently to keep up the interest! They are at present engaged in a campaign to reduce the terrific European 7-mc. 'phone QRM, and, in the effort to cut down interference on that band, are pointing out that generally even better results over the continental area can be obtained through the use of 3.5 mc. This is in line with their own development of national evening gatherings on 'phone over this band.

Swedish amateurs are using 3500 almost exclusively for inland communication; these contacts are practically impossible on any of the other bands, and as the new secretary of the S.S.A., Erik Malmberg, says: "DX is very good, but you long for a rag-chewing with your fellow-countrymen now and then. That is natural." But, if we may say so, wouldn't 1.75 mc. be even better for this purpose, OM's?

In England, the East Midlands district organized a 3.5-mc. field day, which was highly



LU1A, THE EXPERIMENTAL STATION OF THE RADIO CLUB DEL ARGENTINE

successful. The transmitter was housed in a caravan and the station was operated by H. B. Old, G2VQ, under the call G2VR.

Norwegian amateurs are hearing a lot of DX on 3.5 mc., although some difficulty is being experienced in working the stations heard. G. H. Petersen, Vice-President of the N.R.R.L., attributes this to the fact that most Norwegian stations are of quite low power.

3500 kc. we find to be a remarkably heterogeneous band at the present moment. Everything from the most ardent of DX hounds to the most

casual of rag-chewers will be found there, and, surprisingly enough, it seems to accommodate them all very well indeed. But 3.5 mc. seems to us still to be particularly applicable to moderate DX, general traffic-handling over fairly long distances, and 'phone. Really good and consistent DX is still restricted to our high frequency bands, and they should be restrained in violation for such purposes. Purely local work should go on the ultra-high frequencies; our restricted communications activities fit perfectly into our lowest frequency band. Our present frequency spots give us a well-balanced assortment for all the activities of amateur radio; the remaining essential is to apportion and use them wisely.

H. Cecil Page, G6PA, Contact Bureau Manager of the R.S.G.B., reports two corrections to the schedule of 28-mc. tests given in the British report which appeared in November *QST*. An error was made in the announcement of the dates, which should be corrected as follows:

28-mc. Jan. 23rd and 24th, 30th and 31st. March 19th and 20th, 26th and 27th. The times are as stated previously, from 1200 G.C.T. Saturdays until 2400 G.C.T. Sundays of each week end.

28-mc. seems to have been deserted by all but a small group of indefatigable experimenters who keep going irrespective of results or success. We wish them all the luck that lags so fitfully. But on 56-mc. everything is quite the opposite, and this is a complete reversal of the conditions that have obtained on these bands for some years previous. Since the 28-mc. band became amateur public property in 1928, it has been the cynosure of the popular experimental class, while "five meters" struggled away in the background with only a handful of adherents clinging dimly to its minute glories.

But now? Now 56-mc. is decidedly in the limelight in all the countries of the active amateur world; its possibilities for local work are receiving much attention; in several American cities radio clubs have so efficiently organized local ultra high frequency nets that they parallel the land telephone service between members' homes; much the same, on an even larger scale, is occurring in at least one European country; technical minds everywhere are looking with interest at amateur television away up there; while for the special local stunts amateurs delight in, the opportunities are unlimited and unrivalled.

We're "spreading out from the middle," as it were.

Among the European 56-mc. experimenters who have been doing good work are Louis Roland, ON4JB, and Louis Turlot, ON4EL, the latter a highly regarded experimenter of the Hainaut district, Belgium. ON4JB, working at Froid-

Chapelle, has been received R9 at La Louvière, about 12 miles away. A distance of five kilometers has been covered with only .002 watts power, with a plate voltage of 20, voice modulated. The receiver was of the super-regenerative type. On another occasion 40 kilometers, or about 25 miles, was covered with somewhat more power. In this case an ordinary Schnell type of receiver was used.

Swiss amateurs are at present engaged in working out a duplex 56-mc. 'phone system to cover their country. Th. Schinzel, HB9Q, reports that most of the apparatus being built is designed along the lines of the equipment described in recent issues of *QST*.

A new QSL bureau for Porto Rico and the Virgin Islands. Francis M. McCown, KARJ-NEC, Family Court No. 7, Santurce, Porto Rico, has undertaken to forward cards for all known and, whenever possible, any unlisted amateur stations in that locality. He has for some time been doing the work in lieu of Joaquin Augusty, until recently holder of the bureau designation, and so has experience and knowledge of the region to assist him in carrying out his task faithfully.

An R9 WAC is one of the claims to distinction of O. P. Taylor, W6BAX. He has such "worked" cards from each of the six continents, including fourteen countries; R8 from twenty-eight; R7 from forty-eight; and R6 or less from seventy-five. The average DX report is R7. Seven stations in Chile have reported R9, as have more than a dozen in Australia and New Zealand; six in China, four in Hawaii, etc. The transmitting tube is an 852, arranged in a Hartley circuit, with 300 watts input.

As an aggregation of numerals the above is very impressive; as a series of DX with the reports pounding steadily in through the 'phones, it must have been far more so.

All of the existing officers of the S.S.A. were reflected at the sixth annual meeting in Stockholm with the single exception of the secretary. Osborn Duner, SM5ST, who has held the office for some time, resigned, and was replaced by Eric Malmberg, SM5-094. Mr. Malmberg does not have a transmitter as yet, although he has been active in the society for more than a year and has had a great deal of receiving experience, but he says that it won't be long before a new SM5 call is heard in Sweden. Mr. Duner continues in the editorship of the Swedish amateur magazine, "QTC," and great things are expected now that he has more time to devote to its production.

A rather novel idea in tests is the PA counties-worked contest, which has been running continuously with QSO's counted since January, 1929. Huybregson, PA0QF, is record-holder at



present, with Pothast, PA0DW, and Kerker, PA0XF, as close seconds.

The Cuban Short Wave Club has recently been organized by a group of old-time amateurs. Among the members are Mr. Evelio Villar, announcer at CMK, and professor of physics; R. Pego, conductor of the Hotel Plaza orchestra (where the studios of CMK are situated); Dr. Millas, chief meteorologist of the Cuban government, and Saenz de Calahorra, CM2WW, Western Union engineer. The guiding spirit is U. R. Muniz, 37 Primelles St., Cerro, Havana, a Pan-American Airways radio operator.

"We shall be glad to conduct correspondence with any other amateurs and give all available information on Cuban stations," writes Mr. Muniz. "Although most of us old timers have been away from the game a number of years, we have nevertheless kept tab on everything new."

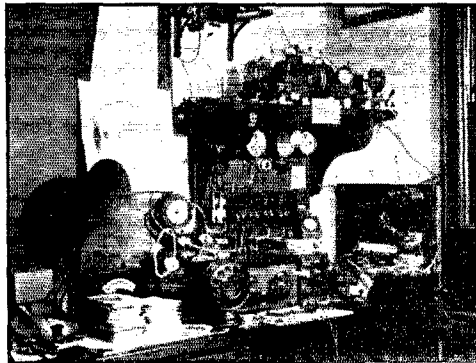
Beginning amateurs in this and other countries will undoubtedly be interested in the work accomplished by Stanley Beach, W8APM, with the little push pull transmitter described in the November, 1930, issue of *QST*. With the pair of type '45's fed at 350 volts specified in this transmitter, which has become extremely prevalent in beginner's stations in this country at least, from his Warren, Ohio QRA, W8APM has worked 43 countries in all the six continents. Asia has been worked four times, he says, Africa six, Oceania about twelve, and Europe many times. Of course, North and South American contacts are too numerous to list.

Ever since July the U.S.K.A. has enjoyed the privilege of issuing regular broadcasts to their members by governmental permission. Each Monday at 2115 G.C.T., Traffic Manager W. Schneeberger, HB9G, or another station designated for the purpose, transmits QTC HB containing announcements concerning forthcoming tests and items of general information.

Good news from Great Britain! J. Clarricoats, Hon. Secretary of the R.S.G.B., reports a substantial reduction in the guard bands fixed on each of the amateur bands by the British P.O. department. Whereas before there was a 50-ke. reduction at each end of the bands designated by the Washington Conference, the new tolerances average considerably less. The new bands are: 1730-1985; 7025-7275; 14,030-14,370; 28,050-29,950; and 56,070-59,930.

The R.S.G.B. has also expressed their hope that by the time this is read the 3.5-mc. band will be opened for daily use at least ten months of the year. At present the band is open from 2000 to 0800 G.C.T., daily, and from 1500 G.C.T., Saturdays, to 2400 G.C.T., Sundays, its use being granted stations applying through the R.S.G.B.

Brief items of gossip from the month's mail: Paul de Neck, esteemed president of the Reseau Belge, had occasion to be editor, printer, office-boy and all the rest for five consecutive issues of "QSO," his very excellent R.B. organ, during the recent typographical strike in Brussels . . . . . And may it be understood that the composing, proof-reading, and printing of a live and timely magazine is not the sort of a job to be handled in the spare time of one man! . . . . . D. Kenneth Auck, W8GDP, offers the rather optimistic suggestion of a separate WAC certificate for each band, numbering them WAC1 (1750 kc.), WAC2 (3500 kc.), WAC3 (7000 kc.), etc. Don't know if



J3DD, K. KASAHARA, NO. 1 TUNAMATI, SIBA TOKYO, JAPAN

*From what we've seen of Japanese amateur stations, this well known representative of J.A.R.L. practice is quite typical in station arrangement.*

anyone has ever worked all continents on any bands except 7 and 14 mc., though, and the latter have been done so often as to be commonplace in this highly competitive modern amateur radio . . . . . The Norwegian Scientific Expedition to Greenland was only able to work a few British stations from its amateur station, XLA2K, which worked on 14 mc., according to G. H. Petersen, LA1D . . . . . "J1EE is one of the most consistent Nipponese stations I have ever heard," reports J. W. Clark, W6CAN. J1EE uses a pair of type '10's in push-pull, and his near D.C. is always loud on the west coast. That's K. Nakagawa, of Tokyo, you know . . . . . Another Japanese station using a type '10 that rolls across the Pacific consistently is J1DN, S. Sugito, also of Tokyo . . . . . Th. Schinzel, HB9Q, imparts the proud fact that every HB is able to work break-in; this kind of operation is enjoying a great predilection in Switzerland, and they urge that more operators in other countries join in . . . . . J. Leclercq, ON4JE, and Louis Roland, ON4JB, give evidence of having established the existing QSO endurance record, for they have accomplished an unbroken contact lasting more than twenty-four hours. As ON4UU says, "Thanks to

*(Continued on page 78)*

# • CALLS HEARD •

**W8BDQ, J. T. Higgins, 45 Haseltine Ave.,  
Youngstown, Ohio**

w4aat w4abs w4abz w4aoo w4ael w4agr w4aie w4aji w4ajx  
w4akn w4ama w4anz w4aom w4aoy w4apj w4ata w4ays  
w4bf w4oh w4dw w4eq w4ex w4gk w4gy w4if w4jx w4nb  
w4oi w4tr w4ver w4wv w4ww w4xp w5aos w5ads w5ahw  
w5amk w5amy w5aoo w5aqe w5aay w5aui w5ayl w5ayz  
w5bke w5bnr w5boz w5btu w5bus w5bvh w5bzt w5oaa  
w5odd w5odq w5ds w5dsk w5it w5lt w5lv w5pm w5rq  
w5vj w5ye w5yh w5bau w5buw w5bqk w5oae w5om w5dep  
w5egh w5eup w5exq w5fol w5wx w7als w7aos w7axq w7bb  
w7bol w7bjs w7bjh w7qe w7elo w7eqg w7efb w7ebu w7eqg  
w7eri k4arg k4rj om2wd om2sv kdvs

**W6DTZ, R. M. Jansen, S.S. Ohioan, New York,  
N. Y.**

14,000-ke. band

om2wd on8mk ot1bx f8bs f8fr f8pq f8sz f8tx g2vq g5vm  
g8rb g6vp hclfg lu7ke on4au on4fp on4gn on4jj on4mok  
on4uu ve4de ve4ed w5aej w5ajg w5ajp w5apv w6afs w6ahp  
w6beb w6bvc w6bal w6can w6cix w6oko w6oyv w6oyr  
w6dbt w6dhp w6dtd w6ezg w6fdq w6yu w7bmr z86y

7000-ke. band

ve3ig ve3yh vk5gk w5vq w6alu w6buh w6eyt

**N. Holman, W. t. Op. S.S. Nassa**

(Heard While at Balikpapan, Borneo, 2nd-5th Sept., 1931)

7-mc. band

ao8zk j3cr k3lce kalcm kalhr kaljr kalup k6aja om2ej  
pk1ab pk1jr pk3bm pk3bq pk4jd vs6ah vk2ba vk2kj vk2ku  
vk2ns vk2ra vk2sk vk2tx vk2xu vk3ek vk3gr vk3gu vk3gx  
vk3hk vk3lq vk3ml vk3nj vk3rh vk3vf vk3wl vk5gr vk5mb  
vk5ml vk5ra vk5wh vk6fm vk6gf vk6ow vk6wi vk7ge  
vx4x w5ach w5va w6ads w6ahp w6aas w6alx w6atj w6bbe  
w6bet w6ccu w6egh w6eif w7aab x1as zs2a

14-mc. band

j1ec j1ee kalcm kaljm oh2na pk4hh vk2ax vk2hw vk2ls  
vk3oo vk4xn vk5dx w9adn yx3b z13ar

**J. F. Quigley, 645 Polk Blvd., Des Moines, Iowa**

3500-ke. 'phone band

w1aby w1avk w1ber w1bje w1byd w1omp w2asq w2obe  
w2cyp w2go w2kr w2ru w2tg w3ahr w3agr w3aqt w3avy  
w3azo w3ots w3jq w3vj w4aad w4ad w4are w4axz w4fi  
w4lt w4lu w4ru w4tm w5abo w5alf w5ali w5ahr w5anw  
w5anx w5ajo w5alu w5aru w5atb w5ato w5awp w5blf w5fe  
w5gy w5ka w5kx w5pp w6bfi w6aqq w6ave w6avj w6bba  
w6bbj w6one w6ohp w6ohh w6eic w6oo w6oqn w6oxg w6dai  
w6dqb w6ejn w6elw w6fal w6fidm w6fin w6rk w7amq  
w7ao w7apd w7aqx w7bbh w7bbx w7bil w7lv w7nw w8akw  
w8amw w8awq w8ayy w8bae w8bke w8bix w8bro w8brj  
w8brw w8bx w8lxb w8byr w8bzq w8chp w8oul 28dml  
w8eej w8els w8feq w8ne w8rw w8wf w8yf

14,000-ke. 'phone band

w1axa w1ccz w2alk w2bro w2tp w2py w3aaz w3zx w4agr  
w4fi w5ql w6aj w6zq w8afm w8opc w9oj w9drd w9evq  
g5by tg1aa

**W6ERT, Al. Goodyear, 1917 S. Mesa St., San  
Pedro, Calif.**

7000-ke. band

w1zza w2arv w3ary w3bm w3gw w3yd w4agb w4ams w4et  
w4gw w4qr w4wm w4zza w5acr w5aab w5afe w5aeb w5akb

w5ak w5aif w5aqy w5asx w5aug w5avi w5aoh w5azo w5bbr  
w5bmw w5bvn w5oae w5it w8dlv w8eik w8eip w8eys w8si  
w8jo w9arh w9asw w9amv w9awe w9ono w9ou w9dct w9dto  
w9eag w9kan w9lkm w9hzt ve4fb ve4ov ve4ff ve4kl ve4he  
ve5dn ve5fi om2fo hh7o ti3la kalhr k6atd k6bue k6oxy  
k6igi k7atd k7pq vk2no vk2tx vk2px vk3ka vk3zw vk5hg  
vk7jk z1lck z12ab z12ce z12fm z12fr z12ou z12gm z12mb z13bj  
z14bt

