

QST

October, 1931
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devoted entirely to

amateur radio

In this Issue—

**A
Short-Wave
Set for
Beginners**



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Yes, YOUR Transmitter! Now! Please!

❖ Look at it, sitting there on the shelf. That's right, turn around and look at it. Hasn't it given you faithful service? Hasn't it swallowed those extra volts and milliamperes without a whimper? Hasn't it stayed up until all hours, night after night, for you? Indeed it has! And isn't it entitled to the best treatment and expert advice that you can give it? Indeed it is! That's why we ask you to consider your transmitter. That's why we urge you to

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AMATEUR'S

HANDBOOK

BY THE HEADQUARTERS STAFF OF THE A.R.R.L.

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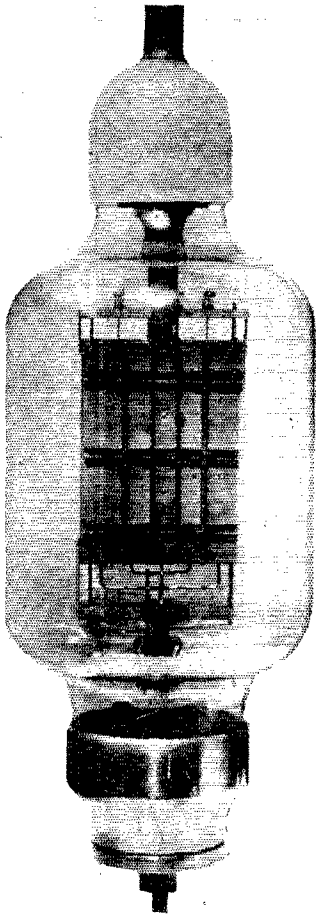
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Type 551 Audion



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Filament Voltage.....11 volts
Filament Current 15.5 amperes
Plate Current.....300 m.a.
Plate Resistance.....1400 ohms
Mutual Conductance
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Amplification Factor.....20
Interchangeable with UV-851

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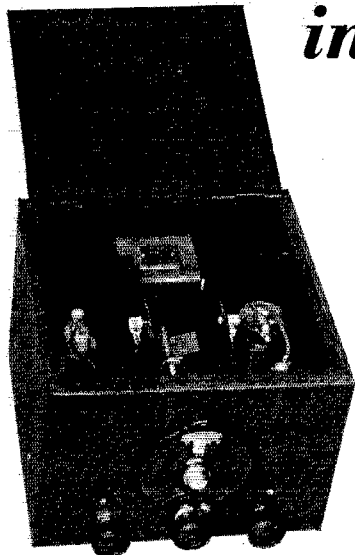
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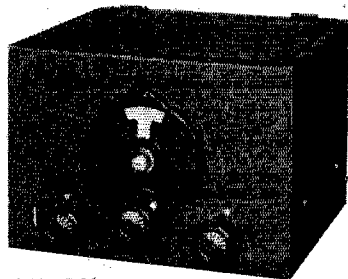
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QST

Published monthly, as its official organ, by the American Radio Relay League, Inc., at West Hartford, Conn., U. S. A.; Official Organ of the International Amateur Radio Union

devoted entirely to **AMATEUR RADIO**

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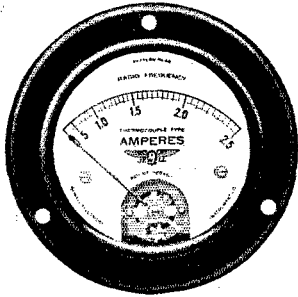
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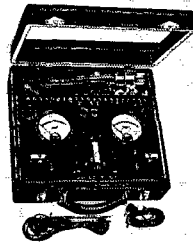
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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors.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

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

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

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• EDITORIAL •

LIFE, say we between groans, is complex. So, by T. O. M.'s whiskers, is amateur radio. Time was, it is averred, when life was simpler, and it doesn't take a particularly old old-timer to recollect the relatively blissful days of amateur radio when everybody operated with about the same frequency, kind of apparatus, power and range. But the price of being a modern is to live in a world of complexities, and amateur radio has not been exempt. Where once we were all 220-meter sparks, where later we kept closely together as we pioneered with low-powered c.w. to ever and ever higher frequencies through an unbroken virgin territory, to-day we operate or experiment in seven different frequency bands, with different interests and different goals and with all sorts of gear, bonded chiefly by the fact that all of this is modern amateur radio, fortunate in the possession of a strong national society to correlate our activities and keep us in touch with each other.

Amateur Radio is a gorgeous mistress and her marvelous ability to be all things to all men is one of her outstanding charms. We pursue her for what we each desire, and it is not always the same. Or, let us say, nimbly exercising the editorial prerogative to change metaphors, that amateur radio is a hobby, and we're in it for the enjoyment and instruction we can get and the service we can render others. We don't want to make hard work out of it. But we pride ourselves upon being skillful moderns, performing marvels with a new science, and it becomes nothing short of a duty to attempt to keep abreast of progress.

First off, then, why do we have so many stations that are hard to read or so broad that they "eat chunks" out of the ether, when a little tinkering would fix them up? And why do we get into ruts and develop into confirmed This-or-That Hounds, experts on one branch of amateur work but knowing little or nothing of the others? Would we not be better off if we made an effort at versatility; if, for example, DX Hounds would occasionally move down to 3500 and handle some traffic for the experience, if the O.R.S.'s would get some acquaintance with "5-meter" phone, if the voice men would develop high-speed code operation on 1750 kc.? Versatility, like virtue, vim, vigor, verve and vaccination, is its own reward in the sense of personal satisfaction it induces, but more than that it's precious close to being a necessity in this complex day of ours.

As an example of what we mean, we wonder why it is that there are stations which are always in the 3500- to 4000-kc. band and never any place else. Granted that if a man's interest is exclusively in the kind of work which presently goes on in that band, he has every right to stick to it and no one can say him nay, it still seems to us that if we were properly versatile and flexible and, in short, sufficiently near perfection, we wouldn't concentrate all of that important work in that one band which is already groaning under its load. We wouldn't, for the reason that that work occurs at all sorts of ranges and if we took full advantage of the progress of the art we'd divide the load. For instance, what a waste of power it is to use all the watts necessary for a husky 3500-kc. signal in passing messages across town. The ideal rig for that work is 60-mc. ("5-meter") apparatus such as *QST* recently described. Then the short-haul out-of-town traffic ought to move in the 1715- to 2000-kc. band. And for long-distance traffic the 7000- to 7300-kc. band and lower power will do the job with much less fuss than running up the watts on 3500 in an attempt to punch through. Think what a tremendous improvement such practices would make in our ease of communicating in the 3500 to 4000 band for the ranges

and purposes for which that band is actually best suited! We suspect that some day it will be considered immensely bad form to gum up any band with activity that by all logic belongs on a decidedly different band. We have the notion that Ye Compleat Hamme Station of the future, to be really "compleat," will necessarily be endowed with three or four separate and complete transmitters.

We're really keen about the possibilities of putting local traffic on the 56- to 60-mc. band. We know one city where the local club has adopted that as a policy and the traffic stations are equipping themselves with auxiliary transmitters and receivers just for 'crosstown work. That's sensible, for it leaves 3500 that much clearer for the fellows who are working "outside," where 3500 is really necessary. Many other communities could profitably use the idea, particularly where there is local organization for collecting and distributing traffic, and it's easily done. It is, we think, the coming idea, and we won't be at all surprised if some day it will be considered just as bad form to use 3500 kc. for 'crosstown communication as it would be to try it to-day with a spark set!

K. B. W.

Navy Day

Annual Receiving Competition to be Held October 27. All set? Mark the date and locate the stations in advance. Report to A.R.R.L. for Commendation

NAVY DAY will be Tuesday, October 27, 1931. A program of telegraphic broadcasts to all amateurs including approximately two thousand members of the Naval Communication Reserve has been arranged under the auspices of the Navy League of the United States. Three transmitting stations have been selected, each to send a different Navy Day broadcast, using frequencies in accordance with the schedule given below. The transmission time of each station has been carefully chosen so that none of the messages will overlap and everyone will have a chance to try for all three stations.

Station	Message From	Frequency (kc.)	Wavelength (meters)	Starting Time
NAA, Navy Dep't., Washington, D. C.	The Secretary of the Navy	4205	71.3	7:30 p.m. E.S.T., 6:30 p.m. C.S.T., 5:30 p.m. M.S.T.
		8410	35.7	
		12615	17.8	4:30 p.m. P.S.T.
WIMK, A.R.R.L., Hartford, Conn.	Lt. Comdr. Hiram Percy Maxim, U.S.N.R., President of the A.R.R.L.	3960	75.8	9:30 p.m. E.S.T., 8:30 p.m. C.S.T., 7:30 p.m. M.S.T.
		7002	42.8	6:30 p.m. P.S.T.
NPG, Navy Dep't., San Francisco, Calif.	The Secretary of the Navy	4385	68.4	10:30 p.m. E.S.T., 9:30 p.m. C.S.T., 8:30 p.m. M.S.T.
		8770	34.2	7:30 p.m. P.S.T.

All participants will be cited in a Navy Day Honor Roll, to appear in QST on receipt of what was copied from one or more (if possible) of the transmitting stations. Everyone who listens and copies these messages has a chance to "make" the Honor Roll. The more messages you can copy and forward to A.R.R.L. Headquarters, the higher will your name stand in the list. There will undoubtedly be Navy Day messages on the air from the several District Commandants and we are glad to have copies of these messages but please bear in mind that *only the three messages sent from NAA, NPG and WIMK* count in the receiving competition. Then, too, there will be twenty-five commendatory letters from the Secretary of the Navy to those operators submitting the most accurate and complete copies. These letters will be divided between the different Naval Districts in proportion to the number of reports received from each District. Legibility and neatness will determine the relative

standing of the high operators if large numbers of perfect copies are submitted — but, as always, ACCURACY counts first in importance. Receiving conditions and difficulties peculiar to certain localities will also be considered in making these awards.

A sensitive receiver, and an accurately calibrated frequency meter or monitor, will enable you to get all set for the contest *before* October 27. It will be well worth while to spend some time in advance preparation — in determining the receiver dial settings for the different frequencies that will be used. Then listening on these different frequencies at the same time of day as the broadcasts will be sent will help to determine which of the several frequencies enumerated will give the most copiable signals in your location. Don't forget to mark the date in the log, on the calendar, or wherever necessary to insure your taking part, too. The schedule that will be followed by the transmitting stations is given herewith.

Please pass the schedules for Navy Day transmissions around to other operators. It is hoped that as many as possible will take part. Stations normally using the frequencies WIMK will use on this occasion are requested to cooperate at the time of this broadcast to avoid unnecessary interference with many amateurs who will enter this activity. All three stations will transmit after a "CQ" or "QST" at *exactly* the hours given. Your *time* ought to be correct so it is suggested that this be checked so that you will not miss any of the transmissions.

This is an opportunity to try our skill in copying and perhaps learn something new or of interest about the Navy and the Communication Reserve at the same time we have a good time twirling the dials. To make a 100% copy requires a sincere effort and considerable proficiency. Copy everything that you can! Mail it next morning to A.R.R.L. Headquarters, Attention the Communications Department.

A Receiver for Beginners

Constructional Details of an Inexpensive Outfit Using Dry Cell Tubes

By George Grammer, Assistant Technical Editor

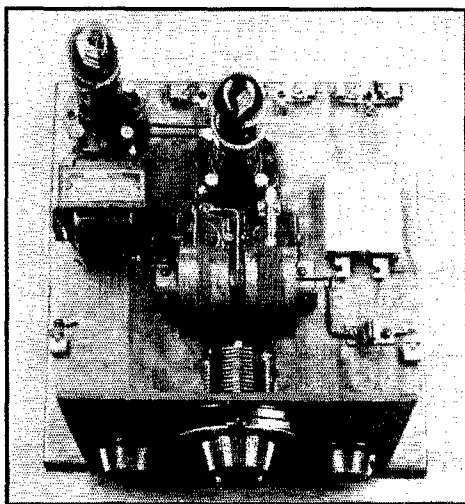
AMATEUR radio is one of the finest forms of recreation, combining as it does the opportunity for agreeable intercourse with one's confreres, the thrills of contacting other amateurs in remote corners of the earth, and the opportunity for learning something about one of the most fascinating of the useful arts. To become a transmitting amateur it is necessary to learn the telegraphic code used in radio communication and to understand something about the working of the apparatus used in amateur transmitters and receivers. Code-learning usually is the greatest stumbling block — the other information can be acquired readily from radio text-books, but knowledge of the code can be obtained only by intensive practice. One of the best ways of learning it is by actually listening to signals — unless one has someone who knows the code as an instructor, which is best of all — and some sort of simple receiver automatically becomes a necessity. We shall describe such a receiver here; practical information on how to go about learning the code as well as other information needed by the beginner who aspires to the ownership of a transmitting station is contained in the *Radio Amateur's Handbook*.

Not the least of the fun that amateurs get from pursuit of their hobby is that of constructing apparatus and making it work. Such products of their handiwork may be far from perfection; they may not be nearly so good as an equivalent piece of factory-made equipment; yet there is a peculiar satisfaction that goes with the successful completion of something built by one's own hands that is lacking in the purchase of completely manufactured apparatus. And without doubt valuable experience can be acquired in the process. In addition there is sometimes no choice in the matter because, particularly when the piece of apparatus to be constructed is simple in design, the higher cost of the factory-built outfit is too great for flat pocketbooks.

The receiver described in the following paragraphs is easy to construct; very few things can go wrong if the directions are followed carefully; its cost is as low as is consistent with adequate performance — a glance at catalogs shows that the cost of the entire set including tubes, batteries, phones and antenna should be not more than about twenty dollars; the frequency range is practically continuous between approximately 15,000 and 1600 kc. (20 to 190 meters), covering

all the amateur bands and commercial frequencies on which numerous stations will be found working at almost any hour of the day or night.

To make construction easy it has been necessary to sacrifice some of those features which many amateurs might think desirable, such as spreading the amateur bands over most of the tuning dial, r.f. amplification, etc. On the other hand, it is not anticipated that anyone will build such a set with the expectation of using it per-



A GENERAL VIEW OF THE RECEIVER
Showing one set of coils and the tubes in place.

manently; it is a sort of "preparatory" outfit, to be used until it serves its purpose of helping its owner learn the code, learn something about short-wave receivers, and become acquainted with amateur radio. When this has been accomplished the parts may be used over again in the construction of a receiver more suited to general amateur needs.

The circuit used in the receiver is a time-tested one — nearly every amateur has used such an outfit at one time or another with excellent results. It consists simply of a regenerative triode detector, capacitively coupled to the antenna, with resistance control of regeneration and one stage of audio-frequency amplification. The tubes are Type '30's, although any of the other three-element d.c. tubes may be substituted without

making any changes except in the filament voltage. The '30's probably are best for the beginner unless other types of tubes are already on hand, because they perform equally as well as '01-A's and are superior to '99's. The '30's are more economical of filament power than any of the other types, and can be operated quite nicely from a pair of No. 6 dry cells or from an Air-Cell battery.

CONSTRUCTIONAL DETAILS

The circuit diagram and a list of the parts required is shown in Fig. 1. For the convenience of those builders who may wish to duplicate the outfit the names of the manufacturers of the parts actually used in the receiver shown in the photographs are given; it should be understood, however, that any other parts of the same electrical values and quality may be substituted, regardless of make. A good many builders will have already in their possession many of the necessary parts, and if so they may be used, of course.

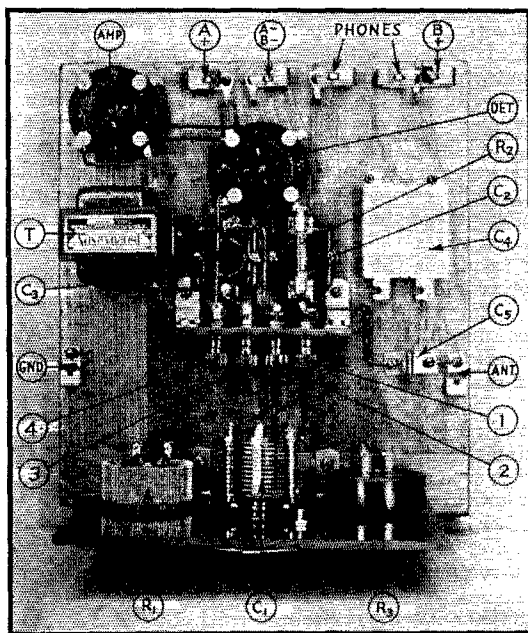
The baseboard of the set is 9 inches wide by $9\frac{1}{2}$ inches deep and three-fourths of an inch thick. For the sake of appearance it should be sand papered and varnished with clear, quick-drying lacquer. The panel is $5\frac{1}{2}$ by 7 inches; it may be of bakelite, hard rubber or even dry wood, although the two materials first mentioned are preferable. On it are mounted the tuning condenser, C_1 , the filament rheostat, R_1 , and the regeneration control resistor, R_2 . It is possible to dispense with the panel altogether and mount these three instruments on metal brackets, but the use of a panel is recommended because it makes a much more solid mounting, which is helpful in tuning. The tuning condenser dial should have a "vernier" movement to make fine tuning possible, because on the higher frequencies the range covered is considerable — many times the number of kilocycles contained in the broadcast band, for instance.

The remaining parts are placed on the top of the baseboard in such fashion that short direct

connections may be made. The mounting for the interchangeable coils is a strip of bakelite or hard rubber four inches long and one inch wide. Four binding posts spaced $\frac{5}{8}$ of an inch apart hold the coils, which will be described later. Looking at this strip in the top view of the set the binding post at the extreme right, marked No. 1, is at the "grid" end of the tuning coil. It is connected to the stationary plates of the tuning

condenser, C_1 , by a piece of covered bus wire which runs under the binding post strip and up to the front panel. One end of the grid condenser, C_2 , is also connected to binding post No. 1 through the medium of a lug on the grid leak mounting which is soldered directly to the lug on the binding post. A third connection is made between binding post No. 1 and the antenna coupling condenser, C_5 . This condenser is formed from two pieces of brass strip, each approximately an inch long and a half inch wide, bent in the middle to form an "L." They are screwed down to the baseboard facing each other, but not touching. There should be a space of about a sixteenth of an inch between them. Neither the spacing nor the size of the condenser "plates" is critical, however, so long as these approximate dimensions are followed.

Binding post No. 2 is connected to the rotary plates of C_1 by a second piece of bus wire run under the strip and up to the front panel. A second connection from this binding post goes to the rear end of condenser C_3 , mounted just behind the strip and beside grid condenser C_2 . This connection deserves special mention, because all the "grounds" in the set focus at this point. The small 6-32 screw furnished with the condenser is removed and one long enough to go through the baseboard is substituted for it. This projects through the board and serves as a common connection point for the various wires shown in the bottom view of the set. This arrangement is convenient and eliminates the crossing of wires that would be necessary if all wiring were on top of the board.



A PLAN VIEW

The notations on this photograph correspond with those in Fig. 1. The connections are explained in the text.

Binding post No. 3 connects to the near side of C_3 and also to the plate terminal of the primary of the audio transformer, T. Binding post No. 4 is connected to the plate terminal on the detector tube socket, which is placed directly behind C_2 and C_3 . The grid terminal on the tube socket connects to the grid condenser, C_2 .

It is important that the binding posts on the coil mounting strip be connected exactly as shown; otherwise the detector tube will not oscillate unless changes are made in the coils.

The remaining connections above the baseboard are those between the "G" post of the secondary of the audio transformer and the grid post of the amplifier tube socket; the necessary connections between the filament posts on the tube sockets to place the two filaments in parallel, and a connection from the left-hand filament binding post on the detector tube socket to the Fahnestock clip which is marked "A+."

The batteries, 'phones, antenna and ground are connected to the receiver by means of the Fahnestock clips at the sides and back of the board.

The connections underneath the baseboard are numbered for convenience in identification, and the function of each wire is indicated under the photograph.

MAKING THE COILS

The coil forms are short lengths of two-inch tubing of bakelite or other stiff insulating material. They are all $1\frac{1}{8}$ inches long except that for

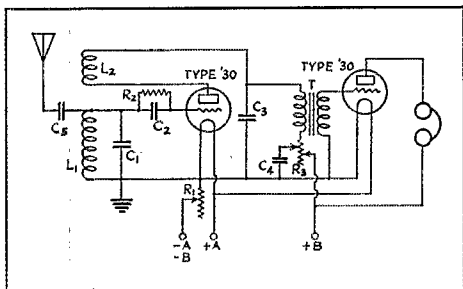
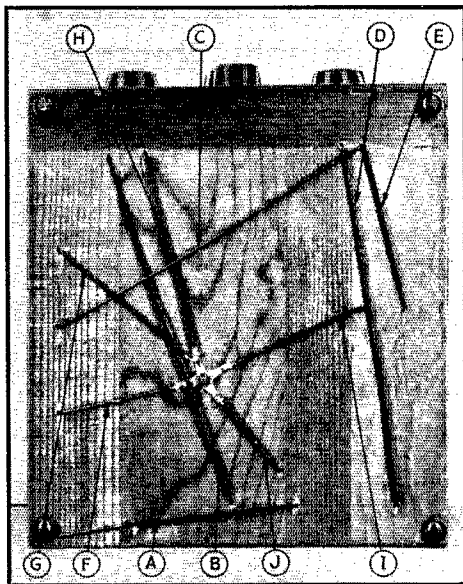


FIG. 1—THE CIRCUIT DIAGRAM

- C_1 —100- μ fd. (.0001 μ fd.) variable condenser (Pilot J-23).
 - C_2 —100- μ fd. (.0001 μ fd.) fixed condenser with grid leak clips (Pilot).
 - C_3 —250- μ fd. (.00025 μ fd.) fixed condenser (Pilot).
 - C_4 —.5- μ fd. fixed condenser (Flechtheim).
 - C_5 —Antenna coupling condenser; see text for construction.
 - L_1 —Grid coil; see text and photograph for construction.
 - L_2 —Plate coil; see text and photograph for construction.
 - R_1 —20-ohm rheostat (Frost).
 - R_2 —2-megohm grid leak (Pilot).
 - R_3 —50,000-ohm variable resistor (Frost).
 - T—Audio transformer (Thorndarson R-260).
- Accessory material includes two Pilot 4-prong tube sockets, a General Radio type 502-A dial, 7 Fahnestock clips, and about ten feet of covered bus wire.

the 1750-kc. grid coil, which is two inches long. These may be sawed off square by placing the tubing in a vise with the correct length projecting

from the jaws and sawing along the face of the vise with a hacksaw. The saw blade should be kept pressed against the vise to keep it from



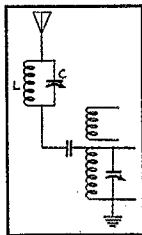
THE WIRING UNDERNEATH THE BASE

Each wire has been lettered for easy identification. They make connections as follows:

- A: From Fahnestock clip holding one end of 'phones to plate post on amplifier tube socket; B: from "A—" clip to one side of R_1 ; C: from "B" terminal of audio transformer to rotor arm of R_3 ; D: from stator of R_3 to "B+" clip; E: from rotor of R_3 to one side of C_3 ; F: from "A" terminal of audio transformer to common post; G: from "Gnd." clip to common post; H: from other side of R_1 to common post; I: from other side of C_1 to common post; J: from right-hand filament post on detector tube socket to common post.

wandering. The rough edges may be finished off with a file. Two holes are then drilled near the edges to allow insertion of the wire and the mounting "legs." The legs are simply pieces of bare bus

FIG. 2—HOW A WAVE-TRAP IS ADDED TO THE SET TO ELIMINATE BROADCAST INTERFERENCE

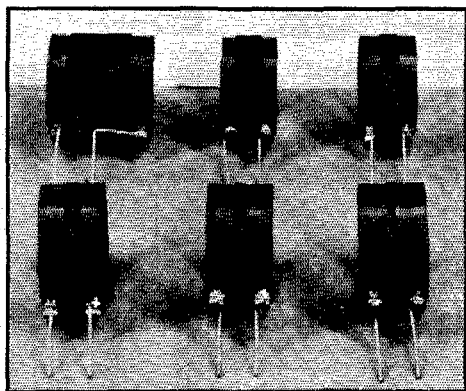


The trap is inserted in the antenna lead-in as shown. The coil L may be 40 turns of No. 22 d.c.c. on a three-inch form. Variable condenser C should be .00035 μ fd. or larger. Any coil-condenser combination which will tune to the frequency of the interfering station will be satisfactory.

wire looped around the screws and bent down to fit in the mounting strip binding posts. They should be about $1\frac{1}{4}$ inches long.

The coils are all wound with No. 22 double-silk-covered wire. The number of turns on each is shown under the photograph. The direction of winding is not important, but it is important that

they all be wound in the *same* direction. Each coil should be centered on its form. When finished they should be coated with collodion, airplane "dope," Duco cement or a similar adhesive. In operation the coil being used as a grid coil should



THE SIX COILS

These are numbered in the order of their size. Each is wound with No. 22 d.s.c. wire on forms described in the text.

- No. 1 — 45 turns
- No. 2 — 18 turns
- No. 3 — 12 turns
- No. 4 — 8 turns
- No. 5 — 6 turns
- No. 6 — 4 turns

be inserted in binding posts Nos. 1 and 2, and the plate or tickler coil in Nos. 3 and 4. The approximate frequency coverage with each of the recommended coil combinations is as follows:

Frequency Range in Kc.	Grid Coil	Plate Coil
1600-3000 (190-100 meters)	No. 1	No. 3
3000-5000 (100-60 m.)	No. 2	No. 4
4500-7000 (70-42 m.)	No. 3	No. 4
6000-11,000 (50-28 m.)	No. 4	No. 5
11,000-16,000 (28-18 m.)	No. 6	No. 5

Since the "grid" coils, those used in the circuit to which the incoming signal is tuned, and the "plate" coils, which feed energy back into the grid circuit and thus allow the tube to oscillate and pick up continuous wave signals, are separate, the experimentally inclined beginner can try many different turns ratios to determine which gives the smoothest performance and greatest signal strength, and incidentally learn a good deal about the practical handling of a regenerative detector.

OPERATING THE RECEIVER

In the initial testing of the receiver after the construction has been completed the first step should be to connect the "A" battery to test out the filament wiring. Of course before connecting anything at all to the set the wiring should be carefully checked against the diagram to make sure that each wire goes just where it should and that none is omitted. The ease with which wires

can be misplaced or overlooked is surprising; do not make a merely perfunctory check, therefore, but be thorough.

Assuming the check of the wiring has been satisfactory, and after making sure that the filament rheostat is in the "off" position, the tubes should be inserted in the sockets and the "A" battery connected to the proper posts. With Type '30 tubes this battery should consist of a pair of No. 6 dry cells connected in series or an Eveready Air-Cell, as mentioned previously. If '99 tubes are used the battery should consist of three dry cells in series. For '01-A's a 6-volt storage battery is best. The rheostat knob should then be turned until about half the resistance is in circuit with '30's and '99's. With '01-A's the knob should be turned almost to the "full-on" position. If a low-range d.c. voltmeter is available the correct setting of the rheostat may be determined by measuring the voltage at the filament terminals on the tube sockets and setting the rheostat to give the rated value. Otherwise it is best to use as little filament current as possible, to prolong tube life. If the tubes do not light in this first test, check over the wiring again and correct the fault.

Next connect the 'phones and "B" battery. Then, with a pair of coils inserted in the mounting strip, turn the regeneration control knob so that the resistance is gradually cut out, and if the set has been made correctly a click will be heard when the knob is approximately at the half-way position. This click — it is hardly that, but more like a soft thud — indicates that the detector has started to oscillate, which means that the receiver is ready to be connected to the antenna and ground and pick up signals. If the click is not heard try touching a finger to the *stationary* plates of the tuning condenser with the regeneration control set in a number of positions. If, when the condenser plates are touched, a decided click is heard the tube is oscillating — if the values given here have been deviated from slightly the detector may oscillate at all settings of the regeneration control.

On the other hand, if no pronounced click is audible the detector is not oscillating and the wiring should be checked over once more. Changing the tubes about may make some improvement, especially if they are not new. Other causes of refusal to oscillate might be the reversal of winding direction on one of the coils (all coils must be wound in the same direction and the connections to the mounting strip binding posts *must* be made as shown); wrong plate coil being used for the grid coil chosen; the primary of the amplifying transformer might be open-circuited; by-pass condenser C_3 might be defective; "B" battery may be old and voltage too low; amplifying transformer secondary might be open-circuited; or there may be no plate current getting

(Continued on page 78)

Improving the Voltage Regulation of Rectifier-Filter Systems

Two Novel Schemes for Reducing Plate Voltage Variation With Change in Load

By Ed. Glaser, W2BRB*

IT IS well known that when using a rectified a.c. supply an increase in load produces a drop in voltage, and, particularly if one is used to playing with batteries or motor generators, the drop is entirely too much! By definition, voltage regulation is, of course, the change in voltage that takes place from no load to rated, or normal, load, expressed as a percentage of rated load voltage. Accordingly, what we want is a power supply with regulation as "small" as possible. A new set of "B" batteries has practically zero regulation. A well designed d.c. generator should have very small regulation (about 5%). But all forms of rectifiers are comparatively bad, so we will devote the remainder of the article to these, our most popular form of supply.

In Fig. 1A we see the voltage regulation curve of a typical broadcast receiver power pack employing a Type '80 tube and a conventional (condenser input) brute-force filter. Normal load is 95 ma., which drops to 84 ma. when the volume control is in the "off" position. The change in voltage from no load (570 volts) to normal load (340 volts) is 230 volts, or 67.6% of rated load voltage, which is the regulation. In a broadcast receiver, however, the regulation does not have to be "good" because the load varies only around 10% and the voltage, therefore, remains substantially constant. With automatic or individual "C" bias, such small voltage changes are certainly permissible in the very best of receivers. What is really needed in receivers is a maximum amount of filtering with the least number of parts and, therefore, this type of rectifier and filter serves its purpose. Incidentally, all the filter that is used in some "midget" sets consists of two 6- or 8- μ fd. electrolytic condensers and the dynamic speaker field! Of course they make use of resistances to further filter the supply for the detector and r.f. stages. But let us proceed to more interesting matters — those concerning our transmitter power unit.

Suppose the old broadcast receiver didn't match the new furniture, or, somehow, we acquired the remains. What could we do to the power pack to adapt it for use in our low-power transmitter? If we plan for 'phone, we could use it with no alterations because we would have a steady load, much as though the receiver were

used. But if we were to use it for c.w. we would have to make some changes, because at least one of the filter condensers would soon travel other paths. And what else would happen? A few moments' consultation with the *Handbook* will tell the whole story. We have time here for only a few facts.

WHY GOOD REGULATION?

If we want to use a self-controlled oscillator, a variation in plate voltage will produce a variation in frequency. So, when we get on the air, a flock of chirps and whines will accompany our otherwise perfect keying (assuming that we have

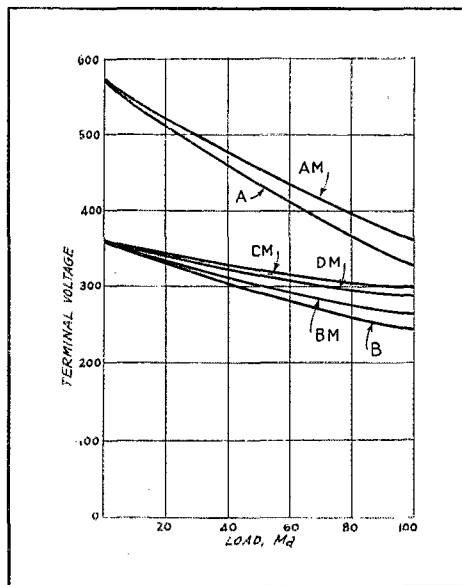


FIG. 1—CURVE "A" SHOWS THE VOLTAGE REGULATION OBTAINED WITH THE USUAL TYPE OF BC-RECEIVER POWER PACK USING A VACUUM TYPE '80 RECTIFIER TUBE

Curve "B" shows the improvement in regulation effected by using choke input to the filter. The "M" curves were obtained with various filter combinations in conjunction with a mercury-vapor Type '80 rectifier and are explained in the text.

no key clicks). These chirps and whines are the products of a variation in frequency which, in

* 209 E. 16th St., Brooklyn, N. Y.

turn, is caused by the change in terminal voltage of our power unit as the result of poor regulation. At the instant we press the key the voltage on the tube is the no-load voltage but, an instant later, this drops to rated load voltage. The frequency "swoop" occurs between these two instants. *QST* has explained this phenomenon called frequency modulation and other names, a dozen times and has given means of avoiding it, so we continue.

We have already mentioned the fact that the filter condenser would blow. This is because they

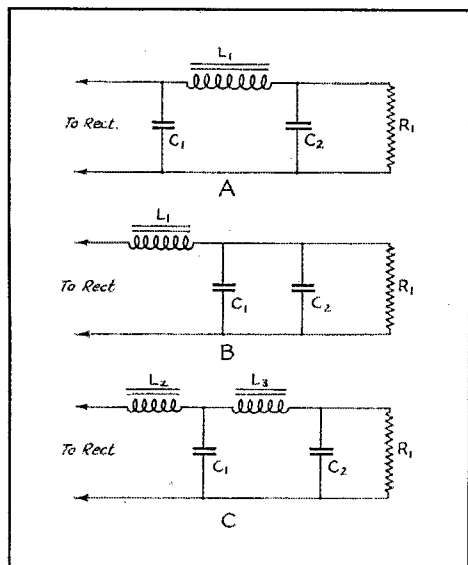


FIG. 2 — FILTER CIRCUITS USED IN OBTAINING THE CURVES OF FIG. 1

- L_1 — 35-h. 620-ohm choke.
- L_2 — 2000-turn 240-ohm choke (see text).
- L_3 — 6-h. 100-ohm choke.
- C_1 — 2- μ f. 650-volt filter condenser.
- C_2 — 2- μ f. 450-volt filter condenser.

were originally designed to be used with the power supply always loaded. So we would have to replace these condensers with higher voltage units rated for our no-load voltage — a costly proposition. However, if we could improve the regulation somehow, the no-load voltage would not be much higher than the full load voltage and, therefore, we could use the original condensers.

There are many other reasons for wanting good regulation. Suppose we wanted to build a combination c.w.-phone transmitter. If we used a conventional brute-force filter and calculated our plate voltages for c.w. transmission, the addition of a modulator or two would cause a considerable drop, thereby reducing our output power. Or, if the transmitter were to be used on three or four bands, changing from one band to another would necessitate adding or subtracting intermediate

or doubler stages which would again cause a plate voltage variation, unless separate power units were used. This is exactly what happened in the kitchen transmitter¹ of W2BRB and was the reason for starting all this rumpus about regulation. So that now, being sold (!) on good regulation, we must find out how to obtain it.

CAUSES OF POOR REGULATION

Let us first analyze the power unit and find out where the trouble lies. First, we have the transformer. If our transmitter is a decent one, we have separate filament and plate transformers. The latter should be of ample rating (as has been mentioned often in these pages), the reason being that the less we load a transformer, the better will be its regulation. It should be quite obvious that in order to have good regulation at the d.c. end of the power unit we must have good regulation at the a.c. end to begin with. When we run a transformer at a high load, there is a considerable loss (IR drop) in voltage due to the resistance of both the primary and secondary windings and, also, there is an increase in leakage flux. All these aid in causing poor regulation in our power transformer but they can be materially lessened by using an oversize job, as previously stated. The next part under suspicion is the rectifier.

These days, most everyone uses tubes, and preferably, mercury-vapor tubes. Rectifier jars may have an exceedingly large drop across them, especially if they are old. Ordinary vacuum tubes have a lower internal resistance, but because of space charge, too much for a decent high-voltage supply. In Fig. 1 the curves marked "M" show the improvement in regulation due to replacing the ordinary vacuum Type '80 with a mercury-vapor '80. The change is all the more noticeable in higher voltage rectifier tubes. There is an enormous improvement, for instance, when a Type '66 is used to replace one of the old vacuum type Kenotrons. We next come to a more important factor; the filter.

The most obvious loss in a filter is the drop in voltage attributable to resistance of the chokes. This should, therefore, be kept as low as possible. Again, chokes of ample current capacity should be used. It is poor practice to overload them, for them not only is the IR drop high, but the inductance goes down rapidly. We are taught that when using gas-filled hot-cathode rectifier tubes a choke should precede the filter to prevent a surge of current through the first filter condenser when the plate power is switched on. This surge can be great enough to wreck the rectifier tubes. However, practice demonstrates that if we limit the size of the input condenser to 1 or 2 μ f. and we are reasonable in the amount of voltage used, we may use a condenser input filter without worry-

¹ Glaser, "A Four-Band 'Kitchen' Transmitter," *QST*, Jan., 1931.

ing about the tubes. Nevertheless, the choke input filter is the easier on the rectifier and is the one to be preferred for good regulation, as we shall see. With a choke input filter, the first choke has everything to do with the regulation, the other parts of the filter having little to do but filter. If the choke is small, however, the first condenser begins to have something to say about regulation; and if no choke at all is used (condenser input filter), the first condenser takes on the job of regulating. Now it so happens that in 99 out of 100 cases, a filter is designed only to filter, no thought being given to improving regulation. It is possible, in some cases, that the regulatory function of a filter may be fully as important as the filtering action. In any case our filter must perform the two functions, filtering and regulating, in cooperation with the rest of the outfit.

THE VOLTAGE-REGULATING INPUT CHOKE

In a condenser input filter the larger the first condenser the higher will be the output voltage and the better the regulation. To get the desired results we would have to use much capacity and endanger the rectifier tubes. What is needed is a means of compensating for the drop in voltage with increasing loads without overloading the rectifier, and this means is right at hand. We know that the inductance of a choke decreases as the direct current through it increases. Therefore, if we could place the choke in an a.c. circuit, so that its reactance would become an important element of our power supply system, and then let the d.c. load flow through it, we would have an automatic voltage regulator. This is exactly what happens when the choke is used between the rectifier and first filter condenser, and seems to be a plausible explanation for the improvement in regulation obtainable when a choke input filter is used. The air gap should be adjusted so that d.c. saturation takes place, the inductance thereby being greatly reduced, with a consequent reduction of voltage drop across the choke (at ripple frequency) with increase in load. This action produces the necessary automatic compensation for resistance drops in the transformer, rectifier and choke; not entirely compensating for all these losses, but, nevertheless, giving a substantial improvement in regulation.

So we finally come out of all this more or less preliminary discussion with a choke input filter, the choke being so adjusted that it saturates at a

fraction of the normal-load current. In practice this means that the choke should have little or no air gap at all, assuming it to be the ordinary variety of choke designed for our particular size power unit.

It is important to note that as the inductance drops in this procedure, so does the amount of filtering contributed by this choke. Therefore, what follows this first choke will have to do most of the filtering. Also, the lower the inductance of this choke, the greater will be the voltage peaks that arrive at the first condenser. Hence this

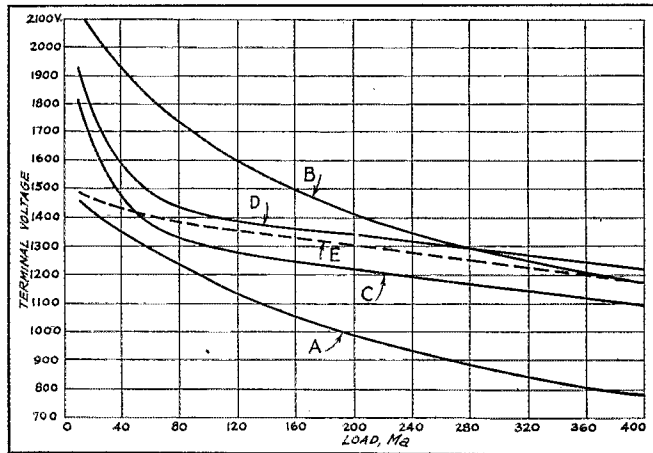


FIG. 3—REGULATION CURVES OBTAINED WITH THE HIGH-POWER SYSTEM

condenser will have to be rated somewhat higher than one following a large inductor, yet not as high as though a condenser input system were used.

PRACTICAL EXAMPLES

We have unintentionally digressed from our low-power transmitter in getting some of the "inside dope," so we return to re-design the power supply for c.w. transmission. We want to use the original condensers and also want to guard against frequency modulation, so our regulation must be good. The filtering doesn't have to be as good as it was in the receiver, but must be good enough to give us that d.c. note. We will start with the original layout, a brute force filter, as shown in Fig. 2A. This gives us the regulation curve "A" in Fig. 1, previously explained, with a regulation of 67.6%. Replacing the vacuum Type '80 with a mercury-vapor Type '80 gives us an immediate improvement of 14% shown as curve "AM." But that is about as far as we can go with a condenser input circuit, so we now connect the choke ahead of the condensers as in Fig. 2B. This gives us quite a drop in voltage due to the high reactance of this large choke, but the regulation has been improved greatly, as shown by curves

"B" and "BM," the mercury Type '80 (curve "BM") giving a regulation of 37%. We next attempt to close the air gap of the choke, but find core and coil embedded in some modern "gooey" substance, suggesting visions of a sloppy job and

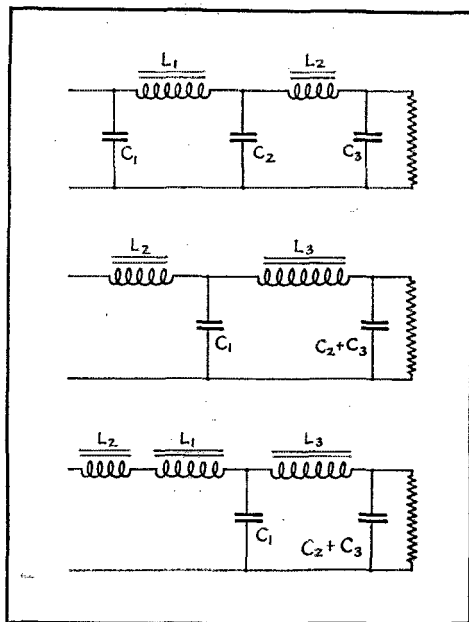


FIG. 4—FILTER CIRCUITS USED IN OBTAINING THE CURVES OF FIG. 3

- L_1 —10-h. 230-ohm choke.
- L_2 —6-h. 95-ohm choke.
- L_3 —15-h. 85-ohm choke.
- C_1 —1- μ f. 3000-volt filter condenser.
- C_2 —1- μ f. 1600-volt filter condenser.
- C_3 —2- μ f. 1600-volt filter condenser.

sticky hands, so we decide to exempt this choke from immediate duty while we scan the junk box or consult the stock records for an inductor not so protected. A few candidates are given a trial. They all work reasonably well when the air gap is closed, bettering curve "BM"; but, on trying a 2000-turn secondary on an old homemade transformer with about a 50-watt core, we get the best regulation in this particular case, as shown by curve "CM." If, now, we place a small bleeder resistor across the output of the filter, we will improve matters further and make sure the condensers always will discharge. Our regulation is now only 20%, assuming a normal load of 95 ma. With a greater load, the improvement over the original 67.6% would be all the more marked because curve "CM" is almost flat whereas the original curve, "A," has a steep slope.

As to our voltages, at rated load the voltage is only 37 volts less than with the brute-force filter, while our no-load (really bleeder-load) voltage is only 20 volts higher than with the normal receiver

load. But our first filter condenser is not protected by the input choke, so that the voltage peaks are much less than 1.41 times the direct voltage. Therefore, the condensers will be safe.

It already has been stated that the filtering of this arrangement (Fig. 2B) is not nearly as good as with the brute-force filter, but it should be sufficient to give a d.c. note when used with a stable oscillator. Additional filtering may be provided by using another choke (a few henries should suffice) in a brute-force layout, as L_3 in Fig. 2C. The resistance of this choke will make the regulation poorer so it should be kept as low as possible. With a 6- or 8-henry choke the regulation may still be kept within 25% or so, as shown by curve DM. With the original 35-henry choke, it rose to 36% due to the high resistance—620 ohms—of this reactor. It is not unreasonable to predict a regulation of 15 or 20% if an oversize transformer and lower resistance chokes are used. This amount of voltage change is consistent with good operation and economy, although such good regulation will be found in but few amateur stations.

Let us take another example, this time a higher powered job: That of the "kitchen" transmitter described in detail in January *QST*. The first arrangement tried was a two-section brute-force filter, as shown in Fig. 4A. This gave curve "A" in Fig. 3, having a regulation of 73%! With 1000 volts (r.m.s.) input to the rectifier using two Type '66 tubes, the terminal voltage at a 300-ma. load was only 860 volts. This was hardly enough to satisfy a pair of hungry '03-A's, so something had to be done! If the voltage was raised to 1500 the filter condensers would evaporate, for they were old-timers rated at "2000 volts"—which, according to our present day standards, would be about 1600 volts. There was no way out but to

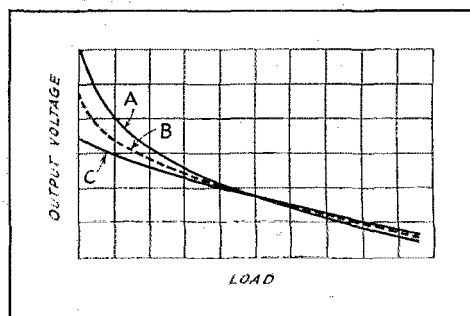


FIG. 5—THE EFFECT ON REGULATION OF THE INPUT-CHOKE AIR-GAP. CURVE "A" WAS OBTAINED WITH TWO 0.2-INCH GAPS IN SERIES; CURVE "B" WITH TWO 0.05 GAPS IN SERIES; AND CURVE "C" WITH NO GAP

improve the regulation. L_1 , a homemade 10-henry choke, had a resistance of 230 ohms. This was deemed too much for use in a decent power supply

so it was temporarily discarded. An RCA 300-ma. filter reactor was borrowed for the occasion from W2CLA. When the experiments were completed, it was borrowed for good! This reactor had a resistance of only 85 ohms and an unknown inductance which we will call 15 henries for lack of more definite information. There was no use just substituting this choke for the homemade one because even a few hundred ohms difference couldn't materially improve matters, so the old and hardy brute-force filter gave way to a choke input filter followed by one brute-force, or mid-shunt, section. This layout is "B" of Fig. 4. It was now time to use the 1500-volt transformer tap because there would be a large reactance drop across the input choke. Fig. 3B shows the results, the regulation being 66%, the voltage at 400 ma. being 1180 while the no-load voltage was over 2100. This was a little discouraging. The next guess was to reclaim the discarded L_1 and add it to L_2 (Fig. 4C). (These tests were run before the others previously described, so there was little to do but guess. Hi.) Anyway, a near-miracle happened in the form of curve "C," Fig. 3. A change of load from 80 to 400 ma. resulted in a drop of only 220 volts! The curve was quite steep from zero to 80, however, and the reason for this was not yet clear. A 30-ma. bleeder was added and the outfit was used that way for a while. This gave a regulation of 47%. With an 80-ma. bleeder the regulation was only 20%, but this was throwing away too much good power.

After the experiments already given had been run on the little outfit and a few good points had been added to our meager knowledge, the lid again was taken off the transmitter. It was evident that the good regulation of curve "C" was because L_1 had a small air gap whereas the poor regulation of curve "B" was because L_2 had a large air gap which prevented saturation. So L_2 was removed and a try made with only L_1 . The results were very encouraging. The next step was, naturally, to close the air gap of L_2 and try that alone. A further improvement resulted, the difference being due to the 135 ohms less resistance. This gave curve "D" with 14% regulation between 80 and 400 ma. Many of the curves of this family lie so close together that it is impossible to show them, so unfortunately they all cannot be included. This last curve looked real good when a 30- or 40-ma. bleeder was used (the regulation was 27%), but the supply of available apparatus had not yet been exhausted. The 3000-volt secondary of a Thordarson 900-watt transformer was next brought into the argument by being used as the input choke. The result was the excellent curve "E" which shows a regulation of only 26% from 10 to 410 mils, the corresponding voltages being 1495 and 1180. This again indicated that an interleaved transformer core was superior to a butt-joint choke type core for use in a voltage-regulating input choke.

From the two examples of power units given, the reader should have a general idea of one method of obtaining better regulation from his power supply without going to any great amount of trouble, the main idea being to get hold of an ample size choke or transformer, with a tightly closed core and of high inductance, and to use this choke ahead of the first filter condenser. For those who contemplate building a power unit for a transmitter, a second method disclosed in what follows will be more interesting. It will be noted that no design data for this input choke have been given. The reason is that there is something a great deal better if one is even a little ambitious. This is the voltage regulating transformer which will be discussed later. In the light of what we have covered it is now time to sum up the various matters that necessarily enter into a discussion of rectifiers and their regulation.

I. Summary of factors affecting voltage regulation:

- A. Power transformer regulation:
 1. Primary resistance.
 2. Secondary resistance.
- B. Resistance of rectifier.
- C. Ohmic resistance of chokes.
- D. Type of filter.

II. Full-wave rectification has been assumed in all the foregoing statements. When using half-

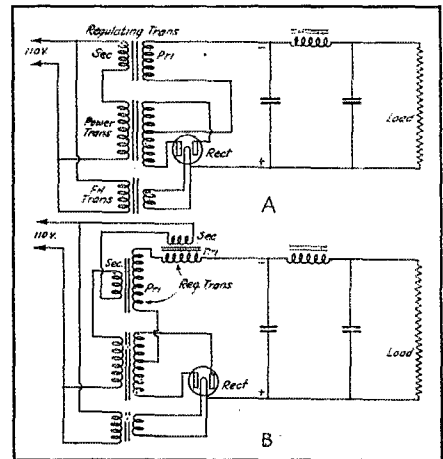


FIG. 6—FILTER CIRCUITS INCORPORATING VOLTAGE-REGULATING TRANSFORMERS

When the load current through the primary of the regulating transformer is zero, the reactance of the secondary winding (which is in series with the primary of the plate transformer) is maximum and the a.c. voltage to the rectifier is reduced. As the load current increases, the core of the regulating transformer becomes saturated, its secondary reactance decreases and the applied a.c. voltage tends to rise. The single-transformer arrangement shown in "A" is objectionable because of induced alternating e.m.f. in the rectifier circuit and the "bucking" two-transformer arrangement of "B" is recommended.

wave rectification (60-cycle output), not much will get through an input choke. Removing one

of the '66's in the large power unit caused the voltage to drop from 1300 to 300!

III. It has been assumed also that the vast majority of amateur stations use the brute-force type of filter which gives very poor regulation, usually between 70 and 80%, and, therefore, these outfits could be subjected profitably to the input choke treatment. In most cases there would be a loss in terminal voltage resulting which may, or may not, be important. However, should surplus voltage be available everything would be pretty. It is important to note that with the choke input filter the rectifier tubes are being worked with less load, so that more current may be drawn from the power unit. In a great many cases the transmitting tubes may be made to take

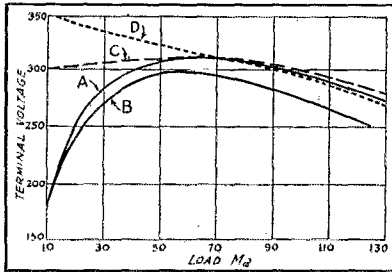


FIG. 7—TYPICAL VOLTAGE REGULATION CURVES OBTAINED WITH A LOW-POWER SYSTEM USING THE VOLTAGE-REGULATING TRANSFORMERS

Note the "negative" characteristic.

slightly larger plate currents, thus compensating for the loss in plate voltage due to the choke. Those who are using choke input filters and who have not given any thought to regulation might profit by closing the air gap and observing some of the other pointers that have been given.

