DE V O T E D E N T I R E L Y T O
PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

I PROMISE TO ABIDE FROM MY NEAREST NEIGHBOR ALL THE POWER I CAN GET—HONESTLY OR OTHERWISE—THAT I WILL FEED MY AUNT ENNA AT ALL COST AND I WILL NOT RUN MY NEIGHBOR UNLESS IT GIVES MORE FOOD TO AUNT ENNA.

RESOLVED—that I will keep my power completely on normal load—that I shall never go west—that I will even be a tough hard baby always cool and never object to a few thousand extra volts.

WE PROMISE TO BE ON OUR WAY IN FEW HOURS ON HITCH OUR DESTINY TO A POSTAGE STAMP.

RESOLVED—that I won't CQ so often—that I will tell my amateur radio friends all about my pure dc when he is just audible and uses raw ac.

NEW YEAR RESOLUTIONS FOR THE OLE SET

JANUARY 1928

I PROMISE TO KEEP TO THE RIGHT AS FAR AS POSSIBLE AND TO KEEP MY HAND OFF OF ZERO MINUS.

January 1928

25¢
Radio Reception

The popular demand for the latest and most improved A C power receivers calls for the latest development in A C tube construction.

Cunningham A C tubes CX-326 and C-327 are outstanding in their performance and will bring your A C power receiver up to its highest efficiency.

See that these two tubes are doing their duty along with other Cunningham tubes in your A C receiver.

E. T. CUNNINGHAM, INC.
NEW YORK        CHICAGO        SAN FRANCISCO

With A C Power Receivers Use Cunningham A C Tubes
Iron and wire—plus long proved success—plus exacting scientific research—plus service—plus guaranteed quality

Insist on Acme Transformers

Acme Purchasers have at their disposal the free services of a highly successful engineering department.

Insist on Acme Transformers

So thorough was the research preceding the manufacture of the first Acme, its design has never changed.

Insist on Acme Transformers

Skilled workmen, superior factory equipment, rigid inspection, and an absolute guarantee, make it worth your while to

Insist on Acme Transformers

ACME TRANSFORMERS
ACME APPARATUS CORPORATION - - - CAMBRIDGE, MASS.

Say You Saw It In QST—It Identifies You and Helps QST
WHEN you crave to raise the jolly old power, and you need a flock of new stuff, and you dig down into the bottom of the sock for the last lone jit—
then
YOU want to be dawgawm sure that you can trust the bird you're buying thru to see that you get good stuff.

Of course, if it's Cardwell Condensers you demand you know they will be fine business, but the rest of the order—h-m-m-m?

Now, we know darn well that for Cardwell stuff to show up best, it's gotta be in a set with other good parts

SO

HERE are some jobbers who do business on the basis of—Best of Quality, Honest, Quick Service, No Substitution, and an iron clad Guarantee that Anything they sell has got to be good. And they handle all the other GOOD parts along with Cardwell Condensers. You can deal with them with absolute confidence that they'll treat you right.

They're Cardwell Jobbers!
so they're good!
For the Best in Short Wave Reception

Build the

Aero Short Wave Receiver

Superlative performance in every respect assured by carefully selected parts around which set is built.

If you want a real short wave receiver—a set possessing unusually long range, fine selectivity, great power and splendid tone qualities—build the AERO SHORT WAVE RECEIVER.

This excellent receiver is neat and compact, and is flexible to an unparalleled degree. It has a normal range of 15 to 130 meters, and completely covers U. S. bands 20, 40, and 80 meters. Range can be reduced or increased if desired (see note below). Any amateur desiring the very best in short wave reception should certainly build this set.

These Prominent Manufacturers’ Products
Make Possible Its Excellent Performance

AEROPRODUCTS, Inc.
Supersensitive AERO Coils, in the form of the AERO Low Wave Tuner Kit, play a big part. This kit consists of 3 interchangeable coils. Special patented construction reduces high frequency losses to a minimum. Price of kit, $12.50. You can lower range of set to 13 meters with AERO INT. 0, or increase range to 725 meters with AERO INT. 4 and INT. 5. These coils priced at $4.00 each. The AERO Choke 60 and AERO Foundation Unit are also used.

AMSCO PRODUCTS, Inc.
AMSCO Condensers are another important factor in the AERO SHORT WAVE. One .00014 condenser and one .00025 condenser are used. These list at $2.75 and $3.00 respectively. AMSCO parts are noted for their accuracy, dependability and fine construction.

THORDARSON ELECTRIC MFG. CO.
THORDARSON radio transformers are particularly desirable in the AERO RECEIVER. For code work the R-151 6 to 1 ratio transformer gives maximum amplification at 500 cycles. For short wave reception of broadcasting type R-152 or R-200 will give excellent volume and tone quality. As used in this set, these transformers leave nothing to be desired.

YAXLEY MFG. CO.
You’ll like the outstanding quality and neat finish of the YAXLEY battery switch, resistances, and rheostat. These items contribute much to this receiver’s beautiful finished appearance and electrical efficiency.

BENJAMIN ELECTRIC CO.
Benjamin sockets insure utmost electrical efficiency. That’s why they’re specified in this receiver.

Any or all of these specified parts are available at your radio dealers. Get them today. For literature or further information regarding the AERO SHORT WAVE RECEIVER address

AEROPRODUCTS, Inc.
Dept. 16
1772 Wilson Ave.
Chicago, Ill.

Say You Saw It In QST—It Identifies You and Helps QST
## Atlantic Division

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## District of Columbia

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*Temporary officials appointed to act until the membership of the Section concerned choose permanent Sectional Managers by the nomination and election.*
About 300 B.C., the Greeks sent messages by means of the Umpavim. In two stations were water jars of equal size in which floated marked rods, the signal by torch or flag, plugs were pulled. When the rods lowered to a certain mark, a signal was known.

Selectivity—Turn the dial of a Grebe Synchrophase Seven. Stations come in—clean, full-toned. No overlapping of programs—station separation is sharply defined. The tone of the Synchrophase Seven, especially when combined with the Grebe Natural Speaker, is unrivaled in naturalness. Its one-dial control assures simplicity of tuning that is remarkable. Grebe construction, backed by eighteen years of making nothing but the highest grade radio apparatus, guarantees the durability of these superior qualities.

Grebe Synchrophase Seven, $135; Grebe Natural Speaker, $35. Send for Booklet Q; then ask your dealer to demonstrate, in your home, that you can "get it better with a Grebe."

A. H. Grebe & Company, Inc., 109 West 57th Street, New York City
Factory: Richmond, Hill, N. Y. Western Branch: 449 So. San Pedro St., Los Angeles, Cal.

Makers of quality radio since 1909
Editorials
Election Results
A General Purpose Device
The Amateur and the International Radiotelegraph Conference
This Amateur Phone Business
Standard Frequency Transmissions
Municipal Ordinances on Radio Transmission Unlawful!
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Radio Frequency Chokes for Receivers
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Rotten Bunk
Matching the Transmission Line to the Antenna
The Unimportance of Short Leads
Admiral Bullard Dies
Experimenter's Section Report
Some Special Uses of the UX-222
He: The International Tests
L. A. R. U. News
Calls Heard
Correspondence Department
Financial Statement
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Hamads
QRAs


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The American Radio Relay League

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

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

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

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

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Communications Manager . . . . F. EDWARD HANDY, Hartford, Conn.

Address General Correspondence to Executive Headquarters, Hartford, Conn.
IN December QST on this page, from the bottom of a heavy heart, we wrote a very black story of the very black outlook at the International Radiotelegraph Conference. It will now be apparent, from the article elsewhere in this issue, that the story of our impending demise was greatly exaggerated. The two accounts are not as much in conflict as might superficially appear, however. There was every justification for the December report; the outlook was at least that black; that we were unreasonably successful does not alter that fact. As this month's article relates, we have received international recognition to an extent that a month ago seemed altogether impossible of happening; and the combination of hard work, a few smiles from the Fates, and the loyal backing of the United States Delegation has produced privileges for us many times beyond what Europe wanted us to have and many times more than one could reasonably have expected from the situation which confronted us about midway thru the Conference. We succeeded beyond the wildest dreams to which we were entitled at that time.

At this writing, just at the close of the Conference, we are unable to state the official A.R.R.L. view of the Conference's provisions for amateurs. Official A.R.R.L. views are made only by our Board of Directors and our Executive Committee. To us at Headquarters, tho, it seems that these provisions offer us every assurance of a continued happy existence; and, in view of the many wild rumors which have been flying about, it seems necessary that we say so.

The nations which ratify the Washington Convention are obliged to put it into effect by January 1, 1929. They may do so as much sooner than that as they desire, of course, provided such action does not conflict with the London Convention of 1912, which remains in effect, presumably, until that date. It is to be imagined that during the coming year our Federal Radio Commission will not make any assignments or regulations that will be found to conflict after the first of 1929 with the Washington Convention. We sincerely trust, tho, that they will permit the amateur regulations of the United States to remain in status quo through the year 1928, to give us the maximum time to contemplate the new situations which will confront us and to permit the amateur societies of the world ample time to make their plans for the new order of international co-operation which will then be essential.

URING the past month the members of the A.R.R.L. Experimenters' Section and the operators of A.R.R.L. Official Relay Stations have been requested by the Federal Radio Commission to conduct a survey of broadcast-reception conditions in their respective towns, particularly from the standpoint of heterodyne interference. The Commission wanted skilled observers, and neutral ones.

We are proud of this opportunity to assist the Commission. It is an honor. It is likewise another example, for the world to see, of the utilitarian value of the American amateur.

TROUBLE comes in bunches. The international conference was not yet over when we were informed that the Federal Radio Commission was again experiencing a flood of complaints against interference to broadcast reception by amateurs. The situation is very serious. We do not know whether the trouble comes from increased listener-interest at the return of cold weather, or increased amateur activity for the same reason, but there is no doubt of the increase of complaints. So serious is the situation that we are informed that the Commission is contemplating an extension of amateur quiet hours, when they are imposed, to six o'clock to midnight. This will be about as bad as sudden death to the amateur who experiences it.

And so we are again waving the old Rettysnitch and we here and now call upon every amateur to take stock of his station and clean house. Do you interfere with your neighbors? If you do, you are very liable to have quiet hours from 6 to 12 hung upon you. It seems up to us, individually, and for our individual preservation, to take the necessary steps to avoid any such interference. If you don't know whether you interfere or not, it is really up to you to find out by inquiry, and to remedy it if interference is occurring. Practically every case of BCL interference can be cured easily. It's an annoying job, we know, but it seems that each one of us had better tackle it. If there's trouble, take a look at the affected BCL set. Perhaps it's obsolete, or too tightly coupled to the antenna, or with too long an antenna. Probably the
trouble can be cured completely with a simple trap made from parts in the junkpile. But it may be the transmitter itself. Most amateur transmitters are too tightly coupled to the antenna—too tight for best communicating efficiency as well as too tight from the standpoint of causing interference. There is no single thing that may be done to an amateur transmitter which will so effectively decrease its interference as to loosen up the coupling. Most of the trouble in amateur stations comes from the keying, either from the actual impact of keying or from the wobbling of the wave as the power goes on and off. Loosening the coupling helps these things a lot. But key filters or other devises minimize the effect of keying upon neighboring antennas are often necessary in addition. There can be no dearth of data on these things—QST has had worlds of material on them; so has the Handbook. And in particular all the ill to which an amateur station is heir can be detected right at the station by the use of a monitor-box such as described on page 24 of our July issue. Every amateur station ought to have such a device and use it frequently to check the quality of the station output. It will quickly show up troubles and indicate what ought to be done about it, as is explained in the article referred to.

There is really little or no excuse for interference to-day with modern-day BCLs. And the Commission is not sharing as wholeheartedly as it used to the view that if an amateur station complies with all the specifications of its license and still interferes, it is the listener's hard luck. Next to the I.R.C. story, the chief news of this month is the tip that every amateur owes it to himself to investigate and clear up any interferences from his station, or we won't be able to stop this 6-12 business.

In February the A.R.R.L. Board of Directors will meet in its annual session to formulate the League policies for another year and to instruct the officers how to carry out these policies. This Board is composed of Directors whose names and addresses appear just before the editorial page in every issue of QST. There is a director from each A.R.R.L. division in this country, and one from Canada. In the determination of A.R.R.L. policies these directors speak for their respective territories. Members having views to express on A.R.R.L. policies should communicate them now to their respective Directors, in preparation for this meeting.

With the International Radio telegraph Conference safely behind us, we have five years in which to speculate upon what will happen to us at the next conference and in which to ponder upon the motives behind the attitude of the European nations this year. The general purpose of that attitude was to come as close as possible to abolishing amateur radio, particularly international amateur contact. That this was not done is attributable to the very fine support given to the amateur cause by those liberally-disposed administrations which have encouraged amateur radio and have found it, as it indubitably is, a great national asset. The European arguments against the amateur were numerous, diverse—and, for the most part, fallacious. It is interesting to examine them. During the eight weeks of the conference I cataloged the following:

1) Fear that amateurs will violate the state monopoly on communications, thus depriving the state of revenue. Fear that a regulation prohibiting this violation would not suffice, that the very number of amateurs makes it impossible to police them adequately in this respect, and that the only safe control is to do away with them or make their operations so difficult technically as to prevent them from accomplishing much.

2) The general denial of the right of any group to participate in communication other than governments and authorized commercial systems. Europe does not permit private enterprise to engage in communication, as is exemplified in this country not only by amateurs but by our limited commercial services, and it is an age-old policy to attempt to deny this privilege.

3) Fear of a general lack of control of amateurs, not only as to the nature of their communications as mentioned in the first item but with respect to technical features of their operating, and particularly a fear that they will cause interference with other services.

4) The general selfish desire of government and commercial interests to retain for themselves all useful wavelengths, and an unwillingness to allow privileges for non-government or non-commercial purposes. The value of an established international communicating service on a single short-wave channel, based on its potential earning power, might be said to be a million dollars. Why give away hundreds of such channels to amateurs, who merely play and never really discover anything? One such commercial service is worth more than 25,000 amateurs. This attitude was beautifully summarized by the gentleman who represented Canada in the frequency allocations when he said that he did not think that amateurs should ever be given any wavelengths that are known to be useful for any commercial or government communication, and that he thought they
should always be obliged to stay within territory which was regarded as completely useless for any commercial or government communication.

5) The delicate business of war talk. The astounding impression, based upon the fact that the technical representatives of the United States Delegation who spoke for that delegation in upholding the amateur were Army and Navy officers, that the American amateur is primarily an auxiliary of the armed forces of the United States—and therefore to be discouraged.

6) Hysterical fear that the needs of new services in the short-wave field, such as shipping, aircraft, navies, etc., were about to create so great a congestion that it was impossible to spare any waves to amateurs even if it were thought otherwise desirable to do so.

7) Fear that amateur licenses might be granted to unscrupulous persons who would use such stations to undermine the security of the state, as by fostering revolution, spreading Red propaganda, etc. It is to be remembered that when amateur stations are permitted in such countries they are the only agencies of communication in the whole country which are not under the direct and absolute control of the state, particularly as regards censorship. There is hardly a government in Europe so stable that it does not have to take account of these possibilities.

8) General unwillingness to be bothered by something that would make additional administrative work. The feeling that the United States Government is little short of insane in having encouraged amateur radio, and determination to avoid taking on that administrative work themselves.

9) Fear of the political power of amateurs if permitted to grow to large numbers. Being completely unable to comprehend that our own Government can and sincerely does regard us as a national asset, Europe has the idea that American amateurs must be forcing their Government to support them through political pressure and the power of their votes—and so the resolution to avoid that in their countries.

It should be perfectly apparent to any informed North American amateur that the long experience of the governments of the United States and Canada, obtained in not only freely permitting but actually fostering amateur radio in this continent since the first days of wireless, offers abundant proof of the fallacy of these arguments. Fortunately the unfriendly European administrators of radio have in many cases returned home with greatly softened views of amateur radio, based upon a much better acquaintance with its nature than they ever had before. But these arguments open to view in some measures the difficulties that confronted the amateur representatives at Washington.

K. B. W.

Election Results

NOMINATIONS in the biennial elections for Director in six A.R.R.L. divisions were examined by the Executive Committee on November 1st. In three of the divisions there was but one candidate and as a result, in accordance with our By-laws, the following Directors have been declared re-elected to succeed themselves, for two-year terms which commence on January 1, 1928:

Dr. E. C. Woodruff, Atlantic Division
Prof. C. M. Jansky, Jr., Dakota Division
Mr. Benj. F. Painter, Delta Division

Mr. A. H. Keith Russell had no competitor as nominee for Canadian General Manager, and has similarly been declared re-elected for a two-year term.

In the Pacific Division Mr. A. H. Babcock, the incumbent, and Lt. Col. Clair Foster were nominated. Col. Foster withdrew his name, leaving Mr. Babcock as the only nominee, and the latter was similarly declared re-elected for 1928-29 without balloting by the membership.

In the Midwest Division three candidates were nominated: Mr. Porter H. Quinby, the incumbent, and Messrs Ray E. Bolin and Frank J. Sadilek. The result, as ascertained by the Executive Committee on December 2nd, was as follows:

Mr. Quinby ..................... 213 votes
Mr. Bolin ..................... 194 votes
Mr. Sadilek ..................... 55 votes

Mr. Quinby has therefore been declared re-elected for 1928-29.

In the Southeastern Division no nominations were made and there is consequently no election. In accordance with the Constitution, Director Harry F. Dobbs remains in office until provision is made for a new election.

K. B. W.
A General Purpose Device

A Combined 15-to 2500-Meter Portable Receiver, Audio and Radio Oscillator, Amplifier and Wavemeter

By Howard Allan Chinn*

For those who for one reason or another find it necessary or convenient to be able to move the receiver around easily and for the man who wishes to get the most possible use from his limited supply of apparatus the set described in this article may be of interest. While it is fundamentally a plug-in coil receiver of the usual circuit arrangement the small set shown herewith will be found useful around the amateur laboratory for many purposes. The panel size is only 6½ x 5 inches, the cabinet depth 5 inches and besides providing a receiver covering all the wavelengths from 15 to 2500 meters (20,000 to 120 kilocycles) the set will be handy for use as a heterodyne oscillator or wavemeter, as an audio oscillator, as a variable condenser unit or as an additional stage of audio amplification for an external set-up.

The photographs show the general panel layout and Figure 1 gives the circuit diagram together with the constants of the various pieces of apparatus. A two section Cardwell condenser is used for secondary tuning and is arranged to permit the use of one section of 65 μfd. maximum capacity for short wave reception (below 200 meters) or both sections of 400 μfd. maximum for the longer waves. The small section consists of three rotor and four stator plates, the rotor plates being cut (originally semi-circular, straight capacity line plates) to give approximately straight frequency line tuning for the first 70 of the 100 dial divisions. The plates were cut this shape merely for convenience in tuning the higher frequencies, the plates in the large section of the condenser being unaltered. Figure 2 shows the resulting shape of the plate. If one uses the usual straight capacity line plates only two rotor and three stator plates, arranged so that there are three active dielectric spaces, will be necessary to obtain the maximum capacity of 65 μfd. The small section of the condenser provided a tuning range of about 1½ to 1. That is to say, if the set tunes to 30 meters with a particular coil with the tuning condenser at a minimum capacity the maximum wave reached with that particular coil will be 45 meters. For the two sections combined a tuning range ratio of 3 to 1 is obtained.

A miniature single-pole single-throw switch is mounted on the side of the dual section condenser (directly on the stator terminals) to provide selection of one or both sections. It is arranged with the switch arm connected to the large section and the switch jaw connected to the small section thus providing the minimum amount of extra hardware tied to the section of the tuning condenser that is used for the short wave reception. A National vernier dial is used for the tuning control, while the particular throttle condenser used was provided with a geared vernier control.

The radio frequency choke r.f.c. is a Samson helical wound choke and has been found very satisfactory on all the waves which the set covers. The use of a choke wound in this manner is strongly recommended in preference to the ordinary layer wound affair in a receiver of this nature where it is essential that the choke operate properly over a very wide band of frequencies. Because of the construction of these chokes there is no pronounced resonance point and therefore no critical region within which the coils give non-uniform or undesired results.

The amplifying transformer used is a high grade broadcast transformer (de-
transformer is desirable because of the high damping of vibration of the detector tube, to permit it being incorporated in a set around the detector. AIX sockets are bought, mum, spring sockets were used. handy, in that, they permit the use of the different types of tubes that are now available with UX bases. A 50-ohm rheostat is used to permit the use of any battery from 2 to 6 volts with either one or two tubes (of any of the usual types) in the sockets. Battery connections are taken care of by means of a flexible multi-conductor cable. This was found to be more convenient than fussing with connecting wires each time the receiver was set up.

Phone tip jacks are used since they permit a quick and easy way of connecting the phones to the circuit and do not require a large amount of space back of the panel.

The coil system is one that has been described many times in QST and has the desirable feature that the coils may be plugged in either way without affecting the operation of the set in the least. The plug spacing is the same as that found on the General Radio coil forms. The outside plugs and jacks (grid and filament) are spaced 1 15/16" and the inner plugs (plate and B plus) are 3/4" apart. All manners of coils and coil forms may be mounted on the plug strip. Some of those which were actually used are shown in one of the photographs. The Samson coil forms will be found handy for those who wish to make a bank winding for the longer wave coils (above 1000 meters) because of the ends provided on the forms which gives one something to wind “against” and does away with the unpleasant slipping of the first turn which one experiences when attempting a bank winding in ordinary tubing.

**WAVEMETER AND SIMILAR WORK**

A coil plug strip with binding posts or Fahnestock clips it may be used in place of the usual coil and by removing the tubes from the sockets we may connect to the secondary terminals and thereby obtain the use of the secondary condenser for an external circuit arrangement we may be working with. Also, by connecting to the proper terminals the throttle condenser can be used in other circuits. There is no reason why either one or both of these condensers cannot be calibrated so as to furnish

**THE ARRANGEMENT OF THE PARTS**

Note in particular the trimmed rotor plates of the two-section variable condenser.

![Diagram](image.png)

**FIG. 1. THE CIRCUIT**

C1 Antenna coupling condenser. Two plates 3/8" square, separated 1/8".
C2 Secondary tuning condenser. Small section of Cardwell dual condenser. 55 μfd, maximum.
C3 Secondary tuning condenser. Large section of Cardwell dual condenser. 355 μfd, maximum.
C4 Sangamo grid condenser. 100 μfd.
C5 Throttling condenser. 500 μfd, maximum.
R1 Grid leak. 5 to 10 megohms.
R2 Filament Rheostat. 50 ohms.
RFC Samson type 125 radio frequency choke
T Samson symphonit transformer.

**FIG. 2. SHAPE OF THE TRIMMED ROTOR PLATES**

A calibrated condenser unit for laboratory work that does not require too great precision.

It is also possible to plug-in a single coil across either one of the variable con-
densers and provide an ordinary wavemeter which is not much larger than the usual one found around amateur "shacks" and one whose calibration will probably hold as well as most of those in said shacks.

If one prefers the heterodyne wavemeter the usual coils may be plugged-in and with the throttle condenser set at a given point to obtain good oscillation the set may be calibrated and it will be found that its calibration will hold quite well (Within 1% or 2%). A heterodyne with a rough calibration of this nature will often be found very handy around the amateur laboratory.

AS AN AUDIO AMPLIFIER

If an additional stage of amplification is needed for some purpose or other one merely plug-in the binding post strip, places the amplifier tube in the socket, connects disconnected from the B battery and connected to the phone tip removed from terminal No. 1. The wave form of the resulting oscillation is, of course, far from sinusoidal but the thing will oscillate at an audio frequency and a source of noise is often useful. The frequency can be varied to some extent by adjustment of the throttle condenser (it now being a tuning condenser) or by variation of the plate resistance of the tube which can most easily be accomplished by varying the filament temperature. It has been found that the tube usually must be run at a very low filament voltage to obtain oscillation in the order of 1000 cycles with the particular transformer used in this set.

Binding posts are provided on the panel for the antenna connection which may be to the grid through the small coupling condenser, directly to the grid or through any capacity that may be inserted in series with the antenna external to the set. Direct connection to the grid is sometimes necessary for certain laboratory work and it was therefore thought desirable to provide the additional binding posts, which, incidentally, permits even the small coupling condenser to be used for other purposes. The ground is connected to the A battery plus terminal.

By connecting the proper apparatus (meter, balancing resistances and batteries) as shown in Figure 3 between the tickler binding posts we have a vacuum tube voltmeter of the grid detection type. The uses of an instrument of this type in the laboratory are innumerable and need not be mentioned here. If one uses the set as shown as a thermionic voltmeter and wishes to measure the voltage across an open circuit (as far as d.c. is concerned) it will be necessary that the circuit be arranged so that the grid leak goes from grid to filament instead of across the grid condenser as shown in Figure 1. This change can be incorporated in the original circuit without affecting the operation of the set as a receiver.
The Amateur and the International Radiotelegraph Conference

By K. B. Warner, Secretary, A.R.R.L. and I.A.R.U.

The International Radiotelegraph Conference is over! The Washington Convention of 1927, signed on November 25th, attests the eight weeks of strenuous work of 200 delegates, 178 special representatives, and uncounted functionaries, attaches and clerks, representing 55 countries and 23 dominions and colonies. The London Convention of 1912 is no more—a new order prevails. In it, for the first time, the radio amateur receives an international status and recognition as a factor in radio, the rules governing his conduct are set forth, and his rights and privileges are defined. Those privileges in most respects are entirely adequate. We have achieved a great victory.

It is extremely difficult to compress within the confines of a single magazine article an accurate account of the eight busiest and most anxious weeks of one's life, weeks when the ultimate fate of the amateur hung momentarily by a thread. I do not know where to begin. I have written much about this conference in my editorials of the past several months, not only because it was the most important news of the day but also because it was a subject that had been occupying me almost exclusively during those months and I knew more about it than anything else. In those editorials I have attempted to depict the gradual unveiling of the Washington picture, and I ask our readers to accept them as the background for this account and let me go on from there.

Vice-President Charles H. Stewart and I were in attendance during the entire eight weeks of this conference. We didn't miss a day. We were joined at critical times by Mr. Maxim, president of the League and of the Union, under whose leadership we worked. We were gloriously backed and represented by the American Delegation and valiantly assisted from time to time by delegates from Canada, Italy, Australia and New Zealand. Most of the rest of the world was against us. Even Canada, thru no fault of the estimable Commander Edwards, was against us when it came to wavebands—of which more anon.