**G6YL, Miss B. Dunn, Felton, Northumberland,  
England**

7000-ke. band

w2dm w8sw fm4ab fm8cr fm8da fm8db xf8nih xf8ufm  
xf8wq cv5bd xd4xzb kalhr xok2ak auykac sulwt vk2tx  
vk6wi vk7ok vk7jk x3b yn6lr z12aq z13xc z14ap zu6a fbho  
fx7e ldka x1rl

14,000-ke. band

w1ccz w1cmx w1ft w1z w2ais w2arw w2ovj w2byp w7aul  
w8arg w8blp w8fs w9adn fm8bg fm8cr cn8mi on8mk es3ht  
au7kac pk1jr pk1pk pk3aj pk3bm pk3bq sb4aa st2d sulaa  
vk2xu w8aw w8ame w8aac yi2dc z66jm z2a z66y zu6w

**W9GKS, Dr. C. E. Gross, 121 Ottumwa St.,  
Ottumwa, Iowa**

(July-September)

7- and 14-mc. bands

oe1ai om2ay om2jm om2mm ear13 g2bm hclfg hcljf hk3rg  
hk7jk j3cc k4sa k4ug k6aja k6bo k6cab k6dvz k6eqn k6ir  
lu9dt oa4s on4au py2ak py2bk py8su rx1aa ti3la velco  
ve1dq ve1dr ve2aa ve2bb ve2ox ve2df ve3bk ve3bm ve3cm  
ve3gh ve3kj ve3ra ve4bb ve4bx ve4cg ve4ex ve4fr ve4fx  
ve4gp ve4gy ve4ha ve4hm ve4ia ve4tj ve5an ve5bo ve5bi  
ve5fe vk2ha vk2oc vk2vo vk2wx vk3bv vk3lm vk3wy vk3zw  
vk3zw vk4ju vk5gk vk5gr vk5lc vk7ou vk7jk x1aa x1ax  
x1bi x1d x1n x2bi x9a z12oj z13ca z13cc z14bt w1aao w1abn  
w1ahk w1akr w1aky w1alk w1apl w1apu w1arh w1asr  
w1au w1awl w1axa w1aya w1ayy w1azy w1bby w1bfb w1bdb  
w1bdl w1bei w1bfi w1bfr w1bit w1bks w1blv w1bpd w1bqr  
w1bsk w1bsz w1oab w1obi w1obt w1obz w1ocd w1ccz w1cg  
w1ciu w1oiz w1coi w1cot w1opt w1scr w1osz w1ovi w1dbr  
w1dby w1dh w1dq w1fb w1fh w1fg w1io w1iz w1me  
w1ms w1ph w1pi w1sk w1uf w1ve w1we w1xu w1z w4abo  
w4abt w4abz w4axx w4aqc w4adj w4adl w4adn w4ael  
w4aek w4agj w4agy w4ahn w4ais w4ait w4ajj w4ajs w4ajt  
w4ako w4ale w4anr w4anv w4api w4ats w4atu w4aty w4de  
w4eg w4ei w4ex w4gb w4gw w4gx w4hd w4lh w4la w4li  
w4mk w4ou w4pab w4py w4qf w4qx w4tr w4uj w4us w4vb  
w4vp w4vt w4zv w4zz w4zdd w6adk w6aac w6aff w6afs  
w6afu w6ahd w6aih w6ahp w6ahw w6alw w6alx w6alz  
w6anq w6amn w6aok w6aqj w6aqp w6arp w6atw w6avb  
w6avo w6awu w6awo w6axn w6azh w6azn w6azq w6azu  
w6azz w6bag w6bbp w6bc w6bdp w6bfc w6bgh w6bjf  
w6bkk w6bkl w6bkk w6bmq w6bnc w6boa w6bpc w6bpd  
w6bpo w6bqy w6bss w6bto w6buo w6buy w6bvc w6bwr  
w6bze w6byp w6cgc w6cgp w6chp w6civ w6cix w6ckr  
w6clv w6cma w6cn w6cno w6cog w6coc w6cpe w6ctm  
w6ctp w6cty w6cyn w6czz w6cwx w6cyr w6dbt w6dze  
w6dai w6des w6dep w6deu w6dgl w6dgu w6dgr w6dik w6dj  
w6dlx w6dmi w6dmp w6doj w6dpy w6dri w6den w6dsz  
w6dtd w6dte w6dum w6dww w6dyn w6dgy w6den w6eak  
w6ebc w6ebd w6ec w6ech w6eep w6efn w6efs w6egh w6ehi  
w6ehw w6ehy w6eip w6eiz w6eme w6enj w6enn w6eny  
w6eop w6epq w6ero w6etr w6eng w6euh w6eul w6eup w6eut  
w6evd w6ewr w6ex w6exo w6faj w6fal w6faq w6fas  
w6fbo w6fid w6fer w6fip w6fiw w6hs w6hy w6io w6iq  
w6od w6og w6wb w6wx w6xk w6xu w6zz w7aa w7aat



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# • CORRESPONDENCE •

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

## The "Nautilus" Cruise

Roslyn, Penna.

Editor, QST:

Now that the excitement of the home-coming and all the headaches that necessarily follow such celebrations are over, perhaps I can take time out long enough to say hello to the boys and thank them for the wonderful coöperation they gave me during the cruise of the *Nautilus*.

No doubt some of the boys are going to say that WSEA was a fine baloney for not keeping skeds and trying more to work hams. First of all, fellows, a newspaper was the principal backer of the expedition. Naturally they were somewhat worried about leaks, and in a polite way I was informed to devote my time in working the specially constructed short-wave station WRH, belonging to the American Radio News Corporation.

Then up pops a condition that no one ever considered in communicating with the Arctic before, and I hope that what I learned up there will be beneficial to any other expedition that attempts to rove around north of 80 degrees north. My work for the first week or so convinced me that 18 meters was not the wave to use for getting through unless I could get some station to stay right on 18. Thirty-six meters seemed to be the best all-around wave, for there was always someone on 36, and plenty of stations to QSO should one fail. Then, it was close to the ham band, and there was a better possibility of being heard should it be necessary to send out a call for help. So after talking things over, we decided to stay on 36 at all times except when directed to conduct tests with any of the boys who desired to do so. It was goat-getting sometimes to be ordered to test on a certain frequency at some time of the day that we knew would not work. There wasn't much sense testing at 3 p.m. for some station on the east coast of America when we knew that only Australians were coming through at that time, and it only took a few seconds to find out what high-power sets could be heard working. The fact that Europeans were coming through in the States at that time was no indication that we would come through, for tests had proved to us that in the Arctic we were in a peculiar zone of our own.

Getting back to 36 meters again, conditions were just as peculiar there, but then there was the satisfaction that someone would surely be guarding that frequency, and we devoted our time to

working on that wave. Another advantage of doing this would be that everyone would know where to find WSEA should trouble arise. Our work on 36 was not only erratic and peculiar, but in my estimation it proves that after all the old earth is round, without a doubt. We would pick up Norwegians for a thirty-minute period, jump to Germany and Netherlands for about an hour, then take England for thirty minutes, then work ships in mid-Atlantic for an hour or so, Chatham would then roll in for about an hour and a half, Tuckerton and Carlstadt for another hour, then we would next pick up Frisco, who stayed with us for three or four hours. The next stop would be out in Manila, and then we would find ourselves working ships in Hong-Kong, China, and coming back around the globe by way of Asia and Europe again.

With all those contacts one would think that WSEA had a cinch. But where the rub came in was that WSEA had to move around. This didn't mean anything to us at first, because no one ever had much trouble working the boys on previous expeditions. But this was a different sort of expedition and the only one that ever moved around in the Arctic with the exception of the aviation outfits that so quickly made the trip and returned. The aerial expeditions had no time to investigate the conditions for working radio, and the surface outfits that remained in one spot for a long period could find out in the first two or three days just when to work and what wave to use. The *Nautilus* would have a fine QSO to-day and make a schedule to see the same stations to-morrow — and then things would go haywire. Some time during the day we would move fifty miles east or west, and fellows that would come through with a band to-day at 2300 would not be heard at that time to-morrow, but would perhaps come in three or four hours earlier or later. What caused this? The only explanation that I am able to offer would be that up in the Arctic, where each degree of longitude is but eight or nine miles, a fifty-mile cruise would mean five degrees of longitude and a wide change in skip distances. Perhaps after Dr. Sverdrup and Sir Hubert have worked out our various position reports and fixes, we can go through our radio log book and make a study of various notations and work up something that will be of real value to future generations. It would be a great help to radio operators of expeditions in the Arctic to know just when to shift to a frequency to work a particular point on

**RCA  
211**

**50 WATTERS  
ALL NEW**

**\$16.95**

Milliammeters 0-15, 0-25, 0-50, 0-100, 0-150, 0-200, 0-300, 0-400, each . . . . . \$1.00  
 A. C. Voltmeters, 0-6, 0-10, 0-15, each . . . . . \$2.50  
 D. C. Voltmeters, 0-300, 0-500 — \$3.50, 0-750 — \$5.00  
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 Filament transformers . . . . . \$1.00  
 18 watts, 7.5 volt center tapped, weight 2 lbs. Just the  
 thing for your 210's, 281's, 250's or CG1162's, 50,000  
 ohm 100 watt bleeder resistance . . . . . \$1.25  
 Genuine Mershon 8 MFD condensers . . . . . \$0.95  
 7 x 18 solid walnut cabinets. . . . . \$1.00  
 RCA Audio Transformers, 3 to 1 ratio . . . . . \$0.75  
 Air King short wave plug-in coil. Set of four . . . . . \$1.75  
 .0001 Pilot midget condensers for above, each . . . . . \$0.50  
 Stand-off insulators, similar to GR \$0.99 ea. Doz. . . . . \$9.90  
 Copper coil 2 3/4" diameter, 1/4" tubing, turn . . . . . \$0.08 1/2  
 Above are equipped with mounting lugs at each end. 5"  
 dials for transmitters, each . . . . . \$2.20

85 watt transmitting grid leaks, 10,000, 12,500, 15,000  
 ohm, each . . . . . \$0.65  
 2 watt resistors, non-inductive, 10,000, 20,000, 50,000 ohm  
 and 1 megohm, each . . . . . \$0.15  
 Radiobuilders chokes, completely shielded, with large stand-  
 off insulators, 30 henrys, 250 mils., weight 12 lbs. . . . . \$3.25  
 30 henrys 400 mils., weight 20 lbs. . . . . \$3.95  
 Latest Amateur Call Book . . . . . \$0.82  
 Enameled aerial wire No. 12, 100' spool . . . . . \$0.75  
 Enameled aerial wire No. 12, 1 length 200' . . . . . \$1.40  
 RCA 2 henry 300 mil chokes, resistance 20 ohms, weight  
 14 lbs., for key click or filter choke . . . . . \$1.50  
 Sangamo mica condensers, 40 to 800 mmfd . . . . . \$0.25  
 Microphone springs, set of 8 . . . . . \$0.20  
 Tested UX250's, seconds . . . . . \$0.85  
 Tested UX281's, seconds . . . . . \$0.85  
 Tested 227's, seconds . . . . . \$0.20  
 9 plate midget condensers . . . . . \$0.35  
 No. 18 thinned hook-up wire. 25' . . . . . \$1.15  
 Lead-in Bowls with 10" rod. Pair complete . . . . . \$0.85  
 1/2 mfd 400 volt by-pass condensers . . . . . \$0.25  
 GE 1 watt G10 Neon Lamps . . . . . \$5.55

**RADIOBUILDERS CONDENSERS**

Mfd.	300v.	1000v.	1500v.	2000v.	3000v.
1	\$1.10	\$2.00	\$2.95	\$4.75	\$6.95
2	\$1.55	\$3.00	\$3.95	\$8.00	\$12.50
4	\$2.75	\$4.00	\$5.50	\$14.00	\$19.95

Above condensers tested at 40% overload.

**RADIOBUILDERS Self-healing Puncture-proof CONDENSERS**

Mfd.	300v.	1200v.	1600v.	2000v.	2800v.	3200v.
1	\$3.00	\$3.35	\$6.00	\$9.25	\$13.00	\$17.50
2	\$2.50	\$4.25	\$4.20	\$8.50	\$16.00	\$22.00

All condensers in heavy metal containers with large terminal insulators. Above ratings are actual DC working voltages. All guaranteed.

**RCA LICENSED TUBES**

UY227's . . . . . \$3.55  
 UX245's, each, \$5.55, UX171A's, each . . . . . \$4.45  
 UX226, UY224, UX280, UX201A, each . . . . . \$6.65  
 UX230, UX232, 335, 551, each . . . . . \$3.75  
 THE NEW POWER PENTODE UZ47 . . . . . \$3.95  
 236, 237, 238, automobile d.c. tubes, each . . . . . \$1.00  
 233, 2V Pent. UX222, DC 5G, each . . . . . \$1.00  
 UX210's, extra large plate, 15 watt rating . . . . . \$1.50  
 UX281's, 110 mill output rating . . . . . \$1.50  
 UX250's, for your modulators . . . . . \$3.45

280M Mercury Vapor Rectifiers . . . . . \$2.00  
 866's, Mercury Vapor Rectifiers . . . . . \$2.95  
 203A's, 50 watters, New . . . . . \$16.00  
 845's, 50 watt modulators, New . . . . . \$17.00  
 CG1162, GE make. Navy 5 watters . . . . . \$4.45  
 All tubes guaranteed 90 days.

Filament Transformers for 866's, 2.5 volts CT, 10 amperes,  
 15,000 volts insulation . . . . . \$2.75  
 For all 50 watt tubes, 11 volts CT, 10 amperes . . . . . \$5.50  
 For all 250 watters, 12.5 volts CT, 10 amperes . . . . . \$6.00  
 Electric soldering irons . . . . . \$1.00  
 20 ohm Kurz-Kasch rheostats for all new 2 volt tubes knob  
 included . . . . . \$0.20  
 2000 ohm head phones, pair . . . . . \$1.20  
 Finest Brazilian Quartz 1" square cut crystals, Accuracy  
 guaranteed 1/10 of 1% in 3500-4000 band, Each . . . . . \$4.40  
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 Give specification for above when ordering. 85 millhenry  
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 Neon tubes for wavemeter in handy carrying case . . . . . \$0.50  
 Hard rubber panels 7 x 10 or 7 x 12 — \$5.55, 7 x 14 — \$6.60  
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 20 ohm CT resistors, \$1.55, 200 ohm CT . . . . . \$0.20  
 20,000, 50,000, 100,000 ohm volume controls . . . . . \$0.50  
 200,000, 500,000 ohm gain controls . . . . . \$0.79  
 Pilot plug-in coil form. Complete . . . . . \$0.39  
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 Grid leaks, 1/4 to 10 megohms . . . . . \$0.15  
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 800 volt fixed mica condensers .0001 to .006 . . . . . \$0.15  
 1000 volt Dubilier mica condensers, capacities .0001 to  
 .0035, Each . . . . . \$0.20  
 1500 volt Dubilier moulded micadon condensers, capacities  
 .0001 to .02, each . . . . . \$0.25  
 .002 Sangamo 5000 volt condensers . . . . . \$1.00  
 Odd lot .00025, .00035, .0005 var. condensers . . . . . \$0.50  
 .00014 variable condensers . . . . . \$0.75

We specialize in obtaining complete KITS for transmitters and receivers as described in QST

COME ON FELLERS—HERE'S YOUR BEST BET FOR A 1932 STEADY P.D.C. SIGNAL—YES OUR PRICE ON THE 866 MERCURY VAPOR RECTIFIER TUBE IS ONLY \$2.95 EACH—NOW

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**1932**

SPECIAL AMATEUR SUPPLY CATALOG

SEND FOR YOURS TO-DAY

All merchandise guaranteed Terms cash or COD. No deposit required All prices FOB Newark N. J.

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# Cunningham RADIO TUBES

RADIO'S MOTIVE POWER  
SINCE 1915



## Safe Pilots of the Air

17 Years of experience and  
tireless research, combined with  
a guarantee against mechanical  
and electrical defect, stand  
behind the name

*Cunningham Radio Tubes*

**E. T. CUNNINGHAM, INC.**

*(A subsidiary of Radio Corporation of America)*

New York    ✦    Chicago    ✦    San Francisco  
Atlanta      ✦      Dallas

the old globe. But that is going to take a long time.