IV. Not much has been said about the general design of filters for r.a.c. power units, it having been assumed that the reader was more or less familiar with this problem.² Theoretically, the main point to observe is to keep the cut-off frequency of our low-pass filter below 120 cycles. If there is any unbalance caused by the rectifier or a misplaced center tap, 60 cycles also will be present. When using mercury vapor tubes there will not be an appreciable unbalance due to the rectifier. Practically, a choke of several henries followed by a 2- μ d. condenser will give enough filtering for most c.w. transmitters, provided they are built properly and have no r.f. currents running around where they shouldn't be. Another choke and condenser will have to be added for the very critical-minded c.w. man and, of course, by anyone attempting to use 'phone.

V. A small load, in the form of a voltmeter or

bleeder resistor, should always be connected across the output terminals. If the first part of the regulation curve is steep, a large bleeder will improve the regulation materially. But it is not sensible to waste too much good power this way. Eliminating the last bit of air gap will go a long way toward flattening the first part of the load-voltage curve.

VI. The capacity of the filter condensers following a large input choke has nothing to do with regulation. Nor has the inductance of a choke following a condenser larger than 1 μ d. much to do with regulation; but, of course, both have a lot to do with filtering.

VII. The effect of an air gap in the input choke is rather interesting. Fig. 5 gives a series of curves showing that as the gap is opened the voltage at no-load and small loads rises while the full-load voltage remains the same. Experiments have shown that a coil wound on a close-fitting transformer-type core was invariably better than a coil wound on a butt-joint choke-type core. It was the elimination of this last bit of gap that flattened the first part of the regulation curves. See Curve "E," Fig. 3, and compare it with Curves "C" and "D."

VIII. A choke used right after the rectifier has to handle the peak voltage so that it ought to have better insulation between layers than one used following a condenser. However, no trouble has been experienced with choke insulation. The greatest source of annoyance has been the buzzing of loose laminations; that is mechanical, rather than electrical, trouble.

VOLTAGE REGULATING TRANSFORMERS

At last we have arrived at the second part of the story; the consideration of the voltage regulating transformer. Fundamentally, this gadget has a small, heavy, low-resistance winding which is connected in series with the primary of the power transformer, and a large, choke-type winding which is connected in place of the input choke, as shown in Fig. 6A. With the rectifier running at no-load the heavy winding acts as a choke in the 110-volt circuit, cutting down the voltage applied to the primary of the power transformer. As load is applied, the core saturates, thereby reducing the inductance of the small winding which, in turn, raises the voltage on the rectifier transformer.³ This is a compensating system that can be made to over-compensate for at least a part of the normal load range. But there is a hitch that first must be ironed out. This regulating transformer also acts as a step-up transformer and feeds straight a.c. into the rectifier circuit which acts on one tube only. This has the same effect as unbalancing the center-tap of the high voltage secondary and produces a bad

² For practical information on filter design, see *The Radio Amateur's Handbook*, Seventh and Eighth Editions, Chapter IX.

³ It might be interesting to old timers to compare this voltage-regulating transformer scheme with the old-time Alexander modulator, the principle being identical.

60-cycle ripple. To get rid of this effect, it is necessary to use two transformers and cause them to buck one another, as shown in Fig. 6B. Then the a.c. voltage due to the step-up transformer effect will be nil, although saturation will still take place. It will be shown later how a single transformer of a special type may serve the same purpose.

The severe limitations of the writer's "apartment laboratory," lack of available funds and scarcity of equipment have not permitted a great deal of design data to be forthcoming, but two very successful voltage regulating transformers have been built with the very capable advice of William H. Holden, instructor in advanced high-frequency circuits at Pratt Institute, Brooklyn. The first was built for the small low-power outfit and the second for the transmitter at W2BRB.

The low-power job consisted of two transformers of the core type wound on a core $1'' \times 1\frac{1}{2}''$ in cross section, the window being $1\frac{1}{2}'' \times 1$. The small winding (which we will call the secondary) consists of about 260 turns of No. 24 silk-enamel covered wire giving a resistance of about 2 ohms and an inductance of about 0.5 henry. The large winding (primary) has about 4600 turns of No. 27 s.e. giving a resistance of about 70 ohms and an inductance of roughly 10 henries. The primary was wound on top of the secondary, being well insulated from it. The coils were wound on heavy paper forms, well doped, and then the transformer core was assembled with the "L" laminations stacked alternately so as to give as little air space as possible.

Fig. 7 shows a series of regulation curves obtained with this pair of transformers, the secondaries connected series-aiding and the primaries series-bucking, used in conjunction with the broadcast receiver power pack previously described. Curve "A" shows the regulation with a 10-ma. bleeder, the voltage actually increasing with load up to 70 ma. It is important to note that the rectifier tube filament must be lighted by a separate transformer. In fact, no load but the high-voltage should be taken from the power transformer or the voltage compensation will be materially reduced. Curve "B" shows the effect of adding a 200-ohm choke to further filter the output (and another condenser, of course). The difference between curves "A" and "B" is due solely to the ohmic resistance of the added choke. By shunting a resistance across the secondary of the regulating transformer, the sharp increase in voltage at small loads can be reduced, or even eliminated entirely. Curve "C" was produced by shunting 300 ohms across the secondary and adding a 20-ma. bleeder. The shape of the

curve can be further altered by providing taps on the coils which, when used in conjunction with a variable secondary resistance, can be made to provide a great variety of curve forms. It is conceivable, although maybe not possible, that this type of rising curve could be added to the choke input type of curve to produce an absolutely straight line characteristic. Of course, in the ordinary case, it is not necessary to go to any such extreme, but it might be a good pastime for someone who has nothing else to do! An input choke was added just to take one shot at this theory, and it did materially flatten curve "A," although the rise at the beginning was still

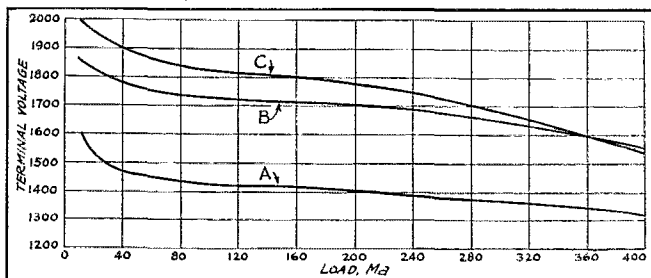


FIG. 8 — CURVES OBTAINED USING THE VOLTAGE REGULATING TRANSFORMERS IN THE HIGH-POWER SYSTEM

present. Of course, it also dropped the voltage. Curve "D" was added to this family just to show the comparison of a reasonably good transformer-type input choke.

The large regulating transformer was made by taking an ordinary 100-watt transformer core of the BC receiver type (which cost 50 cents) and making two separate transformers, each using half the laminations. The centre section of this shell type core measured $1'' \times 1\frac{1}{2}''$ for each transformer. The secondary, which was wound nearest the core, had 170 turns of No. 20 s.e. The primary devoured about 1400 turns of No. 25 s.e., the two secondaries being connected in parallel. The coils were wound similar to the first set, although this was the more exact job and had better insulation. The laminations have a tendency to buzz, so must be clamped. The No. 20 wire used for the secondary is not quite heavy enough to carry the 5- or 6-ampere line current without heating, but was the heaviest available. It just about gets by. It would be better to use about 42 turns of No. 14 d.c.e. and connect the coils in series.

The results with this set of regulating transformers are shown in Fig. 8. Curve "A" was obtained by the transformers as described. Curve "B" was produced by removing a third of the laminations of each transformer, and curve "C" by removing half the laminations. The difference between this set of curves and those of Fig. 7 is caused, at least in part, by the fact that the small

cores were perfectly fitted while these cores, being typical of modern mass production, were rough and uneven. The coating on the laminations was also much thicker and less perfect. These bad features produce a comparatively large air space which probably is the cause of the voltage drop at small loads. A more perfect job would, no doubt, give negative regulation, as in the first case. At any rate, curve "A" is not bad. With a 40-ma. bleeder the regulation is only 10%, and, with a little further playing (made impossible by lack of time), it could be improved even further.

It should not be supposed that the design data

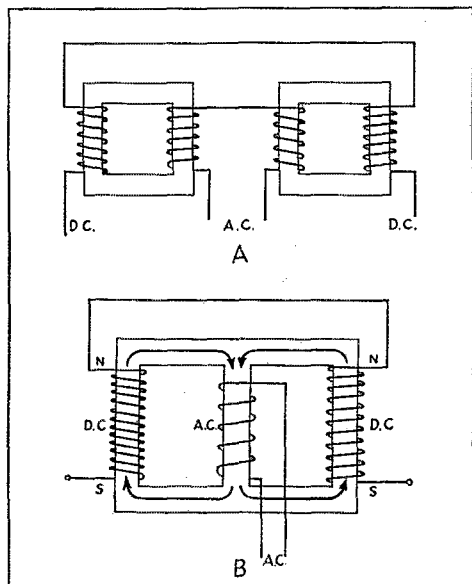


FIG. 9—THE SINGLE SHELL-TYPE TRANSFORMER SUGGESTED BY "B" WOULD BE EQUIVALENT TO THE TWIN-TRANSFORMER ARRANGEMENT OF "A"

given represent the best possible transformer. There is no doubt that one made with more time and greater facilities could do a much better job. To anyone building these transformers the suggestion is to add a few more turns than specified and bring out several taps in order to ascertain the best combination. Above all, the transformers should be exactly alike.

A single equivalent shell-type transformer can be made to do the job of the pair of transformers, as is suggested in Fig. 9. In "A" is pictured the pair and "B" shows the equivalent single transformer. The author intends to build such an outfit at the first opportunity, but, so far, this has remained untried. It is suggested that the centre section, on which the secondary is wound, be of the same cross section as the outer legs. The arrows picture the means of saturation. Care must

be taken to connect the d.c. windings in opposition.

In addition to improving regulation, the separate transformers offer surge prevention in the rectifier circuit, thereby protecting the tubes. They also act as input chokes and contribute to the filtering. Just how far the single transformer would go towards accomplishing these things is not known.

Even though no a.c. gets through to the rectifier circuit, because of the opposing windings, step-up action does occur in so far as the individual coils are concerned and, therefore, the insulation between turns must be better than just enamel. This was the reason for using silk-enamel insulated wire. Referring to Fig. 6 again, it will be noted that the regulating transformers are connected in the negative high voltage lead. This reduces the amount of insulation needed between coils and from primary to core.

In closing, the reader is reminded that the largest replacement cost in amateur transmitters (besides tubes) is filter condensers. By following the advice of this story it is hoped a few filter condensers will be rescued. With good plate-voltage regulation, the multi-stage transmitter can be switched from c.w. to 'phone and from one hand to another, adding or subtracting several doubler stages, without making the readjustments usually necessitated by changes in voltage.

The author is indebted to the aforementioned Mr. Holden for suggestions and corrections that have greatly helped to make this article.

Commission Orders Affecting Amateurs

THE Federal Radio Commission now requires that applications for renewal of station license be filed with the Supervisor of Radio at least sixty days prior to the license expiration, instead of the thirty days that has governed in the past. The new requirement is contained in General Order No. 114, repealing General Order No. 89, the pertinent paragraph of which reads as follows:

Unless otherwise directed by the Commission all applications for renewal of license shall be filed so as to be received at the office of the Supervisor of Radio in charge of the district in which the station is located at least sixty (60) days prior to the expiration date of the license sought to be renewed. Where an applicant for renewal of license fails to meet these requirements and as a result thereof the Commission fails to take action upon any such application before the expiration date of the license sought to be renewed, the licensee shall cease operating in accordance with the terms of said license and no temporary extension thereof will be granted pending decision of the Commission on said delinquent application.

Although applying fully to amateur stations, the regulation is aimed primarily at broadcasting stations. Amateur station licensing is proceeding smoothly. It is necessary to comply with

(Continued on page 76)

The Traveling Man's Portable

A Complete Medium-Power Crystal-Controlled Ham Station in a Suit case

By Don C. Wallace, W6AM-W6ZZA*

PORTABLE W6ZZA has been developed while traveling. It is carried from city to city on Pullman cars, automobiles, busses or ships. During several years of actual use the set has maintained communication with the home "base," Long Beach, California, from Washington, D. C.; Dayton, Ohio; Chicago, Illinois; El Paso, Texas; Salt Lake City, Utah; Seattle and Spokane, Washington; Portland, Oregon; San Francisco and San Diego, California, and many other places too numerous to mention. It is truly a portable that functions daily, a veritable traveling man's amateur station.

This article, for example, is being written on the West Coast Limited, enroute from Los Angeles, California, to Seattle, Washington. The set is under the Pullman seat, in a leather case smaller than a suit case. The tubes stay in the sockets, the batteries for the receiver are inside, the headphones connected, the key ready to "pound" when the case is opened. The 20-foot lamp cord, call book and log book are all in the lid when it is dropped forward.

In the design of the set each part was carefully weighed. If something weighed one ounce less than something else, the lighter part was used, provided it would hold up and do the work just as well. Examples of this are as follows: The Acme 300-watt plate and filament transformer runs hot; therefore no smaller transformer would do. The 1- and $\frac{1}{4}$ -pound filament transformers also run hot, yet hold up for an hour's continuous duty before they start to "smell." The headphones are the new Trimm 4-ounce sensitive type. The switches are miniature. The audio transformer is the original 10 to 1 type light-weight Hedgehog. The meters are the especially light Readrites. Flash-light bulbs used as r.f. indicators weigh much less than r.f. meters would. The case is rather light for the total weight of the set, but is reinforced with small brass angles throughout. Portable size "B" batteries are used; a 4½-volt "C" furnishes a 6-month "A" supply for the receiver. The total weight of the set is 64 pounds, and it is easily handled by "red caps," porters, and "bell hops," along with other baggage.

The average suit case or portable typewriter case will last about two years on the road. The first case on the portable set lasted three years, during which time it was checked as baggage

from place to place after taking out the tubes. This present case is not checked as baggage so the tubes can be left in their sockets; and it is hoped the case will last longer, since it is quite a job to rebuild everything in such a small space.

WHAT BAND?

The first carrying case made provision for plug-in coils for the 3.5-, 7- and 14-mc. bands. The 3.5-mc. band required late hours at night while



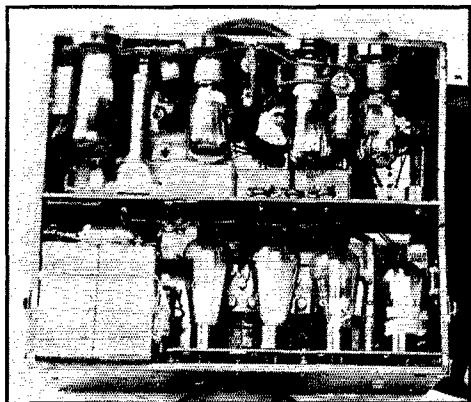
Photographs by WOLLEP

WITH THE FRONT COVER DROPPED FORWARD, the Antenna strung up and the power-plug inserted in a 110-volt a.c. outlet, W6ZZA is ready for operation. All controls are labeled, making it easy for visiting operators to handle the set. The three receiver controls are in the lower right-hand corner of the panel. The 4-pole double-throw switch in this corner connects the "A" and "B" batteries to the receiver when in the "Receive" position; or connects them in the bias circuit of the transmitter when in the "Send" position. The other 4-pole double-throw switch (at the left) connects the antenna system to either the transmitter or receiver. The upper dials, from left to right, are for the feeder tuning (2), amplifier tank, amplifier neutralizing, doubler tank and oscillator tank. The lamp and switch combination between the feeder tuning controls constitutes the radiation indicating device in the antenna system. The feeder terminals are above the feeder tuning dials. The loop and bulb fastened to the panel between the neutralizing and doubler dials is coupled to the doubler tank which is immediately behind the panel. The three milliammeters (left to right) are for amplifier, doubler and oscillator plate current. The s.p.d.t. "High" and "Low" power switch is to the left of the meters. The upper section of the panel is bakelite, the lower aluminum. And the double hand-grip is "just in case"

the 14-mc. band required high noon for proper operation, and then only at great distances. The 7-mc. band functioned best in the morning

* District Manager, Kolster Radio, Inc., 4214 Country Club Drive, Long Beach, California.

and morning likewise proved the best time for schedules—no business could interfere for



THE BACK OF THE SET COMES OFF WHEN THE CATCHES ARE UNSNAPPED

The upper compartment contains the transmitter proper, the tube lineup being, from left to right, the oscillator, the doubler and the two paralleled amplifiers. The tank inductances are between the tubes and the front panel, with r.f. chokes, fixed condensers and other components mounted as convenience dictates. The receiver is at the left side of the lower compartment, largely hidden by the two "B" battery blocks. The rectifier-filter system occupies the right side of this compartment, the Type '81 vacuum tubes being at the left and the R-81 mercury-vapor rectifiers at the right. The necessary portable station and operator's licenses are pasted to the cover along with a handy list of foreign intermediates.

W6ZZA. This time was also convenient for Mrs. Wallace, W6MA. As much as a year goes by now without a single miss in schedules, all on the 7-mc. band and usually at 7:30 a.m. The present set, accordingly, has no provisions for changing bands, thereby making it more efficient.

One extra coil L_2 is carried to exchange with the crystal tank coil which normally is on 3602 kc. This plug-in coil serves as a grid inductance for the doubler when it acts as a t.p.t.g. master oscillator (after removing the crystal oscillator tube). The final amplifier also will function as a t.p.t.g. set provided the neutralizing condenser is tuned to zero. These two methods permit changing frequency within the band, although there seems to be no need of that.

Type '10 tubes are used throughout (in the transmitter) because they handle plenty of voltage, they are all alike, and are interchangeable in case of accident. No spare tubes are necessary, since the transmitter can work with 4 tubes as shown; with 3 tubes, by taking one out of the final ampli-

fier and working on low power (750 volts); with 2 tubes m.o.p.a., or t.p.t.g., self-excited.

The rectifier automatically furnishes its own spare too, as the Type '81 vacuum tubes rectify at 750 volts, furnishing voltage to the doubler at 600 volts, the oscillator at 400 volts, and the low-power tap of the final amplifier at 750 volts. The R-81 tubes furnish 1000 volts with the high-power tap. There is no appreciable drop in these tubes since they are the mercury-vapor type. The dual rectifier has several advantages: it keeps voltages steady, since no voltage divider is necessary; acts as a spare rectifier, since either or both units may be used; and permits quick "come-back" on low power, the actual switch to high power on the slower mercury-vapor tubes being made after sending "de" in the first call.

The crystal, which was ground by W6BAS, is mounted in a special holder. The crystal has never been out of the holder in years, never fails to oscillate, and is carried right in place in the transmitter. The crystal is on 3602 kc. doubling to 7204 kc. It was checked by the Point Fermin Department of Commerce Monitoring Station at 7204.001 kc. This frequency has proved admirable for communication with W6MA who uses a high-gain receiver with 6 tuned stages, including the Aero "Hi-Peak" tuned audio. Her transmitter is the 1-kw. input 7200-kc. crystal controlled set with 6-phase supply¹ and so the simple receiver of W6ZZA is ample. The plan, of course, is to have the best possible transmitter and receiver at home and the lightest possible receiver (and the most power possible from Type '10 tubes) on the road. Incidentally, the Type '10 tubes of this set deliver as much as 175 watts to the portable antenna.

In series with the crystal is a '99 tube filament. This serves as an r.f. indicator, glowing at normal brilliancy when the crystal is oscillating. The filament of the '99 also is just right to act as a fuse. At 60 ma. it glows normally, at 100 ma. it is quite bright, at 150 ma. the filament burns out, thus saving the crystal from cracking. Every amateur can put a '99 in series with his crystal; it does no harm and may save a crystal. It's lighter, cheaper and better than an r.f. milliammeter because meters burn out without protecting the crystal. If it burns out nothing is lost, as most any radio dealer having deactivated '99's on hand will be glad to give them away.



WHEN W6AM LEAVES HOME with a complete amateur station in his right hand and a suit case in his left, he has the assurance of dependable contact with the "base station," W6MA, while he is away. The whole outfit, including a two-tube dry-cell receiver and a complete a.c. operated crystal-controlled transmitter, occupies about the same space as a suit case and weighs 64 pounds—which isn't much of a load for a 200-pounder, at that

¹QST, February, 1928.

The flash-bulb loop on the panel indicates the doubler tank current, as the doubler coil is inside the cabinet just behind the loop. The bulb in series with the antenna is hooked up in such a way that three degrees of brilliancy are possible. One of these connections is such that the bulb is actually shunted around the switch blade, and even then it glows brightly when high power is on.

There are 11 r.f. chokes in the transmitter. Six 1750-volt filter condensers were blown at 1000 volts before it was found that the compactness of the set put r.f. into the condensers, thereby blowing them. This same condition is, no doubt, the cause of many amateur condensers

breaking down. R.f. chokes in the condenser leads solve the problem, and plenty of r.f. chokes elsewhere help the note.

THE QUICK-DETACHABLE ANTENNA SYSTEM

The same antenna is used for transmitting and receiving. If a tuned antenna is good for the transmitter, it is also good for the receiver, but few amateurs seem to realize this. Instead, they put up some piece of wire 50 or 75 feet long and wonder why the other fellow hears more. Of course, to use a properly tuned transmitting antenna a switch must be used, but here the same switch controls the power to the transmitter.

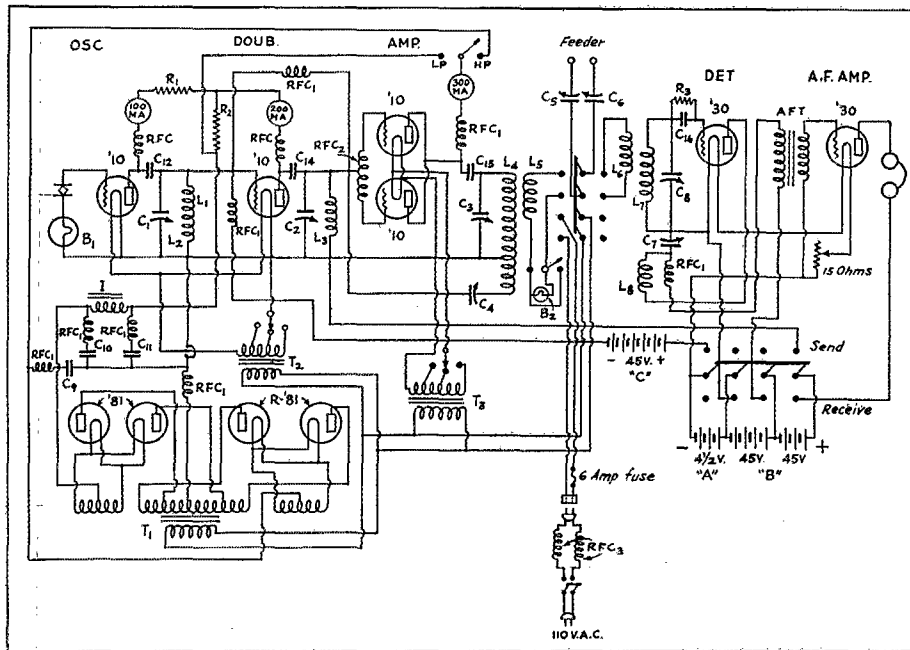


FIG. 1 — SCHEMATIC CIRCUIT OF THE PORTABLE

- C₁₋₇ — 150- μ fd. Pilot midget condensers.
- C₈ — G.R. midget condenser cut down to 2 plates.
- C_{9, 10, 11} — 1- μ fd. 1750-volt filter condensers.
- C₁₂₋₁₅ — 100- μ fd. mica condensers.
- T₁ — Power transformer, Acme 300-watt; two 7.5-volt filament windings, center-tapped; plate winding 750 and 1000 volts each side of center-tap.
- T_{2, 3} — Dongan 30-watt "toy" transformers with cases removed.
- B₁ — Type 99 tube, filament connected in crystal circuit. See text.
- B₂ — Flash bulb.
- L₁ — LX Plug-in coil used as crystal oscillator tank inductance; 20 turns of No. 22 d.c.c. on 2-inch diameter celluloid tube, turns spaced distance equal to wire diameter.
- L₂ — Plug-in coil interchanged with L₁ for m.o.p.a. operation, as explained in text; 12 turns No. 14 d.c.c., 2-inch celluloid form.
- L₃ — Same as L₂ but not plug-in.
- L₄ — 24 turns No. 14 d.c.c., tapped at center; 2-inch celluloid form.
- L₅ — 14 turns No. 22 d.c.c., 2-inch celluloid form; hinged mounting to vary coupling with L₄.
- L₆ — 6 turns No. 28 d.c.c.
- L₇ — 25 turns No. 28 d.c.c.
- L₈ — 15 turns No. 28 d.c.c.
- L_{6, 7, 8} all on one celluloid tube, 1/30-inch spacing between turns, 1-inch spacing between coils.
- RFC₁ — National r.f. chokes.
- RFC₂ — Anti-parasitic grid choke, 60 turns No. 34 s.c.c. on 3/8-inch wood dowel, tapped at center.
- RFC₃ — A.c. line chokes, each 50 turns or so of No. 20 d.c.c. on 1/2-inch form. Prevent QRM to BCL's.
- R₁ — 3500 ohms.
- R₂ — 1750 ohms.
- R₃ — 3 megohms.
- I — National filter choke.

It is important that both sides of the 110-volt lines be disconnected, or else all incoming signals are slightly modulated, due to the nearness of the transmitting equipment. To make sure added power noise is not picked up because of this switch being right on the set, another switch is placed on the lamp-cord extension. No location has been found yet where the latter switch was necessary but it is very small, just about an inch square, so it does no harm and might do some good in a noisy location.

The antenna is a zepp, made from "loop" wire. Brown loop wire is used for the antenna and one feeder, and green for the other feeder wire. The spacers are $\frac{3}{8}$ -inch wooden dowel sticks 3 inches long, drilled on each end and boiled in paraffin. These are placed every 15 inches along the 40-foot feeder wires. The length of flat-top portion of the zepp is 66 feet 1 inch, just right for 7204 kc. The little wooden spacers will not break windows, if they fall, and the entire antenna may be wrapped around the lid of a cigar box.

The procedure for putting up the hotel antenna is somewhat as follows. One of the curtains of the room, preferably a top-floor room, is put outside the window. In this way one can tell which room is his. Every hotel has a fire escape to the roof and the door is always open. Two balls of cotton string serve as the antenna hoisters. The feeders are dropped over the side, till they are opposite the window with the curtain out. They are fastened out to some convenient object or a temporary boom is put out. Most hotel roofs have sticks on them suitable for booms. The antenna is fastened as high as possible, using the balls of string to throw over elevator shafts, water tanks, other people's antennas, flag poles, etc. The string is pulled (after fastening the antenna to it) much in the manner of a rope and pulley. The string is used for insulation; no insulators are used because they might break things should they fall. If the antenna is properly put up, the process takes but 5 or 10 minutes. When the hotel stay is over, yank the antenna, the string breaks, and the antenna can be rolled up from the room window.

The lead-in is fastened by rubber bands to a pair of 2-foot kite sticks. These are fastened together by rubber bands in the shape of an "X". The lead-in goes between several sheets of hotel stationery (for insulation) and the whole thing, sticks, lead-in and paper, is jammed up between the top of the window and the upper sill. The feeders are then fastened to the set, the plug put into the 110-volt socket, the key pushed, and the set is on the air. Sometimes it takes 15 minutes to install but usually 10 minutes is plenty of time. Once, with the help of a bell boy, the installation was made and the set put on the air in 3 minutes.

Hotels are so glad to get customers that they

don't worry much what one does with antennas. If permission is asked, however, it takes about an hour to explain why and what amateur radio is. Accordingly, no permission is asked.

Each component part of the transmitter is adequately labeled: "Send," "Receive," "High Power," "Low Power," "Oscillator," "Doublor," "Neutralizer," "Amplifier," "Antenna 1," "Antenna 2," "KC," "A Battery," "Regeneration." The meters are marked "Oscillator," "Doublor," "Amplifier"; the flash bulbs "Doublor RF" and "Antenna (Bright-Dim)." Even the man who builds a set is likely to forget the dial settings, so above each dial, on a label, the dial setting is marked in pencil. These seldom vary more than a degree. The receiver is calibrated in kilocycles.

When a third or ninth district amateur hears a "6" about R9 a couple blocks from him, he is likely to come over. The labels permit any licensed amateur to operate the set with almost no instruction. Scores of amateurs have accordingly helped keep W6ZZA on the air. Some of these chaps have even clicked with foreign stations; in one hotel for example, five countries were worked during one stay.

Strays

John P. Lippert, of Cleveland, Ohio, who died recently in that city, is said to be the first radio operator licensed under the first radio law in the United States, that of 1912. He operated pre-war 8BE and post-war 8AQ. A photograph of 8BE appears in the first issue of *QST*, December, 1915.

WSBKP, whose station description appears in the August issue, brought his total of countries worked to 101 on July 28th. He believes he is the first in this country to reach the hundred mark. FB!

COÖPERATION NEEDED

Members of the British Empire Radio Union in India and Burma are collecting data concerning the effects of the Indian Monsoon on radio wave propagation and request the coöperation of all amateurs in observing signals from those countries during the monsoon season, which extends to approximately October 1st. Particular note should be taken of the variation in signal strength from both amateur and commercial stations in the affected area. Stations in Chile, Argentina, South Africa, Java, Southern Rhodesia, Zanzibar, Aleutian Islands and Alaska are requested to report on general meteorological conditions as well as signal strength variations. If possible observations should be made at regular times on several frequency bands.

Reports should be forwarded to VU2DR, R. N. Fox, c/o Lyons (India) Limited, 11, British Indian Street, Calcutta.

The W.E. 212-D As a Modulator

By A. E. Rydberg, W9AED*

HAVING decided to build a 'phone outfit in which a Western Electric 212-D was to modulate a Type '03-A Class C amplifier, I proceeded to get some information on such a layout. In looking over several articles describing such transmitters, and asking several amateurs using similar equipment, I found that the recommended voltages on the modulator varied from 1300 to 2000 volts, and that the voltage on the modulated amplifier, for complete modulation, was given as 750 to 1250 volts. As can be seen, all this information was rather indefinite, so I determined to find out the modulation capability of the 212-D. First I looked for some plate-voltage plate-current curves so that the load line for the tube as a modulator could be plotted, and again I met with no success. There were no such curves available. As a last resort I hooked up the necessary equipment to run the curves. Finally, after two weeks of spare-time labor, I had some fairly accurate curves with which to work, and these constitute the basis of this article.

The Western-Electric 212-D, a 250-watt type tube, is used commercially as a radio-frequency oscillator, radio-frequency power amplifier and modulator. Although not available to amateurs through the usual channels, the 212-D is quite commonly used by them. Because of its relatively large audio power-output capability, the tube is well suited to use as a modulator.

The normal ratings of the 212-D are as follows:

Filament volts.....	14
Filament amperes.....	6
Plate voltage (normal).....	1000 to 1500
Maximum safe plate voltage.....	2000
Maximum continuous power safely dissipated by plate.....	200 watts
Amplification constant.....	15 to 17
Average plate resistance.....	2000 ohms

There are four distinct classes of 212-D tubes, each having slightly different characteristics. With a plate voltage of 1500, the grid bias voltage at -60 and the filament voltage 14, the plate current will be as follows:

Class 1.....	110 to 129 ma.
Class 2.....	130 to 148 ma.
Class 3.....	149 to 167 ma.
Class 4.....	168 to 185 ma.

The class number of the tube may be found marked on the glass just above the metal base.

Because the Class 3 and 4 tubes draw more plate current, some amateurs think that these tubes are "soft." Such is not the case, but in-

dicates their lower plate resistance and, consequently, their higher audio power output capability and superiority as modulators.

When used in a modulation system where the modulator has a higher plate voltage than the oscillator or the r.f. amplifier, the 212-D is capable of fully (100%) modulating the r.f. output of such tubes as the Type '03-A, '11, and in some cases the '52 or '04-A at low power. Let us take some examples.

A Class 4 212-D modulator at 1500 volts and 90 ma. input (grid bias -85 volts) has a plate swing of 840 volts, and for 100% modulation a Type '03-A or '11 may be used as a Class C r.f. amplifier with a plate input of 840 volts at 62

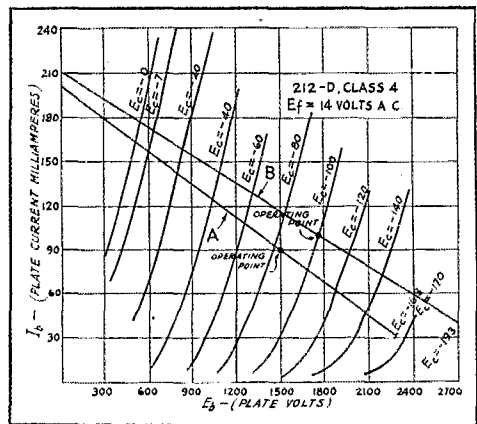


FIG. 1

ma., or 52 watts; which, at 70% efficiency, gives a carrier output of 36 watts. Again, the same 212-D modulator at 1750 volts, 100 ma. (grid bias -100 volts) has a plate swing of 1035 volts, and in this case a Type '03-A, '11 or '52 could be fully modulated at an input of 1035 volts at 65 ma. With 70% efficiency a carrier output of 47 watts rising on modulation peaks to 188 watts would be obtainable — quite a husky 'phone signal.

Fig. 1 shows the plate-voltage plate-current curves for a typical Class 4 212-D. As has been described previously in *QST*,¹ the load characteristic for the tube when used as a modulator may be plotted on the plate-voltage plate-current characteristic. The load line is extended

¹ Westman, "Little-Known Tubes — The UX-841 and UX-842," *QST*, July, 1929; Lamb, "The UV-845," *QST*, November, 1929 and Chapter VIII, *The Radio Amateur's Handbook* (Seventh and Eighth Editions).

* 163 East Graham Ave., Council Bluffs, Ia.

to the vertical (zero voltage) axis, and the value of current at this intersection is the sum of modulator and Class C amplifier plate currents for the same mean plate voltage on the modulator and Class C amplifier. For the load line A, the operating point is chosen at 1500 volts, 90 ma., the grid bias being -85 volts. Locating the load line and having it correctly plotted, we find that

100% MODULATION COMBINATIONS USING 212-D MODULATOR

Modulator					Class C Amplifier			
Type No.	Plate Volts	Plate Ma.	Grid Bias, Volts	Grid Swing, Peak Volts	Plate Resistor, Ohms	Plate Volts	Plate Ma.	Carrier Watts, 70% Eff.
4	1500	90	-85	78	11,300	840	62	36
4	1750	100	-100	93	11,000	1035	65	47
1	1500	87	-70	63	13,160	750	57	30
1	1750	90	-85	78	12,310	950	65	43

Values for Class 2 and 3 tubes will lie between those for Classes 4 and 1. Suitable circuits and information on speech amplifier equipment, Class C amplifier operation, etc., will be found in Chapter VIII, Radio Amateur's Handbook (Seventh and Eighth Editions).

at the intersection of the vertical axis, the total current is 200 ma. Since the modulator current is 90 ma., this leaves a current of 110 ma. to the Class C amplifier. When the tube is operated with a.c. filament supply, the maximum grid swing on either side of the operating point will be less than the bias value by one-half of the filament voltage, or from -85 down to -7 and up to -163 volts, the peak amplitude of the grid swing being 78 volts. At the intersection of the load line and the -7-volt bias line, the plate voltage is 580 volts; and at the intersection of the load line and the -163-volt bias line the plate voltage is 2280 volts. The modulation factor is, then,

$$M = \frac{E_{max} - E_{min}}{2E_o}$$

Where: M = Modulation factor expressed as a decimal.

E_o = Voltage at the operating point.

E_{max} = Voltage at minimum current point.

E_{min} = Voltage at the intersection of load line and minimum bias line (maximum current point).

Then:

$$M = \frac{2260 - 580}{3000} = .56 \text{ or } 56\%$$

To determine the proper Class C amplifier plate voltage for 100% modulation,

$$E_o = \frac{E_{max} - E_{min}}{2}$$

Where E_o = Mean plate voltage of Class C amplifier.

E_{max} = Maximum value of modulator plate voltage.

E_{min} = Minimum value of modulator plate voltage.

$$\text{Then } E_o = \frac{2260 - 580}{2} = 840 \text{ volts.}$$

The proper Class C amplifier mean plate current for 100% modulation is found by multiplying the value of plate current for equal modulator and Class C amplifier plate voltages, by the ratio of amplifier plate voltage to modulator plate voltage, which is the same as the modulation factor where the same plate voltage is applied to the modulator and modulated amplifier. This step is necessary because the Class C amplifier mean plate current must be reduced in value by the same proportion as the plate voltage is reduced in order to make the load resistance the same as that for which the load line is plotted. The plate current for the Class C amplifier is, therefore,

$$I_o = \frac{840}{1500} \times 110 = 62 \text{ ma.}$$

For the load line B in Fig. 1, the operating voltage is chosen as 1750 at 100 ma., the grid bias being -100 volts. Using the same method as above, we find that $E_{max} = 2685$ volts and $E_{min} = 615$ volts (at $E_o = -7$ volts).

Then, for the same plate voltage on modulator and modulated amplifier,

$$M = \frac{2685 - 615}{3500} = .59 \text{ or } 59\% \text{ (approx.)}$$

The proper Class C amplifier plate voltage for 100% modulation is

$$E_o = \frac{2685 - 615}{2} = 1035 \text{ volts.}$$

The value of modulated amplifier mean plate current to give the proper load for the modulator is

$$I_o = \frac{1035}{1750} \times 110 = 65 \text{ ma.}$$

Fig. 2 shows typical plate-voltage plate-current curves for a Class 1 212-D, with the load lines for 1500 and 1750 volts plotted.

The table summarizes the operating conditions for 212-D tubes Class 1 and 4 respectively, showing typical combinations for practically distortionless 100% modulation at different values of Class C amplifier plate current for two different values of plate voltage. From this table the number of modulator tubes necessary to give complete modulation for a given value of Class C amplifier plate current can be determined, additional modulator tubes being required to handle greater Class C amplifier plate current. Regardless of the number of modulator tubes used, of course, the modulation factor of 1.0 (100%) cannot be obtained unless a lower plate voltage is

used on the Class C amplifier than on the modulator.

It is particularly important that the specified values of Class C amplifier plate current be closely followed and that current values much in excess

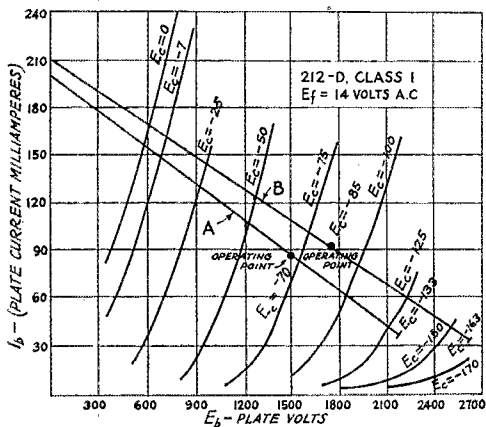


FIG. 2

of those specified be carefully avoided. Otherwise complete modulation with negligible distortion will not be obtained. If it is necessary to operate the modulated Class C amplifier with greater plate current, additional modulator tubes in parallel should be used rather than overload the modulator, injure the quality and sacrifice modulation capability by operating with excessive modulated amplifier plate current.

ELECTION NOTICES

To all A.R.R.L. Members residing in the ATLANTIC, DAKOTA, DELTA, MIDWEST, PACIFIC (including Territory of Hawaii), and SOUTHEASTERN (including Porto Rico) Divisions of A.R.R.L.:

1. You are hereby notified that an election for an A.R.R.L. Director, for the term 1932-1933, is about to be held in each of the above Divisions, in accordance with the Constitution. Your attention is invited to Sec. 1 of Article IV of the Constitution, providing for the government of A.R.R.L. affairs by a Board of Directors; Sec. 2 of Article IV, defining their eligibility; and By-Laws 10 to 19 providing for their nomination and election. Copy of the Constitution and By-Laws will be mailed any member upon request.

2. Voting will take place between November 1 and December 20, 1931, on ballots which will be mailed from Headquarters in the first week of November. The ballots for each Division will list the names of all eligible candidates nominated for the position by A.R.R.L. members residing in that Division.

3. Nominating petitions are hereby solicited. Ten or more A.R.R.L. members residing in any

one Division have the privilege of nominating any member of the League in that Division as a candidate for Director therefrom. The following form for nomination is suggested:

(Place and date)

Executive Committee,
American Radio Relay League,
West Hartford, Conn.

Gentlemen:

We, the undersigned members of the A.R.R.L. residing in the Division, hereby nominate of as a candidate for Director from this Division for the 1932-1933 term.

(Signatures and addresses)

The signers must be League members in good standing. The nominee must be a League member in good standing and must be without commercial radio connections. His complete name and address should be given. All such petitions must be filed at the headquarters office of the League in West Hartford, Conn., by noon of the first day of November, 1931. There is no limit on the number of petitions that may be filed, but no member shall append his signature to more than one such petition.

4. Present Directors from these Divisions are as follows: Atlantic, Dr. Eugene C. Woodruff, W8CMP, State College, Pa.; Dakota, Mr. Cy L. Barker, W9EGU, Henning, Minn.; Delta, Mr. M. M. Hill, W5EB, Natchitoches, La.; Midwest, Mr. H. W. Kerr, W9DZW-W9GP, Little Sioux, Ia., elected in November, 1930, to fill unexpired remainder of term of L. R. Huber, resigned; Pacific, Mr. Allen H. Babcock, W6ZD, Berkeley, Calif.; Southeastern, Mr. Harry F. Dobbs, W4ZA, Atlanta, Ga.

5. These elections are the constitutional opportunity for members to put the man of their choice in office as the representative of their Division. Members are urged to take the initiative and file nominating petitions immediately.

For the Board of Directors:

K. B. WARNER, Secretary

West Hartford, Conn., 15 July 1931.

To all A.R.R.L. Members residing in the DOMINION OF CANADA:

1. You are hereby notified that an election for an A.R.R.L. Canadian General Manager, for the term 1932-1933, is about to be held, in accordance with the Constitution. Your attention is invited to By-Law 29, defining the policy of the League in Canada; Sec. 1 of Article IV of the Constitution, providing for the government of A.R.R.L. affairs by a Board of Directors, of which the Canadian General Manager is a member; Sec. 2 of Article IV, defining the eligibility of Directors; By-Laws 26 and 27, specifying the duties and authority of the Canadian General Manager; and By-Laws 23,

(Continued on page 82)

The Vacuum Contact Key

By Herman Kott*

TRANSFORMING that favorite telegraph key into a power key capable of keying a most ambitious "ham" transmitter or the average run of commercial transmitters, is a simple undertaking with the aid of the Burgess vacuum contact. Indeed, a flame-proof, easy running, smooth and trouble-proof key was the first application that occurred to the engineers assigned the problem of Americanizing the ingenious contact device developed in Germany and now made available to amateurs, experimenters, engineers and manufacturers in the States and Canada.

To begin with, the vacuum contact is exactly what its name implies—a contact in a vacuum. The device comprises a tubular and evacuated glass bulb containing a pair of copper contact members which may be separated by applying a slight pressure on an external glass stem. The action is based on the elasticity of an annealed glass bellows for transferring the slight movement of the external glass stem to the internal glass rod which lifts one contact member against spring pressure to separate the contacts and open the circuit. Normally, the circuit is closed since the contact members are pressed together. However, by applying a constant pressure on the stem, the contact members may be kept apart, thus having the circuit normally open, to be closed by the actuating force. It will be noted that since the contact is in vacuum, the sparking or arcing is reduced to an absolute minimum. A small fixed condenser may be shunted across the contact if the sparking is deemed excessive, such as with an inductive circuit. Also, in the absence of oxygen or air, the contact members cannot become corroded. The contact establishes positive makes and breaks, without chattering or hangovers as indicated by oscillograph records.

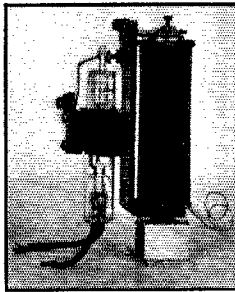
The vacuum contact will handle up to 1320 watts with absolute safety. It is rated at 8 amperes for intermittent and 6 amperes for continuous operation, at 220 volts. It can be operated as rapidly as 40 times per second, without complications. On life tests, these vacuum contacts have operated tens of millions of times without breaking down.

In applying the vacuum contact to the usual telegraph key, there is a considerable latitude in

the exact method followed. The main points, however, are to see that the contact is so held that its contact members are normally separated, to be closed each time the key is depressed. The device may be mounted at the rear of the key and connected to the lever by suitable coupling. Again it may be mounted at the side of the key. However, the most convenient method appears to

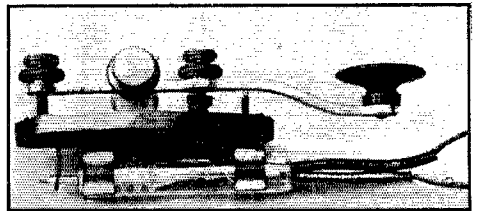
be the mounting of the contact directly below the frame of the key, by means of a strip of metal carrying a pair of cartridge fuse clips, as shown in the accompanying photographs. The rear of the key lever is provided with a short link that slips through a slot in the key frame and connects with the external glass stem of the vacuum contact. The front of the key is provided with an adjustable stop screw in place of the usual contact points, so as to provide the proper stop and not bend the glass stem beyond the safe limit. To mount the key on a table, a long, narrow slot must be cut in the table top to accommodate the vacuum contact below the key.

The movement of the vacuum contact is almost imperceptible. In fact, a movement of only .02 inch at the end of the external glass stem is sufficient to open the contact without arcing. For the operation of the device, the pressure on the external glass stem is less than 10 ounces.



THE VACUUM CONTACT APPLIED TO THE USUAL TELEPHONE RELAY

Normally the contact points are separated by pressure of the flat spring at the left, closing when the armature is pulled down.



THE VACUUM CONTACT FITS INTO A PAIR OF FUSE CLIPS MOUNTED BENEATH THE FRAME OF THE KEY AND IS MECHANICALLY COUPLED TO THE LEVER BY A BRASS LINK SOLDERED TO THE BACK-STOP SCREW

The key can be used with safety in high-voltage circuits because no electrical connection to the key itself is necessary.

For those who have need for remote control keying, the vacuum contact may be applied to the usual telephone type relay, in which case it takes the place of ordinary contact points. It handles

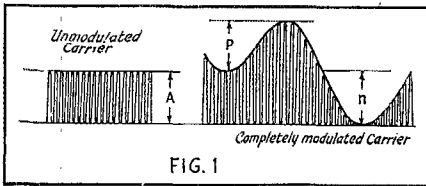
(Continued on page 82)

*Engineer, Radiovisor Division, Burgess Battery Company, New York City.

The Mechanics of Modulation

By Paul R. Huntsinger*

MODULATION is the process of varying the amplitude of a carrier wave in accordance with a signal to be transmitted. For purposes of explanation it is customary to assume that both the carrier frequency and the signaling frequency are sinusoidal although this is not necessarily the case in practice. In discussing the qualities of a given transmitter one usually speaks of the modulation capability of the outfit. The modulation capability of a transmitter may be expressed either as a factor



or as a percentage, and in either case means the extent to which the amplitude of the carrier may be varied at the signal frequency without serious distortion to the latter.

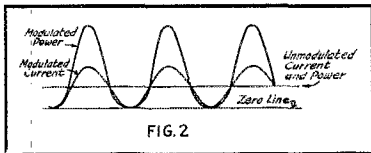
The modulation factor is defined as the difference between the signaling and non-signaling amplitudes of the carrier divided by the non-signaling amplitude. Expressed as an equation,

$$M = \frac{A_{mod} - A_{car}}{A_{car}} \quad (1)$$

where M is the modulation factor. The difference between the modulated and unmodulated carrier wave amplitudes is evidently equal to the amplitude of the signal frequency, so we may write the above equation in the form,

$$M = \frac{A_2}{A_1} \quad (2)$$

The modulation capability may be expressed as a percentage by merely multiplying the modulation factor by 100. Fig. 1 shows a blank carrier and



also one which is modulated completely or 100%. Inspection of Equation 1 shows that for 100% modulation the amplitude of the carrier will be twice the non-signaling value. In the ideal case, as shown in Fig. 1, $p = n = A$.

Unfortunately in practice the positive and negative peaks are not always equal as shown in the figure, so the modulation factor p/A on the positive peaks may not be equal to that on the negative peaks, n/A . In case the positive and negative peaks, p and n , are unequal the modulation factor is defined as the arithmetic mean of the positive and negative modulation factors; that is,

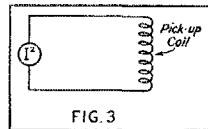
$$M = \frac{1}{2}(p/A + n/A) \quad (3)$$

Inspection of the figure for the modulated wave shows that the limiting position of the negative peaks is zero; hence the ratio n/A can never be greater than unity. In other words the percentage of modulation on negative peaks can never be greater than 100. If a transmitter is modulated over 100 percent the tops of the negative peaks are cut off and the signaling frequency is seriously distorted.

Now the power of any wave varies as the square of the amplitude. Knowing the amplitude of the modulated carrier to be $1+M$ times the amplitude of the blank carrier we may square it and find the ratio of the peak power of the modulated wave to the blank carrier power. As an equation,

$$\frac{P_{mod}}{P_{car}} = (1+M)^2 \quad (4)$$

Thus we find that in the case of 100 percent modulation the peak power will be 2 squared or four times the unmodulated carrier power.



Incidentally, this shows that for complete modulation the tube complement of the transmitter stages handling modulated r.f. must be capable of handling power peaks

four times as great as the carrier power. The average power of a modulated wave is found as follows: The amplitude of the modulated carrier wave is equal to the quantity $(1+M \sin qt)$. As was stated before, the power of a modulated wave varies as the square of the amplitude, so the instantaneous power may be represented by the equation,

$$P_{inst} = (1+M \sin qt)^2 \quad (5)$$

The average power of the modulated wave, that is the average ordinate of the power wave, is found by integrating the power wave over a complete cycle and dividing by 2π . Thus we find

$$P_{ave} = 1 + M^2/2. \quad (6)$$

For complete modulation we have M equal to unity and so the average power is seen to be $1 +$

* WOI, Iowa State College, Ames, Iowa.

$\frac{1}{2} = 3\frac{1}{2} = 1.5$ times the unmodulated carrier power. The power wave is shown in Fig. 2.