I have previously described how the conference was divided into committees. Some matters affecting the amateur arose in most of the committees but most of our matters were centered in the Technical Committee, presided over by the renowned and beloved General Ferrié of France. This committee had three sub-committees, presided over respectively by Professor A. E. Kennelly of Harvard, of Kennelly-Heariside Layer fame and a former A.R.R.L. Director; Mr. E. H. Shaughnessy, assistant chief engineer of the British Post Office; and Professor G. Vanni of Rome, who amongst other titles is president of the Italian Section of the I.A.R.U. The amateur matter first arose in Mr. Shaughnessy's sub-committee when Great Britain's proposal for amateurs was reached for examination, and the battle was on when Japan led off with the devilishly ingenious suggestion that all transmitting amateurs be obliged to use phantom antennas. Mr. W. D. Terrell, Chief of the Radio Division of the Department of Commerce, stemmed the tide with a splendid address on behalf of the amateur, and served the first notice that the American Delega-
tion was expecting its amateurs to get a fair shake. And so a sub-sub-committee on the amateur was appointed, consisting of eleven members with Professor Mesny of France as its chairman. Thru the kind efforts of the American Delegation I was made a member of this sub-committee, as a representative of the amateur.

It is necessary to pause here and say that the preservation of amateur radio on the face of the earth to-day is very largely attributable to the efforts of the United States Delegation. Amateurs in every country of the world are indebted to them for their preservation. There were liberally-minded representatives from other countries, most notably Captain Montefiore of Italy, Commander Edwards of Canada, Mr. Brown from Australia and Mr. Gibbs from New Zealand, and of course the amateur representatives were doing their very best. But all of us would have been sunk if it had not been for the American Delegation. Our people served notice from the first that they would demand that the amateur be cared for. At first the opposition was equally insistent but gradually it wore down a bit, and the eventual result, as in all such things, was a compromise. But for one reason or another, chiefly the economic demand for international waves and the fear that the activities of amateurs in various directions couldn't be controlled, the bulk of the world was bitterly opposed to us. I shall say something on the editorial page this month about these reasons. This seems the proper place, too, to retract the hymns of praise we sang in a recent editorial about the remarkable friendliness and openmindedness of the British Delegation, as judged from a first impression at Ottawa. We regret that we may have given the wrong impression to them. The least of the opposition, they were the amateur's most bitter opponent, and unremittingly and relentlessly they pursued us and hacked at us in every committee. The British are said to be the best negotiators on earth. We presume that from their standpoint they may feel that they did a good job at Washington. For our part, we offer our apologies to the British amateurs for our inference that they didn't know their officials.

And now to get back to that sub-sub-committee on amateurs. It met the next day, and Messrs. Terrell, Edwards, Brown and Gibbs spoke, as delegates from their respective countries, on behalf of the amateur. It was evident that there were going to have to be amateurs. The British delegate at this meeting was Mr. F. W. Phillips, assistant secretary of the G.P.O. Mr. Phillips believed in amateurs too—had they not 1200 of them in England? But of course the amateurs would have to expect to be restricted to narrow territory. Mr. Phillips had a little paper all ready, as it seemed every British delegate always did, and he thereupon proposed that amateurs be assigned a band in the vicinity of 150 meters and not more than six narrow bands, distributed throughout the short-wave spectrum in harmonic relation and located, for example, at 109.33, 82.00, 54.66, 27.33, 13.66 and 6.83 meters. These unusual figures are, with the exception of the 82-meter wave, harmonics of 2750 kc. They were no strangers to us, for we knew that the British had a scheme for the division of short waves which provided a boundary between mobile and point-to-point services at 11 megacycles (about 27 meters) and that, using this as a starting point and working in both directions, they had arrived at this set of figures for us. We had other ideas, but this petite comité could do no actual allocating—it was merely making a recommendation, and of course we were in sympathy with the idea of harmonically-related short-wave bands throughout the spectrum and this was but an example. The argument then hinged on the word "narrow". The friends of the amateur did not want that restriction, as this committee at best was but recommending, but Mr. Phillips (and he was not alone in it) stuck out for "narrow", offering at one time to replace the term "narrow bands" with "bands not over 100 kc. wide". Finally, by a vote of 6 to 5, the word "narrow" was retained. The meeting then decided to recommend that each nation remain free to determine the power of amateur stations; that amateur stations be under the obligation of keeping their waves within their assigned bands, stable, and free from harmonics; and that they sign their calls frequently. When the meeting adjourned it was freely predicted that we amateurs would eventually get 100-kc. bands at the British figures, and nothing more.

This amateur report was accepted by Mr. Shaughnessy's sub-committee and eventually by the whole committee under General Ferris, and from there the recommendation for amateur waves went to the consideration of Professor Kennelly's sub-committee, which dealt chiefly with the allocation of wave-bands. There a considerable delay ensued, for that committee was then working on the allocation of waves down to 200 meters, in which we did not figure, and it was some weeks before the short waves were agreed to.

In the meantime the question of the nature of communications to be permitted amateurs came up in the Committee on General Regulations, where the chief United States representative was the Hon. Wallace H. White, jr., Congressman from Maine, father of the numerous White radio bills, and our friend for years. In practically every country outside of North America, the governments own and maintain all of the communication systems as a state monopoly, and they were all very insistent that this monopoly be protected against in-
fringement by amateur messages. Many countries had made proposals about this, some of them amazingly drastic. France formulated a compromise between the proposals of Germany Great Britain and Switzerland which would confine amateur signals in every country to those relating to experiments under way and prohibit code, secret language, commercial language, "personal or actual information", or information for a third party. This was ter-
tween private experimental stations of different countries is forbidden, if the administration of one of the interested countries has given notice of its opposition to this exchange. When this exchange is permitted the communications must, unless the interested countries have entered into other arrangements among themselves, be effected in plain language and limited to messages bearing upon the experiments and to remarks of a personal character for which, by

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<th>Assignment</th>
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This was an international conference and its findings should not concern the domestic policies of any country; a country should be free to permit her amateurs to handle messages internally if she wishes; even internationally if both countries agree. It looked like the rest of the world wanted to prohibit our American amateur traffic just because they didn't want their amateurs to handle messages. We rushed to Mr. White; he was already looking for us, to help. The British had a less obnoxious counter-proposal—they felt that the French proposal went too far, altho why we don't know. We seized upon the British compromise as a basis, but this text forbade any international messages under any circumstances and even international contact between amateurs if one of the countries concerned should object. Mr. White negotiated a further compromise for us, and by the next meeting had the agreement of the British, French and Germans. At that meeting he made a fine and able plea for the amateur and eventually we had the pleasure of seeing the compromise text adopted. Without his assistance we would again have been sunk, with useful message-traffic absolutely denied us. When the text finally came out of the Drafting Committee it read as follows:

"The exchange of communications be-

"reason of their unimportance, recourse to the public telegraphic service might not be a consideration."

If this sounds hard, consider what it avoids! It is cruel to hear talk of an administration denying its amateurs the right to communicate internationally, but of course that has always been a nation's privilege if it wanted to exercise it. As to the necessity for special arrangements between countries before international traffic is permitted us, we've never had any particular international traffic except with Canada, and that we feel sure can be arranged. The amateurs of other countries have been prohibited from message handling anyway—which is possibly proper enough in the case of actual messages whose handling actually denies revenue to the state—and so they lose nothing. The general freedom of action allowed under this provision I find quite gratifying, and certainly infinitely superior to the original proposal which would prohibit every amateur from saying anything in the way of "personal or actual information".

And now let us return to our wavelengths, where the real story remains to be told. The sub-committee on allocations was an unwieldy body. Its work was of vital importance to everybody, so its meet-
agreements were attended by the delegates of 78
nations and the representatives of a hun-
dred special interests. It had to conduct
its business formally, with recognition from
the chairman, interpretation of remarks into
French or English, and its minutes had to be
kept carefully, paralyzing free speech.
In the case of the long waves, then, it was
early recognized as hopeless to attempt an
agreement in so large a body, and so the com-
mittee adjourned while the various dele-
gations attempted to get together and agree
informally on a tentative program to be set
up as a basis for discussion. Specially
trusted representatives of the bigger powers
met each other informally and discussed
wave-lengths, over the afternoon tea-cups
or in hotel rooms at night. Gradually the
"tea-cuppers", as they came to be called,
found themselves approaching an agree-
ment. Then two of them would meet the
representative of another country, reach an
agreement that the three of them could
accept, and so progress to the point of tak-
ing in a few more countries, until eventually
a tentative agreement had been reached be-
tween the eight or ten leading powers. This
had all been done entirely informally, out-
side the actual conference, without official
commitments, with no records kept and
with everybody therefore able to speak free-
ly. Ten days or so were thus consumed,
and then the sub-committee reconvened
and received the suggestions. By that time it
had the endorsement of the leading coun-
tries and provided an admirable basis for
discussion, being of course altered in the
process of discussion but eventually being
adopted closely as negotiated over the tea-
cups.

When all the waves down to 200 meters
had been decided upon it was determined to
employ the same method for a preliminary
agreement on the short-waves, and the sub-
committee again adjourned to await a re-
commendation. Our anxiety then can be
imagined. We had seen the long-wave
agreement negotiated informally, only the
possible way but with many people unable
to participate in the original formulation,
and we had seen that plan subsequently
adopted with little alteration. The short-
wave problem was admittedly much more
difficult, so difficult that the possibility
existed that there would be no agreement at
all. But if one were eventually secured,
what chance would there be to get altera-
tions in it if we didn’t like it? About zero,
we figured. It was therefore a tremendous
relief when I was personally invited to
participate in the short-wave discussions, to
represent the amateurs.

Altho elated that I was to be a tea-cupper
myself, we had our grief even then, for they
informed us that the room where the sub-
committees were to be held was so small that
there was room for but one amateur re-
presentative. And so we had to break up the
old Stewart-Warner firm and I went alone.
I cannot tell you amateurs of my emotions
as I sat for days in those meetings, the only
amateur representative. I felt that my re-
sponsibility was a very heavy one. The fate
of the amateur world rested largely on U.S.
I conducted myself. I had loyal friends in
the United States representatives present,
and an occasional one from another country,
but the rest of the world was frankly against
me. Would I be able to put it over, even
with all the help of powerful friends?
Would I be able to tell our story convinc-
ingly enough to get our modest requests
from an assemblage which was determined
not to give it to me? I had no one with
whom to consult during the meetings; I
could only keep my wits about me and do
my best. But between meetings Mr.
Stewart and I had long sessions of our own,
analyzing the work to date and altering our
plans as the situation changed, and then I
would go back to another meeting to carry
on.

It is necessary here to digress a moment
to explain the informal American organiza-
tion which represented this country in these
wave-length discussions. All technical
matters of the American delegation were un-
der the direction of Major General Charles M.
Saltzman, Chief Signal Officer of the Army.
General Saltzman is a respected amateur
and he proved it thorough the con-
ference. Amongst the technical advisers
attached to his staff for the conference were
Lieutenant Colonel Joseph O. Mauborgne,
for the last several years in charge of re-
search and development for the Signal Corps
but now on duty at the Chief’s Office; Capt.
ain S. C. Hooper, in charge of the Radio
Section of the Bureau of Navigation; and Lieu-
tenant Commander T. A. M.
Craven, U. S. N., who was recalled from
sea for duty at the conference on behalf of
the Navy Department because of a previous-
ly demonstrated peculiar aptitude for this
kind of work. These three technical ad-
visers represented the United States in the
wave-length negotiations. There was the
real meat of the whole problem, and there
was where their insistence on behalf of their
Government that amateurs be provided for
was really effective. We amateurs have
much for which to be grateful to them, for
they saved the day for us. Captain Hooper
presided at all the informal meetings of the "tea-cupping". Commander Craven conducted the actual negotiations. In fact, the structure of wave-length allocations finally arrived at is largely his handiwork. This young Naval officer has made an enduring name for himself. It may be said that he is personally responsible for the successful negotiating of the wave-length agreements embodied in the Washington Convention of 1927. What a monument to have to one's credit! The conference has praised him for it. I sing his praises too, for he was the staunch and clever friend of the amateur and in large measure we owe what we got from the conference to his skill and perseverance. These three officers let no opportunity go by to stand up for us. If we did not get all we want, it only shows the difficulty of the task and how hopeless we would have been without their help. I want to tell you amateurs that our friendly bonds with the Army and Navy have paid the richest possible dividends!

But I must get on with the tea-cupping. It was a most difficult task. There were about twenty-five people present at most of the meetings, representing eight leading countries and a number of special interests. Six meetings were held, stretching over eight days. Gradually an agreement began to take form. There were endless arguments between mobile and point-to-point, conflicts with expensive beam stations, and what not. It was really very difficult and only a splendid effort to secure agreement by mutual compromise made the result possible. Amateurs were left out while the preliminary chopping between mobile and point-to-point was made, but with pointed insistence by the U. S. delegates that the meeting should return later and fit the amateur into the picture. I was on needles and pins for days, watching this part of the program in which I did not participate, inwardly pulling for a division which would put point-to-point bands at the places where I wanted to see amateur bands. The United States wanted the same thing, and eventually the division was made along lines that made that possible. In the meanwhile the upper amateur band, to be "in the vicinity of 150 meters", was located as from 150 to 175 meters. Higher territory seemed impossible; it had already been determined to give 175 to 200 to mobile exclusively, when the long waves were discussed; I didn't much care; that seemed ample for our needs in an upper band, even if it were non-exclusive (as indeed it already is in this country). Besides, I was holding my fire for the short waves.

At last they got thru the table, down to 13 meters. Then they started on some narrow bands for short-wave broadcasting but couldn't agree and decided to leave that for a still smaller group to discuss. At last

the amateur question! I took another reef in my belt and prepared for action.

Mr. Shaughnessy led off. The table as agreed at that time provided certain exclusive bands for point-to-point, some more exclusive bands for mobile, and some narrow shared bands. His proposal was that the amateurs share a small part of the already shared bands. I had horrible visions of a senseless selection of amateur bands without harmonic relation and filled with mobile interference. Some days previous we had prepared and circulated a paper containing a suggestion for the amateur bands, proposing that they be centered at 20, 40, 80 and 160 meters as locations where our operations of the last several years had undoubtedly served to keep them clearer of established commercial services than any other locations; and, instead of "narrow" exclusive bands, use moderately wide "N.G.P." bands, that is, bands reserved for stations not open to general public correspondence, such as government stations, amateurs, etc., from which bands amateur stations might be provided. The idea was that this would provide sufficient flexibility to make wider bands possible in countries having many amateurs, yet leaving a nation free to assign her amateurs but small bands if the number of amateurs was small or the administration hard-boiled. I countered Mr. Shaughnessy with this proposal, and Commander Craven backed me up with the request from the U. S. Delegation for more definite amateur bands. But nobody else liked the N.G.P. idea, it seemed. The situation instantly was serious, for with this idea of flexibility lost we would be confronted with fixed bands which would inevitably be narrow—the maximum to which international assent could be got. Then Captain Gino Montefinale, of the Royal Italian Navy, the commandant at IDO, proposed a counter scheme, suggesting amateur bands centered at my figures and of variable width, as each administration desired, but not exceeding certain maxima, and those maxima were the same as the proposed widths of my N.G.P. bands. Captain Montefinale was a fine friend of the amateurs throughout these meetings, and in fact absolutely the only one we had outside of the American delegation, for even Canada worked steadfastly against us for all her delegate was worth. The amateurs of Rome should give Captain Montefinale a dinner—his assistance was most appreciated. But nearly everybody objected to his scheme the same as they had to mine, and the battle waged on thru anxious moments. France would accept if the bands avoided the mobile waves. Mr. Shaughnessy objected that our proposed waves would hit into the center of the point-to-point bands and again demanded that amateurs be in narrower bands, with fall of 800 kc. total for us, in which he was supported by Germany. I objected again,
backed this time by all the mobile people, including the U. S. and Japanese navies. And finally we sold them on 20-40-80! I think that tremendously important, not because those were our American waves but because our occupancy of them had made them much less likely to conflict with established commercial services than any other locations one might have named—and future events showed I was dead right in that. Mr. Shaughnessy would agree if the amateur bands were narrow as the sub-sub-committee had recommended, and came from the edges of those point-to-point bands, and he proposed 400 kc near 18½ meters, 200 kc, near 37½, and 100 kc, near 75. This was a tremendous concession for him, but fixed bands of those widths were hopeless and I said so, again urging my flexible scheme. A vote was taken and the KBW-Montefinale scheme was lost, and the general idea of the Shaughnessy proposal voted. France, be it said, voted against both, thinking my plan too ambitious and Mr. Shaughnessy’s too restrictive. Only Italy and the United States supported us at this juncture. Then abruptly it was found that no agreement could be reached readily on the width of the amateur bands—this meeting was still too large—and so this subject was referred to the same small group, more or less voluntary, which was going to meet that afternoon to recommend some narrow bands for short-wave broadcasting, and the meeting adjourned.

We took stock of the situation that noon. We had established the location of our bands where we wanted them. The flexible N.G.P. plan had been discarded, and rigid amateur bands of small dimensions were proposed. In the certainty that we were going to get clipped badly on the international waves, it became more important than ever to work for wider territory in the national waves than would be afforded by a rigid family of harmonically-related bands. At once we determined to abandon this idea and to negotiate for each band separately, as we found conditions, and to ask for wider non-exclusive territory in the 80-band rather than the paltry 100 kc. that would be afforded by any true harmonic plan.

It was an odd assembly which met that afternoon to decide upon the broadcasting and amateur bands. “Sub-teacuppers” is the proper term for us, I suppose. There were seven of us: Col. Mauborgne, Commander Craven, Major W. Arthur Steel of Canada, Dr. Van der Pol, of the Netherlands, representing the European broadcasters, Mr. Charles E. Rickard, representing the Marconi beam stations, Capt. H. Abraham, of Germany, representing Telefunken, and I. Major Steel was the only actual government delegate present and, aside from Col. Mauborgne and Commander Craven, the rest of us didn’t even represent a government. But this group was constituted for this purpose, and away we went. I kept out while the broadcast bands were being settled, and Mr. Van der Pol laid off when we got to the amateur matter. At last the moment had arrived! Now or never! But what an odd group to say what the amateur should have! It was a good enough group to decide the broadcasting question but it was only by chance that it was given the additional job of recommending the amateur bands.

I had explained to Commander Craven my idea for wider non-exclusive territory in the 80-band, to which he readily assented, and in short order he personally sold the meeting on 3500 to 4000 kc. non-exclusively for amateurs, our present American assignment. This was immensely better than I had hoped for; it assured us “a place to live”, from which to sally forth to narrow international bands if we got short-changed below, as seemed unavoidable. Non-exclusive was quite a right we always shared that band with army mobile, naval aircraft and naval vessels working naval aircraft, without trouble. Then we tackled 20, for which the proposal was 400 kc. There wasn’t a chance to get any more. It really seemed about sufficient for the rather limited amount of day-light work which we amateurs do. We have had 2000 kc. there not because we needed it but because that width was dictated as the harmonic of our 40-band in defiance of the inverse economic value of the respective bands. I also found amateur occupancy of the 20-band entirely insufficient to justify a demand for any more, to say nothing of needing to hold my steam for the 40-band. The 20-band was located between 14,000 and 14,400 kc., those figures escaping the established services of the gentlemen present. And then we tackled 40, the real rub. That was our international night band, the place where we all assemble from every nation for our international communications. Next to our national bands, territory there was our most important need. I was asking for 800 kc. there and our own government was quite in agreement, as they had planned 7000-8000 kc. for us on the N.G.P. basis. But there was never a chance for it—it was too much more than the British idea of 100 kc. or Mr. Shaughnessy’s generous 200 kc. The meeting attempted to find a place in the 7000-region where no commercial services were already in existence, as indicated by lists available. A start was made at 7000 kc. but only 200 ks. were available before a snag was encountered in the form of an existing German station. I didn’t know, and don’t know to this day, just what that had to do with it, but the idea was to get unanimous agreement of all the other interests to what was given us amateurs, and here the Telefunken representative couldn’t agree because he had a station there! He might
have been out-voted here but the main tea-cuppers would have supported him the next day. Another location was tried but Major Steel objected, claiming that Canada had a large number of stations established in that 7000-8000 band which has been assigned to amateurs in Canada for four years. In fact Major Steel steadfastly refused to give his agreement to any large amateur assignment in that area, and he hurt us a great deal. He had been appointed by his delegation to represent them thru all the allocation matters. In these matters he sided most of the time with the European viewpoint, particularly the British, and but rarely with the American. It seems so strange, for surely Canada’s radio destiny is the same as that of the United States, not Europe’s—and that has been Canada’s policy for years. But the Major’s idea on amateurs was at least as bad as that of any European and he worked against us steadily. It will be a disappointment to Canadian amateurs to know that their representative did not uphold any of the usual policies of their government respecting amateurs, but instead was quite of the opinion that amateurs should not be permitted to occupy useful communicating waves, and that he did all he could to keep us out of them. He joined the Telefunken agent in refusing to agree to anything as rash as 400 kc. for amateurs in the 40-band. Eventually Capt. Abraham agreed to move one of his stations and a 225 kc. band from 7000 to 7225 kc. was determined upon. It is interesting to note that this band was clear of any established commercial or government stations, and that its limits are defined by the maximum width to which Capt. Abraham and Major Steel would agree in consideration of their established stations! Our band was no more than the Telefunken agent would agree to! Nor could it be widened or moved because of Major Steel. It seems so odd that such considerations as these should have entered into the recommendation of this meeting, yet this little group had been appointed to make a recommendation and of course this was what they were going to hold out for, and the best efforts of our American people were unable to change it. I couldn’t assent to these figures, and didn’t, but that didn’t alter the maximum to which the meeting could get agreement. Then the 10- and 6-meter bands were easily fitted into the picture, and we adjourned.

The next morning the sub-tea-cuppers reported to the tea-cuppers and, strange to relate, the only objection was from me! I was then holding out for 400 kc. at 40 instead of 225. By then I was prepared to recommend that we agree to the rest of the table but I thought we needed and rated more at 40 and I could see no good reason why it couldn’t be spared to us. Capt. Hooper, as chairman, supported me, but the British claimed that they had important services there and that it was out of the question. Capt. Abraham then said that the preceding day it had seemed too difficult to shift existing stations but that he would now compromise with 300 kc.—7000 to 7300. Mr. Shaughnessy would shift his stations too and agree. It meant 75 kc. more and it became apparent that it was the very maximum to which agreement could be got. But the fireworks weren’t quite over, for Mr. Shaughnessy objected to our 10-meter and 5-meter bands being marked exclusively amateur, saying that we might succeed in developing the 10-meter band into useful communicating waves and that in that event we shouldn’t be permitted any such exclusive possession of valuable waves. It was at length determined to compromise by opening them to “amateur and experimental”. Altho a small point, it illustrates the determination with which the British pursued us at every stage of the game. And finally everybody agreed upon these figures for us amateurs and the whole report was accepted.

From that time on there was never a chance for any alteration in the figures. These meetings were strictly informal and not officially binding upon a soul present, much less upon the interests they represented. But it was considered that an agreement had been reached and there was an unspoken pledge to stand by the agreements. This pledge was at once the weakness and the strength of our position for, altho it made impossible any attempts to increase our 40-band allocation, it insured strong backing for the preservation of the table against any who might attack it. It shortly became apparent that it was considered that our United States delegation, by having participated in the negotiations, was bound to support these allocations for amateurs, and in fact it was considered that we had accepted them too and for the same reason. Careful sifting of the situation showed that there wasn’t a chance to get any agreement on anything greater. Besides, these figures really weren’t half bad. To make a very long story decently short, the tea-cuppers laid their work before Prof. Kennelly’s sub-committee on allocations as a basis for discussion. It was hopped upon by various people, particularly folks who wanted to question the great width of the amateur assignments. Here Prof. Kennelly roundly defended us, and the very fact that it was considered that an agreement

had been reached amongst the major powers caused them all to stand their ground and defend the whole short-wave table against attacks. As a result, it was easily adopted in the sub-committee without alteration and similarly adopted a few days later by the Technical Committee. At length it reached the Plenary Session and there it was adopted just as easily, amidst great applause, for it was realized that a perfectly mountainous piece of work had been accomplished and that it was really a rather good job. This was the largest international conference ever held in the history of the world, with nearly eighty nations represented, and they had unanimously agreed upon the partition of wavelengths from 30,000 meters to zero.

This is the true story of the determination of the amateur wavelengths in the convention of 1927. Our wave-bands are shown in the accompanying table. If the reader feels that we got a satisfactory deal, give the credit to our United States Delegation. If they do not seem enough, they were the best that could be got in the face of united opposition. But I feel that we must consider that we have been most successful. We have received a great deal more than most of the world wanted us to have. With the single exception of our 40-meter band I believe we have all that we shall need. For our international night work in that band we shall have to devise new methods, perhaps new apparatus, and certainly we shall have to employ a greater measure of international cooperation than ever before. But all of these things are possible to us and we have always gloried in the necessity for picking a new job.

There will be time in succeeding months to analyze the new problems confronting us and to arrange for their solution. The convention does not go into effect until the first of 1929, so there will be time to adjust ourselves to the new situations. These new amateur wave-bands should be considered gorgeously ample for every country but ours, and we in this country will find a way. It should be emphasized, tho', that no nation is obligating itself to permit the existence of amateurs—that is strictly its own business—and unfortunately the conference offered no opportunity to insure the existence of amateurs in every country. Nor is any nation obligated to put the entire width of these bands at the disposal of her amateurs—in fact few of them will; the bands are merely those which nations have internationally agreed are to be used for amateurs in countries which so wish. We may feel sure, though, that we have gone a long way towards selling the amateur to the administrations of the different countries, and now that there is international agreement on amateur territory and a nation may know that it is not stepping on the toes of another in giving certain waves to its amateurs, we may hope that there will be a much greater disposition in foreign countries to treat the amateur liberally. Believe us, they have certainly heard about the amateur at Washington!

And now, rapidly, some other amateur matters. Each administration will fix the maximum power of its amateur stations. The stations must be licensed and the administrations must assure themselves of the proficiency of the operators. The stations must comply with all the general requirements of the regulations, particularly as to observance of wave-length, stability of wave and freedom from harmonics. They must sign their calls at frequent intervals. The calls are to be assigned from the same "national blocks" as the calls of commercial stations, consisting of the one or two initial letters that indicate nationality in such calls, a single figure, and not more than three letters. These calls will be used in connection with the intermediate "de". Thus the governments do away with the necessity for our international intermediates—beginning in 1929. The other important amateur question was the nature of our communications, and that I have reported previously.