My agreement with my employers forbids me to write an article on what took place aboard the *Nautilus* until six months have elapsed. So you will have to read Sir Hubert's interesting articles in one of the many papers that give the details, and then when the six months' time limit is up I will try to give you all the low-down on my own personal experiences. All I can say at present is that my log book is just full of thrills and great material, not only for those interested in radio but the whole world in general. I was thinking for a while of taking the high spots out of the log and offering them to amateurs and radiomen of the world at a small profit. I feel sure that every radioman would want a copy of these interesting items and my signature for a real souvenir of the *Nautilus*, and perhaps the comments of brother hams would solve the problem.

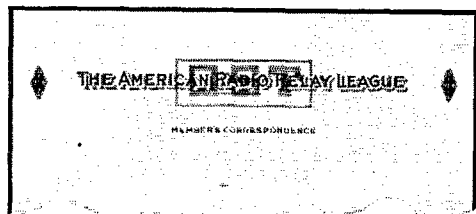
I had the support of hams all over the world, and it was a big thrill to hear from so many of the boys. On our arrival in England, hams from all over came down to see our outfit. No ham was ever turned away, and those that came aboard, I think, really enjoyed the visit. The English boys made arrangements for skeds, as did the boys back home. Then came the stop at Norway, and our friend LA2V presented the greetings of the Norwegian hams and prepared to make me an honorary member of the N.R.R.L. Then on our return to England, Harold Old, Secretary of the RSGB, presented me with the insignia of the various English radio societies and made me the guest of the RSGB radio show.

Both the Norwegian and the English hams sent messages back to the States telling of our departure and date of arrival, and the whole crew of the *Nautilus* appreciate this very much. We have some great friends in England and Norway, and, as soon as the radio inspector grants my change of address, you will hear W3AJZ back on the air making a desperate attempt to QSO them once more. To add a little more in favor of the hams abroad, let me say that one amateur, Brian Leighton by name, secured a stateroom aboard a steamer bound to Iceland just for the purpose of listening in to WSEA in case an emergency arose. He was not permitted to take a transmitter along, but made arrangements with the ship owners that any urgent traffic received by Mr. Leighton would be sent on by the ship's operator.

So please pass along the word to the American hams and hams all over the world that I appreciate all the coöperation they gave and, while there were not many QSO's from WSEA, I always felt that at any time I wanted to get through some ham would be there ready to do his stuff. Some of the boys sent me various articles, including log books, ham books and even gloves, and I carried them with me up under the ice. I suppose they would like to have them for souvenirs, and as soon as opportunity permits I will return them should they so desire. Several of the items placed aboard went down with the *Nautilus* to



# Every Amateur Uses These Forms



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One color (black) heading now being used at greatly reduced cost to members.

Write your radio letters on League stationery — it identifies you.

Lithographed on 8 1/2 x 11 heavy bond paper.

100 sheets.....50c  
250 sheets.....\$1.00  
500 sheets.....\$1.75

Postage Included

## Everything that you've wanted in a log is in the Official A. R. R. L. Log Book

New page design to take care of every operating need and fulfil the requirements of the new regulations!

New book form! No more fussing with binders, or trying to weight down loose sheets when the breezes blow!

New handy operating hints and log-keeping suggestions, put where they are always convenient!

New number sheet (C.D. Form 3) is now included in each Log Book at no extra charge — to simplify and systematize the numbering of messages.

<small>OFFICIAL MESSAGE BLANKS CLASS A SPECIAL PERMIT</small>		<small>P. O. ORDER COMMUNICATIONS SECTION</small>		<small>U. S. GOVERNMENT PRINTING OFFICE 12-34802-1</small>	
<b>THE AMERICAN RADIO RELAY LEAGUE</b> HEADQUARTERS WEST HARTFORD CONN. U. S. A.					
<b>RADIOGRAM</b>					
<small>CITY OF ORIGIN</small> HARTFORD CONN.		<small>STATION OF ORIGIN</small> W1UC		<small>DATE</small> MARCH 26 1937	
<small>TO</small> CARL FRANK MOOG 14 NINTH STREET N. W. WASHINGTON DISTRICT NOBUSTON MICH.		<small>THIS MESSAGE WAS RECEIVED AT</small> <small>STATION NAME</small> <small>CALL LETTERS</small> <small>STREET ADDRESS</small> <small>CITY AND STATE</small>			
<small>KINDLY ADVISE PRESENT STATUS OF THE ORIGINAL TRAFFIC ROUTE RUNNING FROM THE EAST COAST TO THE ORIGIN STOP IN WOOD STILL A MEMBER OF THIS CHAIN QUERY LATEST ROUTE MANAGERS BULLETIN DATED TODAY 78          W. L. BARTT</small>					
<small>RECEIVED BY</small> <small>CLASSIFICATION</small> <small>RECEIVED AT</small> <small>DATE</small> <small>TIME</small> <small>OPERATOR</small>					
<small>Rec'd</small>		<small>From Station</small> MOOG		<small>Located at</small> FAYNOTH, PITTSBURGH, PA.	
<small>Sent</small>		<small>To Station</small>		<small>DATE</small> 3/25/37	
		<small>Time</small> 8:54 P. M.		<small>SP</small>	

AMATEUR RADIO STATION LOG									
DATE	TIME	FREQUENCY	MODE	CALLED	CALLED BY	STATION HEARD		MESSAGE REMARKS ETC.	
						NAME	CALL LETTERS		

There are 39 pages like the one above, 8 1/4" x 10 3/4", carefully designed to incorporate space for all the essential information you want and need to record about your station's operation. Thirty-nine blank pages (backs of the log pages) to be used for notes, experiments, changes of equipment, etc. Durable covers of heavy stock with space for your station call and dates over which the log entries extend. On the inside covers and first two pages are complete instructions on maintaining your log, convenient tabulations of the most-used Q signals, miscellaneous abbreviations, operating hints, amateur prefixes and signal-strength scales. The information you want, always at your finger-tips.

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<b>MESSAGE DELIVERY CARD FOR RADIOGRAM VIA AMERICAN RADIO RELAY LEAGUE</b>		
<small>From:</small>	<small>Date:</small>	
<small>To:</small>		
<small>Time received:</small>	<small>Date:</small>	<small>At Radio Station:</small>
<small>Phone:</small>		
<small>THIS MESSAGE WAS TRANSMITTED FREE OF CHARGE BY          AMATEUR RADIO STATIONS OF THE AMERICAN RADIO RELAY LEAGUE          MEMBERS WILL BE SENT FREE BY FILING AT THIS STATION.</small>		

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Neatest, simplest way to deliver a message to a near-by town. On U. S. stamped postals 2c each. On plain cards (for Canada, etc.) 1c each, postpaid.

The new regulations require a log; a well-kept one identifies your station; a uniform series constitutes a progressive and permanent record.

We honestly believe the new Official A. R. R. L. Log Book is the best you've ever seen!

40 cents each

Three for \$1.00

Postpaid anywhere

AMERICAN RADIO RELAY LEAGUE + WEST HARTFORD, CONN., U. S. A.

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◆ EFFECTIVE AT ONCE ◆

**I R C**

TYPE "K"

*Metallized*

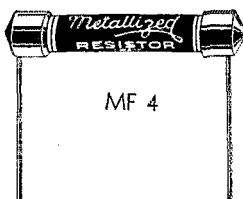
**RESISTORS**

For the first time in International Resistance Company's long and successful history, *Metallized* Resistors are now in the "low-price range". Rising demand for the new Type "K" *Metallized* units — and rapidly increasing volume have made possible these substantial reductions: —

	Former Price	Now
1/2 Watt Resistors	50c List	<b>30c</b>
1 Watt Resistors	50c "	<b>30c</b>
2 Watt Resistors	75c "	<b>40c</b>
3 Watt Resistors	80c "	<b>50c</b>

No let-down in quality. The well known I.R.C. standards in both materials and craftsmanship will be absolutely maintained. I.R.C. service helps will be supplied as heretofore. Ask your jobber — and look for the I.R.C. *Metallized* label.

**INTERNATIONAL RESISTANCE CO.**  
Philadelphia Toronto



her watery grave, after the greatest cruise in history.

The continuous activity has spoiled me, and this laying around, helping wash the dishes with the OW, is making me a bit jumpy. She doesn't want to see me roam around again, and says that on the next trip she goes along, but confidentially, hams, if you hear of anything exciting and you can't make it yourself, please give me the low-down. Meanwhile I'll get an apple stand somewhere in Philadelphia so I can pay for a new set of tubes for the old stone crusher. With a hearty 73 to the staff of QST and hams all over the world I am,

Fraternally yours,

— Ray Meyers

Montreal, P. Q.

Editor, QST:

This yarn might well be called "Brainfever or The Outbursts of a Young Ham That Hardly Knows His Bacon But Still Loves to Chew the Fat," but for the sake of yours truly, who is his own advertising agent, we will compromise and head it "Friendly Swapping of Ideas Between Two Hams, One Old and the Other (capital I) Old Enough to Know Better." The episode took place one day in the Depression Year 1931 a.c. (here's hoping it will rectify itself). We will call the old, wise, cynical and particularly hard-boiled ham, Fred (to divulge his correct name would be suicide), and the younger one, Bill.

Bill: "And apart from bum notes, 5-minute CQ's, glass arms and stuttering, spluttering bugs, there is the stereotyped ham."

Fred: "What do you mean?"

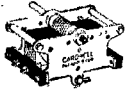
Bill: "The fellow who tries to work ten stations an hour and always comes back with the same: -'G.e. o.m. Tnx fer cl- ... -Ur de sigs QSA-, R-, hr in- . . . . Pse QRK, QRI, QRA? - . . . - (there must be at least five of these as the sender is thinking hard) - . . . - Hw? . - . - . etc. And the second time: 'QRU hr' and a long string of thanks 73's etc., etc. I have listened to stations repeating this until I was convinced that they had repeated the same thing so long they just can't get it out of their systems. Don't you honestly think there would be more pleasant QSO's if the fellows tried to make them more human and individual? There are surely millions of interesting things happening in the world every day, and it shouldn't be so doggone hard to find something unusual that has occurred to exchange views on."

Fred: "True, but how do you know that the other fellow is going to be interested in chewing the rag? He may be a traffic man, an experimenter, etc."

Bill: "I was just coming to that phase of it. I grant my system would fall flat if it were not for directional CQ's. These ill-used little fellows hardly seem to get a decent break, do they? How would it be to have something like:

CQ e to mean Experimental, testing desired  
CQ b " I am a beginner





**Cardwell Condensers**  
153-B — 15 plate —  
.0003 capacity. List  
\$4.75. Special \$1.50  
King Cardwell  
Dual Condensers

each section .0025 in series .0005 or  
parallel. Listed at \$4.25. Special \$1.50

**Cardwell Transmitting Con-**  
**densers at These Unusual Prices**

147-B .00044 List \$10. Spec. \$6  
T-199 .00033 List 10. Spec. 6  
T-183 .00011 List 10. Spec. 6  
164-B .00022 List 5. Spec. 3

All other Cardwell condensers in  
proportion to above special prices.

**ALUMINUM PANELS**

Cut to size

1/16" thick ..... 7/10c sq. in.  
3/32" thick ..... 1/2c sq. in.  
1/8" thick ..... 1c sq. in.  
3/16" thick ..... 1 1/2c sq. in.

**Aluminum Shield Cans Assembled**  
**with Slotted Corner Pieces**

Height	Width	Length	Price
5"	5"	5"	\$1.00
6"	5"	9"	1.85
6"	7"	9"	2.25
7"	6"	10"	2.45
6"	6"	14"	2.85
7"	6"	14"	3.25
7"	8"	14"	3.95
7"	7"	12"	2.95

Special sizes to order, can be shipped  
same day.



**COPPER  
COIL**

Make your own transmitting coils.  
Copper tubing transmitting inductance.

Size of tubing

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

Prices per turn

**LEEDS CRYSTAL HOLDER**

Dustproof, the kind you usually pay  
not less than \$2.50 for. Our price  
\$1.95

Precision made holder as illustrated  
in Oct. issue. Special..... \$3.45  
Oscillating crystal 1" sq. 80 to 100  
meter band. Guaranteed. Special  
\$6.50



**NEON TUBES**

It has many, many uses.  
G10 — 1/2 watt, 2" high,  
standard base. \$ .55  
S14 — 2 watt, 3" high,  
standard base. \$ .75  
S45 — 1/2 watt, long, 1 1/2"  
high, candelabra base. \$ .75

Sockets to fit  
above 10c each

**General  
Radio  
COIL  
FORMS**

List \$1.25 each —  
at the price we are  
offering them they  
won't last long.  
35c each.  
3 for \$1.00



**SIEMENS CONDENSERS**  
40% discount off list

**MAIL ORDERS FILLED SAME DAY**  
10% Cash Must Accompany All C. O. D. Orders

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WRITE FOR OUR QUOTATIONS**

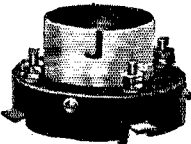
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**NEW YORK**  
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**Transmitting Apparatus**  
*When in Town Visit Our Store*

**LEEDS 50 WATT SOCKET**



Heavy special  
porcelain base.  
Double  
phosphor  
bronze  
springs,  
high grade  
construc-  
tion  
through-  
out.

Extra  
special price **\$1.50**

**Antenna wire, 1 foot or 1000 feet**  
**Special Prices**

**Solid Copper — Enameled Wire**  
14E..... 2c foot  
12E..... 3c foot  
10E..... 1 1/2c foot

**Stranded Copper — Enameled Wire**  
1/22..... 1 1/2c foot  
1/20..... 1c foot  
1/18 heavy duty..... 2c foot  
9/18 heavy duty..... 3c foot

**Silicon Phosphor Bronze —  
Ship Antenna**  
7/22..... 1 1/2c foot  
7/20..... 2c foot  
7/19 super sensitive..... 2 1/2c foot  
7/18 super sensitive..... 4c foot

**Special Prices on Filament Transformers**  
Special 866 P.H. Trans. 2 1/2 v. 10 amps, 10,000 v.  
insulation. Special..... \$3.95  
Special Filament Trans. 7 1/2 Volts. Center  
tapped — 7 amp..... \$3.95  
\$6 C. R. Audio Trans. 3 to 1-6 to 1..... 1.20  
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3 separate 7 1/2 v. C.T. windings for crystal control  
transformers. Special..... \$8.50

**THORDARSON TRANSFORMERS**

All Brand New

2124-A — 1-7 1/2 v. Centre tapped wind-  
ing for 210; 1-7 1/2 v. winding for 281;  
this winding is connected internally to a  
600v. winding, which connects to 2-30H.  
choke. The addition of filter condenser  
to this unit gives you a complete power  
supply for 210 or 250.  
2572 — same as above with single choke.  
2115 — 620 volts — center tapped. One  
5 volt filament center tapped; two 30 H.  
120 mill. chokes; size 5 1/4 x 4 1/4 x 3 1/4,  
weight 8 lbs.  
These transformers were made to sell  
from \$15 to \$20 each. Cased in the  
familiar R210 boxes — all  
guaranteed perfect — any  
one of them only..... **\$3.45**

**Specials on Flechtman Condensers**  
TC-200 2 mfd 1000 volt D. C., list  
\$6.50, net..... \$3.50  
T-200 2 mfd 1500 volt D. C., list  
\$8.00, net..... 4.25  
TF-200 2 mfd 2000 volt D. C., list  
\$15.00, net..... 7.29

**IT'S A WOW**

**A Real 5-Meter Xmitter.**

**LEEDS leads again with the  
latest 56 MC transmitter kit**

Composed of the following parts:

2 G. R. 568 K. Condensers @ \$4.....	\$8.00
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1 Special Grid coil.....	.80
1 G. R. 437 Resistor.....	.35
2 R. F. Chokes @ 95c.....	1.90
1 Special 10,000 ohm leak.....	.65
1 Special Grid coil.....	.50
1 Special Antenna coil.....	.65
1 Special Plate coil.....	.65
1 Baseboard.....	1.00
Misc. parts.....	1.70

Total..... **\$21.70**

**COMPLETE KIT**  
*or parts separately as listed* **\$18.50**

**This 5 meter transmitter, fully described in**  
**Oct. 1931 General Radio Experimenter**

**Write for FREE folder giving**  
**complete data and hook up**

We recommend Hull's 5-meter super regenera-  
tive receiver described in July, 1931, QST.