Now as for the antenna or tank current of a transmitter under modulation, the amplitude of the current will evidently be $1+M$ times the unmodulated amplitude. Since the power varies as the square of the current, the average current will necessarily be equal to the square root of the average power. Thus we have

$$I_{ave} = \sqrt{1+M^2/2} \quad (7)$$

In case the modulation is complete, or 100 percent, the average power will be 1.5 times the non-signaling power and hence the antenna current will be equal to the square-root of 1.5 or 1.226 times the unmodulated antenna current. It should be borne in mind that this will only be the case if the modulating signal is a pure sine wave and then only after sufficient time has elapsed for the antenna ammeter to reach its maximum steady reading.¹

METHODS OF MEASURING MODULATION PERCENTAGE

One method of measuring the modulation factor of a transmitter is by the use of a current-squared galvanometer.² The hook-up used is shown in Fig. 3, the pickup coil being coupled to the tank of the output stage of the transmitter. Two changes must be made in equation (1) before it is suitable for use in this method. First, since the galvanometer is calibrated in current squared, it will be necessary to take the square-root of the right hand member. Second, since the

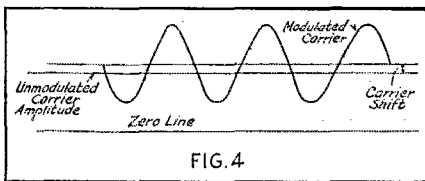


FIG. 4

instrument reads effective rather than peak values and since the factor is defined in terms of peak values, we must also multiply by the square-root of 2. Making the above changes in the equation and simplifying we have,

$$M = \sqrt{2 \left[\frac{D_{mod}}{D_{car}} - 1 \right]} \quad (8)$$

where D represents the deflection of the instrument under the conditions shown. A convenient way of finding the factor is to couple the pickup coil to the tank sufficiently so that a reading of 40

¹ The increase in antenna current as indicated by the r.f. ammeter will be 22.6% only when the modulating signal is sinusoidal. Complex modulation frequencies such as those caused by speech or music will give an antenna current increase of greater than 22.6% for amplitude modulation of 100%. — ERROR.

² See also Experimenters' Section, May, 1930; and "The Neglected Current-Squared Galvanometer," Feb., 1931. — ERROR.

scale divisions is obtained with no modulation. Complete or 100 percent modulation will deflect the pointer to 60. For any deflection noted upon modulation, the factor may be computed by sub-

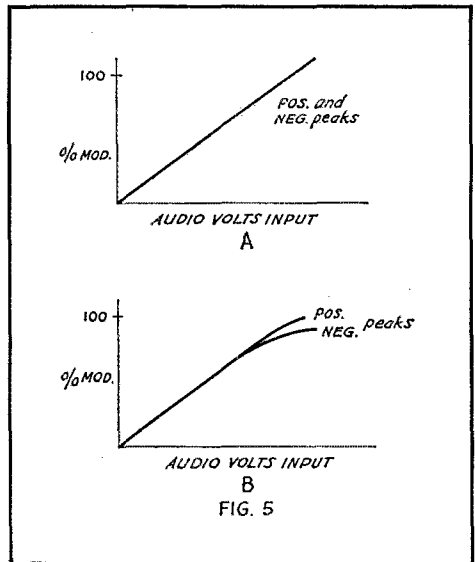


FIG. 5

stituting the readings in the equation. Here is a check upon the above method. The full-scale reading of the instrument represents a current of 115 milliamperes. The current for any deflection will then be,

$$I = 11.5\sqrt{D} \quad (9)$$

From the above equation we find the current for a deflection of 40 divisions to be 72.773 ma. while that for 60 divisions is 89.079 ma. The ratio of the second to the first is 1.226 which, as shown before, is the ratio of the antenna currents for complete and zero modulation of the carrier wave. The fault in this method of determining the factor is that nothing whatever can be told of the relative amplitudes of the positive and negative peaks. However, the average modulation, as defined before, can be determined very easily by this method.

The modulation factor may be determined also by means of a linear rectifier and vacuum tube voltmeter.³ This method is used in the General Radio modulation meter. Both positive and negative peaks may be measured as well as the resulting carrier shift if the peaks are not equal. It is readily seen that if the positive peaks are greater than the negative peaks the carrier power will shift upward under modulation and vice versa as shown in Fig. 4. A transmitter should be tuned

³ This method is used in the modulometer, described in *QST*, Aug., 1929. Positive or negative peaks may be measured by reversing the input connections to the grid circuit of the voltmeter tube. — ERROR.

so that the mean plate current of the modulated stage and that of the linear amplifiers does not shift either up or down on modulation. If so tuned there will be no carrier shift and consequently the positive and negative peaks will be equal in amplitude.

The relation between audio-frequency volts inputs to a transmitter and percentage modulation must be linear over the working range of the transmitter if no distortion of the modulated signal is to take place. This relation, both for positive and negative modulation, is easily determined if one has a good audio frequency oscillator and level indicator. The ideal case is shown in Fig. 5A while a possible relation is shown in Fig. 5B. The negative peaks drop off slightly, hence there will be some carrier shift upward at this level. This falling off of the negative peaks is due to curvature in the lower end of the dynamic characteristic of the tubes. A transmitter should be adjusted so that there is no carrier shift in modulation and then the curves for both positive and negative peaks will coincide. If this is done practically the only distortion encountered will be a slight flattening of the tops of the wave at high modulation levels. If the curve for negative peaks is swung around we have the modulation characteristic of the entire transmitter. By assuming a sine wave input to the transmitter and plotting the output wave as shown in Fig. 6 we may analyze it for harmonic distortion. If the curves for positive and negative peaks coincide, the transmitter operating point is midway between the upper and lower bends in the dynamic characteristic of the tubes and the undistorted output will be a maximum.

The oscillograph is the best method for checking the operation of a transmitter since it will show the waveform of the output as well as the value of the peaks. A typical oscillogram is shown in Fig. 7A and was obtained by exciting the oscillograph element from the output of a linear rectifier which was coupled to the tank circuit. Fig. 7B shows what happens to the waveform of a signal when one tries to modulate 100% a transmitter having but 30% modulation capability. The cutting off of the positive halves of the cycle is caused by the modulator grid going positive.

Still another method of measuring the percentage of modulation is shown in Fig. 8. A resistor of proper size is connected in the plate supply lead to the modulated tube. The alternating-current voltage drop in the resistor is rectified by a copper-oxide rectifier which drives a direct current microammeter. The direct current component of the plate current is kept out of the rectifier by the blocking condenser *C* whose impedance is low at audio frequency. The resistor is made of such size that the instrument reads full scale when the alternating-current component of the plate current is equal to the direct current component, which is the condition for 100%

modulation. Another form of the instrument uses a current transformer and alternating-current ammeter. This type is inferior to the first mentioned since the scale of the instrument is not linear and the damping is necessarily high, the last mentioned preventing the instrument from following the peaks.

Strays

W2BIU sends us the following corrections to the list of marker stations which appeared on page 26 of the July issue:

WIR is now of 4276 kc. instead of 4050.

WKI is using 13,960 kc. in place of KWT.

Several days after W5AUX completed the installation of a new Zepp a neighboring BCL called to ask what made the sparks fly off at each end on certain nights. Puzzled, AUX checked up and found there had been no operation on the nights specified by the BCL. An investigation disclosed that the long glass insulators at each end of the antenna shimmered in the moonlight on clear nights, which was what the BCL had mistaken for sparks!

Salesman (pet shop): "Madam, may I show you our line of pedigreed poodles?"

Lady: "No, I wish to see one of those DX hounds I've been reading about."

— A. Taillon

IN GREAT BRITAIN, NOW —

On July 1st members of the Derby Wireless Club paid a visit to Messrs. Bass's brewery premises at Burton.

— *Wireless World*

A new product which hams will find useful is the Elastic Stop Nut, a self-locking nut which stays tight once put in position. It eliminates the use of lock washers and holds better. Elastic Stop Nuts are manufactured by the Aga Company, Elizabeth, N. J.

And now we have myriacycles, a word coined by the Crosley people for the apparent purpose of cutting off the last figure on calibrated dials on BC receivers. It means "tens of thousands of cycles"; for instance, 1200 kilocycles is equal to 120 myriacycles.

Here's a kink for finishing aluminum panels. Place the panel on a flat surface, moisten with a soft cloth and sprinkle lightly with Dutch Cleanser or some similar kitchen cleaner. Apply a small amount of elbow grease, rubbing in small circles gently but firmly. After a few seconds rinse the panel with clean water and dry. The result is a nicely "dulled" panel which doesn't look as if it just came out of someone's hardware store.

— W6DZK

Passing the Government Examination for Amateur Operator's License

This article, originally published in the January and February, 1930, issues of QST, has proved so popular that our supply of copies of those two issues has been exhausted. The present print has been revised to include recent changes in the amateur regulations.— Editor.

Part I—In Two Parts*

SIMPLE as it is, the examination given by the Department of Commerce to prospective amateurs is too frequently the downfall of the radio neophyte. It is with the idea of indicating the type of questions asked during the government examination as well as aiding the prospective amateur over his first real difficulty that this article is written.

The examination for an amateur operator's license does not include all of the questions given in this article. Generally, the examination consists of but ten simple questions. This discussion of the subject is necessarily more extensive and complete, with enough additional material added to the essential questions to give some background to the minimum required amateur knowledge. The person who can send and receive the signals in the International Morse Code at a speed of ten words per minute (five letters to the word) and can answer the questions in this article should have no fear whatever of the government examination. The answers to the questions asked in the examination may be found in "The Radio Amateur's Handbook" as well as here.

The examination contains questions of two types; questions relative to the radio laws and regulations and those intended to disclose the candidate's technical proficiency. In this installment the first mentioned class of questions is discussed by the means of typical questions and answers.

Q. What is an amateur?

A. A radio amateur is an individual interested in the art of radio communication from a strictly personal point of view and without pecuniary interest. In radio regulation the term is applied to those who have licenses and operate their own private transmitting and receiving stations.

Q. Why are amateurs subject to federal regulations?

A. Some regulation of all radio communication is required to prevent chaos. Signals emitted even by very low-power transmitters are not confined to the State in which the signal is

* The second section of this article dealing with technical matters in the amateur examinations will appear in the next issue of QST.

originated, and since interstate communication is outside the jurisdiction of the various States, it naturally comes under federal jurisdiction.

Q. What is the regulation governing the location of amateur stations?

A. An amateur station may not be located upon premises controlled by an alien. (The holder of the station license also must be a U. S. citizen.)

Q. Define "mobile" and "portable" stations.

A. A mobile station is one permanently located upon a mobile unit and ordinarily used in motion. A portable station is one so constructed that it may be moved from place to place, and is in fact so moved from time to time, but which is not used ordinarily in motion.

Q. May amateur station licenses for mobile and portable stations be secured?

A. Amateur station licenses are not at present issued for mobile stations. A license for a portable station may be secured, but the licensee of such a station must give advance notice to the Supervisor of Radio in the district where the license was secured of all locations at which the station will be operated.

Q. What is the regulation concerning amateur station logs?

A. The licensee must keep an accurate log of all transmissions, the data to include the time of transmission, station called, input power to the last stage of the transmitter, and the frequency band used.

Q. Are amateur stations subject to state or municipal regulations?

A. No, except as the latter may exercise a legitimate police power in safeguarding health, enforcing electrical codes, and abating nuisances.

Q. What are "quiet hours"? Under what conditions are they imposed?

A. Quiet hours, from 8:00 p.m. to 10:30 p.m. local time and on Sundays during the broadcast of local church services, are imposed upon amateur stations which interfere with other radio services. No quiet hours need be observed at amateur stations operating without interference to other radio services.

Q. What is the Washington Convention of 1927?

A. The Washington Convention is an inter-

national treaty on radio communication drafted at Washington, D. C., in 1927, which sets forth rules and regulations relative to modern radio communication. It was signed by almost every nation.

Q. Is the Washington Convention binding upon the United States?

A. Yes, the United States ratified the Convention, and in this country it has the power of law.

Q. What is the Federal Radio Commission?

A. The Federal Radio Commission is the regulating and licensing authority on matters dealing with radio communication in the United States. It is composed of five commissioners appointed by the President. Among its duties they: (a) classify radio stations; (b) prescribe the nature and service to be rendered; (c) assign bands of frequencies or wavelengths; (d) determine the power, operating hours and location, of each class of station. It is the Federal Radio Commission which issues station licenses. Operator's licenses, however, are issued by the Department of Commerce.

Q. What are the rules and regulations regarding the secrecy of radiograms?

A. See Section 27 of the Radio Act of 1927. Briefly, the contents or meaning of an addressed message must not be divulged to other than the addressee or his agent, except to an authorized communication channel or upon the demand of a competent court; nor may a message be intercepted and divulged even to the addressee without the authority of the sender; nor may any person use the information in an addressed message for his own benefit. The law does not apply to information which has been broadcast for public use.

Q. What penalties may be imposed for violation of radio laws and regulations?

A. For violating any provision of the Radio Act of 1927, punishment may be by fine not exceeding \$5000 or imprisonment not exceeding five years, or both. For violating or failing to observe any rule contained in any international treaty ratified by the United States, or made by the licensing authority, the punishment is made by imposing a fine of not more than \$500 for each offense. In addition, an operator who violates any law or regulation, wilfully damages apparatus, transmits superfluous signals or profane or obscene language, or wilfully or maliciously interferes, may have his license suspended for a period not to exceed two years.

Q. What class of radiograms holds precedence over all others?

A. Radiograms relative to distress calls hold precedence over all other classes of radiograms.

Q. What is the law regarding the transmission of fraudulent communications?

A. No one shall knowingly transmit any false or fraudulent signal of distress, or communication relating thereto.

Q. What are the international regulations relative to the maintenance of constant frequency and purity of signals?

A. The waves emitted must be as constant in frequency and as free from harmonics as the state of the art will permit.

Q. Give the meaning of the following signals; SOS, CQ, QRT.

A. SOS is the international distress signal.

CQ is the general call to all stations and has two uses. It may be used as a signal of inquiry when desiring to communicate with any station within range, in which case the signal is terminated with the letter K, or as a preface to broadcasts to which no reply is expected. In the latter case the terminating letter K is omitted.

QRT means "stop sending."

Q. What is the law regarding the amount of power to be used to communicate over a given distance?

A. The minimum power required to insure satisfactory communication should be used at all times.

Q. What is the distress signal for radiotelephony?

A. "Mayday," from the French pronunciation of "M'aider" meaning "help me."

Q. What signal denotes the end of a message?

A. - - - - -

Q. What signal denotes the conclusion of communication between two stations?

A. - - - - -

Q. What does the letter K mean at the end of a transmission?

A. It is the invitation to transmit meaning in effect, "go ahead."

Q. What persons may operate amateur stations?

A. Only holders of radio operator's licenses issued by the Department of Commerce are permitted to operate amateur stations.

Q. What are the restrictions placed upon amateur stations regarding the transmission of news, music, lectures, or any form of entertainment?

A. Amateur stations are not authorized to broadcast news, music, lectures, or any form of entertainment.

Q. What are the regulations concerning communication between amateur stations and government or commercial stations?

A. Amateur stations are not permitted to communicate with commercial or government stations unless authorized by the licensing authorities except in emergency or for testing purposes. This restriction does not apply to communication with pleasure craft such as yachts or motor boats which may have difficulty in establishing communication with commercial or government stations.

Q. What frequencies are assigned to ama-

teurs by the International Radiotelegraph Convention which met at Washington, D. C., in 1927?

A. The following frequency bands are made available to amateur stations:

1715 kc. to	2000 kc.
3500 kc. to	4000 kc.
7000 kc. to	7300 kc.
14,000 kc. to	14,400 kc.
28,000 kc. to	30,000 kc.
56,000 kc. to	60,000 kc.
400,000 kc. to	401,000 kc.

Q. What frequencies may the amateur use for radiotelephony?

A. The following frequency bands may be used for amateur radiotelephony:

1715 kc. to	2000 kc.
3500 kc. to	3550 kc.
56,000 kc. to	60,000 kc.

In addition, specially qualified amateurs may obtain permission to operate 'phone transmitters in the band between 14,100 kc. and 14,300 kc.

Q. What frequency bands are assigned exclusively to amateurs?

A. The following frequency bands are assigned exclusively to amateurs by international agreement:

7000 kc. to	7300 kc.
14,000 kc. to	14,400 kc.

Q. What amateur bands are shared, and with whom?

A. The 1715-kc. to 2000-kc. and the 3500-kc. to 4000-kc. bands are internationally assigned as shared between fixed service, mobile service, and amateurs. In the United States these bands are assigned only to amateurs except for limited use of the 3500-kc. band by off-shore Naval aircraft. The 28,000-kc. and the 56,000-kc. bands are available for experimental as well as amateur uses.

Q. What is the maximum power allowed amateur stations?

A. A power input of up to one kilowatt on the last stage of the transmitter is authorized.

Q. How often must the call letters of an amateur station be transmitted during communication?

A. The call signal of the amateur station must be transmitted at the end of each transmission. If a single transmission is more than fifteen minutes long, the call signal must be transmitted at the end of each fifteen minute period.

Q. What vessels of the United States are obliged by law to carry radio equipment?

A. The following is quoted from the Wireless Ship Act of July 23, 1912: ". . . from and after October 1, 1912, it shall be unlawful for any steamer of the United States or of any foreign country navigating the oceans or the Great Lakes and licensed to carry, or carrying, 50 or more

persons, including passengers or crew or both, to leave or attempt to leave any port of the United States unless such steamer shall be equipped with efficient apparatus for radio communication, in good working order, capable of transmitting and receiving messages over a distance of at least 100 miles day or night."

Q. What is the SOS frequency?

A. 500 kc. (600 meters).

Q. What is the priority of various classes of radio communication?

A. (1) Distress calls and communications relating thereto.

(2) Communications preceded by the urgent signal (XXX).

(3) Communications preceded by the safety signal (TTT).

(4) Communications relative to radio-compass bearings.

(5) Government radiotelegrams.

(6) Radiotelegrams relating to the navigation, movement, are requirements of ships, the safety and regularity of air-services, and radiotelegrams containing weather observations destined to an official meteorological service.

(7) Service radiotelegrams relative to the operation of the radio service or to the radiotelegrams previously exchanged.

(8) Public correspondence radiograms.

Q. What is meant by "superfluous signals?"

A. Superfluous signals are those which are not necessary in carrying out radio correspondence; their use is forbidden.

Q. What are the international regulations relative to the exchange of communications between amateur stations of different countries?

A. Such exchange is forbidden in cases where either country gives notice of its opposition to such communications between amateurs; otherwise it is permitted. Except where interested governments have made special agreements between themselves however, "the communications must be carried on in plain language and must be limited to messages bearing upon the experiments and to remarks of a private nature."

It is highly desirable that every prospective amateur become familiar with the provisions of the Washington Convention, the Act of 1927 regulating communication in the United States, and the regulations of the Federal Radio Commission and the Radio Division of the Department of Commerce. Much of this information has appeared in *QST* and the "Radio Amateur's Handbook."

Strays

WIZI wants to know if anyone has a really up-do-date remote control system — one in which you reach for the key and interrupt a beam of light, thus actuating a photo cell which turns on the transmitter!

QRX Frequency Measuring Test

DATES: OCTOBER 24 and 31 (Saturdays)
TIME: 9 p.m. to 1 a.m. E.S.T.
 6 to 10 p.m. P.S.T.
BANDS: 3.5 and 7 mc.

Two different frequencies in the 3.5-mc. band will be sent for the first half hour of each hour. Two different frequencies in the 7-mc. band will be sent the second half hour of each hour.

PROCEDURE: Each transmission on a certain frequency will last 15 minutes and be divided into three five-minute periods. "QST" will be sent 3½ minutes to enable listeners to cover the band and find the sending station. During the last 1½ minutes of each period three 30-second dashes will be sent. This is when all frequency measurements should be made. It is requested that listeners designate measurements as (1), (2), and (3) to indicate whether the first, second, or third five-minute period of a given station's transmission was measured.

TRANSMITTING STATIONS: Page 37 of September, 1931, *QST* gives the schedule in full. The tentative line-up of stations in the order of time of transmission is as follows: October 24 — W1AXV, W3ZF, W1MK, W1AXV; W8GU, W8DGS, W9UZ, W8DMS; W9FFD, W9DFR, W9GY, W7AAT; W6AM, W6CUH, W6EGH, and W6CIS. October 31 — W1ASY, W2AHN, W1AXV, W1MK, W8DGS, W8GU, W8DMS, W9UZ; W9DFR, W9FFD, W7AAT, W9GY; W6CUH, W6AM, W6CIS, W6EGH.

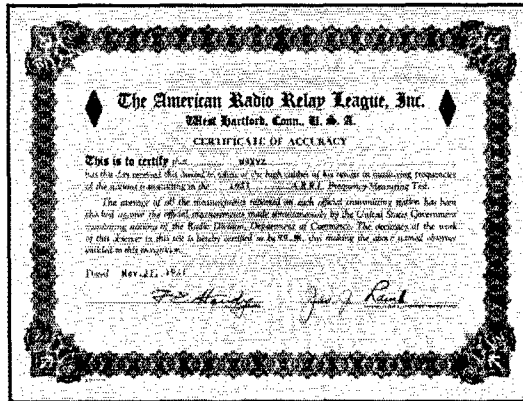
How to TAKE PART: Only a receiver and frequency meter are required. *Everyone* is invited to take part. Just tune in the stations, measure frequency as accurately as possible, and report measurements on not less than two separate transmissions to A.R.R.L. The two test transmissions measured may be logged at any time on either one or both dates. Of course you will try to measure as many stations as possible so that a better average may be obtained on the percentage accuracy of results as compared with the official measurements made by the Radio Division.

IF YOU DO NOT TAKE PART: Listen in — and keep your transmitter off the air. Do not spoil some other fellow's reception of the test transmissions. QRM must be minimized.

FORM FOR REPORT: Use 8½" x 11" (approx.) paper, ruling columns in which to list the transmitting station, local standard time, frequency-meter dial setting, frequency — and leave a blank column on the right for use of the checking committee at A.R.R.L. Headquarters. Give your full name, address and radio call signal (if any) above the column headings at the top of the sheet. Special log forms will be mailed postpaid to anyone requesting them by a card or message to A.R.R.L.

Follow the schedule in September *QST* as the transmissions progress from the eastern to western territory. Measure all the stations transmitting that you can. Don't forget to check your own time closely from NAA or by other reliable radio time signals because the sending stations will be as exactly on schedule as possible. Make regular use of the calibration transmissions from W1XP, W9XAN and W6XK *right now*. Mark the dates of the Frequency Measuring Test and report promptly to A.R.R.L. Headquarters at the completion of the Test.

Note that Standard Frequency Transmissions of Fridays, October 23rd and 30th come on eves of the Test.



EVERY TEST PARTICIPANT MEASURING TWO OR MORE TRANSMISSIONS TO WITHIN ONE-TENTH OF ONE PERCENT AVERAGE ACCURACY WILL RECEIVE A CERTIFICATE LIKE THE ONE SHOWN ABOVE

STANDARD FREQUENCY TRANSMISSIONS

Dates of Transmission		
Oct. 2, Friday	BB	W1XP
	B	W9XAN
	A	W6XK
Oct. 3, Saturday	BX	W6XK
	C	W9XAN
Oct. 4, Sunday	BB	W6XK
	B	W1XP
	A	W9XAN
Oct. 9, Friday	BB	W9XAN
	C	W6XK
	C	W6XK
Oct. 11, Sunday	C	W6XK
	C	W6XK
	C	W1XP
Oct. 16, Friday	C	W6XK
	C	W6XK
Oct. 18, Sunday	C	W6XK
	C	W1XP

(Continued on page 86)

EXPERIMENTERS' SECTION

Another Arc-Tipping Scheme

Here is another idea to add to that endless chain of foolproof automatic mercury-arc tipping systems. The diagram is shown in Fig. 1.

The keep-alive circuit is standard and need not be discussed. The arc is weighted so that it "idles" in an upright position with no contact between the two pools. Across the two pools is connected a relay in series with a resistance. The tension and spacing of the relay and the value of the resistance are adjusted so that the relay will operate on the output of the keep-alive rectifier when the arc is not lit but will not operate on the 14-volt drop across the pools when the keep-alive arc is operating. The contacts of this relay make and break the a.c. from the keep-alive plate winding that operates the tipping solenoid.

The operating is quite obvious. When current is supplied to the transformer the tungars light

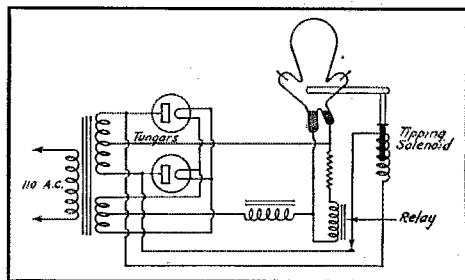


FIG. 1

and when they have reached an operating brilliance they pass sufficient voltage to operate the tipping relay which in turn supplies a.c. to the tipping solenoid. When the solenoid pulls the arc over the pools short, thus shorting the voltage across the relay winding, and the relay contacts open permitting the arc to return to a normal position and starting the keep-alive arc. If the keep-alive arc should go out, the voltage across the relay winding increases until the relay operates again and the process repeats.

Once adjusted, this system will give no trouble whatsoever. It is well to get a high resistance relay that operates on a current of 0.1 amp. or so in order that a high resistance may be used in series with the winding, thereby reducing the drain on the tungar rectifiers. Long tungar life is secured as the relay does not operate until the tungars have reached an operating temperature.

— J. H. Platz, W9GY

Operating the Keying Relay from the Plate Supply

As an old reader of *QST* I am passing along an idea that is practical and should be welcomed by the all-a.c. ham.

The idea is one in which the keying relay is operated from the plate supply. With the approxi-

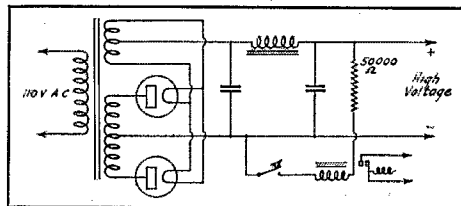


FIG. 2

mate values shown in Fig. 2 the current required to operate the relay was only a little more than two mils. The relay is an ordinary pony relay which was rewound with No. 40 d.c.c. wire so that very good action was obtained to the two mil drain. For some reason or other the key clicks disappeared and very stable operation resulted.

Using this with a voltage of about 450 from a rectifier using 216B tubes and a transmitter of the push-pull t.p.t.g. split stator type very good reports were obtained.

The relay works well even with a long remote control line as the resistance of any reasonable line is much less than that already in the circuit.

— D. D. Rulchic, ex-9CNK-W6AOG

Curing Reverberation

The remarks contained in the following letter from Jack Paddon, Indianapolis, Indiana, are worthy of consideration by 'phone men. Not all the distortion in 'phone transmitters is attributable to the set itself. Witness the precautions taken in broadcasting studios to avoid reflection of sound.

"Have been listening to a number of 'phones and a great many of them have a fuzzy speech characteristic. After two years of recording studios it was a cinch to spot the trouble.

"One station, as an example, is located in a large empty cellar. As you know sound has a velocity that is constant. The OM talks away at the mike and a split second later the mike picks up the same thing from reflection off the walls. This gives an out of phase condition between the

source and reflected sound and hence the fuzziness.

"The cure is very simple. If you're a rich man, make a room out of celotex or some other sound

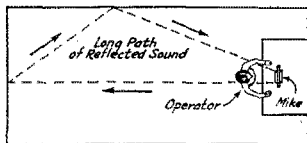
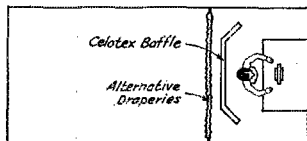


FIG. 3



insulator. Simpler yet, make a screen out of celotex boards or even simpler yet—swipe an old blanket or some kind of drape and hang it behind the operating position. See sketches in Fig. 3."

Adjustable Crystal Holder

Fig. 4 is a diagram of a crystal holder which is my idea of about the simplest adjustable affair the amateur can construct. It is similar to the mounting used by General Radio and Westinghouse for 100 kc. bars.

I believe my diagram more or less self explanatory. Two pieces of 1/8" brass angle are cut from stock length with faces about equal to the size of the crystal. One is mounted permanently

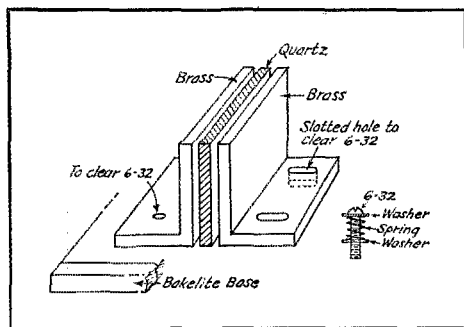


FIG. 4

and the other is adjustable. The quartz plate stands on end. On the adjustable plate 6-32 machine screws with washers and springs under the heads are used for getting quick changes in adjustment for different crystals. I find with this holder air gaps as large as 1/16" will work with some crystals.

The plates should be as square as possible but experiment shows that with most any crystal it is not necessary to have a precision-machined job.

This type of holder can be adjusted with a thickness gauge for about .001 to .005" clearance

for the crystal. The crystal can be held in the hand and lowered into the holder, and if it is a good oscillator it will start before you let go of it.

— James Wood, W1AYG

A Filter Kink

The following letter from Burton Waldron, W9ZT-W9AKN, illustrates an interesting point with regard to filters:

"I'd like to drop a line of dope that might come in handy to those hams who have a hard time getting a d.c. note on 14 mc., especially with high power. In my original filter for a 2000-volt supply to a UX-852 I used a double choke with 18 henries in each section, with one μ d. across each end and another one μ d. across the middle. Even with the best adjustment of the transmitter I couldn't get d.c.

"When I blew the condenser next to the rectobulbs, the note didn't get much worse. Not

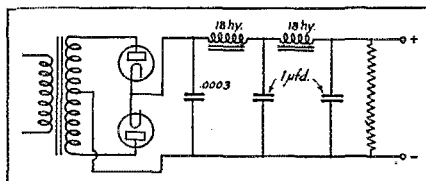


FIG. 5

having another 3000-volt condenser on hand, a .0003- μ d. 5000-volt Sangamo was substituted, as shown in Fig. 5. Lo and behold, the monitor tuned in a beautiful pure d.c. note. However the monitor can be a prevaricator on occasion so I proceeded to call a W1 that I heard calling CQ. He came back 'Ur fb stedi PDC sigs-'. Hearing is believing according to somebody or other, so that filter stayed as it was."

It is probable that the small condenser is acting simply as a short-circuit for unwanted r.f., coming either from the transmitter or from the rectifiers. As the mercury vapor in the tubes ionizes on each positive half-cycle a small high-frequency oscillation is set up which can easily pass through the filter and put undesired modulation on the signal, since most filter condensers act as chokes at high frequencies and the distributed capacity of the chokes renders them useless for stopping high frequencies. A non-inductive mica condenser is a good r.f. by-pass, however, and will take out most of the r.f. In the same way it will short circuit any r.f. getting back from the transmitter to the rectifier tubes—another cause of unwanted modulation.

The moral is—give the filter a chance to do its work by keeping the r.f. where it belongs.

Feeder Switching

The sometimes messy job of changing zepp feeders from series to parallel when shifting from

band to band can be simplified by using one of the switching arrangements shown in Figs. 6 and 7.

The circuit of Fig. 6, suggested by Frank Murphy, W8ML, requires a 4-pole double-throw switch (or two double-pole double-throw switches).

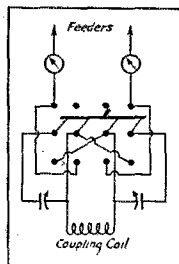
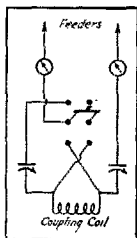


FIG. 6
(LEFT)
FIG. 7
(RIGHT)



It has the advantage that when thrown to the parallel connection (switch down) both feeder condensers are put in parallel. This is sometimes necessary with certain feeder lengths. W8ML also points out that a similar arrangement may be used to switch the antenna ammeter, when only one is available, from one feeder to the other.

Fig. 7 is used by J. D. Olle, VK2OZ. Only one double-pole double-throw switch is needed, and only one of the condensers is in the circuit when the feeders are parallel-tuned. The coupling coil should be fairly large and should be adjustable by a clip to take care of tuning on all bands.

Inexpensive Lead-In Insulator

I have seen various ideas as to different forms of lead-in insulators using pyrex custard cups,

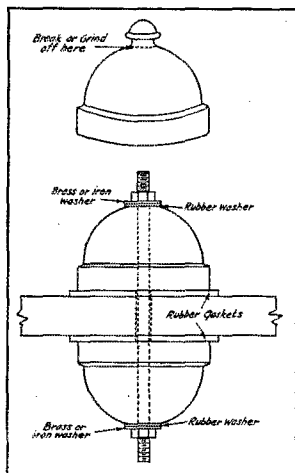


FIG. 8

baking dishes, etc. Several months ago while installing my station I struck the idea of using percolator tops. They can be purchased for two

for five cents, and if a few are broken one is not out much. To break off the knob on top tie wool yarn or string just below the knob. Saturate it in kerosene, light and allow to burn as long as it will, then plunge in cold water. This will make a clean break which can be ground down smooth on an emery wheel. If a person has access to a power grinder the top can be ground off if care is taken not to get the glass too hot.

After the top has been broken off, procure two $\frac{1}{4}$ " threaded brass rods about 5" long with 4 nuts and washers for each. Cut some rubber washers about 3" in diameter to put under the tops and mount as shown in Fig. 8. It makes a very nice looking job and above all is very reasonable — in trend with the times.

— L. D. McClintock, W9GUS

Strays

W5AGA is using a Type '47 pentode as the second audio stage in his receiver, and when amplifying a low-frequency note such as is produced by touching the detector grid it is possible to draw sparks nearly an eighth inch long across either the primary or secondary of the output transformer!

"Radio Receiving Tube Data" is the title of a pocket-size booklet published by Lefax, Inc., Philadelphia. There are more than eighty graphs giving static and dynamic characteristics of all types of receiving tubes, including pentodes and variable mu tubes. Service men and all those concerned with design data will find it a convenient reference source. The price is one dollar.

Good r.f. choke forms can be made from old adding machine tape spools, which are usually $\frac{3}{4}$ to one inch in diameter. A threaded bolt should be mounted in the chuck of a hand drill and the latter mounted in a vise. The spool is then fastened over the bolt with a washer and nut at each end. Hold a hack-saw blade on the spool and turn the drill, thus sawing a groove. This can be made as wide as necessary by holding the blade at an angle. A groove an eighth inch wide and the same deep will be about right, and three or four grooves about a quarter inch apart should be cut. Wind these full of No. 36 d.c.c. wire, starting at one end and continuing until all are full. Chokes thus wound used on a transmitter show no trace of r.f. at the "cold" end.

— W9GNV

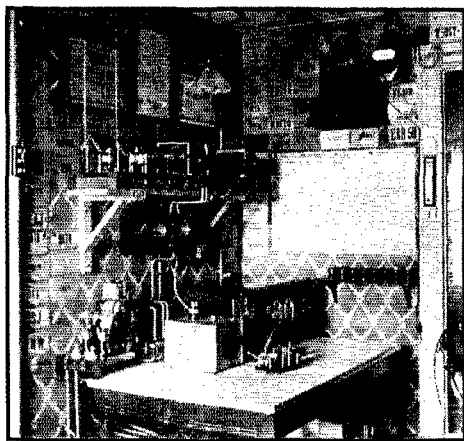
W7ADU solved the problem of economically making 6-prong coils and sockets for his receiver. It was found that the "wafer" style of 5-prong socket had plenty of room in the center for mounting a G. R. jack, so a plug was mounted in the center of the bottom of a regular 5-prong coil form and the job was done.

A Group of Low-Power Stations

WIAGW, New Bedford, Mass.

S. B. WILBER, 653 Kempton St., New Bedford, Mass., owns WIAGW. The entire station, antenna and all, is located in the attic. WIAGW says he had some trouble locating a half-wave 7000-ke. zepp in the limited space, but it is there — and works.

The photo of the station shows how the apparatus is arranged. The receiver, at the right on the operating table, is a superheterodyne built to specifications in March, 1929, *QST*. All signals are copied on the loudspeaker mounted on the wall above the table. To the left of the



WIAGW

A good arrangement for a low-power station. Note the rack on the wall for holding unused receiver coils.

receiver is an aluminum box containing a heterodyne frequency meter which is calibrated from Standard Frequency Transmissions.

The transmitter is a push-pull t.p.t.g. outfit similar to the one described in *QST* for June, 1930, except that Type '10 tubes are used. The split condensers for this circuit were obtained by cutting a four-gang broadcast tuning condenser in two, making two balanced units. The transmitter is mounted on a shelf above the operating table. Just below it is a panel containing a plate milliammeter and plate voltmeter, the latter acting both as voltmeter and power supply bleeder.

The power unit is at the left end of the table and is quite conventional, with a pair of '81 rectifiers and a brute-force filter.

The cards on the wall indicate the extent of WIAGW's activities.

W8AT, Erie, Penna.

ROBERT PELTON, owner of W8AT, put his first transmitter on the air in September,

1929. A 201-A was the first tube to bear the burden, being replaced later by a Type '10.

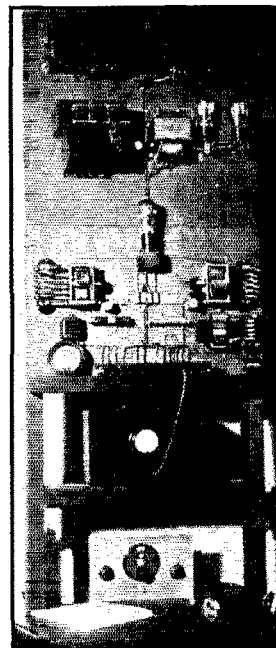
As now constituted, the entire station is mounted on a single frame. The frame consists of two "two-by-fours" just as long as the room is high and two feet apart. The panels on which the transmitter and power supply are mounted are made of three-ply wood. For the sake of convenience all the wiring is on the front. The frame and panels are stained to improve their appearance.

At the very top of the frame are two transformers used mainly for test purposes, although one of them supplies the filament power for the Type '10 oscillator. Just below them is the rectifier, filter and power transformer. The rectifier tubes are R81's, and the filter is the usual brute-force arrangement.

The transmitter is a t.p.t.g., operating on 7000 kc. Normal input is about 70 watts. Just below it is a row of jacks which allow meters to be inserted in various parts of the circuit.

One meter is made to serve for all d.c. measurements. This is a 0-1 milliammeter, mounted in the box sitting on the shelf below the transmitter. Shunts are used to increase the range to several convenient values, and series resistors change it into a voltmeter of several ranges. A 4½-volt "C" battery in the cabinet can be hooked in to make it an ohmmeter. A row of jacks on the front panel of the cabinet makes possible the selection of any of the ranges at will.

W8AT's receiver is a standard two-tube, tube-base coil outfit using Type '01-A tubes. There is also a combined heterodyne frequency meter and monitor which is frequently calibrated from Standard Frequency Transmissions. A small box to the left of the receiver contains a 100-ke.



W8AT'S ENTIRE STATION IS MOUNTED ON ONE FRAME which serves also as an operating table. Everything is in full view of the operator and is easily accessible.

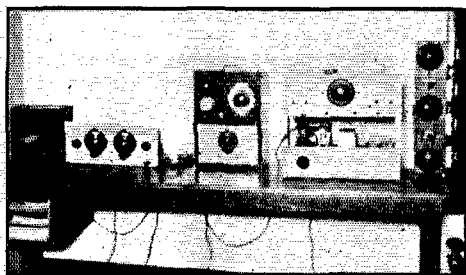
temperature-controlled crystal which is used for checking the frequency meter between S. F. transmissions. The antenna is a 67-foot Zepp forty feet high.

All U. S. and Canadian districts as well as some foreign countries have been worked, and W8AT has been heard in Australia.

W8BUL, Pittsburgh, Penna.

W8BUL, owned by Philip Ewald, 447 Avon Drive, Mt. Lebanon, Pittsburgh, came on the air in January, 1930, starting, as many have, with a '71-A in the transmitter. This rig failed to do much in the QRM, however, so a 210 was acquired and the present transmitter built.

The transmitter is a TNT outfit similar to that described in December, 1929, *QST*. It occupies



W8BUL

Another example of neat station layout. The shelves underneath the table hold log books, paper, etc., and keep the table space clear.

the upper deck of the frame shown in the photograph of the station, and is arranged to work on all bands. The power supply fills up the lower part of the frame. This consists of a 600-volt transformer, a pair of '81 rectifiers, and a brute-force filter with a 4- μ fd. condenser each side of a 30-henry choke.

A 133-foot Zepp antenna is used at W8BUL, with 43-foot feeders. The panel at the extreme right of the table holds the antenna tuning condensers, two of which are used for series tuning and the other for parallel tuning. Christmas tree lamps serve as resonance indicators and are shorted out once the antenna circuit is tuned.

The receiver is entirely a.c. operated, and has a '24 detector and two '27 audio stages. Condenser control of regeneration is used, and the '24 is resistance-coupled to the first audio stage. The speaker at the left-hand end of the table is used for most reception. A home-made "B" substitute supplies plate current for the receiver.

The monitor and frequency meter, although separate instruments, are built in the same box. The monitor is quite usual in construction, and has coils provided for 3.5, 7 and 14 mc. The upper part of the box houses a dynatron frequency

meter, d.c. operated, which is calibrated from Standard Frequency Transmissions.

Most of the operating time is taken up by rag-chewing, but traffic is handled occasionally and some DX is worked. W8BUL says that, like most other hams, he has a mania for tearing down good apparatus and rebuilding it so that by the time this appears in *QST* there may be an entirely-different-looking station behind the call.

Strays

Drilling small holes in tube bases or coil forms is quite a delicate job if the hole is very small, on account of the probability of snapping off the end of the drill. The drills also bend quite easily under light pressure. As an excellent substitute for small and medium size drills, clip the head off a shingle nail or saw it off larger nails, and use in place of a regular drill. Nails have more strength on account of their shorter length, and will drill just about as quickly as a regular drill. They will save on both the pocketbook and the temper.

— WCEIJ

And now let's all kneel down and pray

To save the soul of Alec O'Day.

They found his body right near the spot

Where he touched the wire to see if 'twas hot.

— WCEIJ

W9DRG recently "rediscovered" his old high-school radio spark station, 9BMO, intact after all these years. He'd like to hear from anyone who remembers hearing the outfit.

A TRICK SLIDE RULE

Since the *L-C* product is the starting point for all tuner design, it is a great saving in midnight oil to engrave an inverted *C* scale along the top edge of your slide rule, above the *A* scale. The 750 on the inverted *C* scale should coincide with the 45 on the *A* scale. Then the inverted *C* scale reads directly in frequencies (cycles, kilocycles, megacycles); and the corresponding points on *A* are the respective *L-C* factors. To extract *L* and *C* constants in any ratio merely divide in the usual manner with the *B* slide.

There are slide rules on the market with an inverted *C* scale, but it is on the slide and has to be set, and is in the way for the next operation. The above plan puts it up out of the way, and at the same time ready for use.

Proceed as follows: reverse the slide so that the inverted *C* runs under *A*, and clamp it with 750 opposite 45. Using the runner as straight edge engrave the inverted *C* scale along the top edge above *A*, starting with 1, 2, 3, 4, etc., and including such half and tenth divisions as you are apt to have use for. "Engrave" with a sharp knife, and run some red ink into the cuts to make an ornamental job of it.

— F. I. Anderson, New Boston, Mass.

THE COMMUNICATIONS DEPARTMENT

F. E. Handy, Communications Manager

E. L. Battey, Asst. Coms. Manager

Fined for Off-Frequency Operation

HARMON OGDEN WINSTON (WIBCV) paid a fine of \$500 in the federal court at Boston, July 22, 1931, on his plea of guilty to operating amateur radio station W1BVC (New Bedford) outside the frequency band allocated to operators of amateur stations by the Washington Convention. On conviction of this violation of F. R. C. General Order No. 84 (the amateur regulations) Winston was not only assessed \$500 but the radio set located at 98 Austin St., New Bedford, Mass., was confiscated in accordance with the court decree.

The Government has *not yet* rested its case, as the said Winston is to be reindicted and prosecuted for violating the *Radio Act itself*, conviction of this felony being punishable by a fine of \$5000 and/or imprisonment for a term of not more than five years for each and every such offense.

Traffic Briefs

Wayland Groves, W5NW is returning to the U. S. A. from Sumatra and expects to be located near Houston, Texas, after arrival there in late October. Tittle of W5BSY at Denton, Texas, has handled many radiograms from KAIHR from Groves during the four years he has been in Sumatra.

W8BAH, W8AXV, W8AHH, W8DDS (Sec'y), W8CIO, W8DVL and W8BOT are officers of the newly organized Cleveland Radio Traffic Association, the purpose of which is to promote better traffic handling in the city, to bring traffic stations closer together, and get more Cleveland stations handling traffic in organized fashion. One must have an active station and be familiar with A.R.R.L. procedure to become a member.

The Garfield Heights Short Wave Association also of Cleveland, Ohio, limits its membership to twenty-five. The society has its own station for both 'phone and radio-telegraph work, is out to handle traffic and has made application for O.R.S. appointment. W8DQC, W8CKH and W8DYG (Sec'y) are officers. Licensed amateurs are senior members and junior members must have their licenses in one year or be dropped from the membership rolls.

W3AAJ, Route Manager of Virginia, reports organization of the Virginia "Goodtime" Network for fall. Richmond, having most active stations, is acting as the hub. A bulletin listing all Virginia points and stations is being returned by the individual cooperating stations making schedules with W3CFL, W3ZU, W3FJ, W3AEW, W3AMB, W3AAJ, W3ASA, or W3IB who cover the Richmond end. This makes it possible for transfer of traffic between all Virginia points through Richmond and the volume of traffic is already on the upgrade.

W3FJ, W3ASA and W3AAJ set up a portable station for the National Guard at Camp Pollard, Beach, Va., and ac-

complished some excellent contact work for the Guardsmen during August.

Patterson, W4WS, reports 32 active 'phone members in "Knights of the Kilocycles" who meet over the air every Sunday morning. W4WS is "Master Oscillator" of this net, which has been active since Christmas Day, 1930. The object is good fellowship, development of a communications system second to none for Florida, and membership is now being extended to c.w. telegraph stations. The Army Amateur Phone Net has been active all summer with 22 stations answering roll call each Monday, W4ABL net control. FB work!

W9FFY's June-July total of 313 messages (53 orig., 46 d'ld, 214 relayed), was inadvertently not reported in September *QST*. In addition to putting him in the B.P.L. for that issue it puts Southern Minnesota over North Dakota, leading the Dakota Division. Also it enables the Dakota to take tenth place away from the Southeastern Division.

The Ninth Naval District Master and Alternate Control stations NDS and NDP were awarded jointly the Director of Naval Communications trophy cup for the highest score in the National Competition for Communication Efficiency for the year ending June 30. This is a nationwide U.S.N.R. competition. The scores take into consideration such elements as the number of drills attended, closeness to frequency (4045 kc.), quality of note and accuracy of keying. FB.

The Detroit Amateur Radio Association will stage another of its popular, painless (to pocketbook) hamfests at Ypsilanti, Mich., Sunday, October 11th. A great program is promised. Invitation is extended to hams in Ohio, Indiana and Ontario as well as Michigan.

W9GFZ at Wheaton, Ill., is following all the 28-mc. skeds of VEK3WL (Aug. *QST*) and VE2AC (Sept. *QST*) and has two '52s on 28.6 mc. Copies of WLY's high frequency schedules through January, 1932, are still available from A.R.R.L. on request.

The two-day Hamfest held by the Alberta Radio Experimenters Association in Calgary, on July 6th and 7th, has been voted a huge success. On Monday evening, July 6th, an enjoyable trip was made to the Turner Valley Oil Fields. Tuesday afternoon was spent in a sight-seeing tour of the city and the various Calgary stations. A banquet was held in the Board of Trade rooms. The program for the evening was opened by the President, F. Gully, followed by a brief talk by Mr. R. Ainslie, the local radio inspector. Skits pertaining to ham radio were put on by VE4CY, VE4GD, VE4HQ and VE4GX. Through the courtesy of the Canadian General Electric Co., a film was shown depicting the progress of communication from the days of the heliograph, smoke signal and semaphore up to present-day radio systems. Throughout the entire program VE4AF entertained at the piano.

On June 28th the Mississippi Valley Amateur Radio Association held its first annual basket picnic at Rand Park, Keokuk, Iowa. A total of 125 were present including amateurs from South Dakota, Missouri, Wisconsin, Illinois and Iowa. Two portable transmitters for autos were demon-

strated and a station was erected. A public address system was also demonstrated. Mr. Anderson of the Tobe Deutschmann Company gave an interesting talk on interference and its elimination. Visitors were shown through various places of interest at Koekuk. The officers of the Mississippi Valley Amateur Radio Club are W9EVH, President, W9CWG, Vice-President and W9AFQ, Secy-Treasurer. The club has an official publication "QRN" copies of which will be sent to anyone on request.

CM8YB spent his vacation at home in Los Angeles. While there he was royally entertained by W6BMO, W6CII and W6FA, as well as the Amateur Radio Research Club. CM8YB is now on the air again and will gladly QSP all south-bound traffic. Operating hours are 0630 to 0730; 1600 to 1730; and 2145 to 2400 E.S.T. daily on the 7-mc. band.

28-mc. Schedule of VE2AC

Dates, October	Dates, November	(Time G.M.T.)
2, 9, 16	6, 13	1400, 1800, 2000
3, 10, 17, 24, 31	7, 14, 21, 28	1200, 1300, 1400, 1500
4, 11, 18, 25	1, 8, 15, 22, 29	0000, 0100, 0200, 1200 1400, 1500, 1600, 1700, 1800 1900, 2000, 2100, 2200, 2300
5, 12, 19, 26	2, 9, 16, 23, 30	0000, 0100, 0200, 0300
6, 13	3, 10, 17	1300, 1500, 1900, 2100
7	4, 11, 18	0100

Poor Mental Operating

By P. H. Gould *

In January *QST* (page IV) we invited 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 practise, commentary on the place of radio-telephony, experimenting or development work in present-day amateur radio, data on low-power possibilities, 1750-kc. 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. Our offer is good throughout 1931. The article presented herewith is the prize-winning article for this month.

— Communications Manager.

“GE, OM, tks for rpt — ur sigs QSA5 fb do — wl gess nm so cul 73 — ar sk.” How does this answer make the call signal of the station you have just contacted stand out in your mind?

Do you ever stop to think what you are going to say to a ham that you work when you sit down at the key? Such an answer, as just described actually *discredits* your station in the mind of the operator whom you have just treated discourteously. Such an answer in a personal contact is almost an insult.

How else can one answer a station? Here is a subject for all thinking brasspounders to ponder over for a few minutes

* W9DHP, 2515 S. Irving Ave., Minneapolis, Minn.

while their mercury vapor rectifier tubes are receiving the evening's initial toasting. When you start to build a new transmitter, you draw at least a pencil sketch of how your sockets and coils are going to be located. Then why don't you make at least a mental sketch of what you will say to a station when you are calling him or unreeling a CQ? If your mind is so intent on that antenna ammeter which jumps up to five each time you make a dash, why not tell the other fellow about your five-amp thrill? This "non-thinking" operating of so many amateurs of to-day is a sore spot with the many wide-awake hams who try to make good contacts.

My favorite method of starting a real rag chew, interesting discussion of amateur problems or profitable traffic exchange with a station is to add a simple query such as "wx? QTC?" to my report on signals. If the operator answers those questions, then ask him the kind of a receiver he uses or what his occupation or sport is. I like these last ideas because they produce the most interesting material. I can best illustrate this by telling of one of my best "rag chews."