In the near future, probably the next issue, QST will print pertinent extracts from the Washington Convention applying to the amateur. We shall advise where and how the document may be obtained as soon as it is available. The coming year undoubtedly will see in QST much discussion and much new material and many new decisions based upon our new conditions, as we analyze them and learn their possibilities.

It has been a great two months, the hardest but the most interesting in my life. It has been a wonderful experience. I am proud that we may call it successful. The unyielding world has yielded, and we amateurs are safely written up in the greatest communications document of the age, the Washington Convention of 1927.
A MATEUR radio phones have probably been the cause of more bad feeling among the QST staff than any other thing he has ever been attempting.

After operating an amateur phone for some years we have arrived at the conclusion that most of the bad feeling has been justified. The moral is, "If you are going to use phones use a rig which will not disgrace the whole A.R.R.L. to say nothing of your own particular station."

We plead guilty to "getting quite a kick out of" operating our radio phone sets. The idea seems to prevail that no one except a "ham", a "kid" or a rank beginner even looks at these sets. Unfortunately this is true to some extent but there are old timers who enjoy "chewing the rag" by phone. These men are not DX crazy, they know they have no chance to get a WAC certificate with a 15-watt phone set but they can get the RCC certificate easily and they find it enjoyable to handle traffic with people who have something to say besides "YY GLD QSO CUL 73" even though they are only a hundred miles away, which for that matter is not always the limit for a good phone of low power.

We still remember when we started our first phone set.

Says Lackey to Spencer: "Where do you get the dope on a phone set?"

"Ballantine," says Spencer.

So we got it down and read it. It is a great stuff; every amateur should have it (phone or c.w.) but a lot of them don't.

"Now, how about QST?" says Spencer.

So we got down the complete volumes and looked them over. Plenty of dope on c.w. on receivers and on everything else and all of it FB but almost nothing about phone. How comes? We decided that QST was an "amateur" phone and were all heated up and ready to grab up a sheet of asbestos and write a letter on it when we saw that the League had persuaded the new radio commission that the amateur should retain the 150- to 175-meter band. Right on top of that we see a "stray" saying that QST will consider some articles on amateur phone.

"Let's write one," says Spencer.

"Nix!", says Lackey. "Who in Sam Hill told you we could write an article?"

"Well," says Spencer, "we can tell them about our experiences and they might print it if someone doesn't take a notion to write a real article."

So here we are.

The first thing is to build the oscillator and an OGY has often remarked, "the circuit you like the best is the best for you."

Without even considering the modulation system, first get the oscillator going on the desired wave length. In this case it must be one of the bands allotted to amateur phone and must emphatically not be in the 40-meter band. We believe the 170- to 180-meter band to be the most satisfactory as the very essential "DC tone" can be obtained much more easily in that region than on 84 meters. Our sets accordingly work in the 170- to 180-meter region though it one insists on hunting for trouble they can easily enough be adapted to 84-meter work by simply changing the oscillator inductance.

For no good reason, other than the fact that we "like it best", we use the Hartley circuit with shunt feed. Since this circuit has been thoroughly discussed we will say no more about it but refer you to the diagram.

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3. The staff is of the opinion that because of selective fading the 80-meter band is much less favorable.—Tech. Ed.

4. Before decent modulation can be hoped for, the oscillator must be adjusted so that the antenna current will be proportional to the plate voltage. This can be done with the grid and plate clips and the grid leak and should go before any thought of modulation. Better put the modulator off for a few weeks, or altogether, if you can't get this adjustment. See the following reference in QST April, 1926, page 8; May, 1926, page 17; also page 43; June 3, 1926, page 29; July 1926, page 8; also page 29; August, 1926, page 19; Nov., 1926, page 22; December, 1926, page 9; January, 1927, page 14 and page 27; February, 1927, page 9; March, 1927, column 2, page 17; and page 83 the same issue. Be sure to read "Some Light On Transmitting Tuning," July, 1927, page 24. None of the crystal control sets referred to operate in the 175-meter region but the necessary modification is obviously to multiply the constants all the way through by 2 or 4.—Tech. Ed.

This article was turned in before the 80-meter band was closed to phone operation. All information is applicable to the new 20-meter phone band.—Editor.
Oscillator Adjustment

Use any of the methods described in previous issues of QST to determine what kind of a tone you have, then juggle the filter and the oscillator adjustments until you have an absolutely pure d.c. whistle. (Mainly, notes stay at the bottom of QST)

The Transmitter Diagram

Shown mainly to point out that it is perfectly normal as to wiring and that good results depend on careful adjustment, not on a new circuit. The constants given are for 175-meter region where a phone should work best. The antenna happens to be a 5-wire cage 60 feet long, 40 feet up and L connected, but may be larger. The countenance is a 5-wire fan 90 feet long, L-1 12 to 18 turns No. 6 bare copper on 5-inch tube, tapped each turn.

L-2 25 turns No. 6 bare copper on 7" tube, tapped each turn.
R.F.C.-1 Three hundred turns No. 26 on 3" tube.

A.F.C. iron cored audio frequency choke or modulation choke. Inductance 6 henries. Made as described or used R.C.A.—UP415 or make from Ballantine's design page 151.

R-1 Grid leak, 5,000 ohms.
R-2 Radiostat or other suitable variable resistance.
X Closed circuit jack for cutting in telegraph key.
C-1 Primary tuning condenser, 500 µf.d. or larger.
C-2 Grid condenser 200 µf.d. or thereabout.
C-3 Plate stopping condenser, 200 µf.d. or thereabout.
C-4 Filament by-pass condenser, 2000 µf.d. receiving condenser.
V-1 Plate voltmeter.

Articles but this is highly important. Don't trust the other fellow's statement as to your tone. People have repeatedly reported my 20-meter signal as d.c. when it had over 50 percent of 60-cycle modulation and three quarters of the people reporting 9XL call that signal d.c. although it has perhaps a 15 percent high frequency modulation—as much modulation as is used by some broadcast stations! Tech. Ed.) Past issues of QST have given the information on filters for everything from a motor generator to —— a rock crusher! If you will start with that information (or Ballantine's) and do a little careful work you should have no difficulty.

Modulation

You will notice that the usual D.P.D.T. switch for throwing all tubes in parallel is absent. This is primarily a phone set, the switch causes losses, and the gain from putting four tubes in parallel is usually not very much worthwhile. When the set is used for CW the key is plugged into the closed circuit jack in the "center tap". This jack is indicated by “X" in the diagram.

A glance at the diagram will show that a microphone, microphone battery, microphone transformer, two additional r.f. chokes and an iron core audio choke (also called "modulation choke") are needed to operate the two modulator tubes. Microphone transformers appear to be scarce and a reasonably satisfactory one can be built from an audio transformer. Remove the leads from the binding post, tagging them as you do so, carefully remove the primary winding and replace it with as much No. 26 or 28 wire as possible. Then reassume the transformer and bring the leads out to the proper terminals.

The plate reactor can be made in the same manner, if necessary, except that both primary and secondary windings of the audio transformer should be removed and replaced with one winding of No. 26 or 28 wire. This plate reactor really should have an inductance of 6 henries at least, for the UX-210 tubes.

A good speech amplifier between the microphone transformer and the modulator tube is worth while. A stage of push-pull amplification works very well at 5A. The thing can be supplied with the same A, B and C voltages used on the transmitter but this is complicated and we advise separate supply. While speaking of the supply a.c. may be used on the modulator and oscillator filaments but the center tap must be right and don't forget that the plate supply must be pure d.c.

Adjustment

First, adjust the oscillator with the modulator tubes removed and don't go a step further until this adjustment is perfect.

5. Awful quality will result if the core of the transformer becomes saturated or the microphone fuses. Keep the microphone voltage down. If the reactor is too small little modulation will result. —Tech. Ed.

6. Be sure to use a voltmeter and to make the adjustment indicated in note 4. If that adjustment is not made you are simply clawing around in the dark. Don't try to see how big the antenna current can be made or you will absolutely destroy the straight line ratio between plate voltage and antenna current.—Tech. Ed.
fect. Now insert the modulator tubes, connect a 45-volt C battery, close the microphone switch and put on the plate power. If the modulator tubes try to burn up add more C battery before going on. We have used as much as 135 volts for UX-210 tubes. When these tubes run at a decent temperature run a test with one of those very rare amateurs who really knows what decent modulation is. Then make final adjustments for best results.

We acknowledge freely that there is nothing new in the set we have described but we hope that our comments as to the extreme importance of adjustment may be of some benefit. Such adjustment having been made, the transmitters at 5AJ and 5JU have given very gratifying results. At 80 miles they have permitted communication by voice every afternoon for three weeks. This has been during the static season. Naturally, these transmitters have gathered in no extreme distance records (for that we have a 200-watt c.w. rig) but in four years of operation we have had reports from both coasts, from some 33 states and three Canadian Provinces.

As we remarked at the beginning we get much satisfaction from talking with our fellows and we really believe that the “amateur spirit” exists among the phone bugs.

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Standard Frequency Transmission from 9XL

Station 9XL is a special station, comprising one of the three portions of the "Gold Medal Station", WCCO-9XL-9WI at Anoka, Minnesota. WCCO operates as broadcast station, 9XL purely as a standard frequency station and 9WI as a general amateur station, the three transmitters having independent equipment and antennas but a common power supply. Through arrangements made by K.V.R. Lansingh of the Official Wave Length Station Committee of the Experimenters' Section, A.R.R.L. 9XL is operated on schedules regularly announced in QST. The work of operating the station is done without charge by Chief Operator Hugh S. McCartney and his operating staff.

While no guarantee of accuracy is made on a gratis service, it is the aim of the staff to maintain an accuracy of 1/10 of 1%, which is materially better than can be "held" by most wavemeters. The frequency values are based on the Standards of the Bureau of Standards and have been checked by the Communications Laboratory of The Massachusetts Institute of Technology, also by Cruft Laboratory at Harvard University.

Important Notice—The continuation of this free service from month to month depends on the response received. Direct acknowledgments to “Experimenters” Section, A.R.R.L., 1711 Park Street, Hartford, Conn.”, using ordinary stationary or else the special blanks supplied by the Experimenters’ Section, on request. A goodly number of these blanks has been gathered and as the number grows we will gradually gain a unique and accurate record of transmission phenomena possible with no other station. Details on 9XL may be found on page 8 of the June issue. 9XL now uses a small percentage of tone modulation to make the signal distinctive.

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<th>Time</th>
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The relay contest is coming. You haven't forgotten the dates—Feb. 6 to 19 inclusive. Be sure to enter them on your calendar pad. If you live in the U. S. or Canada, get your entry in while there is opportunity. It will be too late to enter after Feb. 1.
Municipal Ordinances on Radio Transmission Unlawful!

By A. L. Budlong*

In the excitement surrounding the decisions of the International Radio Conference regarding amateur wavelengths, it is easy to lose sight of a less spectacular but nevertheless important victory that the amateur has just attained in another direction.

We refer to a court decision in the District Court of Kentucky, where Judge A. M. J. Cochran has recently handed down an opinion that municipal ordinances designed to limit or regulate amateur radio transmitting stations are unlawful and unconstitutional, and cannot be enforced.

The story behind the decision is a long one and it is only now that it can be told. Beginning about a year ago various towns and cities over the country began to pass local ordinances seeking to restrict and control the operation of amateur and broadcast transmitters within the city limits. The A.R.R.L. immediately recognized this as a great danger to amateur operation and had unpleasant visions of the dire consequence that might result if all the cities and towns throughout the U.S. got the same idea.

After careful deliberation at its last meeting, the A.R.R.L. Board of Directors decided that the best way to combat the ordinance proposition was to select some particularly obnoxious ordinance and endeavor to get a court decision against it, which decision could thereafter be used as a precedent in discouraging similar moves on the part of other cities. Director Segal, who is a bang-up attorney in private life, was appointed as League counsel, and we began prowling around for a suitable ordinance to pick on.

It was finally decided to open the battle in Portland, Oregon, which city had some time previously passed an ordinance that prohibited all kinds of interference, including amateurs. Director Segal went to Portland to prepare a brief and take the necessary steps to secure an injunction in the courts. In this work he was assisted by our Northwestern Division director, Mr. K. W. Weingarten.

Just as they were ready to file the case with the courts, however, the city authorities got wind of the suit, became panicky and upset the apple-cart by calling a special meeting of the town council and revising their ordinance so that it wouldn't apply to amateurs.

It was a big moral victory, but it meant that we didn't have our court decision, and several months' work was lost.

About this time, however, another ordinance had turned up which had all the earmarks of being just what we wanted. The town of Wilmore, Kentucky, had passed a measure which required the licensing of amateur stations, a $100-yearly license fee, and various other provisions designed to limit and control amateur operation.

Fortunately there was an amateur station in that town, also, so again Mr. Segal went to work to prepare a case. To make a long story extremely short he was successful this time, and after several months work our Counsel-Director emerged with a clean-cut court opinion against such regulatory measures, and, shortly after, an injunction preventing the town from enforcing the ordinance. The court decision is so important that we print it in full:

"This suit is before me on defendant's motion to dismiss the bill for want of equity and that it does not state facts sufficient to entitle plaintiff to the relief which he seeks.

"The plaintiff is an amateur radio operator. He lives in and operates an amateur radio station located in the City of Wilmore, a municipality of this State located in this District. This has been done since October, 1924. He has a license to do so from the United States. It was granted October 19, 1925, for two years by the Secretary of Commerce, under the Act of August 13, 1912, and was extended March 15, 1927, by the Federal Radio Commission, appointed under the Act of February 23, 1927, by General Order No. 1 until further orders therefrom. The designation of his station is 9ALM.

"On October 1, 1926, the defendant by its Board of Council passed an ordinance requiring all persons, firms and corporations to pay a license tax therefor and providing a penalty for failure to do so. The tax provided is not on the property of the radio operator, but on the business of radio broadcasting. Radio communications are all interstate. This is so though they may be intended only for intrastate transmission. And interstate transmission of such communications may be seriously affected by communications intended only for intrastate transmission. Such communications admit of and require a uniform system of regulation and control throughout the United

*Assistant to Secretary, A.R.R.L. (Continued on Page 70)
The Grinding of Quartz Plates

By E. G. Watts, Jr.*

The high cost of finished quartz oscillator plates has prevented many amateurs from enjoying the unique advantages of crystal control. Since a large part of the value of a finished plate is presented by manual labor in grinding, it is not likely that existing prices can be lowered. However, the amateur, as he is accustomed to do in other things, can perform the labor himself. I have found no particular difficulty in grinding to a finish the blanks which are obtainable from optical houses, with no more equipment than a micrometer, some plate glass, and grinding material. The blanks are usually about one inch square, and somewhat over one millimeter thick, and are cut at a predetermined angle from the natural crystal.

Experience has led me to believe that the quality of a plate as an oscillator is in inverse relation to the amount of variation in the thickness. Most plates refuse to oscillate without added feedback if this variation is more than one-half percent of the thickness. Another important factor is the condition of the edges. Unless carefully rounded and free from nicks or oscillation will be weak. It is not uncommon to find that the edges means the difference between strong free oscillation, and oscillation which added feedback is necessary to sustain.

Keeping in mind these requisites for a finished plate, let us see what pitfalls beset us in obtaining them. The plates are cut from the natural crystal at a definite angle to the electric axes. This process has been described in QST for Nov., 1925 and Sept., 1926. In removing any amount of quartz from a plate, one can readily see that this angle could easily be altered enough to upset things. As shown in Fig. 1, the X and Y axis are only thirty degrees apart. To make matters more precarious, plates are often cut at an angle between these axes to reduce the temperature coefficient. The result is that an alteration of only a few degrees is sufficient to shift the plate's frequency-thickness ratio from the 104-meter per millimeter ratio of the X axis to the 117 ratio of the Y axis. This change can occur at a critical time in the grinding process, and result in a ruined plate. Restoring the former relation is of course a very uncertain process. If the plate were to shift from the higher ratio to the lower it could neatly jump the band into which it was to be ground.

To avoid this possibility it is obviously necessary to preserve the original angle of cut. One side of the plate is therefore identified and left alone in the grinding process, with the exception of a light grind to make it as plane as possible. There is little evidence that the actual flatness of the faces has much to do with the oscillation properties as long as the faces are parallel. It is well, however, to remove any high spots which might make the grinding difficult on the other side. Beyond this I have not found it necessary to go to any great lengths to obtain plane faces.

Having observed this precaution regarding the angle there is practically nothing else which can cause a plate to become a “dud” in the grinding process. It was formerly supposed that a plate might suddenly cease to oscillate for some mysterious reason, but I have found no grounds for such a belief.

The grinding process can be divided into five steps:

1. Taking the light grind on the reference side.
2. Grinding the other side roughly parallel for a test to determine characteristics so that the finished thickness can be calculated.
3. Rough grinding to nearly the finished thickness.
4. Working the variation down.
5. Finishing (edges etc.).

It is necessary to have several pieces of plate glass which may be anything over about six inches square, and ¼" thick, for the several steps of grinding, so that a change can be made when the surface becomes too concave. This has happened when the corners of the quartz insist on going

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*4FM, 1924 S.W. 9th St., Miami, Florida.
down too rapidly; but it is best not to wait for this to show up, especially on the last few cuts, when it is very important to be able to control the grinding points.

Plate glass is to be preferred to other kinds. I would not want to trust ordinary window glass, as it is not always uniform, and unfortunately I know nothing about the uniformity of photo plates. Automobile glass is the best quality plate glass usually. The idea is to have sufficient thickness to give a working surface with no resiliency, as well as a plane one. Pieces as small as 6" square allow ample grinding surface, but it is well to have some margin, so that it is not necessary to run the abrasive over the edges. Two grades of abrasive are necessary.

Grade "A" valve grinding compound mixed with kerosene is not too coarse for roughing. In this stage several thousandths are to be taken off at a time, and this grade with kerosene so it will stick. This metal plate may be of brass, ¼" thick, and about the size of the quartz plate, with a face previously ground flat using the grade "A" compound and kerosene and another piece of glass. Using enough kerosene with the carborundum to allow easy motion, move the plate with a circular motion, describing a circle about two inches in diameter, and gradually working over the whole surface of the glass. When the plate begins to scrape, use more kerosene. Turn the plate under the fingers periodically so as to generalize the pressure, using as little as possible. It is practically impossible to determine by any common methods just when the bumps have been worked out, but as this is not of great importance, it can be considered as accomplished after a short period. This completes the first step.

Marking the reference side with white paint (do not rely on lead pencil marks as erasing may be disastrous) measure the plate in nine points: four corners, four centers of sides, and centers as shown in Fig. 3, marking the thickness; noting the high points, place the quartz on the glass with the fingers properly distributed (without the metal plate this time) for pressure on these high points. Since the plate will be quite thick at this stage, it will oscillate with a relatively large variation (that is comparatively deep hollows and large bumps do not keep it from working). Measuring and grinding periodically, work the variation to a reasonable value. Washing with Carbona (or any grease solvent) test the plate for oscillation, calculating from the thickness and wavelength the ratio, and thereby the finished thickness on the desired wave. This will complete the second step.

Mixing the grade "A" valve grinding compound with kerosene until it is quite liquid, place it on the glass. It is not necessary to make any changes of glass until the roughing is done. It will not be necessary to make more than two or three measurements during the roughing. Being very careful to keep the reference side up, use the metal plate again, and bear with some pressure taking moderate care to equalize the pressure so that it will not be difficult to work out the variation. This will probably be several thousandths when the plate is within a few meters (by calculation) of the finished wave. Make enough allowance so that there will be no doubt about leeway to work the variation in before the finish is reached.

The fourth step is the longest and most tedious. Here we discard the metal plate again in favor of fingers and use the fine abrasive. Use just enough kerosene so that

![Fig. 2. Grinding Using the Metal Plate](image-url)
it does not come up over the plate too much, as it is difficult to keep the thickness numbers easily legible. The old numbers are to be wiped out before each measurement of course, but it is desirable to be able to check how much has come off each time on a certain point. It is best to make measurements during this step at an interval of from five minutes at first, down to one or two, when the variation is small, marking the thickness in the usual nine points. A factor related to this stage of the grinding is what may be called "grinding efficiency", i.e., to be able to make a reduction in the variation without taking off from the lowest point on the plate. It is fairly easy, by careful distribution of pressure, to maintain a 100% efficiency. For instance, if one corner of the plate is lower than the rest, and it is desired to "lay off" that corner, it should be found that, while a reduction of several ten-thousandths may have been made elsewhere, the low corner remains the same. By careful application of this principle it is possible to work a variation down within very close allowances.

While this treatise will relate to the preparation of plates as low as 40 meters, it is evident that the plates on the order of 80 meters do not require nearly as much care to obtain good oscillation. Thus, with plates designed for 80-meter work, the fourth step can be said to be terminated when the variation has reached a figure near five hundred-thousandths (half a ten-thousandth) or even one ten-thousandth as measured by the micrometer, being sure that no high or low spots exist between the nine points of measurement. This can be determined by sliding the plate thru the micrometer across these spots. If an off point is found, it will be necessary to mark it specially and grind it out. The grinding usually proceeds uniformly, however, and it is rare to find an off point.

With plates which are to be ground to the vicinity of forty meters, the variation must be worked in as closely as possible. With a ten-thousandths reading micrometer, it is possible to estimate to within five hundred-thousandths. Beyond this point, which is not fine enough for the forty-meter plate, the micrometer ceases to be of use as a measuring instrument, and can henceforth be used only to compare different points on the surface of the plate. This is done by what may be called the "slip and stick" method. Hills and valleys on the faces can be felt very plainly by sliding the plate gently thru the micrometer. It is very likely that variations of less than 25 millionths can be felt in this manner. Differences so small as to not be discernible on the vernier scale markings can be plainly felt. It is a simple matter to mark these spots and grind them out. The rapidity with which they disappear also testifies their minuteness.

One must grind very lightly, or a valley may appear where there was a hill. It is also necessary to be extremely careful not to strain the plate during this process, as a piece of quartz .010" or so thick is not very rugged.

When the variation has been worked to within the desired value, the fifth and final step is finishing the edges. As stated before, these have a large effect on the oscillation. It has not been determined just what it is that is responsible for this, but nicks which exist on any sharp corner are suspected. Therefore it is desirable to smooth off the edges so that there will be no nicks. A bevel leaves corners, so a rounded edge is preferred. The corners of the plate should not be rounded too much, however, as it is then difficult to place a round edge on them. Nicks which are visible must of course be ground out, even if a thirty second of an inch must be removed to do it. Grinding off one edge or another does not appear to affect the frequency, but has a somewhat haphazard effect on the strength of oscillation. I have not been able to lay down a rule for this effect, and grinding off of one dimension or another may either strengthen or weaken the oscillation. Neither have I been able to find a particular relation between the shape of the plate and the output, although I have seen poor plates which I suspected might be caused by an oblong shape. Rectangular plates are to be preferred to round ones for electrical as well as mechanical reasons.

In selecting a plate which is to be ground to forty meters, it is unwise to use any but those responding to the lowest thickness wavelength relation so that they may be as thick as possible. Plates cut with the thickness parallel to the "X" axis show the
A necessary adjunct to the grinding operation is a test oscillator. While it may seem that the conventional power oscillator circuit will be best for this, it has certain disadvantages for test work. It is not possible to advance the feedback without producing self-oscillation, and neither can the feedback adjustment be made independent of wavelength change. A circuit which overcomes these difficulties nicely is shown in Fig. 4. It will be recognized as a "modified Hartley" or "tuned grid with plate tickler" with the usual blocking condenser replaced by the crystal. In this circuit, fundamentals can be brought out that will not appear with any other, and without the tube going off into self-oscillation. The amount of feedback is smoothly variable by the coupling between L1 and L2. It can be set so that only the principal fundamental of a plate will show up, or so that a collection of other fundamentals appear. This circuit also gives a larger percentage of movement of the plate current meter when a fundamental is struck. The movement of the meter is upward instead of downwards as in the conventional circuits using bias battery on the grid. The response is so large, in fact, that if the meter is of low enough range to give good indication of the weaker fundamentals, the stronger ones will run it off the scale. Using 42 volts with a 201-A tube a 0-5 milliamperes meter will be found suitable. With the stronger fundamentals it may be found necessary to reduce the plate voltage to 22, to keep the current within the range of the meter. The tickler coupling can be loosened to provide the same effect. The range of coupling should be such that it may be reduced to a value equivalent to the amount of feedback which occurs thru the tube capacity in the conventional tuned plate power oscillator. This value may be approximated by observing when oscillation is obtained on the main fundamental only, although others can be picked out with tighter coupling. In order to make the circuit of wide usefulness, condenser C1 can be made large enough to allow a tuning range from 40 to 150 meters, and further extended by the parallel condenser C2 when desired. No trouble will be had with critical tuning, no matter how large C1 is made. The condenser C3 is necessary only when there is danger of having the mounting plates short-circuit the plate supply. The choke X can be one such as would be used in a receiver. With this oscillator it will be possible to follow the plate during the grinding process without having to work the variation down a great deal. The circuit is not well adapted to power and transmitting use as it accentuates the temperature coefficient of the plate, and the frequency changes also, more readily than do other circuits.

I will be pleased to advise anyone who runs into difficulties, if they will write me.
Radio Frequency Chokes for Receivers

By Glenn H. Browning*

There seems to be a great lack of exact data on radio frequency chokes in general and somewhat hazy ideas in the minds of radio engineers in particular as to the method to be used in measuring their efficiency. The writer, in endeavoring to get some exact data on performance of a choke for one particular purpose, had occasion to talk to a number of well-known engineers and was surprised at the difference of opinion given.

Every day, more r.f. chokes are used in various parts of radio circuits so that it is timely to analyze their uses and outline a number of different methods used to measure efficiency.

R.f. chokes may be used either above or below their natural period. Suppose, for example, that the distributed capacity tunes the choke to 600 meters. This choke would act as a small condenser at wavelength below 600, that is, it would have a capacitance reactance, while at wavelengths above 600 it would act as an inductance or a positive reactance. Thus, the reactance curve plotted against wavelength would look something like Fig. 1, the exact shape depending upon resistance and the amount of distributed capacity per unit of inductance. Fig. 2 shows a receiving circuit with five radio frequency chokes, four of which are used in different capacities. Radio frequency chokes No. 1 and No. 3 are used for a parallel feed system and are employed to keep radio frequency current out of the “B” supply. Naturally, their impedance to radio frequency current, whose frequencies are within the range to be received by the set, should be as high as possible. Usually these chokes are worked below their natural wavelength. Radio frequency choke No. 2 is used as a positive reactance in the plate circuit of the second radio frequency tube to make the grid oscillatory circuit tune sharply. This coil might or might not be called a radio frequency choke, but we shall at least consider the definition of that quantity to be sufficiently broad to cover that phase.