Composed of the following parts:

1 Aluminum Panel, 5" x 7" x 1/16".....	\$2.25
1 Aluminum Panel for base, 5" x 8" x 1/16".....	.28
2 Aluminum Brackets, 2 1/2" x 6 3/4".....	.30
1 National Type "A" Dial.....	1.47
1 Special Insulated Coupling.....	.25
1 Cardwell 406-B.....	1.65
1 Bakelite 1/2" Rod.....	.15
1 Cardwell Balancer Condenser.....	.75
1 .00025 Fixed Condenser.....	.15
1 .004 Fixed Condenser.....	.30
2 1 mfd Flechtman or Aerovox @ 60c.....	1.20
1 .907 Condenser.....	.35
1 .001 Condenser.....	.21
1 Lynch 2 meg. Resistor.....	.30
1 50,000 W.W. Clorostat.....	.90
2 2,000 ohm Electrad Suppressors @ 24c.....	.48
1 150,000 ohm Lynch Resistor.....	.30
4 General Radio 274-J jacks @ 5c.....	.20
1 Pair Plug-in Coils as specified.....	.70
1 R. F. Choke as specified.....	.35
3 General Radio 438 Sockets.....	1.05
1 Phone Jack.....	.30
5 Eby Binding Posts @ 9c.....	.45
1 General Radio 285-H Transformer.....	1.30
1 Oscillator Coil as specified, wound on bakelite form.....	1.50
1 Pair bakelite end plate for condenser mount as specified.....	.50
Hardware.....	.85

**\$16.39**

**COMPLETE KIT**  
Specially priced. Any parts  
sold separately as listed. **\$14.75**

Note above prices; approximately 40% discount  
has been deducted from the regular list price

**HERE IT IS —**

**A Classy Class "B" Kit**

A complete line of high grade trans-  
formers for the class "B" audio  
amplifier employing a 227, 2-245s and  
2-210s in the output stage, built  
specially for us by the Thomaston  
Laboratories. These units will give  
you an amplifier that is flat from 100  
to 5000 cycles, with the tremendous  
output obtainable only with this type  
of amplifier.

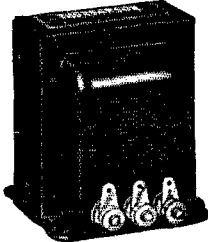
Double button microphone trans-  
former, list \$15.00, net price..... \$9.00  
227 plate to push-pull 245 grids,  
list \$12.00, net price..... 7.20  
245 plates to class "B" 210 grids,  
list \$14.00, net price..... 8.40  
Class "B" 210 plates to 5000 ohm  
load, list \$17.00, net price..... 10.20

**NATIONAL SETS — A complete line of short**  
**wave sets at wholesale prices in stock. Write for**  
**quotations.**  
R. E. L. No. 278 — Amateur receiver..... **\$28.50**

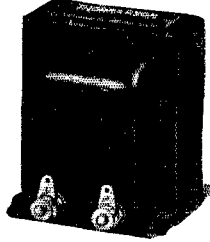
**Write for Circular**

# THORDARSON Pentode output transformers

T-4831



T-4843



**THE** Thordarson T-4843 output transformer is designed to couple the new single power pentode tube to the voice coil of a dynamic speaker. The turn ratio of the transformer is 30 to 1 and the impedance ratio is 900 to 1. The Thordarson T-4831 for push-pull pentodes has a turn ratio of 42.4 to 1, and an impedance ratio of 1800 to 1.

These transformers are designed so that the reflected load on the pentode is 8000 ohms when connected with a speaker whose voice coil has an impedance of 8.9 ohms. Sizes  $2\frac{1}{2}$  x  $2\frac{1}{2}$  x 3 inches. Weight — 2 pounds. Each, \$6.00.

For sale at all good Parts Dealers.

# THORDARSON

TRANSFORMER  
SPECIALISTS  
SINCE 1895...

**THORDARSON ELECTRIC  
MANUFACTURING COMPANY**  
500 West Huron Street Chicago, Ill.  
U. S. A.

CQ r " Rag chew desired  
CQ tfe " Traffic desired

and many others. For example, I would have a spare hour and would listen in on my set. I hear a fellow call: CQ CQ CQ e de W5 -. Being a true ham and willing to oblige a fellow friend, I would call him and perhaps hook up with him. It should be just as pleasing to me to give that W5 station reports on his various transmissions as it would be for him to find a chap willing to stand by and 'sacrifice' the opportunity to say 'QRU hr' to a dozen or so stations. And undoubtedly his reports on my signals would be much more exact and in detail than I would get from the average hook-up."

Fred: "Sounds good all right, but do you believe such a directional CQ would fetch any replies? I would say NO. I have tried it myself before. And another thing, do you realize that 98% of all newcomers to amateur radio get these revolutionary ideas but somehow or other they never materialize? Ham radio goes on just the same as before."

Bill: "Guess so, but can't for my life understand it. And how about the 'T' Tone System? It's not used as far as I know, but would not a report something like: 'Your sigs QSA4, R4, T5' convey more to you than just 'Ur sigs nde QSA4, R4'? Judge for yourself."

Fred: "To tell you the truth it would not, for like 99 99/100% of all the other hams I am not familiar with the Tone System."

Bill: "About time you should learn it then, for honesty is it excellent."

Fred: "You win. Why don't you write a letter to QST? The Editor is a personal friend of mine and would be only too glad to find some space for it in the W. P. B. You know, they have one of those in Hartford, too."

Bill: "Funny, aren't you? Anyway, I'll try it. Try anything once is my motto, so we shall see what we shall see. You can fool some of the editors some of the time, etc." . . . (Sat. nite, 10.00 p.m., E.S.T., N.B.C.)

CURTAIN

(If you have none, a clean handkerchief will do)  
— "QLC Ham Spirit"

## I. A. R. U. News

(Continued from page 63)

your YL's, OM's!" . . . . Charles K. Topping, CE1AH, was up to headquarters for a short visit during November. He has been a mining engineer in Chuquicamata, Chile, for more than fifteen years; an active amateur much of that time . . . . The N.R.R.L. informs us that interest in amateur radio in Norway is increasing, as is the quality and number of their stations. Nearly 50 transmitting licenses have now been issued, and N.R.R.L. membership has passed the 200 mark . . . . There's a mighty good story they tell of Robert Monnier, HB9R. It seems that he has been trying for a long time to work his first VK, but with a total absence of success. Finally, in what we imagine must have been something like

(Continued on page 90)

# UNCLE DAVE



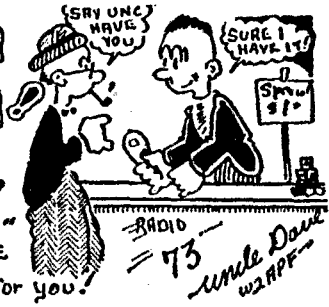
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Marco illum. dials, special.....	\$ .95
Edkon 2000 mfd., model condensers.....	.75
R.E.L. New short wave three, special.....	28.00
Samson 7.5 volt, 2.5 volt, 1.5 volt, .35 watt filament transformer. Beautifully encased No. 463 transformer, list \$18.00, Special.....	3.50
Samson No. 132, 200 volt c.t., 5 volt c.t., 40 watt.....	2.95
Benjamin adjustable sub panel brackets, per set.....	.60
New Jewell No. 107 tube checker.....	6.15
Arco Power transformer 1150 volt c.t., two 7 1/2 volt fil. winding, Special.....	5.00
Manhattan full wave rectifier tubes, 90 mills at 470 volts (no filament), 45 mills at 800 volts.....	.75
Ryder New Perpetual Service Manual.....	4.15
New Jewell pattern 135 0-5 volts, Special.....	1.95
New Jewell pattern 135 0-50 volts, Special.....	2.45
New Jewell pattern 33 0-100 volts.....	3.50
Hedgehog audio transformers.....	2.00
Monitor cans.....	1.15
Baldwin type C head phones.....	4.50
Baldwin type G head phones.....	4.95
Radio Amateur Call Books.....	3.85
Arco 860's, 1000 hours uncond. guar. Each.....	3.35
New U. S. Signal Corps type bugs (similar to the Vibroplex).....	9.65
Arco tube shields, complete.....	.39
Arco 10,000 ohm, 100 watt trans. grid leaks.....	.69
Arco 12,500 ohm, 100 watt trans. grid leaks.....	.69
Ward-Leonard 25,000 ohm trans. grid leaks.....	.95
Ohmite 5000 ohm, 100 watt trans. grid leaks.....	.55
Sangamo .0005, .0001, .0002, .00025, .0005, .001, .002, .0005 volt condensers.....	1.10
New sealed cartons RCA UX 865 tubes.....	13.50
New National 865 tubes.....	10.00
New Flechtheim 2 mid. 1500 volt trans. condensers.....	4.50
New Flechtheim 4 mid. 1500 volt trans. condensers.....	6.75
2 only W.E. photo-electric cells, each.....	7.00
New Cardwell .00023-3000 volt. var. trans. condensers.....	3.25
New Cardwell .00044-3000 volt. var. trans. condensers.....	6.25
New Orig. crates Esco 24-800 volts, D. C. Generator.....	34.00
Used 110 volt d.c. to 110 volt a.c. rotary converters.....	32.50
Samson Pam 19-20 amplifiers uses two 281, two UX 250, two UV 227 tubes, list \$175, our net price.....	46.50
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<b>Aluminum Panels</b> Cardwell 3000 volt trans. com. 1/16" thick, 1/2 sq. in. Type 147-B .00044.....	\$9.25
3/32" thick, 7/10 sq. in. Type 164-B .00023.....	3.25
1/8" thick, 9/10 sq. in. Type 123-B .0005 rec. cond. 2.90	
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Crystal blanks, unfinished.....	1.75

Special This Month Only. Dustproof Bakelite Crystal Holder with Each Purchase of \$4.75 Crystal

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2 mid. 3.50	2 mid. 9.50	2 mid. 12.50	2 mid. 12.50	2 mid. 14.00	2 mid. 14.00
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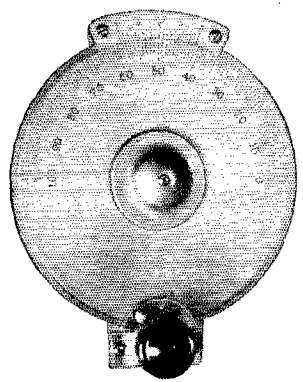
Long Distance Phone 4-5746

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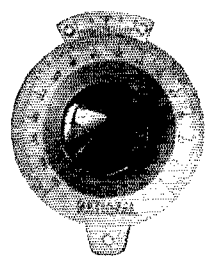
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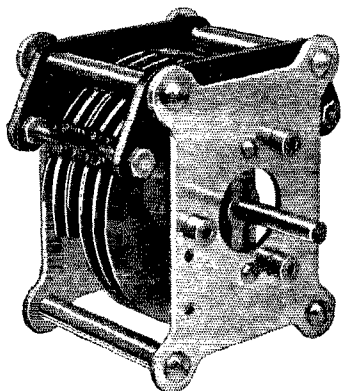
## The Communications Department

(Continued from page 60)

**SANTA CLARA VALLEY**—SCM, F. J. Quement, W6NX — Traffic handlers are the backbone of amateur radio. It is they that serve the public and it is through their untiring efforts that amateur radio gains prestige, so again I thank the brass pounders of this Section for the FB traffic handled. W6FEY is the US terminal of OMITB with a fine total of 357 trans-pacific messages. W6DRU is a newcomer. W6AMM continues with PI and Guam daily. W6YG is warming up with FB total. W6NJ is U.S.N.R. station at Santa Cruz. W6DSZ puts 400 watts into a '52. W6YU is certain to run up heavy traffic during school term. W6DCP, W6BMW, W6FBW and W6ALW all contributed nice traffic totals to help put the Section over. W6ACV is now Secy. of SCCARA. W6CEO is Treas., W6NX Pres. and W6HC Vice Pres. W6DDS had receiver trouble. W6FBU is back at Stanford. W6BET may go sea. W6BHY is recovering from sickness. W6HM is back at Carmel.

Traffic: W6FEY 357, W6DRU 343, W6AMM 284, W6YG 204, W6NJ 82, W6DSZ 59, W6YU 57, W6DCP 46, W6BMW 40, W6FBW 36, W6ALW 21, W6ACV 12, W6DDS 6, W6FBU 2.

**ARIZONA** — SCM, Ernest Mendoza, W6BJF — Don't forget the Arizona Short Wave Radio Club; it meets the first and third Wednesdays of every month, at the Phoenix Armory building, at 7:30 p.m. From now on calls will be listed in our report according to amount of traffic handled each month. Don't permit yourself to be listed at the bottom, or near the bottom, continuously. All ORS should be found right at the top, always. Let's give W6ALU a little competition now on traffic totals. The RI finally put in an appearance at Phoenix, after an absence of five years, and 23 men and 1 ex-YL (6BRI) took the exams for amateur first class, 3 the amateur extra first class (6CCU, 6EFC, and 6BJF), and 2 the limited broadcast. Several hams in Tucson also were given the opportunity to change their temporary permits into green tickets. W6ALU makes the BPL both ways. W6BJF worked nine foreigners, Hong Kong to Cuba, one after the other one morning. W6CKW handled his traffic on 3540 'phone exclusively. W6EFC is building a duplicate of his 50 watt crystal rig for W6HS. W6AWG keeps daily schedule with Los Angeles stations in order to keep in touch with his folks. W6HS, the RM, on various trips throughout the state on business, dropped in on W6DNP, W6EAW, W6EUT, W6CPF, W6DNE and W6FAI. W6CPF now has a crystal m.g. on 7070 kc. W6BLP received a crystal from W6CMQ. W6EKP has just had 500 cards printed. W6CEC has been off the air in preparation for his state fair exhibit of bees and honey. W6EFN reports a new ham, W6EEJ, in Ajo. W6BRI is doing a lot of rag-chewing with her little crystal heap. W6CAP is on with a '10 in TNT. W6AND is still waiting for a replacement adjustment on his '03A. W6EJN is waiting for renewal for his station license. W6CWI has a '52 ordered for his present '10 MOPA set. W6DSQ is a new 3500 kc. 'phone in Phoenix. W6DJH regained his license by RI's exams. W6BVN has been confined to her home by illness. W6CVR is making a new receiver. W6AWH occasionally pounds brass with his '04A. W6FAI and W6DNE visited the hams in Bisbee. W6CVW, old 5AGN of 5 years ago, is active again. W6AEK has a National converter. W6DKF, Parker of Hayden, is a newcomer to the 3500-ke. band. W6EEB of KGUP, Phoenix Skyharbor, has the power supply completed for his crystal 'phone. W6BCD tried MOPA PP with '01As, with excellent results. W6CFT departed from Tucson for southern California where he is engaged as a musician for a dance orchestra. W6DKU is an old timer in Mesa. W6DVJ is a radio service-man in Glendale. Old ex-6EAA (KTAR opr) is now W6CTI. W6COI has to devote all of his time to P. J. C. this winter. W6DXC is a private first class in the Nat'l Guard H.Q. Co. radio section. W6GZ teaches radio repairing in new night school class. W6AMV has moved to a new location. The fellows are invited to try out the new line of National receivers at Griggs', W6FEA. Ex-W6DWP has taken exams for licenses. W6EBP is the new call of an old navy operator in Phoenix, Bill McCabe, A.S.W.R.C. Vice-President. W6BHC has a crystal controlled, temperature controlled, 500 watt modulated by a 5-kw. tube, water cooled and fed by several large motor-generators; a couple of 60 foot lattice towers; and condenser "mikes"; but luckily for other hams nearby it operates in the broadcast band as KOY! W6DJH, W6DRE, and W6AWG keep the wheels



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turning and the records changed! W6DOW has just returned from Detroit where he saw the Legion Convention in full swing. W6DRX has a beautiful dynatron frequency meter. W6DIE has the mercury arc automatic tipping mechanism and power supply all finished for his revamped '52 transmitter. W6DNP and W6EAW, both of Prescott, are active on the air now. W6DUQ is a professor at Tempe Teachers College. W6EUT is either sick of his new multi-tube crystal heap, or else love sick. W6BEP is being coached in the art of short-wave radio by W6EJN. W6BYD is getting out better than ever with his 3500 kc. 'phone.