I had just hooked an "S." He gave sensible answers to my first ventures. He answered my question concerning occupation with "rubber research worker for tire company." To this he added that it was his first job after graduating from the School of Chemistry of a certain college the previous June. I asked him his favorite sport and if he expected to make rubber bands pull farther.

After about four hours of fighting through the 20 meter Sunday afternoon QRM, I discovered that he knew no less than two dozen people whom I also knew. He had worked his way through college by slinging hash in the winter and playing "sparks" on a lake passenger boat in the summer. The next summer I met him personally. Did he remember me when I whistled my call letters to him over the telephone? Why he came back with an R9 and invited me out to dinner. I count him among my best friends to-day.

Since then my motto has been, "Give the other fellow a chance by asking him a question first." If he completely disregards your hints of "wx? QTC?" twice in a row, make a face at him in the reflection of your tubes and find someone who sounds more friendly.

Believe me, fellows, contacts like the one I have just related are the ones which really count. They make your station noteworthy in the eyes of other stations. Operate with a purpose. Do things that make your work really interesting and worth while to others at the same time you pound brass for a hobby. Think of something to say each time you call another station or whenever you let out a CQ. You will find your amateur-life twice as enjoyable. See how the REAL gang will respond. Best of all, you will be recognized as one of the gang of better operators on the air to-day, not as "just another op."

Traffic Briefs

The value of amateur radio to the public was again demonstrated recently when W8DSS, Onieda, N. Y., wished to advise his uncle in Chicago that a brother was seriously ill. He started a message to Chicago on Thursday, July 16th. It traveled W8DSS-W8BJO-W8CKI-W8PP-W9DZS-W9DFT. Due to poor conditions, the answer did not get back to W8DSS until the following evening. Saturday morning, July 18th, the uncle and his family arrived from Chicago, having acted on the radiogram.

W8CKI, Buffalo, recently had emergency messages for Yonkers and Ryders Mills, N. Y. W8DSS took them and relayed to W2BZZ, Poughkeepsie, and W2BJA, Albany. Both of these amateurs 'phoned the addresses and gave an OK on delivery to W8DSS. W8DSS then again contacted W8CKI and told him they had been delivered. FB!

The Indianapolis Radio Club made a trip to Tippecanoe, Ind., on June 19th and 20th. Among the amateurs present were W9CYQ, W9ASE, W9FUT, W9GJG and W9CKG. They took along a portable transmitter, and from a camp in the Tippecanoe woods communicated with Indianapolis. W9DSC and W9CVQ at Indianapolis contacted the group with no difficulty.

BRASS POUNDERS' LEAGUE

Call	Orig.	Del.	Rel.	Total	Call	Orig.	Del.	Rel.	Total
CX7	2361	1403	—	3764	W9BEX	57	62	148	267
W8DD8	781	437	826	2046	W6ETFJ	208	30	20	358
W8BAF	681	1486	628	1807	W9DFC	135	121	—	256
W8ER	571	124	862	1557	W6ZM	245	7	4	256
OMITB	516	191	823	1530	W6ET	214	3	38	255
W8CG8	407	261	727	1395	W9DVQ	125	124	—	249
W6EGH	501	371	420	1292	W9AK	20	64	165	249
W5VQ	56	39	1058	1153	W8TE	110	53	86	249
KAIHR	195	189	662	1046	W9BGW	47	32	170	249
W6BCK	952	8	42	1002	W5AB	30	25	190	245
W8CKI	129	117	722	968	W3ARN	14	103	119	236
W9EDQ	151	164	592	907	W8APC	71	71	84	226
W6DMJ	258	540	21	819	W6AOA	34	9	183	226
W8PF	103	75	573	751	W8BNC	42	51	132	225
W6EFC	25	10	600	635	W6LJ	20	18	186	224
W9BGL	185	418	13	616	W6EUT	34	12	174	220
W8FYY	12	10	528	550	W2CJP	—	—	217	217
W5FW	34	8	477	519	W3AGH	47	21	148	216
OM2CS	235	165	110	510	W6NM	93	100	18	211
W38M	326	62	106	494	W8DU	50	88	71	209
W9BANU	164	177	136	477	W2CG	56	78	72	206
W8BYD	222	72	177	471	W3BLU	112	63	27	202
W6SN	65	80	317	462	W6VH	162	14	26	202
W8DFR	98	48	310	456	W8CIO	33	16	152	201
W3ARV	134	52	236	422	W6BET	69	115	16	200
KAJCE	205	87	126	418	W8CAK	29	53	112	194
W5AHI	3	29	373	405	W8CUL	88	51	48	187
W3BWT	101	100	201	402	W9GKV	109	72	2	183
W9APF	190	187	—	377	W8EXQ	79	83	—	162
W5BMI	64	86	226	376	W9DQF	65	74	2	141
W1MK	78	113	182	373	W8AUI	81	57	—	138
W6COI	5	15	352	372	W6DER	14	61	36	131
W9DI	24	74	259	357	W6DPR	12	68	40	130
W48O	148	184	16	348	W2CEN	—	70	58	128
W8MH	64	56	228	348	W3APT	13	53	61	127
W9AMO	15	29	294	338	W3ZI	47	65	12	124
W9FLG	112	191	34	337	W9FLI	24	50	50	124
W3QL	97	90	148	335	W1BGW	10	66	45	121
W8YA	24	58	238	320	W9VQ	34	81	4	119
W8AXV	34	48	212	314	W3ZU	49	51	—	100
W9HJS	24	7	282	313	W6CDU	21	60	1	97
W6ADX	124	186	—	310	W9GXD	4	51	1	56
W5AUC	51	64	192	307					
W6ATJ	15	35	254	304					
KA1SL	117	126	60	303					
W9FFY	60	29	210	299					
W8AUI	201	97	—	298					
W8D88	47	52	198	297					
W6AMM	94	199	—	293					
W6CFN	226	35	30	291					
W3CKM	41	38	207	286					
W9BWJ	158	98	28	281					
W9ALA	17	14	246	277					
W6YAU	95	157	24	276					
W8MV	96	167	10	273					
W6BJF	96	63	114	273					
W9DMY	192	24	56	272					
W3RE	205	64	—	269					

Month of July 15-August 15 above. Deliveries count! Special credit should be given to the following stations in the order listed responsible for over one hundred deliveries in this message month: W8BAF, CX7, W6DMJ, W8D88, W8BGL, W8EFC, W8CKI, W6AMM, OMITB, W9FLG, KAIHR, W9APE, W6ADX, W48O, W9BNU, W8MV, OM2CS, W9EDQ, W6YAU, KA1SL, W8ER, W9DVQ, W9FRC, W8CKI, W6BET, W1MK, W3ARN, W3BWT, W6NM.

After August 15 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?

Traffic Summaries

(JULY-AUGUST)

Pacific led by Los Angeles (5972)	16,428
Central led by Ohio (8900)	14,723
Midwest led by Kansas (7161)	9021
Atlantic led by Western Pennsylvania (2314)	7984
West Gulf led by Oklahoma (1294)	2914
New England led by Connecticut (732)	1960
Roanoke led by Virginia (1321)	1734
Northwestern led by Oregon (890)	1108
Rocky Mountain led by Colorado (917)	1091
Hudson led by New York (City and Long Island (543)	1054
Delta led by Arkansas (628)	1047
Dakota led by Southern Minnesota (478)	924
Southeastern led by Georgia-South Carolina-Cuba-Isle	
of Pines-Porto Rico-Virgin Islands (484)	791
Quebec	73
Vanalta led by British Columbia (57)	57
Maritime	52
Prairie led by Saskatchewan (10)	14
760 stations originated 19,074; delivered 14,222; relayed 27,679; total 60,975 (74.7% del.)	



OHIO retains the Banner with 8900 to her credit. KANSAS' organized traffic work for the National Guard nearly put her over the top with 7161. LOS ANGELES' origination of invitations to La Flesta put that Section in third place with 5972. The above summary shows the relative standing of all Divisions and the leading Section in each Division for the July-August reporting month.

DELIVERIES COUNT! Attention is called to the fact that deliveries slipped back from 78.5% to 74.7% with this report — a danger signal worth watching. Increased volume of traffic doesn't mean a thing if it is gained by sacrificing delivery performance. Only one of the three high Sections, KANSAS, made a better-than-average record of deliveries. Kansas delivered 84%, Ohio 68.8%, Los Angeles 38%. The Santa Clara Valley

Section deserves great credit for deliveries on a quantity of trans-Pacific traffic. Comparing messages originated and delivered by stations reporting in this Section we find the rare case of an "apparent" delivery figure of 188% — meaning that totals were not swelled by origination, and that more than the average number of messages originated in other Sections were delivered. Detailed figures from which these percentage figures are derived are available from Headquarters on request, and affiliated clubs and C.D. officials also have this information. Remember, DELIVERIES COUNT. A message delivery is the final touch perfecting and completing a radio service. Without a delivery all the process of origination and relaying has been in vain, at least from the standpoint of the parties sending a message and more especially the addressee. Let's watch deliveries carefully and lose no chance to DELIVER.

— F. E. H.

Official Broadcasting Stations

(CHANGES AND ADDITIONS)
(Local Standard Time)

W3QP	(3700 kc.) (CW) Tues., Fri., 9:00 p.m.
	(14164 kc.) (Phone) Tues., 8:30 p.m.; Fri., 4:30 p.m.
W4AEM	(7010 kc.) Sun., Thurs., 4:30 p.m.; Tues., Fri., 8:30 p.m.
W4WN	(3542 or 3510 kc.) (Phone) Mon., Wed., Fri., 6:00 a.m.
W6BJF	(7050 kc.) (CW) Daily except Mon., 8:00 p.m.
W6CEC	(3548 kc.) (Phone) Daily 6:00 p.m., 10:30 p.m.
W6CFP	(7250 kc.) (CW) Daily 5:00 p.m., 8:30 a.m.
W6ETJ	(7250 kc.) Daily except Sun., 8:00 a.m.
W8D88	(3970 kc.) Mon., Wed., Fri., 8:00 p.m.
W8EFN	(3540 kc.) (cc) Six days a week 6:00 p.m.
W9AEQ	(14144 kc.) (cc) Mon., Thurs., 6:00 p.m. (Will be sent in CW then followed by phone on same QRH).

ELECTION NOTICES

To all A.R.R.L. Members residing in the Sections listed below:

(The list gives the Sections, closing date for receipt of nominating petitions for Section Manager, the name of the present incumbent and the date of expiration of his term of office.) This notice supersedes previous notices.

In cases where no valid nominating petitions have been received from A.R.R.L. members residing in the different Sections in response to our previous notices, the closing dates for receipt of nominating petitions are set ahead to the dates given here-with. In the absence of nominating petitions from Members of a Section, the present incumbent continues to hold his official position and carry on the work of the Section subject, of course, to the filing of proper nominating petitions and the holding of an election by ballot or as may be necessary. Petitions must be in Hartford on or before noon of the dates specified.

Due to a resignation in the Western New York and Vermont Sections, nominating petitions are hereby solicited for the office of Section Communications Manager in these Sections and the closing date for receipt of nominations at A.R.R.L. Headquarters is here specified as noon, October 20, 1931.

Section	Closing Date	Present SCM	Present Term of Office Ends
Philippines	Sept. 15, 1931	S. M. Mathes	Sept. 28, 1931
Alaska	Oct. 20, 1931	W. B. Wilson	Mar. 28, 1928
San Diego	Oct. 20, 1931	Harry A. Ambler	Sept. 16, 1931
British Columbia*	Oct. 20, 1931	J. K. Cavalsky	Sept. 16, 1931
New Mexico	Oct. 20, 1931	Leavenworth Wheeler, Jr.	Nov. 15, 1931
Vermont	Oct. 20, 1931	Clayton F. Lettette (resigned)	.....
Western New York	Oct. 20, 1931	John R. Blum (resigned)	.....
Connecticut	Nov. 20, 1931	Frederick Ellis, Jr.	Nov. 30, 1931
Washington	Nov. 20, 1931	Eugene A. Plety	Dec. 6, 1931
Montana	Jan. 15, 1932	Cly. Wiers	Jan. 21, 1932
East Bay	Jan. 15, 1932	J. W. Frates	Jan. 21, 1932
Alberta*	Jan. 15, 1932	Fred Barron	Jan. 21, 1932
Quebec*	Jan. 15, 1932	Alphy Blais	Jan. 21, 1932
Louisiana	Jan. 15, 1932	F. M. Watts, Jr.	Jan. 21, 1932

To all A.R.R.L. Members residing in the Sections listed:

1. You are hereby notified that an election for an A.R.R.L. Section Communications Manager, for the next two-year term of office is about to be held in each of these Sections in accordance with the provisions of By-laws, 5, 6, 7, and 8.

2. The elections will take place in the different Sections immediately after the closing date for receipt of nominating petitions as given opposite the different Sections. The Ballots mailed from Headquarters will list the names of all eligible candidates nominated for the position by A.R.R.L. members residing in the Sections concerned. Ballots will be mailed to members as of the closing date specified above, for receipt of nominating petitions.

3. Nominating petitions from the Sections named are hereby solicited. Five or more A.R.R.L. members residing in any Section have the privilege of nominating any member of the League as candidate for Section Manager. The following form for nomination is suggested:

(Place and date)

Communications Manager, A.R.R.L.
38 La Salle Road, West Hartford, Conn.

We, the undersigned members of the A.R.R.L. residing in the Section of the Division hereby nominate as candidate for Section Communications Manager for this Section for the next two-year term of office.

(Five or more signatures of A.R.R.L. members are required.)

The candidates and five or more signers must be League members in good standing or the petition will be thrown out as invalid. The complete name, address, and station call of the candidate should be included. All such petitions must be filed at the headquarters office of the League in West Hartford, Conn., by noon of the closing date given for receipt of nominating petitions. There is no limit of the number of petitions that may be filed, but no member shall sign more than one such petition.

4. Members are urged to take initiative immediately, filing petitions for the officials for each Section listed above. This is your opportunity to put the man of your choice in office to carry on the work of the organization in your Section.

— F. E. Handy, Communications Manager

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed in a number of Sections on or before the closing dates that had been announced for receipt of such petitions. As provided by our Constitution and By-Laws, when but one candidate is named in one or more valid nominating petitions this candidate shall be declared elected. Accordingly, election certificates have been mailed to the following officials, the term of office starting on the date given.

Eastern New York Robert E. Haight, W2LU Sept. 16, 1931
In the Eastern Pennsylvania Section of the Atlantic Division Jack Wagenseller, W8GB, and Edward Hart, Jr., W3BF, were nominated. Mr. Wagenseller received 102 votes and Mr. Hart 37 votes. Mr. Wagenseller's term of office began July 15.

* In Canadian Sections nominating petitions for Section Manager must be addressed to Canadian General Manager, Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid such petitions must be filed with him on or before the closing dates named.

Traffic Briefs

W7QD reports receipt of a QSL card from ZS5X in the Union of South Africa confirming their QSO of April 26th. W7QD was using 14-mc. 'phone — 40 watts input to a type '10. ZS5X used c.w. W7QD received report of QSA3 R4, and says ZS5X was about the same. This contact was at 4:30 p.m. P.S.T., and W7QD says the DX is over 12,000 miles . . . mighty fine low power 'phone work!

We have recently been receiving QSL cards addressed to "Operator 'CL,' W1MK." And "RP" was at the key at the time mentioned on the cards! Next thing we know we'll be getting cards for operators "AR" and "SK"! Mr. Brainard Field gets a surprising number of W1MK's QSL cards, too.

The Miami Amateur Radio Club cooperated in providing communication at the 1931 All-American Air Meet. The line-up was very much the same as that used when the club conducted the communication at the 1930 races. The following amateurs cooperated in the 1931 efforts and put over the communication between pylons in great style: W4MD, W4QL, W4AEQ, W4AKW, W4ANB, W4BT and W4AGR. The portable calls used at the various stations at the Meet were: W4PAO, W4PAZ and W4PAA. W4AGR maintained communication with Hartford, Conn., and handled messages for the Connecticut National Guard, 43rd Division Squadron, which was at the Meet. Messages were at hand for the commander of the squadron before the planes landed. The main high light and exciting event so far as high frequency radio communication was concerned was furnished in connection with the crash of a plane near Pylon No. 2, where W4PAZ was installed. Operator Wisenbaker, W4AKW, ran to the crash to give what assistance he could. At the same time Operator Bowers, W4NB, called the key station and gave them an emergency message. In a few moments an ambulance was speeding to the wreck. In about a half-hour newspapers were on sale in the grandstands and on the streets of Miami carrying an account of the disaster based on the reports sent in by radio. Had radio communication not been available it would have taken from thirty minutes to an hour longer to get aid to the wrecked plane. The members of the Miami Amateur Radio Club feel that being able to render assistance in such an emergency alone amply repaid any cost or labor involved in furnishing radio communication for the 1931 All-American Air Meet.

W5ZG says, "I would like to see QST waterproofed, as it is darned hard to read in the bathtub." So say we, OM!!

Sometimes when listening-in we wonder how many hams, if any, have ever read the chapter on "Operating" in the Handbook. What a millennium it would be, if all amateurs studied that chapter before attempting to "operate" their stations.

The benefits of a careful study of good operating practices as explained in the Rules and Regulations of the Communications Department, and in the chapter on "Operating" in the Radio Amateurs' Handbook, are manifold. Just listen to the following which we quote from a recent letter received by W9GRY from an old time amateur: "When I first heard you answering my CQ I was particularly attracted by the machine-like precision of your sending. It was so clean-out; each and every character was sent perfectly. The way you transmitted your message Nr. 1 struck me as being an example of your efforts in studying the procedure recommended by the A.R.R.L. Your transmission of that message was exactly right from beginning to end. If you will continue to follow your method of sending, and also the prescribed message form and procedure when sending messages, undoubtedly you will soon reach a place in the ranks of amateur radio that will make it ever so much more enjoyable when operating." FB, W9GRY! And say, the rest of you fellows, take stock of yourselves. Do you think you could rate a letter like the above? If not, brush up on your operating procedure. We'll send you a copy of the R. & R. to help you along, if you haven't already received your copy.

GOLF BY RADIO

By I. S. Limer, Acting SCM, Manila, P. I.

You hear of chess and checker tournaments, and even bridge games being played by radio, but have you ever heard of a golf match by radio? Here is one which was played at a distance of approximately 7800 statute miles. Carson Taylor, W6ESA, son of the publisher of the *Manila Daily Bulletin*, was bragging to KAISL in Manila of having shot an eagle on the eighth hole at the California Country Club in Los Angeles. The news was duly forwarded by KAISL to the OM. The OM offered to play his son a match lasting one week . . . the best cards of the week to be compared. One end of the match was played at the California Country Club while the other was being played at Wack Golf Club in Manila. Results of the match were compared between W6ESA and KAISL on the following Saturday schedule, and the discovery was made that the OM had lost by a bare margin of one hole. Let's get organized for more sports by radio. It gives pep and renewed interest to amateur radio. Let's try a track meet by radio or something similar. How about it, you college athletic managers? Let's have a challenge. Or perhaps some of you Army fellows will challenge our units out here to a competitive shoot.

Watch 3500 kc. for DX this winter! Among the DX contacts on that band reported recently are two QSOs with HH7C by VE3HM. VE3HM was using low power, too.

W8DUL has received a card from New Zealand receiving station ZL205 reporting reception of his 'phone at 7 p.m. N.Z.M.N.T. on April 24th. This is mighty FB 'phone reception.

The California National Guards conducted their usual annual summer camp at San Luis Obispo, Calif. During the period July 4th to 19th, the 184th Infantry, the 159th Infantry, and the 143rd Field Artillery were under training. The Regimental Headquarters Battery of the 143rd Field Artillery had the distinction of having the only amateur radio station in the three units. This station operated under the call W6CNG. W6BTZ was chief operator. W6AIN and W6BKM were first and second operators. Schedules were arranged prior to leaving Oakland with East Bay amateurs and other amateurs for the purpose of handling messages from the boys at camp to their home folks. W6ASH handled the largest amount of traffic. W6SC ran him second. W6CSF, W6ZX, W6ZM, W6CDP and W6ALX contributed toward a total traffic of 296 sent and 152 received. Through the cooperation of W6CDP two-way communication between W6AIN's and W6BKM's folks was often established. Other Sections and Districts as far away as Ohio took considerable traffic for the eastern states and helped build up the grand total of 399 originated, 161 delivered and 46 relayed, a total of 606.

A new radio club has recently been organized in Virginia — The Ashland Radio Club. W3AGH has been elected President, and W. J. Steifbold, ex3WX, is Secy-treasurer. Meetings are held on Tuesday nights, and plans are being made for a club station which will transmit code lessons and theory classes by 'phone.

A joint meeting and hamfest of the Washington Radio Club and the Richmond Short Wave Club was held at Richmond, Va., on June 13th. The attendance was 61. Among the licensed amateurs present were W3CDQ, W3NR, W3BEG, W4W1, W3LZ, W3LW, W3BWT, W3EJ, W3LX, W3CAB, W3BRA, W3ARD, W3BRQ, W3ADR, W3NT, W3BFT, W3BRL, W3TM, W3LL, W4RV, W4TR, W4OC, W3BZ, W3HY, W3AHQ, W3BKJ, W3BKI, W3AEW, W3AMB, W3FJ, W3FE, W3IB, W3AAJ, W3ZU, W3CFL, ex8CFL, ex3FE, W3BSW and W2EW. Needless to say, a good time was had by all.

A recent "round table" QSO on 14 mc. included W1CCZ, W1SZ, W2MB, W4AGR, W8DLD and W9DRD. All, with the exception of W1SZ, were using 'phone. This was a real "old-timers" get-together for the "amateur radio years" of these six amateurs total about 56.

The operators of 14 Ontario Forestry Branch radio stations are amateurs and hold the following calls: VE3AQ, VE3AR, VE3AW, VE3BO, VE3BZ, VE3CJ, VE3CV, VE3DD, VE3ET, VE3GT, VE3GX, VE3HA, VE3UR and VE3DY. Of these fourteen, five, VE3DY, VE3CJ, VE3BO, VE3ET and VE3GT are A.R.R.L. Route Managers or ex-RMs. It is good to see so many amateurs operating Government stations. FB!

All news dispatches to the National Geographic Society from the Haardt Trans-Asia Expedition in Asia are being received and delivered to the Society by radio amateurs. The dispatches are transmitted by FXC, Beyrouth, Syria, on 8 mc. at 2300 G.C.T. daily. Washington, D. C., amateurs have organized to copy the dispatches regularly and deliver them to the Headquarters of the Society in that city. Amateurs in the Washington line-up are W3BWT, W3CXL, W3BEG, W3CIC, W3NR and Jesse R. Clough, who does not yet have a call. Outside of Washington many other amateurs are cooperating in copying FXC, including J. Binford Thompson of Portsmouth, Va. Mr. Thompson's station is our most reliable receiving point outside of the Washington line-up, and copies the dispatches daily just in case something goes wrong at Washington. One night a bad electrical storm hit Washington at just the time of the FXC transmissions, and all Washington stations were unable to get the message. However, Mr. Thompson and Edmund Lindan at Richmond Hill, L. I., were outside of the storm zone and, although static was very heavy, they copied the dispatch and delivered to Natgeosoc. Had it not been for their efforts, the message for that date would not have reached the Society. In addition to the above-mentioned the following are also cooperating in copying FXC: W8AJ, W1AQW, W1ASY, W3EV, W3MC, W4PM, W8CWO and W9FFD. W6CGM is listening for the dispatches regularly, although as yet he has been unable to hear FXC. W9CVT is doing his part by getting other stations to cooperate. Any and all reports on reception of FXC should be mailed to A.R.R.L. HQs, together with a copy of the dispatch copied. Perhaps you will be the one to get the message sometime when every one else fails.

W8CIL suggests that the International Signal QSP be revised to mean "Will you relay to within 24 hours or deliver immediately?" We can't change the signal but it would be great to have that 24-hours or deliver clause in there! What say, gang?

1750-Kc. CODE PRACTISE

W8UF, Youngstown, Ohio, Daily — Midnight — 1 a.m. W9CXD, Paducah, Ky., Wednesday and Saturday 1995 kc. (crystal) 10:30-11:30 p.m. C.S.T. W9GDL, Lincoln, Nebr., Friday, 1900 kc., 8:30 p.m., Sunday, 1900 kc., 3:30 p.m. C.S.T. W8CSW, Montour Falls, N. Y., is on the air (1774 kc.) Wednesdays, 7 to 8 p.m., 'phone and c.w. with code for beginners, the schedule being started in mid-September. At this writing all the stations sending 1750-kc. code practise for beginners last season are being asked to give A.R.R.L. revised schedules for QSP. Some great possibilities are in store for 1750-kc. work this coming season. Any stations working in this band wishing to volunteer regular schedules of code practise should get in touch with A.R.R.L. Headquarters at once so that their schedules may be published and distributed by mail to those interested.

DIVISIONAL REPORTS

ATLANTIC DIVISION

EASTERN PENNSYLVANIA — SCM, Jack Wagen-seller, W3GS — W3UX leads the section. W3AAD has been elected president of the Quakertown Radio Club. W3QP has a 14 mc. phone perking FB. W3AOJ is a new OBS on 7010 kc. W8VD is back on the air. W3MC built a new receiver and is experimenting with 56 mc. W3AKB is rebuilding her receiver. W3DZ is now both ORS and OO. W8DHT spent most of the summer away from home. W8EU has been very QRL. W3OP is rebuilding. W8CFI

at Bucknell Univ. will open again in Sept. W9EWV is chief opr. there. Nice reports were received from the following non-ORS: W3BHU, W3BET, W3BBK, W3BTP, W3AUR, W3NA, W3BES, W3BRH, W8DPQ, W3BNU. The following ORS did not report: W3AWO, W3UHI, W8CWO, W3AVI, W3ADE, W3EV, W3AQN, W3MG, W8AIT. The following are still in cold storage: W3ZF, W3NF, W3AQQ, W8CFI, W3OK. Too many ORS are slipping up on their reports. A word to the wise is sufficient.

Traffic: W3UX 102, W3AAD 73, W3BH 58, W3QP 31, W3ACJ 26, W3BET 23, W8VD 22, W3MC 19, W3AKB 17, W3BBK 16, W3BTP 14, W3DZ 11, W3AUR 10, W3NA 10, W3BES 9, W3BRH 8, W8DPQ 7, W8DHT 2, W8EU 2, W3OP 2, W3BNU 1.

SOUTHERN NEW JERSEY — SCM, Robert Adams, 3rd, W3SM — Six stations made the BPL: W3QL, W3ARV, W3ARN, W3SM, W3RE, W3ZI. W3ARV kept nine skeds. W3ZI handled official messages for the N. J. National Guard. W3AWV is organizing the Delaware Valley Radio Club. W3QL, our Route Manager for the Southern half, kept eight FB skeds. W3ARN leads with the most deliveries. W3UT and W3BDO were away on vacation most of the month. W3BPD is qualifying for ORS. W3AEJ wants ORS. W3SY is getting out FB with very low power. W3JL reports the Morris County Radio Club is having fine meetings. The Camden Unit of the U.S.N.R. is meeting each Thursday night at W3SM's house, who is the New Jersey Commander. A new unit is being formed in Atlantic County. W3SM is keeping three foreign skeds on 40 meters. Each Thursday night at 2200 E.S.T. W3SM sends QST of sectional news, on 3048 kc. This section needs more Official Observers. New ORS appointments this month were W3BDO, W3UT and W3SY. W3RE reports a nice total for the National Guard located at Eggerts Crossing, Trenton, N. J.

Traffic: W3ARV 422, W3QL 335, W3SM 494, W3JL 23, W3BSC 37, W3BUP 15, W3RE 269, W3ZI 124, W3AWV 67, W3UT 4, W3BEI 38, W3AEJ 20, W3BWR 12, W3BPD 9, W3ARN 236, W3ATA 18, W3SY 72, W3BDO 34, W3UT 8.

MARYLAND-DELAWARE-DISTRICT COLUMBIA — SCM, Harry Ginsburg, W3NY — W3VJ, Salisbury, Md., now Route Manager for the Eastern Shore of Md. and Delaware, is organizing the boys in his territory to QSP traffic and become Official Relay Stations. Write him for skeds into the Eastern Shore. With W3AFF as Route Manager for W. Md., W3BWT as Route Manager for D. C. and Southern Md. and Chief RM for the Section; W3VJ as Route Manager for Eastern Shore of Md. and for Delaware; and W3NY covering the balance of Maryland; we can take care of "Ye Olde QSP" and give 'em all the "old Harry"! Maryland: W3AFF handled a message for the Honorable A. C. Ritchie, Governor of Md. W3A00 blew his rectifiers. W3ZK has his Xtal frequency meter perking FB. W3LA reports heavy QRL. W3BBW will be in full swing again by September 15th. W3NY handled his traffic on 3900 kc. Delaware: W3HC changed his QRA to 119 Grier Ave., Richardson Park, Del. W3ALQ says the hot weather has kept him from doing much transmitting. District of Columbia: W3BWT handled his usual FB total. Sergeant Carl Black, formerly W1ADI and W2AHF, is now operator at WLM-W3CXL. Sergeant George Kimmel is now one of Washington's finest police and has been appointed Radio Aide to the A.A.R.S. for the Third Corps Area, as W3CXD. W3BEG is now ORS. W3CDQ says she is pounding brass on a remodeled transmitter into a new Zepp antenna. W3CAB helped considerably with the messages, to the various governors to help promote the Washington 1932 Bi-Centennial Celebration, as did also W3BWT, NED, W3BEG, W3CDQ, W3LX, W3EI. W3PN has been very QRL with vacation and work. W3BAT has changed his QRA to Silver Springs, Md., and has an 80-meter Zepp between two 75-foot telegraph poles.

Traffic: W3BWT 402, W3NY 111, W3BAT 79, W3A00 57, W3CAB 52, W3AFF 42, W3HC 8.

WESTERN PENNSYLVANIA — SCM, Robert Lloyd, W8CFR — W8ER, old W8CHC, reports a fine total. W8YA has a new quarter KW crystal job. W8CAX will be at school again this fall. W8CTE is trying to QSO Asia. W8AAG is the Naval Reserve station in Pittsburgh. W8BUC

is lining up schedules. W8AGO is working with 56 mc W8CWL sends in his first report. W8CUG is going to build a rectifier — to keep his batteries charged! W8CQA is re-building, he reports W8BOZ and W8DUL on the air from Warren. W8APQ uses a pair of 245's now. W8CMP says schedules are hard to get. W8DLG is getting set for winter. W8BSE has a new transmitter. W8CEO resigned his post in the A.R.R.S. W8AJE reports for W8CPE and W8BJC. W8ASE has shielded his transmitter. W8EEC blew his filter. W8CRA worked WDDE. W8AVY is hunting schedules for fall. W8CFR worked a few of the gang.

Traffic: W8ER 1557, W8YA 320, W8CAX 194, W8CUG 87, W8CPE 56, W8CTE 29, W8AAG 22, W8BUC 10, W8AGO 8, W8CQA 7, W8CWL 7, W8APQ 4, W8CMP 4, W8DLG 4, W8BSE 2, W8CRA 2, W8CFR 1.

WESTERN PENNSYLVANIA TRAFFIC CONTEST

The following rules have been adopted by the SCM for a traffic contest open to all the amateur stations of Western Pennsylvania. Every contestant should read the conditions carefully. The contest will extend from midnight, October 15th, 1931 to midnight, April 15th, 1932.

PRIZES

1. For the station handling the greatest number of *bonafide* messages during the six months' period: One pair of UX-866 rectifiers.
2. For the station making the greatest number of *bonafide* message deliveries each month: Three A.R.R.L. Log books.

CONDITIONS

1. No station shall be eligible for more than one monthly prize.
2. In case of a tie for monthly prizes, the total amount of traffic handled shall determine the winner. If the contest is tied for the six months' prize, the total of message deliveries shall determine the winner.
3. The usual copies of all messages handled must be kept on file subject to inspection by the SCM.
4. Formal entry is not required. Any station to be eligible must only report its monthly traffic to the SCM in the usual manner, except that reports received later than the 19th of each month will not be counted for the monthly or the six months' total.
5. Any unfair practices, such as the use of rubber stamp messages or the exchange of messages between two stations while QSO where the messages are addressed to each other solely to pad totals shall disqualify the stations involved.
6. All stations must conform strictly to the Rules and Regulations of the Communications Department of the A.R.R.L.

WESTERN NEW YORK — SCM, John R. Blum, W8CKC — October 20th is the closing date for receipt of nominations at Hq. for our new SCM. W8CKI led, making the BPL both ways with 20 skeds. W8BYD got his total in 16 days' work with reliables W3BWT, W8DDS, W8CKI, W3ADD, W8BJW, W8PP, W8APC and W8BKM. He worked W109, aircraft. W8DSS likewise had good skeds and handled some emergency traffic. W8EXQ's traffic was all for and from the National Glider meet at Elmira. A portable was used and W8DCX also operated. W8AUI with W8ACQ as opr. was a second portable at the meet. W8BYO kept U.S.N.R. skeds and says the Rochester unit has 15 members. W8CZP handled a bunch. W8BOM gets good DX on 7 mc. W8DHQ has a new MOPA on 3800 kc. W8BIF was heard in Germany. W8BLH worked on 7 and 14 mc. and is strong for the Empire State Net. W8CIL has a new split Colpitts. W8CYG is back on with low power to work the gang. W8AFM has been flying a lot on his vacation. Look for W8GQ on 3650 kc. (xtal) — first report FB. W8AGS has rebuilt and is looking for good skeds. W8AWM is off but operates daily at W8ON, the JARA station. There will be a big traffic station again at Chautauqua County Fair (Dunkirk) Labor Day week again this year. W8COI is a new ham on the air at Cassadaga.

Traffic: W8CKI 968, W8BYD 471, W8DSS 297, W8EXQ 162, W8AUI 138, W8BYO 53, W8CZP 42, W8BOM 36, W8DHQ 19, W8ON 10, W8BLF 8, W8AGS 6, W8GQ 4, W8DCX 3, W8BLH 2.

CENTRAL DIVISION

MICHIGAN — SCM, R. J. Stephenson, W8DMS — W8PP is our star performer this month. The three Wolverines made the BPL two ways. The Detroit Group under the leadership of W8DYH assisted by W8FX, Western Mich. under W8BMG and the Northern Peninsula via W9HK and W9GJX should be able to keep us in front. W8BNS will handle Gd. Rapids messages. W8DED digs up a few in his spare time. Felden of W8MV operated at a boys' recreation camp handling plenty with his home station handled by Beechler. W8BJ is keeping reliable morning skeds. W8DFE is all set for coming season. W8EGN and W8EBV will handle Mich. West coast traffic. W8BJT has 50 watter perking in 7 mc. W8BWJ ran into two Davenport, Iowa, hams while vacationing in the woods, through a whistled CQ. W8JX and W8FX both have new QRAs. W8EGI is rebuilding. W8DYH is still busy watching a four channel speech amplifier. Considering past records, watch out for W8DEH. W8LU visited W1MK recently. W8AGJ has MOPA with 211D wiggling his sky wire. W9EGF complains of poor luck with skeds. W9EQV is back after a six months' silence. W8BCK was a visitor at W8WR. W8AUT is vacationing up around the Soo. W8AM finally finished that a.c. 5G receiver. W8DXY is sticking out in the woods near Pontiac and handles a few. W8GP, W8AW, W9CSI, W9GXE and W9DUE are all on with new transmitters. With the new equipment reported, Michigan should pull itself out of the "Skip District." W9GKR promises to help keep the Mich. nines up in the running. W8AJC is back with us and will be active in Lansing. We hope that W9DRR can keep his drives in bounds on the fairways as he keeps hams in bounds on the air. W9HSQ is newcomer in Marquette and looking for skeds. W8BMG is proving to be a live wire in his district and is on with M.O.P.A. now. The August meeting of the D.A.R.A. was well attended and "Ev" Battey's talk was thoroughly enjoyed by all, as were also the movies of the Cleveland Air Races. Another Michigan Hamfest scheduled for October 11th. Ohio and Indiana hams are cordially invited and if you don't get a notice, QSL W8COW or W8DMS for details. Are your dynatron oscillators all calibrated for the frequency measuring contest? Let's not only beat Ohio and Illinois in traffic, but also in this and other competitions. W8DGS has made application to transmit measured frequencies. W8JZ is all set to go on 7 mc. ktal with a 204-A. W8BTK reported.

Traffic: W8PP 751, W8AIU 298, W8MV 273, W8AM 192, W8BMG 160, W8BJ 111, W8DFE 65, W8DYH 53, W8FX 29, W8DXY 23, W8DMS 28, W8AW 17, W9HK 17, W8GP 16, W8DED 14, W8BWJ 14, W8AUT 11, W8BJT 9, W8BNS 8, W8COW 8, W8EGI 6, W9EGF 6, W8EGN 4, W8WR 3, W9EQV 3, W8DEH 3, W8EBV 2, W8TK 18.

INDIANA — SCM, George H. Graue, W9BKJ — W9AET won the crystal in the traffic contest with a grand total of 359 points. W9DSC resigns as RM for central Indiana. W9AXH's rectifier is going hay wire. W9HSD and W9HTX are new hams in Indianapolis. W9GJS and W9DDB are on cruise with U.S.N.R. W9RS has a keen signal on the air. W9GJG has changed to crystal. W9CVQ expects to try out fone. W9EGE has a 56-mc. station perking. W9ABW is going to try for a commercial ticket. W9ERK is building a MOPA. W9DHJ has changed to TPTG PP. W9FYB is waiting for renewal of license. W9EFV is getting ready for 14 mc. fone. W9CHA is having receiver troubles. W9AIN reports a couple of prospective hams. W9AKJ and W9FQ report change in QRA. W9HOL reports for the first time. W9FSG has applied for ORS. W9HHI has changed QRA. W9A00's 66 is going bad. W9AK is being blessed with rubber stamp messages for QSP. W9HTP is a new ham at Gas City. W9ETH is changing over to fone. W9AAI has QRO. W9ESU newly made transformers are giving trouble. W9HKS is a QRM buster. Everybody is billing W9GYB for burnt out fones. W9HUO is a new ham at Frankfort. W9CZD is another one at Sullivan. W9BHM has a new frequency meter.

Traffic: W9AK 249, W9ESU 118, W9CKG 114, W9GJS 100, W9RS 31, W9GJG 25, W9BKJ 25, W9CVO 10, W9EGE 7, W9ABW 6, W9GYB 3, W9DSC 6, W9AXH 4, W9YV 4.

ILLINOIS — SCM, F. J. Hinds, W9APY — RM, E. A. Hubbell, W9ERU — Report skeds to W9APY immedi-

ately. W9CGC is going to Michigan. W9GDM has done fine traffic work. W9AM has a schedule with SFZA who is the Steamship Margaret Johnson of the Johnson Lines. QRD Sweden by way of South America from San Francisco. QRH is 40 band. W9JO says traffic is hard to get. W9ANQ is building a crystal 852 outfit. W9BBR and W9BJH are again on 3500 kc. W9CNQ uses both 20 and 40. W9CGW blew his power transformer. W9DEU is moving into the cellar per OW's orders. W9DXX works 3500 now. W9ANQ and W9EGY are building a public address system. Between radio service calls W9GIG hits the air hard. W9GTI and W9HPJ are newcomers. W9FYZ has come into Illinois from Missouri. W9GYO is trying out different circuits. W9GAI attends night school at R.C.A. W9FUE is now on 3500 with a fifty. W9DDE is building up a dandy outfit for intense traffic work. W9AD is proud possessor of a new National SW5-AC set. W9BNR is polishing up the set. W9CNY is building a new rack to hold two transmitters. W9DGZ is getting ready to burst forth again. W9ENH and W9FO are merging into a powerful station. W9EIP is back in Minnesota. W9ERU worked EAR96 and received a report of CCDC QSA5. W9BVV worked Oceana. W9CTP is working on an a.c. receiver. W9HNK is using a TPTG. W9HLL is perking out with a dandy TNT. (W9APY can't get his to work so is going back to old faithful Hartley). W9BYL has just returned from Naval cruise where he worked the sets 16 hours a day. W9LL has been appointed Net Control Station in Illinois for the Central Division Network. W9ALA now works three bands. W9DZG, W9DJG and W9DZU all have dandy portable receivers. W9BSR has been in Vermont this past summer using W1AVO but is now home. W9AVB is finishing up the M.O.P.A. Things are going strong at W9CSB using push-pull. W9AFA also uses push-pull with a Hertz doublet antenna. W9AFN is knocking down the foreign stations with his big crystal. W9AMO gets the honors this month for traffic. M.O.P.A. trouble at W9CN. W9FGD is going to try out a M.P.O.A. soon. W9FCW, W9ERU and W9APY are on the traffic route to the East to W1MK now. W9GIV says his sigs don't sock out any more. W9FXE reports a new man in W9HUX. W9DRN uses both fone and CW now. W9BIR spent a month on 14,000 trying to QSO DX. W9PK is going to get a better receiver. W9BRX is using the new R.C.A. 235 detector. No traffic seems to come in at W9BYV. W9DBE keeps fine schedules. W9ACE is going out strong for schedules and traffic. W9IN will soon be on now. Another fine traffic and schedule station is W9ATS. W9CZL worked VK5GR as his best this month. The crystal set at W9FPN is slowly taking shape and will be heard shortly. Who can work W9Q1 at noon on 7000? W9ACU has been in hospital for operation.

Traffic: W9AMO 338, W9ALA 277, W9FCW 104, W9ACE 80, W9EIP 69, W9GDM 60, W9ERU 43, W9GYO 30, W9ATS 25, W9AM 24, W9AFA 20, W9CZL 18, W9Q1 16, W9FI 15, W9CN 15, W9DBE 15, W9GAI 15, W9DZG 14, W9FYZ 14, W9BSR 11, W9CUH 11, W9CSB 10, W9BRX 8, W9DRN 8, W9ACU 7, W9AFN 6, W9ENH 5, W9FGD 5, W9BIR 4, W9FXE 4, W9HNK 4, W9CTP 3, W9ECR 3, W9FPN 3, W9PK 3, W9AVB 2, W9FTX 2, W9JO 2, W9GIV 1.

KENTUCKY — SCM, J. B. Wathen, III, W9BAZ — W9EDQ has been appointed RM of the Northern Kentucky district. Six ORS failed to report at all, while four more handled no traffic. ORS renewals are due early in November. W9BWJ handled all of his in three days. W9OX has resumed building receivers for the local gang. W9BAZ got himself another chariot. We can't figure out why W9CNE doesn't pop the question to his QSA-5 YL. W9CEK made his report over long-distance 'phone. W9HCO has finally got loose in the traffic dept. You may now call W9BAN "Uncle" and get away with it. W9EQO wants an ORS tag. A new 852 graces W9GGB's shack. W9FQJ can't make his PA behave. The MO does. W9AEN is trying to bring two protégés into the fold. W9DQD has been appointed ORS. There is a new transmitter at W9CDA. W9AZY says N.G. Station will be on about September 1st. W9CEE is leaving to enroll at Gulf Radio School. Listen for him from W5GR. W9BEW is at Great Lakes Training School for the present. YL's still bothering W9ABG. Glad to hear from W9GNV down in Harlan. W9ETD, Kentucky's fone OBS,

would like to have reports from Kentuckians on his coverage. Start the winter off right with a box of W9QT's cold pills.

Traffic: W9EDQ 907, W9BWI 281, W9OX 75, W9BAZ 57, W9CNE 45, W9CEK 33, W9HCO 33, W9BTM 31, W9BAN 18, W9EQO 11, W9GGB 11, W9PQQ 7, W9AEN 5, W9DDQ 3.

WISCONSIN — SCM, C. N. Crapo, W9VD — W9ZY is increasing power to 100 watts. W9AZN is new Route Manager for Western Wisconsin. W9HFH rebuilt his transmitter on a panel. W9FAA has new M.O.P.A. W9GVL has been going good. W9DKH says traffic quiet. W9EHD reported via long distance. W9HMS has been experimenting with 28 mc. W9GFL visited the SCM. W9FAW is operating W9HHD at Camp Williams. W9OT has his crystal rig perking OK now. W9GYW will start up in earnest soon. W9BWW has new modulator and mike. W9VD has been working 28 mc. Sunday afternoons.

Traffic: W9ZY 33, W9HFH 23, W9FAA 23, W9GVL 16, W9DKH 41, W9EHD 14, W9HMS 1, W9VD 12.

OHIO — SCM, H. A. Tummonds, W8BAH — Here is your call in the BPL, OM, W8DDS, W8CGS, W8DFR, W8MH, W8AXV, W8APC, W8BNC, W8DU, W8CUL, W8BAH. District No., W8DDS, RM, leads his district with 2046. W8AXV has a new 5-meter job and wants to test. W8BNC makes BPL for first time. W8CIO, a new ORS, makes the BPL. W8DVL, a Morse operator, will be an ORS by next report. W8BAC handled vacation traffic. W8CMB is back. W8CCK never misses a report. W8EGO, Lakewood Radio Club had three men pass for ham tickets. W8TH will have a new a.c. receiver. W8DIH active at Norwalk Radio Club. W8BFA says why doesn't someone work up a little excitement on 80. W8DKG has two skeds. W8EBY is a new reporter from Cleveland Heights. W8DDY should be an ORS. W8EBT and W8RN still operating on the lakes. W8BHJ is a new reporter from Cleveland. Rebuilding and out of town report W8BMX, W8EXA and W8EEW. District No. 2, W8BKM, RM, has been on U.S.N.R. Cruise. W8DMK wants traffic for South America. Rebuilding report W8EF, W8DEP, W8BDU and W8BCI. District No. 3, W8APC makes BPL. W8JR is on from 6 to 9 every morning. District No. 4, W8MH makes BPL. W8DTW is a new reporter from Fostoria. W8ATV is back again. W8HT thinking about school. W8ADS has new call, W8QC. W8UW off air soon and going to U. of Cincinnati. Here is a new reporter from Lima, W8FCB. W8ANZ sends first report from Plymouth. W8EEQ going on vacation. Another new reporter, W8DZH, from Greenwich. W8CUR, W8CK and W8OQ report. District No. 5, RM W8NP working hard. W8DFR back on the air and makes BPL. W8EFN (Phone) Canton, O., has applied for ORS, all phone men please give him a boost on his American Legion Net. W8EGC back on schedule with W8NP and W8BAH. W8LI skeds Cleveland daily. W8BSR reports Buckeye Short Wave Radio Assn. active. W8DVE has been rebuilding for crystal. A new reporter from Akron, W8EXI. W8BZL reports 15 new hams starting in Akron. W8BFL is a new reporter from Ravenna. District No. 6, W8DU makes the BPL again. W8BBH is on regular and schedules W8MH. W8CNM rebuilding for 50 watter. W8BAX reports. W8ARW has 4 or 5 fifty watters. Getting married August 22 reports Windy. W8GZ. District No. 7, only two ORS this district. W8VP skeds W8BAH now. W8CKX, RM, just finished rebuilding. District No. 8, RM, W8CGS is working hard and reports a 1395 FB total. W8CUL makes BPL as Phone RM. W8ENH has nice report from Dayton. W8FA reports a month's schedule with W4TN never failed. W8ESW is new reporter from Bethel, O. W8DBK reports. District No. 9, W8TK has sked with W9EDQ. W8DQJ and W8DUV say better report next time. W8HH reports. W8BAH has nine skeds. Two new traffic radio clubs in Cleveland, names are Cleveland Amateur Traffic Assn., W8DDS, Secy, and Garfield Heights Short Wave Assn., W8DYG, Secy.

Traffic: W8DDS 2046, W8BAH 1807, W8CGS 1395, W8DFR 456, W8MH 348, W8AXV 314, W8APC 226, W8BNC 225, W8DU 209, W8CIO 201, W8CUL 187, W8BKM 120, W8NP 105, W8BBH 96, W8BAC 84, W8ENH 84, W8DTW 81, W8DVL 83, W8ATV 73, W8HT 67, W8VP 64, W8DMK 61, W8EFN 55, W8EGZ 42,

W8LI 40, W8CNM 35, W8FA 31, W8CKX 31, W8CMB 28, W8BAX 23, W8QC 22, W8TK 21, W8CCK 20, W8BSR 20, W8JR 20, W8EGO 18, W8TH 16, W8DDV 15, W8EEQ 14, W8DVE 13, W8DIH 12, W8UW 11, W8DQJ 11, W8DUV 10, W8EXI 9, W8ARW 9, W8BFA 8, W8EBY 8, W8DZH 7, W8DKG 7, W8FBC 3, W8ANZ 4, W8BZL 3, W8EXA 1, W8BHJ 1.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Guy L. Ottinger, W9BVF — W9DGS is trying to get enough stuff scraped together to get his xtal working. W9BVF visited W9DM and W9BQU and WNBC, the airport station at Pembina. W9EGI returned from his Naval cruise and is going to be on the air again. W9DM is going to get another 210 and have a push-pull tgrp. W9CRL is going strong again. W9BVF is making a 210 outfit for A.A.R.S work on 3.5 mc. W9BQU is a new ORS.

Traffic: W9BVF 130, W9DGS 110, W9CRL 25, W9DM 16.

SOUTH DAKOTA — SCM, Howard T. Cashman, W9DNS — W9HLH is a new ham in Lennox. W9GWR is moving to Rush City, Minnesota. W9CPB still says "40" is "THE" band to work in. W9ALO has added a dynatron frequency meter and a harmonic monitor to his station. W9DKL is going back to M.O.P.A. The Sioux Falls gang seems to be too busy with vacations, YLs, etc., to think about radio. W9DNS plans to attend Iowa State College. W9AJP is going to install a crystal in his xmitter now that he has his YL fixed with one. W9DRB wanted another license on his wall so he got married. Their QRA is now Willmar, Minnesota.

Traffic: W9FLI 124, W9DNS 3.

SOUTHERN MINNESOTA — SCM, H. Radloff, W9AIR — W9FFY makes the BPL for the 6th consecutive time! W9BN is trying to make an AC receiver work perfect. W9FJK is a success at coaching new tlc handlers. W9DRG holds the portable call W9HRU. Welcome to W9HFF, W9HXR, W9HRH and W9HOP, all new Mpls brasspounders. W9FNK worked PXR. W9AQH holds call W9HCC at his Lake Minnetonka QRA. W9GUX wants to become ORS. W9CKU visited NAA on his trip east. W9BNN had W9HWO as guest. W9BTW handled tlc with expeditions KGE and WDEE. W9COS says its good to take a vacation. A new dynatron freq. meter at W9EYL. W9DGE and W9DHP report hamfests with the St. Louis and Rockford fellows. W9DBC tells of W9BHB and W9CBE trying 56-mc. fone. W9HMY is reaping a harvest of QSO's with a lone 245. W9EPJ manages the Winona studio of WKBH. W9BKK entuses over the new pentodes. W9FMB is getting cards when he hasn't been on. W9CH vacations out West under his former call W6AWR. W9BQF is entering the radio servicing game. W9EZZ has a cc. xmitter of novel design on 1.8-mc. fone. W9DRK also on 1.8-mc. fone with crystal. W9CIQ and W9DUB are again evincing an interest in the game. W9EPK finds the Jr. op quite a QRM. W9EEB built addition to his shack to accommodate the new xmitter. W9FLE still very QRL. W9BKK means to make the Minnesota A-A organization the best in 7th Corps Area. W9AIR is perfecting plans for the coming traffic contest between No. Minn. and So. Minn. Sections. W9EAT has a new Hull receiver. W9EJR reports visit by W9GBZ.