Radio frequency choke No. 4 simply acts as an impedance grid leak, but should have its natural period with the grid-filament capacity of the tube well out of the wavelength range being covered with the receiver. Radio frequency choke No. 5 is designed to choke back radio frequency current so that it will pass through condenser C, and not enter the audio amplifier.

Let us now see how we should go about measuring each coil for its respective purpose.

Radio frequency chokes No. 1 and No. 3 should have their impedances as high as possible to currents whose frequencies are in the wavelength band covered by the set. The most convenient way to measure this impedance was found to be the method shown in Fig. 3. A source of E.M.F. whose frequency could be varied was supplied from a five watt oscillator. The voltage across this source was measured by a Rawson thermal voltmeter. The radio frequency choke to be measured and a resistance of 5,000 ohms were connected as shown. A vacuum tube voltmeter, previously calibrated, was then connected across the 5,000 ohm non-inductive resistance and the voltage across this resistor noted. Knowing the voltage and the resistance, the current through resistance is easily calculated. Consequently, E and I are known, from which Z (the impedance of the circuit) is deter-

1. See the remarks on Fig. 1, also note comments of Austin Lidbury on pages 27-31, October QST.

2. Most amateurs know that if there is a negative reactance in the plate of a radio frequency amplifier tube, the coil-condenser tuning system will be very broad because no regeneration whatsoever is introduced.—Author.

3. A Tobe Veritas resistor was found to be excellent for his purpose.—Author.
mined. The resistance of 5,000 ohms in comparison with the impedance of the choke being measured, was so small that in some cases it could be neglected. Of course, if the impedance of the choke is being measured, it will be small compared to the impedance of the choke used in the circuit.

Let us now consider how to choose radio frequency choke No. 2 in Fig. 2. As has been indicated before, this choke is to have a positive reactance so as to make L/C react sharply without at any time throwing that circuit into oscillation. By placing a calibrated variometer in the plate circuit of tube 2, Fig. 2, the amount of positive reactance necessary to make L/C react could be easily found. It would probably be a small grid-filament capacity.

The result of a set of measurements on two different chokes is given in Fig. 4. Choke A has an inductance of 148.8 mh. and a natural wavelength of 1,397 meters. It was used below its natural period and, consequently, had a capacity reactance over the band from 200 to 560 meters. It will be noted from the chart that it was a suitable radio frequency choke to be used for a parallel feed system in a receiver as its impedance was never below 40,000 ohms. Its curve of impedance was regular and, as would be expected, had a rising characteristic with wavelength. On the other hand, choke B, whose inductance was 49.4 mh. with a natural period of 3,500 meters, had an impedance less than 1,200 ohms and a characteristic which was anything but uniform. It should be noted that in the broadcast band choke A had roughly three times the inductance with a relatively small distributed capacity a combination which would seem to be more desirable.

Although radio frequency choke No. 5, in Fig. 2, is used in somewhat different capacity than any of the others, its prerequisite is large impedance to radio frequency current with no natural period in the range of frequencies to be received when combined in the circuit shown, that is, with R &

FIG. 2. A DIAGRAM OF A BROADCAST RECEIVER TO SHOW VARIOUS POSSIBLE USES OF CHOKES

FIG. 3. A METHOD OF MEASURING CHOKES IMPEDANCES

The volt meter V is a thermo-volt meter which is correct at radio frequencies. The resistance R is chosen so that it will be small as compared to the impedance of the choke, thus it becomes fairly correct to assume that the current thru the choke is E/R and the impedance of the choke is E/R E. Some thought must be given to the avoidance of any resonance effects from the input system at the left.

The most convenient way of determining the suitability of radio frequency choke No. 4 is to place it directly across a vacuum tube voltmeter, noting the readings on the meter when different frequencies in the band to be used are induced directly in the choke. Any tendencies toward natural periods, such as were indicated in choke B, will show up by great variations of the meter as the input E.M.F. frequency is changed slightly. Of course, this choke should have none of these periods for most satisfactory operation. It should also have an impedance to radio frequency current as is practicable. This may be determined as previously.
C. Natural period could be determined by placing a vacuum tube voltmeter across either R, or B, and noting the meter's reading at different frequencies are induced directly in the choke.

![Diagram of C. Natural period determination](image)

**FIG. 1. CURVES ON SOME RECEIVING CHOKE COILS**

Curve A is for a coil with an inductance of 140 millihenrys and a natural wavelength of 139.7 meters. Curve B is for a coil with an inductance of 49.4 millihenrys and a natural wavelength of 2500 meters. Note that coil A has a lower distributed capacity and a higher inductance, also that it is being operated within reasonable distance of its natural wavelength.

The writer has endeavored to give a short analysis of the radio frequency choke problem and he sincerely hopes that these notes may be beneficial to those using chokes in various circuits.

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**New Station Licenses**

In last *QST* we announced the issuance of new amateur regulations by the Federal Radio Commission, and a new station license which was gradually to supplant the existing Department of Commerce licenses. Supplies of the new license form have now been sent to the Supervisors of Radio, with instructions to recall existing amateur station licenses and replace them with the new F.R.C. form. The Radio Act of 1927 requires that all persons requesting a station license first make formal application therefore, and so the Supervisors, as rapidly as they can get around to it, are sending out notices accompanied by a blank application form, which is to be executed and returned with the old license, whereupon the new one will issue. Holders of temporary station licenses issued since March last have already filled out the required application form, and therefore no new application will be required of them; they will receive a regular license automatically, based upon the original application.

With 17,000 amateur stations to care for, this is a large order for the Supervisors, and it will be some months before the job is completed. The work has already started in some districts, however.

We mentioned last month that we were in general quite pleased with the new "blanket" form of station license provided for us. Current instructions to Supervisors state that inasmuch as all amateur stations, under the law, must be operated in accordance with the provisions of the Radio Act of 1927, the Supervisors need not concern themselves with the details of the station for which a license is requested, and applicants for amateur station licenses need not be required to submit diagrams of their transmitters or to indicate the type of plate supply used, etc. This is a part of the new plan that an amateur station should be permitted to do anything legal which doesn't interfere with other services, but that quiet hours are going to be imposed upon it if it does interfere, regardless of apparatus used.

It is to be emphasized that the new amateur regulations and the new amateur station licenses have no connection whatever with the new provisions of the International Radiotelegraph Conference. The latter do not necessarily go into effect until 1929 (altho they may before). The new licenses are based upon existing regulations of the F.R.C. and relate to the operating privileges which, with but minor variations, have been in force for the past four years.

New instructions governing the issuance of portable amateur station licenses have also been issued. Portable stations in general are divisible into two classes. The usual roaming station for which a portable license is generally sought will carry the usual station license, with the usual amateur call, but the license will indicate that the station is portable and bear the restriction "Valid only for operation in the Radio District". Portable stations desiring to leave the district will be permitted to do so only for definite trips, for the duration of which they will be given a term license carrying a special call which consists of the district numeral followed by the letters ZZA, ZZB, etc. Supervisors of the districts in which the station will be operated are to be notified of the facts by the issuing Supervisor, and at the conclusion of the trip the license will be cancelled and the call restored for reissuance. The ZZA-ZZB calls will be issued only to portables which contemplate definite excursions beyond the border of their home district.

—K. B. W.
A Portable Power Supply

By Rudolph Sturm*

I HAVE done quite a bit of experimenting along the lines of portable and emergency transmitters and have never been satisfied with the methods so far used to obtain the high voltage plate supply.

I have used spark coils with the ordinary means of primary interruption (vibrator) and also with mechanical interruption using a chopper driven by a small 6-volt motor as shown in Fig. 1A. The efficiency of an outfit of this kind is low and the maximum output limited to about 10 watts at which the input to the motor driving the chopper is about 18 watts and the input to the coil 20 watts. The over all efficiency is 26 per cent. The disadvantage with this system is that if using one transmitter tube it utilizes only one half cycle. The voltage of the other half rises so high that it is almost certain to break down the tube somewhere. This trouble could be overcome by using a special spark coil with fewer secondary turns or by connecting enough capacity across the output of the coil, in which case the output voltage will be reduced, and with it the output too.

The next method that seemed promising was to use a transformer instead of the spark coil retaining mechanical interruption of the input voltage. This proved disastrous to a perfectly good transformer as it promptly broke down. After building a transformer for the purpose it was found that the characteristic was the same as the spark coil but the output was quite a bit higher as was also the efficiency. It was plain that one could not easily handle much power in this manner, therefore it was decided to rebuild the chopper into a motor driven switch that will reverse the current therefore make an alternating current out of the d.c. input which will have the same voltage characteristic on both halves of the cycle.

The 6 volts of storage battery supply are changed to something less than 6 volts a.c. and then stepped up as high as wanted by the aid of a transformer. The output is limited only by the capacity of the battery if the unit is properly built. My converter puts 100 watts on the plates of two UX-210 tubes and also supplied 7.5 volts to the filaments. (See Fig. 3) With a 12-volt battery as the source of supply 250 watts were fed to three UX-210 tubes in parallel besides the filament power of 7.5 volts and 3% amperes. The a.c. voltage can of course be stepped up or down as desired by

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The voltage at the output brushes is somewhat uncertain and should be measured with a good a.c. voltmeter, which will give a nearly correct reading. The uncertainty as to IR drop and wave form makes calculations worthless.

The ordinary 0-15 a.c. filament voltmeter is not of much value at voltage below 7.—Tech. Ed.
arranging proper windings and taps on the transformer.

As to the construction of the converter I believe the photos are clear enough to show how the parts are arranged. The 4-section commutator shown in the draw-

![Commutator Diagram](image)

ing of Fig. 1B is really a 20-segment commutator taken from a discarded 110-volt motor. Five segments are tied together to form one. They are interconnected as shown in the diagram. The output frequency depends upon the speed of the motor and the number of sections in the commutator. The formula for this is

\[ F = \frac{P \times \text{R.P.M.}}{120} \]

where \( F \) = frequency,

\( P \) = number of commutator segments,

R.P.M. = revolutions per minute and 120 is a constant.

The commutator brushes will have to be arranged as many degrees apart as any two segments of opposite polarity.

Example:

- 4-segment commutator 90°
- 6-segment commutator 60°

8-segment commutator 45° or 105°
- 10-segment commutator 36°-108°-180°

The motor driving the commutator and slip rings should be shunt wound, mine being a 110-volt motor that I rewound for 6 volts.

As to the dimensions of my converter; the motor is 3¼" in diameter and 3½" long; the commutator 1½" in diameter and 3¼" wide, the slip rings ¾" in diameter and 3¼" wide. The commutator brushes are ¼" × ½", the slip ring brushes ¾" square the base 7" × 3½", the height is 5" and the weight 1¼ lbs.

The advantages as compared to a motor-generator are that the cost is low, the device weighs much less and is more compact, also it is very rugged, not being injured by getting damp or even wet. The transformer can be put in a water-proof case; since the transformer can be changed at will the whole rig is very flexible as regards output voltage. Summing up the whole thing I think it is the “berries” for a portable or emergency transmitter when a.c. mains are not available as the whole transmitter can be supplied by the battery that “Henry” puts in the “baby Lincoln.”

The circuit of the transformer primary winding is never broken, therefore no unsafe potential is developed in the secondary winding. The duration of the apparent short circuit is very small; practically no sparking will be evident. If more than 12 volts d.c. are used it may be a good idea to insert a small choke consisting of few turns of heavy wire on a core choke in the battery leads as shown in Fig. 1B in dotted lines.

As to procuring the various parts, an old commutator can be had for the asking at almost any electric repair shop. The only requisite is that it must have an even number of bars so as to divide up into an even number of sections. As an illustration let us say we got a 32 segment commutator from a G. E. ¼ h.p. d.c. motor and wanted to make a 4 section commutator out of it. We would divide 32 (number of segments) by 4 (number of sections we want) which would give us 8 bars per section that must
be jumpered as shown in the drawing only that this is done on the risers—the commutators instead of the front as shown.

Most motors of ½ h.p. have a ½-inch shaft while at the commutator it is 9/16 and back of that ¾. To get the shaft out of the commutator that has been sawed off the rest of the armature the commutator should be heated to around 200° F., and then the small end of the shaft pounded through; this is done with a light hammer, not a sledge, striking sharply.

The slip rings are turned out of brass or copper and have an inside diameter the same as that of the commutator (nine-sixteenths of an inch) so that a fibre rod can be pressed (not driven) through the whole arrangement. A hole is then drilled in the fibre to fit tightly on to the motor shaft. I believe that those who have no lathe would do well by having the commutator and slip rings fitted on the fibre and the hole for the motor shaft bored or drilled at a motor repair shop or machine shop as this whole part ought to run true for best results.

The brush holders for the slip rings may be made of 1/16" or 3/32" copper sheet.

The commutator brush holder can be made more simply than mine by using sheet copper. The spring tension against the brushes can well be made as shown since the construction is simple. The brush holder opening should not be quite as broad as the commutator and I believe not more than ⅛ wide.

The brush material and pig tails can be bought at a motor repair shop. It is cheaper to buy enough material for all the brushes and cut it up with a hack saw rather than to buy small brushes of the exact size wanted. The brushes are drilled and tapped for the 6-32 screw ends of the pig tails and these are screwed in tightly. If another type of pig tail is used it is easy to contrive a way of fastening, remembering that it is important to secure good electrical connections since this is a low voltage outfit and therefore all resistances must be kept down. For the same reason when buying the brushes try to secure the special low resistance graphite. If you cannot get that you can buy Ford generator brushes which will have to be sawed and sand-papered to size.

Because of the low voltage it is also advisable to wind the transformer primary with No. 10 wire or larger. A transformer whose core has a cross section of one square inch will require about 7 turns if the commutator is operating at 200 cycles. Knowing what secondary voltage is wanted one can figure the secondary turns by direct ratio.

An interesting test of the smoothness of the output was accidentally made one evening when the power supply went off so that our broadcast receiver could not work. I connected the 110-volt convertor output to the B eliminator and we listened to the end of the program.

**Horace A. Beale, Jr.**

With the passing of Horace A. Beale, Jr., the League has lost a staunch friend and supporter.

Mr. Beale, who was a director of the League for over two years, was the owner of stations 8Z0, 30I and 3XW located at Parkesburg, Penna. 8Z0 was probably the largest and best equipped station that amateur radio has ever known.

As the result of a long illness, Mr. Beale became inactive in amateur matters and died on September 6, 1927, leaving many friends among the amateur fraternity.
The Helpful Audio Filter

When one has reviewed all the different opinions it seems that there is no audio system that will suit everyone nor even an audio system that will suit the same person under all weather conditions and for all varieties of signals or music. In the ease of telegraphic signals one may for instance ordinarily wish to use an audio system having a curve like that of Figure 1A, so as to gain the full benefit of the "body" which the lower tones lend to the signal, but on a night when interference is bad and static worse it may be a great relief to whittle this curve down to something like Figure 1B, so as to lose most of the horrible noises, even if the signal suffers in the process. This particular job can be done by the simple rejector system of Figure 2 which has been repeatedly described in this magazine by Mr. Hatry. As suggested in the label of Figure 2 such filters are largely a matter of cut and try, especially as the inductances of the transformers depend on the tubes and the tube voltages.

When it comes to the reception of a broader band of frequencies such as encountered in radio telephony the filter is even more useful, of this Frederick Dellenbaugh, Jr., says in a letter, "This is a perfectly standard way of correcting amplifier and loud speaker behavior. It is almost axiomatic that volume and quality are mutually exclusive and a sacrifice must be made in one to improve the other. Therefore filter systems for correcting defects appear to be reasonable since if the same correction were to be made in the transformer or loud speaker it would usually mean lower amplification per stage or greater damping and the loss of loudness is about the same."

Mr. Jack Ward of 6KC has furnished the details of one simple filter which are given in Figure 3. This device is of the low pass variety and is designed to correct amplifier systems having a bad bump in the vicinity of 3500 or 4000 cycles which (though it ordinarily helps out most loud speakers) is bad when one is working with a good head set or a good loud speaker, especially if there is a noisy background since the noises are usually on the higher frequencies. It will be seen in the photograph of this particular filter and in the diagram of Figure 3A that a switch is provided to be opened when speech only is
being received. The effect of this is to cut the higher pitches off still further. Dr. Dellenbaugh suggests a modification of this filter system which is shown in Figure 4. This figure differs slightly in its constant and in having two additions of which C is to allow the higher frequencies to pass to some extent, the principle effect of the system then being to cut down frequencies around 2000 or 3000 cycles most of all, and to reduce those above these figures somewhat. The amount of this "somewhat" depends mainly upon the size of C. The other addition is the resistance R which should have a range from 5000 to 50,000 ohms and controls the effectiveness of the system as a whole. This is a refinement of the switch D in Figure 3A. Dr. Dellenbaugh also suggests the filter system of Figure 5 which is a band elimination filter stopping everything between 500 and 3500 cycles. Since one does not wish to have complete elimination but only some depression the controlling resistance R is provided as before. Such a filter has characteristics the reverse of most of the loud speakers ordinarily used and it may therefore be used to correct them.

Where the problem is simply to cut down the high end of the curve one can frequently do the job with as simple a contraption as shown in Figure 6A which is taken from an article by H. J. Barton Chapel in Amateur Wireless. The part of the system to the left of the dotted line will be recognized as being the usual thing in loud speaker filters designed to keep the current of the power tube out of the speaker. The group of condensers and the flexible leads are provided to give an adjustable cut-off on the high frequency end. This part of the device can also be built with a fan switch or with a comparatively large condenser in series with a resistance as shown in Figure 6B. These variable filters have the advantage over ordinary fixed ones that it is easier to secure some sort of an agreement of the set with any loud speaker it may happen to be called upon to work with.

--R. S. K.

Southeastern Division—Florida Convention
January 13th - 14th, Hotel Alcazar, Miami, Florida.

Look at the above dates and put red circles on your calendar. The Miami Amateur Radio Club is sponsoring the convention and is planning a wonderful program.

Don Mix is expected to be the guest of honor. Director Dobbs has promised to be with us and Headquarters will send Treasurer Hebert to represent it.

All members of the Southeastern Division are cordially invited to attend—and hams from other parts of the country spending the winter in Florida. Write E. G. Watts, Jr., Secretary, 1024 S. W. 3th St., Miami, Fla., and tell him you will be there.
nu3CAB

The ether stresser known as radio station 3CAB is located at 38°-56'-13" North and 77°-2'-2" West, a point known to the Post Office Department as 1311 Spring Road, N. W., Washington, D. C.

The call 3CAB comprising the initials of the owner and operator, C. A. Briggs, was secured by the virtue of self-restraint. He put in his application for this call before it was issued and then waited patiently until its turn arrived.

The station was first put on the air in the spring of 1922. With the aid of a spark coil and a borrowed VT, signals were put out and reported by local stations as QSA. The expression "FB" had not come into use.

The first circuit used was the well named "sure-fire" arrangement. Frequently, the result of tightly coupled grid and plate coils, such a transmitter showed a versatility not suggested by the amount of wire in sight. Care had to be taken or else in addition to transmitting on two hundred meters, signals would be dispatched on 360 meters or thereabouts.

After two years the station was moved about half a mile to its present site. NAA could still be tuned in and heard plainly on 2650 meters. This was marveled at as the new site was surrounded by three systems of tin roofs bounding an enclosure laced over with a wonderful screening system of telephone wires. Viewed from the upper floor they seemed close enough together to walk on, and helped to explain the reason for the dividends of the Telephone Company during the last few years. The antenna hugged closely one corner of the triangle and extended upward into the metal maze.

Due to the inferiority complex arising from the surroundings aggravated by the appearance of BCL antennas nobler in equipment and competency for space above the house tops, the boundaries of the District of Columbia for a long time marked the active range of the station. However, experimenting was continuous. Finally, in the summer of 1926 the accumulation of equipment in preparation caused an attempt to be made to extend the range of the station. Results followed at once. It seemed that everyone reported the signals from a five wattter. Improvements have continued and the present transmitter consists of a 203-A in a Hartley circuit. The inductance consists of eleven turns of \( \frac{3}{4} \)-inch copper tubing. The tuning condenser is placed across the whole coil and transmission may be had in either the forty-or eighty-meter band by adjusting this condenser. It is not necessary to shift the clips on the inductance when changing from one band to the other. The key is located in the primary of the plate transformer. The filament of the tube is supplied from a separate transformer.

As may be seen in the view of the station, the transmitter is mounted at the left end of the table on an extension to the table top. The pole transformer giving 1100 volts and the chemical rectifier may be seen underneath the same table. Directly below the table extension holding the tube are mounted the filament transformer, plate milliammeter, plate choke, grid leak and grid choke. This last choke is necessary because the leak goes from the grid to the filament center tap and is therefore in shunt to part of the helix. Two keys are provided at the right of the table. These are covered by a small elevated shelf protecting the keys from accidental closing and affording a place for messages disposed of. One key is a side contact key for regular use and the other is a straight key for visitors.

The Zeppelin type of voltage-feed Hertz antenna is used. The amount of space for erection being small, its dimensions are scant and it is necessary to use 16 turns of \( \frac{3}{4} \)-inch copper tubing in the feed circuit. The condenser is used in a series connection for operation in the 40-meter band and in

A VIEW OF THE STATION

The short-wave equipment is on the table to the left and the other table holds the broadcast set. The cardboard pockets holding the blank messages are at the left, attached to the lamp stand.
parallel to the inductance for the 80- and 20-meter bands.

Detuning the oscillator from the antenna will produce a steady note on a wind-driven antenna, when the signals could not be read while exact tuning was used. Although this

requires relatively tight coupling between the circuits, the results are excellent.

The receiver may be seen in the center of the operating table. A close-up is also shown. It is mounted on three legs which provide a desirable increase in the effective table area. The circuit is of the familiar regenerative type employing one variable condenser for tuning and one for the control of regeneration. Instead of employing plug-in coils for changing the range of the receiver, a fixed condenser is used and when shunted across the tuning condenser, it shifts the range from the forty- to the eighty-meter band. Clips are provided for this fixed unit and it may be connected in the circuit in very short order. Although the receiver is not a “thing of beauty”, it works excellently which, after all, is what a receiver should do. It has a characteristic of all the tuners built at this station during the past few years, the detector tube is mounted up-side-down. This enables the shortest possible leads to be obtained in this circuit.

The chemical rectifier bears somewhat the same relation to the station as a flea to a dog—it receives a great deal of attention! First starting with 500 volts on the plate the twenty mule team product was used on twenty jars. The rehabilitation of aluminum and lead was a mussy process. Then the voltage was increased to 750, the jars to 30; and special solutions used. These did fairly well, but evidence for any conclusion could be selected. Some solutions turned brown, some black, some stayed clear, and some of each color worked and some of each shade did not.

The voltage was then increased to 1100, the jars were decreased to 20, and in deference to the much advertised desirability of drift, a new batch of solution, courageously diluted, was used.

Forthwith things began to happen. After sending “cq” the dial seemed full of responses, a “grand and glorious feeling”. The innocent and quiet coils belied their looks and nipped brutally the skin of incautious fingers. This caused a revision in several ideas that the lesson was learned that the frequency of high frequency burns should be low.

On the table to the left of the one holding the transmitter is a broadcast receiver and when it is tuned to a local station, and the plate voltage of the transmitter is kept down to 550 volts, the transmitter does not affect the BCL set afloat as both are using the same antenna. The BCL set is connected to the antenna thru the capacity of the change-over switch. Key clicks may be heard but these come entirely from the primary a.c. supply and are not affected whether the transmitting tube is in its socket or not.

The BCL set is connected to the loudspeaker shown above, and also to others upstairs and in the basement. The set is turned on or off by pushbuttons located at convenient points throughout the house. Flash light bulbs are placed in series with the tubes, each serving the quadruple pur-
$3.50. This gives an idea of how far in the past they were bought.

A "B" battery charging system is provided for the Edison Battery below the table. Plug connections for operating the "A" battery charger in the basement below are also at hand. One plug is used for operating the transmitter and all the charger and auxiliary devices such as soldering irons, etc. But one thing can be done at a time with the result that there are no accidents from crossing circuits.

The work shop of the station has several interesting features. By means of a simple arrangement, the light may be shifted to any position in a large area. The light is hooked over a wooden pole running from left to right and may be moved to any position along it. Eyelets are screwed into the ends of the pole and two wires which run at right angles to the wall, pass through the eyelets allowing the pole to be moved either way from or towards the wall. It is also possible to remove the light from the pole in a few seconds so that it may be used elsewhere.

A pilot light for the soldering iron plug reminds the worker not to leave the shop with the iron connected. Swinging service brackets are provided for soldering equipment and for drills.

The arrangement of the tools is the result of evolution, those being most frequently used at any position along the bench are placed nearest that point.

Supplies of screws, nuts and a quantity of parts are kept in glass jars. Just a small portion of these are shown in the photograph, the majority being on shelves not in the picture.

It is probable that this station has handled more messages without schedules than any other amateur station. This is due to special circumstances. Since the first of September, 1926, over a thousand messages have been handled, a negligible portion being the result of schedules. A considerable portion of the traffic has related to government business.

Organization has done what otherwise requires schedules. The owner is in one of the government departments. He has business dealings and friends in practically every one of the larger cities in the country. Attached to the lamp stand at the operator's left is a series of cardboard pockets. In these, addressed message blanks are placed according to localities. When good contact is made with a station, and there is any event of incident or business that can be advantageously handled by radio, it is placed on the partially filled blank and sent. In this way the other operator is given a live message which he can deliver.

Innumerable times the other operator has been able to phone the message and get a reply at once. In this way a series of messages of special interest and potency are exchanged.

However, in addition to this traffic a large amount of other messages has been handled. A perusal of them is engaging. Births and deaths are announced. A youngster in a distant city sends a message from his own station to his uncle. The uncle is profoundly moved, and in acknowledging it states that it was some time after he was born that the pony express started across the plains, and now, boys flash news about the country in an instant.

Many rubber-stamp messages are in the lot but they are often of importance. When they are from or to a person for the first time they should be given great weight. Most people, when they receive a radio message by phone are somewhat stunned, and their reply is generally rubber stamp in type, but the message is really very important under the circumstances. Some people are tremendously interested in receiving or sending a radio message, others are not. The persons may or may not be important, their interest is a matter of temperament.