Traffic: W6ALU 642, W6BJF 168, W6CKW 84, W6EFC 52, W6BCD 39, W6AWG 39, W6HS 33, W6CPF 31, W6BLP 28, W6EKP 17, W6CEC 16, W6CWI 15, W6EFN 14, W6CVW 12, W6AND 5, W6AEK 4, W6CAP 3, W6BYD 3, W6BRI 1.

**PHILIPPINES**—Acting SCM, I. S. Liner, KA1SL—This report received via radio by W6ALU and mailed to HQs. KA1HR makes BPL. KA1CM is picking up momentum. KA1SP is also getting under way. KA1SL is trying to do too much at once.

Traffic: KA1HR 1524, KA1CM 125, KA1SP 112, KA1SL 51.

**HAWAII**—SCM, L. A. Walworth, K6CIB—K6YAL will soon be percolating on 14-mc. c.w. and 3.5 mc. 'phone. K6CQZ, formerly W6CQZ, is pounding out regularly on 7 mc. K6CXY is on 'phone again. K6ELN and K6EXP are using crystal 'phones. K6DPP is the old standby for mimeographing the SCM bulletins. K6ENE is with RCA at Kokohead receiving station. K6EBR will direct the Army Amateur Net in Hawaii which functions from 8:00 to 9:00 p.m. H.S.T. each Monday. K6ALM copies press regularly for one of the local Japanese dailies. K6ALM and K6COG will probably be the next candidates for SCM. Dr. O. E. Wall, veteran Ham of King spark days, having used K6DB for years, has installed a crystal 7-mc. c.w. and is using K6DJG at his Lanakai Beach home. K6LR, K6AUQ, K6DTI, K6DSF, K6BFI, K6BHG, K6ACH and K6ANA are new calls. K6DMM is back from the coast. K6EXP has been having trouble with his new Oscillator-Amplifier 'phone. K6AYD of Makawao is sticking by the guns with 'phone. Not a word has been heard of K6DPG since he went to the University of North Dakota to study medicine. K6CRW was heard on the east coast last summer according to Oct. QST Calls Heard. K6COG is still the most consistent station in Hawaii, though FCX runs him a close second. K6DV staff have been on furlough and in maneuvers. K6CIB lost his 50-foot mast during a wind storm, but the three broken guys had clear, plain phier cuts. The K6YAL Club are writing a round robin letter to K6ERH who is attending a radio school in Chicago.

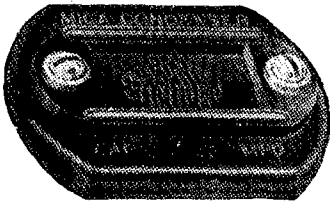
Traffic: K6BOE 325, K6AUQ 57, K6BAZ 38, K6COG 20, K6AYD 16, K6ELN 4, K6EDH 3, K6CIB 6, K6CRU 3, K6CCS 1.

### ROANOKE DIVISION

**WEST VIRGINIA**—SCM, C. S. Hoffmann, Jr., W8HD—W8BDD and W8CXR have new crystal jobs. W8BOW and W8CSF have new push-pull rigs on the air. W8IB has commercial license. W8DPO is working numerous "G's." W8TI is going to handle lots of traffic. W8BOW got a first-class ticket. W8BTV reports coming home for Thanksgiving. W8OK has been busy, due to wife's illness. W8WK reported again selling out! W8HD is working 6's and 7's on 3.5 mcs. W8BWK and W8CSF are inquiring for schedules. Welcome to Old-Timer W8ADI, our new ORS! Good traffic outlet for foreign messages is W8DPO, and for the West Coast, W8HD. W8CWY is a new ham in Wheeling. W8EGS is new amateur in Shinyston. W8FJS is portable call of W8BWK, W8ZZH portable of W8IB.

Traffic: W8OK 78, W8IB 31, W8HD 26, W8BOW 10, W8TI 4, W8BWK 4, W8ADI 4, W8CVK 4, W8DPO 10, W8ELO 1.

**NORTH CAROLINA**—SCM, H. L. Caveness, W4DW—We want to welcome three good hams home: W4AHS back from RCA in Philadelphia, W4AAE back from a radio school in Texas, and W4RE back from a search for health up North. The most active station in the state, so far as we know, is W4AOE, who makes the BPL this month, and incidentally W4AOE is the second station to make it since W4DW has been SCM, W4AIS having made it last month. Congratulations. W4ATC is getting into the traffic game also, but too late to make such a big showing this month. W4ZH says the 14-mc. band is so dead it smells bad. W4TJ



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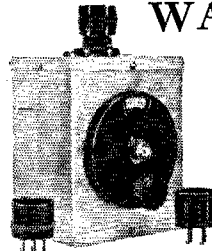
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Relay League  
West Hartford, Conn.**

drove his motorcycle into an automobile, and now he is walking on crutches. W4AVT is organizing a radio club in the high school of his home town, and is making some good operators out of those high school students. W4TU now has an '03A as final amplifier in a crystal outfit. W4RE is also on both 7 and 3.5 mc. with crystal, and welcomes traffic for any destination. He reports W4ALK, a new ham in Tarboro. W4RX explains that his activity this month has been nil, due to QRM from a baby girl who is just beginning to develop her lungs at his home. W4TR recently made contact with his thirtieth country, but still none of them in Asia. The Naval Officer discovered minor physical defects in W4AEL, so he is still with us and has been working some VKs. W4BX sends in a nice report, saying that he is on now with crystal and wants traffic. W4MR complains about the small number of stations in the state on 3.5 mc.; says it is almost impossible to deliver traffic except by mail. W4QO is also back on the air after having moved to Greensboro. W4ABW has been DX hunting. W4DQ spends his time experimenting. W4IF has been adding QRM to the 3.5-mc. 'phone band with some '10s, but he gets out. On November 8th W4DW worked all U. S. districts and one Canadian on 3885 kc. W4AK, W4TR, W4EC, and W4GA visited us this month. W4OC has added a 250-wattter as modulator for his 3.5-mc. 'phone, and has built a crystal outfit for 14-mc. work. W4RV is getting very good results with his two '10s in push-pull in the final stage of his crystal transmitter. W4UI is gradually accumulating parts with which to rebuild after having sold out completely. W4EG, W4ANU, and W4VI are getting ready to rebuild into crystal-controlled outfits.

Traffic: W4AOE 241, W4DW 109, W4MR 51, W4TU 39, W4AEL 35, W4BX 25, W4TR 21, W4IF 20, W4ATC 17, W4RE 8, W4ABW 2, W4AGF 2.

**VIRGINIA** — Acting SCM, R. N. Eubank, W3AAJ — R. M. S. T. Terry, W3AGH. Want to thank every man for wonderful cooperation. It makes my first month as Acting SCM fine. W3AGH and W3HL are rebuilding. W3HJ is new station in Franklin. W3BBE is new station in Dryden. W3YD is putting code class on three times daily. W3ZU is new ORS. W3MK is working in Richmond. W3CFL kept schedule with W3AVU, Yorktown Sesqui. W3TN shut in for year. W3APT applies for ORS. W3ASA and W3AMB operated W3AVU at Yorktown Sesqui. FB. W3AUG is Secretary of Hampton Roads Radio Association. W3WO is handling Western Section FB. W3FJ is A. A. R. S. Net control now. W3NT has DX schedules. W3BJX is helping a lot. W3AEW is rebuilding to crystal. W3BUY wants schedules. W3BFR is new traffic man. W3RS is going to school at Manassas. W3BDQ handles traffic. W3BTM, a new ORS, is getting another. W3AQK says watch them next month. W3EJ-W3BAI will handle W3ARU end. W3CA is on air and reports. W3MQ, Asst. RI, is operating part time. W3ANM reports U.S.N.R. traffic. W3AVY is on 'phone and CW. W3BSM, new station, reported traffic. W3BSB works DX with an '01A. W3BFD let license expire. W3BRY asks to be put on inactive ORS list for two months. W3BAD and W3BLE are handling traffic for Western Virginia. W3BGS is changing from MG to Rectifier. W3CXM's MG burned out again. Richmond's YL, Miss Gwynn, has license and will be on soon. W3BRA will also be on soon. W3IE is in Washington now. W3ADD is on some. W3BUR is doing his bit. W3IQ sends nice news. W3AAR can't use antenna in new location. Twenty-five from Richmond Club attending Norfolk Club Hamfest November 21st-22nd. Grether, W3NO, put the ball rolling for club. He is President; Turner, W3BEK, Vice-President. Virginia needs a FEW more ORS. Traffic men, write SCM or A. R. R. L. VIRGINIA QSO party every Sunday, 2 to 5 p.m., 3500-ke. band. Join us. VIRGINIA NETWORK very fine. Schedules moving traffic. See reports. Write SCM, W3AAJ, for maps, schedules and information on above. W3BRY is getting Lynchburg Club under way. W3WO is forming club at Fincastle. Norfolk Club has eighty members including Portsmouth, Norfolk, Suffolk, etc. Richmond Club is showing more activity than ever. Prizes at meets do it. Clubs or would-be clubs, write W3AAJ or A. R. R. L. for organization, program information, etc. Is your club affiliated with A. R. R. L.???? DO SO NOW. W3FJ loaned transmitter for Yorktown Sesquicentennial. W3WO and W3NT are assistant route managers, with W3AGH as R.M. W3TN and W3AUG are interested in 56-mc. work. W3BAI is getting wallop with '47. W3EJ is doing good work. With such cooperation in Virginia, we are headed for the top.



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### ROCKY MOUNTAIN DIVISION

COLORADO — SCM, E. C. Stockman, W9ESA — W9DNP is busy at KVOR. W9GBQ is on the air again after short absence while moving outfit to another room. W9FQJ and W9EDM are rebuilding for 3.5-mc. 'phone. W9FQK is teaching at Wellington. W9BCR is busy at school. W9APZ received license renewal. W9EFP is shucking corn. W9DQD is operating at KFXJ. Ex-W6CEB moved to Grand Junction. W9BRZ is building AC receiver. W9EAM is doing nice job in A.A.R.S. and ALN nets.

Traffic: W9ESA 108, W9EAM 89, W9GBQ 58, W9GNK 41, W9DNP 21, W9BJN 17, W9FCK 16, W9FQJ 8, W9CWA 3, W9DQD 2.

UTAH-WYOMING — SCM, C. R. Miller, W6DPJ — W7AWZ continues his good work. W6DAM has a very fine find note on 3.5, 7 and 14 mc. He, W6DWH, W6EYS and W6DPJ are now "Red Lots" in the A.A.R.S. W1ZZA has a new dynamotor. W6BXT was very busy directing a play. W6EXL rebuilt to 15 watts push-pull. W6BSE gets better reports since his chirp left. W6APM blew his '80 rectifier. W6VBB likes his MOPA. W6CRX is new man in Grantsville, Utah. W6EYS has a new MOPA. W6AHD, in Cedar City, starts the ball rolling in southern Utah. Keep it going, OM. School keeps W6DPO away from the key. The YL keeps W6CRS on the run. W7HX reports conditions bad on 3.5 mc. W7AAH has very little time for radio.

Traffic: W7AWZ 66, W6DPJ 63, W6DAM 39, W1ZZA 23, W6BXT 8, W6BSE 7, W6EXL 7, W6DPO 4, W6APM 4, W6EYS 1.

### SOUTHEASTERN DIVISION

ALABAMA — SCM, Robert E. Troy, Jr., W4AHP — W4RS leads the state with a very PB total. W4ASM is keeping some fine schedules. Another good worker on the A.A. net is W4KP. W4FI has two very fine crystal-controlled transmitters located under the W4PI towers. We welcome W4AZE at the U. of A. He is W2BJF at home in Brooklyn. W4AZH is building a new receiver. W4LT has moved to Dothan, Ala., and has a new call, W4PCD. W4AV is in Baton Rouge, La., using his portable call W4ZZA. W4AIZ uses his spare time running a motorcycle around the country. W4AKM is on the air now. W4HB is on the air in Montgomery, having moved down from Birmingham. W4AP is getting on fine. W4AEZ is still operating his 'phone with more or less success. Your SCM wishes each of you a most successful New Year.

Traffic: W4RS 101, W4KP 16, W4ASM 43, W4AZH 2, W4AP 12.

GEORGIA-SOUTH CAROLINA-CUBA-ISLE OF PINES-PORTO RICO-VIRGIN ISLANDS — SCM, J. C. Hagler, Jr., W4SS — W4JD comes to the front this month with a fine total. K4RK is runner-up. W4AUI comes in third. CM8YB holds schedules with W3SM-W3YD-K4ACF-HH7C and H18X. W4CE paid a visit to Bristol and Roanoke, Va. W4AFQ finds time to work some between tricks at the airport in Spartanburg, S. C. W4AXB sends in a nice traffic report handled on 'phone. W4AAY has a new MOPA. W4SS has a 7-mc. outfit on the air now. CM8UF is leaving Cuba by January 1. W4ACE reports by radio direct to the SCM. W4ACQ is rebuilding. W4AJH is active on 3.5 mc. W4AAS made the Lanier High Club and Honor Roll last month. W4WB worked ON4AU and PY1FF on 14 mc. W4ST has a new Zepp. W4UF broke a crystal. K4RK is located in the spot made famous by K4KD. He sends lots of news from P. R. and V. I. Mayaguez apparently leads the Island in amateur activity, in numbers of stations at least at this time. Most active is K4RY with the well-known PP TNT with two '45s. Other stations more or less active are K4KC and K4AAV. In San Juan, K4RJ does considerable work and K4UG is heard occasionally. W2FN will be on the air at Guaynilla by the time this is in print, using portable call K4PCI. We would like to see more reports from the V. I. as well as P. R. and Cuba. How about it, fellows?

Traffic: W4JD 324, W4AUI 104, CM8YB 66, W4CE 46, W4AFQ 32, W4AXB 29, W4ABP 27, W4AAY 27, W4SS 22, W4MA 14, W4DV 11, CM8UF 11, W4ACH 10, W4AJH 7.

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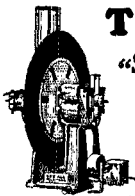
W4ACQ 8, W4WB 4, W4BW 4, W4PJ 3, W4GY 3, W4ST 2, K4RK 130.

**WESTERN FLORIDA**—SCM, Edward J. Collins. W4MS — Route Manager W4ACB-W4PCN. W4KB leads the traffic this month with that very FB 'phone of his. Congrats. W4AGS also turns in a nice total. W4AXP visited the Pensacola hams this month. W4AAX is working on a still better crystal 'phone. W4AXF had her 'phone perking. W4QU has a low-power 'phone. W4SZ has a real 1932 note. W4AUA is getting his U.S.N.R.F. unit underway. W4QR has been busy with his fto business. W4ACB has a nice new crystal rig underway. NDD-W4HQ has moved into a new location with two 150-foot masts. W4AUW reports that he is on 14,000 kc. on Sundays. W4AUW is rebuilding again. W4ASG has gone 'phone for the time being. The Marianna gang want the next hamfest held there. What say, fellows? W4AFT has two ops. One is getting married to a YL that is interested in ham radio. The other is building a new station. W4SC still pounds out all over the country. W4A00 is rebuilding again. W4UW-W6NO paid W4AQY a visit. W4AXQ is moving to Alabama. W4PCN is really a keen-looking portable rig. The YLs have completely taken over W4MX. W4AWJ is very silent. W4ART still works the DX. W4ARV really handles the traffic with his low power. W4UW gets out better with his new antenna system. W4ALJ and W4ADV are on active duty at NAS. W4ATN has a new push-pull rig. W4FV-W6CXZ worked an African on 7,000 kc. W4ASV has power trouble — with his Dad. Hi. W4PBW is making numerous tests all around West Florida. W4QK is having trouble getting on the air at his new location. W4VR is driving a new Ford. W4PN is very busy with his road job. W4MS rebuilt the 7,000 kc. transmitter. Come on, fellows, let's make our little section show them how CU on the air and 73.