Traffic: W9FFY 299, W9BN 58, W9FJK 34, W9DRG 22, W9HFF 17, W9FNK 16, W9HCC 11, W9GUX 7, W9CKU 5, W9BNN 2, W9BTW 2, W9COS 1, W9EYL 1, W9DGE 1, W9HXR 2.

NORTHERN MINNESOTA — SCM, Raymond H. Weihe, W9CTW — Remember, gang, that the intersection contest is in full blast, and that you are to get in on it. If you haven't received the dope, write the SCM. Many new stations are being reported. Among them are Mr. E. Kohls, Plato, W9HNS Nopeming. W9HUK Chisholm and W9HIE of St. Paul. W9EDN has a hard time working DX. W9HIE left for St. Louis, W9BRA and W9HED were on the Naval Cruise. W9BVI visited Headquarters on his trip East. W9FQI was off the air for some time, due to his license expiring. W9BVH is still inactive. W9CTW will be on the air when this comes to print. The Arrowhead Radio Amateurs had their annual big picnic, and a wonderful report on

same received from Lindy W9GKO. He reports the club more active than ever. Several ORS have not reported for three months, and if not received by the next time, cancellations will take place.

Traffic: W9HDN 19, W9HIE 8, W9BRA 5, W9BVI 4, W9FQI 2.

DELTA DIVISION

MISSISSIPPI — SCM, William G. Bodker, W5AZV — All prospective traffic handlers are requested to write the SCM if interested in ORS. W5ID of Canton is now OO for Mississippi. W5VJ is now stacking 750 volts on a protesting type '10 tube. W5ANX sends in a nice traffic total most of which was handled on 3.5-mc. fone. W5AZV is installing a 3.5-mc. M.O.P.A. with a 50 watt in the final stage. W5BHL is inoperative due to a rushing BCL repair business. W5BQX reports working several west coast stations on 3.5-mc. fone. The Tri-state Ham convention held its initial meeting Aug. 15, at the home of W5ACS at Indianola, with approximately 25 hams from Arkansas, Louisiana and Mississippi present. It was decided at the meeting to make this get-together a permanent institution, the next meeting to be held four months from date, at which time a large number of amateurs are expected to be present. W5LV of Dermott, Ark., was elected chairman and W5VJ of Jackson, Miss., Secretary. Amateurs expecting to attend the next meeting should write the Secretary.

Traffic: W5AZV 55, W5AWP 34, W5ANX 24, W5VJ 5. **ARKANSAS** — SCM, H. E. Velte, W5ABI — W5BMI wins the title of GOLD MEDAL STATION, for having handled the most traffic during the last twelve months. W5IQ and W5AY have been busy moving their bread winner, KLR.A, to a new location. W5HN was heard in New Zealand on 3.5 mc. during the last A.A. QSO party. W5UI and W5BNX are two new stations in Little Rock. W5UI uses a pair of '45s in push-pull while W5BNX uses a pair of type '10 tubes. W5ABL is building a new monitor and dynatron frequency meter. W5BED is using a type '10 tube in a T.N.T. rig. W5ADT and W5BDW are off account of their rectifiers. W5ABI has been on 7 mc. most of the summer. W5JK is also back on the air on 7-mc. band. W5BRI has been having trouble getting a pair of 50 watters to work in push-pull. W5BDR is a new station in Dewitt and is using a type '10 tube in a TPTG circuit. W5JK reports.

Traffic: W5BMI 376, W5ABI 245, W5JK 7.

TENNESSEE — SCM, James B. Witt, W4SP — W4FA and W4AMH are building xtal xmitters. W4ANC has new xmitter on 40. W4AQV will be on soon. W4AJJ is on with new xtal xmitter and receiver. W4AD, W4PV and W4HL will be going strong on 80 meter fone band. W4ABR visited A.R.R.L. Headquarters. W4OV has new portable station with call letters W4PBI. Any Tenn. fone stations who want skeds get in touch with W4AD.

Traffic: W4OV 6, W4PBI 6, W4RO 2.

LOUISIANA — SCM, Frank M. Watts, Jr., W5WF — W5BPL has a new transmitter which will soon be a xtal control job, for 3500-cc. 'phone work. W5AXD has QRM from YLs plus a new "Lizzie!" W5NS is now off the air. W5BFP has a new M.O.P.A. with two signals at once. W5ANQ has a new job as a service man. W5EY is a portable rig with the Louisiana National Guard. W5AXU is on 'phone on 3.5-mc. band now. W5KC has been suffering with power leak QRM. W5BDJ is on 7- and 14-mc. bands now. W5BSR was heard by OA4Y. W5BPN says he is getting out fine in American Legion Net. W5WF still on with the old trusty '10 and wants more traffic from anywhere to anywhere. W5RR Jr. up and united with a wife. Congrats, Bob, OB. W5BHV, W5ACY and W5BWK report.

Traffic: W5WF 147, W5BPN 32, W5AXU 40, W5ACY 23, W5KC 14, W5ANQ 10, W5BHV 8, W5BSR 3, W5BWK 5.

HUDSON DIVISION

NEW YORK CITY AND LONG ISLAND — Acting SCM, W. J. Warringer, W2BPQ — Those desiring appointments please communicate with me. Manhattan: W2SC no vacations in the Army so they keep up their good work. W2BXW is all set for the winter. W2CBB on vacation

in New Hampshire. W2BBY not having much luck. W2BDJ just back from Camp Smith. W2ADI still using 20 meter fone. Bronx: W2FF working them all on 14 mc. W2BGO standing by for his new license. W2CWP is also W2DFY now. W2APV is on vacation. The SCM just back from Camp Smith with W2BDJ and W2AFT. XW2ANE is waiting for his new license. Brooklyn: W2BO says new National receiver is FB. W2AZV is getting ready for A.R.R.L. Freq. contest. W2FF is getting set for A-A work. W2BJF is leaving for Univ. of Alabama. W2CCD is still operating W2KW at Radio Hill, N. Y. W2BEV has a new Dynatron Freq. meter. W2LB has been traveling for past few months. Long Island: W2BTE is an old timer. W2AVP reports W2AST now on the air with 100 watt. W2AIQ getting ready for the fall. W2BFC kicks in a report. W2CTO is knocking the DX down. W2CTR worked his first station. W2AVJ corrects dates of Mineola Fair. They are Sept. 15th to 19th. W2KG worked PAOASD in Amsterdam, Holland on 7/11/31 at 10:10 p.m. E.D.S.T. on 80 meter band. Staten Island: W2WP reports a new ham on the island W2AHO. W2CKN knocked off due to the heat.

Traffic: Manhattan — W2SC 112, W2BXW 7, W2CBB 4, W2BBY 1. Bronx — W2FF 60, W2BGO 33, W2CWP 7. Staten Island — W2WP 11. Brooklyn — W2BO 30, W2AZV 22, W2PF 15, W2BJF 6. Long Island — W2BTE 20, W2AVP 6, W2AIQ 2, W2BFC 1, W2KG 206.

NORTHERN NEW JERSEY — SCM, A. G. Wester, Jr., W2WR — W2F still turns in high figures. W2AOS has been appointed Communications Officer, 7th Battalion, U.S.N.R. W2AGX is determined to put out only high class sigs. W2CJX has been devoting his time to tennis. W2AMR promises a strong comeback. W2BPY is using his portable call W2COS until his new license arrives at the new QRA. W2MQ has moved to North Bergen, N. J., and has been away on a U.S.N.R. trip. W2CEX reports for the first time in several months and handled over 100 messages. W2CDQ has been fooling with 85-meter fone. W2AIF intends to take in the Roanoke Division Convention. W2AMT complains bitterly against radio conditions. W2AUP has been handling some fine DX traffic. W2ADP just goes after DX. W2BPV has joined the U.S.N.R. W2BAP spent the month at Fire Island, N. Y. W2AOY is trying to spear DX on 20. W2BYX reported after a silence of a few months. W2CHZ is now vacationing.

Traffic: W2F 40, W2AOS 18, W2AGX 2, W2CJX 12, W2BPY 10, W2MQ 4, W2CEX 128, W2CDQ 6, W2AIF 19, W2AMT 13, W2AOY 1, W2BYX 5, W2CHZ 7, W2AUP 29.

MIDWEST DIVISION

NEBRASKA — SCM, S. C. Wallace, W9FAM — W9DI leads the gang this time. W9DMY, a new ORS, is knocking 'em stiff. W9BEX is still going strong. W9EWO is coming to the front. W9DFR is going on U.S.N.R. cruise soon. W9FWW is very active and reports lots of activity in Lincoln. W9GDL is very busy rebuilding and QRL radio shop. W9GQR will have xtal rig going soon. W9EHW says not much doing. W9FUW has new outfit rebuilt. W9BNT made application for ORS. W9GNZ-W9FXQ is a newcomer from Denver. W9FAM is just about rebuilt and will be on the air very soon now.

Traffic: W9DI 357, W9DMY 272, W9BEX 267, W9EWO 96, W9DFR 15, W9FWW 14, W9GDL 4, W9BNT 24, W9GNZ 20.

IOWA — SCM, George D. Hansen, W9FFD — W9AWY is holding four skeds. W9GMX still at bat for W9EOP, xtal control and final stage of 50 watts planned for the latter. W9BCL "lil ole half-pint" comes through again, has some good DX, and also got in on tlc from Washington to several governors which helped to boost the total. W9FFD comes trailing along, still quite QRL at this and that. W9GP says he finally got out with the PP. W9AHX reports good DX. W9IO reports tlc and DX for the 'phone he has been using on 3542 kc. W9AYC reports and has his eye on an ORS. W9ACL reports via air, a total for himself and also for W9BJP. W9BFL gives us news of a 100-watt C.C. job soon to bust up the job. W9FZO turns in a total regardless that he has been head over heels QRL with the coming Convention in S. C. W9EIV also reports via air. W9CWG another

aspirant toward ORS. W9FEB getting all set for a busy season. W9EJQ comes through with a suggestion which we hope will materialize this season. W9DIB sends his report from down in Dixie, where he is enjoying a nice vacation. W9AG requests a leave of absence. W9AHQ sends in application for OBS.

Traffic: W9AWY 79, W9GMX 50, W9BCL 41, W9GP 22, W9FFD 22, W9AHX 17, W9IO 12, W9AYC 11, W9ACL 11, W9BJP 7, W9BFL 7, W9FZO 5, W9EIV 5, W9CWX 5, W9FEB 4, W9EJQ 3.

KANSAS — SCM, J. H. Amis, W9CET — Over the top with 7161 messages and 11 stations in the BPL. This large total is due to the very fine work of amateurs in Kansas cooperating with the Kansas National Guard. The 100 watt T.N.T. xmitter at CX7 maintained communication with the home stations of nearly every unit in the state. Prizes were offered to the stations handling the most traffic with CX7 and will be awarded in the near future. Much credit for this fine bit of work is due Lt. Col. W. F. McFarland, W9EVT, who made all the arrangements for sked and secured the prizes. The following stations make the BPL: CX7, W9BGL, W9BNU, W9APF, W9FLG, W9FRC, W9DVQ, W9GXV, W9DQF, W9FVQ and W9GXD. W9CXW operated at CX7 last month. W9FLG is building a fone and grinding Xtals. W9GXV has a new a.c. receiver under way. W9BNX wants traffic skeds with fone stations. W9HL has been on his vacation. W9CET, W9FRC, W9EVT, W9BGL and W9ESW have returned from Fort Riley. W9BLK called on the SCM. A number of stations report traffic for the first time.

Traffic: CX7 3764, W9BGL 616, W9BNU 477, W9APF 377, W9FLG 337, W9FRC 256, W9DVQ 249, W9GXV 183, W9DQF 141, W9FVQ 119, W9BBM 77, W9GXD 56, W9SS 39, W9FXY 24, W9BYM 11, W9AEL 16, W9CXW 5, W9EFE 97, W9CYV 96, W9AEK 82, W9CGM 71, W9DZI 59, W9CPY 6, W9CSD 3.

MISSOURI — SCM, L. B. Laizure, W9RR — W9ECI sends in the following from St. Louis: W9ECI rebuilt transmitter for fall work. W9GUC and W9HJL are two new stations, each using a 210. W9DYJ reports ND on account of the heat. W9FTA reports a number of St. Louis hams won prizes at the hamfest July 26 at Centralia, Illinois. Present from St. Louis were W9ECI-EVV-HVI-ENO-FTA. W9AMR is still up on WYDJ; ham call now is W9HUZ. W9FHT says ND account Colorado vacation. W9BGN is now op in AM's at KFEQ and busy with U.S.N.R. W9DHN at N.G. camp, Nevada with Co. M, 138th Inf. W9BJA very QRL with A-A net work. W9GAR promises some traffic for Sept. W9EYG swears to make the BPL next month, but didn't see the new requirements first. W9BGW is in CMTX at Leavenworth. W9CDU asks for his ORS to be filed away temporarily. W9AJJ reports a QSO party held on Aug. 2nd. W9FPJ is handling traffic in Kansas City. W9AOG managed to hook an oil exp. party "FX." W9FHV turned in a welcome report of traffic for July. W9CFL and others took in U.S.N.R. cruises during July-August. W9RR was absent from Kansas City most of August for same reason. W9DOE reports he is experimenting with a new type tube 242-A.

Traffic: W9DHN 3, W9BJA 124, W9EYG 9, W9BGW 249, W9AOG 4, W9FHV 30, W9DOE 71.

NEW ENGLAND DIVISION

EASTERN MASSACHUSETTS — SCM, M. W. Weeks, W1WV — W1ASI and W1WU are candidates for SCM. W1ABG is rebuilding his portable xmtr to push-pull. W1CCP is building a Pentode receiver. W1KY is on vacation. W1WU has been autoing through Maine and N. Y. State. W1ADK did a little tfe on 3.5 mc. W1CAW visited W1CEL. W1ACE is a new ham in Norwood. W1KH is trying a new National a.c. receiver. W1WV worked a little 14 mc. DX and was QSO 111M. W1AFP visited W1XP. W1CHR spends most of his time yachting at Nonquitt. W1ATX is on vacation at Wickford, R. I. W1CQN is building a M.O.P.A. W1ASF leads in the E. Mass./Conn. Message Delivery Contest with a total of 448 deliveries. W1ACD is using Xtal on 3595 kc. W1ME also has xtal on 3525, 7050 and 14,100 kc. W1BGW is high traffic station and makes BPL on deliveries. W1AKY expects soon to resume code lessons on 1750 kc. and would like to hear from all those

interested. W1BFR's antenna blew down. W1BJM is looking for an ORS appointment. W1RNJ has been touring New England. W1AGA reports from New Bedford. ORS are reminded to send in their certificates for renewal signatures before they expire. W1BZQ reports. W1AAL reports transmitter nearly complete.

Traffic: W1BGW 121, W1ASI 52, W1ME 39, W1KH 34, W1BFR 24, W1BJM 23, W1AAL 17, W1AFP 11, W1ADK 9, W1CAW 8, W1ACD 8, W1ANK 7, W1CQN 5, W1AGA 5, W1BNJ 4, W1WV 2, W1CHR 2, W1AKY 2, W1ABG 1, W1BZQ 35.

WESTERN MASSACHUSETTS — SCM, Leo R. Pelquin, W1JV — Our Route Manager, W1ASY, is ready to arrange schedules for you if you will write him stating your operating hours. W1ASY leads the section again this month. W1APL is rebuilding. W1BVR has gone from Zepp to single feeder. W1AJD worked overtime so no traffic. W1BSJ has been playing with 5-meter outfits. W1BWW Springfield Radio Assn. reports signing up four new members. W1BVP keeps a sked with New York's YL station W2WP. W1BKS is our champion DX traffic handler this month. T. F. Cushing went on his vacation with his portable station W1AWW. W1AZW returned from his vacation in time to turn in his traffic report.

Traffic: W1ASY 71, W1BVP 36, W1BVR 25, W1BWW 21, W1AZW 15, W1AWW 10, W1JV 10, W1BKS 8, W1APL 2.

MAINE — SCM, John W. Singleton, W1CDX — W1BEZ leads the list again. W1BLI reports two newcomers, W1ASQ and W1BKY. W1ATO is a new OO. W1CEQ has a nice bunch of schedules. W1BOF did some nice rush relay work. W1IR has a pair of 866's. W1APX reports lots of activity in Rangeley. W1BEU is busy rebuilding his transmitter. W1BWO is a new ORS. W1BWB is the Maine Section cartoonist. W1APU reports traffic. W1ANU reports an old timer, W1AGL, is back on the air. W1BWI is going in for 'phone. W1QH reports a very fine ham fest at the opening of the new Queen City Radio Club headquarters. W1AQL, W1BEZ, W1FQ and W1AIK are at camp with the National Guard. W1AQW is camping with the Boy Scouts and has taken a portable along. The Maine men are enjoying an "All Maine QSO party" on the 16th of each month. W1MN is a new ham in Kennebunk. W1AJC reports.

Traffic: W1BEZ 124, W1BLI 76, W1ATO 76, W1CDX 58, W1CEQ 35, W1BOF 28, W1IR 25, W1APX 16, W1BEU 13, W1BWO 8, W1BWB 8, W1APU 6, W1ANU 5, W1BWI 2, W1AJC 28.

CONNECTICUT — SCM, Frederick Ellis, Jr., W1CTI — W1MK leads with the highest total. R.P. says he will be a long time recovering from his trip to N. H. and Maine. W1BDI's total was practically all WCEN traffic. W1AZG made some improvements in his transmitter. W1AOK reports that W1CFY's 5th QSO was with ZP4AB, using W1AFB's 201A's. W1BEO has a new 50-foot stick. W1CJD is going strong. W1AFB says QRL! W1ASP is using a M.O.P.A. and wants to be a RM. W1ES skeds VE2BB and W8CIK. W1ABV reports that W1BUN is a cop. W1BNB skeds W2AUB and W2BEN. W1BBJ is getting out FB on 3.5 mc. W1HQ and W1BVV are rebuilding. W1AXB took a trip through New England with W1AUB and W2BSD and visited W1BIC, W1BNR, W1AVK, W1CWH, W1BZB and W1CBX. W1UE was busy at W1MK while Bob was on his vacation. W1HD is on 58 mc. but will be back on 3.5 mc. soon. W1AMG is rebuilding to M.O.P.A. W1BUB keeps a 58 mc. sked with W1HD. W1TD has been on vacation. W1CNU sends in his first report and says he has been rebuilding and helping W1APZ rebuild. W1APZ is on 7 mc. with T.G.T.P. and a new a.c. receiver. From Bristol comes news of a new radio club with the following members: W1CDN Pres., W1VK Treas., W1COJ Secy., W1ANC, W1AYF, W1AYR, W1BIQ, and W1CWD. The following are active operators and their personal signs at W1CBA the station of the Conn. Brass Pioneers Assn: W1FL-DM, W1CTI-FE, W1ADJ-IB, W1AMS-HG, W1CNU-RN, W1AUB-MH, W1AMO-FA, W1CJS-PG, W1AXB-WW, W1APZ-HH, W1UT-PS, W1ABK-RF. By the time you read this W1CTI will be at his new QRA — 19 Merrill Road, Norwalk with a completely rebuilt station. W1FL

spent a couple of weeks at Fort Ethan Allen, Vt., and is moving to a new location. WIBHM is spending his vacation in New York State.

Traffic: W1MK 373, W1BDI 69, W1AZG 61, W1AOK 51, W1BEO 45, W1CJD 38, W1AFB 18, W1ASP 16, W1ES 15, W1AVB 9, W1BNB 7, W1BBJ 7, W1HQ 4, W1BVV 3, W1AXB 2, W1UUE 2, W1CTI 2, W1ANC 5, W1BIQ 3, W1AYR 2.

RHODE ISLAND — SCM, Norman H. Miller, W1AWE — W1MO reports DX very poor. W1ATM pushes the key on 3.5 mc. band. W1CAB is all set for the U.S.N.R. drills. W1AWE is on 7 mc. in the early morning and uses 14 mc. at night. W1BUX still works on 14 mc. W1BES has his fone set completed. W1DAH and W1BGM are new hams in Providence. W1ID has a FB fone. W1BDQ is bothered with the heat. W1EX is doing 15 days' duty with the Naval Reserve at the Squantum Airport. W1ARK is going strong with service work. W1BOP is now chief operator at WJAR and has 1AUV, 1BML, W1CNZ for his staff of operators. W1GR and W1GV manage to operate. W1CPV is on 7-mc. band daily. W1AMU is busy with the new broadcast set for Providence. W1AMD is chief operator at WPWA. W1CJH, W1AAD, and W1BGA have their troubles with wine, women, and song. W1ASZ was heard in Italy with his flea-popper transmitter. W1CGO, the new ham in Pawtucket gets out quite well. W1DW manages to get in on all the contests. No reports came from Newport, Westerly, or Woonsocket this month.

Traffic: W1MO 12, W1ATM 7, W1AWE 5, W1ASZ 4.
NEW HAMPSHIRE — SCM, V. W. Hodge, W1ATJ — W1CGM is planning on getting on the air soon. W1IP is trying DX. W1BFT is at Center Harbor with a 210 on all bands. W1BAB in Woodsville is using a 245 with good results. W1AYA handled some traffic for W.D.D.E. W1HG, who is applying for ORS, is using a M.O.P.A. on 3.5 and T.N.T. on other bands. W1BAC is now slinging hash in a lunch room. W1AEF is too busy to do much work at the key. W1BFY says the new 230 series tubes are FB for his SW receiver. W1LY is building an AC receiver.

Traffic: W1BAC 20, W1BFT 10, W1AYA 8, W1IP 4.
VERMONT — SCM, C. A. Paulette, W1IT — W1CGX turned in the highest message total this month, using crystal on 3810 kc. W1ATF was visited by W1BD (Mr. and Mrs.), W1BII, W1BJF, W1AWH, and W1BAS. W1AXN has been honeymooning in Maine. W1AOA, W1BD and W1ATF paid him a visit. W1BD has been adding a stage to his transmitter and experimenting with tuned r.f. in the receiver.

Traffic: W1CGX 15, W1ATF 5, W1AXN 2, W1BD 1.

NORTHWESTERN DIVISION

ALASKA — SCM, W. B. Wilson, WVDN — K7ANQ, the YL op at Unga (Wosnessenski Island), now uses two 50s and works only in the 40-meter band. K7ANQ keeps daily skeds with K7AUM on Kanaga Island and K7QS on Unga Island (There is a second YL op at K7ANQ now — via W7TX.) K7AUM is using a 75 watter with 1500 volt supply from a m.g. K7AIF-W7AF at Nelson Lagoon is using a 210 in T.P.T.G. with a dynamotor. K7SO at Dundas Bay is using a 201-A with "B" battery supply and working the states nightly in the 80 meter band. K7AQC left Cape Decision the latter part of July enroute Camden, N. J. K7PQ built a small T.P.T.G. using 201A's for one of the assistant light keepers at Tree Point who expects to get on the air as soon as he hears from the Supervisor. K7PQ has a new 50 watter xtal control job on the air.

Traffic: K7ANQ 68, K7AQC 30.

OREGON — SCM, Wilbur S. Claypool, W7UN — (Report sent in by F. L. Bernhardt). W7ALM, the reliable Philippine traffic handler has traded his 204-A for a pair of 852s. Southern Oregon is showing renewed activity with W7AME reporting several stations being heard. W7PL is busy with his wheat harvest. W7PE is busy with farm work. The Rose City Radio Club of Portland has a slogan "Every member crystal control by 1932." Coos Bay continues active with five stations reporting. Many of the bunch express their intention of attending the Tacoma Convention. W7IF is gradually getting back on the air. W7BGX, portable station installed in the Marshfield hobby show by the

Coos Bay Amateur Radio Club handled a nice bunch of traffic. Next month will see a new SCM subject to the August elections so let's give him our hearty cooperation. BPL in the first two days of the message month on deliveries alone is the enviable record of W7ALM. W7ED holds a kA1 sked and is rebuilding to 500 watts CC. W7QY is putting in two weeks' active service at NDQ, Seattle, during fleet maneuvers. W7ZD reports a visit from W6EMZ, Santa Cruz, Calif. W7SY reports.

Traffic: W7AMF 167, W7ALM 151, W7BGX 254, W7ED 103, W7QY 47, W7WL 42, W7HD 30, W7ATC 16, W7AME 15, W7AJX 10, W7ZD 6, W7AHJ 4, W7SY 45.

MONTANA — SCM, O. W. Viers, W7AAT — W7HP has gone east to visit HQ, W1MK, C.E., and Westinghouse. W7AHF has been on the sick list. W7CU reports several new stations in Missoula. W7AOD is a new station at Missoula. W7BFA is a new Helena station. W7AFS is putting in a pair of '10s soon.

Traffic: W7CU 8, W7AOD 5, W7BFA 5, W7AFS 2.

IDAHO — SCM, Oscar E. Johnson, W7AKZ — W7ACD reports that he has joined the A.A.R.S. W7AFT spends most of his spare time copying the commercials. W7KG lost a fifty and his whole power supply so is now on with a pair of 510's. W7AJQ has been QRW moving. W7ANA, a non-ORS, reports again. W7AT says he won't promise much traffic this fall because of YL-itis. W7QD is building a new Xtal outfit. W7AUR and W7BEO are moving to 160 meter fone. W7ACP has started to line up his winter skeds. W7AKZ is having trouble with receivers. W7ACO punctured his Xtal. W7ALW is building a new 3.5 kc. fone rig.

Traffic: W7KG 16, W7ACD 6, W7ACP 22, W7AUR 5, W7BAA 6, W7ANA 16, W7AFT 7, W7AKZ 22.

PACIFIC DIVISION

SACRAMENTO VALEY — SCM, Paul S. Farrelle, W6AXM — W6BYB is building a 1-kw. 14-mc. phone xmitter. W6ADS is building a 50-watt set. W6DON is coming back with a 250-watt M.O.P.A. rig and asks for traffic. W6AUO took a Naval Reserve cruise. W6QT is quitting the game for a while. W6CMA is coming right along with his traffic work. W6TM is getting the dust off his rig. W6ELC aspires to the SCM's job. W6EOU spends most of his time hammering at other stations. W6EOC says YLs and radio don't mix. W6BBW is a brand new ensign in the U.S.N.R. W6AIM will be RM for the northern part of this section. W6EJC is spending his time on 7 mc. W6BLX is heard with a high speed bug and a nice note, W6EMX is back from Alaska. W6ESZ is back after a long absence. W6AID has a nice little rig going on 7 mc. W6DPR is getting back on the air again. W6AXM has been very busy during the past month explaining his large traffic totals. W6AIM says Col. Lindbergh needs higher power, so that the hams will be able to hear him.

Traffic: W6AIM 15, W6ADS 11, W6CMA 6.

LOS ANGELES — SCM, H. E. Nahmens, W6HT — Midsummer with a total of 5972. Eleven men make the RPL: W6EGH, W6BCK, W6SN, W6ADX, W6CFN, W6YAU, W6ETJ, W6HT, W6TE, W6DER, and W6VH. W6EGH runs a total of 1292, with 371 deliveries! W6BCK pounds his way to second place with 1002. W6SN still sees La Fiesta traffic in his sleep. All P.I. traffic received at W6ADX is delivered promptly by mail. W6CFN-W6NF is supervising instruction of Boy Scouts in communication work in his territory. Consistent skeds at W6YAU hold his totals high. A new job keeps W6ETJ hopping. Your SCM proves to be a BP. If you see a cloud of dust go by it's probably W6TE in his "dinged up" Ford. Moving his QRA kept W6VH off for a few weeks. W6ERL finally breaks 100. W6BVD, an old timer, is active in U.S.N.R. W6DLV, W6BVZ and W6UTN are brand new ORS. W9FIF now signs W6BKU in Los Angeles. W6AKW spent most of his time experimenting. W6AIX is a darn good op but has to be reminded to report. W6CUB rebuilt entire station. W6CVZ claims he will make the BPL next month. W6BVZ attended convention. W6CXW had FB time in Japan visiting hams. W6ADH, W6CUJ, W6DZR and W6FBK report for first time. W6ETM was QSO ZL on 3.5 mc. W6EQW continues to bat 'em out in Naval Reserve. All W6AWY's relations seem to be joining ham ranks. W6DEP back on crystal with

852 in final stage. Station W6AM will probably be used in Standard Frequency Contest. W6DWW handled National Guard encampment messages. W6CAE graduated from Stanford. W6DZI reports QRM from unlicensed stations. W6AVJ uses 500 watts to modulate the socks off a couple '03A tubes. W6WO asks for leave due to school. W6AOR blew his '04A tubes but plans on 1 kw. In ten days portable W6ZZA was QSO five times with W6MA from five hotels in four cities in seventh district. W6DNA says W6ESB, not W6ESO as reported, is new ham in Lancaster. W6ESA has returned from vacation. W6FAU is moving to Huntington Park. W6DJZ is attending University of Santa Clara. YL in hospital kept W6DMY QRL. W6AEO has new crystal rig perking FB. W6VO is "regusted" trying to get his heap going on high power. W6EZK sends postal from Virginia Lakes. W6EQD enjoying himself at Catalina. W6BGF off air due to moving. Wallie Nelson of W6CGW fame, will soon be heard on the air again. W6UP is now operating at W6ABR. The Glendale Amateur Radio Club meets at the Chamber of Commerce, 116 East Wilson, on each first and third Thursday at 8:00 p.m. The Santa Barbara Radio Club shows promise of becoming a really worth-while organization from report received from W6DJS, Secretary. The A.R.R.C. has been active with various amateur communication projects. The Associated Radio Amateurs of Long Beach are working hard on what promises to be the biggest hamfest ever held in the Section to be given at the New Masonic Temple on September 26th. The Pasadena Short Wave Club acquired four new members at their meeting August 14th. W6CVZ is trying for ORS appointment. Glendale Junior College has an M.O.P.A. with two 510's in final amplifier. Pasadena Junior College W6YBB xmitter will be xtal control CW and 'phone. W6BEB xtal control 500 watts wishes traffic and good sked East between 2 p.m. and 6 p.m. P.S.T. expect to go on 20 meters soon. W6KA shooting 250 watts from six phase rectifier FB. W6FAV and W6BXV experimenting on 56 meg. tone and CW. W6EFA handled 22 messages over his 2-210 M.O.P.A. W6BSW is rebuilding an M.O.P.A. for all bands. W6BWG on 80-meter 'phone. W6ON is building a PP 50-watt amplifier for his PP 410's handled 4 messages.

Traffic: W6EGH 1292, W6BCK 1002, W6SN 462, W6ADX 310, W6CFN 291, W6YAU 276, W6ETJ 258, W6HT 255, W6TE 249, W6VH 202, W6ERL 105, W6BVD 100, W6DLV 91, W6BKU 75, W6AKW 68, W6ALX 64, W6CUI 55, W6GVZ 54, W6BVZ 51, W6CXW 44, W6ADH 43, W6ETM 41, W6EQW 40, W6AWY 38, W6DEP 36, W6BYF 31, W6AM 29, W6DWW 27, W6EZN 25, W6DZR 19, W6CAE 19, W6FBK 16, W6CUJ 16, W6LN 16, W6DZI 15, W6AVJ 15, W6WO 13, W6AOR 10, W6TN 9, W6ZZA 8, W6DNA 6, W6DLI 6, W6CZZ 6, W6MA 6, W6ESA 4, W6FAU 3, W6DMY 3, W6AKD 2, W6AEO 2, W6VO 1, W6FDQ 19, W6DER 131, W6FDE 13.

SAN FRANCISCO — SCM, C. F. Bane, W6WB — Our SCM is very QRL with convention plans so this report is written by the RM, W6DZZ. W6EKC again leads the section in traffic totals. W6ERK is second. Army-Amateur Net skeds again put W6DFR in the BPL. W6ZS has a new xtal transmitter using a pair of 211's in the final stage. He has been keeping a fine sked with K7AKV. W6CAL keeps one sked three times a week. W6ADK hands in a fine total. W6BVL reports consistently. W6BIP has been in southern California rounding the gang for the convention. W6ABB is still looking for a job to pound brass. W6AVO has a nice low power set on 3.5 mc. and wants west coast skeds. W6DK is doing extensive work on 56 mc. W6DHE has an 852 on 20, 40 and 80. W6BFO lost his old call, W6DYW, and attends college along with W6AUM and W6DZZ. W6CZK is a new ham in the section. W6CIS reports.

Traffic: W6EKC 184, W6ERK 131, W6DFR 130, W6ZS 60, W6CAL 54, W6ADK 41, W6BVL 17, W6CIS 35, W6BIP 7, W6DZZ 7, W6ABB 6, W6AVO 4, W6DHE 16.

SANTA CLARA VALLEY — SCM, F. J. Quement W6NX — This section handled approximately 1312 messages Trans-Pacific. 878 messages delivered — what a record — most of these being sent air-mail! W6DMJ handled 819 messages transpacific. W6AMM and W6BET, who maintain daily skeds with P.I. and other points, handled close to 500 messages. W6FBW, W6DCP, W6BMW, W6ALW, W6CEO

W6CLV turned in nice reports. W6BHY was laid up during the month. The SCM visited the Santa Cruz and Watsonville radio clubs and found active groups at both places. W6YG is back on the air and out to make the top of the BPL, as is W6YU. W6BET now has 500 watts xtal control with oven, and new shack. W6AMM is beset with difficulties due to QRM.

Traffic: W6DMJ 819, W6AMM 293, W6BET 200, W6FBW 51, W6DCP 36, W6BMW 26, W6ALW 24, W6CEO 3, W6CLV 4.

NEVADA — SCM, Keston L. Ramsey, W6EAD — W6UO held skeds with W6AJP and W6DFR. W6AJP has a new receiver using a 24 detector and pentode audio. W6BYR has a new speech amplifier and modulator unit and worked his first fifth district on 'phone. W6CRF received a verified report of being heard in London, England, on 3500-kc. 'phone. He is holding code classes twice each week and has built a new portable 'phone transmitter using crystal control.

Traffic: W6UO 30, W6AJP 26, W6BYR 5, W6CRF 1.

EAST BAY — SCM, J. Walter Frates, W6CZR — W6ASH is now at sea on the steamer *President Pierce*. W6ATJ turned in a very excellent bunch of traffic, all done on 7050 kc. He reports that Mr. Manglesdorf, instructor of the operating classes at the Central Trade School of Oakland, has issued instructions to all operators of the school station, W6YM, to go after traffic. W6ZM has been working up some preliminary stunts with the officials of the California Flower Festival prior to the show and the installation of a ham booth. W6RL lands right up among the leaders this month with a couple of hundred messages. Mac certainly provided some fine entertainment for the gang at the last tri-section hamfest. He says that he got an R5 report from Kuala Lumpur, Malaya. W6NM, the net control station of the Naval Reserve, sent in a nice total through W6DTM and W6DKO. W6CTX is still the old DX boy. W6PB, an old timer from the old spark days, has sent in his first CW traffic report. W6BPC of Vallejo is doing a lot of work with the Army Net, and says that W6CQZ is now K6CQZ. W6BKM relayed a whole handful of messages this month. W6BTZ had a new junior op arrive at his house. W6CIQ reports that he is trying an M.O.P.A. and doesn't find it so hot. His best DX was OM1FO. W6CDP is getting good results with an M.O.P.A. with a 201-A oscillator and a type 10 amplifier. W6CFN sent in a belated report. W6FAJ is attending the University of California. W6BQB says he will be off the air for a time while he rebuilds the outfit. W6AUN eloked off a number of relayed messages. W6BMS reports that his temperature control unit now has a thermostat and a thermometer. W6CGM, now W6AF, has been up in the mountains near Portola with a receiver listening to the DX roll in. W6AN is still busy counting up the proceeds of the last tri-section hamfest. Quite a gang turned out for the affair from the San Francisco and Santa Clara Sections. W6ZA presented some motion pictures of the Renogambling at joints. Mr. Cox, who is installing the new Berkeley police radio system, described the new police broadcasting outfit, and considerable entertainment and eats were offered.

Traffic: W6ATJ 304, W6ZM 256, W6RJ 224, W6NM 211, W6CTX 141, W6PB 85, W6BPC 74, W6BKM 50, W6BTZ 49, W6CIQ 47, W6CDF 29, W6FCN 28, W6FAJ 15, W6BQB 14, W6AUN 4.

ARIZONA — SCM, Ernest Mendoza, W6BJF — W6HS has been appointed Route Manager. The following are now Official Relay Stations: W6BJE, W6COL, W6EUT, W6CPF, W6HS, W6CEC, W6EFN, W6CDU, W6BJF, W6CEC and W6CPF are the new Official Broadcast Stations. Four stations make the BPL this month, one on deliveries: W6BJF with 63 deliveries. W6EFC heads the list this month with a total of 635 messages handled with W6COL running second totaling 372. The Arizona Shortwave Radio Club has met now for the 3rd time, with a membership of 19 members. W6HS, Frank Fassett, is our President, Bill McCabe, an old Navy Radio Operator is Vice-President, and W6DWP, Bill Martz, Secy. and Treas. Mrs. W6CEC on her own initiative voluntarily published and distributed the first issue of "Ham and Radio" renamed by the Club "Arizona Shortwave Radio News." W6AND is making a lot of QRM now with a 503A with 900

volts. W6COI had his 210's, 281's and most of his filter pass out on him. W6BJF is taking his xmitter to Nat'l Guard camp for two weeks' schedules with home Army station W6CDU. W6CDU has been confined to bed. W6HS-W6DKX visited W6UG, W6ANO, W5DE, W5BRG, W5AOE, W5AJR, W5AOT and W5AHL. Reports seeing W5QE at work erecting new range station at Winslow. W6CPF is at Clark's Rest Home, Tucson, Ill. W6BYD called on F.A.I. at Fort Huachuca, and reports the most wonderful 'phone station he has ever seen. W6EFC is back on the air with a 3503-ke. crystal outfit. W6CVW is constructing a crystal rig with push-pull 250's for 7000 ke. W6UP will be off the air for some time by doctor's orders. W6CKW is spending summer in Los Angeles. W6CBA is back on the air. W6EFN finally has M.O.P.A. working. W6FAI is back on the air after several months of building.

Traffic: W6EFC 635, W6COI 372, W6BJF 273, W6EUT 220, W6CPF 119, W6AND 101, W6CDU 97, W6AWD 88, W6CEC 29, W6EFN 16, W6BYD 4.

SAN JOAQUIN VALLEY — SCM, E. J. Beall, W6BVY — The SCM is now located in his new QRA. W6SF reports that W6FAN is leaving this division. W6BIP, late of the Bay district, turned in a nice report on the Fresno gang. W6AHO has returned from the mountains. W6BRU is busy hamming since his YL left. W6BVM is on with an 852. W6CLU succeeded in hooking a few Japs. W6CVT is on 80 with his 245 T.N.T. W6DQR uses pair 245's T.N.T. push-pull on 20 and 40. W6ANA is vacationing. W6NE uses pair 245's push-pull T.N.T. W6KB is on 20. W6FFP has a new N45 National Rec. W6AAY is new man. W6BBC and W6DZN alternates with W7ABZ. W6AEQ is busy rigging up a transmitter for the County Fair Sept. 22nd to 26th. W6FFU reports 56 meg fone is FB. W6AV is back from his vacation. W6CUL is leaving for 'round the world cruise. The SCM paid a visit to the Bakersfield gang Aug. 16th and everything seems to be in shape for a record year. W6BQC is joining the A.A.R.S. for traffic. W6QA is now located in Fresno. W6AOA will take over the RM's job for the section as soon as his appointment is completed.

Traffic: W6DQV 45, W6BQC 7, W6FFU 16, W6BUZ 11, W6FFP 55, W6AV 44, W6CLP 5, W6FAN 62, W6CXT 62, W6BIP 9, W6AAY 12, W6BBC 50, W6DZN 54, W6SF 39, W6BVY 41, W6AOA 226.

SAN DIEGO — SCM, H. A. Ambler, W6EOP — W6BGL leads the section this month in traffic. W6BKX says DX good and traffic picking up. W6CTP found time to handle a few and says rag chewing FB if it is a YL. W6BAM says he lost his schedule with W9DES. W6BFE and W6AYK say traffic nil. W6BAS still QRL work. W6CTR is building two new sets. W6ACJ is overhauling his station and will be ready for schedules soon. W6EOS has a new Pentode receiver. W6CNK reports but no traffic handled. W6ADC Thos. Jeffries is leaving for Michigan to attend school and expects to be an 8 soon. Good luck, OM, sorry to lose you.

Traffic: W6BGL 23, W6BKX 13, W6CTP 11, W6BAM 4, W6BFE 2, W6ADC 8.

PHILIPPINES — Acting SCM, John R. Schultz, KA1JR — KA1HR nothing new but leads among P.I. BPL. KA1CE sked with W6BET brought him next. KA1SL was awarded certificate for highest number of messages handled for P.I. in International message relay. Congrats, OM. KA1SP leads QSO with a W5 with a 210. KA1JR contemplates CC later.

Traffic: KA1HR 1046, KA1CE 418, KA1SL 303, KA1JR 77, KA1SP 50.

GUAM: (By radio via W6DMJ-W1MK, fill by W4ABT.) Five stations reported this month. OM2CS is going strong on 7 mc. having schedules with Trans-Pacific stations. OM1TB has daily schedules with KA1CE, KA1HR, KA1SL and also handles all traffic for Philippine Islands and China. OM1FO reports 41 messages this month. OM2CS makes the BPL again this month. OM1TB is still on the air. We have a new station with us this month. OM2CJ. OM2RC was heard once in Africa. OM2CX is off the air again.

Traffic: OM1TB 1530, OM2CS 510, OM1FO 41, OM2RC 5.

HAWAII — SCM, L. A. Walworth, K6CIB — Mr. Linden, Radio Supervisor of Sixth District, is in Hawaii at this time making the first inspection tour of the past six

years. Hawaii is changing back to the first of the month for traffic reports and no reports given this time. K6YAL has received the new instruto-graph for automatic code work and expects to have it on the air next month for beginning hams. K6BAZ leaves for a week's visit in Hilo before beginning a busy school year as President of K6YAL club. Herbert Hong of Kahului is making call plates for K6 stations trying to get money for his station thus. K6CIB has finished his summer's work for the R.C.A. and returns to teaching radio at K6YAL. K6AJA reports three YLs taking ham exam soon.

ROANOKE DIVISION

WEST VIRGINIA — SCM, C. S. Hoffmann, Jr., W8HD-W8NS — W8DPO and W8CDV lead in DX contacts, W8DPO working three ZLs and two VKs on 7 mc., W8CDV working PY, EAR, G and VE4 on 14 mc. W8CA and W8ADI are continuing their Navy skeds and W8ADI has been recommended for promotion. W8BTU and W8BOW were elated over the hospitality shown them on their visit to A.R.R.L. and to W1MK. W8HD is installing xtal. W8BWK and W8ETX have YLitis! W8DNN is operator at NAM, Naval Operating Base, Hampton Roads, Norfolk, preparing for a Commercial license. W8TI works skeds with W8CIY. W8AYI had some bad luck with his set. W8ATE is going to school in Baltimore. The Ohio Valley Radio Amateurs Assn. of Wheeling is contemplating erecting a club house and constructing a transmitter for members. W8OK is rebuilding.

Traffic: W8ATE 28, W8DPO 26, W8ADI 26, W8HD 12, W8BTU 10, W8CA 6, W8BWK 3, W8BOW 3, W8CDV 2.

VIRGINIA — SCM, J. F. Wohlford, W3CA — W3CXM is being operated by Mr. Kimmel of WLM in absence of "BN." W3BLU is keeping some good schedules. W3BRA sends a report for the whole Norfolk gang. W3BRA has just completed their duty at Naval Base Hampton Roads for work in U.S.N.R. Ex-W3BCI let his license expire to get another call as he didn't like the one he had. W3NT is rebuilding his power supply. W3NB will be call assigned the new 250 watter for the U.S.N.R. All wanting skeds write Ensign Melton. W3ARD is rebuilding. W3BRG has purchased a pair of fifties. W3BWA is a new ham with a pentode tube. W3AQK went into Canada for a vacation. W3AJT operates when he has the time. W3BRK says work QRM's his ham operation. W3BEK will be on with a pair of fifties. W3BFT is working a lot of DX and has QSO'd Russia. W3APT wants skeds with the Virginia gang worked all districts but 7th also Canada and Cuba. W3ZU calibrating monitors for the local hams with his dynatron. W3AAJ reports hearing DFA on 3.5 mc. W3AMB has returned from camp. W3FJ, with the National Guard encampment, handled radio traffic along with W3ASA and W3AAL. W3AGH handled the bulk of the traffic from the National Guard encampment. Ashland Radio Club operating under call W3AOW with pair '45's on 3.5 mc. W3BRY will handle the skeds in and out of Lynchburg. W3BUY is applying for ORS. He has worked ZL-2CU and several South American stations and EAR-36. W3BGS is applying for ORS. W3BSB and W3BGS attended the Washington Club meeting. W3BSB is using a 201-A with 180 volts. W3BTR blew up his filter condensers. W3FE working 14 mc. mostly now to get away from QRM on 7 mc. W3AAR sold out to a new ham. W3WO went fishing again. QRN breaking up skeds. W3ZA is still getting the OB out every Sunday morning 10:30 a.m. on 'phone. W3BZ spent week or so in Philadelphia. W3BSE will be back with M.O.P.A. outfit. W3BAZ also says the heat drove him out of the shack. W3AGY has applied for renewal of license. W3BDZ expects to get going with cooler weather. W3BUR is moving into new location. W3BRZ has trouble getting the junk to perk. No report from the western part of the state this month.

Traffic: W3CXM 286, W3BLU 202, W3NT 23, W3BRQ 52, W3BRA 10, W3APT 127, W3ZU 100, W3AAJ 33, W3AMB 10, W3FJ 77, W3AGH 216, W3BUY 48, W3WO 131, W3ZA 4, W3BSE 1, W3BAZ 1.

NORTH CAROLINA — SCM, H. L. Caveness, W4DW — W4AXX answered his first CQ recently. W4RX has rebuilt his crystal rig and put in a pentode tube as frequency doubler. W4AVT has built a new a.c. receiver. W4AKC says

he is going to store away his transmitter for the winter and go to State College. His best DX this month is G2IG. W4AOJ, an ex-radio mechanic in the U. S. Air Service, and W4GC are new hams in Richlands. W4AVT and W4AOJ request ORS application blanks. W4TU is still off the air. W4DQ completed that crystal rig on 7075 kc. W4AEL keeps schedules and shoves traffic along. W4ABW calls our attention to a mistake in a previous report. The new station reported as W4PW should have been W4AWP. W4AAE is in Port Arthur, Texas, attending a radio school. W4AIS reports handling traffic from K6BOE. W4AGO is using an 852 now, but will be a student at the University of N. C. this winter. Lightning visited W4TR's radio shack while he was not in. W4QO has been transferred to Greensboro. W4CC sends us a picture post card from Mass. W4MI has been vacationing in Ky. W4AGX, W4ACY, W4BV, W4AVT, W4TR, W4RV, W4ANU, W4VI, W4HV, W4EG, and W4GA have visited W4DW this month. W4ACY has a FB fone on 80 meters also a pentode push-pull outfit on 20 meters for CW. W4AEO, the Greensboro High School station, has a 75 watt on the air. W4BV has been getting foreign "heards" cards. W4ZH has installed two 880's in push-pull in his crystal rig in the place of the 852. W4RE has been working some VK's, ZL's, G's, F's, and D's this month. W4CP transformed the chicken house into a radio shack. W4TN dropped down to 20 meters long enough to hook an F and a G this month. W4ABT sends in some fine looking fotos of his station and quite a bit of advance dope on the convention. Prizes are still coming in and the speakers are being lined up. A record breaking crowd is indicated.

Traffic: W4TN 83, W4AIS 51, W4DW 44, W4AEL 24, W4AAE 20, W4ABW 17, W4ABT 15, W4AKC 14, W4AGO 11, W4AVT 9, W4RE 6, W4RX 2, W4TR 1.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, Edward C. Stockman, W9ESA — W9FYF takes traffic honors. W9HJS is second. W9CDE reports freakish conditions. W9GNK says U.S.N.R. is being established at Durango. W9EAM handled a few. W9HGS-W9HFS Summer Camp Audubon, Ward, is now closed and W5ARV is back home. W9APZ received his license renewal. W9CSR is now going to show up the traffic hounds with his new receiver. Lightning struck W9DNP's antenna and put his transmitter out of commission. W9BJN just returned from a three months' trip to the Northwest. W9EFP still making hay while the sun shines. W9GLP is back from Kansas. W9FTP is getting started. W9FQJ, W9EAM, W9HEM and W9DNT are working on M.O.P.A.'s.

Traffic: W9FYF 550, W9HJS 313, W9JB 13, W9DNP 12, W9FPZ 9, W9EAM 6, W9GNK 4, W9CDE 3, W9DNT 3, W9HGS 2, W9APZ 1, W9CSR 1.

UTAH-WYOMING — SCM, C. R. Miller, W6DPJ — W6EWW is working on a five meter outfit. W6APM is handling traffic and working lots of DX. W6DAM is second district DNCs of the A.A.R.S. W1ZZA is spending the summer in Wyoming. W7HX has nothing to say. W6DPO is putting in crystal. W6BSE has been to California. W6BTX enjoyed an F B vacation to California and the Northwest. W6CNX is considering crystal control.

Traffic: W6DPJ 103, W6EWW 21, W1ZZA 23, W6APM 22, W7HX 5.

SOUTHEASTERN DIVISION

WESTERN FLORIDA — SCM, Edward J. Collins, W4MS — It is with deep regret that we record the passing of a real ham in the death of W4DP. 3500-ke. band. W4AAx is still having trouble getting his xtal to perk as he wants it to. W4AOO says no DX. W4KB got QSA5 R8 in Ohio with his 245 fone. W4AXF has her fone perking weakly. 7000-ke. band. W4ACB, Route Manager, reports that he spent the entire month rebuilding. W4QR has been very busy keeping W4SC on the air. W4AUA is getting a real Navy going in Tallahassee. W4ADC seems to have QRT ham radio. W4VR has a receiver going. W4PN has been kept on the jump by work. W4AWC is about to crash out on the air. W4OE has been busy repairing the generator at WCOA. W4ARV continues to do excellent work on low power. W4ART says his receiver won't work in rainy

weather. W4AXQ, our newest ham, is on and getting out FB. W4QK has been building a new home. W4AQY has been on the air but has a jinx following him. W4AFT is contemplating a fone. The summer slump has W4ASG. W4AUV is heard more of late. W4ASV has had several QSO's but no traffic. W4HQ has a FB M.O.P.A. going now. W4UW has a 50 watt perking and has three complete power supplies for it. W4ALJ has a new push-pull rig that is a beauty. W4MX has trouble getting messages to Mobile (YL's). (Mrs.) W4KB is getting the DX. W4ADY is heard regularly. W4AWJ burnt out a complete set of tubes at one shot. W4ATN had to build a new receiver and also has a FB new wavemeter. W4QU found out how big a blister high frequency current juice will burn. W4MS has been on vacation. 14,000-ke. band. W4AUW has been having trouble trying to get his M.O.P.A. to perk on 14,000 as well as it does on 7000 kc. W4FV nearly made WAC but blew his entire plate supply. W4ARD has been jumping from 7000 to 14,000. W4ABJ and W4ALH are still at sea. I would like to hear from all prospective hams and ORS, OBS and qualified OO in this section. You new fellows in Bonifay and Holt, let me hear from you.