A copy of the index to volume XI, the 1927 series of QST, was included with all membership copies of the Dec. 1927, issue. Newsstand readers, or members requiring additional copies, can obtain them from QST's Circulation Dept., 1711 Park St., Hartford, Conn., at 10c per copy, stamps acceptable.

Don't forget to send your card to International Contest Headquarters if you want to enter the Tests. Entries close Feb. 1! No chance for U. S. or Canadian amateurs to win prizes or get the official test messages if they forget to enter before that date.
AY, Warner, what's all this bunk about writing to our Senators to chase all the rest of the world out of radio so we amateurs shall have it all to ourselves? I copied something out of the air to this general effect the other night. Is it possible that some of us think that the results of the Washington Conference call for this sort of action?

I suppose because we shall have to shrink down some on our forty-meter wave in 1929, some of these hair-trigger young squirts think amateur radio is on the skids. Looks like it’s time to send out for a small bottle of common sense. A few drops of it on the end of the Wouff Hong just before sticking the latter into the patient would do a heap of good.

I have followed what they pulled off in Washington fairly closely, and if I remember aright, there were about half a hundred separate and distinct nations that sat down to parcel out the wave-lengths. Also, if I remember aright, there were several interests besides amateurs that wanted a smell at the spectrum. There being only one spectrum, it was voted early in the proceedings that the amateurs could not have it all. I have a more or less mystic impression that all but a very few of the nations had very definite ideas on this subject.

After all the fireworks had been set off at the Washington Conference, it turns out that our A.R.R.L. and the I.A.R.U. have secured international recognition for amateur radio, and in addition a band between 150 and 175 meters, another between 75 and 85 meters, another between 41 and 43 meters, another around 20 meters, another between 10 and 10.7 meters, and another down in the slums around 5 meters.

Pretty rotten, eh what? So frightful that we are asked to write to the United States Senate to scrap the whole works.

Say, if these young squirts had operated before the war, with spark coils and rotary gaps and with 200 meters as the top limit, they would not be writing their Senators. We used to think we were lucky, and we used to work DX. I don’t suppose any of them ever heard of Paul Godley and those first transatlantic sigs at Ardrossan, Scotland, with Paul sitting up all night in a tent in the pouring rain. That was all done on 200 meters. I don’t suppose they ever heard of Fred Schnell and Deloy in France, working back and forth every night for weeks on 110 meters? And of all the other things we did as we gradually slid down the wavelengths, discovered the new things and pointed them out to the Radio Corp.

Instead of writing to our Senators, we ought to be inquiring into what kind of osteopathy it was that you and Stewart were using on them down at Washington to get as much as you did. We’ve got enough frequencies to do everything that anybody can think of. The forty-band may be squeezed some, but it isn’t all gone, and even if it were, there are all the others. The trouble with some of us is that we get the notion that the frequency we happen to be on is the only workable frequency in the spectrum.

Our eighty-meter band is the best band we have for all the working back and forth inside our own country. It doesn’t skip much, and it works late into the morning and starts early in the afternoon. And the 150-band is just as good as it ever was. What’s the use of writing the Senators about either one of these bands being worn smooth, when they have just as good mileage in them as they ever had?

And enough of the twenty-meter band is still there. Nobody has pinched it or put it in hock or fed it hooch. It’s just as good as it ever was. And Final Authority said at the Radio Club the other night that the upper end of the new ten-meter band had indicated positively that it could do things that would make an old timer’s mouth water. His band was considered as elegant than mine and Radical’s, but he had us all haired up just the same.

Now listen: If these nuts who want us to write to our Senators could be sent to Washington and made to go up against those hard-headed boys they call statesmen, it would be the best dose of medicine any of them ever had in all his life. Those folks in Washington have a way of making the proponent of an unreasonable measure look like the worst plugged nickle that ever came out of Chicago. I can imagine a committee of red-headed amateurs appearing before a Senate Committee and asking them to make reservations in the Radio Treaty because the amateur’s forty-meter band had been pinched in a little at the waist, and then having one of those smart fellows from the Radio Supervisor’s office point out that the 150-meter band, the 80-meter band, and the mutilated but still peppy 40-meter band, the 20-meter band, and the 5-meter band were still there—with a new band at 10 meters to boot. The result would be too

(Concluded on page 44)
Matching the Transmission Line to the Antenna

By Walter Van B. Roberts*

If a transmission line for current feed is connected right into an antenna as in Fig. 1 without any transformer, not only will the range of the station be reduced, but meters placed in the transmission line can no longer be trusted to read the antenna current. Hence both for the sake of increased output and convenience it is worthwhile to give some attention to the method of connecting the line to the antenna.

Suppose the transmission line is made of two round wires of diameter d, with their centers D apart. It is easy to derive from first principles the formula for the characteristic impedance of the line—that is, the impedance of an infinite length of the line. The formula is:

\[ \text{Characteristic impedance} = 276 \log_{10} \left( \frac{2D}{d} \right) \]

very approximately.

Next suppose the antenna is a plain open oscillator—a straight wire a little less than half a wavelength long—say about 44% of a wavelength long. (See QST p. 16, October, 1926). The radiation resistance of such a wire working at its fundamental

![Figure 1. The Type of Antenna Under Discussion](image)

is in the neighborhood of 70 ohms, whatever the wavelength. Hence the total resistance of the antenna will be probably somewhat less than 100 ohms.

Now the problem is to match the transmission line whose characteristic resistance we will call \( R_t \), to the antenna whose total resistance we will call \( R_a \). The first thought would be to choose D and d in building the line such that the formula given above makes \( R_t \) come out about 100 ohms, so as to match \( R_a \). But in order to do this it will be found that the wires would have to be kept too close together to allow maintaining an even spacing. Hence it is better to build the line with a convenient spacing, calculate \( R_a \), and then interpose a step-down transformer between the line and the antenna.

A simple and highly efficient transformer (it is not the usual sort of transformer with primary and secondary windings, but much better for the particular wavelength for which it is designed) is shown in Fig. 2. The transmission line is to be connected to the left hand terminals and the antenna is cut in the middle and connected to the right hand terminals. The capacity of the condenser should be

\[ \frac{1}{\sqrt{\frac{R_t - R_a}{2 \pi f R_c}}} \text{ farads} \]

where \( f \) is measured in cycles per second and \( R_c \) in ohms.

The coils are preferably equal, and if coupled at all should preferably be so coupled that if the condenser were short circuited and the inductance between the right hand terminals then measured, the coupling would increase the total inductance. This total inductance

\[ \frac{R_t - R_a}{2 \pi f R_c} \sqrt{\frac{R_t - R_a}{R_t}} \]

is equal and are not coupled to each other, the inductance of each would be half of the above value.

The input end of the line can be coupled to the oscillation circuit as shown in Fig. 1. As has been noted repeatedly in QST it is decidedly preferable to couple the line rather than to tap the coil P. The same statement holds good for single-wire lines.—Tech. Ed.

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3 by a coil of any convenient size, in series with a condenser of proper capacity to tune out the inductance at the frequency used.

Fig. 1 shows the complete set-up. Any desired oscillator or amplifier may be used. The coupling coil \( L_4 \) is shown split with the condenser \( C_3 \) in the middle for the sake of symmetry. The transformer \( L_2, L_3, C_3 \) is mounted on a small board held up by the two halves of the antenna.

**AN EXAMPLE**

For the sake of illustration suppose the wavelength is to be 40 meters then frequency \( f = 7,500,000 \) cycles per sec. The overall length of the antenna will be about 44\% of 40 meters or 17.6 meters. Let us suppose the antenna is a single wire of small diameter so that the total resistance of the antenna, \( R_a \), is about 100 ohms. Suppose also that the transmission line is made of wire one millimeter in diameter, spaced 50 mms. apart. Then by formula,

\[
R_a = 276 \log_{10} \frac{1}{100} = 552 \text{ ohms}
\]

Knowing \( R_a = 100 \) and \( R_4 = 552 \) the formula gives us

\[
C_3 = \frac{1}{2\pi(7,500,000)(552)} = 81.7 \times 10^{-8}
\]

Farads = 81.7 \( \mu F \). \( L_2 \) and \( L_3 \) will have a total inductance of

\[
\frac{552-100}{100} = 4.5 \times 10^{-6} \text{ henrys or 4.5 \( \mu H \).}
\]

We will assume that \( L_2 \) and \( L_3 \) are the two halves of a single straight cylindrical coil which is cut in the middle to allow the insertion of the antenna as shown in Fig. 4. Then this coil before cutting would have 4.5 microhenrys inductance. (The coil should be firmly mounted before cutting so that the halves won't move.)

Coil \( L_4 \) may be of any convenient size, the only requirement being that \( L_2 \) and \( C_3 \) are related by the formula

\[
f = \frac{1}{2\pi \sqrt{L_3 C_3}}
\]

For definiteness, suppose \( L_2 = 10 \text{ microhenries} = 10^{-4} \text{ henrys} \). Then we must have

\[
7,500,000 = \frac{2\pi \sqrt{10^{-2} C_3}}
\]

whence \( C_3 = 44.5 \times 10^{-6} \) farads approximately, or 44.5 micromicrofarads.

After the antenna and transformer and transmission line and coupling device \( L_4, C_4 \) have been constructed according to the foregoing formulae, it should be only necessary to vary the oscillator frequency and coupling to the transmission line to obtain maximum output. If everything is built correctly a meter in any part of the line will read proportionately with the antenna current. The actual antenna current will however, be larger than the line current by a constant factor because the step-down transformer increases the current in the ratio \( \sqrt{\frac{R_a}{R_4}} \).

It is particularly pleasing to note that several hundred feet of transmission line may be used without any noticeable loss of antenna current.

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**Rotten Bunk**

(Continued from page 42)

painful to dwell upon. 'Tis better that we draw the veil.

Better get out the old Wouff Hong, son, and send down to the store and get a few drops of common sense extract, and proceed as per directions.
The Unimportance of Short Leads

By L. W. Hatry*

SHORT-LEADS have their place in set design. However, we often use leads too short for best results, convenience or appearance. The first of these things is italicized because there seems to be a strong belief that leads cannot be too short. In the italicized words we have a partial explanation of the fact that often an experimental layout with long leads outperforms a supposedly "decent" duplicate assembly with short ones. (Of course, there are plenty of set-makers who use long leads and fail in both best results and convenience.)

The conditions under which to judge the need for shortness of connections can be settled by answering this question "Can the leads be harmful?"

The answer to the question will be, "Yes," when the leads add excessive R, L or C. We can guess closely at R and the rest, (they are interlocking effects as usual) if we consider the placing of the connections as: (1) Leads within a tuned r.f. circuit; (2) r.f. leads outside a tuned circuit, and (3) other than r.f. wiring.

Fig. 1 shows a tuned circuit. The coil and condenser are shown with terminals which we may pretend are attached in the usual way. The coil and condenser are drawn heavily to make sharp the distinction from the leads which are drawn lightly. Within this tuned circuit the current at resonant frequency oscillates back and forth, suffering no opposition save from the resistance of the circuit. Consequently if we have gone to considerable trouble to produce a good coil and condenser it is important not to harm that achievement by using German silver leads or by adding resistance in some other fashion. We can most effectively add resistance to the tuned circuit by placing L so close to C (while trying to get short leads!) that eddy currents are set up in the plates of C, or by getting L too close to any other mass of metal. This exact method is used in more than one receiver to prevent oscillation on the lower broadcast wavelengths. The coil L ought to be kept at least 2/3 of its own diameter distant from the large metal areas. The actual resistance of copper leads not smaller in gage than the coil wire is of no importance in the usual hookup.

Leads in a tuned circuit can produce several effects by adding capacity and inductance. If close together and insulated the leads can add resistance by becoming a poor condenser but uninsulated leads can seldom do worse than add "good" capacity which builds up the circuit minimum. As no length of connection within reason can do worse, why worry? In a multi-stage tuned r.f. job long leads can couple by capacity or inductance but even these things are unlikely to be important compared to coil-to-coil coupling. Not until the set has become fully neutralized are these effects the largest ones. In the usual regenerative set, hand-capacity will result from a large field due to long tuned-circuit leads, which may seem short. In Fig. 2 the heavily drawn leads seemed short but they produced a single large turn that had a large field and with which the hand interfered although the variable condenser itself was grounded properly as touching the finger on the shaft proved. Not even a metal dial will always cure a case like 2.

*Radio Department, Hartford Times, Hartford, Conn.
I ran the leads in this set directly from the coil to the condenser, behind the condenser, and placed the leads close to each other to restrict their area of operation.

![Schematic](image1)

**FIG. 3. THE CIRCUIT REVISED TO CURE THE DIFFICULTY MENTIONED IN FIG. 2**

The hand effect was now eliminated, even on 40 and 20 meters. The revised version is in Fig. 3. In a tuned r.f. circuit the leads connecting the coil and condenser should be direct but in the average plug-in-coil 20-, 40- and 80-meter receiver are practically never too long nor can they reasonably be made so.

R.f. leads outside the tuned circuit are unimportant as long as the concentrated inductance capacity in the condenser are much larger than the distributed L and C of the outside leads; all of which usually is the case at 20, 40 and 80 meters. In fact the hand effect may be either actual resistance or a poor condenser effect, the latter being impossible if air insulation serves between related leads. As the losses are determined by the simple formula 1/ R and as the r.f. grid control is largely by voltage with very little current flowing to the grid added loss do not occur importantly with resistances less than 200 ohms, as experiment will prove. See Fig. 4. As the G to F capacity of the tube and the grid-lead to filament-lead capacity can become an important part of the tuned-circuit capacity (see Fig. 5) when the variable condenser capacity is low (so much so as to carry over half the r.f. current within the tuned circuit) a short lead may become important at some dial settings. This fact may account partly for the observation made by myself and some others that a small grid-condenser (which helps to reduce the importance of lead and tube capacity) is of advantage. Experiment shows that this is not a complete explanation.

The inductance of leads may come into account at very high frequencies. As has been mentioned in other articles in the magazine, a straight wire can act as an r.f. choke.

A more practical discussion may be based on the well known circuit of Fig. 6. The outside r.f. leads are drawn heavily and

![Layout](image2)

**FIG. 4. THE CURRENT IN THE TUNED CIRCUIT IS LARGE AND A RESISTANCE AT R-1 WOULD BE DEADLY BUT THE CURRENT TO THE GRID IS SMALL AND RESISTANCE AT R-2 DOES LITTLE HARM UNTIL IT HAS BECOME QUITE HIGH**

are numbered. The lead 1 may have important capacity relations to leads 3, 5 or 6. The results in any case are "dead-spots" (due to antenna resonance) even with P and S loosely coupled. Lead 3 is active to 4, 5 and 6 but the effects to 4 largely may be ignored. The effects to 5 and 6 result in excessive tuning effect from the regeneration control, or in freak tickler sizes, usually extra small. Little else is likely to result importantly. My prefer-
I like bare bus-wire because it is rigid and can be soldered to at any point. Under appearance we may consider sub-panel work (which knocks repair convenience into the rough), square-cornered wiring, spaghetti, etcetera, all of which can be used harmlessly.

Admiral Bullard Dies

R E A R Admiral Wm. H. G. Bullard, U. S. N., retired, chairman of the Federal Radio Commission, died suddenly in Washington on November 24th, aged nearly 61. His death occurred on the final day but one of the International Radio-telephone Conference, where he was also an American delegate. He was the second member of the Commission to pass on, Colonel Dillon having preceded him in September.

Admiral Bullard was long connected with American radio. He was the first commandant at NAA and the first Director of Naval Communications, serving in that office from 1912 to 1916. After duty at sea he again became D.N.C. from 1919 to 1921. He was instrumental in the formation of the Radio Corporation of America as an all-American communications agency which would retain control of American communications within this country.

It is fitting at this point to quote an Associated Press despatch from Washington: "Admiral Bullard was a great friend of the amateur operators and guarded their communication band with zealous care. To them he attributed much of the progress of radio in America and he often expressed the belief that they would keep this country in the foreground of radio development.

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—K. B. W.

Readers are requested to make the following correction in the 1927 Index, which was published as a supplement to December QST. Under the head “Amateur Radio Stations” a number of references to page numbers and issues incorrectly appear as a group at the end. These references are to editorials bearing upon “Amateur Regulations & Legislation” and belong in the second line of the following section, which bears that title.

This index has been furnished without cost to all member-subscribers. Others may obtain a copy upon request.
Experimenters

The 5-meter test reports have come in very slowly indeed and thru sickness of two of the men prominent in the test it has become unavoidable to carry the whole report over another month. It must be realized that this is being written at the last possible moment for this issue—which is to say, December 1st.

STANDARD FREQUENCY TRANSMITTERS

The standard frequencies from 9XL will be continued. We were considerably disturbed when a change of station management took place but it seems now that Chief Operator McCartney and his crew will be able to continue as before with these transmissions and station WCCO-9XL-9WI will continue to occupy its wholly unique position of combined broadcast station, standard frequency station and amateur station. There is also a good chance that another station will be added before the winter is over.

Meanwhile it is suggested that the acknowledgments of the work of the station be made on the standard blanks supplied by the "X"-section or in the complete manner shown by the following letter.

O.W.L. Radio Station no-3FC, 268 Queensdale Ave., Toronto, Oct. 14th, 1927.

Anoka, Minn., U. S. A.

Dear O.M.'s:

Your Standard Frequency transmission to-night was followed without any trouble from the time I reached the set here at 10:30 E.S.T. until 11:50 when you were on 7 T. at 425 meters with your QST. I afterwards heard the music modulation, but owing to some rather severe fading at that time, the music was not all of the best.

At 10:40 on 5.70 Mc. signals were steady R7. At 10:47 on 6.50 Mc. signals were steady R7 to R8. At 10:55 on 7.00 Mc. signals were steady R7 to R8. At 11:10 on 7.50 Mc. signals were steady R7 to R6. At 11:20 on 8.00 Mc. signals were steady R6 to R7. At 11:30 on 8.50 Mc. signals were R7 and still steady except at times a slight tremor was noted. At 11:42 on control on 4.25 Mc. signals were R6 to R7 with a very pure note. The tremor spoken of before was also noted at this time and fading began to be apparent soon after the QST was finished. Signals faded from R7 to R4 at fairly regular intervals of about one minute. The music modulation seemed to fade to a greater extent than the cw, appeared to do but perhaps that is a fallacy of my ear. When fading was at its worst, distortion was also quite noticeable, in fact the two seemed to peak together.

I much prefer the tone modulation now used on these S.F. transmissions, to the pure CW used before, although I do think that the pure CW allows greater margin of accuracy on obtaining the true zero beat in the receiver. The receiver used, by the way, was an ordinary 3 coil affair with detector and one A.T. tube. The antennas 15 feet high and 30 feet long all told including lead-in.

I want to congratulate you all on your very nice work and your exceedingly good signal strength as usual. Keep up the good work, and more power to you!!!

Many thanks for the timely checks.

E. C. Thompson, Asst. ACM, Ontario, Central District.

Section Report

PROBLEM G-13 IS ALIVE

The following letter and circular are a splendid illustration of the way an active problem should be handled.

Fairmont, Minn.

Experimenters' Section, A.R.R.L.

You have at intervals sent me schedules of 5-meter tests, etc. Now I am interested in these things and like to know what is going on. I am not using the "X" section resources to send that kind of stuff to me as I make no use of it that will ever give the Section returns. I am working on problem G-13 to avoid static and other interference and devoted all the time I have to spare on such work to that problem.

1 do not know if the headquarters gang know that any of the G-13 men are still alive or not but as a matter of fact there are several quite active "static dodgers" hammering away at the so-called Tyzzer System of Radio.

H. B. Starkey, 153 Cowan Ave., Toronto 3, Ont., Canada, acts as a sort of correspondence clearing agent for the gang and is building a receiver for the tests we expect to run.

H. B. Bennet of Rockford, Ill., is also building a receiving set. Krebe expects to do both transmitting and receiving work as a navy yard man and has access to plenty of equipment.

G. E. Gustofson of Mt. Prospect, III., and operator at W2AZ is also expecting to put an xmitter on. His old 9XN equipment is available. There is not an "X" section member. There are also a few others interested. I am expecting to put on some tests myself before long. How long depends on amount of time I can spare and number of bugs I have to eliminate. Have xmitter ("one UX-310 power") and receiver built and have tested over a few blocks with very good results but have found several of the before mentioned bugs which have to be picked before trying for longer distance and serviceability data. Expect to run test over a distance of about 150 miles if possible and over a period of time long enough to get data on the system's possibilities for amateur work.

If you have any data along this line or new G-13 men on the list let me know. Also Mr. Tyzzer's present address if available, also where any information can be had on single side band transmission as it seems to some of us that it could be worked in on the Tyzzer system to advantage.

J. A. Nightingale, Radio 9ABE, 228 S. Main St., Fairmont, Minn.

(We do not know Mr. Tyzzer's address, having been unable to reach him by mail for some months. Information will be appreciated.)

A STARKEY BULLETIN

The following is a sample of the sort of mimeographed material sent out by Mr. Starkey:

153 Cowan Ave., Toronto, Ont., Canada.

"Some want circuits, so here are a couple—rather crude but giving the basic circuits without new ideas. If you fellows will send in your circuit plans I'll devote the next bulletin to them so that we may all pick out the ideas we like best in each. Please send complete details, including aerials, power supply, and keeping with a description of your apparatus.

The first circuit, using Helium modulation, needs two similar tubes. The 2nd, using grid modulation, could use a smaller tube for the lower frequency.
H. E. Bennett, 1515 Burton St., Rockford, Ill., has come in for the receiving end.

Krebs, SAEA, says he is busy building two navy transmitters, but that when he does get started it won't take him long to get on the air, as he has all the necessary "junk".

Gustafson, WJAZ, says "Will try to make some tests next week." Fast work!

Nightingale—too busy to report. "I haven't done a thing but draw and redraw my circuit plans and 'crum' the railroad for non-arrival of my material which is following me to Canada by freight."

We seem generally agreed on the 3.5-4 megacycle band, at least until we can put an amplifier between the transmitter and the antenna to pass only one side-band. Are we also agreed on keying in the high frequency to start with? Later, when radiating only one sideband, it will make no difference where we have the key and we can hope to use a modulation frequency in the B.C. band with B.C. receivers for I.F. amplifiers.

Don't be afraid to report no progress. No report—no bulletin! We've got to keep in touch with each other if we want to accomplish anything. If you find it possible—write to all the active men as well.

Your Secretary,
Healdon R. Starkey.

CONCERNING TELEVISION

There seem to be experimental possibilities in the Cooley "rayfoto" method of transmitting pictures. The details are gradually coming forth in a series of articles in Radio Broadcast. Unfortunately the series is getting at the principle last, instead of first so that a bit of study will be necessary. Who will be first to shoot an amateur picture across the country?

Some Special Uses of the UX-222

By Harold P. Westman

The object of this work was to obtain a circuit arrangement whereby with a tetrode and a single coil and condenser not requiring any taps off either, it would be possible to generate oscillations dependent upon the constants of the coil and condenser which could be used for a laboratory oscillator. An indicator of resonance having characteristics closely approaching those of the grid meter in an oscillating circuit employing a triode was also required in order to make the instrument capable of competing with such a driver. The output of the oscillator was not considered as a matter of prime importance as it was not to be used where high outputs were needed.

Figure 1 shows a circuit that will oscil-
as a triode connected in an Armstrong circuit, the choke was substituted for with a resistor of 8,000 ohms. The circuit still continued to oscillate at approximately the same wavelength though with a decided drop in output. The resistor was of the coated glass filament type commonly used as grid leaks, therefore having a negligible inductance.

Neither the voltage on the inner grid nor the plate was critical and both could be at the same potential. That the oscillating energy in the circuit was but a small part of the total energy was apparent when oscillations were stopped. The currents in all the circuits (not counting filament heating current) increased by about five per cent over their values when oscillations were being generated. The current in the inner grid circuit was approximately 5.5 mils; in the plate circuit, 2 mils, and in the outer grid circuit, \( \frac{1}{2} \) mil. The radio frequency current in the tuned circuit was dependent upon the C/L ratio and is therefore meaningless unless one knows not only the C and L values but also the amount of resistance in the circuit.

The fact that no large current changes took place when the oscillations started and stopped made this circuit unsuitable as this did not allow these conditions to be indicated on a meter. The meter in the tuned circuit gave the greatest indica-

A 5-METER TRANSMITTER USED IN TESTS FROM WGY, OR RATHER FROM ONE OF THE MANY 2X-STATIONS AT THAT TEST-POINT.

of the total energy was apparent when oscillations were stopped. The currents in all the circuits (not counting filament heating current) increased by about five per cent over their values when oscillations were being generated. The current in the inner grid circuit was approximately 5.5 mils; in the plate circuit, 2 mils, and in the outer grid circuit, \( \frac{1}{2} \) mil. The radio frequency current in the tuned circuit was dependent upon the C/L ratio and is therefore meaningless unless one knows not only the C and L values but also the amount of resistance in the circuit.

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as a triode connected in an Armstrong circuit, the choke was substituted for with a resistor of 8,000 ohms. The circuit still continued to oscillate at approximately the same wavelength though with a decided drop in output. The resistor was of the coated glass filament type commonly used as grid leaks, therefore having a negligible inductance.

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of the total energy was apparent when oscillations were stopped. The currents in all the circuits (not counting filament heating current) increased by about five per cent over their values when oscillations were being generated. The current in the inner grid circuit was approximately 5.5 mils; in the plate circuit, 2 mils, and in the outer grid circuit, \( \frac{1}{2} \) mil. The radio frequency current in the tuned circuit was dependent upon the C/L ratio and is therefore meaningless unless one knows not only the C and L values but also the amount of resistance in the circuit.

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tracted toward the grid and will attain velocities that are quite high due to the grid being located so close to the filament and there being such a large difference of potential between the electrodes. Not all of these electrons are going to be caught by the grid and some, due to their high velocities, are going to slip through its mesh and travel on to the plate. Now when the speed or velocity of the electron is high enough, it may, when it impinges itself upon a piece of metal, liberate from that metal, one or more electrons. These electrons are logically called secondary electrons and the phenomenon, secondary emission. Now, the velocity of the secondary electrons is comparatively low and they will be attracted to the grid which is at a higher positive potential than the plate from which they originated. If the velocity of the initial or primary electrons be great enough to dislodge more than one secondary electron, it is obvious that the plate current will be in a reverse direction to the usual flow. While secondary emission occurs in the usual circuits in which triodes are operated, the plate is always the electrode of the highest positive potential and the secondary electrons are attracted back to the electrode from whence they originate making a net gain or loss of zero as far as this secondary emission is concerned.