Traffic: W4FV 30, W4AGS 21, W4AUW 9, W4KB 57, W4UW 3, W4ASV 6, W4QU 5, W4ARV 8, W4SZ 2, W4ART 2, W4MS 27, W4AXP 2, W4ATN 4, W4AXP 2, W4AXQ 11.

**EASTERN FLORIDA** — Acting SCM, Ray Atkinson, W4NN — And here it is. To those who have contributed to this, our greatest total in years, I extend my personal congratulations. Take a deep breath and then glance at the totals. The place of honor goes to W4AEM, Jacksonville, who made the BPL, closely followed by W4VP, Daytona Beach. A close third is W4AKW, RM at Miami. W4NN was hard after W4AKW. Hi. W4AHE reports that stations W4QY, W4ATX, W4KY and W4LX are active in Ft. Meyers. W4MM is on the staff of WFLA along with W4AKA. W4TK says everything gone to the dogs. W4AER is on an RM with transmitter. W4TQ wants 'phone schedules. W4AAB, RM at Gainesville, will help you to get schedules. W4AHH worked five W6's out of six called. W4SK wants schedules. Only one station reported from Tampa, a 'phone, W4ABL. W4WS is another 'phone who is doing his share of message work. W4FB is building crystal MOPA. W4LA. Miami Amateur Radio Club station, says Miami is always ready to boost traffic and will always QSP. W4AON is stepping out. W4A9N shoves that '45. W4ABZ worked CTIAZ on 7 mc. W4HY shot in some traffic. W4SQ has moved to Hialeah. W4ZU got his transmitter going November 15th. Lakeworth Amateur Club station W4AWO is one of the most consistent in Florida. Clarke at W4BG, U.S.N.R. station, reports increase of traffic. W4AXY handled messages to newspaper convention via W4KM in Ft. Pierce. A splendid hamfest was held in honor of Captain M. L. Jones, Radio Aide to the Signal Officer of the Fourth Corps Area, at W4AMQ, Tampa. Those attending were W4ABA, W4FF, W4ACZ, W4ASQ, W4WS, W4ATG, W4AXY, W4AIV, W4GS, W4ARV, W4ADB, W4PT, W4AMQ, W4ABL, W4BN, W4OZ, W4SM, W4R1 and KGAW. The Army 'phone net is working 100% at present. W4GR says DX FB as is flying. W4ASR has bad QRM from a new baby. Congrats to the mother. W4UJ will soon have crystal MOPA. W4AGB, YL, says not much time for radio. According to W4EQ traffic is getting hot, W4FZ agrees with him. W4PI and his pipe. W4AZB is now on the air. W4KK reported direct to HQs. Several ORS and OBS have not been heard from in the last two months. If inactive, please inform me at once. We want reliable stations for OBS and OO. Please write. Watch our totals skyrocket.

Traffic: W4AEM 254, W4VP 123, W4AKW 110, W4NN 102, W4BG 90, W4AWO 67, W4ABL 54, W4WS 42, W4FP 47, W4EQ 35, W4AER 28, W4AFN 27, W4PI 27, W4KK 23, W4HY 18, W4AGB 16, W4SK 16, W4AXY 16, W4AQT 11, W4UJ 9, W4AFL 7, W4FZ 6, W4GR 6, W4ZU 5.



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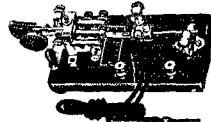
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F	250	750-0-750, 7 1/2 ct.	& 7 1/2	5.75
G	400	750-0-750, 7 1/2 ct.	& 7 1/2	7.45
H	150	350-0-350, 5, 2 1/2 ct.	& 2 1/2	3.75
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## WEST GULF DIVISION

**NORTHERN TEXAS** — SCM, Roy Lee Taylor, W5RJ — W5AUL, our Route Manager, is anxious to have all hams that are interested get in touch with him at once. W5WW reports new Dynatron. W5AZC, a new reporter from Dallas, is handling his share of traffic. W5RJ still pounds out a few. W5BJX seems to be Wichita Falls' main traffic station. W5HY is on once in a while. W5BII reports QRL school work. W5BKH has a low power rig now having graduated from his flea power rig. Hi. W5BAM reports the arrival of BAM, Jr. Congratulations, Gene. W5AXK reports everything OK. W5CF has a new National SW3 on the way. W5BYF is another new addition. W5BNO has a new gutter pipe antenna. W5AID is building a new a.c. receiver. W5BXW is installing new crystal rig. W5ZC, our Director, comes through with a report. W5ARV is working everything he can hear. W5BIV reports for the first time. W5BSY has been working DX. W5AYX is still handling traffic, also W5APD. W5AGE is a new ham in Wichita Falls. W5BIF is proud possessor of a commercial ticket. W5AVF says that Groves of W5NW (Soupy) is now located in Jacksonville. W5ANU says too cool for DXing. W5BAMZ is also located in Jacksonville. W5LY has sold out and is rebuilding a *g i n*. Hi. W5BUH is pounding away. W5QU is QRL at A. and M. college. W5QA has worked 20 VK and ZLs since last report. W5AUJ reports working all districts on 7 and 14 mc. W5CAM reports for the first time and wants dope on reporting. He also says W5LF and W5AXT are new hams in Dallas. W5AZX-BXY is laying for VKs. W5AAO plans a 100-watt push-pull job real soon. This is a very nice report, fellows, and I appreciate it very much. Keep after your friends and let's get the reports going like they should. Don't forget the prize the SCM is giving for most traffic handled (a new 210 tube); also the Handbook offered by R.M. Talbot for the first station in Northern Texas to break into the BPL. Let's go.

Traffic: W5AUL 130, W5WW 84, W5AZC 66, W5RJ 36, W5BJX 19, W5AAO 21, W5HY 18, W5BII 18, W5BKH 17, W5BAM 17, W5AXK 17, W5CF 10, W5BYF 9, W5BNO 6, W5AID 4, W5BXW 3, W5ZC 10, W5ARV 14, W5BIV 2, W5BSY 52, W5APD 1, W5AYX 3, W5AVF 13, W5QY 3, W5BUH 7.

**NEW MEXICO** — Acting SCM, Warren M. Andrew. W5AIE-W5ZZA — W5AUW turns in another nice total. The high wind got one of W5AIE's poles. W5AOE says the new a.c. receiver is the berries. Let's have some reports, fellows, especially from Clovis and Roswell.

Traffic: W5AUW 364, W5AOE 1, W5ZZA 2.

**SOUTHERN TEXAS** — SCM, H. C. Sherrod, Jr., W5ZG — Each day sees the advent of more and more amateurs. This report contains quite a few newcomers. You who are primarily interested in short and medium distance 'phone communication should give more consideration to the 1750-kc. band than you have in the past. The proper selection of an operating channel best suited to your individual requirements would result in general and mutual benefit. For short and medium distance communication the 1750-kc. band is unexcelled, due to its almost complete lack of interference. Houston: W5CBV and W5IG are experimenting with the shove and jerk system of modulation. W5BTD is on now and then with 'phone and c.w. W5CBL is off due to the sudden and complete departure of his filter system. W5CAJ has increased power. W5AZR is on occasionally. W5ON has increased power to two '10s. W5AXH is on 3.5-mc. 'phone now. W5BKW has been dividing his time between 'phone and c.w. W4AU recently visited W5ON. W5RHO, Secretary of the Houston Amateur Radio Club, has a number of QSL cards for Houston amateurs. Missouri City: W5BKY-W5UW is using two '10s in MOPA on 14 mc. Richmond: W5AEA is back on after an extended illness. Sugarland: W5EW is on 14 mc. with an excellent crystal note. W5LB, brother of W5EW, also operates. Noxville: W5HX has been QSO all U. S. Districts, Canada 3, 4, and 5, and Mexico. Corpus Christi: W5BKG, competent Secretary of the Corpus Christi Radio Club, sends a nice report. W5ALV is working on 56 mc. W5ZN is rebuilding his station. W5BZP is on the air with a nice d.c. note. W5AQK and W5BKG will shortly be on with crystal control. W5AGG is on the air when he is not busy with the YL. El Paso: W5ES reports by air mail. Kerrville: W5BKE, one of the best ORS in the Section, is building a fifty watt crystal controlled rig. W5BKZ is on. W5BSF also has a new rig. Austin: W5CT is now a member of the A.R.R.L. Net for the American Legion. W5KA and W5WB are crystal controlled now. W5BXH is now on 1750 kilocycles. W5BB is rebuilding a 100 watt

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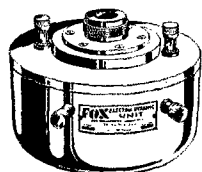


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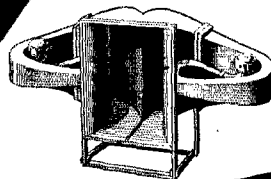


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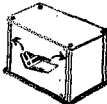
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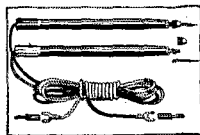
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 Always sharp pointed, using phono-graph needles, 4-ft. wires, spade or phone tips. Colored nipples identify each lead. \$1.50 pair.



MOPA. W5VV is also going again. College Station; W5BWB is a newcomer. Hutcheson, Secretary for the A. & M. Radio Club, reports for W5AQY. San Antonio: W5BVG sends in the usual complete report. W5CCF sends a nice report. W5VL is broadcasting the S.A. Club news and rebroadcasting the official broadcasts on 3500 kc. phone. W5CS is doing the same on c.w. W5ABQ is working on a 75-watt 56-mc. rig between times at KMAC. W5BQH has a '71-A on one meter. W5RV has been working VK8S and ZL's. W5MN is back on. Hasbrook has W5CCF going fine at S.A. Jr. College. Ex-W5AFX is threatening to come back. College QRM was too much for W5BWM. W5EU is back after many moons. Randolph Field: Smith and Muller have been moving W5AUC out to Airport City and rebuilding it simultaneously. Let's try to use more of our bands and conscientiously try to move your traffic: Don't leave it on the hook to die.

Traffic: W5CT 32, W5CCF 7, W5BVG 5, W5AQY 133, W5BKE 133, W5ES 3, W5HX 1, W5BHO 62, W5BKW 15.  
 OKLAHOMA — SCM, Wm. J. Gentry, W5GF — W5VQ still is the going thing. W5NF is back on the air. W5AEG is waiting for power transformer. W5BEE is working some nice DX. Chief Operator Hicks of the Tulsa Police Station is waiting for his call. W5AYF is using crystal. W5PL wants an outlet for traffic in Okla. City. W5BOZ worked a K6. W5ATB has been overhauling his transmitter. W5ALF has his '52 perking on 14 and 7 mc. W5ZZF is a new reporting station in Blackwell. W5BOE has some nice schedules. W5BMU has a nice report. W5ALD has his new rig ready to go. W5BPM has ordered a new National receiver. W5AAV is trying to make a dime or two for the beans. W5QL is busy running down interference with W5GF. W5BSS has a new rig about ready to go.

Traffic: W5VQ 651, W5BMU 57, W5BOE 27, W5ALF 19, W5PL 14, W5BOZ 12, W5ZZF 11, W5BEE 8, W5ATB 6, W5ALD 6, W5BPM 6, W5GF 3, W5NF 3.

## CANADA

1931 has been a banner year. Our traffic totals increased 30%. Licenses issued increased 15%. Enthusiasm and cooperation are 100%. We look to 1932 with optimism and hope that a trans-Canada route will soon be in full swing. Our idea is to have at least one station on 3500 kc. each night in every large city of our Dominion to pass traffic along. SCMs and RMs kindly boost 3500-ko. trans-Canada routes for 1932. I wish to thank members for their confidence placed in me by re-electing me for another term; and to extend to you all best wishes for a bright and prosperous New Year.

CANADIAN GENERAL MANAGER  
 ALEX REID, VE2BE

## MARITIME DIVISION

NOVA SCOTIA — SCM, A. M. Crowell, VE1DQ — Reporting card for station with highest total was forwarded to HQs late without call letters. So we'll have to say, VE1?? leads the Section and wishes the gang would all report their traffic so our Section will make a better showing. VE1AG is rebuilding. VE1AK still pounding out with high power phone. VE1AX has the big 212-D modulating on 3.5. VE1BL is still on 7-mc. CW. VE1BV is swatting out on 7 and 14 mc. VE1CY is a new call on the 14-mc. band. VE1DR at Glace Bay is still going strong. VE1DQ has worked ZU, ZS, G, F, K, CM, TI and BYX during the past month. IMPORTANT NOTICE — ALL CONTESTANTS FOR THE C.H.N.S. SILVER TROPHY ARE ASKED TO SUBMIT THEIR QSL CARDS NOT LATER THAN JANUARY 31st FOR CHECKING AND JUDGING. THIS BEAUTIFUL SILVER CUP WILL BE AWARDED TO THE AMATEUR IN THIS DIVISION WORKING THE GREATEST NUMBER OF STATIONS DURING THE YEAR 1931. SEND IN YOUR CARDS FOR VERIFICATION.  
 Traffic: VE1?? 55, VE1DQ 14

## ONTARIO DIVISION

ONTARIO — SCM, H. W. Bishop, VE3HB — Zowie! Look at our traffic. VE3GT, RM, makes the BPL. FB. VE3JL and VE3IX are new stations in Toronto. VE3IR has a wonderful increase in his traffic. He introduces VE3JB of Deloro. VE3ZZ blew the works. VE3AD is QRL



## EASTERN AMATEUR HEADQUARTERS

WE don't make a lot of false claims, but sell only new, first-class merchandise. We guarantee it fully.

- |  |         |
|--|---------|
| 845 Modulator Tubes  | \$15.80 |
| 203A Oscillator Tubes  | 14.80   |
| 211 General Purpose Tubes  | 14.80   |
| 866 Mercury Vapor Tubes  | 4.50    |
| 866 Filament Transformers  | 4.35    |
| Modulation Output Transformers                                   | 7.00    |
| Class "B." 3000V Insulation for 210 Tubes                        |         |
| In-Put Transformer for above                                     | 4.90    |
| Plate Supply Transformer   | 3.80    |
| For speech amplifier, having the required regulation             |         |
| Plate Supply Transformer   | 11.00   |
| For modulator and Class "C" R. F. Amplifier. Has good regulation |         |
| Modulation Reactor, 30 Henries                                   | 11.00   |
| at 150 MA, Special Alloy Core                                    |         |
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15 TO 30 WATT PHONE AND C.W. IN  
BEAUTIFUL WALNUT CABINET

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 toned walnut cabinet. Has ample space for AC power supply. Price includes one Stromberg-Carlson microphone.

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

**ATTENTION HAMS:** Why waste a lot of money on paper condensers when electrolytics are better, cheaper and self heating? Mershon 8 Mfd. Electrolytic Condensers, 500 volts \$5.85. A series of four of these condensers will give 2 Mfd. at 2000 volts.

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Midget Power Transformer, 3-227 or 224 tubes, 1-247 or 245 and 1-280 tube, 700 volts C.T. Ideal for low-powered transmitters. \$1.95

**Smallest Completely Shielded Screen Grid Coil available—\$5.55 each — matched set of 3 — \$1.65.**

Aero Pentode Auto Radio . . . . . \$20.00

Uses four-236 tubes and two 238 tubes. We guarantee a thousand-mile radius. Price complete with tubes, dynamic speaker, batteries and suppressors. . . . . \$39.50

World Wide 2-Tube Short Wave Receiver, \$11.75. Complete with set of 6 clip-in coils. Covers 14 to 350 meters. Can be used with any standard base tubes.