Traffic: W4KB 18, W4UW 15, W4QR 1, W4ARD 10, W4MX 3, W4AUW 1, W4ARV 4, W4ATN 2, W4QU 3, W4MS 7.

GEORGIA-SOUTH CAROLINA-CUBA-ISLE OF PINES-PORTO RICO-VIRGIN ISLANDS — SCM, J. C. Hagler, Jr., W4SS — Sorry to lose our friend W4BO, ORS and RM. He is going to Port Arthur College. W4SO applies for ORS. W4AJ is going to Ga. Tech. W4MO reports three new hams in Atlanta: W4AEL, W4ASN and W4AHV. W4DV has returned from Oshkosh, Wis. Our OO W4PM reports a good many off-wave stations around 6900 kc. The Georgia hams had a great meeting in Macon in August. W4WB is attending Mercer Summer School. W4AEV is pounding brass for the National Guards in S. C. W4WT and W4ABP were visitors at W4JD's shack. W4QZ is keeping Monday night skeds with the newly organized A. A. R. S. fone net of which W4APK is Ga. NCS. W4GY made the cruise to Nassau, Bahama Islands, and Key West with the U.S.N.R. on the U.S.S. Taylor. W4WQ is now W5BZN. W4HN spent his vacation in Washington, D. C. W4UC was QSO So. Africa. W4IS is building 20-meter fone. W4AHG waggles a bug for the railroad. W4ADA will be at Ga. Tech. and W4AOR will be at South Georgia State College. W4QE has moved to Columbus from Ft. Benning. W4IR reports "No Ketchum" this month. W4LL was heard in So. Africa while QSO W8AKV on June 24th on the 3500-ke. band. W4AMA worked a K7 and VK5 in a half hour on the 40-meter band. W4AT traveled over most of Georgia the past month. W4KX is busy with his work as editor of the magazine of the Georgia amateurs. W4ADA, a new member in Columbus, sends in a fine report. W4GT is back from a 12,000-mile auto trip to Mexico, California, and Canada. W4SS is on the air with a new transmitter, a M.O.P.A. with an 852 in the last stage kicked by a 210 osc. in a T.N.T. circuit. W4QN has just about finished a 50-watt fone set for 80 meters.

Traffic: W4SO 348, W4ADA 35, W4WB 26, W4AOR 15, W4UC 15, W4DL 9, W4MA 5, W4JD 5, W4PM 5, W4IS 6, W4GB 4, W4DV 4, W4HN 3, W4AHG 2, W4MO 2.

ALABAMA — SCM, Robert E. Troy, Jr., W4AHP — W4AKM is trying to get a multi-stage crystal outfit going. The same goes for W4AHP except he is about through trying. W4JX reports a fine vacation in Columbus, Ohio. He operated at W8BYR. W4LM is afflicted with an abundance of YL's. W4RS is being overhauled. W4TI is off the air due to a large amount of service work. W4AG is working them on 14 and 7 mc. W4AP has been on his vacation. It seems that W4KP has spent his time lately collecting high-power parts. W4ASM, a new ORS, moved to Leeds, Ala. W4ATL is a new ham in Marion. W4VV has an FB outfit on 14 mc. W4AMS of Fairfield is trying to increase his power. W4JI has a fine signal on the air. 14-mc. stations everywhere are being worked by W4OA. Mobile will have a crystal fone this winter called W4GP. W4AEZ is still working fone. W4AJR blew one 210. Where is W4EA and the rest of you fellows?

Traffic: W4KP 8, W4AP 12.
EASTERN FLORIDA — SCM, E. M. Winter, W4HY — W4AOT is a new ham in Jacksonville. Ex-W4AKJ, now

W4AFV in Tampa, has applied for ORS. W4JH is on 7050 kc. W4AQT and the Plant City Radio Club had an all-day picnic at Crystal Springs. W4AEM worked two 6's. We are sorry to report that Julius W. Poston of Bay Harbor, Fla., W4DP, died in an automobile collision July 21st. W4AGY reported from Miami via Western Union. W4ALL is active again. W4UX has gone back to sea. W4AKV reported via radio. W4NN is very active, as is W4AGB, his OW. W4MF is very active on 'phone. W4JO isn't quite settled at his new QRA. W4TK says QRN is still wicked over at his shack. W4AAJ is using 45s in a push-pull TPTG job, and a screen grid a.c. receiver. W4SK says "QRN." W4ZV says I missed his last report. W4AKV promises to mail in his reports promptly hereafter. W4WS keeps daily skeds with four 'phone stations. He reports the Knights of the Kilocycles is now being made into a permanent organization to include 'phone, CW and interested SWL's. W4AGB, a YL op, is the new Secretary of the JAROC. W4SQ has left Tampa and taken a job with Pan American Airways at Miami. The A.A.R.S. 'phone net continues to gain and is now working 25 stations. W4ALQ and W4FF, at Deland, are new 'phone stations. W4AMQ is back from Haven Beach. The hams in Lake Worth have organized the "Lake Worth Radio Club" with seven licensed ops and one other interested party. W4AWO is President, W4CZ Vice President and W4AJL Secretary. It meets every Monday night at the shacks of the different members. Organizers of the club are W4ANF, W4OK, W4AFN, W4ASA, and A. B. Shirley. Second meeting of the club was held with W4OK as host, featuring a review of the early methods of detection in radio. Third meeting discussed the principles of magnetism, magnetic electricity and induction coils. Most of the discussion is led by W4CZ, ex-RM2C U. S. Navy. A contest was held to determine the maximum number of QSO's possible in a 24-hour period. W4AWO had trouble and didn't do much. W4ASA had 27 QSO's with 9 states and 5 districts. W4OK had 25 QSO's with 10 states and 8 districts. W4AFN had 23 QSO's with 8 states and 8 districts and 2 foreign countries. Total for the 24-hour period was 76 QSO's, 18 different states and 8 districts and 2 foreign countries. The Lake Worth Radio Club are to be congratulated on their good work. W4AAB says the summer slump has hit the Gainesville territory. W4AGN is rebuilding his transmitter. W4TQ is in Georgia prospecting for lime rock deposits. Ex-W4SD has decided to return to the fold. W4WW and ex-W4ABL blew their power transformer. They were visited by W4ADP of Crescent City who was having trouble with his 210. W4GD has received an appointment as Junior Radio Inspector. He has been very active also, with W4AGN and the USNRF. W4GS is one of the first Florida National Guard rigs to go on the air, being operated jointly by W3ASQ and W4GS. W4GS was at Camp Foster July 5th to 19th, chumming with W4DU, also on duty there. W4GS had a nice rag chew with W4AIV on 'phone. W4NF has burned out his motor generator. From all indications the new shortwave rig for A.A.R.S. work will be FB. Ray Ogden, at Palatka, also is a commercial Morse op. The ticket agent at Palatka, old man Cooper, is a hot prospect for a 'phone rig, and is continually talking crystal control. W4AEM is a new ORS-OBS in Jacksonville. W4HY is rebuilding his receiver and expects to come out with a completely shielded a.c. job before this gets in print. There are 42 licensed hams in Jacksonville. W4SQ, by reason of his removal to Miami, has resigned as Route Manager at Tampa. W4DU, on 'phone, has recently erected a new Zepp antenna. W4UK and W4PK are on 'phone. W4MF is doing lots of 'phone work every morning. W4RU has gone to college. W4FM plans to leave for college the first week in September. W4QP reports eight licensed hams in Vero Beach now.

Traffic: W4JH 5, W4AFV 16, W4AQT 15, W4AGY 2, W4ALL 3, W4UX 15, W4NN 4, W4AGB 3, W4MF 17, W4JO 2, W4SK 5, W4ZV 26, W4AKV 6, W4WS 26, W4ABL 29, W4AGN 35, W4GS 7, W4QP 7.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, Roy Lee Taylor, W5RJ — W5BMP of Waco is moving to Schofield Barracks, Hawaii. W5AUL reports U.S.N.R. Unit going in Abilene. W5HY is visiting hams in Kansas City. W5RJ has 1 kw.

input to the xtal rig now and just returned from all north Texas, Okla., Colo., Ariz., and New Mexico vacation. W5QY is sporting a calls heard card from "Russia," this being done while he was using 1 type '10 tube. W5AVF reports W5BTZ a new ham in Jacksonville, also reports W5ANU working 6 VK's. W5BII wants some reliable skeds. W5CF is back after an absence of several months due to illness in his family. W5CF Jr. (Bob) is a traveling salesman and runs into quite a few of the gang. W5BAD is on 85-meter fone. W5LY has been vacationing and reports U.S.N.R. net being organized. W5ARV is back from Camp Andoborn, Colo., where he signed W9HFS this summer. W5AVA worked 2 VK's and a ZL with his 245 rig. Eleven members of the W.F.A.R.C. with the YF's attended a hamfest in the Wichita Mountains of Okla. recently. W5UO and W5AYX have rebuilt. W5BYM is a new call in Wichita Falls. W5ASC has moved and is rebuilding. W5BAH and W5ASP are experimenting with crystals. X6SW-X5TO, formerly of Bisbee, Ariz., is now W5OY of Naacodoches, Texas. He reports W5BGC is getting on soon and W5BLN has moved to Victoria, Texas. W5RH is on again with his 210. "Somebody Stole My Ford," says Maersch of W5AGQ. W5KL is on a vacation to Canada and Pacific Northwest. W5BNO is rebuilding his xtal job and will use an 860 in the last stage. W5BKH is on with low power at Ballinger. The SCM will give a prize that every ham can use if lucky enough to win, this prize to be given to the one handling the most traffic from November 1, 1931 to March 15, 1932. Come on and get your skeds lined up to win the prize, fellows.

Traffic: W5BMP 32, W5AUL 30, W5HY 29, W5RJ 28, W5QY 20, W5AVF 16, W5BII 12, W5CF 5, W5AYX 7, W5BJX 4, W5BKH 6.

SOUTHERN TEXAS — SCM, H. C. Sherrod, W5ZG — W5LB is on the air on the 18th and the 19th of each month to take reports from stations in this section who desire to report. An official broadcast regarding this subject is being made by W5MS and W5AUC on 7000 kc. and W5BKW and W5BHO on 3500-kc. fone. The schedule calls for the broadcast of this information once each day on both the bands mentioned for the next thirty days. Houston: W5TD has the rig ready to go and will be on regularly with the coming of fall. W5EI has sold out. W5ON is still trying to make the P.P. fone rig work. W5BOC has changed his call and is off the air temporarily. W5ASM is not on much these days. W5BTD is busy at K.T.L.C. W5BOK is also off. W5AMX is using M.O.P.A. with '10 tube on 3500-kc. fone. W5AVU has rebuilt the fone and is using a condenser mike. W5AHW is a newcomer in Houston with a 210 tube and is working on 7000 kc. with excellent results. W5CAB is a new ham in Houston. W5WL is teaching a code class. The M.O.P.A. at W5WL has been rebuilt. W5LB has been busy grinding crystals and dividing his time between twenty and forty meters. Galveston: W5AUX is on with crystal control. Sugarland: W5EW, brother of W5LB, is off at present but will return shortly with crystal control. Missouri City: W5BKY-W5UW, a newcomer, will be on with a '10 and an 865 tube in a M.O.P.A. Rosenberg: No word from W5PU. Austin: Barelay reports as usual. W5CT will shortly be back in Austin and after an A.A.R.S. appointment. W5BHO reports the following: W5BXH has a good 3500-kc. fone. W5BWQ is also getting started with the vocal artists. San Marcos: W5AEQ is on with 3500-kc. fone. Harlingen: W5ATW is also working with 3500-kc. fone. Holland: W5AMW is on both 3500-kc. fone and 7000-kc. CW. Sequin: W5UB reports by radio. At present W5UW is operating a portable station. Kerrville: W5BKE also reports by radio. Lawson is just back from Colorado. San Antonio: W5AUC is off the air due to expiration of license. However, Smith and Muller will be back with us shortly with a 500-watt job. W5AUC has been QSO VK, ZL, J, F, OM, and AC. Parker reports for Ft. Sam Houston. As W5AIQ he represents the Army post to amateur radio. W5ON is planning regular skeds with the far east and Australia and New Zealand. Hasbrook, W5BWM has just returned to S.A. from a vacation in Galveston. The following was reported by radio from W5CS: The San Antonio Radio Club has discontinued operating until September. Brown of W5OW has moved to Louisiana. Parker is the new op and a live wire. W5CS is using a pair of '10 tubes in P.P. The portable license

W5BEC is also available. W5BQH is on with a 211-D. New Hams in San Antonio are W5BYG, W5BWM, W5PC and W5CAP. W5JC is on intermittently. W5RV is using an 852 in a M.O.P.A. W5BKI is using the same circuit with a 50 watter. W5AHA is not on now, W5AZD, President of the S.A. Radio Club, is on with a 50 watter, W5VL has been QRW college. W5AYR is rebuilding for 3.5 mc. fone. W5AX and W5ABQ each have a 50 watter going. W5BUV is doing experimental work on ten meters. W5BWM and W5CS are planning 50-mc. fone tests early this fall. W5UX now boasts a crystal-controlled rig with an 852 in the last stage and 1500 volts on the plate. Noxville: W5HX is now on 20 meters. Junction: W5AYB is now on the air. Woodsboro: W5MS is broadcasting full information on the transmission of reports to the SCM. Taft: W5BRY sends in the original report for this little city. W5BYE is building a P.P. rig using 245's. W5FH has a case of YL-itis and a bad receiver. Sinton: W5ZX has been off the air while working with a P.P. pentode amplifier. Jacksonville: W5EQ has taken unto himself an OW. Fort Bliss: W5FW is heard regularly. Bay City: W5CAZ will shortly return to Tyler Commercial College. W5BZO is using two 10 tubes in a T.N.T. circuit. W5KM-W5ABH recently QSOed the Philippines. Wharton: Walker, as yet unlicensed, is planning to represent this city shortly and will be using fone.

Traffic: W5AUC 307, W5FW 519, W5BRY 7, W5LB 45, W5UB 10.

NEW MEXICO — SCM, Leavenworth Wheeler, Jr., W5AHI — W5BQE is fitted out with a new set of tubes. W5AUW is doing an FB job as OBS. W5KT has moved to Carlsbad. W5BRV is working on an M.O.P.A. rig. W5TV is technician at KGB, San Diego. Your SCM is sorry to state that he is leaving for California in Mid-October. W5AIE, 116 South Haward, Albuquerque, will carry on as Acting SCM until such time as a new SCM is elected. All reports and correspondence will be handled by him after October 1st.

Traffic: W5AHI 405, W5BQE 13, W5BRV 2, W5AUW 123. OKLAHOMA — SCM, Wm. J. Gentry, W5GF — W5PL is overhauling his rig. W5RRD is going on 14-mc. fone. W5APY is planning on a new receiver. W5AFH has gotten well OK now. W5BSS is doing some good DX with a couple 245's in push-pull. W5QL has been very busy with the convention program. W5ABO is all set with a new panel job on 3500 and 14,000-ke. rigs. W5MMI is going into business for himself. W5VQ at Ft. Sill carries off the honors again. W5BPM is hoping to be back on soon. What happened to W5CBT W5BMU is a new ORS. W5AYF and W5ASQ must have a net work of their own. W5SW is waiting for \$ oil. W5OJ is going strong on 7 mc. W5KZ has given up radio for an OW.

Traffic: W5VQ 1153, W5BMU 54, W5OJ 53, W5PL 3, W5BOE 4, W5GF 12, W5ALD 15.

CANADA

With the best of DX conditions prevailing; more stations than ever before, and unbounded enthusiasm, Canadian amateurs will make this a banner year. With an increase of over 8% in licenses issued SCMs should experience little trouble in boosting traffic totals in their sections. There are vacancies in each section for OBS, ORS, and Route Managers; those who desire these appointments should get in touch immediately with their SCM. You cannot expect your SCM to know your wishes; every member should keep in touch and assist in every way. By acting these positions you will be helping the amateur cause, and in return receive more pleasure from amateur radio.

Do not blame your SCM for a poor showing. Do you know that only 10% of the members report monthly to their SCM? From now on let us get behind our SCM. A postcard each month will keep him informed.

CANADIAN GENERAL MANAGER
ALEX REID, VE2BE

MARITIME DIVISION

NOVA SCOTIA — SCM, A. M. Crowell, VE1DQ — VE1AG is using CW and fone on the 3.5-mc. band. VE1BT is using CW. VE1BV is using TGTP. VE1BW is using the 7 mc. CW in addition to his 3.5-mc. fone. VE1BC has worked SU1AQ, EAR and F, on 7 mc. CW. VE1AX is waiting the arrival of his double button mike. VE1DQ shot his xtal power supply. New Brunswick: VE1CL just got back from a visit to W1CDX. VE1AU just got some new filter condensers via VE1CL-W1CDX. VE1AK is still fooling with trick modulation. VE1BO is using 3.5 mc. fone and getting FB reports.

Traffic: VE1BC 23, VE1CL 10, VE1BV 10, VE1DQ 7, VE1BW 2.

QUEBEC DIVISION

QUEBEC — SCM, Aphy Blais, VE2AC — VE2CX, our star station, has kept skeds with VE2CU all summer. He is using a 201-A and 135 volts on his portable. VE2BB is doing DX as usual. VE2CA adds to his DX list. VE2AP is back from his fishing trip in the north. VE2AC is busy with his 28 mc. tests. The Quebec Division will probably have a show on at the Radio Exhibition. The SCM will be present at the booth all week at the end of September during the show. For those amateurs of this division seeking work here are a few positions vacant ready to give away to serious operators: one job as Route Manager; one or two as American Legion net stations; at least ten as Official Relay Stations; not less than three as Official Observers; three or more Official Broadcast positions. Rush in your application and get the job you like.

Traffic: VE2BB 20, VE2CX 27, VE2AC 11, VE2BE 15.

VANALTA DIVISION

BRITISH COLUMBIA — SCM, J. K. Cavalsky, VE5AL — VE5AM and VE5BI report some success on high frequency. VE5AL is constructing some more low power transmitters to push traffic. VE5CO had the hard luck to drop his transmitter and burst his poor little 210. VE5EC is rebuilding again. VE5DV is talking MOPA while VE5DQ kicks them over on forty. VE5EZ is another new call of the Victoria Club. VE5CH is holding down his sked with Vancouver and is going to live at Horsefly. VE5HP is on 3575 kc. with a nightly sked into Vancouver. VE5DM and VE5BL are camping. VE5CT is on when the fishing is poor. The SCM would like to get the QRA or meet any of the new call owners which are heard around these parts. VE5AC reports.

Traffic: VE5AL 7, VE5EC 2, VE5AM 2, VE5DC 10, VE5HP 4, VE5CH 27, VE5AC 5.

PRAIRIE DIVISION

MANITOBA — SCM, John L. Green, VE4BQ — VE4HM, Edmonton, paid a brief visit to Winnipeg and was met by VE4DJ, VE4BQ and ex VE4GG. VE4GX has recently been transferred from Calgary. VE4DJ was QSO five Aussies on the 7 mc. band. No dope re VE4GQ's fone yet. VE4IS, 4AE, 4IU, 4FT have been on fairly consistently lately. VE4IS was QSO several South Americans. VE4FN is building a 20 meter xtal job and plans experimental work on 28 mc. VE4BQ is applying for membership in the W.A.C. Club. VE4BU will be returning to the key in the fall. The M.W.E.A. season's activities should be away to a good start by the next report.

Traffic: VE4DJ 4.

SASKATCHEWAN — SCM, W. J. Picking, VE4FC — Please excuse the lack of a report last month — holidays. VE4BF, who has been off the air, has returned. VE4GR would like to hear a few more VE4's at noon on 7 mcs. VE4CV has clicked with WDEE in harbor at Baffin Island and ON4FE. VE4BE has been on holidays for a month but is back again.

Traffic: VE4GR 8, VE4CV 1, VE4BE 1.

LATE AND ADDITIONAL REPORTS

W2CJP reports W2AUE is op at W2ZZK at Camp Rotary, Pilot Knob, Lake George, N. Y., handling Boy Scout traffic and teaching code and radio principles. W1CCP-W1BSF reports W1ACE is a new 3.5 mc. ham in Norwood. Traffic: W2CJP 217, W1CCP-W1BSF 20.

pa0an pa0dw pa0qf pa0qq vo8z z1at z1ax z1bb z1fr z1ft
z1ab z1a2 z12bp z12gh z14ao la1g rx1aa h1k oa4q oa4t oa4z
sp1bn sp3gr sp3pb k4akv k4je k4lz k4ni k4bpf ct1aa ct1by
cv5or zu1b ear94 sm5uk sm6ua cx1af cx2bt yv1xc yv3lo
k4aan k4caf k4dk k4kf wdde vn2bg qqla b7x xq

**W9IN, J. H. Lewis, Jr., 634 East 51st St., Chi-
cago, Ill.**

7000-cc. band

w1abn w1abp w1aw w1awe w1bdi w1bsz w1bsz wlcpw w1ek
w2adq w2aen w2agf w2agh w2alo w2ami w2anv w2anx
w2api w2arv w2atz w2axx w2bee w2bnd w2boq w2bsa
w2bvz w2bzi w2cwf w2cht w2ckr w2crn w2ko w2zc w3bel
w3bes w3bhv w4abw w4adt w4aft w4ais w4al w4alm w4amd
w4ams w4ans w4anu w4apj w4apt w4asd w4gb w4gg w4kb
w4ky w4mo w4mrv w4ax w4tk w4to w4vc w5aac w5abw
w5acs w5acb w5ah w5aja w5ald w5alp w5amk w5avf w5axy
w5ayx w5bet w5bmu w5bpf w5dpu w5ec w5fw w5id w5jv
w5ny w5yh w6aku w6amm w6apg w6bpf w6bua w6buo
w6cgv w6cqv w6dbb w6dde w6dzn w6ely w6etg w6exq
w6fan w6feg w6flf w7axo w7bjx w8aam w8akf w8bwc w8bz
w8cbs w8dde w8dlw w8dkj w8do w8dpc w8evy w8jy w8ma
w8rk w8zw w9adm w9arl w9bbg w9bbv w9bgd w9bnn
w9erh w9euc w9evq w9drq w9dvq w9ena w9etg w9fau
w9fbc w9ffd w9fno w9fvz w9fyj w9gch w9gkz w9gml
w9hdu w9hfd

**W2CL, Harry F. Washburn, 333 Packman Ave.,
Mount Vernon, N. Y.**

7000-cc. band

f8ub fx gx2tm ilhv k6avl k6boe k6dmm k6egd nnisc py7aa
vk2ap vk2oc vk2xu vk2zk vk2zw vk3bw vk3ek vk3es vk3rw
vk4ah vk5hg vk6mu vk7ch vxz4x z1lar

14,000-cc. band

g2vq g5by g5is g6pv g6wt g6xq oa4z oh7nb on4jb pa0fp
py1ca py1cc py1cr py2bo ti2bf tixa wcen x1aa xpa zt1t

**W9FDJ, Chas. B. Kindred, U. S. S. Arctic,
at port, Seattle, Wash.**

(Heard Aug. 1st Aug. 15th)

14,000-cc. band

w1cmx wlcoi w1cpm w2ace w2acn w2ahz w2amn w2bg
w2bgs w2ff w2lf w3bdm w3bhr w4abh w4afk w4mk w4mr
w4nt w4vk w5alk w5ajg w5ayb w5ayz w5bhv w5ot w5rr
w6ahz w6ann w6bco w6bfe w6boq w6egx w6dgv w6dk
w6doz w6dzn w6ere w6exg w6qvw w7fv w7ld w8adg w8aed
w8bf w8br w8bud w8dhk w8duh w8jk w8my w8pe w8rw
w9abd w9afn w9aic w9ayd w9ces w9dfj w9ecz w9eel
w9ext w9gdn w9gks w9gok w9lf w9pvc w9vbm w9zcf w9zj
k4kd cm2sh f8sz cx2wg py2ay lu2dq kfu2.

7000-cc. band

w4ama w4ql w5adp w5bbr w5bfz w5bld w5bqe w6aa w6aay
w6agu w6aoa w6aor w6apz w6arp w6avu w6awo w6bbp
w6bee w6bik w6bip w6bja w6bkm w6bnp w6bpb w6bpd
w6bpt w6bxq w6byq w6bzf w6bbr w6cae w6cal w6can w6cel
w6ceo w6cf w6cge w6cio w6cla w6csp w6cuv w6cxw w6dce
w6dio w6diq w6dmp w6dre w6dtd w6dxa w6dyb w6dyg
w6dzf w6eau w6ebd w6egh w6ein w6eng w6env w6epw
w6eri w6ert w6erw w6exq w6eyo w6eza w6fdu w6ft w6fz
w6li w6lr w6og w6pb w6san w6uk w6yo w7aax w7afl w7afw
w7ahu w7aji w7axt w7baa w7bac w7ew w7jb w7jc w7jt w7q
w7zq w7rt w7ve w7enw w8pl w9afn w8bes w9bow w9cac
w9clq w9evq w9dnp w9dzl w9fpi w9gyb w9hrs w9pp w9ql
k6aja k6avi k6boe k6ecs k6dvt k6ed k7akv k7bdw k7pq
k4aan k4dk vk2hl vk2oc vk2rf vk3xi x1ax vxz4x om1fo fx
jtee

3500-cc. band

w3cic w3lg w6brv w6cul w6epp w6zdd w7aau w7awh w7azb
w7cj w8ddv w9grw k7asq k7lh ve5ag ve5ch

'phone.

w6ffn w7ant w7bbl ve5ai ve5as.

**W1CV, 18 Prospect Hill Ave, Somerville, Mass.
7000-cc. band**

w4aba w4abd w4ait w4add w4ard w4awz w4aie w4aur w4aja
w4aot w4arz w4asa w4aw w4eg w4ft w4fr w4fx w4o4
w4jx w4jw w4ag w4go w4pbi w4jc w4vb w4pf w4re w4ajx
w4re w4it w4og w4og w4od w4tr w4lj w4iabw w4ata w4agh
w4ago w4auo w4ams w4alm w4zn w4anu w4cl w4hq w4hs
w4to w4ama w4atd w4al w4ux w4aqq w4avq w4ei w4wt
w5afx w5aap w5akp w5alb w5adv w5aug w5asg w5bvw w5bsy
w5bjf w5bmi w5va w5mn w5ef w5mx w5jc w5id w5bwx
w5avq w5aqw w5avf w5aug w5yh w5btu w5tr w5ahw w5un
w5acl w5ahj w5bet w5bmi w5zsl w5bzo w6am w6boq w6blp
w6br w6dzn w6dwi w6ezq w6ege w6ehy w6ut w6uc w6ln
w6sc w6ewk w6uk w6ds w6apd w6bqk w6eyf w6adk w6exy
w6erc w7aax w7fv w7gm w7lp w9akl w9avj w9air w9ahx
w9al w9afn w9agz w9bxy w9buw w9bxi w9cvt w9efm w9eno
w9civ w9ego w9esc w9dlk w9ddy w9dbw w9dfh w9dhh
w9ddu w9dfu w9eom w9efs w9epy w9efu w9fhw w9fhw
w9fdg w9ftt w9fgg w9fgd w9fgy w9fbo w9fax w9gfc w9gwk
w9gtb w9ob w9ut w9gt w9tj w9jl w9hch w9hhq w9fi w9fs
w9dgy w9gm w9dxm w9hpt w9any w9bnl w9pw w9feu
w9adu w9dct w9efc w9cn w9hpk w9ext w9dgc w9ftx w9dka
w9dka w9gcv w9ecf w9mc w9ase w9gyp w9dgg w9fsw
w9gki w9aeh w9asq w9bca w9bag w9ebq w9hae w9bpd
w9afb w9ayd w9hwe w9hhq w9gai w9hij w9gus w9gjq
w9fve w9hsb w9eqc w9fjg w9uz w9czy w9dka w9fei w9hqn
ve1ca ve1co ve1bl ve2co ve3ce ve3gg ve3ed ve3wk ve3hv
ve3ix ve3fj ve3bc ve3bm ve3hj ve3ij k4ag k4aan k6dv
vk1da vk3xi vk3oc z1bb z1cc z14am uo1je hel1g vn2bg
ny1aa x29a daiv wsq nedf

W6EPQ, Keith Daulton, Box "O", Madera, Calif.

14,000-cc. band

j1ec j1dr oh3tm ear436 f8pz f8tv g5by k6erh k6vg k6baz
k6ir k7bad z1fe z14ba wsa vd2xy hel1g

7000-cc. band

au1pd cm2pa f3ger gx2tm hel1g j1dm j1ee j1ek j1dn j1dy
j1ei j3ek j3cr j3df j3dj j3cp ka1hr ka1ce ka1rc ka1rj ka1nf
ka1co ka1sl ka1cm ka1jm ka9pb kvd k6dqf k6exy k6aja
k6erh k6ocg k6fcx k6vd k6alm k6dvh k6baz k6dv k6eln
k6agi k6bvp k6boe k6bc k6avi k6dmm k6lal k6bhh k6bhg
k7bad k7aml k7cj k7ox k7at k7bec k7hh k7pq k7wm k7xd
k7ced k7bd k7fj n1t n1ns ny1aa om1fo pk3bq x29b xebm
vxz4x khael (gra7) vk2ok vk2sb vk2oc vk2tx vk2nr vk2zw
vk2oj vk2zz vk2ap vk2fm vk2hq vk3rw vk3tm vk3zw
vk3bd vk3bw vk3oc vk3bb vk3mn vk4ju vk5gk vk5yx
vk6as ar

W4VK-W9DZJ, Taylor B. Rice, Ripley, Tenn.

14,000-cc. band

ce1lk ce3ch em1fm em2fo em2jm em2wk em2pa em2cf
em2mm em2ww em2vm em2wa em5er enz1 ox3bt ct1aa
ear96 fx gx2tm hel1g hh7c hk1fw hk3rg k4aan k6dv k6dbb
k6ces k6dmm k6cab k6boe k6ir k6ask k6dpg k7ox ka1ro
ka1hr ka1nf lu2ca lu2da lu2dje nnisk oa4z om1uj pk3bq
py1ca py1ed py1ba py2ay py2bo py2ba py2bk py2br py3ad
py3aj py8ia rx1aa ti2bf ti3la vi1yb ve1dr ve1bv ve1be ve2df
ve2ay ve3cf ve3ew ve3he ve3fr ve3ge ve4ov ve4vy ve4bq
ve4dj ve4ce ve4ey ve4iu ve5ac vk2ap vk2hw vk2ix vk2vs
vk2gr vk2jz vk2oc vk3w vk3fv vk3vy vk3vi vk3pp vk3bv
vk3zw vk4dj vk4ju vk5hg vk5gr vk6wi vk7jk vn2bg vp2pa
vxz4x x1aa x1ax x1d x3d z14am

'phones

w1ecz w2brc w2bio w2tp w5ql w6aj w8ddl w8wu w9ahq
w9drd w9ggy

W9HLZ, Leo W. Born, Box 323, Iola, Kans.

14,000- and 7000-cc. bands

ce1ai ce3ci ce3ch ce7aa em1by em2jm em2sh ep1aa ct1bx
ct1ar cm2rz cx1ba hel1g kfu2 lu1ba lu2ca lu3fa lu3de lu4dq
lu8dj lu8en oa4j oa4q oa4y oa4z py1ca py1ah py1ga py2az
py2ba py2bf py2bn py2au py2bj py3ad py3bj py3ia rx1aa
ti2fg ve1dr ve2aa ve3bm ve3hd ve3xc ve3rf ve2ca

ve4ai ve4is ve4ic ve4rs ve09j x1x x1xp x3a x9a z1lce z1zgw zp7ab

W6DZZ, E. J. Hoetzel, 941 Stanyan St., San Francisco, Calif.

ac1bd ac1ts ac3gb ac8go ac8ag ac8hm ac8js ac8na ac8tj
aun1z au1zb celah celao celae ce7aa cm1by cm2fv cm2wa
cm8uf cm8yb cx1aa cx2ay f3mta f3ocb f3ooc h1fy hclfg
hh7c j1et j1dm j1dm j1dn j1do j1dp j1dq j1dr j1dy j1ec
j1ee j1eh j1ei j1ek j1es j1px j1xm j3cc j3ch j3ek j3cl j3cr
j3cx j3de j3dm j5cc j5ce j6ca j6cc j7ca kbaja kbavi k6alm
k6bhl k6bjj k6ccs k6cdd k6dqf k6cog k6dmm k6dud k6dv
k6erh k6eff k6evv k6fex k7aky k7aun k7anq k7ari k7atd
k7bad k7bbk k7bdw k7cj k7js k7mn k7ox kalaw kalce kalcm
kalco kaljd kalfl kalhr kaljm kaljr kalpw kalre kalrt
kalre kalst kalsp kalss kalxx kalza kalze kalzh ka7lg
ka9pb lulcz lu3fa lu8en nn1nic oa4e oa4j oa4o oa4s oa4t
oa4y om1fo om1tb om2es om2re pk3bm pk3bq pk3pr pk4hh
py1aa py1aw ti2ft ti3xa vk2dm vk2fy vk2hq vk2jz vk2jt
vk2ka vk2nb vk2tz vk3bd vk3ju vk3lu vk3rj vk3wz
vk3zz vk4ju vk4rv vk5hg vk5gr vk5mf vk6nk vk6vi vk7ch
vk7dz vs1ab vs2af vs3ae vs6ae vs8ag vs9ah x1aa x29a x29b
x9a x9b z1bn z1ft z1fu z1ab z1ac z1zag z1zar z14aa z14ao
z54m z55u zt2e cab nijt zcbm xobq

OK1AW, Alois Weirauch, Mestec Kralové, No. 9, Czechoslovakia

w1akn w1al w1avj w1aya w1aao w1afd w1bje w1ccz w1cpt
w1md w1uh w1qb w2agx w2amr w2bal w2bhz w2ez w2zco
w2epg w2fd w2rs w2zf w3ad j w3di w3cee w3een w3sf celal
ce3cr em1fm cm2wd kirj sulaa sulch pylor pylah rx1paa
ys1x y1rm y1ld y1zfy v1yb velab velbr velbv veldr
ve2ca vo8mc zeljm nams b7x

Ray Thomas, 1a Oliver St., Ballarat, East, Victoria, Australia

14,000-ke. band

w5aot w6bvx w6uf w6hax w6qw w6ama w6wf w6vl w6een
w6afs w6cdt w6kt w6eqb w6che w6cte w6eme w6egv w6ahz
w6ahp w6dyv w6xa w6hyd w6ave w6aj w6edx w6dk w6asd
w6cyv w7aax w7aoy w7wf w7aav w7ao w7jz w7vt w8bos
w9fur om2es x9a x1aa ye4ee ye4ha ye4go k6erh j1ee

7000-ke. band

w1wu w1mx w1ahp w1cek w1ia w1bo w2awk w2ass w2jd
w2cc w2bmm w2bzk w3avj w3qp w3pn w4adm w4mm w4vk
w4pf w4bk w4ajx w4sg w4ais w4lt w5vq w5aeb w5bmi
w5buc w5ao w5ayl w5ml w5bju w5mx w5adv w5awf w5bwd
w5arr w5yh w5bti w5hj w5bld w5pj w5bbr w5ald w6cal
w6dak w6aa w6dre w6eri w6cal w6eop w6bqo w6cya w6ff
w6daz w6bht w6byz w6ezb w6aar w6fff w6ew w6cxh
w6aoa w6biz w6fcv w6dru w6fff w6cdv w6err w6ln w6eyc
w6dtt w6adk w6eri w6bkm w6ash w6ctx w6bji w6rw w6dzu
w6wp w6cf w6jm w6bje w6amz w6bck w6ciq w6lv w6aqq
w6yo w6xm w6dog w6btt w6cix w6ayh w6ama w6ely w6bpo
w6axm w6djr w6dwb w6ffm w6dmj w6dur w6cpg w6asi
w6aoh w6eng w6egm w6exg w6bik w6efr w6eyf w6bbp
w6eif w6amo w6lf w6dds w6yq w6dzn w6bax w6bc w6ehy
w6dam w6da w6dtd w6qt w6ele w6dkw w6wx w6ero w6evz
w6egh w6eww w6bvr w6dte w6ehw w7axr w7aax w7ayy
w7apr w7qi w7abx w7ag w7ait w7vt w7bba w7axl w7ap
w7aza w7ho w7fl w7afe w7fv w7bck w7dwy w7bwc w7baz
w7bjo w7dft w7pp w7gq w7exg w7adn w7gy w7lf w7drq
w7dmp w7fz w7egd w7fzg w7ajb w7ha w7eky w7aio w7ome
w7fqy w7fp w7fvz w7aas w7hk w7gl w7efn w7bw w7eey
w7bqw w7ml w7io ac3ma ac8se wplws vplm avlnz hh7c
ve3jw ve4dj ve5ee ve5dx om1tb om1fo kalhr kalce kalnf
kaljm kaljr kalco kalsl k6vg k6dmm k6dv k6baz k6fze
k6ed k6cog k7hh k7bdw k7ox k7aky k7iw j1dm j1ef j1zz
j1dmr j1px j1ep j3fb n1jt vxz4x kdp

3500-ke band (phone)

w6eqj w6elw

G2XT, J. R. Wilson, 23 Sallers Road, Gosforth, Newcastle on Tyne, England

14,000-ke. band

w1aya w1mk w1ept w1qb w1ph w1amq w1aao w1bdl w1avj
w1axx w1mo w2bkg w2ais w2ber w2cuj w2fd w2old w2btv
w2ff w2abc w2ccj w2biv w2ejm w2aqp w2apv w3oh w3di
w3gp w3la w3zx w4jn w4jc w8aat w8ald w8adj w8sf w8enu
w9cao veldr ve5fx ve2bd ve1bt en8mi cm2wa cm2wd oa4z
ti2fg

7000-ke. band

w1cpl w1cqv w1afa w1sk w2bic w2ago w2gqw w2ob w2jd
w2ct w3cbv w3mt w4ux w4vx w4vp w6rt w6ho w4vk
w6bvs w8cte w8eci w8bdg w8efe w9fqn w9fi

W1PE, 62 Hemman St., Roslindale, Mass.

b7x ce1am celao ce3ch em1by em1fm em2jm em2jt em2mm
em2ra cm2sv cm2wa cm2wd cm2ww em5ea cm8uf en8mi
et1aa et1bx et1ew ex1bu ex1or ex2bt d4cht d4go d4jpc ear9
ear16 ear94 ear96 ear185 eise f3mta f8bs f8btr f8dmf f8ex
f8pz f8sf f8sx f8az f8tg f8ug fx g2bl g2dh g2gf g2oi g2rs g2rv
g2tk g2yd g2zw g5bj g5dd g5is g5ni g5oy g5pl g5qy g5rv
g5sr g5wd g6xg g6iz g6rb g6rg g6vp g6xq g6yk g6yl g6ym
haf2g he2jc he2jm k4rj la2bl la2z lu2ca lu3da lu3de lu3de
lu3oa oa4h oa4j oa4y oa4z on4fe on4jb on4jj on4ro on4xh
pa0fb pa0fp pa0gg pa0ld pa0xf pxbd pxr py1bk py1ca
py1ed py1em py1or py2ba py2bf py2bk py2hm py2bo
py2bq py3ad py3aj py8ia rx1aa rx1paa sp3ar ti2ags ti3la
ti3lu ti3xa uo1em uown velbr velbv veldr ve1bv ve2fd
ve3bg ve3bp ve3da ve3fj ve3ft ve3gs ve3he ve3jw ve3wa
ve3wk ve4ae ve4au ve4bv ve4dj ve4er ve4ja ve4go ve4gy
vo8ae vo8mc vo8z vp2pa w4de x1aa x2bi x9a ys1fa w6adk
w6ahz w6aiq w6ann w6bbz w6bem w6bih w6bit w6bou
w6bvx w6bvs w6bxc w6bxl w6byb w6cay w6cuh w6cus
w6dgv w6djp w6diz w6dse w6dxt w6eak w6een w6epl
w6enl w6ere w6etr w6exq w6fal w6fv w6qw w6uf w6wb
w6wp w6xk w7apg w7agf w7bac w7buk w7wk

14,000-ke. phone

w4agr w5abo w8ldd w8rd w9ggy

VK2DM, D. Maclaren, 56 Hawthorne Parade, Haberfield, Sydney, Australia

7000-ke. band

w1mx w1ou w2atz w2jd w4adt w4nn w4kh w4eg w4aj w4agr
w5bqc w5rg w5aqc w5bfp w5bqu w5agq w5lb w5auc w5lv
w5bbr w5bmi w5arr w5va w6awa w6aoa w6dww w6bqq
w6cii w6lx w6uc w6dqv w6ann w6dqi w6wd w6dgi w6axm
w6gf w6boh w6fbh w6cig w6fff w6ela w6cpe w6bji w6bqc
w6ffe w6enk w6ejo w6jm w6emk w6wom w6ads w6bvw
w6ctx w6aw w6aar w6ekn w6dmj w6der w6cut w6bkm w6by
w6aku w6byy w6cfr w6cvg w6cvf w6fbk w6bss w6dtw
w6dtt w6exa w6bco w6ph w6am w6det w6der w6omu w6cii
w6amm w6hm w6bct w6bkl w6cuh w6bpb w6aok w6efe
w6ebg w6wx w6dxt w6eep w6dre w6ets w6cf w6dpu w6sa
w6vq w6egm w6dkw w6eri w6al w6czz w6bax w6ele w7vt
w7bb w7aax w7aof w7df w7dm w7dca w7bck w7dye w7dcau
w7ao w7jl w7gl w7bgl w7ya w7gv w7gxc w7io w7ml w7dnp
k6aja k6boe k6baz k6cog k6ccs k6ene k6dmm k6ed k6fze
k6agi k6cfx k6dv k6avl k7atd k7axa k7ox k7hh kalce kalhr
kalnf kaljr kalsl kaljm kalsp kalpw kalze ka4fw om1tb
om1fo om2es j1et jlka vplm nn1nic f3ocb hclfg aulnz
vxz4x vj1ql vn2bg

W9FVM, Frank M. Davis, 1010 N. Sixth St., Monett, Mo.

ce1ai ce3ch cm2jm cm2kw cm2pa cm2ra cm2rz cm2sv
cm2wd cm2ww cm5fc em5ni cm8uf et1aa et1aw et1bx et1ew
ex2bt d4rng ear96 f3cc f3mta f8btr f8ex f8pz g2ay g5bj
g5by g5is g5ns g6pv g6vt hh7c kalce kalhr k4rj k6aja
k6bjj k6cog k6doe k6ed k6ef k6ir k7qs k7aky lulcz lu2ca
lu2cd lu2ex lu3fa lu3fe lu3de lu3dje nn1nic nn1sc nx1aa
(Continued on page 84)

• I. A. R. U. NEWS •

Devoted to the interests and activities of the

INTERNATIONAL AMATEUR RADIO UNION

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Headquarters Society:

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Norsk Radio Relae Liga
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Rede dos Emissores Portugueses

Reseau Belge
Reseau Emetteurs Francais
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Sveriges Sandareamatorer
Union Schweiz Kurzwellen Amateur
Wireless Institute of Australla
Wireless Society of Ireland

Conducted by Clinton B. DeSoto

INTERNATIONAL amateur radio lives up to its descriptive adjective perhaps more fully than any other existing international group. Our work is truly work between nations. We are to be found in just about every nation on earth, and communicate with nearly every other nation. It is this intense cosmopolitanism, perhaps, that makes amateurs generally so much interested in all projects of an international character, whether concerned with radio or not. Because of this, we feel that the International Pacific Highway projected to be laid along the Pacific shores of the American continents, and the Second International Pacific Highway Expedition which surveyed the route from Mexico City to San Salvador, and especially the radio equipment used on the expedition, are entitled to a few words of review in these columns.

The initial story of IPH, dispatched with the First Expedition from Los Angeles in 1930 which blazed the highway trail to Puebla, Mexico, was told in September, 1930 issue of *QST*. The Second Expedition extended the exploration work from Puebla to San Salvador, the capitol of the Republic of El Salvador, far into the heart of Central America, and travelled 1435 gruelling miles of the most chaotic terrain ever encountered by a party of men and automobiles.

The radio equipment, again operated by Bertram E. Sandham, W6EQF, was altered considerably from the outfit carried in 1930. Recognizing that transmission problems would be much more difficult and perplexing south of Mexico City, it was deemed desirable to provide all possible power within certain weight limitations, and batteries were supplanted by a small gasoline engine-driven generator. Originally de-

signed to be of a full 100 watts output power, the highest possible output under operating conditions in the high altitudes south of Mexico City was about fifty watts, and this was still further reduced in the high altitude of the Mesa Central, the motor revolving at only 2400 revolutions per minute rather than at the 3000 revolutions necessary to produce strong signals in the States.

But communication was carried on, nevertheless, excepting only for one or two gaps when conditions became too bad, and one occasion when the extreme necessity of conserving the shrinking gasoline supply forbade operation of the little engine which ran the generator. Of course, all the arrangements connected with the progress of the expedition over all that wild country was handled by IPH. A few paragraphs quoted from the quotational American magazine, the *Literary Digest*, gives a picture of the conditions:

"CQ . . . CQ . . . CQ."

The tiny radio set, perched "atop a windswept mountain" 500 miles south of Mexico City, sang its song persistently. The operator, "huddled close in a large overcoat," frowned, for there was no reply.

"CQ . . . CQ . . . CQ."

Undaunted, the radio repeated its call time after time. At last, we read in *Popular Mechanics*, "An amateur in Illinois heard the weak signals and answered. Then field station IPH told how three small American automobiles and their crews of six had progressed three miles during the day up steep mountainsides, en route from Nogales to San Salvador, surveying a route for the 12,000-mile highway to connect all the nations of North and South America, from Fairbanks, Alaska, to Buenos Aires."

And so it goes . . . *international* amateur radio . . .

From H. Dolbeth Lucas, president of the Liga de Amadores Brasileiros de Radio Emissao, comes an offer to forward QSL cards intended for either known or unknown Brazilian amateurs. The address of the L.A.B.R.E. QSL Department is as follows:

Caixa Postal 286, Sao Paulo; Brazil.

From Robert Maloney, W2BPY-W2COS, comes the following pertinent paragraph: "I offer you as a suggestion for your column in *QST* that you bring out the fact that English hams use 'test' instead of 'CQ' as their general inquiry signal. To a lot of hams this is quite old stuff, but I have been surprised at the number of amateurs who, just coming to 14 mc., do not know about it and undoubtedly lose many QSO's. I have heard quite a few fellows start swearing because 'that darn Englishman has been testing for the last five minutes and hasn't started to CQ yet.' Hi!"

And in the parlance of some of our local fra-

sue. But it is important, if only in confutation of those DX-pessimists who say it can't be done. The "doing" of it was between the hours of 1:40 p.m. and 10:55 p.m. C.S.T. one day in last July. The stations worked were, in order: J1DO, F8TX, FM8JO, PY2BN, ZL3AR and W5ADP.

Numerous instances of short-time WAC are reported to this department at frequent intervals. Their novelty has somewhat worn off, except



CT2AA, ANOTHER RECENT WAC STATION

Marshall Killen has done good work with his 50-watt *water* from the Western Union Cable Station at Horta, Fayal, in the Azores, 1000 miles west of Lisbon.

when they come from unprecedented localities such as W9AJA's, whose QRA is Hammond, Ind. But surely half-day WAC's aren't the only direction in which record seeking and making amateurs can exert themselves. Hasn't some one an idea for a new and novel sort of achievement, something indicative of both consistent and careful as well as skillful operating, of a properly adjusted good station used to its limit? Let's have some suggestions.

Australian Report

By W. G. Sones, Federal Publicity Officer

The Five Point Relay Test proved very interesting to transmitting members, and was won by VK3RH, Ivan Hodder, Glenorchy. The principle of the test was that each message to count had to be handled through five states, its object being to stimulate traffic channels. Points were allocated for messages originated, received, and relayed and on completion of the five point circuit five points were allocated to the stations concerned. If the message did not complete the circuit all points were lost and it was, of course, apparent just where the message was left on the hook. The next test will probably be a six point relay and will, therefore, have to be passed through all states to count any points.

The additional winning stations were, in order: second, VK4BS, G. F. Grimmett; third, VK7CH, C. Harrison; and fourth, VK6CB, C. Brown. The winner is awarded a handsome cup donated by the Federal Executive.

The work of the technical development section during the month has been of a more or less rou-

(Continued on page 74)



CM2WA, A NEW CUBAN WAC CLUB MEMBER

Owned by Esquiel Santos, in Habana, this ten-watt station has worked the world from its central location. The self-rectified Hartley employs two TB04/10 tubes.

ternal brethren, hihi! If this note will help to relieve the blueness of the atmosphere around some of these uninformed shacks, well — there's this month's good deed.

There are always two sides to every question, so philosophers tell us. There most certainly are in this matter of DX. For instance, many amateurs residing in the midwestern or north central section of the United States tell us that for them DX is an unattainable quantity, owing to the vast remoteness of their location from far-distance foreign signals. They mean it, seriously, too.

Yet, nevertheless, some remarkable DX work has been done by middle western W's. The latest noteworthy example is a one-half-day WAC by Neil Werner, of W9AJA. It doesn't compare in actual performance, of course, with the work of G2UX, mentioned in the September is-

• CORRESPONDENCE •

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

The Decibel

1640-50 Walnut St., Chicago, Ill.

Editor, QST:

I have read with much interest the article in the August issue of QST entitled, "What Is This Thing Called Decibel?"

The writer's picture of the decibel may be of some interest, and is based on wire table ratios.

The B & S gauge, which is universally used for copper wire, very closely approaches the decibel ratio as regards area or cross section and consequent resistance. A change of ten decibels either multiplies or divides the power by ten, depending whether it is up or down; a decrease of ten sizes in the wire table multiplies the cross section or divides the resistance by ten. An increase of ten sizes does the reverse.

A three-decibel change doubles or halves the power, and a change in three sizes of wire doubles or halves the cross section and the resistance changes also by a factor of two.

Engineers who are accustomed to working with copper wire have these ratios well in mind, and the fact that the decibel ratio is the same as the wire table cross-section ratio allows a mental picture to be had directly from past experience, and does not require a complete new set of ratios to be memorized.

It should be noted that the wire table ratios are not exactly those given, the error being of the order of $\frac{3}{4}$ of 1%, which may be entirely neglected when ratios in multiples of unity are considered.

— John H. Miller, *Electrical Engineer, Jewell Electrical Instrument Co.*

Ultra-High Frequencies

412 Central Ave., Wilmette, Ill.

Editor, QST:

In response to your request for data on Barkhausen-Kurz oscillators, I am inclosing some information on experiments performed by myself at the University of Chicago.

I used the hook-up as given by Gill and Morrell in *Philosophical Magazine*, Vol. 49 (1925), page 369.

Using UX-199 tubes with approximately 7 volts on the filament, a plate potential of 16 volts and a grid potential of 90 volts, an oscillation of a wavelength of 90 cm. was measured and an oscillation of a wavelength of approximately 40 cm. was detected.