To get back to Figure 2. If the potentials applied to the plate and outer grid are properly chosen, the secondary emission can be made large enough to cause the plate current to be reversed and the circuit will oscillate. These voltages must be quite close to the necessary values or no oscillations will be generated. The potential on the outer grid may be left constant and by means of a variable resistor in the lead to the plate, the voltage applied to that electrode may be varied until the correct value is found. This value is critical and the circuit will not oscillate for any value which gives a reverse plate current but only for values over a limited range. In the particular set-up used, the plate voltage was 56 and the outer grid voltage was 95. The inner grid was returned to filament minus.

In going from an oscillating to a non-oscillating condition, the currents in the various circuit made these changes; inner grid (grid leak circuit current) from ¾ mil to zero; outer grid, from 6.8 mils to 5.9 mils and plate current from .9 to .63 mils (in reverse direction). As the changes in the currents in these circuits did not compare favorably with the change that is had in the grid circuit of a triode oscillator, this circuit was also considered as being impractical for the purpose.

**FIG. 2. THE LOWER NUMBERS ARE FOR THE NON-OscILLATING CONDITION, THE UPPER ONES FOR THE OSCILLATING CONDITION**

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**Re: The International Test**

The first International Contest held last May was so successful and so enthusiastically received that it is being followed by another somewhat similar contest which is scheduled to open February 6 next. Complete details were given in December QST so that they might be distributed to the most remote parts of the world before the contest opens. Such contests have a number of important objectives. They promote international fellowship and goodwill. They create opportunities for making new records. The coming tests in addition offer a chance for you to win valuable apparatus prizes at the same time you engage in two weeks of rare international sport. Stations at each end of an international contact must help each other in turn with the test messages to add equally to their scores. New friendships will be cemented through the teamwork thus brought about. Every amateur station in the world is invited to participate.

Attention is called to the fact that entries are required of U. S. and Canadian contestants. The closing date for entries is midnight of February 1, 1928. Before you get next QST the chance to enter in the tests and to become eligible for a prize award have gone. A QSL-entry-card mailed today will put you in line to receive a set of official test messages and a serial number assignment which will be necessary if you expect to participate. To delay will mean that you may later be denied the opportunity to enter. Rule 10 (see p. 33 Dec. 1927 QST) will be rigidly enforced as will all the other rules of the contest. Mail that entry card today.

We already hear of plans being made in

(Continued on page 63)
Perhaps you have had some inquiries relating to a short-wave station signing xo5MA. If so, you may find the following information to be of interest.

"I have been intensely interested in amateur radio for many years and have been in communication from Australia (xo5MA) with many foreign countries. I was finally overtaken with a desire to meet these fellow hams personally and saw an opportunity of satisfying this desire by signing on the six-masted American barquentine, E. R. Sterling, the largest of her kind in the world. She was loaded with wheat and bound for Europe via Cape Horn.

"Accordingly, April 16th found me looking over the rail watching Australia become just a faded blue mass on the horizon.

"Of course, I had some short-wave equipment aboard with me. The transmitter consisted of a 210 in a Meissner circuit with three 201-As for modulators. Plate power was obtained from an Esco dynamotor running off a 6-volt storage battery. The output of the machine was rated at 65 watts at 500 volts. An 8-volt battery supplied the filament. Besides this transmitter, I had the main ship's set, a 1½-kw., 1,000-cycle, quenched spark transmitter and a 10-inch spark coil for emergency use.

"The main antenna had a flat top 140 feet long and was 120 feet above sea level. This aerial gave the best results on the short-waves. Many others were tried and some brought back quite good reports on signal strength. However, none approached the big antenna in the steadiness of the wave during rough weather, and I'm about to tell you that we met some rough weather before we again reached port.

"The receiver was a three coil affair with plug-in coils and a switching arrange-
QSL Percentages

Henderson, Ky.

Editor, QST:

Much has been said concerning the acknowledging of signals by card but no one has given any statistics about it. While the following figures are not exactly exciting, they are worth glancing at.

At this station out of 685 “nu” stations worked, 411 or 60% QSLed by card. To give an idea of how the various districts stand in this matter, the percentage of returns from them are as follows: sixth, 74%; seventh, 69%; first, 64%; ninth, 63%; third, 61%; second, 60%; eighth, 58%; fourth, 56% and the fifth, 49%.

These are just plain facts. What say, now, let’s try to boost these averages. The old hand should remember that although they may have enough cards, there are lots of others who are anxious to get them and so have their reports in black and white or whatever other colors may be used.

I am one of the many who QSL to everyone worked or else this wouldn’t be written.

—George F. Taylor, 9BAN

Pse QSR

Hq, Btry, 2d U.S.F.A. Btn.
Gatun, Panama Canal Zone

Editor, QST:

I’ve certainly got a grudge to get off my chest and I guess that some of the gang have it coming to them, too. It’s about this traffic business and the handling of messages.

Why is it that some of the fellows have such a long hook? Why don’t they cut it off so that they can get to those messages. I have sent many and relayed many but never has one hung on my hook longer than twenty-four working hours, but it looks as though some messages intended for me are going to be on some hooks for twenty-four years. One sender has beat his messages down here and it looks like he will be grey-haired before they catch up with him.

I have spent lots of postage money getting messages to places I couldn’t get to by air and I don’t see why the other fellow can’t do the same. I have received one message out of thirty that were headed this way. Where the others are, I haven’t the least idea, but I’ll bet someone feels guilty.

I know that I did when I let one slip by at first, and it’s never happened since.

Although I am now off the air indefinitely, I’d like to let the gang know just how I feel about it. I feel cheated after working hard to be of service to them. However, I want to thank those fellows who kept skeds with me and you may be sure they’ll hear from me when I set up in the U. S. A.

—Henry P. Karr, ex n2EZs

Pse QRX

4114 N. Kedzie Avenue
Chicago, Ill.

Editor, QST:

You may or may not have come across this new form of super-obnoxious pest who is now darkening the horizon of Hamdom. This wretch in question after having QSO’d with you long enough to ascertain your QRA and get a report on his signals will ask you to please QRX for a few seconds while he, presumably, makes some minor changes or answers a phone call. Blissfully unaware of his wiles, you say, “Sure thing I’d be glad to QRX.” He then QSYs to another part of the band or perhaps a different one and in fiendish glee begins a CQ to Europe or Australia.

The courteous innocent at the other end is still QRXing. After ten minutes or so you begin to wonder, then doubt and finally shut down thinking that something has gone bad at the other end. By running over the dial, you might find your erstwhile partner working the same trick a couple of meters away.

My only delight in the matter is in thinking of the everlasting torture that must await him after he crosses the River Styx.

—Morton Fagen, sBOA

Bugs

Box 372, Omaha, Neb.

Editor, QST:

I have been out of the radio game for a couple of months and just got my receiver going again the other night. I was greatly surprised and almost horrified at the number of poor bug senders on the air. In most cases, it sounded like a poorly adjusted bug rather than an inability on the part of the manipulator. Perhaps a little information on the subject of adjusting these bugs for best operation will not be amiss.
WHAT would happen if your antenna ammeter should fail during the February contest? Think of the long nights of vigil, and the many hours of constant service required of this one instrument! Stamina, accuracy, and ability to withstand accidental overloads are highly important considerations if you would avoid anxiety in the crucial test.

Why take chances? Make sure that you have the best instruments obtainable. However you decide, do not be misled by superlative statements of performance or unfounded claims. Words are available to all, and imitators usually employ them with rash extravagance. If in doubt consult a reliable laboratory.

We merely claim the privilege of reminding you that Thermo-couple type instruments are an original Weston development, and that other makes are necessarily only imitations.

WESTON ELECTRICAL INSTRUMENT CORPORATION
158 Frelinghuysen Ave. - Newark, N. J.

Much depends upon the Instruments you use during the February International Test

Model 425
Thermo Milliammeter

What you will find in Weston Thermo-Milliampimeters

1—Definite assurance of your output.
2—Accurate readings after hours of constant service.
3—Extra large overloads will not burn out these meters. They will stand the following currents without damage:
   500 milliampere range—1 Ampere
   250 milliampere range—750 M. A.
   125 milliampere range—500 M. A.
4—Model 425 is ideal for short wave transmission, as it has a very low internal electrostatic capacity. For this reason it gives the true value of the current in the circuit, and does not disturb the constants of your transmitter.

Model 425
Radiation Ammeter

Model 425 is made in ranges from 125 M. A. to 20 amperes.
Overload capacity of ammeters, from 1 to 20 ampere ranges—50%.

Say You Saw It In QST—It Identifies You and Helps QST
I have used a bug on both Morse and Continental and I believe it to be a wonderful saver of time, energy and religion but let me say, never try to set a bug for good Morse work and then use it on radio. If you do, chances are that 50% of your dots will not be heard by the other operator. The reason is that for Morse work, a very light dot is required. For radio work, a very heavy dot is necessary. I got the best results from my bug by screwing up the dot contact so that the thing closes after seven or eight dots. That gives a good heavy dot that is easy to read.

And another thing, just because you have a bug and like to hear yourself send fast is no reason that the rest of the gang like it. Pull all the weights out to the far end of the bar, buy another one if necessary to slow it down and you will find that QSOs will increase and QTA's will decrease. There is nothing prettier to listen to than good bug sending on a bug set as outlined above but nothing is a greater abomination than the bug sender that thinks he should send at a breakneck speed just because he can. (Half of those fellows can't do it anyways.)

—J. H. Platz

Appreciation

3086 Eastern Blvd.
New York City, N. Y.

Editor, QST:

I would like to recommend the work of Charles Heiser of 55 Frances Street, Auburn, N. Y. for recognition by the American Radio Relay League.

My husband, Donald A. Cadzen, left on June 11th as ethnologist with the Putnam Expedition to Baffin Island. Through the efforts of Mr. Heiser who has been in almost constant communication with the schooner Morrissey of the expedition, I have been able to keep in touch with Mr. Cadzen practically all summer.

Many times, Mr. Heiser has been able to get in contact with the ship when other stations have been unable to hear her signals. He has also relayed some articles from Mr. Putnam for the New York Times.

I really believe his work warrants some mention in your magazine, QST.

—Helen H. Cadzen

Superheterodyne

Editor, QST:

I have been re-reading with interest and appreciation, the several articles which have appeared during the past year on the use of the superheterodyne for high frequency reception. As you know, I use the superheterodyne exclusively for all my work, from the broadcasting band up to over 20 megacycles, principally because it lends itself so well to metrical work.

Using an autodyne oscillator-detector for conversion to intermediate frequency, I
POWER FOR YOUR 210 TRANSMITTER

This Thordarson 130 M.A. power supply unit will operate your 210 Transmitter at full capacity. The excellent filtering improves audibility by "sweetening" your note. This unit when in operation in the 9-J C Transmitter was reported from coast to coast at R-5 with a pure D. C. note.

Power Supply Transformer T-2098

Double Choke Unit T-2099

NEW

THORDARSON

Plate and Filament Transformers
A Complete new line of Thordarson long distance transmission equipment has just been released including filament supply, plate supply and microphone transformers and filter reactors for use with all existing transmitting tubes.

WRITE FOR YOUR CATALOG TODAY

THORDARSON ELECTRIC MANUFACTURING CO.
Transformer specialists since 1895
WORLD’S OLDEST AND LARGEST EXCLUSIVE TRANSFORMER MAKERS
Chicago, U.S.A.
Make once. • set an orderly appearance. Gives an orderly appearance.

Send for folder
THE ACME WIRE CO., Dept. S
New Haven, Conn.

BEST OUTDOOR ANTENNA YOU CAN BUY.
Seven strands of enamelled copper wire. Presents maximum surface for reception, resists corrosion; greatly improves the signal. Outside diameters equal to sizes 14 and 16. (We also offer solid and stranded bare, and stranded tinned antenna.)

Loop Antenna Wire
Sixty strands of No. 38 bare copper wire for flexibility, five strands of No. 36 phosphor bronze to prevent stretching. Green or brown silk covering; best loop wire possible to make.

Flexible Celatsite Wire
A cable of fine, tinned copper wires with non-inflammable Celatsite insulation. Ideal for sub-panel or point-to-point wiring. Strips easily, solders readily. Nine beautiful colors; sold only in 25 ft. coils, in cartons colored to match contents.

Acme Celatsite Wire
Tinned copper bus bar hook-up wire of non-inflammable Celatsite insulation. In 9 beautiful colors. Strips easily, solders readily, won't crack at bends. Sizes 14, 16, 18, 19; 30' lengths.

Spaghetti Tubing
Oil, moisture, acid proof; highly dielectric. Used by leading engineers, nine colors, for wire sizes 12 to 18; 30' lengths. (We also make tinned bus bar, round and square, in 2 and 3½ ft. lengths.)

Battery Cable
A rayon-covered cable of 5, 6, 7, 8 or 9 vari-colored Flexible Celatsite wires for connecting batteries or eliminators. Plainly tabbed; easy to connect. Gives an orderly appearance.

Send for folder
THE ACME WIRE CO., Dept. S
New Haven, Conn.

Acme
ANTENNA

M A K E S  E '  T T  E

acme
WIRE

MAKES BETTER RADIO

58 Say You Saw It In QST—It Identifies You and Helps QST

have repeatedly verified your observation that a more favorable signal to noise ratio can be obtained than when the conversion is directly to an audio frequency. But the purpose of this letter is not to discuss this fact, but rather the means by which an audio frequency beat note is produced in the second detector.

It would appear from the columns of QST that there is some question whether it is better to use a separate low frequency oscillator, or allow one of the intermediate stages to oscillate. Most of my experience has been with a completely neutralized intermediate train, so that I had to use a separate oscillator, but I have recently compared the two methods, finding that a separate oscillator is decidedly better. One reason for this is that if the oscillations are produced in the intermediate train there is no easy way to clear the oscillations of harmonics, which for reception of all frequencies under three or four megacycles produce an annoying series of "birdies" from end to end of the condenser dial.

With a separate oscillator, it is a simple matter to shield, punchhole, Newly plate leads, and then a simple filter circuit in the output, so that only the fundamental of the low frequency oscillator is applied to the second detector, and none of the harmonics get into the first detector. Not only do the "chirps" cease, but the self generated noise of the receiver is noticeably lessened.

—Greenleaf W. Pickard

Help the Beginner

3 West State Street.
Gloversville, N. Y.

Editor, QST:

Being an ardent reader of the "Correspondent" columns of QST, I would like to say a few words about communication between beginners and those who have had more experience. Much of my time has been spent working with new operators and the indifferent attitude of many hams has prompted this short missile.

It seems that within the past few months I have been in contact with several beginners and with a little patience have been able to carry on some interesting chats. During these chats, they say that they are not getting the amount of fun from their amateur operating that they had anticipated and upon questioning, one gets an answer similar to this, "Sa ob u r the first ham I hv ever QSO who cared to talk with me." The reason! Just this, the poor beginner has all he can do to receive his ten per and some of them have difficulty in copying at that speed even. The average "speed demon" considers it too much of a bore to carry on a conversation at such slow speeds and considers it to be much greater sport to carry on with someone who can rip it off at twenty-five to thirty words per. About the only thing such men are interested in is the report on their signals and, after that is had, the QSO is fin-
Raytheon—the one rectifying tube that maintains constant voltage

The reason?
"IONIZED HELIUM"

Raytheon Long Life Rectifying Tubes have demonstrated the advantages of Raytheon's principle of ionized helium gas over all other methods of current rectification. But the possibilities of this superior principle are almost beyond comprehension. In the Raytheon Research Laboratories a group of scientists are continually discovering new properties and further capabilities of ionized helium gas which will be incorporated in future developments when manufacturers have advanced their products sufficiently to accommodate them.

Today, the simplest and most satisfactory method for receiving complete light-socket operation is the series filament receiver powered by an A-B-C power-unit using but one rectifying tube—the Raytheon type BA. Tomorrow may see still further advances and Raytheon is ready for them.

Raytheon Manufacturing Co.
Cambridge, Mass.
Precision Resistance
at Low Cost

You'll appreciate the Volume Control Clarostat. It's a little fellow, compact, good looking, inexpensive, handy—just the thing for the receiver itself. Hot stuff for controlling regeneration in short-wave reception. Can't be beat for regulating c.f. and detector plate voltages. It's there as a means of matching transformers, controlling volume and other applications requiring precision resistance. Practically zero to 500,000 ohms in several turns of knob. Ample current carrying capacity for receiver applications. Holds resistance adjustment. Silent in operation. One-hole mounting. Screw terminals. And all for $1.50!

Of course you must continue to use the Standard Clarostat for handling heavier currents, and the Power Clarostat for the heaviest currents, as heretofore.

There's a Clarostat for every "ham" need. Make sure, however, you get a genuine Clarostat—look for distinctive green box and name CLAROSTAT stamped on nickel shell. Don't be fooled, O.M.!!

You know more about how to use Clarostats in your work than we do. But if you want our dope, just address:

American Mechanical Laboratories, Inc.
Specialists in Variable Resistors
235 N. Sixth St.
Brooklyn, N.Y.

ished as far as they are concerned. This lets the beginner out.

When I first started, I know I had both hands full to get my ten per but I will say that with but very few exceptions all the hams I ever tied in with gave me an even break. I wonder what is responsible for these changed conditions? We all had to go through the same stages and I suppose that we just forget for a moment about this. I am sure that the man who now chops it off at thirty per will agree with me that he was no "speed demon" when he made his first QSO. Many of us laugh when we think back of the thrill of the first real QSO that we had. If we would only remember that this is the same thrill that the beginner is getting, we would lay aside a little more time for an encouraging chat with him.

Is DX more thrilling than a slow, drawn-out QSO with a beginner? Certainly, but remember we are not doing this for ourselves, but for the other fellow who is following along in our footsteps. Let's make it, "One for all and all for one" and give that beginner a little more time than just enough to find out our QRK. What say, OMs?

—Charles S. Robbins, s5RF

Another Angle

803 East 7th Street
Superior, Wis.

Editor, QST:

Sometimes I get so sick and tired when I read of the new hams that say the old timers won't give them a hand that I want to go out and shoot the works or else blow my fifty.

Why? Because the old timers won't help them? No! Because the young squirts have the crust to ask for it.

I'll tell you why. First, when radio was young, or rather when KDKA first started tormenting the ether with strains of heavenly (?) music, several fellows came to me and asked me to help them build sets so that they could receive aforesaid music—adding that code work might interest them later. I helped them and received a bare thanks.

That was all right. Being naturally modest, I didn't care whether they said thanks or not. I rested peacefully in the thought that radio was to have several more amateurs in a short while.

Then, when stations began to be smeared all over the band, my transmitter happened to cause a little disturbance to those receiving near 200-meters. And here came the surprise.

These BCLs that I had helped when they were green as grass, were the first to jump on my neck. I shared hours with them and still they kicked. They wrote the Radio Inspector instead of coming to me. They cut down my counterpose and threatened bodily injury.
TRANSMITTING INDUCTANCES

There are more REL Transmitting Inductances in use throughout the world than the combined output of all other Inductance makers.

Equip your station with them now.

Double unit—$11.00, complete with glass coupling rods and 6 clips.

Single unit—$5.50 (3 clips)

TRANSMITTING KITS

Tuned Plate Tuned Grid (pictured), Hartley, M. O. P. A. and Beginner’s Transmitter are all noted for their peerless construction and fine performing qualities. We have a transmitter that will fill your need. Prices on application.

RECEIVING COILS

These were the first short wave coils made for the Amateur and are now a part of the receiving equipment in every well known amateur station throughout the world. Wavelength range 15 to 100 meters with .0001 mfd. condenser. Kit includes six coils with base mounting. Price $6.00.

No. 130 RECEIVING KIT

This was the first Receiving Kit ever produced for the Short Wave enthusiast. Its popularity is increasing every day. The price is unusually low at $36.00.

REL's catalogue is something you shouldn't be without. The stock of complete Dope on S. W. "or what have you" will come in mighty handy many times. Send for your copy today. 25c cash or M. O.—and we keep it up to date for you by issuing timely bulletins.

REL owns and operates experimental Station NUXV on 15.1, 30.2, and 60.4 meters

Radio Engineering Laboratories

100 Wilbur Avenue, Long Island City, N. Y.
Say, You Saw It In QST—It Identifies You and Helps QST

FINANCIAL STATEMENT

By order of the Board of Directors the following statement of the income and disbursements of the American Radio Relay League for the third quarter of 1927 is published for the information of the membership.

K. B. WARNER, Secretary.

STATEMENT OF REVENUE AND EXPENSES FOR THE THREE MONTHS ENDED SEPT. 30, 1927.

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EXPENSES

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<td><strong>Total Expenses:</strong></td>
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**Net Gain From Operations:** $1,229.21

Additional net gain due to restoration of litigation expenses in first and second quarters, now charged against Surplus appropriation -------------------------- $1,182.70

$2,412.91
A. C. Filament Voltmeters

Transmitting and receiving tubes using A. C. excited filaments require an accurate means of determining the exact voltage applied to the filaments. This can best be accomplished by the use of a suitable alternating current voltmeter.

For amateur use the Jewell 3-inch instrument Pattern No. 74 has been the favorite for many years, but the advent of alternating current tubes for receiving sets required the development of a smaller instrument and which Jewell has provided in their Pattern No. 190, illustrated.

Pattern No. 190 is a flush mounting instrument of the conventional moving vane type with special modification for its small two-inch case. It is accurate and neat, and in general appearance matches the Jewell Pattern No. 135 direct current type. It is designed for continuous service and consumes a small amount of current. It is made in ranges of 0-1.5, 0-3, 0-5, 0-15 and 0-150 volts. The 1.5 volt range is suitable for tubes using directly heated cathode, the 3-volt range is used for tubes having indirectly heated cathodes and the 150 volt range for primary control.

The Jewell 15C Radio Instrument Catalog gives a complete description of Jewell miniature A.C. instruments. Write for a copy of it.

Jewell Electrical Instrument Co.
1650 WALNUT ST., • • CHICAGO
“28 Years Making Good Instruments”
### Experimental Radio

#### Third Edition

**By** Professor R. R. Ramsey, Indiana University

117 experiments, 150 figures, printed and bound in permanent form. Just off the press.

"Then as now we recommend it very strongly to the Radio Experimenters," Review 3rd Ed. GSP.

Not a text-book but an experimental manual. "The author contends it is not a text book. It is the best text we have ever seen." N. Y. Sun.

The book that tells you HOW as well as WHY. Price $2.75, postpaid or C. O. D.

Ramsey Publishing Co., 615 E. 3rd Street
Bloomington, Indiana

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**REFERENCES and BOOK REVIEWS**

*By R. S. Kruze, Technical Editor*

**Lexax Radio Handbook** revised 1927, by Dr. J. H. Delling. Published by Lexax Inc. 9th and Sansom Sts., Philadelphia. Price $2.50 or with one year's supplementary leaflets $7.50.

Like the preceding editions of this well known reference handbook this particular one is divided into sections marked by heavy pages with index tabs with headings such as "What Radio Does," "Fundamental Principles," "Receiving and Transmitting," "Assembly of Receiving Sets." The headings already given suggest that the book attempts to cover an enormous territory and that therefore not be expected to be exhaustive in any one field. On the whole the attempt is successful and the information given is concise and useful. One unfortunate exception must be noted. The transmitting circuits are confusingly drawn and are without exception constructively coupled to the antenna in a manner not permitted by law in the station of an amateur. This is doubly true of those accidental "carry overs" from an earlier edition capable of sometimes escape even the most careful reviewer.

**Les Ondes Electriques Courtes** by Rene Mesny, Professeur d'Hydrographie de la Marine. Published by Les Presses Universitaires De France. Received for review through the courtesy of E. M. Zandonini, Radio Section, Bureau of Standards.

It is unfortunate that this book is not printed in English as well as French for we have nothing of the sort insofar as we know. Not only is the general subject matter of short wave communication scarce but in addition to this there is material regarding directive transmission with reflectors and with special attention to the controlling which either the horizontal or vertical portion of a bent system is caused to cancel out. There is also a discussion of linear antennas in several articles and the operation of antennas at harmonics. There is quite a generous amount of material on extremely short waves (below 1 meter) of which the larger part is known to the short wave experimenter but is not ordinarily available in one place. Above all, there is that very important thing, a good bibliography.


The title page of this book carries a list of 12 contributors to this volume, and it is presumed that the bulk of the text is supplied by them. If this surmise is correct one must credit the editor with a remarkably well unified piece of work for it is written by different people. Besides this the book is illustrated much more liberally and much better than is the customary so that one does not need to overcome an unpleasant first impression. There does not seem to be any reason why "Everyman's Guide may not become an inspiration by the comparatively simple process of making additions and changes from the same sources which served so well in this case. It is very probable that this has been in the mind of the editor and that for such a reason he has adopted the weird system of labeling the different figures "F-3." "L-1," and the like very definitely preventing the reviewer from discovering how many figures there actually are.

The following list of references makes no pretense at completeness but includes simply such material as is encountered through the ordinary activities of this desk.


The Performance of Valves in Parallel
What Power Unit are You Building?

Dubilier Condenser Blocks for these well-known B and A B C power supplies are all that the care-taking experimenter could ask for in ruggedness, accuracy, safety and long life. Dubilier Type PL 574 is designed especially for the Thordarson R 171 Power Compact, and all light-socket devices employing the Raytheon BH Rectifying Tube. Maximum transformer voltage should not exceed 700. Type PL 575 block is the approved condenser for Thordarson R 210 Power Compact, AmerTran, Samson and all other power supplies using 216 B or 281 type filament rectifiers. Maximum transformer voltage not to exceed 550 V. per plate. Full instructions enclosed. Your dealer has them. Type PL 574—$16.50. Type PL 575—$17.50.

You Can't Build a Better Aerial!
So why bother with a troublesome, expensive outdoor antenna? Just connect the Dubilier Light Socket Aerial to your set and plug in. All the distance you need, all the volume you want, and clarity that an outdoor aerial can't touch. Less static, less interference and no lighting hazard. You risk nothing to prove it, for all good dealers sell the Dubilier Light Socket Aerial with a 5-day money-back guarantee. Price $1.00.

Dubilier Condenser Corporation
4377 Bronx Blvd.
New York, N. Y.
NO HUM!