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

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

AC-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. \$9.95 extra.

Aero Shortwave Converter Superheterodyne. Converts your AC or DC radio set into a short wave superheterodyne 15 to 200 meters. . . . . \$12.50

Send for Catalog

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*Since 1927*

#### AMATEUR FREQUENCIES

1715 to 4000 Kc. . . . . \$7.50  
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Blanks (1 face and edges finished) . . . \$2.50

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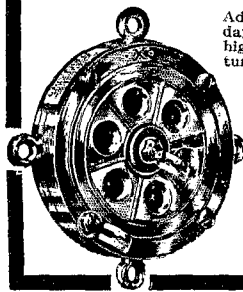
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a practical  
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holder  
with  
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at a  
low price  
Write for  
details.*

## Herbert Hollister — Merriam, Kansas

*Merriam, Kansas is a suburb of Kansas City, Mo.*

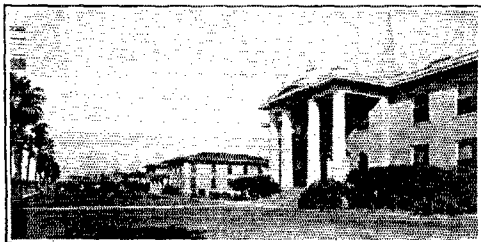
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NEW 2-BUTTON MICROPHONE \$10.00



Advanced 1932 superiority at today's rock-bottom prices. Same high standards, same exclusive features. Pure gold contacts. Duralumin diaphragm. Is exceptionally rugged. Model X sets a new high standard for quality, at a price that defies competition . . . For sale by dealers everywhere . . . New Catalogue with diagrams now ready.

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Say You Saw It in QST — It Identifies You and Helps QST



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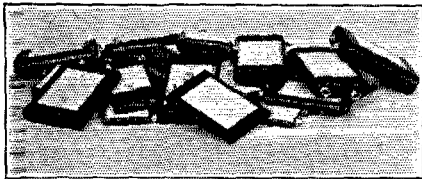
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25 uncased highest quality filter condensers, assorted sizes, all voltages ¼ MFD to 2 MFD in 200 and 600 D.C. working volts.



List value \$25.00  
**SPECIAL \$8.95**

Only one assortment to a customer

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Power transformers all sizes **75c** up.

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(Eighth Edition)

### DIRECTIONS:

Realizing that Handbook must be had, proceed as follows:

- (1) Fill out below, tear off.
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A.R.R.L.  
38 LaSalle Rd.,  
West Hartford, Conn.

SEND IT AT ONCE.

(Name)

(Street or P. O. Box)

(City and State)

with traffic. VE3GP is having trouble with traffic for Ontario. VE3DW, the happy combination, has a new filter. VE3GK, another contented duet, are very QRL. VE9AL is busy flying. VE3IH has rebuilt. VE3CD is a new ORS. VE3BV reports that VE3HG has QSY'd to Welland. VE3II has a new junior op. Congrats. VE3DB wants the gang to try 1.7 mc. for traffic. VE3AU is QRM Varsity. VE3AA is playing with 56 mc. VE3TT is building a PP job for traffic schedules. VE3DC is on again at the farm. VE3BT is showing some activity. VE3SA at Ottawa reports for the first time. VE3HN is QRL with school. VE3EI is rebuilding. VE3IS is coming with an MOPA. VE3FU schedules VE3CP. VE3HA is back from the OFB. VE3HC has something new in PP. VE3HB paid a visit to the Toronto hams. VE3HZ has been very sick.

Traffic: VE3GT 721, VE3IR 203, VE3ZZ 194, VE3AD 124, VE3GP 77, VE3HB 36, VE3DW 57, VE3GK 23, VE3AL 17, VE3IH 15, VE3CD 10, VE3BV 6, VE3DB 4, VE3AU 3, VE3TT 3, VE3AA 3.

### QUEBEC DIVISION

QUEBEC — SCM, Alphy L. Blais, VE2AC — Congratulations to Alex Reid, who has been reelected Canadian MS General Manager. The amateurs of Westmount have formed the Westmount Radio Club. Please drop VE2BB a line occasionally for his report to R.S.G.B. The B.T. Company is pushing VE2BZ all around the Province. VE2DL in Quebec operates the Signal Corps Station. VE2CID is looking for schedules with Montreal. VE2CA is busy building a crystal rig. VE2CL is having transmitter trouble. VE2BG, VE2HV, VE2AL and VE2LG, 'phone stations, are heard QSA5 down here regularly. VE2AG is using push-pull. VE2AP helps out with wonderful report on Westmount Club work. VE2BH uses 75-watt crystal outfit. VE2BO is on 'phone on 14 and 3.5 mc. VE2CU is building for 'phone. VE2CO is on 'phone also on 3.5 mc. VE2CX is working on 28 mc. VE2DX uses 'phone on 3.5 mc. VE2EM is exclusively crystal control on 3.5-mc. 'phone. VE2CG is coming back on the air. VE2AC keeps test schedules, Sundays, on 28 mc. Future QRG is 28,480 kc. ORS numbers 1 to 5, please send in your ORS certificate for reappointment and signature of SCM. Special notice: ORS failing to report will have their certificate annulled. No dead wood will be put up with in this division. And now we wish you a Merry Christmas and a Happy New Year.

Traffic: VE2AC 80, VE2BB 63, VE2AP 38, VE2BO 8, VE2CU 5, VE2CA 5, VE2CO 33, VE2CX 24, VE2DX 2, VE2CL 4, VE2BE 28.

### VANALTA DIVISION

BRITISH COLUMBIA — SCM, J. K. Cavalsky. VE5AL — VE5AM is very busy. VE5FI has been out of town. VE5AG is pleased with new Hartley. VE5BC says 2 volt tubes don't last long when you try them on six. VE5FF has big ideas of 3 transmitters. VE5AL can't get on in the p.m. on account of night shift. VE5DM is keeping a couple of schedules. VE5GT says the P.R. gang are trying hard to uphold the northern end of the "B.C. net." VE5FG is kicking out fine. VE5EI is operating at Usk. VE5EC reports for Victoria. VE5DV is on with a fifty. VE5EZ is having tube trouble and VE5CO antenna trouble. VE5HR handles some traffic. VE5BR is working several schedules. Let's get the "B.C. net" perking 100%.

Traffic: VE5AL 12, VE5AG 14, VE5AM 8, VE5DV 18, VE5EC 2, VE5HR 23, VE5FF 20, VE5FG 27.

### PRAIRIE DIVISION

MANITOBA — SCM, J. L. Green, VE4BQ — VE4BP has returned to the game after two years' absence. VE4DJ worked VK2TX and X1AX on 7 mc. VE4IS is losing plenty of sleep trying to raise Oceania. VE4DK is now using a 7-mc. Zepp. VE4AG, VE4IU and VE4IS are making good use of the 7-mc. band. VE4GB has recently arrived here from Churchill. A new station has been heard signing VE4CP. QRu from VE4IC, VE4FT, 4E4FN, VE4AE and VE4BU.

Traffic: VE4DJ 9, VE4BQ 1.  
SASKATCHEWAN — SCM, W. J. Pickering, VE4FC — VE4AT is on regularly. VE4CQ reports his first traffic. VE4BB is again Route Manager. VE4BF has been churning up the ether. VE4GR sends in news of the Saskatoon gang. VE4HX is now putting out a DC signal on 7 mc. VE4FD is on daily. VE4EJ is on at odd times. VE4DA is now in Saskatoon. VE4BA and VE4BX are back at University.

Traffic: VE4GR 4, VE4BF 2, VE4BB 1. VE4CQ 1.

# Sending Is *EASY*

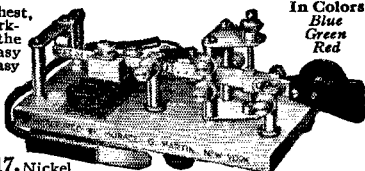
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*Easy-Working*  
Genuine Martin No. 6

## New **VIBROPLEX**

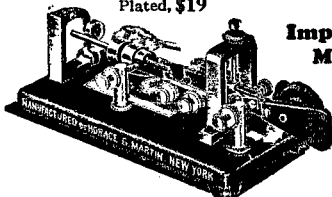
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**Improved MARTIN Vibroplex**

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Old Vibroplex accepted as part payment Remit by Money Order or Registered Mail

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# QST Oscillating Crystals

"Superior by Comparison"

New Price List Effective Immediately

New prices for grinding power crystals in the various frequency bands, said crystals ground to an accuracy of plus or minus .03% mounted: —

(Frequency range)	New list
100 to 1500 Kc.	\$40.00
1501 to 3000 Kc.	\$45.00
3001 to 4000 Kc.	\$50.00
4001 to 6000 Kc.	\$60.00

Above prices include holder of our Standard design. If crystal is wanted unmounted deduct \$5.00 from the above prices. Deliveries can be made within two days after receipt of order. In ordering please specify type tube, plate voltage and operating temperature. *Special prices will be quoted in quantities of ten or more.*

### POWER CRYSTALS FOR AMATEUR USE

The prices below are for grinding a crystal to a frequency selected by us unmounted (if wanted mounted add \$5.00 to the price list) with a calibration accurate to BETTER than a tenth of one per cent. Immediate shipments can be made and all crystals guaranteed.

1715 to 2000 Kc. band	\$12.00 each
3500 to 4000 Kc. band	\$15.00 each

### LOW FREQUENCY STANDARD CRYSTALS AND HEATER UNITS

We have stock available for crystals as low as 13 Kc. Prices upon receipt of specifications. Heater units for temperature control of crystals \$300.00 less crystals. Description upon request.

## SCIENTIFIC RADIO SERVICE

124 Jackson Ave., University Park  
HYATTSVILLE, MD.  
"The crystal specialists"

# BECOME A RADIO OPERATOR

See the World, Earn a Good Income,  
Duties Light and Fascinating

LEARN IN THE SECOND PORT U.S.A.

Radio Inspector located here. New Orleans supplies operators for the various Gulf ports. Most logical location in the U. S. A. to come to for training.

Our students qualify for the various branches of radio. Runs to all parts of the world. Positions Ashore and Afloat. New Course in Radio Servicing and Repairing. Special Courses. Day and Night Classes. Enroll any time. Oldest and Largest Radio School in the South.

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# CONDENSERS

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We have a quantity of items to close out. Particularly suitable for the needs of radio amateurs and experimenters, they include

Mica Receiving Condensers  
Mica Transmitting Condensers  
Filter Blocks  
Impregnated Sections, etc.

WRITE for special price list No. 500, descriptive of these inventory clearance bargains.

## Dubilier Condenser Corp.

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NEW YORK CITY

For *REAL SATISFACTION* use the best

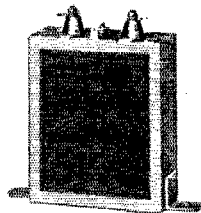
It's cheapest in the long run

Siemens & Halske Condensers are the world's standard for quality

YOUR NET PRICE IN U. S. A.

Working voltage	1000	1500	2000	3000
Test voltage DC	3000	4000	6000	10000
1 MFD	\$2.25	\$2.70	\$5.25	\$12.00
2 MFD	3.90	5.10	8.10	19.50
4 MFD	6.60	8.70	15.60	36.00

(At your dealer or write direct)



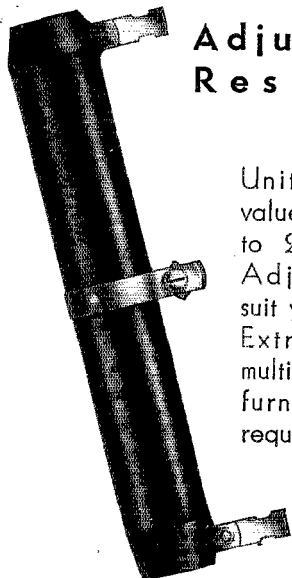
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## MORRILL AND MORRILL

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## Adjustable Resistors



Unit resistance values from 500 to 25,000 ohms. Adjustable to suit your purpose. Extra clips for multiple taps are furnished when requested.

Write for  
Circular 507

WARD LEONARD ELECTRIC CO.  
MOUNT VERNON, NEW YORK



## WE EXPAND

THIS CONCERN WISHES TO THANK THE HUNDREDS OF COMMERCIAL AND AMATEUR STATIONS ALL OVER THE WORLD WHOSE INCREASED PATRONAGE HAS MADE THIS MOVE NECESSARY.

WE ARE NOW IN A POSITION TO TAKE CARE OF THE SUDDEN HEAVY DEMAND FOR FIFTY CYCLE EQUIPMENT REQUIRED FOR BROADCASTING STATIONS BY GENERAL ORDER NO. 116.

*Our new location is*

**AMERICAN PIEZO  
SUPPLY COMPANY**

*40th and Woodland Ave.*  
**KANSAS CITY, MISSOURI**

## I. A. R. U. News

(Continued from page 72)

desperation, he piled his big transmitter and rectifier-filter power supply into an automobile and drove to the highest mountain with electric power lines going up the side that he could find. Here he set up his station at the highest point reached by the power mains, and did not leave the key until he had had a QSO with VK3WL!

## 56-Mc. Band Marching Ahead

(Continued from page 33)

radio clubs. A letter from Mr. C. H. Jenkins, W3VX, President of the South Jersey Radio Association, tells of the formation of a "5-meter club" within the Association, the requisite for membership being the ownership and operation of at least a 56-mc. receiver. A "headquarters" station to operate 24 hours a day for a period of 3 months is in the works. South Jersey is in for a deluge of 56-mc. signals, it would seem.

From the well-known Bloomfield Radio Club comes word of an eight-station 56-mc. net that does business nightly at 9 p.m. There's no getting ahead of these New Jersey gangs. Large attendance and enthusiastic interest, we learn, marked a recent Hudson Division "5-meter" meeting sponsored by Director Walsh in New York. The epidemic has crossed the Hudson.

Hq. laboratory experiments in the development of equipment continue, a transmitter using the Class B modulator being "in the works" at this writing.

These notes, we might say, have been compiled from a bunch of letters which enthusiastic 56-mc. workers have boiled off in the form of steam. Merely to outline the activity we have heard about indirectly would make a picture of even more unusual activity and development. What we need is "dope" from every amateur engaged in 56-mc. work; here's hoping that by next month we'll have it.

— R. A. H. & J. J. L.

## Strays

POEME

*Fundamental* —

Roses are red,  
Violets are blue,  
Send me a card  
And I will you.

*Second Harmonic* —

Roses are red,  
Berries are black,  
Sent ninety cards,  
Got fourteen back.

*Third Harmonic* —

Roses are red,  
Asters are pink,  
Send cards again?  
I don't think!

— W5BPM

# HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.

(3) The Ham-Ad rate is 15c per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 25th of the second month preceding publication date.

(6) A special rate of 7c per word will apply to advertising which, in our judgment, is obviously non-commercial in nature and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League takes the 7c rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and takes the 15c rate. Provisions of paragraph (1), (2), (4) and (5) apply to all advertising in this column regardless of which rate may apply.

PLATE power for your set, the very heart of its performance. For quietness, DX ability, lifelong 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 872-886 rectifiers, complete plate power units, Rectifier Engineering Service, 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. Ensmall Radio Laboratory, 1527 Grandview St., S. E., Warren, Ohio.

CARDWELL, Thordarson, National, Ward Leonard, Electrad-Pyrex, REL, Flechthim, Jewell, Shallcross, Universal, etc. Wholesale discounts. Tubes, 866, \$4.41, 872, \$13.23, R-3, \$7.35. 20 weeks information service, \$1. Six pounds data, circuits, reports, etc. 50¢ prepaid. Kladdag Radio Labs., Kent, Ohio.

TRANSFORMERS made to your order. High quality, moderate prices, quick service. Write for quotations. Specify voltages, currents (or wattage) and frequency desired. Baker Engineering Laboratories, 2131 Curdes Ave., Ft. Wayne, Indiana.