I believe that old 199 tubes will perform better than new ones due to the fact that under the strong electrical field produced by these ultrashort waves large quantities of gases are liberated from the internal elements of the tube causing them to go soft, whereas a used tube does not go soft so easily. It also may be mentioned that the filament potential was approximately 7 volts because an extremely large quantity of electrons is needed and this is the best way to secure them. Of course the life of the tube is greatly shortened.

Another phenomenon was noted; the tube does not go into oscillation smoothly but sort of breaks in.

This experiment was done under the helpful guidance of Dr. Hoag, to whom I am indebted for its successful result.

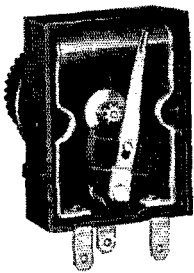
— Alfred Klapperich

A Suggestion for 'Phones

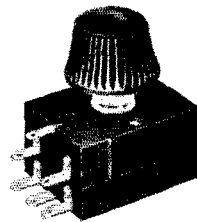
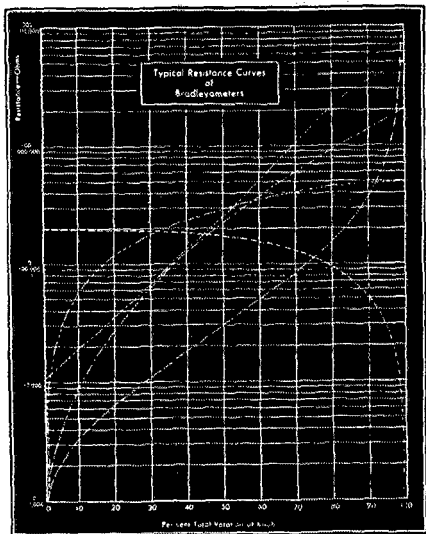
United States Naval Academy, Annapolis, Md.
Editor, QST:

Here is a suggestion that should interest the high power 'phone stations. So far as is known there is no organized transcontinental 'phone relay operating on regular schedule. I am offering here a tentative plan, the details of which might be worked out by Headquarters in conjunction with experienced amateurs interested in 'phone work who have the necessary high quality, high power stations, and the willingness and interest necessary to put across a plan of this sort.

The relay should operate on two successive nights, let us say Friday and Saturday, for example. Two or three stations on the East coast and two or three on the West coast would act as key stations. All messages to be handled by the transcontinental relay should be delivered to the key stations by a certain time on Friday evening, preferably rather early in the evening. With proper functioning of the relay, Eastward and Westward bound messages should be received at the other coast some time Friday night which would permit delivery by telephone on Saturday morning. Saturday night the relay would be repeated and answers to messages could be quickly handled back to their source. If the traffic warranted it, two transcontinental routes might be worked out, and a little competition as to efficiency in handling messages injected to spice things up. Alternate or substitute stations could be designated so that it would not be necessary



In the Bradleyometer approximately 50 solid resistance disks are interleaved between metal disks forming a resistance column of any desired value. No other resistor offers such flexibility or accuracy.



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Radio Resistors

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Fixed or Variable for any Electronic Circuit

BRADLEYUNIT RESISTORS are made in five sizes, with or without leads. All Bradleyunits are color-coded to meet set manufacturers' specifications. These solid molded resistors are accurately calibrated and have great mechanical strength. They are used by the world's largest radio manufacturers for providing correct C-bias, plate voltage, screen grid voltage and for use as grid leaks.

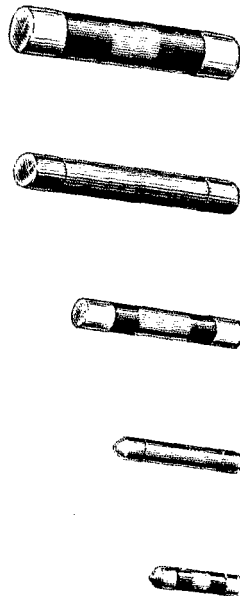
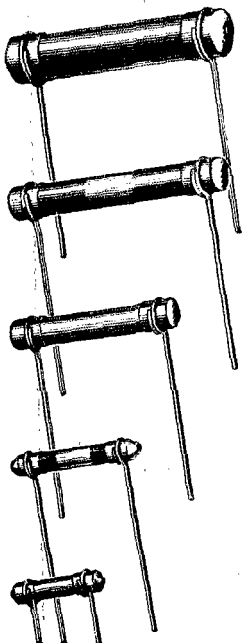
The Bradleyometer is a stepped potentiometer of most amazing performance. It has astounded radio engineers who were skeptical of its advertised performance. Any type of resistance-rotation curve can be arranged to meet your requirements. Samples will be sent to established manufacturers of electronic apparatus, for test and trial.

Get an Allen-Bradley quotation on your next resistor order.

Allen-Bradley Co.

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Milwaukee, Wisconsin

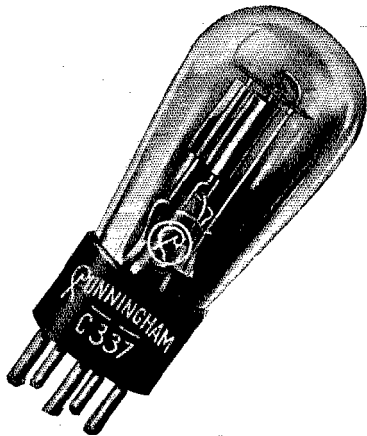


ALLEN-BRADLEY RESISTORS

Produced by the makers of Allen-Bradley Control Apparatus

Cunningham RADIO TUBES

RADIO'S MOTIVE POWER
SINCE 1915



C-337

DC Heater
General Purpose Tube
Operating Voltages

Ef — 6.3 Volts (DC)

Eb — 135 Volts

Ec — -9 Volts

A new general purpose tube, designed primarily for use in automobile radio receivers. It employs a cathode designed to insure uniform heating over as wide a range of heater voltage as possible, making it suitable for operation from automobile storage batteries under normal voltage variation during charge and discharge. Being of the cathode heater type, it has the added feature of general freedom from microphonic and battery circuit disturbances.

The mutual conductance of this tube is 900 when operated at the above voltages. C-337 is suitable for use as detector, amplifier, or oscillator.

E. T. CUNNINGHAM, INC.

A subsidiary of Radio Corporation of America
New York / Chicago / San Francisco
Dallas / Atlanta

for every station in the relay to be on duty two nights a week.

The idea here is not to turn the 'phone band over to traffic handling at the expense of the interesting conversations and contacts which make 'phone work so fascinating, but something of the sort suggested here is certainly necessary if the 'phone men want to have good material to back up their plea for a wider 3500-kc. band. Prove the utility of the 'phone and it won't be long before you have the necessary band allocation for satisfactory operation.

There would doubtless be trouble from interference and for that reason I have suggested that the call for volunteers be directed to high-power 'phones only. Stations interfering with the relay would be willing to stop sending for a while until the messages were cleared. I have found that most of the people on 'phone work have the true amateur spirit. Those who show that they haven't got it soon find it difficult to contact the worthwhile 'phones.

The very great utility of a transcontinental schedule of this sort is at once apparent. The prestige to amateur 'phone work that would result from the successful operation of this relay would more than compensate those interested for the extra hours at the microphone.

This letter should act as a starter and bring forth some interesting ideas on the subject. With the backing of Headquarters and some initiative on the part of the live wires in the 'phone game, the plan should produce something really worthwhile. Good luck to you all. I only wish that I were going to be in the States during the next two years so that I could do my bit to help things along.

— DeWitt C. Redgrave, Lieutenant, Construction Corps, U. S. Navy, Ex-3RW (Pre-war) and NZO

Appreciation

Naval Operating Base,
Hampton Roads, Norfolk, Va.,
Public Works Department

Editor, *QST*:

I have had several occasions recently to make use of your service in handling quite a little traffic to the Philippines, where I expect to be transferred soon. I feel that your organization is deserving of considerable praise in the very excellent work which you are doing. Mr. Bruce Stone, W6AMM, San Jose, Calif., has been extremely kind about handling the very considerable traffic for me and in transmitting replies to me from Manila.

— W. B. Howard, Jr., Lieut. (jg) (CEC)
U. S. N., Assistant Public Works Officer

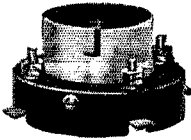
Be a Brasspounder

3389 E. Monmouth Road,
Cleveland Heights, Ohio

Editor, *QST*:

Well, gang, some breezy thoughts just blew into my mind, and maybe the Editor will let

LEEDS 50 WATT SOCKET



Heavy special porcelain base. Double phosphor bronze springs, high grade construction throughout.

Extra special price **\$1.50**

ALUMINUM PANELS

Cut to size

1/16" thick.....7/10c sq. in.
3/32" thick.....3/4c sq. in.
1/8" thick.....1c sq. in.
3/16" thick.....1 1/4c sq. in.

SPECIAL SHIELD CAN

5" x 6" x 9", special.....**\$1.85**
7" x 8" x 14", special.....**3.95**

Write for prices on many other sizes

Special 866 Filament Transformer **\$4.35**

Special Filament Transformer 10 Volts.....**\$5.65**

Filament Transformer. Has 3 separate 7 1/2-v. C.T. windings for crystal control transmitters, etc.
Special.....**\$8.50**

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EVERYTHING IN

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CARDWELL AEROVOX
SIEMENS CONDENSERS

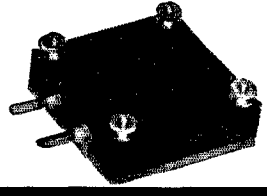
IN STOCK

Complete line of transmitting Grid Leaks and Bleeder Resistances. Write us for advice on size bleeder required — state voltage and amount of mills drawn.

LEEDS Precision Made Crystals & Holders

For that 1932 transmitter Holders as illustrated; sturdy construction, of bakelite and metal with contact surfaces that are truly flat. Accommodates crystals up to 1 1/4" and is completely dustproof. Fitted with G. R. pins to facilitate fast QSYs.....**\$3.45**

Oscillating crystals 1 inch square "V" cut ground to within 1% of the frequency you desire in the 80 or 160 meter bands. Output, accuracy, finish and stability fully guaranteed. A laboratory product at a **\$7.50** Ham price; only.....



COPPER COIL

Make your own transmitting coils. Copper tubing transmitting inductance.

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

Prices per turn

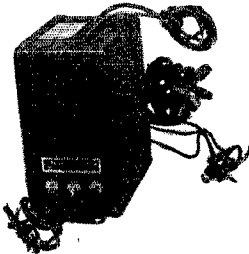
LEEDS 866 Type 2 1/2 volt Filament Mercury Rectifier Tube

Many new features such as wire mesh filament, etc. Every tube rectifier tested before shipment insuring satisfaction.
Special, each.....**\$5.00**

AIR GAP SOCKET

As described in May QST.
Special each **35c**

THORDARSON TRANSFORMERS



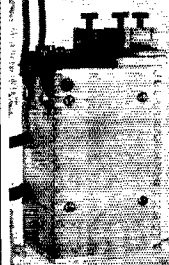
All Brand New T-2124-A — has 2-7 1/2 volt filaments, 4 amps each — 1 center tapped; also 2 heavy duty 30 H. 150 mil chokes. Weight 12 lbs. size 6 x 4 1/2 x 3 3/8" complete with mounting bracket and extension cord to socket.

T-2572 — same as T-2124-A only difference is — 1 single choke, 30 H. 200 mils. 2115 — 620 volts — center tapped. One 5 volt filament center tapped; two 30 H. 120 mil chokes; size 5 1/2 x 4 3/8 x 3", weight 8 lbs.

These transformers were made to sell from \$15 to \$20 each. Due to business conditions we bought them for a fraction of their value — all new — all guaranteed perfect — any one of them only.....**\$3.45**

Filament Transformer.....**\$8.50**

Special Filament Transformer.....**\$4.35**

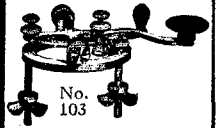


MESCO 1/2" Spark Coil

The coil of a 101 uses. Can be used as a peaked audio choke. For fixed condensers, etc. Many other uses will suggest themselves to the experimenter.
Reg. \$7.
Special **\$.75**

MESCO KEYS

Grand cleanup on these high grade keys; while they last.
No. 103 each... **95c**



FERRANTI

Power Transformers

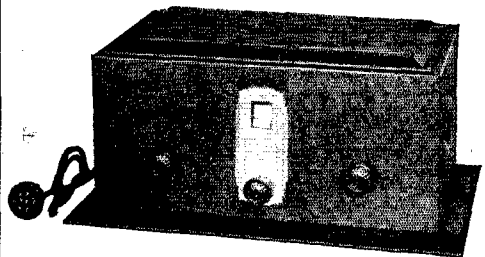
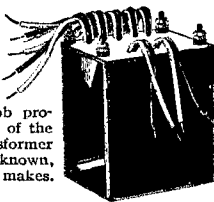
EXTRA SPECIAL OFFER **\$7.95**
List price \$40 each.....

This transformer is a quality job produced by a company making some of the finest radio equipment. The transformer should not be confused with unknown, overrated transformers of inferior makes.

Specifications:

Primary 110 or 220 volts a.c. 60 cycles
1-1300 volt center tapped 200 M.A., 650 volts each side
1-7.5 volts c.t. — 3 1/2 amps 1-2.5 volts c.t. — 4 amps
1-7.5 volts c.t. — 3 1/2 amps 1-1.5 volts c.t. — 2.5 amps
Total wattage 325 watts
Weight — 18 1/2 lbs. Size 5" x 6" x 6 1/4" overall

Complete line of Leach Relays in stock



NATIONAL Short Wave Receivers

All National Short Wave models in stock — including the new S.W. 3 — described in Sept. QST. Write for our special prices. D.C.S.W. 5 for use with the new 2 volt tubes; all wired.

A.C.S.W. 5 — National A.C. set, all wired.
Type 5880 A.B. Power Supply for use with A.C. short wave Thrill Box.

PLEASE PRINT YOUR NAME AND ADDRESS PLAINLY TO AVOID DELAY

WRITE FOR SPECIAL PRICE LIST

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

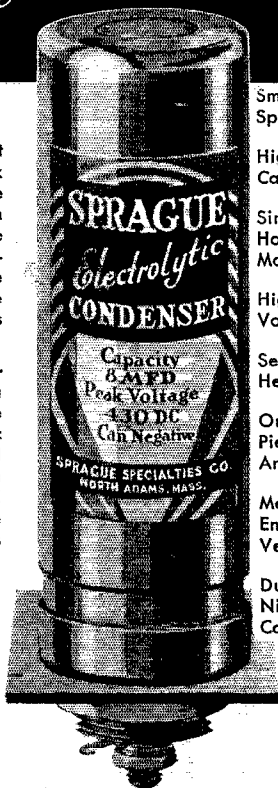
LEADING
Radio Receivers
are equipped with
SPRAGUE
Electrolytic CONDENSERS

THINK of the greatest names in radio—think of the names that have made radio history both because of the excellence and wide sale of the product—and because of the high standards of the manufacturing companies themselves.

MOST of these names—most of the outstanding radio manufacturers—use the Sprague Electrolytic Condenser as standard equipment because in efficiency, economy and absolute uniformity, the Sprague Condenser gives greatest satisfaction.

Let us give you full information about the Sprague Electrolytic and Paper Condensers, including illustrated booklet, diagrams, etc.

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Small Space
High Capacity
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Metal Enclosed Vent
Dull Nickel Can

me pass them along to you. It concerns three branches of our game that seem to be troubling beginners, not to mention some old timers. I am referring to the originating, relaying, and delivering of messages.

Most brethren have no trouble originating messages, since one can always find some love and kisses to send to one's friend some place in southwest Podunk, Minn. The exact address is not important, as the main object is to get the message off your hook before the love cools and the kisses sour. The proper way to start a message on its way is to call CQ East, West, or indifferent. Always make CQ's long, continuous affairs. Remember that the law of averages proves the longer a CQ, the more listeners you will have. Don't worry about being tuned out, because a fellow leaving you after only twenty or thirty CQ's will not be patient enough.

Relaying is not as important a matter, but some hints to that effect would not be amiss. Even when conditions are excellent and you copy the message 100%, ask for some fills. It shows that you are interested. When a message is copied only in places ask for the whole works again. And again.

If you should get only two or three words, don't ask for a full repeat, but rather tell him the words you have, ask what words he has, and what he wants you to get. This brings about a fair exchange, no robbery.

When you get a relayed message with the date—well, slightly out of date, advance it a few weeks, so the recipient (not the wastebasket, you lid) will believe the amateurs beat the mail.

If you are in a hurry to get a message off your hook and the air sounds like a bunch of Mōdel T horns, always remember the space just above and below the band is usually clear. You won't need a frequency meter to move the transmitter. The double O will tell you, and if he won't—the R. I. will.

Never keep a file of your messages. Someone will always be asking you what you sent so-and-so, but if the evidence has been destroyed you may politely inform said so-and-so the wx must be getting on his nerves.

Now, we come to this touchy subject of deliveries. Much has been written in *QST* about how, when, and why to deliver a message so little need be added here. However, never deliver a message when you get it, as your time can better be spent CQ'ing. Use the time when the air is dead to deliver. You will need plenty of time. F'r instance, if you attempt to 'phone, if and when she gets the right number, you may be greeted by "Hallo—whoosis—no I donna hoperhate no raadio—vel than, watis? love—huh—wazat—and kisses—say fresha ting, I calla my husband, etc." Hang up and throw the message in the wastebasket.

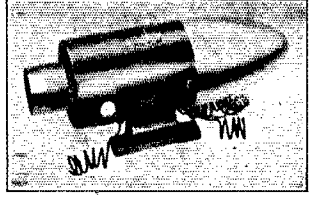
Now that you have absorbed these hints, try them on the next fellow you work and watch for his letter in the Correspondence Department.

— Walter Schwalm, W8ADJ

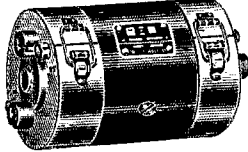
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Generator, air plane, Signal Corps, with shaft, can be used as motor, 13 volt 33.6 amps. 5000 R.P.M. \$10.00
 Generators, 12 volt, 60 amp., has automatic controls \$20.00
 Double filter RCA chokes, contain two 30 henry 80 mill chokes. Weight 6 lbs. \$9.50
 Ammeter, Weston No. 425 thermo-couple 0-2 amp., incl. on large bakelite base with D.P. hi voltage switch. \$7.50
 Ampere hour meter, Sangamo, battery charge and discharge, type MS 0-500 scale, capacity 15 amp. \$10.00
 Milliammeter, Westinghouse, 0-150, surface mtr., b. con. \$5.00
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 Motor generator Holtzer-Cabot, 110 D.C. 220 A.C., 500 watt, 500 cycle. Ball bearing. \$50.00

Complete line 500 cycle motor generators 1/4 to 5 K.W.
 Transformers, Simon, 220 to 11,500 closed core, 1/2 K.W., 500 cycle, "pancake" secondary \$5.00
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 Transformer, West. Elec., output, No. 102-A, 4 to 1 ratio \$3.50
 Transformer West. Elec., output, No. 202-A, 5 to 1 ratio \$3.50
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 Condensers, transmitting, Maradock .002 mfd. 12,000 volt, ideal for plate blocking. \$2.50
 Condensers, Wireless Specialty, copper glass Leyden jar, 10,000 working voltage .002 mfd. \$2.00
 Condensers, West. Elec. 31 A.A., 1 mfd. 1000 volt A.C. test. \$1.00
 Headphones, West. Elec. No. 194V same as C.W. 334, 2200 ohms, D.C. slightly used. \$5.00
 Western Electric Radiophone Transmitter unit, 320 W. Special \$1.50
 Dynamotor, aircraft 32/275 volt, with shaft. \$5.00

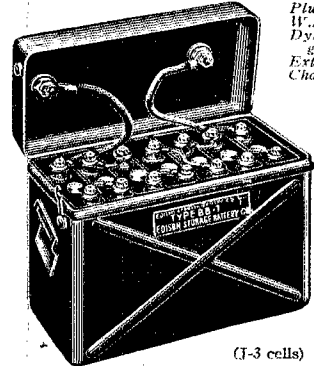


Navy Aircraft Dynamotor, Gen. Elec., new, 24/1000 volts, 1 amp., extended shaft with pulley, giving 24 volts output for Hammett and 1000 volts for plate or driven by its own input of 24 volts. Value \$250.00. Our special price. \$50.00

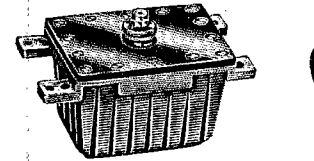


Western Electric Dynamotor System No. C.W. 927. Two 32/350 volt dynamotors in shock-proof hanger. May be used in parallel to give 160 mils at 350 volts, or in series, giving 80 mils at 700 volts. Can be used to operate transmitters up to 50 watts power from 32 volt D.C. mains. Ideal for Deleo systems. Two dynamotors in hanger. \$15.00
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U. S. Navy headphones, excellent for practice and instruction purposes, pair. \$7.75
 Coils, Choke, West. Elec. Co. 57C, .83 ohm, 2 windings. \$7.75
 Choke coil West. Elec. No. 65A, 1800 ohm, 12 henry. \$2.00
 Choke coil West. Elec., No. 66A, 85 ohm 1.3 henry \$1.50
 Choke coil West. Elec., No. 64B, 11 ohm 1 henry. \$1.50
 Souders, Signal Corps, 20 ohms, adjustable. \$2.50
 Spark transmitter, complete, airplane type, rotary gap, transformer, mica condenser, 200 watt 500 cycle with Gen. self excited ball-bearing. \$25.00
 Generator, Westinghouse 110 volt, A.C. 900 cycles, 200 watts self excited. \$15.00
 Generator 1/2 kw. 500 cycle, 300 volt, self excited can be hand driven. \$25.00
 Voltmeters, D.C. portable new Weston model 45, 3 scale 0-3-15-150 guaranteed 1/4 of 1% accurate. \$35.00
 Ammeters, D.C. portable, new Weston model 45, 3 scale 0-1.5-15-150 with 3 scale external shunt and leads 1/4 of 1% accurate. \$35.00
 Headphone, Radio School, leather head-band, 75 ohm. \$1.50
 Keys, transmitting, Navy, back connected on buketite base, 2 kv., 5/8-inch silver contacts. \$5.00
 Receivers, Navy, C.N. 240, 1000-10,000 meters. \$35.00
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 Switchboard, 8 line portable Western Electric, magnet rining, dry cell talking circuit; 8 drops, 20 anti-capacity 12 to 10 terminal keyswitches, regular price \$175.00, special. \$30.00



NEW Edison Storage Battery, Type EB-1, 10 volt, 37 amp., contains 7 cells. Complete in steel portable case. \$15.00



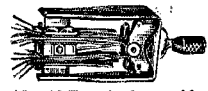
Condensers, Mica, op. volts 12,500 cap. .004
 Dubilier, new. \$17.50
 Dubilier, used. \$15.00
 Wireless spec. new. \$15.00
 Wireless spec. used. \$12.50
 Condenser, Dubilier, mica, volts 40,000 cap. .0012-.001-.0008 or .003. \$25.00
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Special: — Only a few left! — Magnetos, W. Elec. four bar hand crank. \$2.50

Largest Radio Electric Supply House in U. S. on Army Navy Surplus. Sufficient postage and deposit of 20% required on C. O. D. orders. No orders shipped for less than \$1.00. CANADIAN ORDERS MUST INCLUDE FULL REMITTANCE — WE DO NOT ISSUE CATALOGS.

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Say You Saw It in QST — It Identifies You and Helps QST

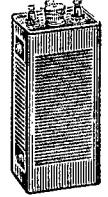


Also 12 Terminal, one side momentary other closed. \$95

ANTI-CAPACITY SWITCHES W.E. 12 and 16 Terminals, all with Platinum Contacts, value \$3.50 each. Our price, 95¢ each. Lots of O. \$5.00



Holtzer-Cabot, "Mike" Utah type, carbon granular transmitter. Special \$1.50

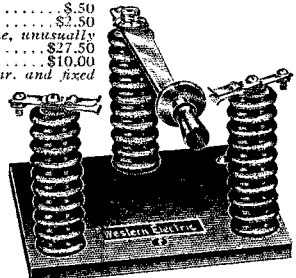


Edison Storage Battery Cells

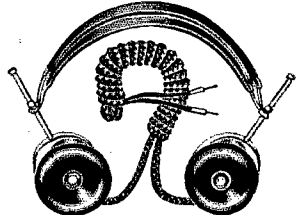
Type A-4, 1.2 volts, 175 amp., nickel alkali. \$3.50
 Type A-6, 1.2 volts, 225 amp., nickel alkali. \$4.00



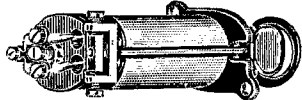
Type M-8, 1.2 volts, 11 amp., never used, per cell. \$1.50
 Type L-40, 25 amps. new \$2.00



Lightning Switch, High Grade, W. E. Heavy Copper Blade and Contacts. Size 7 x 8 x 6 high. While they last, \$35.00



Baldwin Headphones, Genuine Mica Diaphragm 2000 ohm. Regular \$15.00 value. \$4.50

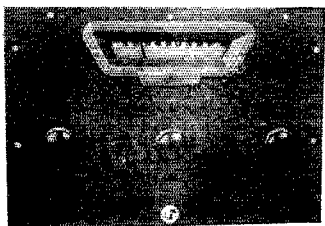


Western Electric Signal "Drops" 1000 ohm, Type D-12 can be used as relay. \$1.00

Condensers, W. Elec. type 31A, 1000 volt A.C. test, three caps: 125, 25, 5. \$1

Your Receiver

AMATEUR **REL** SPECIAL



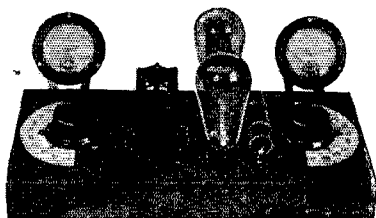
CAT. No. 278

Pulls 'Em In When Others Don't

Screen Grid Radio Frequency Type UX-236
Screen Grid Detector Type UX-236
Pentode Power Audio Type UX-238
Full Vision Illuminated Noiseless Dial
Absolute Spread of 20, 40 and 80 Meter
Amateur Bands
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100 Wilbur Ave., Long Island City, N.Y., U.S.A.

The Card Situation

Box 979, Riverhead, N. Y.

Editor, *QST*:

Every once in a while a letter regarding the QSL situation appears in *QST*. I wonder if I might be permitted to express my views on the subject? In the I.A.R.U. news of the June issue, a request is made in the German report to amateurs overseas to at least reply to reports received from German receiving stations. Most of the amateurs in that country are confined to sending reception reports to other stations. Naturally they derive no great satisfaction from merely sending out reports. They might as well throw a handful of QSL's out of the window as to send them and never know whether or not they arrived at their destinations. In fact, throwing them out of the window would be much better, because then they would know that they had not wasted their time sending a report to someone who did not appreciate it enough even to say, "thank you." Remember, fellows, whenever you receive a report, someone went to a lot of trouble to make out that report and send it. Is it asking too much that you take a few minutes of your valuable time and show him that you appreciate his effort by acknowledging it? Let's do all we can to encourage the amateur spirit.

In the same issue the South African amateurs complain of poor QSLing on the part of W stations. I should like to make the same complaint against stations in general, but especially those in Europe and Australia. The South Americans are not quite so bad in this respect. In 1927-28, when I operated 9EFW, I worked several score Australian and New Zealand stations. I was fortunate enough to receive QSL's from almost every one of them. QSL interest seemingly has diminished since then. I have had my station here in operation since February. Of several Australians worked, only 2 cards have been received. Quite different from the former record. From 10 stations worked in Germany, Belgium and Holland, not a single QSL has been received. Of 14 G's worked, 6 cards received. Not quite so bad, but surely not gratifying. Here, however, is something that should discourage almost anyone. Out of 10 French stations worked, only 1 lonely card has reached me. The only station worked in Africa, on 7 mc., has not confirmed our contact. Some day I may need that confirmation to win the coveted WAC certificate. Of course it must be understood that all these stations have been allowed more than ample time for their cards to arrive.

I wonder if others have noticed any falling-off in QSL activity. After an absence from the air of two and a half years, it certainly does seem to me that there is a difference. An unfortunate thing, surely! QSLing is a five activity. To me it is half the fun. I get just as much kick out of receiving a card now as I did when I got that first one. The joyful feeling they create in me hasn't lessened one little bit. If anyone ever expected a card from me and did not get it, it was only because it got lost, or that I could not get the QRA somewhere.

UNCLE DAVE

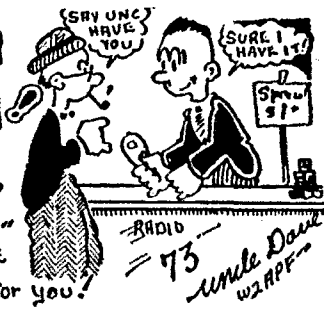
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The fact is that I should greatly appreciate a request for one from any station that should have received a card and did not. That is sometimes the only way one learns that the fellow at the other end didn't get his QSL. Another thing, fellows, don't wait for the other station to QSL first. You know what would happen if everyone did that. Not a single card would ever be sent.

Let us not let this fine custom that grew up with amateur radio die out. If it does, I am afraid that it will be the beginning of the end of amateur radio. Let's keep it alive and going. There is no better way of encouraging the amateur spirit. In December, 1922, *QST*, the editor, in a note to a letter, said, "Sending a card is rendering a fellow amateur a service and it may mean a record for him."

— Arthur M. Braaten, W2BSR, ex-9EFW

Calls Heard

307 W. Sherman Ave., Peoria, Ill.

Editor, *QST*:

I have noticed a letter of W3QP and also one from W9CMQ, and I do not agree with their idea of doing away with Calls Heard. Every now and then for the last six years or so, some one gets a brilliant idea that the Calls Heard Department is useless and stale. The only way I know if I am getting out is through Calls Heard, as I never get a card or any report, and I have been in the game for eleven years. We all don't or can't work DX due to conditions, and when we do it feels mighty good to be in the Calls Heard.

They say the space could be used for more articles that are more valuable. If they would look through back issues of *QST* and compare with some of the present articles and call these present articles new, then I'm from Missouri. *QST* has been harping on 5-, 10- and 3/4-meter stuff for the last six years or so, and of what use are they? No one seems to care or use these bands, so why not leave these articles out and put in more space to Calls Heard?

The amateurs will never use these bands, so why waste all the time on these useless bands? If it would be on some new improvements on the 20-, 40-, 80- or 160-meter bands then I would say leave Calls Heard out or add more pages to *QST*.

— Fred C. Roeger, W9BIR

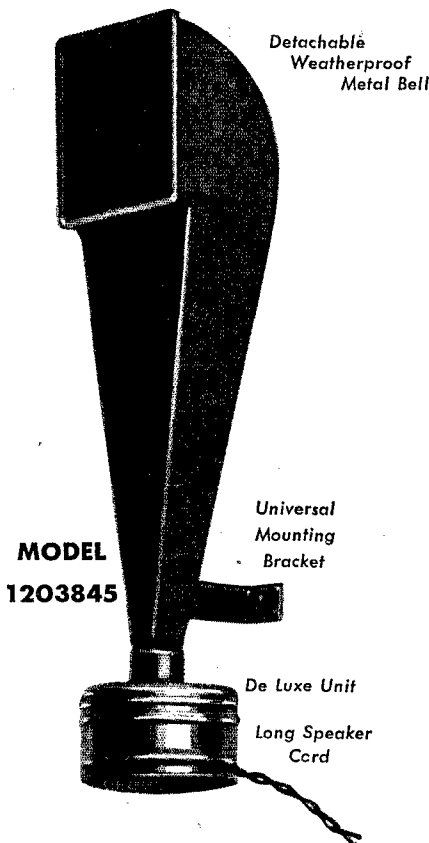
1329 Teaneck Road, West Englewood, N. J.
Editor, *QST*:

I always have been interested in DX, so have naturally felt some qualms at the recent reference to the foolish idea of eliminating the Calls Heard column from *QST*. Foolish? Yes! Because it is not only technical knowledge that makes amateur radio interesting — not by far! The interest and encouragement that Calls Heard offers us cannot be so easily substituted. You will find that 90 percent of our active hams look to this column before any other page in *QST*, and the cry to my

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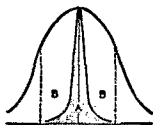
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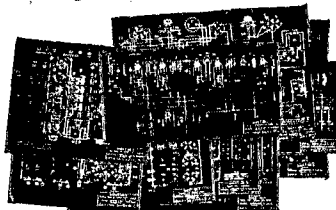
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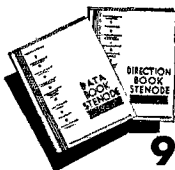
Down on the Ham bands, that's where the noise begins. But—STENODE selectivity never lets it get amplified. Dr. Robinson's new principle of radio reception permits most amplification of signals with least amplification of static and other interference. Study STENODE'S selectivity curve as compared with the so-called 10 KC selectivity of the best present day supers. Practically dead silence between stations. —No background noise. Yet by Dr. Robinson's amazing new method of audio compensation high audio frequencies are heard better than ever before.

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knowledge has been for more, not less, of this page.

To a veteran, or a WAC certificate holder, this may seem rather far-fetched, but I will bet it was mighty interesting the first time your call was heard in a far-away land. Let's not lose sight of the weight this column carries with our new hams. Let's keep Calls Heard!

—C. Brewster Lee, W2ADP

A Flexible Unit System of Transmitters

San Francisco State Teachers College,
Buchanan and Walker Streets

Editor, QST:

In the last year I have built about a dozen different transmitters and so have arrived at a scheme which will avoid much waste of time in tearing down and building up. Here it is:

Take two baseboards (my size is 8 x 15 inches) and obtain four 3/4 x 3/4 inch pieces each about 7 inches long. These latter are to be supports for the upper shelf. Put these together and you have a lower and upper shelf. Put rubber bumpers on the lower shelf and mount a small panel perpendicular to the upper in case you wish meters or indicating dials to appear on the front.

Now, here's the secret of this plan. My power pack for any transmitter is mounted on a separate baseboard which will just fit snugly on the lower shelf. It has five terminals brought up to the upper shelf by flexible cords (two h.v. and two fil. plus center tap). Thus the power pack can be used on this set by simply screwing it down on the lower shelf and attaching the five terminals. It can be removed in about two minutes and placed on another transmitter also of the same double shelf plan, thus making it possible to have several different sets available, or having an emergency outfit in case the regular one goes out.

I find that the flexibility is well worth while, though I have only used it on small low-powered outfits. Perhaps some of the boys can extend the idea to bigger ones. For example, a separate unit could be hooked ahead to take care of a m.o.p.a. Another inherent advantage is the saving of table space and that is of importance in many localities.

—C. S. Mundt, W6ZI-W6ZJ

A Word from Australia

Singleton, N. S. W.

Editor, QST:

I have often read criticisms regarding the use of CQ DX, none of which seems to see the proper aspect of the case. I call CQ DX, firstly because I wish to attract the attention of DX stations and, secondly, to let them know I will search all the band carefully and not only notice the loudest signals.

I've noticed W stations coming in here FB calling CQ, but have never raised them for the sim-

Amateur's Bookshelf

GOOD TEXTBOOKS and operating manuals should be on every amateur's bookshelf. We have reviewed practically all the books in which the amateur would be interested, and have arranged to handle through the *QST* Book Department at A.R.R.L. Headquarters those volumes which we believe to be the best of their kind. Take pride in a small but good radio library; buy a few good books and get into the habit of reading them.

Principles of Radio, by Keith Henney. This book is chock-full of meat for the experimenter. The subjects treated range from the fundamentals of electricity to the most modern concepts of modulation and detection. 477 pp., 306 illustrations. **\$3.50**

Elements of Radio Communication, by Prof. J. H. Morecroft. This is a new book by the author of the "Principles" listed below. It is about half the size of the larger work, and the subject is treated in more elementary fashion. Simple algebra is sufficient. An excellent book for the "first-year" student. 269 pp., 170 illustrations. **\$3.00**

Principles of Radio Communication, by Prof. J. H. Morecroft. An elaborate general textbook, and one of the recognized standards on theory for the engineering student. A working knowledge of mathematics is desirable for the reader who expects to get the greatest benefit from this work. 1001 pp., 5¾ x 9. **\$7.50**

Radio Engineering Principles, by Lauer and Brown. While not as voluminous as "Morecroft" this excellent general textbook on radio principles is the favorite of many students. A moderate knowledge of mathematics is desirable. 300 pp., 5¾ x 9. **\$3.50**

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Radio Theory and Operating, by Mary Texanna Loomis. Although giving a moderate amount of theory, it is essentially a practical handbook for commercial and broadcast operators, and as such ranks among the foremost publications of this sort. Used as a textbook by many radio schools. A good book for any amateur. 1000 pp., 800 illustrations. **\$4.25**

The Radio Manual, by George E. Sterling. Another excellent practical handbook, especially valuable to the commercial and broadcast operator, and covering the principles, methods and apparatus of all phases of radio activity. Over 900 pp. **\$6.00**

Radio Telegraphy and Telephony, by Duncan and Drew. Still another work along the lines of a general practical handbook. In size it is approximately the same as the two listed just previously, and the subject matter generally follows along the same lines. A good book in this class. 950 pp., 468 illustrations. **\$7.50**

Practical Radio Telegraphy, by Nilson and Hornung. Written particularly for the student training for a commercial license, and covering theory and apparatus. A practical handbook. 380 pp., 223 illustrations. **\$3.00**

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Thermionic Vacuum Tube, by H. J. Van der Bijl. For many years this has stood out above all other works as a theoretical textbook and treatise on the vacuum tube and vacuum tube circuits. A knowledge of higher mathematics is required. Not a book for the beginner, but for the laboratorian and engineering student it is without a peer. **\$5.00**

Radio Operating Questions and Answers, by Nilson and Hornung. Revised Edition. This is intended as a companion volume to "Practical Radio Telegraphy" by the same authors. In conjunction with that work it should leave the commercial license applicant well prepared for his examinations. There is a chapter on amateur license questions and answers, too. 267 pp., 5½ x 8. **\$2.00**

How to Pass U. S. Government Radio License Examinations, by Duncan and Drew. Intended as a companion volume to "Radio Telegraphy and Telephony" by the same authors, as a guide to the applicant for commercial licenses. It is not a text in itself. The chapter arrangement follows that of the sections of the commercial theoretical examination, each being made up of typical examination questions and their answers. 169 pp., 92 illustrations. **\$2.00**

Theory of Radio Communication, by Lt. John T. Filgate, S.C., U. S. Army. An excellent book on the theory of receivers, transmitters and associated equipment for those familiar with elementary electricity and magnetism. 250 pp., 180 illustrations. **\$2.00**

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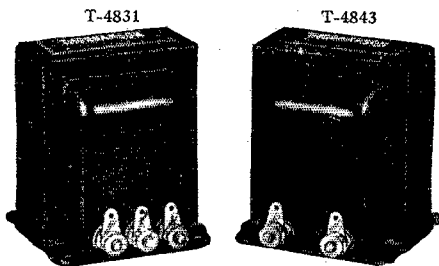
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ple reason some other W on the opposite coast with an R9 signal is bound to call and the W station calling is soon QSO him. He does not seem to realize that a VK may be calling him and he does not expect them to. Hence CQ DX is more than anything else an indication that the calling station is going to listen carefully.

Now considering the low cost of gear in U. S. A. it's a shame more of the gang does not go in for good notes. Gear in Australia is very expensive, and yet VK signals are generally of a very high order. It makes me shudder to think how those prehistoric signals must tear up the band over there. If anyone comes on with a punk note here he is promptly told, and soon improves his note and popularity. Hi.

I have always found that the W gang are very keen and all FB fellows. W7VT hung on to me the other night for an hour to take a message for W1MK. It had to be repeated seven times.

It makes me envious to read of the hamfests you have in U. S. A., and if I lived over there I think I would spend my time attending them all.

Cheerio for now and very best of luck to QST and all the W gang.

— A. S. Mather, VK2JZ

I. A. R. U. News

(Continued from page 61)

tine nature, although considerable progress has been reported on the matters indicated in last month's report. Work on VK3WI, which will be the official HQ station for F.H.Q. in addition to that of the Victorian Division, is proceeding satisfactorily and should be on test within a couple of weeks. The sub-standard meters and oscillators are also progressing satisfactorily.

It is interesting to note that experimental work on 56 mc. is being inaugurated in several states. Both 'phone and c.w. are being used, and results are promising. The Queensland Division makes the most complete report to date.

British Report

By J. Clarricoats, Hon. Secretary R.S.G.B.

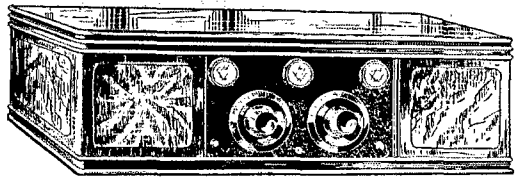
Preparations have now been made for our Sixth Annual Convention which is to be held in London on September 25th and 26th. Overseas visitors will be especially welcomed and we hope all who can will make the journey, for we assure all who visit us that R.S.G.B. conventions are meetings never forgotten. The National Radio Exhibition is to open in London on September 18th and, as in previous years, the R.S.G.B. stand will be the meeting place for all amateurs.

Amateurs throughout the world will be interested to hear that the Premier Trophy of the R.S.G.B. has been awarded this year to Mr. Harold Old, G2VQ, in recognition of his fine B.E.R.U. work with Australia, New Zealand and other parts of the Empire, and also as an appreciation for the services he has rendered the home membership in his capacity as Provincial Districts Manager.

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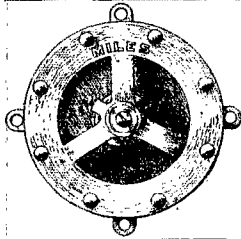
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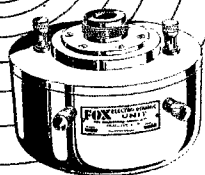
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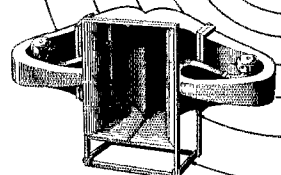
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**The American Radio
Relay League
West Hartford, Conn.**

The Wortley-Talbot Trophy has been awarded to another well-known amateur, Mr. R. A. Bartlett, G6RB, in recognition of his work on 3.5 mc. and particularly for his contact with New Zealand on that band.

The 1.7 mc. transmitting and receiving trophies have been won by Mr. J. B. Scott, EI7C, and Miss B. M. Dunn, G6YL, respectively. Owing to poor results on the 28-mc. band during the society's tests, the Powditch Trophies will not be presented this year. We hope to organize a further series of tests in the autumn, and make the awards at the annual general meeting.

We have the honor to record that the South African Radio Relay League was the first national society to be elected to the B.E.R.U.

Commission Orders Affecting Amateurs

(Continued from page 20)

the requirement, however; a failure to do so may, at the least, cause the loss of a cherished call.

Another order of amateur interest relates to the employment of licensed operators and is here reproduced in its full text:

GENERAL ORDER No. 113 (May 11, 1931)

It Is Ordered:

I. All stations licensed under the Radio Act of 1927 shall keep the licensed operator or operators of the grade specified by the Secretary of Commerce on duty during all periods of actual operation at the place where the radio transmitting apparatus is located; provided, however, that in the case of a remotely controlled transmitter delivering power to the antenna not in excess of 1,000 watts, operating on frequencies other than those in the broadcast band (550 to 1500 kc.), the Commission may authorize such operator or operators to be on duty at the control station during all periods of operation of the station if and when

(1) the transmitter can be properly operated in accordance with the terms of the station's license, and

(2) the transmitter will be monitored from the control station with apparatus which will permit placing the transmitter in an inoperative condition in the event there is a deviation from the terms of the license, in which case the radiation of the transmitter shall be suspended immediately until corrective measures are effectively applied to place the transmitter in proper condition for operation in accordance with the terms of the station license, and

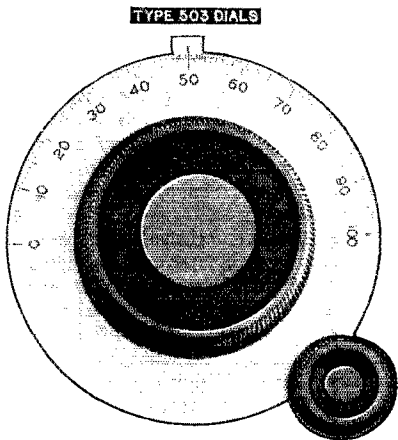
(3) the separation between the transmitter and the remote control station does not exceed five miles by air line distance, and

(4) the transmitter is so located or housed that it is not accessible to other than duly authorized persons.

II. A licensed operator in charge of the transmitter on duty as specified hereinabove may be employed at the discretion of the licensee for additional operator's duties commensurate with the grade of operator's license which he holds.

III. The person manipulating the transmitting key of a manually operated radiotelegraph mobile or amateur transmitting station shall be a regularly licensed operator. The licensees of other stations which are operated under the constant supervision of duly licensed operators may permit any person or persons, whether licensed or not, to transmit by voice or otherwise, in accordance with the type or types of emissions specified by their respective licenses.

The feature which here interests us most is the last paragraph. The owner of an amateur 'phone station is now authorized to permit an unlicensed person to speak over his 'phone station, that is, to actuate the microphone, provided a licensed operator is at all times in charge of the apparatus and supervising the operating. This clarifies what



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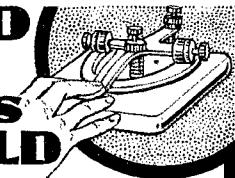
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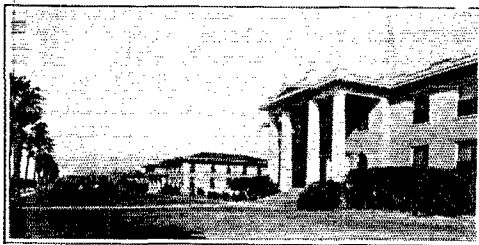
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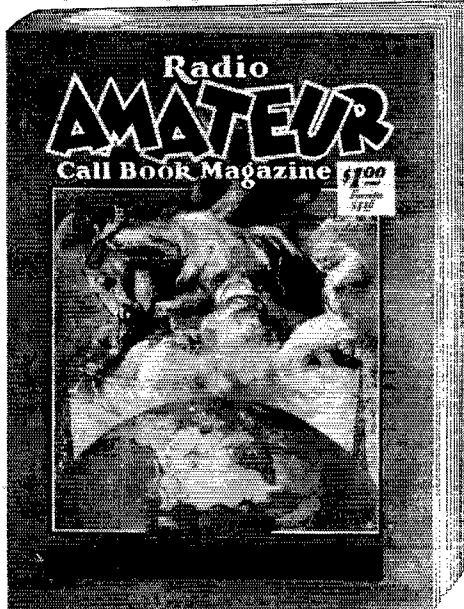
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has been a doubtful point, since in general terms only a licensed person can actuate an amateur station, and the license of course requires a knowledge of code. *It is important to note that this permission applies only to "third parties."* It does not mean that amateurs engaging in 'phone operation do not need to be licensed, or are relieved from the necessity of knowing the code. Every amateur station, including stations which work only with voice, must be in charge of a licensed operator of amateur grade or higher, and the minimum code requirement under any such license is ten words per minute.

The first section of G. O. 113 also has an application to amateur stations employing remotely controlled transmitters. "Remote" is not defined, but it would not seem that a transmitter is remotely controlled within the intention of this order just because it is in the next room, the attic or the basement, or in a "dog house" at the far end of the back yard. However, if it is in the next block or 'cross-town, the provisions do apply: there must be another licensed operator at the transmitter unless special authorization is obtained from the Commission. This special authorization may be obtained if the installation complies with the four requirements cited. However, if the transmitter is more than five miles from the control point, a second operator is in any event required at the transmitter location.

K. B. W.

A Receiver for Beginners

(Continued from page 12)

to the amplifying tube. The test for the latter condition may be made quite simply by pulling out one of the phone tips from the Fahnestock clip; if a loud click is heard the amplifier plate circuit is OK. To check for any of the other possibilities the piece of apparatus under suspicion should be taken out and tested. This may be done with a dry cell and a pair of phones, which should be put in series with the condenser or transformer winding being tested. There should be no pronounced click in the phones when testing a condenser, but there should be a readily noticeable click through transformer windings. These tests usually will indicate where the trouble lies. If the parts used are known to be in good condition and are the same values as those shown on the diagram there should be no occasion for trouble-shooting. Should everything check out satisfactorily but the detector still refuses to oscillate try using a plate coil (L_2) with a few more turns.

The detector is most sensitive to signals when the regeneration control is set at the point where oscillations just start. In searching for signals, therefore, the tuning dial and regeneration control should be worked simultaneously so the tube is always just barely oscillating. It may take a little practice to get the knack of tuning down to a fine art, especially on the coils which cover the higher frequencies, but there is nothing difficult about it.



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Mfd.	800v.	1000v.	1500v.	2000v.	3000v.
1	\$1.10	\$2.00	\$2.95	\$4.25	\$6.75
2	\$1.55	\$3.00	\$3.95	\$6.15	\$10.25
4	\$2.75	\$4.00	\$5.50	\$8.70	\$16.00

All above in heavy metal containers with large terminal insulators. All condensers tested at 40% overload before shipment. All guaranteed.

MILLIAMETERS 0-100, 0-200, 0-300, 0-400.

Each.....\$1.00

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DOUBLE BUTTON MICROPHONE

Frequency range 60 to 4000 cycles. Price \$9.00

Set of 8 microphone springs.....\$2.25

5000, 10,000, 15,000 ohm transmitting grid

leaks, 85 watt rating, each.....\$.65

UX or UY sockets.....\$.10

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Neon tubes for wavemeters in handy carrying case.....\$.50

8 Mfd. electrolytic condensers, each.....\$.95

Dials 3" — \$.15, 4" — \$.20, 5" — \$.30 each.

RCA UX230, 231, each \$1.20. UX232, each \$1.60

RCA power chokes, 25 henrys at 200 mills \$2.50

5 henrys at 750 mills. Shipping weight 18 lbs.

All fully mounted and shielded.....\$3.00

1" Square cut Quartz Crystals 3500-4000 Kc.

Accuracy guaranteed 1/10 of 1%. Price, each \$4.40

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INTERFERENCE FROM BROADCAST STATIONS

Sometimes local broadcasting stations cause a great deal of interference, especially when the lower frequency coils are being used. A simple but effective cure for such interference is the old-fashioned wave-trap. The trap is simply a coil and condenser which will tune to the frequency of the broadcast station causing the trouble, and is inserted in the antenna lead-in. It acts as a rejector circuit and prevents the unwanted signal from getting to the receiver, although having no effect on signals of other frequencies. The values shown in Fig. 2 will be effective over the entire broadcast band.