At last you can step down your 110 volt A. C. house current to operate your set with standard A. C. tubes such as Conningham, RCA and others, without having to use separate device for center tap, and with ABSOLUTELY NO HUM. Let the Karas A-C-Former FILAMENT Supply. Type 12, replace your "A" battery and charger. With 1 1/4 volt Type 220 or 221 Tubes, or 4 volt Type 227 or 227 Tubes, and 2 5-volt Type 227 Tubes at one time. Compact, powerful, sturdy and built the Karas Way—by precision method. Write for complete information about the new Karas A-C-Former and also data on the Karas 2-Dial Equamatic.

KARAS ELECTRIC COMPANY
4030-A North Rockwell St., Chicago

Changes in Frequency Due to Shielding, H. A. Zahn, Radio News, December, 1927.
The Telefunken Broadcast Transmitter in Germany (apparatus at all classes of stations) W. Meyer. Same reference as above Transmitting Antennas, M. A. Cremall (Part 2). Very good discussion of antenna possibilities QST, August 1927.
The Horizontal Hertzian Aerial For Transmission, M. G. Scroggie, Experimental Wireless, March 1927.

Here is a date to paste in your hat! The Third Annual Convention of the Institute of Radio Engineers will be held on January 9th, 10th and 11th in the lobby of the Engineering Societies Building, 33 West 38th Street, New York City.
The program will include the installation of the new officers for 1928, presentation of the Liebmann Memorial Prize by Dr. A. Hoyt Taylor, eight technical sessions and some trips. These trips will give all a chance to see the new high power experimental transmitter of the Bell Telephone Laboratories at Whippany, N. J., and also the opportunity of going through the new Holland Tunnel under the Hudson River. The other trips will be to WJZ at Bound Brook and to the new Roxy Theatre where demonstration of the making of talking movies will be given. On the last evening, a dinner-dance will be held.

All who have attended previous conventions of the I. R. E. will want to come to this one and those who have not here-tofore had that pleasure should make sure that they don't miss it this year.

Say You Saw It In QST—It Identifies You and Helps QST
FOR greater selectivity, finer appearance, longer life, lighter weight, use Aluminum Box Shields in the set you build—and look for Aluminum Shielding in the set you buy.

Designers agree on the superiority of Aluminum for shielding. It has become an established factor in radio design—recognized alike by advanced amateur set builders and engineers responsible for commercial production.

Aluminum Company of America's standard box shields, designed especially for amateur sets, are made of heavy Alcoa Aluminum with satin-dip finish, size 5 in. x 9 in. x 6 in. high. They are easily adapted to smaller sizes. They require no soldering.

Three of these standard Alcoa Aluminum box shields are called for in the Q. S. T. Short Wave Set described in the December issue of this magazine.

If your dealer cannot supply you with Aluminum Box Shields send us his name and we will see that he is put in position to service you promptly. Be sure to send, also, for a copy of the new edition of "Aluminum for Radio." It is free.

ALUMINUM COMPANY OF AMERICA
2460 Oliver Building
Pittsburgh, Pa.

Say You Saw It In QST—It Identifies You and Helps QST
some quarters for “signing on” a friend as extra op to keep the station on the air more hours per day than otherwise possible. Another individual is scheming to use an automatic transmitter to win a prize. A third is entering two stations to better his chances of winning. The opportunities for getting a friend to help as op, for tuning the station to the highest degree of efficiency for different useful waves, for working up schedules in advance of the tests, are equal for everyone or as nearly so as we can make them at any rate. Frankly, we must admit we can’t get the viewpoint of the man who surrouns himselfs to bring to advantages to assure success. We believe in competing fairly or not at all. Every participant is on his honor as a gentleman to abide by the spirit as well as the letter of the rules of the contest.

The award committee (representatives of several departments of Headquarters will be asked to serve on this) may also consider itself appointed to consider any irregularities and rule if they are unethical or unfair should help to him win. A ruling. This committee on irregularities may set up any general policies it deems necessary in carrying out its work, basing these on the rules and printed announcements of the contest of course. It is necessary to draw the line somewhere to protect the interests of the average station owner who takes part in the contest—hence the committee on irregularities. This committee will be asked to consider any irregularities or more independent reports of off-wave operation (or other irregularities) from reliable sources may be accepted by the committee as sufficient to disqualify any pcrticipant. In other matters than off-wave operation, the committee shall haive power to decide whether the penalty for irregularities shall be loss of points or disqualification depending on the evidence submitted. The active functioning of this committee and its observers will be even more important than during the last tests when the need for such a committee was shown due to the fact that there are prize awards involved in the decisions this time. Enough about the award and irregularities committee—remember all the rules and watch your step!

If a station shall be heard making schedules for another station for the purpose of handling test messages during the contest this shall be considered unsportsmanlike. This station shall be reported by whom-soever shall hear it and shall be penalized to the extent of losing all points that it is
Since the hot-wire type meter is independent of frequency it may be used for any purpose in the transmitter from radiation ammeter to regulating the battery charging rate.

The 127 line of meters is supplied in front of panel and flush mounting, and portable types.

Ranges — 100 milliamperes (full scale) to 10 amperes (full scale)

Prices .................. $7.25 to $10.00
Centralab Power Rheostat

This new unit is a knock-out for warp-proof, heat-proof performance. Its construction permits continuous operation at temperatures of 432° F. and beyond. Resistance wire is wound on metal core, asbestos-insulated; core expands with wire, insuring smooth action. Narrow resistance strips give small resistance jumps per turn, further assurance of even regulation. Compact 2" diameter. Ohms—500, 250, 150, 50, 15, 6, 8, 1.2, 0.5—price $1.25. Can also be furnished as a potentiometer. At dealer's, or O. D. You need this new Power Rheostat. Send postal for new circuit literature.

CENTRAL RADIO LABORATORIES
25 Keele Avenue  Milwaukee, Wis.

Municipal Ordinances on Radio Transmission Unlawful
(Continued from page 26)

States. And Congress has covered the field by appropriate legislation. It follows that the ordinance is void as a regulation of interstate commerce.

"The motion to dismiss is overruled.

A. M. J. Cochran, Judge."

We hope everybody realizes to the fullest extent just what this means. Where other local ordinances already exist, we now have the most clean-cut kind of precedent to cite in seeking an injunction. What is more important, however, is that it is extremely unlikely if any city will attempt to pass such an ordinance, with the above in mind. The city-ordinance danger no longer exists as a menace to amateur operation.

It is most unfortunate that space will not permit the inclusion of Director Segal's brief in the case. It required a tremendous amount of work and research. It was a great case, a masterly and air-tight job, and the amateur fraternity will be forever indebted to him for it.
THROUGH correct proportioning of the size and shape of the cone, the new Stromberg-Carlson Speakers are able to reproduce exactly every note and vibration sent to them from the scientifically adjusted Stromberg-Carlson Receivers.

The apex [center] of the cone is thinner than the outside edge, gradually increasing in thickness from the center to the outer rim. This thinning of the "radiator" at the center makes possible accurate reproduction of the higher frequencies, while the rest of the cone gives a faithful portrayal of the low and intervening frequencies. The objectionable "paper rattle" usually found in large cones is eliminated by this graduation of the cone thickness.

Fashioned of tough paper fibres, gathered on a cone shaped form there is no grain or seam, thus insuring uniformity of tone and great durability. Another feature of these exceptional Speakers is the specially designed "baffle board" placed on the back so as to prevent rattling and resonating at the lower frequencies.

Stromberg-Carlson Cone Speakers are built expressly for use with Stromberg-Carlson Receivers. Their superior reproducing qualities will, however, greatly improve the reception from any other high class Receiver of the same power.

Stromberg-Carlson Telephone Mfg. Co., Rochester, N.Y.
I. A. R. U. News

(Continued from page 52)

energy from the radio transmitter getting into it. An electric motor was encouraged to act as a generator after some of the field turns had been removed. It was belted driven from the flywheel of the gas engine and had to travel at 5,000 revs per minute in order to deliver enough power to run the bad weather that belt played all sorts of tricks and power for charging batteries was strictly limited. While I could not be on the air very often at this time, some fine contacts were made when we reached warmer and finer weather. While off New Zealand, nc4FZ was worked. This was the best DX while at sea.

After leaving New Zealand waters, all short-wave signals became weak, even WIZ. However, on 600-meters several California coast stations were copied. Gradually, amateurs in Chile, Brazil Uruguay and Argentina were worked and while off Cape Horn the sea became as calm as a mill pond.

"A few days after sailing clear of the dense ice fields off the Falkland Islands, we were struck by a fierce squally gale which in a few minutes carried off our main mast and, half an hour later, the mizen mast also crashed to the deck. Both masts trailed over our starboard side held by the wire and rope rigging. They struck the rudder several times with great force before we were able to cut them adrift.

"After the gale moderated, the ship was once more headed toward Europe, now under jury rig, four masts remaining. A new antenna was erected and the weather conditions improved as we reached the tropics. While still a few hundred miles from the equator and only four hundred miles from the nearest coast station (Perumbuco, Brazil), I tried for hours to push through news of the accident. Fierce static made this impossible up to 7 1/2 watt and with 35 watts input sent the news via n2RS and nu8LDL without any difficulty. Many other stations also handled our traffic and I wish to thank them right here for the kind cooperation.

"On September 4th at 2 a.m., ship's time, I was QSO nu8LDL on schedule and told him I would have to QRT as it was getting too rough to work. So I closed down and turned in until 4 o'clock when I was awakened. The ship was in a roaring hurricane. When I reached the deck, there was wreckage everywhere and shreds of sail were whistling and flapping in the wind. At about 7 a.m., the large steel foremost with its six square yards of canvas crashed to the deck and the mountainous seas took charge of the ship. Ventilators, pumps and light woodwork were washed off flush with the deck. Leaving us a pitiful wreck, the hurricane subsided shortly after eight o'clock.

"The chief mate who was in a serious condition was carried to the after cabin where he died not long after.
QST BINDERS

You'll NEED ONE of these for your 1927 copies of QST

and some for your previous volumes, too

Maroon Buckram with title stamped in pure gold
Just fits twelve issues of QST

SENT POSTPAID 1.50 ea.

Get a set to hold all your back issues of QST—you know they deserve permanent preservation

QST
1711 PARK ST., HARTFORD, CONN.

Note the wire fasteners. Unnecessary to mutilate copies. Opens and lies flat in any position.
Quality Amateur Apparatus

Ensall Radio Laboratory Products are Quality Built for Transmission and Reception. We supply Transmitters for Radiophone or C.W. Receivers of the Three to Eight Tube Designs with Wave-length Range from 15 to 210 Meters. Our Speech Amplifiers are supplied for Direct or Remote Control. We also make and supply, Wavemeters, Inductances, Choke Coils, etc. Distributors for Nationally known Microphones, Transformers, Plate Reactors, Motor Generators, etc. We build to order using your parts if desired. Prices on Application.

ENSALL RADIO LABORATORY
1208 Grandview Ave. Warren, Ohio
Amateur Broadcast Marine
"Pioneer Builders of Short Wave Apparatus"

“Only the center mast now being in commission, we more drifted than sailed and six weeks later we reached Sombrero Island light (about 180 miles East of Porto Rico) where the U.S.S. Grebe who had been sent by the St. Thomas naval authorities found us and towed us to St. Thomas (Virgin Islands). I have certainly been cordially treated by the two amateurs on the island np4AAN and np4ACF.

“At the time of writing this, we are still at St. Thomas awaiting the arrival of a tug which is to tow us to England. I have hopes of again QSOing the gang while on the way over and believe this part of our trip will be less exciting than that already over.”

—M. B. Anderson, WIS.

JAPAN

The Japanese amateurs have at last won the right to build and operate amateur experimental stations. The government has recognized the amateur to the extent of granting licenses for such stations.

The only wavelength on which transmission can take place is 38 meters. No other waves can be used. The maximum power output is 10 watts and some licenses allow only 4 watts output. This will most probably not be considered as a handicap as many of the stations now in existence are using powers of this magnitude.

As all communication in Japan is managed by the government, these private experimental stations are strictly prohibited from handling messages and also from “chewing the rag”. Stations are allowed to communicate with each other only about matters necessary to the conducting of experiments and a report on each and every such communication must be sent in to the government official who handles this matter. However, all the licensed stations will be glad to get into experimental communication with amateurs in other parts of the world.

The call letters assigned to these stations will be four lettered ones. The calls already issued are listed herewith and it will be noted that so far, three of the letters are the same for all calls, but one letter being changed to make the calls different.

JXAX Kankichi Kusama, Hirano, Mikangecho near Kobe.
JXBX Takesi Sembh, 1-3 Sugamo, Tokyo.
JXXC Noboru Eimura, 1102 Nakanobu Hirazuka, Tokyo.
JXXD Shiro Akuwawa, 25 Tatamechi, Maebashi.
JXXE Hauro Horikita, 957 Shimohibikubo, Ebara, Tokyo.
JXXFX Momoki Sumi, 1401 Shimo-shibuya, Tokyo.
JXXG Toshi Seki, 33 Sakusabe, Tsugamura, Chibaken.
JXXH Hikotaro Takeuchi, 419 Ikebukuro, Tokyo.

There are four other licensed stations in Japan concerning which we have some in-
In September we published this advertisement:

$4 Worth of Book for $1

SOMEBODY got to figuring not long ago and made some interesting discoveries about THE RADIO AMATEUR'S HANDBOOK. They show what we mean when we say the Handbook is the biggest dollar's worth of radio literature ever offered.

This Handbook is not printed in the fashion of an ordinary book. Books are printed in relatively large type, lines clear across the page, space between lines. We found it more convenient to print the Handbook after the fashion of QST—the same size page, the same size type, and the same two columns to the page. The result is that the Handbook has that same often-unrealized quality of QST—it has an astonishing number of words between its covers. It runs three times as many words to the page as an ordinary book. If printed after the ordinary fashion of books, the Handbook would have over 500 pages!


If the Handbook had been produced like an ordinary book it couldn't have been sold for less than $4. Now you know what we mean when we say the Handbook will represent the best dollar you ever spent.

"THE RADIO AMATEUR'S HANDBOOK"
A Manual of Amateur Short-Wave Radiotelegraphic Communication

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

Price $1 Postpaid Anywhere

Published by


—and now the new, revised, 3rd edition, 32 pages larger and up-to-the-minute, is available!
For Organ or Piccolo

From the lowest resounding note of the thundering organ to the highest pitched note of the piccolo, the Sangamo Audio Transformer amplifies every tone and every modulation with uniformity.

Brings the silvery voices of great tenors and the thrilling vibrations of the lowest bass into your home in all their original beauty.

Best results are obtained by using two Sangamo Audio Transformers (one in each stage) but one will improve any audio amplifier. A power tube should be used in the last stage.

Completely shielded. Tested at equivalent of 1,000 volts d. c. between windings and between each winding and case.

3 to 1 ratio Price $10

Sangamo Mica Condensers are accurate and stay accurate.

SANGAMO ELECTRIC CO., Springfield, III.

The truest and clearest AC Electric Radio is a standard set equipped with Balkite Electric "AB" $64.50 and $74.50. Ask your dealer.

SANGAMO AUDIO TRANSFORMERS

For Organ or Piccolo

The truest and clearest AC Electric Radio is a standard set equipped with Balkite Electric "AB" $64.50 and $74.50. Ask your dealer.

Balkite Radio Power Units

76

Say You Saw It in QST—It Identifies You and Helps QST

formation. JKZB is a purely experimental station controlled by Y. Imaoka who is on the research staff of the Tokyo Electric Company. It is located at Kawasaki.

JLZB is the station of T. Kusumoto, 3256 Kakomi, Nakano, Tokyo. We believed this station to be doing amateur work but find out that it is operated by a government agent for the purpose of obtaining information concerning unlawful operation of stations. We believe the same thing to be true of JMPB which is run by T. Kokumai, 1242 Nakameguro, Meguro, Ebara, Tokyo. The same may be true of JLYB, I. Arisaka, 84 Kami-umahikizawa, Komazawa, Ebara, Tokyo although we have no definite information concerning the status of this station.

All the owners of the licensed amateur stations are members of the Japanese Amateur Radio League and all letters for them or other Japanese amateurs may be addressed to the League, 1-3 Sugamo, Tokyo, Japan.

We are showing a view of aj3WW but unfortunately were unable to get any information as to just what all his equipment is. The station is located near Kobe and has done some excellent work.

AUSTRIA

"The Austrian transmitters are still unlicensed but notwithstanding this fact, the number of transmitting amateurs is increasing every day. Many of these are now in every night contact with all continents. The conditions for making contacts being very good just now, especially with the United States, Australia and Brazil.

"The official QSL service is now handling a large number of reports and the ten thousandth card has been received recently. All cards should be sent under cover to Radiowelt, Wien III, Rudengasse 11, Vienna, Austria.

"Many of our stations working on 45, 32 and 22 meters would like to obtain schedules with nu stations. Any nu stations interested in these schedules should write to the above address concerning them. Receiving conditions are improving every day and many nu stations are to be heard with signal strengths varying from R5 to R9. "2XAF is still our favorite short-wave broadcast station and may be received on three valves with loudspeaker strength 'most every night. Very little fading is noticed.'"

—Th. Mossig, eaAC.

BELGIUM

"Although the 40-meter bands get crowded each autumn, it seems to be even more crowded this year than any before. This, in spite of the fact that many of our best stations are working in the 20- and 32-meter bands, is due to a large extent to the many phone stations that have come down to this wave. It seems to be very much more difficult to keep within the amateur laws, two or three phone stations than a hundred key punchers."
EVERY TRANSMITTING AMATEUR USES THESE FORMS

—a reminder that your supply may be low—

A.R.R.L. Log Sheets
Designated by hams for hams. 8½ x 11 bond paper, punched for standard three-ring loose-leaf binder. 125 sheets postpaid for $1.00 or 500 for $3.50.

Members' Correspondence Stationery
Write your radio letters on League letter-heads—it identifies you with the biggest radio organization in the world. Lithographed on 8½ x 11 heavy bond paper. 100 sheets postpaid for 75c or 250 sheets for $1.70. Sold to members only.

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

American Radio Relay League
1711 Park Street Hartford, Conn.
HERE, AT LAST—is a filter condenser that's ALL CONDENSER. No fancy frills or unnecessary trimmings, just your full money's worth of quality all the way through.

If there is one spot in your transmitter where you cannot afford to risk uncertain quality, it is here. The tiniest defect in a $5.00 condenser is $5.00 gone up in smoke and possible damage to more expensive apparatus.

Don't be misled by high ratings and low prices of some condensers. Lincoln quality simply cannot be built at Ford prices. We have absolutely proved our product to be superior in actual tests. They are worthy of your confidence.

FREE COURSE (Continental or Morse)

A New HAMALOG is yours for the asking.

E. F. JOHNSON COMPANY,
Waseca, Minnesota.

Manufacturers of SILVER PLATED Transmitting Inductors, No. 30 Steel-coated Inductors, High Voltage Variable Condensers, and other products.

AUTOMATIC CODE SENDER

The TELEPLEX

Makes It Easy To Learn Code at Home

The only instrument of its kind that can reproduce actual sending of EXPERT Operators.

Cuts Learning Time In Half

The Teleplex provides unlimited practice anytime—anywhere. Sends messages at the rate of 5 to 80 words per minute. Simple, easy and fascinating. Records consist of perforated tapes.

FREE Course (Continental or Morse) one tape sends FIVE times as many words as any other instrument, and 8X is furnished. Tapes cannot be memorized. Last indefinitely. Used by leading Universities, Technical and Telephonic Schools and U. S. Navy. In handphone, leatherette-covered cabinet with carrying handle, with or without key and sounder, or button. Fully guaranteed. Write for literature.

Canadian Representative Wanted

TELEPLEX CO., 76 Cortlandt St., NEW YORK

“Half a dozen are busy working on 5-meter sets and arierials. Some interesting results have already been obtained and our first two-way contact took place in 1925 between Vilvorde and Brussels, a distance of 5 miles. The transmitter used no regular antenna, the coils and wiring in the set doing all the radiating. Later on in the same year, Mr. Mussche, eb4Bj (old ebC2) who is our Technical Manager and who did this first work, made a good contact on a wave of 8.5 meters between Antwerp and Brussels, a distance of 40 miles. A few days ago, the 5-meter signals of eb4bd were heard in Brussels which is 100 miles from him.”

—Paul de Neck, President, Reuse Beige,

The accompanying photo shows a view of eb4FT (ex eb08), the station of G. Neeleman who is the General Traffic Manager of the Reuse Beige. The station is located at 15 rue du Luxembourg, Brussels.

The transmitter employs two German RS5 or two French 150 watt Fotos valves in a Mesny push-pull circuit having the grid circuit tuned. The plate input is between 100 and 150 watts and the potential is 1500 volts which is obtained from an Esco motor-generator set. A fifty-henry choke and two mikes of capacity comprise the filter. A single wire horizontal aerial and counterpoise are used. All continents have been worked. The receiver is of the plug-in coil variety using a capacity control of regeneration. One stage of audio amplification is employed.

HUNGARY

“The so-called ‘Act of Short Waves’ permits amateur transmission under regulations that are quite similar to those in force in England. Probably the best of the legally operated stations is ewh4 who has made many contacts with nu stations.‘We find that a large number of American stations send at a rate that is beyond our ability to copy and we must, therefore, forego the pleasure of working them. It must be remembered that we are just starting in with the handling of the Morse code and have still to obtain our experience. So far, we have had to be content with doing most of our work with other European amateurs.

“By no means all of our transmitters are licensed. There is a large number that are working under cover and every day we receive from sixty to eighty QSL cards for
Faithful Service

The function of a power resistance is to control voltage and current — accurately — permanently — silently.

AEROVOX PYROHMS used with GOOD equipment make a BETTER power unit.

AEROVOX PYROHMS are built to last — are used by more than 20 leading power unit manufacturers. — This is conclusive evidence of their reliability — accuracy — worthiness.

Made in all values of resistance for continuous duty at 20, 40, 100 and 200 watts.

GROSS COILS

GROSS SHORT WAVE LOW LOSS “PLUG-IN” COILS

The coils you will eventually use. Wound with number 16 double silk covered wire with turns spaced the diameter of a turn. It is a recognized fact that the space wound solenoid is the most efficient form of inductance. The distributed capacity is at a minimum and dielectric losses are too low to be measurable.

An extremely thin film of celluloid which only touches the turns at the very bottom, is the binder which serves to make this coil as rugged as if it were wound on a solid form. No impregnating dope of any kind is applied to the winding. The winding is extremely rigid and may be grasped firmly in the hand.

Each of these coils will cover a sufficient range to overlap with the next smaller and larger coil. There is one for each amateur waveband and it can be plugged in and out as easily as a pair of phones.

The base which contains the jacks, also holds the antenna coil on a small swinging arm, which permits all degrees of coupling from zero to 100.

These coils will unquestionably improve the appearance and operation of any short wave receiver.

Price of base with coil for one band, $4.50
Price of coils only: 20 meter band $2.75 40 meter band 2.75 80 meter band 2.75 300 meter band 2.75 600-3000 meters 3.25

GROSS RECEIVER KITS

Composed of high grade material throughout. Good Transmitter Kits, Tuned Grid, Tuned Plate.

Gross Transmitter Kits, Tuned Grid, Tuned Plate.
2 Tube Kit .............................. $15.75
2 Tube Assembled Receiver ......... 18.00
3 Tube Kit .............................. 18.75
3 Tube Assembled Receiver .......... 21.00
Above Receivers or Kits supplied with one plug in coil for 20, 40 or 80 meters, as you select.
Extra coils $2.75 each.

Dealers and Representatives Wanted. Write for discounts.

J. GROSS COMPANY
30 Park Place
New York City

Say You Saw It In QST — It Identifies You and Helps QST
Now That Everybody
Demands Electrically-Operated Radios
Dongan Is in Production
on All Types

Here Is the
Newest
No. 6515 Transformer
for use with 4 UX
226, 1 UX 227, A C
tubes and 3 UX 171
tubes. Together with
a B Eliminator, this
new transformer will
convert old type set
into an efficiently
operating A C set.

$22 List
A B C Power Unit for
UX 226, UX 227, UX 171
and UX 230 tubes.

Order from your dealer
or send check or money
order to factory direct.

Dongan Electric Manufacturing Co.
2999-3001 Franklin St., Detroit, Mich.

QUALITY PRODUCTS

FLECHTHEIM
Superior Condensers
For Amateur Stations

BY-PASS FILTER
BUFFER HIGH TENSION
TRANSMITTING
All Standard Sizes
Accurate capacity rating
Dependable for continuous duty

Write for Catalogue

A. M. FLECHTHEIM & CO., Inc. Dept. QT
138 Liberty St. New York, N. Y.

BECOME A RADIO OPERATOR
See the World. Earn a Good Income
Duties Light and Fascinating.

LEARN IN THE SECOND PORT U.S.A.
Radio Inspector located here. New Orleans supplies oper-
ators for the various Gulf ports. Most logical location in
the U. S. A. to come to for training

Practically 100% of radio operators graduating on the
gulf during the past five years trained by M R. CLEM-
MONS, Supervisor of Instruction. All graduates secure
positions.

Member of the A.R.R.L.—Call "5 G R"
Day and Night Classes—Enroll anytime—Write for cir-
cular.

GULF RADIO SCHOOL
844 Howard Ave.
New Orleans, La.

Gulf Radio School
844 Howard Ave.
New Orleans, La.

Say You Saw It In QST—It Identifies You and Helps QST

Now that everybody demands electrically-operated radios, Dongan is in production on all types. Here is the newest No. 6515 Transformer for use with 4 UX 226, 1 UX 227, A C tubes and 3 UX 171 tubes. Together with a B Eliminator, this new transformer will convert old type set into an efficiently operating A C set.

$22 List
A B C Power Unit for UX 226, UX 227, UX 171 and UX 230 tubes.

Order from your dealer or send check or money order to factory direct.

Dongan Electric Manufacturing Co.
2999-3001 Franklin St., Detroit, Mich.

FLECHTHEIM
Superior Condensers
For Amateur Stations

BY-PASS FILTER
BUFFER HIGH TENSION
TRANSMITTING
All Standard Sizes
Accurate capacity rating
Dependable for continuous duty

Write for Catalogue

A. M. FLECHTHEIM & CO., Inc. Dept. QT
138 Liberty St. New York, N. Y.

BECOME A RADIO OPERATOR
See the World. Earn a Good Income
Duties Light and Fascinating.

LEARN IN THE SECOND PORT U.S.A.
Radio Inspector located here. New Orleans supplies operators for the various Gulf ports. Most logical location in the U. S. A. to come to for training.