LEARN Wireless (Radio) and Morse telegraphy. School, oldest, largest, endorsed by telegraph, radio and government officials. Expenses low. Can earn part. Catalog free. Dodge's Institute, Wood Street, Valparaiso, Ind.

CRYSTALS: Highest quality quartz crystals scientifically manufactured. Look for the name BLILEY on each. Guaranteed powerful oscillators. X-cut inch square to approximate specified frequency (calibration 0.1%): — 1715-2000kc — \$5.50. 3500-4000kc — \$5.50. 4667-4800kc — \$7.50. Dust-proof plug-in holders: \$2.50. Standard Frequency Equipment: 100,000 cycle bars — \$9.00. Fixed holder: \$4.00, variable, \$6.00. Ovens — \$3.75. Mercury thermostats — \$10.50. Thermometers — \$3.15. Relays — \$4.00. Heater wire — cent per foot. 100kc. Duolateralis — \$1.40. Crystals ground to any frequency, or precision: 25kc-6000kc. We can do it — write us. Bliley Piezo-Electric Co., Masonic Temple Bldg., Erie, Penna.

GENERAL Electric 24/1500 volt 350 watt dynamotors \$37.50. 24/750 volt 150 watt \$27.50 with filter. 375 volts on 12 volt battery. Westinghouse 27.5/350 volt 80 mills \$7.50; 6-15 volt 500 watt aircraft generator \$15. 500 watt 500 cycle aircraft \$7.50. Complete 900 cycle aircraft spark transmitters \$25. W. E. Helmets \$7.50. Henry Kienzle, 501 East 84th St., New York.

GOOD crystals. Trade for meters and test testers. Herbert Hollister, Merriam, Kansas, W9DRD.

100 QSLs, 90¢, stationery, samples. W3BHG, 3536 Roland Ave., Baltimore.

3000V. 2 ampere double commutator motorgenerator with filament generator \$750; 3000V. 1 ampere double commutator motorgenerator \$450; 1000V. ½ ampere motorgenerator \$35. C-Bias 1 ampere motorgenerators \$35. Motors, generators, converters, etc. Queen City Electric, 1734 Grand Avenue, Chicago.

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COMPLETE 852 (new) transmitter. Also power pack (2300) V. Complete ready to go. Cost \$143. Will sell \$65. W9BXR, Hillsboro, Ill.

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IMPORTANT to you. See Irben Experimental advertisement page 93.

COMPLETE dx ham station. xtal controlled push-pull 210s, final stage. a.c. Pentode receiver, 2 stages sg radio. Extremely sensitive. \$125 with all tubes and power supplies. Send for photos, wiring diagrams. W2AFB.

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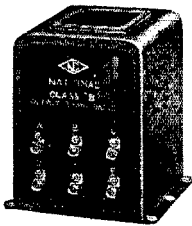
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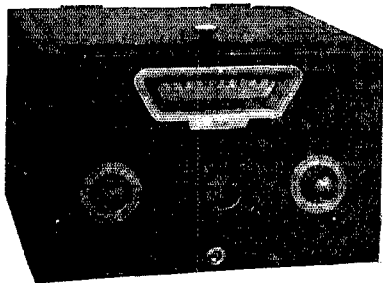
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Amateur Stations in the sixth, seventh districts and many foreigners are being copied consistently on the "278" with a ten-foot indoor antenna by an amateur in the second district—Which means **SUPER SENSITIVITY AND SELECTIVITY**—Can anyone ask for more?

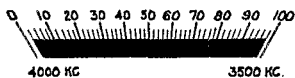
Correctly proportioned LC ratio gives "High C" on 20 and 40 meter bands thus assuring against **RECEIVER SIGNAL CREEPAGE** ("High C" for receivers is just as important as for transmitters)—Smooth, easy operating controls—Capacity controlled regeneration which gives the set a "VELVET ACTION" necessary for either phone or CW reception. (Resistance regeneration control eventually becomes noisy, that's why REL employs capacity.)

Employs two type-36 Screen Grid tubes as RF and detector and type-38 pentode as audio. Also adaptable to 2½ volt tubes—Economical, draws only 10 mils for "B" and "C" power—Housed in a solid, neat appearing metal case—Every part thoroughly moisture proofed, making the "278" ideal for tropical and adverse climatic locations—Best of all the "278" is priced so low that it does not pay to build your own. A demonstration of the "278" will convince you that there is nothing finer for "Ham" work.

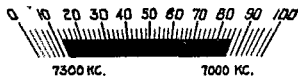
SEE THE FAMOUS "278" AT YOUR FAVORITE DEALER

## REAL BAND SPREADING ON FULL VISION DIAL!

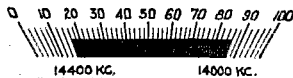
EACH COMPLETE BAND BEFORE YOUR EYES—INDIVIDUAL CALIBRATION ON EACH "278"—UPPER AND LOWER LIMITS OF EACH BAND CLEARLY DEFINED



The 3500 KC amateur band is spread over 91 divisions of the full vision dial scale as illustrated above. This is what REL means by full spread tuning.



Showing here, the amateur, 1000 KC band is spread over the scale of the "278" receiver. The whole band covers only 20 KC in its entirety, nevertheless careful designing has permitted a spread of 74 divisions on the scale.



How the 1000 KC amateur band is spread over the tuning condenser scale. The smooth section dial on the "278" and the band spreading feature will delight the operator with a new thrill when hunting the air for DX.

The above illustrations show how the three popular amateur bands are spread over almost the entire tuning dial scale—A unique beat frequency selector allows the reception of twice as many signals as can be heard on the average present day receiver, without QRM.

The Radio Engineering Laboratories, Inc., manufacture a complete line of practical apparatus for the radio amateur and experimenter. Ten years of successful designing and engineering is behind each REL product. New transmitter kits, parts and frequency measuring equipment is fully described in our new bulletins, which will be forwarded upon request.

# RADIO ENGINEERING LABORATORIES, INC.

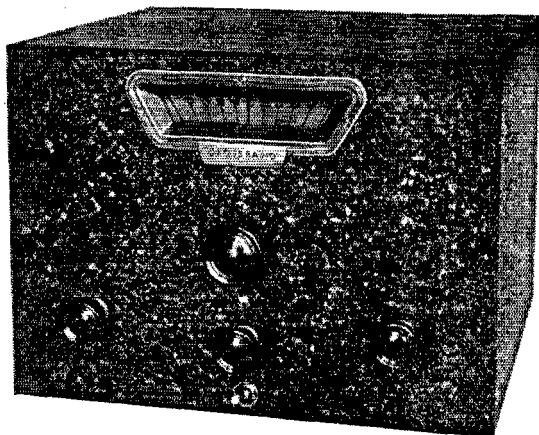
100 WILBUR AVENUE      LONG ISLAND CITY, N. Y.

Export Department: 116 Broad Street, New York City

# SENSATIONAL S. W. RECEIVER

*at a Sensationally Low Price!*

**ADVANCED DESIGN PRACTICES!—LATEST CIRCUIT!**



**HIGH GAIN SCREEN GRID R. F.**

**HIGH GAIN SCREEN GRID DETECTOR**

**HIGH GAIN PENTODE AUDIO**

Here at last is a low priced Short Wave receiver embodying features comparable to those in sets selling at a much higher price. Unusually flexible, designed for Ham band spreading or continuous broadcast range coverage. Constructed of finest material available.

**\$22**  
NET

## CHECK THESE FEATURES!

**Screen Grid R. F. and Screen Grid detector** offering highest possible gain and most efficient regeneration.

**Pentode Power Audio** — gives same audio gain as obtained from two ordinary transformer coupled stages.

**Tank Condenser** — is operated from the front of panel and eliminates the objectionable necessity of lifting the cover. Speedy range changes at your finger tips.

**Dial** — latest design, full vision, illuminated calibration scale, real vernier control over any portion of the frequencies covered. Absolutely will not jump or slip.

**Regeneration Control** — employs condenser for stability, ruggedness and velvetlike smoothness.

gedness and velvetlike smoothness.

**Plug-in Power Cable** — Eliminates possibility of wrong connections and insures absolute electrical contact.

**Band Spreading Condenser** — very small capacity permits widest possible calibration spread over a multitude of ranges.

**Cabinet** — metal compact, hinge cover, dark brown crystalized finish. Completely shields apparatus.

**Range** — 17.5 to 115 meters — Three plug in coils are supplied with each receiver.

**Universal** — for A. C. or D. C. operation. Sent to you wired and tested for D. C. operation requiring the following tubes:

- 1. Type 236 Screen Grid R. F.
- 1. Type 236 Screen Grid Detector
- 1. Type 238 Pentode, Audio

Voltage requirements, 6 v. for filament and 135 volts "B" supply. For full A. C. operation will supply upon request information regarding slight change.

Careful buying, the elimination of jobbers and dealers profits enables us to sell you this remarkable receiver at such an unusually low price. Completely wired and thoroughly tested ..... **\$22**

Seeing is believing and hearing is the proof of the pudding. Jerry invites you to drop in to see and hear the most outstanding receiver value ever.

### CLASS B MODULATION TRANSFORMER

For that new system of modulation described in December issue of QST. Priced to be within the reach of all. Priced per pair \$10.00.



COMPLETE LINE OF STANDARD AND "HARD TO GET" PARTS

### SAVE TIME AND MONEY

Order from Jerry. Just deduct an additional 2% for cash from our competitors' quotations on standard merchandise. Shoot the order in to Jerry.

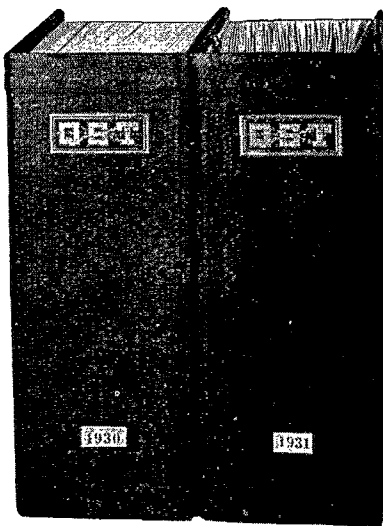
### FREE ADVICE ON RADIO

Write or drop in to Jerry's Place, that "different" kind of a ham store, one block west of City Hall.

### FREE CODE CLASS

Every Wednesday evening from 6:00 to 7:30 p.m. at Jerry's place. Here's your chance to learn the code or speed up. Bring your phones.

**25 WARREN STREET, NEW YORK TELEPHONE BARCLAY 7-6**



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BINDER!

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A Dupont fabrikoïd material of waterproof and oilproof imitation leather in a rich wine color, which matches the color of your present binders. Instead of metal wires, it has well-designed strong metal strips to conveniently place your copies in the binder—13 such strips, too—12 for the yearly supply of QST and one for your QST index. You'll like this binder, and it doesn't cost any more either.

Right now you should have at least two of them—one for your complete 1931 file of copies, and one for each 1932 issue as published.

## QST BINDER

(Holds 12 issues of QST and index)

**\$1.50 each, postpaid**

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**American Radio Relay League**

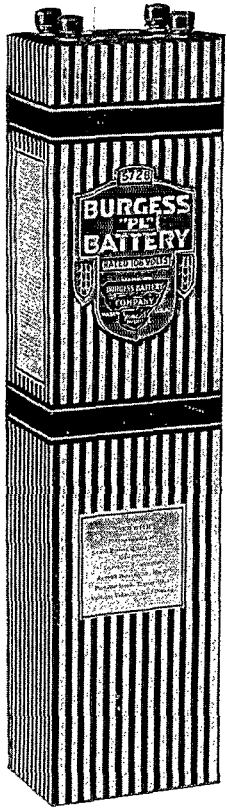
*38 LaSalle Road*

**West Hartford, Connecticut**

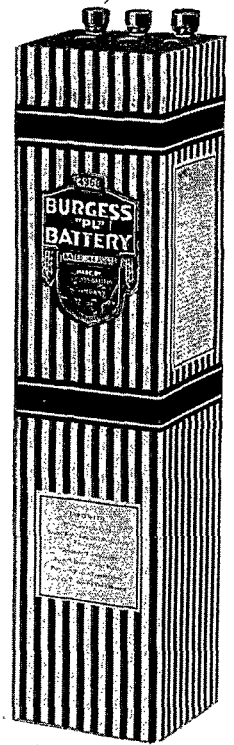
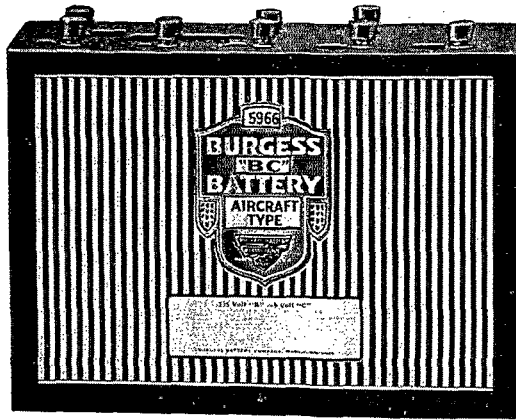
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## "PL" BATTERIES

### HIGH VOLTAGE - LIGHT WEIGHT COMPACT - RUGGED



Modern advances in the radio art—light sensitive cells, sound reproduction, geophysical equipment, portable transmitters, aircraft beacons and transmitters, radio compasses, grid biasing—have brought new dry battery requirements. To meet these Burgess has developed the "PL" battery, a high voltage, light weight, compact, and rugged unit. They are made with the patented Burgess stick construction, and actual use under the most exacting conditions has proved that they meet the needs for which they were designed.



*"Ask any Radio Engineer"*

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## BURGESS BATTERY COMPANY

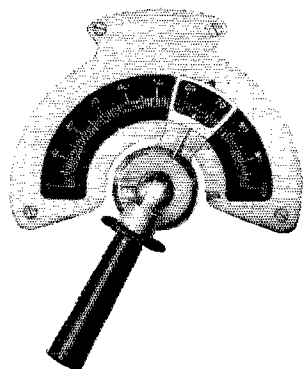
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# NEW...NEW...NEW...

## A NEW DIAL!



**F**OR your transmitter panel. Enhance the beauty of your transmitting equipment by installing the Cat. No. 276 Lock Dial on all of the major controls. Can be rotated to any position and locked there by simply pressing the handle towards the panel. Die casting beautifully finished in cadmium lacquer. Additional scale space for marking individual calibrations. Price Cat. No. 276 dial and complete scale arrangement \$6.00.

## PORTABLE RECEIVER

**T**HE most compact and efficient receiver available—ideal for amateurs—police departments—ship operators—forest patrols—mining exploits—etc. Can be used for

monitoring—interference finding—stand by receiver—time signals—weather and press. Completely shielded and self-contained in one piece cast aluminum case with carrying handle. Weight when completely loaded—12 lbs. Complete with 3 plug-in coils covering continuous wavelength range from 20 to 100 meters. Coils for other ranges can be furnished. Employs two UX-230 tubes. Batteries will last one year. Requires two small 22½ volt "B" and one standard 4½ volt "C" battery for "A" supply. Price complete ready to operate with coils, no tubes or batteries included—\$30.00.



If your favorite dealer can not supply you with standard REL products, you may purchase them direct. Write in for attractive net prices to you.

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100 WILBUR AVENUE, LONG ISLAND CITY, N. Y.

# CLASS "B"

## MODULATION TRANSFORMERS FOR TYPE-10 TUBES

Designed to operate in Jim Lamb's "More Modulated Watts per Dollar" Transmitter, as described in December 1931 issue of QST.

SPECIAL CLASS "B" INPUT TRANSFORMER  
SPECIAL CLASS "B" OUTPUT TRANSFORMER

(For use with Class "C" RF Amplifier using two — 10 type tubes)

**NET PRICE — \$8.30 Per Pair**

**Q**UANTITY built transformers designed and built with the same precision and workmanship as is found in all Radio Engineering Laboratories products having the following necessary features:

1. Flat frequency response 60 to 5000 cycles providing properly matched tubes are used.
2. Completely mounted and shielded.
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- One Input Transformer, One Output Transformer, known as T3 and T4 in December QST—\$8.30 per pair.
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