WHAT TO LOOK FOR

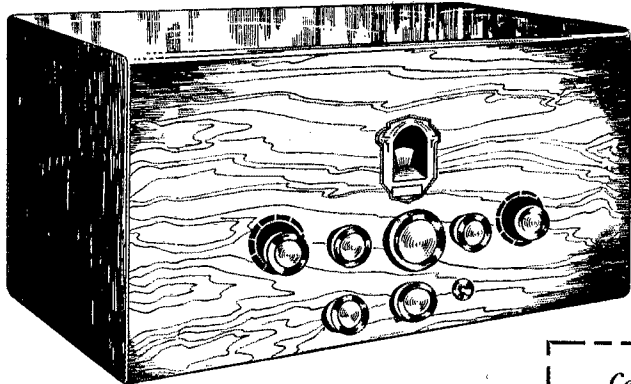
The set of coils covering 1600-3000 kc. includes the 1750-kc. amateur band. Current *QST*'s give schedules of amateur stations broadcasting code practice on this band for beginners, or this information may be obtained by writing to the Communications Department, 38 LaSalle Road, West Hartford, Conn. Very few commercial or government stations sending "code" will be heard on these coils.

There is a great deal of amateur and commercial activity on frequencies between 3000 and 5000 kc., and the pair of coils covering this band offers plenty of opportunity for code practice at moderate speeds. On the higher frequencies commercial stations predominate and may often be heard working at slow speeds. In addition short-wave broadcasting stations may be picked up, along with the transatlantic telephone stations. Amateurs on the 7000-7300- and 14,000-14,400-kc. bands may be heard as well. With a good ground and an antenna of reasonable length — 50 feet or more — there should be no trouble in picking up stations on one set of coils or another at any hour of the day or night.

The Maritime Division Convention

WHAT we lack in numbers is more than made up in enthusiasm as evinced during the Maritime Division Convention held at the Lord Nelson Hotel, Halifax, on Friday and Saturday, June 19th and 20th. With the arrival of our Canadian General Manager, Alex. Reid, VE2BE, the gang for the first time had an opportunity of meeting him and received a complete report of the Board of Directors' meeting as well as Canadian affairs. Visits to ham stations disclosed the fact that every station is thoroughly modern and the fellows take pride in their amateur radio. When old Joe Fassett and Alex. Reid met it was just like the meeting of two lost brothers. That's the kind of friendship amateur radio makes. It was evident from the very first that those present believe a convention is a place to have a good time and Art. Crowell, the Chairman, so planned the program. There was staged at Bedford a golf game which proved most interesting; the honors went to Frank Eaton (a beginner in the ham game, but no novice at golf) and Alex. Reid made the second place.

CQ-CQ • AMATEURS LOOK! • CQ-CQ



SPECIAL AMATEUR RECEIVER

An E. M. Sargent Design, a High-Grade Receiver built for Station Owners Who Want the BEST.

LOOK AT THIS LIST OF FEATURES:

1. Absolute "One-Spot" Tuning.
2. 10 K.C. Selectivity.
3. A Real Band Spreader that Operates on the Large Vernier Tuning Dial.
4. Tap Switch Control for Waveband Selection.
5. Especially "Peaked" for Highest Efficiency on 10, 20, 40, 80 and 150 Meter Bands.
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Cable Address "RADIOSTRUX"

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I am interested in your Short Wave Models, particularly the
... CONVERTERS ... ALL-WAVE RECEIVERS
... SPECIAL AMATEUR RECEIVERS
Please send me complete details:

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Address.....
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What Amateur and Commercial Radio Operators Can Do After Taking the CANDLER System Course

They can make perfect copies of WNU press with pencil or "mill"; can cut mimeograph stencils directly from WNU, WHD and KUP press; can copy press 3 to 5 words behind easily without losing out; can count checks automatically and OK copy instantly; can send perfect code groups with key or bug at 30 to 35 wpm and more.



WALTER H. CANDLER
World's Only Code Specialist, Instructs You Personally

If you can't do all this you should take THE CANDLER SYSTEM Course in High-Speed Telegraphing. It trains your Brain, Muscles and Nerves to CO-ORDINATE in doing fast, accurate work. It gives you CONFIDENCE, natural CONCENTRATION and banishes Nerve Strain. Original CANDLER METHODS have developed over 45,000 of world's fastest Morse and Radio operators including the champion.

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FREE Advice. If you want to become a real EXPERT Radio Operator, write us fully and receive the benefit of our 20 years' experience in developing EXPERTS. Your questions will be answered promptly.

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6343 South Kedzie Avenue Chicago, Illinois

AD. AURIEMA, INC.
Manufacturer's Export Managers
116 Broad Street, New York, N. Y.

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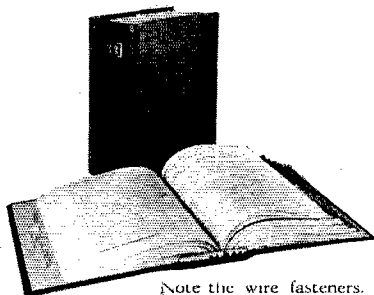
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38 LaSalle Road

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Connecticut

G. F. Harris, local radio inspector, gave the delegates a good talk and complimented the amateurs on the little trouble they gave him and assured them they would receive fair treatment from his office.

Several interesting contests took place with everything leading up to the big event of the convention — the banquet; and some feast it was, too. Major "Bill" Borrett, formerly division manager, was in true form and gave a fine talk on amateur radio in the Maritimes from 1920 to 1927, and his many jokes on old Joe, Art. Gregg and Art. Crowell, were enjoyed greatly by all. Major Borrett then presented a beautiful cup donated by station CHNS to be given to the Maritime amateur, who during this present year works the greatest number of stations on any band, c.w. or 'phone to count; QSL cards confirming the QSO to be sent to SCM Crowell on December 31, 1931, who will act as judge.

Art. Crowell in his capacity of Section Manager urged those present to keep after traffic and to report to him every month so that he could send in a good monthly report and show the outside world that the Maritime Division is active.

After the toasts and prize awards, the room was cleared up and the stage set for that solemn initiation into the ROTAB; ten new members were initiated into the Royal Order and with the completion of this interesting part the convention came to a close with congratulations extended to Art. Crowell and Gordon Arthur who shouldered the responsibility for this affair and a vote of thanks to the local merchants who so kindly donated the prizes.

A. R. + A. A. H.

The Vacuum Contact Key

(Continued from page 28)

over a thousand watts in place of the few watts handled by the ordinary telephone relay contact points. The relay itself can be controlled by an ordinary key and a 22½-volt "B" battery may be used for the current source. For remote keying at a distance of a few feet, a Bowden wire or camera shutter cable release may be employed.

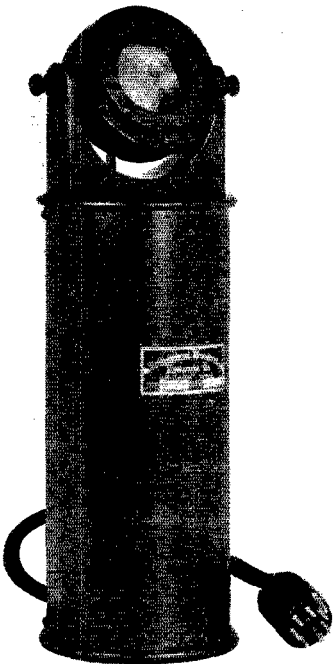
Election Notices

(Continued from page 27)

24, 25 and 28, providing for his nomination and election. Copy of the Constitution and By-Laws will be mailed any member upon request.

2. Voting will take place between November 1 and December 20, 1931, on ballots which will be mailed from Headquarters in the first week of November. The ballot will list the names of all eligible candidates nominated for the position by League members residing in Canada.

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



CONDENSER TRANSMITTERS

The engineering experience which is built into International products is your guarantee of uninterrupted performance and minimum servicing. Revolutionary manufacturing methods make it possible to quote prices in keeping with present budgets.

Type C Condenser Transmitter, only... \$35.00

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(Including 25 ft. cord, plugs and wall plate.)

Prices net, F.O.B. Chicago

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Manufacturers of a complete line of speech input equipment

Announcing . . .

A complete line of instruction in Practical Radio Engineering and Practical Television Engineering

Due to the demand from the less experienced radiomen who felt unable to handle our advanced course in Practical Radio Engineering we have added complete preparatory work. This, combined with our advanced course, forms our complete course which can be handled by even the less experienced radioman.

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We are the oldest home study school in America offering advanced training in Practical Radio Engineering. Write for full details of this Practical Engineering Training.

Capitol Radio Engineering Institute
Riggs Bank Bldg., 14th and Park Road, N.W.
Washington, D. C.

Please send me without obligation complete details of the following course: (Check course).

- Advanced course in Practical Radio Engineering
- Complete course in Practical Radio Engineering
- Advanced course in Practical Television Engineering
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Name

Address

..... (Oct. QST)

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Here is 25c. Send me new VOLUME CONTROL GUIDE

Name

Address

City..... State.....

QST

(Place and date)

Executive Committee,
American Radio Relay League,
West Hartford, Conn.

Gentlemen:

We, the undersigned members of the A.R.R.L. residing in the Dominion of Canada, hereby nominate of as a candidate for A.R.R.L. Canadian General Manager for the 1932-1933 term.

(Signatures and addresses)

The signers must be League members in good standing. The nominee must be a Canadian member of the League in good standing, and must be without commercial radio connections. His complete name and address should be given. All such petitions must be filed at the headquarters office of the League in West Hartford, Conn., by noon of the first day of November, 1931. There is no limit on the number of petitions that may be filed, but no member shall append his signature to more than one such petition.

4. Mr. Alex. Reid, VE2BE, of St. Lambert, P.Q., is the present Canadian General Manager.

5. This election is the constitutional opportunity for members to put the man of their choice in office as the Canadian member of the A.R.R.L. Board of Directors. Members are urged to take the initiative and file nominating petitions immediately.

For the Board of Directors:

K. B. WARNER, Secretary.

West Hartford, Conn., 15 July 1931.

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Its Methods and Uses

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Radio Consultant

276 Pages, 5½ x 8, Illustrated, \$2.50

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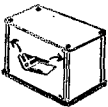
Name of Company

Position

QST-10-31

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Genuine "ALCOA" stock, silverdip finish. 5 x 9 x 6 \$1.89 — Cornet size \$4.65. 10 x 6 x 7 Monitor size \$3.25. 5 x 5 x 5 Coil Shield (like picture on the left) \$1.00.



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Coil Shields, Coil Hole Covers, Shielded Wire, National Equitune Double Spaced .000125 cond. \$2.50. 0 to 50 Ma. Weston 301 meter \$3.45. Aerovox

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Neon Glow Lamp 65c. G.E. 110-

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very good Mike, 85c.

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EVEREADY Air-Cell Batteries.

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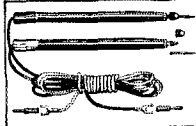
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Calls Heard

(Continued from page 59)

nylaa on4q on4v on4fe pylca pyler py1tt py2ba py2bm py2bn py2bo py2bq rx1a rx1pa rx1tas rx1ta rx1xa uoler ve1ac ve1bc ve1bt ve1bv ve1dm ve2ac ve2ar ve2bb ve2bl ve2ca ve2cq ve2cu ve2df ve3al ve3bk ve3bj ve3bm ve3bq ve3bt ve3cf ve3ci ve3cp ve3cs ve3er ve3gt ve3ha ve3hm ve3ix ve3jw ve3ud ve3wa ve3wk ve3wm ve4ae ve4ag ve4ai ve4bq ve4cv ve4ey ve4jd ve4dt ve4ea ve4fn ve4fx ve4gf ve4gp ve4gu ve4ky ve4hy ve4jb ve4lm ve4si ve5ao ve5al ve5am ve5aw ve5ec ve5fx vk2kj vk2lz vk2sk vk2tx vk2xu vk2xy vk3bz vk5hz vo8z x1aa x1g x1n cmb6 ctbj ddoe kn2 jfh prr pxr b1yb wdde

W1AFU-R. Bassett and W1APL-A. Roncalli,
Springfield, Mass.

3500-kc. band

w6ec w6akw w6bqb w6czz w6dly ve3gt ve3hd ve4ih

7 mc.

w6ew w6gf w6nx w6qp w6sn w6acv w6akf w6akw w6amy w6aoj w6aos w6arv w6ayl w6azh w6bjl w6bso w6bxx w6car w6cbr w6cqe w6dai w6der w6dkw w6duf w6ebo w6eec w6eer w6eda w6edo w6efr w6exq w6zgz cm2pa cm2xa cm5fl cm8yb ear10 ear21 ear122 ear126 f8pz f8sm f8ub g2ol g5by haf3c i1hv k4rj k6agz k6agt k6ams k6exp k6boe k7anq kn2 nn1nic on4hv rx1ao ve3hg ve3rs ve3wn ve4ag ve4dj ve3me vk2zk vk3bz vk3nm vk3hk vk3zx vk4ju vk5gr vk7ch vk7jk z2ac

14 mc.

w6id w6ew w6jn w6kb w6vq w6jp w6qc w6qw w6up w6dy w6sn w6sy w6di w6de w6eri w6ecr w6dqc w6cup w6dbt

NEW LOW PRICES

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NEW PRICE LIST EFFECTIVE JULY 1, 1931

We are extremely pleased to announce New Reduced Prices for High Grade Crystals for Power use. Due to our New and More Efficient Method of preparing these crystals, we are allowing you to share in the Lower Costs of producing these crystals.

We are proud of the confidence our customers have shown toward us, we extend to them our sincere thanks for their patronage thus making this reduction possible.

New prices for grinding Power crystals in the various frequency bands, together with the old prices are as follows:

OLD LIST	(Frequency Range)	NEW LIST
\$55.00	100 to 1500 Kc	\$40.00
\$60.00	1501 to 3000 Kc	\$45.00
\$65.00	3001 to 4000 Kc	\$50.00
\$75.00	4001 to 6000 Kc	\$60.00

The above prices include holder of our Standard design, and the crystals will be ground to within .03% of your specified frequency. If crystal is wanted unmounted, deduct \$5.00 from the above prices. Delivery two days after receipt of your order. In ordering please specify type tube, plate voltage and operating temperature.

Special Prices Will Be Quoted in Quantities of Ten or More

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The prices below are for grinding a crystal to a frequency selected by us unmounted (if wanted mounted in our Standard Holder add \$5.00 to the prices below), said crystal to be ground for Power use and we will state the frequency accurate to better than a tenth of one percent. **Immediate shipment can be made.**

1715 to 2000 Kc band	\$12.00 each
3500 to 4000 Kc band	\$15.00 each

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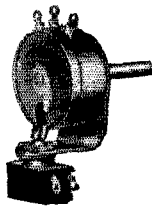
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Mfd.	1000 D.C.	1500 D.C.	2000 D.C.	3000 D.C.
1	\$1.95	\$2.45	\$4.95	\$8.90
2	3.15	4.35	7.45	16.50
4	4.95	6.25	12.95	50.25

GENUINE RCA RADIODIODES. — UX210, \$4.11; UX281, \$2.94; UX224, \$1.17; UX280, 82c; UX245, 82c; UY227, 73c; UX250, \$3.53.

COLUMBIA POWER TRANSFORMERS

Type	Voltage	Output Voltage	Filament voltage	Price
A	200	600-0-600	7 1/2 ct & 7 1/2	\$3.75
B	250	750-0-750		4.95
C	350	1000-0-1000		6.25
D	500	1500-0-1500		9.50
E	750	2000-0-2000		13.00
F	250	750-0-750	7 1/2 ct & 7 1/2	5.75

FILAMENT TRANSFORMERS: An efficient sturdy constructed job. All secondaries centered. Deduct 10% from these prices if no centertap is wanted.

Voltages	12 Watts	25 Watts	50 Watts	100 Watts
2 1/2	\$1.25	\$1.95	\$2.50	
2 1/2 and 2 1/2	1.50	2.25	2.75	4.95
7 1/2	1.25	1.95	3.25	5.25
7 1/2 and 7 1/2	.....	2.25	3.95	6.25
10	.....	.....	3.40	5.95
12	.....	.....	.....	6.30

BRISTOL double button microphone transformer. May also be used for single button, special, \$1.40

RCA VICTOR power transformers, 150 watts. Just the job for that 245 push-pull transformer trans nifty. Supplies 750 volts centertapped, 2 1/2 centertapped, 5 ct. and 2 1/2, 1 1/2, and 1 1/2. \$2.25

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GRID LEAKS: Hardwick Hindle, wire wound, for all tubes up to 250 watts, 10,000 Ohms, 1 1/2 x 6", 95c; 5000 Ohm, 65c. Kroblack 50 Watt, 50,000 Ohm, 75c

COLUMBIA: 30 Henry, 200 Mill chokes. Very rugged. Specially priced. \$2.40

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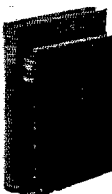
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w6bif w6cut w6eqb w6dwl w6exa w6enx w6dgr w6ana
w6eep w6buc w6dxy w6aue w6dzy w6ehp w6aqr w6bag
w6bvs w6fal w6bih w6ejc w6dgy w6eam w6dhp w6dov
w6exq w6cax w6abz w6bck w6cht w6btk w6byb w6elc
w6ahp w6dtt w6fan w6evz w6bjf w6chy w6bto w6cqx
w6buz w6aqj w6erf w6dio w6bkk w6azh w6cub w6ebu
w6ecn w6bjf w6dvr w6dgv w6cpi w6dzt w6cbr w6doz
w6dgg w6etr w6djp w6ele w6bso w6aoe w6ayl w6azu w7nm
w7fh w7kk w7mx w7dh w7ek w7in w7dp w7hp w7bd w7bb
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w7aic w7awz w7aax w7awu w7afx w7acq w7aik w7ani
w7asb w7akm w7ajj w7aul w7ath w7abo w7aio w7aqi w7alw
w7amq ce3ab ce3cs em1ma em1fm em1hy em2cf em2ww
em2ay em2sh em2jm em2wd em2pa em2wa em2gc em2jc
em5ea em5ex em5fc em5fl em5yb em5uf em5ml em5mop
em8rx ep1br ex2bt et1aa et1bh et1ec et1by et2aa et2aw
et2an d4abg d4wer d4brv d4mf d4ll d4ggg d4wao d4acj
d4lrm d4rbr e4iwf ear1o ear1e ear18 ear2l ear96 ear74
ear12l ear128 ear136 ear169 ear185 ear187 ear149 ear18
e18e e17e e12b f8bj f8bx f8cs f8dt f8ef f8ej f8eo f8ug f8eb
f8eq f8er f8ex f8fa f8fo f8gi f8ha f8hj f8hr f8j1 f8j2 f8j3
f8l1 f8p1 f8pm f8px f8py f8r1 f8rn f8rs f8ru f8sk f8sm
f8sx f8sz f8tl f8tp f8tq f8tu f8tx f8uj f8uk f8ul f8um f8vp
f8wz f8xz f8ye f8zd f8acw f8dmf f8ets f8jz f8swa f8tux
f8wok f8ub f3mta f3ami fm8cr fm8mt fow g2un g2og g2ma
g2nh g2xy g2ay g2az g2gm g2dw g2op g2xh g2xl g2gf g2rv
g2vq g2ol g2by g2ux g2ao g2dh g2pa g2yq g2yd g2oi g2vz
g2cb g2qf g2wq g5by (fone) g5ay g5bz g5pj g5wq g5bj g5lv
g5is g5la g5fa g5zl g5bd g5wj g5dd g5hj g5em g5ox g5yk
g5qy g5mb g5us g5hx g5sz g5jk g5nf g5yq g5om g5gs g5w
g5hj g5wy g5wt g5gn g6li g6lk g6rv g6dh g6gd g6ot g6fx
g6oh g6wm g6cl g6hq g6co g6ac g6xj g6rb g6py g6gc g6gz
g6rg g6nj g6dv h6tc haf3c haf3d haf4d haf8b haf3qx
haf3ex haf3mx i1to j1dp j1dh j3ch km4 km4 kfuz k4kd k4bpf
lu2ch lu3fa lu3de lu4da lu9dm lu9dt l6jk l6fh m1nic on4gw
on4uu on4ar on4jf on4im on4fm on4gn on4fp on4wk on4aa
on4fq on4ja on4fe on4hc on4ic on4ij on4eu on4j1 on4lj
on4or on4bc on4db on4dc on4ha on4hm ok2ao ok2ak ok2ny
ok1vp oa4z oa4j oa4y oz7t oz2h oz7vp oh5ng oh7nf py1ca
py1eb py1er pylem py2bk py2da py2bn py2ba py2bf py2qa
py2bm py3aj py7aa py7ab pk1aw pxbd pxx pet paaps paqf
paqq paqzk paqmm paqfp paqfb paqdl paqwr paqxi paqjl
paqoo rx1aa sp1ae sp1kc sp3lz sm5uw ti2jj ti2fg ti2fk ti2ags
to3xa uo1em uo1er uo1fh uo3wb uo2op uo2wn ve3ha ve3gf
ve3oc ve3er ve3gj ve3va ve3rf ve3rp ve3vm ve3af ve3ic
ve4dk ve4ev ve4gx ve4ae ve4bx ve4rs ve4at ve4iu ve4el
ve4bu ve5bi ve5ec ve5al ve5dn ve5fx ve5cj vo8ae vo8aw
vo8mc vo8an vo8z vo8j vo8l v1ja v1yb vs7my vp2pa vp2ap
vq4ere vq4orf vk2zk vk2hc vk3jw vk3ka vk3xi vk3bz vk3hk
vk3zx vk3wx vk3pa vk4ad vk4kg vk4ju vk5mb vk7ch x1b
x1d x1aa x1af xoq x17c x3a xw1b xf8map y12ra yv31o zl1ce
z1lbw z12ac z13ap aulal bx b7x

QRX Frequency Measuring Test

(Continued from page 35)

Oct. 23, Friday	A	W1XP
	B	W9XAN
	B	W6XX
Oct. 30, Friday	BB	W1XP
	B	W9XAN
	A	W6XX
Oct. 31, Saturday	BX	W6XX
Nov. 1, Sunday	C	W9XAN
Nov. 6, Friday	BB	W6XX
	B	W1XP
	A	W9XAN
Nov. 8, Sunday	BB	W9XAN
	C	W6XX
	C	W6XX
Nov. 13, Friday	A	W1XP
Nov. 15, Sunday	C	W1XP
Nov. 20, Friday	A	W9XAN
	B	W6XX
	B	W1XP
Nov. 27, Friday	BB	W9XAN
	B	W6XX
	A	W6XX
Nov. 28, Saturday	BX	W6XX
Nov. 29, Sunday	C	W9XAN

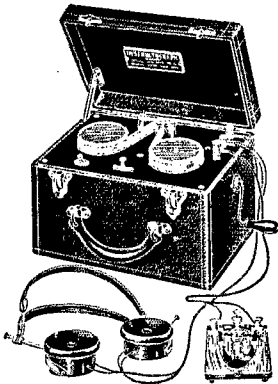
Everything You Need to Become an Expert Wireless or Wire Operator

Instructograph
Code Transmitter

Ten Rolls of
Tape

Complete
Instructions

Only \$24.50



The unit illustrated includes the machine, ten rolls of double perforated tapes (approximately 2,000 feet of characters), and a large booklet of instructions.

Booklet contains a comprehensive and thorough course of instructions (both Codes) for study and practice with the Instructograph and interpretation of the tape matter, as well as complete directions for the care and operation of the Instructograph. It also contains illustrations and complete directions for building and installing an oscillator unit. We can supply a "Buzzer" or oscillator, if desired, at a reasonable price, but you can easily build your own by following directions in Booklet.

Amateurs write for information regarding our "CQ" call tapes

Extra tapes — either code, \$1.00 each

INSTRUCTOGRAPH COMPANY

815 Leland Ave. Dept. Q-2 Chicago, Illinois

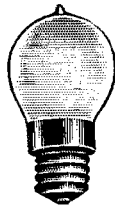
ODEON LO-RIPPLE Mercury Vapor Rectifiers

Type	Fil.		Plate	Price
	Volts	Amperes		
80	5	2	2000 Volts	.3 Amps. \$2.00
866	2.5	5	7500	.6 \$3.00
866B	5	5	7500	1.2 \$8.00
281	7.5	5	7500	2.0 \$5.00



Odeon Mercury Vapor Rectifiers are guaranteed to reproduce a lower AC ripple than any other Mercury Vapor Rectifier in the present market, and to have an operating life in excess of 1000 hours.

RECTIFIER CHARGER BULBS



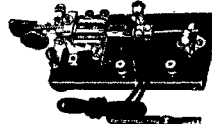
2 AMP.
WITH TOP
OR BASE
CONTACT

\$2.65

5-6 AMP. \$4.65

Extra Discount to Dealers

SPEED-BUG Telegraph-Key



This Key has been made for and approved by the U. S. Signal Corps

CLEAR — SHARP
SIGNALS Price \$10.50

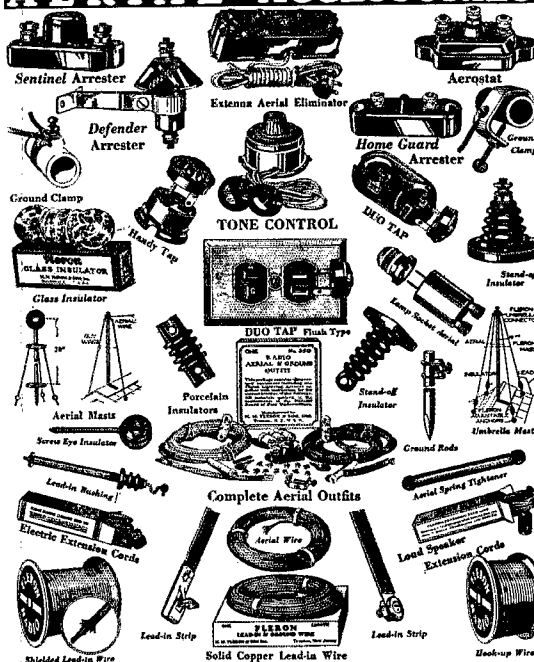
20% With Order — Balance Shipped C.O.D.
Send Postage or Express Charges

MAIL ORDERS TO:

ODEON MANUFACTURING CO.

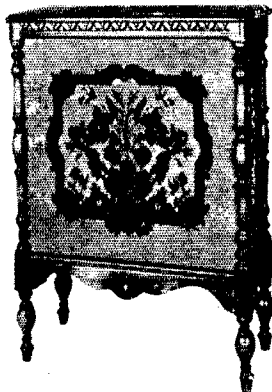
30 CLINTON STREET
NEWARK N. J. U. S. A.

FLERON RADIO AERIAL ACCESSORIES



The Complete Line from One Source
M. M. FLERON & SON, Inc. NEW JERSEY

EASTERN AMATEUR HEADQUARTERS



"R C A" Model 106 Speaker

Incorporates latest discoveries in electrical acoustics. Thirty-inch baffle. Full dynamic speaker. Range 7 octaves. Westinghouse dry-disc rectifier for AC 110-volt operation. Input impedance, 2000 ohms. Matching transformer with unit. Packed in original cartons. Guaranteed perfect. Limited number at this special price.

\$13.50

Regular Value \$188

\$150 Victor Electric Pickup and Turntable \$19

has General Electric Induction motor, automatic stop, gold-plated high impedance. Victor pickup. Mahogany case. Model CD 20X. Ideal for public addresses or home use. The machines were made to sell for \$150. We offer the last few at \$19. A bargain while they last.

Send in for New 1931 Fall Catalog

M. & H. SPORTING GOODS CO.

512 Market St., Phila., Pa.



Oscillating Crystals

Precision ground by experts,
scientifically inspected,
powerful oscillators

**UNCONDITIONALLY
GUARANTEED**

80 and 160 meter bands	\$5.25
40 meter band	3.00
1 inch oscillating blanks	2.50
Unfinished blanks	1.50
Dustproof holders	2.25

Our crystals are made from
finest quality *Brazilian Quartz*—
the best raw material in exist-
ence and calibrated to one tenth
of one percent or better.

High or low frequency crystals of all
descriptions made to order

WE INVITE YOUR INQUIRIES

Write for any further information
you may desire

**PREMIER CRYSTAL
LABORATORIES, Inc.**
74 Cortlandt Street New York City

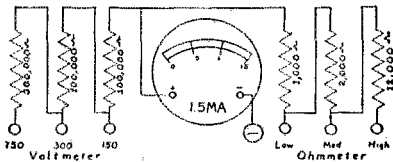
SHALLCROSS

Wire  Wound

Resistors

.0025 to 10,000,000 ohms

are recommended and extensively used for television
radio production and service test equipment. The ac-
curacy and dependability of the testers described on
page 1085 June and page 118 July Radio News de-
pend upon SHALLCROSS RESISTORS.



Send 4 cents in stamps for Bulletin 100-C and other
literature describing the multi-range meter circuit, sim-
ilar to the diagram above.



Shallcross Mfg. Company

ELECTRICAL SPECIALTIES
700 PARKER AVENUE
Collingdale, Pa.



STANDARD FREQUENCY SCHEDULES

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

Saturday Morning Schedule and Frequency

Time (a.m.)	BX
	kc.
	4:00 7000
	4:08 7100
	4:16 7200
	4:24 7300

The time specified in the schedules is *local standard time at the transmitting station*. W1XP uses Eastern Standard Time, W9XAN, Central Standard Time, and W6XX, Pacific Standard Time. Schedule BB transmitted by W1XP is intended particularly for European amateurs and starts at 2100 G.C.T. Schedule BX is transmitted especially for amateurs in Oceania and the Far East. It is transmitted starting at 1200 G.C.T. by W6XX. Reports on these special schedules are particularly desired, not only from overseas hams but from those in the Americas.

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

TRANSMITTING PROCEDURE — NEW CHARACTERISTIC LETTERS

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

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

3 minutes — Characteristic letter of station followed by call letters and statement of frequency. For the month of September, the characteristic letter of W1XP will be "G"; that of W9XAN will be "D"; and that of W6XX will be "F." *Effective October 2nd, however, the characteristic letter used by W9XAN will be changed to "Q" and that used by W6XX will be changed to "Z."* W1XP will continue to use "G." The new letters will be more suitable for calibration purposes.

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

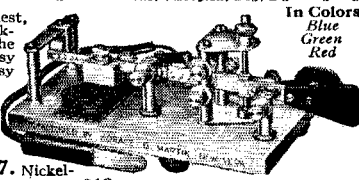
2 minutes — Time allowed to change to next frequency.

* W6XX transmits 3660 kc. instead because of local interference on 3600 kc. from fourth harmonic of 900-kc. transmitter.

Sending Is *EASY*

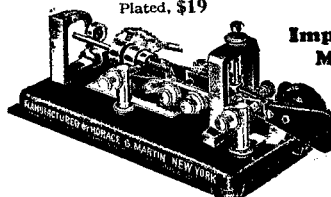
With the *Easy-Working*
Genuine Martin No. 6
New VIBROPLEX

The smoothest,
easiest - work-
ing bug on the
market. Easy
to learn. Easy
to operate.
Make s
ending
easy.



Black or
Colored, \$17. Nickel-
Plated, \$19

In Colors
Blue
Green
Red



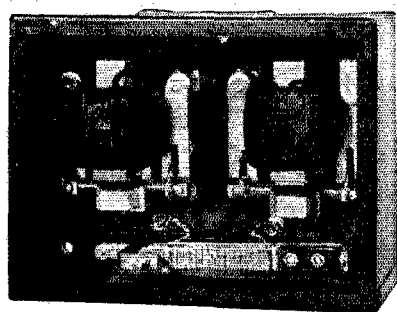
**Improved
MARTIN
Vibroplex**

Black or Colored, \$17
Nickel-Plated, \$19

Special Martin Radio Bug — Extra large, Specially
Constructed Contact Points for direct use without relay. Black or Colored, \$25

Old Vibroplex accepted as part payment
Remit by Money Order or Registered Mail

THE VIBROPLEX COMPANY, Inc.
825 Broadway, New York City
Cable Address: "VIBROPLEX" New York



TIME DELAY RELAY

For Mercury Vapor Type Rectifiers

Delays the application of
plate voltage and prevents
tube destruction.

Send for circular 81,007

WARD LEONARD ELECTRIC CO.
MOUNT VERNON, NEW YORK

Massachusetts Radio and Telegraph School

18 Boylston Street, Boston
Send for Catalogue

Tel. Hancock 8184 *Established 1905*

TRANSFORMERS

3 KVA 3 phase 1500 — 2000 v. each side.....\$65.00
700 watt 1000 — 1500 each side..... 14.50
250 watt 500 — 750 — 1000 each side
unmounted \$10.00; mounted \$11.50

Yale University, University of Cincinnati, University of North Dakota,
State College of Texas, WJAB, WJAK, CJON, KFXR
are satisfied customers

W9CES FRANK GREBEN

1917 So. Peoria Street, Pilsen Sta. Chicago, Ill.



**The Superlative
Broadcast Microphone**
Extra Heavy Type
Two Button

Outstanding beauty of work-
manship and finish. True, Nat-
ural Tone. Tremendous Volume.
Scientifically Damped.

Extra Heavy 24-Carat Pure
Gold Spot Centers. Duralumin
diaphragms. Accurately Ma-
chined. Carefully Adjusted.
Fully Guaranteed. Three De-
grees of Sensitivity.
Other Models from \$5.00 up.

Model "B B"
List Price, \$25.00
Microphone Only

UNIVERSAL MICROPHONE CO., Ltd.
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Calif., U. S. A.

It's EASY to Get a New HANDBOOK

(Eighth Edition)

DIRECTIONS:

Realizing that Handbook must be
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- (1) Fill out below, tear off.
- (2) Reach in pocket, produce
U. S. A. \$1 bill, old or new
size (we don't care).
- (3) Clip together, mail us.

A.R.R.L.
38 LaSalle Rd.,
West Hartford, Conn.

SEND IT AT ONCE.

(Name)

(Street or P. O. Box)

(City and State)

**BUY FROM THE OLDEST
AND MOST CONSISTENT
HAM SUPPLY HOUSE**



Everybody is yelling "LOWEST PRICES." Yelling it at the top of their pages. Why don't you compare for yourself? Get a copy of the "AMERICAN FLYER" before you buy and see our prices on special Amateur equipment. We are also authorized distributors of over 90 nationally advertised radio products and can fill your requirements at big savings to you.

AMERICAN SALES COMPANY
44 West 18th Street New York City

RUSH YOUR BULLETIN!

(Name)

(Street or P. O. Box)

(City and State)

Of course you already have a copy of **The Radio Amateur's Handbook**. To it you should add to your library from the list offered on page 73 of this issue of **QST**

"H-H" QUALITY CRYSTALS

VERY "FB"

That's the verdict of hundreds of amateurs on four continents . . . "H-H" Quality Crystals have been standing the gaff since 1927 . . . and they cost no more than ordinary crystals. Ask the best CC station you hear; the chances are he has one.

Also available for Commercial Service
Orders filled by return mail

Herbert Hollister - Merriam, Kansas

THE TRANSMITTING STATIONS

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

W9XAN: Elgin Observatory, Elgin National Watch Company, Elgin, Ill., Frank D. Urie in charge.

W6XK: Don Lee Broadcasting System, Los Angeles, Calif., Harold Peery in charge.

REPORT AND TEST BLANKS

Blanks for reporting on the regular S. F. transmissions will be sent postpaid upon request. Just send a card or message to the Standard Frequency System, *QST*, West Hartford, Conn., asking for S. F. blanks. Although no formal entry in the October tests is necessary, log sheets for recording the measurements, and schedules of the Official Transmitting Stations will be sent to all who ask for them.

WWV 5000-KC. TRANSMISSIONS

The Bureau of Standards Station WWV will transmit calibration signals on 5000 kilocycles, accurate to within one part in a million, between 2:00 and 4:00 p.m. and between 8:00 and 10:00 p.m., E.S.T., every Tuesday throughout October and November. The transmissions consist mainly of continuous unkeyed carrier frequency, making them particularly suitable for the calibration of piezo frequency standards having a harmonic on 5000 kc. The first five minutes of a transmission are taken up with "CQ de WWV" and announcement of the frequency. The frequency and call letters are given every ten minutes thereafter. The Bureau is desirous of receiving more reports on these transmissions and amateurs are urged to cooperate, giving information on signal strength, fading, type of receiver used and type of receiving antenna. Reports should be sent direct to the Bureau of Standards, Washington, D. C., or via A. R. R. L.

F. E. H. and J. J. L.

Strays

Unsupported copper-tubing inductances may be quickly and easily cleaned by immersing them in a solution of nitric acid for a short period of time. About four or five minutes will be sufficient when using a 30% solution.

— W9CZV-EZL

G6WY claims to be the only amateur in the world who possesses the initials H. A. M. He says it seems to be in the blood!

Pedro T. Dimal, of Kabasalan, Zamboanga, P. I., gives his radio library the right atmosphere by using a pair of worn out "B" batteries as book ends. The weight of the "B's" is sufficient to hold as many books as are found around most shacks.

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 paragraphs (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, life-long permanence, absolute dependability, lowest ultimate cost, no other plate source even approaches the achievement of an Edison steel alkaline storage B battery. Built painstakingly; every joint pure nickel, upset electrically welded. Genuine Edison Electrolyte. Our list describes complete batteries, construction parts, enameled aerial wire, silicon steel. Available immediately, filament and plate transformers for the new 872-866 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. Ensell Radio Laboratory, 1527 Grandview St., S. E., Warren, Ohio.

WHOLESALE discounts. Approved parts. \$50.00 stock. Over six pounds, catalog, circuits, data — 50¢, prepaid (Outside U. S. — \$1.00). Weekly (new items, test reports) bulletins — 20 weeks — \$1.00. Experimenters 56-page house organ — 25¢, prepaid. Kladrag Radio Laboratories (Established 1920 — over 4000 radiowise customers), 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.

QUARTZ, direct importers from Brazil of best quality pure quartz suitable for cutting into Piezo electric crystals. Write us for full details. The Diamond Drill Carbon Co., 720 World Bldg., New York City.

GOOD crystals. See our display advertisement. Herbert Hollister, Merriam, Kansas, W9DRD.

CRYSTALS: Highest quality quartz crystals scientifically manufactured. Designed for greatest power. Steady single frequency. Guaranteed. Power-type inch square to approximate specified frequency. 0.1% calibration: 1750kc — \$5.50; 3500kc — \$5.50; 4866kc (14mc tripler) — \$7.50; Plug-in holders — \$2.50. Build your own 100kc Standard Frequency Meter! Easily tuned to 100,000 cycles. Quartz Bar — \$9.00 including data; Holder — \$3.00. Crystals manufactured from 25kc to 6000kc. Higrade Constant-Temperature Oven Equipment; Thermostats. Thermometers. Ovens. Heater wire. Honey-comb coils. Relays. Write for further information. Bliley Piezo-Electric Company, Masonic Temple Bldg., Erie, Penna.

QSL cards, stationery, etc. W8AXD, Smethport, Pa.

SUPREME Instruments Corporation of Greenwood, Miss., have always built service instruments of the highest quality. Naturally, their inventory would consist of highest quality parts. Write today for surplus stock list — all parts strictly new and guaranteed at prices less than half the original cost. Good stock of Weston meters. Most any range you want.

TRADE complete R. C. A. correspondence course and Teleplex with rolls for Colts or Smith & Wesson 22 calibre target pistol. Bob Payne, Room 3, Cook Bldg., Marion, Ind.

CASH for Jewell transmitting meters, condensers 852s, power transformer. Sell or trade fifteen dial Omnigraph, three range portable Jewell a.c. voltmeter. W7ACB.

N.R.H. experience, 288 pages, seventy illustrations. Greatest "kick" \$2. postpaid. Cespedes, Heredia, Costa-Rica.

LATEST Tech Publications fully explains electron theory, parallel and series circuits, design of r.f. couples and inductances with design data. Price one dollar. Tech Publications, 12 Sackville St., Charlestown, Mass.

SELL — new style Thordarson 500 watt 1500 and 2000 volt each side c.t. for \$15. GE UV211 new, \$15. New RCA and Cunningham 210 and 250, \$2. Only have four of each. W9CNE, 601 Republic Bldg., Louisville, Ky.

GUARANTEED crystals, 3500-kc. band, \$5, including reprints of my article (QST) "Neutralizing R.F. Amplifiers." W9QT-W9ZZE-WLH4.

THE Buchaneer, short wave eight tube receiver. Most powerful for distance. Easy to construct. Constructional blue-prints. 50¢ (currency). The finest short wave receiver. Ensell Radio Lab., 1527 Grandview St., S. E., Warren, Ohio.

QSL government postal cards printed two colors, \$2.25 per 100. Square Deal Printer, Ballston Lake, N. Y.

SELL — TNT xmitter with coils, 245s, 280 and neat power pack, \$28. Receiver on aluminum with coils and 230s, \$16. 3000 volt 2 mfd. Flechtheim \$14. Good RCA 852, \$14.50. Pair 110-2200 potential transformers, 300 watts each at \$5.50. 300 mil. Jewell \$4; 500 mil. Jewell \$4. W9ADS.

TUBES — Transmitter tested PX-210 oscillators, SX-250 modulators \$1.92, AX-281 \$1.49. Mercury rectifiers PX-280-M \$1.95, CX-281-M \$2.95, PX-866 (5000v) \$3.35 VaS-866 (10,000v) \$4.95. Full-wave TUNGARS \$1.65. Standard makes. Everything guaranteed. Crystal bargains. Write. Howard Tube Service, 5508 Fulton St., Chicago.

500v., 300 ma., full-wave mercury-vapor rectifier, Perryman '66 type \$4.44. Hatry & Young, Inc., Hartford.

SLIGHTLY used 250 watt W.E. 211D tubes, \$25. Guaranteed to work okay. Also motorgenerator sets and transmitter parts. Will consider trade for camera and lens. What have you to offer? Stanley F. Northcott, Bay City, Michigan. W8DAT.

FOR sale — one new Geo. W. Walker super short wave converter. Four sets of coils. Price \$25. One model 198 Jewell analyzer, brought up to date for pentode tubes. Price \$50. L. D. Kelly, 605 Hamilton St., Ottumwa, Iowa.

A.C. screen grid s.w. receiver \$16. D.C. 13 coil, 8 to 300 meter receiver with tubes, \$11. Want UV204A xmtr. condensers and meters. Trade new 210s, 250s, chokes and electric clocks. T. Adamo, 236 Landis Ave., N. J.

FOR sale — transmitters, \$9.95 up. Receivers \$9.95 up. New 852 211. 210 new \$2. Write W5ZZF, Blackwell, Okla.

POWER chokes fully mounted and shielded in polished metal containers, large stand-off insulators. 3500 volt insulation. Made in the following sizes: 30 henry 200 mls weight 11 pounds \$3.20 each. 5 henry 400 mls weight 13 pounds \$3.20 each. 30 henry 100 mls 5 pounds price \$2.25 each. Sent C.O.D. United Radiobuilders, 1236 Springfield Ave., Irvington, N. J.

WANTED — Transmitting tubes. W9DWA.

RADIO course \$19.85. Code-machine included. Radio Instruction, Winchendon, Mass.

NEW, perfect RCA 250s — \$2.50. Our own type 866s — \$4. (10,000 peak volts). We have a large supply of high power transmitting parts at dirt cheap prices. Quarter KW screen grid tubes \$20.00. Write for list. Edwin C. Ewing, Jr., 29 S. LaSalle St., Chicago, Ill.

TRANSMITTING condenser cartridges. Save cost of case. 1000v, working (4000v. test), 1 mfd. \$1.45, 2 mfd. \$2.35. Hatry & Young, Inc.

MERCURY arc rectifier, solenoid operated. Everything complete. Will sell to highest bidder. Write W9AFO.

WE387 double button mikes \$25, WE212Ds \$35, WE211Ds \$12, on trial. — W9ARA, Butler, Mo.

QSLs, two color, \$1. W9GQH, Java, S. D.

TECHNICAL men who have some selling ability and can finance themselves for a few months will find our agency proposition a great opportunity. Radio Receptor Co. Inc., 108 7th Ave., New York City.

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80 or 160 meter crystals, calibration, 1%, \$5.50. To frequency you specify, .1% accuracy, \$9.00. Hatry & Young, Inc., Hartford.

RELAYS, 6 volt, 10 contact, capacity 1 amp., \$1.75 postpaid. Dundee Electric, Dundee, Ohio.

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TRADE new Kueffel and Esser two foot slide rule with case. Cost \$25. For good used fifty watt. Swap 6/400 dynamotor for used fifty or plate transformer. W8ASO.

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KITS, Parts, wired sets, new National Amateur receiver as in September QST. Write now. Hatry & Young, Inc. Hartford.

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W6AJV — Charles Merton Moser, 615 Acacia St., Glendale, Calif.

W7AEM — Ralph L. Hardman, Box 34, Tigard, Oregon.

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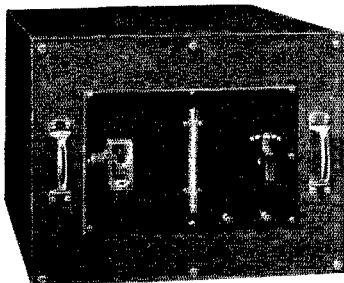
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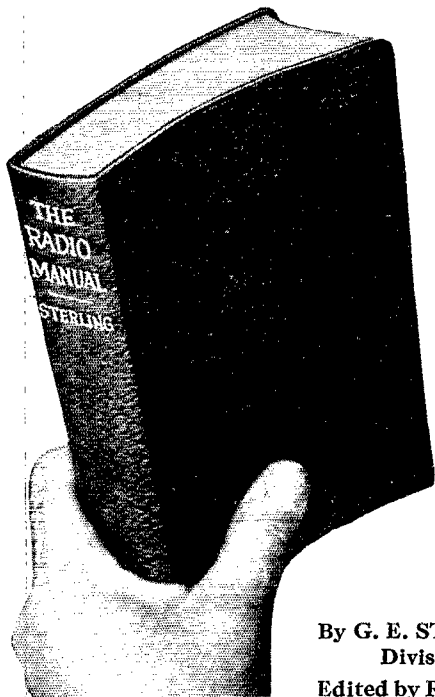
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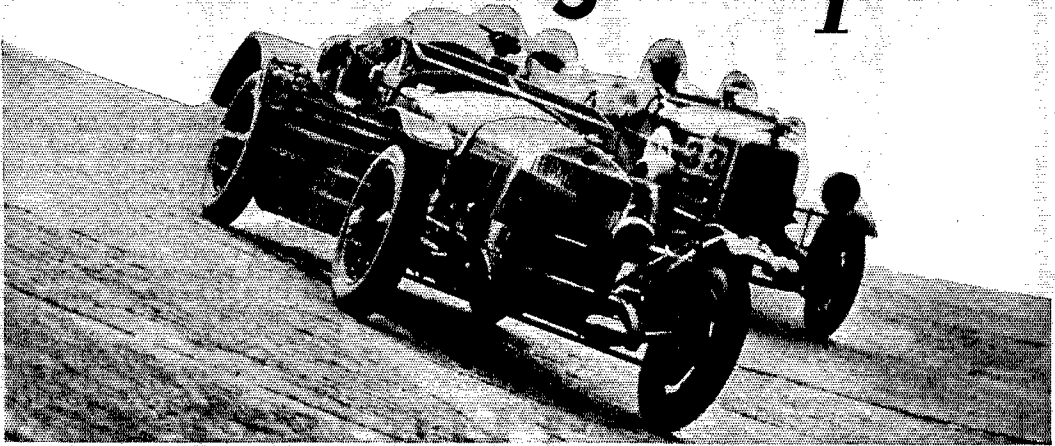
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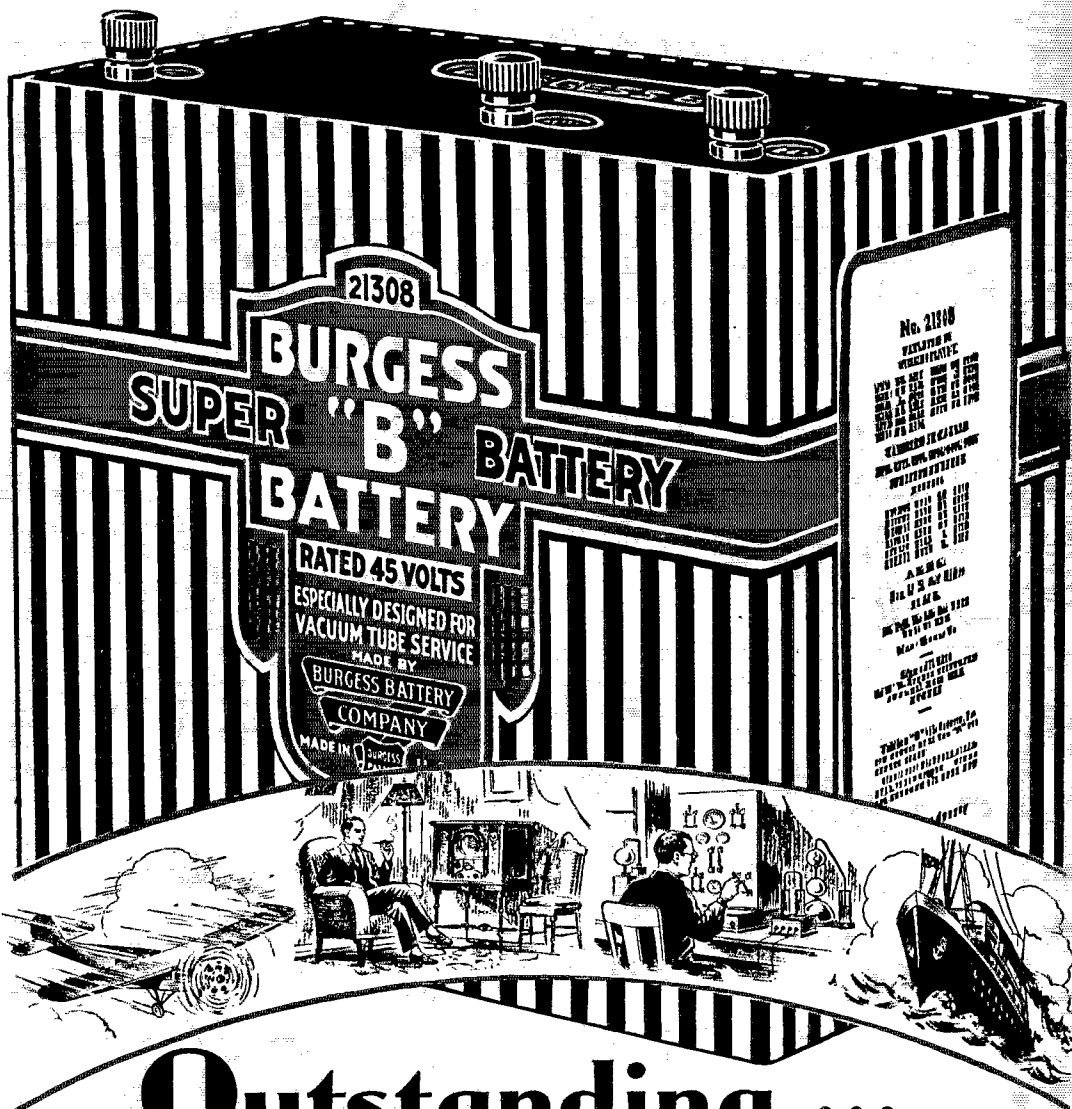
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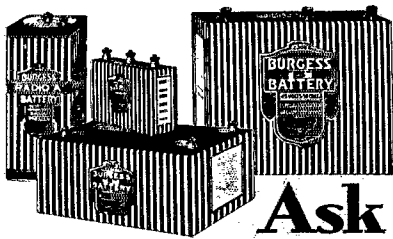
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