Practically 100% of radio operators graduating on the gulf during the past five years trained by M R. CLEM-MONS, Supervisor of Instruction. All graduates secure positions.

Member of the A.R.R.L.—Call "5 G R"
Day and Night Classes—Enroll anytime—Write for cir-
cular.

GULF RADIO SCHOOL
844 Howard Ave.
New Orleans, La.

Gulf Radio School
844 Howard Ave.
New Orleans, La.

Say You Saw It In QST—It Identifies You and Helps QST

The text describes various products and services related to radio operation and equipment. There is also a mention of the Dongan Manufacturing Co., which offers electrically-operated radios and tubes. Additionally, there is an advertisement for the Gulf Radio School, offering training for radio operators.

For South Africa:

We are showing a view of foA4L, the station of Robert Oxenham who used to supply us with our South African news each month.

On the right, mounted to the wall, is the transmitter which employs a Mullard 0/150 tube. Plate supply is obtained from a motor-generator which applies 1400 volts to the tube. The input is usually 100 watts although the tube is rated at 150 watts. The filament is supplied from a storage battery which may help account for the many crystal control reports received.

In the center is the short-wave receiver of the "Reinartz" type covering all the amateur waves down to ten meters. The detector tube is a B. T. H. (for the manufacturer's name, British Thompson-Houston Co., Ltd.) power tube which seems to work best with two volts on the filament and nine volts on the plate. A wavemeter and a broadcast receiver comprise the other equipment on the table.

A4L is a member of the WAC club and has made an enviable reputation not only on the air but as one of QST's most consistent correspondents during that time when he was detailed by the S.A.R.R.L. to keep us informed as to the doings of our South African friends.

As the result of a vote of the I.A.R.U. members in Australia, the Wireless Institute of Australia has been designated as the National Section of the Union in Australia.

Much credit for the successful negotiations resulting in this step is due to the
GET TRUE MUSICAL RECEPTION

TIMMONS Combination Power Amplifier and “B” Supply
List $70.00
(Special $23.50 ea.)

TIMMONS Power Amplifier
List $45.00
(Special $15.50 ea.)

Both of these high quality compact units use a U.X. 216B or 281 tube for rectifying and a U.X. 210 super power audio tube as an amplifier which gives distortionless and true natural reception with wonderful tone quality and volume.

Both instruments are identical in their performance as super power amplifiers. The Combination however is also a complete “B” Eliminator furnishing all the “B” current required by the regular tubes of the set. No adjustments required and no output transformer or similar auxiliary equipment needed with either unit. For use with alternating current 105-120 volts, 50-60 cycles.

Every unit is brand new, packed in original factory sealed carton and fully guaranteed. They have been approved by Popular Radio and Popular Science Laboratories.

AMERICAN SALES CO., 21 Warren St., New York City

Item 37, 2 unit four bearing set, delivering 1000 volts, 600 watts for plate and 12 volts, 300 watts for filament. The “ESCO” Set is shown here furnishing Power Supply for 4—50 watters in a phone or telegraph set. This is the Item used by CB8 in pioneer achievement of the first two way amateur wireless communication between North and South America.

ELECTRIC SPECIALTY COMPANY
Mark “ESCO” Trade
522 South Street
Stamford, Conn., U. S. A.
Manufacturers of Motors, Generators, Motor-Generators
Dynamotors and Rotary Converters, for Radio and Other Purposes
A Resistor
Is Known by
the Company It Keeps

Ask any one of the companies listed below
what they think of Harfield Resistors:
Stromberg-Carlin Telephone Mfg. Co.
Croley Radio Corporation
American Transformer Co.
Feastefy Products Co., Inc.
Martin Copeland Co., Inc.
Pacent Electric Co.
Spifford Electric Co.

They are but a few of the more prominent
companies who have turned to Harfield
Resistors during the past year.

Tell us about the resistor you want
and let us make up a sample for you
with prices. Write to

HARDWICK, FIELD, INC.

SALES DEPT.
100 FIFTH AVE.
NEW YORK

FACTORY
216 EMMETT ST.
NEWARK, N. J.

DODGE RADIO SHORTKUT
With Appendix and Hints for Better Key Work. Fills
Signals in mind to aide—Kills Habituation. Cultivates Speed and
Good Fist—Produces Results. Shows Hams raise speed 62 per cent in 2
per cent in few evenings. Previous Failure equal and
pass exam quickly. Beginners master code and pass in
100 days.

DODGE HIGH SPEED METHOD
(Intensive Speed Practice)
Quickly puts 25 per Hams in 50-40 per class. Five
Hams report made this gain in few evenings. One of
them in 75 minutes total practice only.

DODGE MORSE SHORTKUT
Emotion mastered by Radio Ops—Kills tendency to mixup
or confusion. Either code used as desired.

REPORTS FROM USERS
Tell the complete story—Stated on request. Radio
$3.50. High Speed $2.50. Morse $2.50. Money order.
None C. O. D. Foreign add 50 cents.

C. K. DODGE, MAMARONECK, NEW YORK.

Tasmanian Division of the Wireless Institute
of Australia under the able leadership of P. Oakley Fys, OA7P.
Our congratulations and best wishes for
a long and healthy existence go to this,
our latest, Section.

Here is a summary of what to do about
the International Contest if you live outside
the United States and Canada in order to
take in on the fun and to be in line for
winning a prize as the best contact station in
your locality for “ne”s and “nu”s.

1. This contest will last fourteen days
(Feb. 6, 1928 0000 GCT to Feb. 20, 1928
0000 GCT). For complete details see pages
31, 32, and 33 of December QST—also page
51 of this issue.

2. During the tests work just as many
“nu” and “ne” stations as possible. Each
station worked will give you a short test
message with a special long serial number
which identifies the participant sending
the message. When properly acknowledged
at the time and turned in to International Contest Headquarters as provided in the
Rules of the Contest this counts one in your
score.

3. To each message you get write a reply
whose text and signature together contains
ten or more words. Give each message
the serial number of the message to
which it is a reply. At the first opportunity
give the reply message to a different U.
S. or Canadian station than the one from
which you got that serial number. When
you have complied with all the Rules of the
Contest this counts three in your score.

4. Work as many stations as you canun up a score. You can QSO many stations
during the contest—and probably add
four points to your score for each station
worked after the first one. Turn in confirmations promptly at the close of the
contest (Rule 7).

The U. S. wavebands that may be used are:
12.5-21.4; 37.5-42.8; 75.0-85.7; 150-200.
Canadian amateurs use the same
wavebands and may also be found on 32.5
meters for work with British Dominions.
The U. S. gang now uses 20-meters regular-
ly and foreign amateurs who can use
23 meters will find it to their profit to do
so in these tests to make 100% use of the
24-hours in each day. 30-meters is
again becoming more popular for interna-
tional work in some quarters and opportu-
tunities should not be overlooked.

You should use any wave permitted by
your government’s regulations, choosing
the ones that are going to prove most effec-
tive for your purpose. Take care that the
stations you work are inside one of the
bands mentioned above. Better mark the
limits of the band on your receiver and
keep the wavemeter around. North American
stations working outside their assigned
wavebands will disqualify both themselves
and stations they handle test messages with.

Better get your station ready for the
tests right NOW—in readiness to go after
your share of the prizes. The prizes are
The New AmerTran Push-Pull Power Amplifier

A new completely assembled two-stage unit containing a first stage AmerTran Deluxx followed by AmerTran Input and Output transformers for power tubes. When operated from a power source supplying sufficient voltage, (such as the AmerTran A B C Hi-Power Box) the Input to the speaker is almost perfect, and fidelity of reproduction is limited only by the ability of the speaker. The energy output to the speaker is increased, especially at the lower musical frequencies. This means greater clarity of tone at low or high volume. The amplifier is easily connected to the detector of any good receiver, replacing its audio amplifier.

The AmerTran Push-Pull amplifier is built in several types, depending on the type of power tubes preferred. Type 2 A P-10 is designed for 210 tubes and Type 2 A P-71 for 171 Tubes. The difference is only in the Push-Pull Output transformers. This complete unit is licensed under patents owned or controlled by the Radio Corporation of America.

See this new unit and a demonstration of it at stores displaying the sign “Authorized AmerTran Dealer”. Price $60 without tubes, East of the Rockies.

Fidelity of Reproduction

A New Standard of Quality in Audio Amplification.

Connects to the Detector of Any Good Receiver.

American Transformer Co.
178 Emmet St. Newark, N. J.

"Transformer Builders for Over 26 Years"

---

$21.00

cash with order, f. o. b. Peoria, Illinois. Complete with B. H. Raytheon 125 m. tube. Money back guarantee with every unit. (Formerly $35.)


Guaranteed output—185 volts at 55 m i l s o n 110 V. 60 cycle. Will operate any set with 1 to 12 tubes.
every one of them worth while apparatus that you would like to have in your
station. Just think of it, a chance to win some valuable additional equipment and to have
some good fun at the same time. You will
be adding to the amateur radio prestige of
your country as well as collecting a stack of new records for the shack and making some
new friends.

If you can't receive on 20, 40, and 80
meters you may be handicapped in the tests.
The transmitter should be able to QSY
quickly from one band to another, too, if
your administration permits you to use several bands and if you plan to make best
use of all the operating time at your
disposal. The tests open February six, so
plan to do any rebuilding necessary NOW.

Do your best in the February tests. Let's
have a report of each and every score for
QST however large or small it may be. There
will be more about the prizes in an
early issue and as complete a report after
the test results are in as possible giving
credit to everyone. Luck and 73. Be ready
for action at 0000 GCT February 6 and
don't forget to report promptly at the end of
the tests.

Calls Heard

(Continued from page 53)

(40 meters)

(Continued from page 53)
VITROHM Transmitting Grid Leaks and Rheostats now cover the entire line of transmitting tube circuits. The prices on these amateur products are reduced materially. Your dealer should stock Vitrohm Transmitting Products. If you have difficulty in obtaining them, write us direct.

<table>
<thead>
<tr>
<th>CATALOGUE NUMBER</th>
<th>PRODUCT</th>
<th>RESISTANCE</th>
<th>DISSIPATION</th>
<th>CURRENT</th>
<th>MAX. TUBE RATING</th>
<th>PRICE</th>
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<tr>
<td>507-2</td>
<td>Grid Leak*</td>
<td>5000 ohms</td>
<td>44 watts</td>
<td>90 m.a.</td>
<td>100 watts</td>
<td>$2.00</td>
</tr>
<tr>
<td>507-3</td>
<td>Grid Leak*</td>
<td>5000 ohms</td>
<td>200 watts</td>
<td>200 m.a.</td>
<td>1000 watts</td>
<td>2.80</td>
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<tr>
<td>507-4</td>
<td>Grid Leak†</td>
<td>50,000 ohms</td>
<td>200 watts</td>
<td>60 m.a.</td>
<td>1000 watts</td>
<td>6.50</td>
</tr>
<tr>
<td>507-5</td>
<td>Grid Leak†</td>
<td>20,000 ohms</td>
<td>200 watts</td>
<td>100 m.a.</td>
<td>1000 watts</td>
<td>4.25</td>
</tr>
<tr>
<td>507-51</td>
<td>Grid Leak*</td>
<td>10,000 ohms</td>
<td>200 watts</td>
<td>135 m.a.</td>
<td>1000 watts</td>
<td>4.00</td>
</tr>
<tr>
<td>507-66</td>
<td>Grid Leak**</td>
<td>15,000 ohms</td>
<td>200 watts</td>
<td>120 m.a.</td>
<td>1000 watts</td>
<td>6.00</td>
</tr>
<tr>
<td>507-63</td>
<td>Rheostat†</td>
<td>50 ohms</td>
<td>50 watts</td>
<td>1 amp.</td>
<td></td>
<td>5.50</td>
</tr>
<tr>
<td>507-59</td>
<td>Rheostat†</td>
<td>20 ohms</td>
<td>80 watts</td>
<td>2 amp.</td>
<td></td>
<td>5.50</td>
</tr>
<tr>
<td>507-83</td>
<td>Rheostat††</td>
<td>12.5 ohms</td>
<td>60 watts</td>
<td>2.2 amp.</td>
<td></td>
<td>5.50</td>
</tr>
</tbody>
</table>

* Center-tapped  
† DeForest P or R. C. A. 852 Tube  
De Forest H Tube  
†† Steps at 5M—10M—15M  
‡ For Primary Control  
§ Filament and Primary Control

Ward Leonard Electric Company  
37-41 South Street  
Mount Vernon, N. Y.

HIGH VOLTAGE  
FILTER CONDENSERS  
Manufactured by Dubiller Condenser & Radio Corp.  
1 1/2 mfd. 1000 volts rated D.C. Working Voltage  Extra Special at $1.35 each  
7 mfd. 600 volts, rated D.C. Working Voltage  Extra Special at $3.50 each  
3.9 mfd. 900 volts rated D.C. Working Voltage  Extra Special at $2.70 each  

Manufactured by Stromberg-Carlson Tel. Mfg. Co.  
3 1/2 mfd. 600 volts rated D.C. Working Voltage  Extra Special at $1.75 each  
All of these High Quality Filter Condensers, are brand new, and guaranteed as rated. They are excellent for use in your Transmitter, Eliminator or Experimental Work.

AMERICAN SALES CO.  
21 WARREN ST., N. Y. C.

RADIO SCHOOL  
Send for Catalogue  
MASSACHUSETTS RADIO and TELEGRAPH SCHOOL  
NEW TERM JAN. 3  
18 Boylston St.  
Boston, Mass.

QUARTZ CRYSTALS  
Processed For Maximum Effect  
One inch sections ground to within 1% of your specified frequency:  
75-100 Meters  817.50  
100-200 Meters  10.00  
200-500 Meters  12.00  
Quotations on request for sections of any practicable specifications. Thorough satisfaction guaranteed. Immediate delivery.  
John T. Roney, Consulting Chemist.  
31 Cabinet Bldg., Buffalo, N. Y.

At $6.00 this famous Cabinet has no equal!  
THE BLUE RIDGE  
7x18x10" Mahogany or Walnut Finish  
Southern Toy Co., Inc.  
Manufacturers  
Hickory, N.C.

Say You Saw It In QST—It Identifies You and Helps QST
The NEW CHI-RAD Short Wave Coils
20—40—80 Meter Band

Designed by CHI-RAD engineers to meet the demands for an extremely efficient short wave coil. Complete with mounting, hardware, and three interchanging plug-in covers to cover 20, 40 and 80 meter wave bands. These coils are noteworthy for their convenience in design, neatness in appearance and simplicity in construction. All plugs give positive contact.

Chi-Rad Short Wave Coils Complete for 20, 40 and 80 meter band $10.00
Extra coil for broadcast band $2.00
Details and Set-builders—write for further details and discounts.

Chicago Radio Apparatus Co.
415 South Dearborn St.
Chicago, Ill.

FLECHTHEIM
SUPEROIR CONDENSERS

The new line of FLECHTHEIM condensers are reliable and dependable in every way. We recommend them highly to the amateur and the experimenter.

SPECIAL PRICES FOR QST READERS
T-100 1 MFD-1200 volts D.C. $2.45 net
T-200 2 MFD-1200 volts D.C. $4.40 net
T-400 4 MFD-1200 volts D.C. $7.50 net
We can offer the remaining entire line of FLECHTHEIM CONDENSERS to the amateur trade at list price less 35%.

For further information write for our folder.

UNITED STATES RADIO SALES COMPANY
24 FRONT STREET
NEW YORK CITY

HERCULES AERIAL MAST

$10 and up. We pay the freight. All steel construction. 20 to 100 ft. high. Rod or earth type complete with guy wires. Made and shipped ready for use. Write for full details.
J. M. Hall Co. Dept. 3
2004 E. Fourth St., Cleveland, Ohio

RADIO THEORY AND OPERATING
3rd Edition. Revised Text. Price $2.50
By Mary Texanna Loomis
LOOMIS PUBLISHING CO.
Dept. T-465 9th St., Washington, D. C.

Say You Saw It In QST—It Identifies You and Helps QST
Kenotron Rectifying Tubes
(Type T. B. I.)

MFD. BY GENERAL ELEC. CO

These rectifying tubes operate on a filament voltage from 8 to 10 Volts and draw 1.5 amps. They will safely stand an A.C. input voltage up to 750 Volts and pass plenty of current and voltage for the plate of the Transmitting Tubes. They are also very efficient rectifiers for use in "B" Battery Eliminators.

STANDARD BASE
NEW IN ORIGINAL CARTONS
PRICE ONLY $1.25 Ea.

AMERICAN SALES COMPANY, 21 Warren St., N.Y.C.

Hey, have you ordered your copy of Andy's Handy Handbook?

THE BEST $1 YOU EVER SPENT!

PUBLISHED BY
AMERICAN RADIO RELAY LEAGUE
1711 PARK ST., HARTFORD, CONN.

A. R. R. L. Members -- What about your friends?

You must have a friend or two who ought to be members of our A.R.R.L., but aren't. Will you give us their names, so that we may write to them and tell them about the League and bring them in with the rest of us? The A.R.R.L. needs every eligible radio enthusiast within its ranks, and you will be doing your part to help bring this about by recommending some friends to us. Many thanks.

American Radio Relay League, Hartford, Conn.

I wish to propose

Mr. of

Mr. of

Street & No. Place State

for membership in the A.R.R.L. I believe they would make good members. Please tell them the story.
Seventh Edition Just Off the Press

ROBISON'S MANUAL OF RADIO TELEGRAPHY AND TELEPHONY

Completely Revised and Up-to-Date

Of the 6th edition of this book reviewed by QST it was said this is perhaps

"The Best Radio Book That Ever Came To This Desk"


Price $5.50 postpaid (former edition sold for $8.00)
Address: Secretary-Treasurer, U. S. Naval Institute, Annapolis, Md., U. S. A.

Get the ADVANCE "Sync" RECTIFIER

Get this improved "Sync" Rectifier. Superiority proven by its prevailing use in international transmitting. Lower in price in spite of higher quality. The Advance Sync Rectifier meets all requirements for heaviest duty. Improves all transmission--giving clearer tone and better volume. Can be easily and quickly filtered. Speedy starting. Requires no attention—always ready. With 1/4 H.P. Westinghouse motor. $2.00 complete.

Get the best. Write now for free descriptive folder.
ADVANCE ELECTRIC COMPANY
1260-1262 West Second St., Los Angeles, Calif.

To Our Readers Who Are Not A. R. R. L. Members

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

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

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

............................................................1928

Station call, if any ......................................
Grade Operator's license, if any ........................
Radio Clubs of which a member ........................
Do you know a friend who is also interested in Amateur Radio, whose name you might give us so we may send him a sample copy of QST? .........................

............................................................ Thanks!

Say You Saw It In QST—It Identifies You and Helps QST
Don’t Forget

That the A.R.R.L. Emblem is the badge of every real Amateur.

It is available in various sizes for button, pin, auto or radio-mast.

“That ham may recognize ham —display the A.R.R.L. Emblem.”

American Radio Relay League, Hartford, Conn.
HAM-ADS

NOTICE

Effective with the July issue of QST the policy of the "Ham Ad" Department was altered to conform more closely to what it was originally intended that this department should be. It will be conducted strictly as a service to the members of the American Radio Relay League. Advertisements should be submitted under the following conditions:

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

2. The signature of the advertiser must be the same as the individual member or his officially assigned call.

3. Only one advertisement from an individual can be accepted in any issue of QST, and the advertisement must not exceed 100 words.

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

5. No display of any character will be accepted, nor can any irregular arrangement, such as all or part capital letters, be used which would tend to make the advertisement stand out from the rest of the text.

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

CLOSING DATE: The 25th of second month preceding publication.

THE life blood of your set—plate power. Powerful, permanent...dries, bleeds, cures. B, B eliminators. Trouble-free, rugged, abuse proof, that's an Edison Steel-Alkaline Storage, B-battery. Upset electrically welded pure nickel connectors insure absolute quiet. Lithium-Potassium solution (that's no lie). Complete, knock-down kits, parts, chargers. Glass tubes, shock-proof juts, poppy elements, pure nickel, anything you need. No. 12 solid copper ensamed permanently perfect aseal wire $1.00, 100 ft. Steel crystal lamination for that transformer, full price list. Frank Murphy, Radio 8ML, 4837 Rockwood Rd., Cleveland, Ohio.

SALE—25 watt transmitter, phone and CW. Also parts. GE Dynamotor 24/1500, $10.00. One h.p., $2 volt SC $25.00. Selling on account of sickness. Wm. Hanover, Jr., Niles, Michigan.

FELLOWS we have obtained more wonderful bargains, just take a look at 'em, Navy V714 5 watts, new and in original boxes $1.50 each O-10 AC filament voltmeters, fluid mount $2.25, Q to 0-400 fluid mount milliammeters $1.50, state range wanted. 0-500 DC voltmeters $4.50. Amplifying transformers 5-1, $1.10. Western Electric 500 volt 2 MFD condensers $1.00, 50 Henry 150 milliampere chokes $2.50. Cardwell .0035 condensers $1.00. Pyrex sockets 50c. Federal 2200 Ohm phones $2.50. Large Neon tubes $1.00. Plug-in coils 15 to 200 meters $1.25. Orders sent C. O. D. Please include postage. E. P. Hufnagel 879 So. 18th Street, Newark, N. J.

NEW Bradley radiocat, price $3.00. John Brabson, Greenwood, Conn.

NEAT, accurately calibrated wattmeters in hardwood cabinet, with genuine Bakelite panel and Marco Vernier Dial. Coils wound on grooved Bakelite forms—$7.25 each. 3½" heavy copper tuning inductance. 4½" diameter—12¢ per turn 3¢. 8c. Milliammeters, O-100, $1.90; O-300, $2.75. Pure aluminum, lead, pair, complete, 2½" x 2½", 1½" x 1½". Extra heats, 15¢ each. Send for free catalog. William Harrison, 35 Ft. Washington Ave., N. Y. C.

ROTARY spark gaps. Motor 110-60 cycle. 1500 volt 1 kw .002 mf condenser preferred 1500 volt. Any experimental electrical equipment you may have you must be in good condition. Joseph D. Brown, 2 Colorado St., Ashtabula, Ohio.


HIGH grade chokes with adjustable core to vary from 30 to 100 Henry. 150 M.A. capacity, 6000 turns and 38 watt loss. Less than 1% loss of efficiency in continuous operation, 0.75. Transformers—100 watt 825-255 and 71½ volts $7.25. 50 watt 275-275 and 5 volts $4.10. Low voltage wound 825-825 OHM chokes—100 M. A. $3.00. 50 OHM chokes—100 M. A. $3.00. 30 OHM chokes—60 M. A. $2.25. "RH" Raytheon kit $16.75. 2¾x Silicon steel cores $1.50. Write for list of meters, chokes etc. M. Leitch, South Park Drive, West Orange, N. J.

LICENSED amateurs only—Aero Short Wave Kit—$5.18. 560.18 Aero 7 Kit—$58.18. $146.34 Tyron Turner Kit—$78.81. $25.00 Browning-Drake Kit—$16.35. $10.00 Enesco 36" Cone Kit—$6.18. $31.00 Modern B. Eliminator, with Raytheon 1922. $23.00. Cardwell transmitting items—15¢, AmerTran, Jewell (transmitting meters—25%), Thordarson, Benjamin, Samson—35%. On Manson, D.C., K. Barcat,70 Mar- marund, Kodel, Silver-Marshall, Abox, Yalex, Bodine, Ceco Raytheo—40%. Postpaid. Our weekly data sheets give more "QST" than all 60 magazines combined. Twenty weeks—$1.00, 26 weeks—$2.50. Over two pounds, catalog, data, circuits, prepaid—25¢. Fred Luther Kline, Kent, Ohio. (Established 1920.)

FOR sale—OmniGraph, 15 diads, heavy key, buzz, buzzer. On one bce. I. J. Story, Wessington Springs, S. D.

FOR SALE, half price or less: Remler Capacity Units, 0-6600, $2. ca. Fada Detector Stand and extra crystals, 50¢. Weing and many other useful items of QST, and the advertisement must exceed 100 words.

No display of any character will be accepted, nor can any irregular arrangement, such as all or part capital letters, be used which would tend to make the advertisement stand out from the rest of the text. No display of any character will be accepted, nor can any irregular arrangement, such as all or part capital letters, be used which would tend to make the advertisement stand out from the rest of the text.


OMNIGRAPHs, vibroplexes, "S" tubes, teleplexes metroimeters, perfectoforms, transmitters, receivers, chokes, meters, transformers, 50 watt transmitter generators, portable superfaderies. Bought, sold, exchanged. L. J. Ryan, 90NS, Hannibal, Missouri.


NEW—two 204s used but O. K. mountings. Priced right. Want 80 and 350 meter crystals. Fowler E. Macy, Versailles, Indiana.

BARGAIN—600 volt 260 mill. 110 volt Emerson MG, $40. John Williams, Winfield, La.

2. 0 OMNIGRAPH with buzzer on base. Set 15 beginners dials and set 15 regular dials. $15. paid. Also late Browning-Drake broadcast model with power transformer finished military case. A-4 Type V-2 amplifier with two 99s two 85s one 20a one 6 power tubes thirty dollars. Gilbert Meyers, Andover 4, Harvard, Cambridge, Mass.

I am not selling out, but I have a lot of stuff I don't need and want to sell. Write for list. 500, Box 205, Montgomery, Ala.

FOR sale or trade. Complete new mercury are rectifier oil cooled with keep-alive transformer and reater.

FOR SALE COMPLETE transmitter or parts separately. Omni-graph, wavemeter, etc. Write for list. 8DNX, 3255 Blackstone Dr., Toledo, Ohio.

FOR sale or trade for transmitter parts, one 7A Western Electric amplifier, fifteen dollars. G. N. Karmans, Sears, Greaves, Texas.

Say You Saw It In QST—It Identifies You and Helps QST

91
BARGAINS—W.E.212-D 250 watt tube new $50; W.E. 7-A amplifier with tubes $15; UV 303A new $20; R.C.A. UP 1016 power transformer $16. Acme Plate transformer 150; 300 watt transformer $2. Jewell 0-5 amps antenna meter $5; UP 414 modulation transformer $2; Two Karas orthometric receiving condenser sets. 12 inch heavy duty $10. One UT1187 Magnetic modulator $2; Receiving condensors of all types and capacities, state kind wanted; White 9 volt b11a tube socket black block. J. C. Gill, 1282 Gill Ave, Galion, Ohio: 8 B C A.

FOR sale: Almost New Westinghouse M.G. set 1000 v. 250 watts 110 volt a.o. drive $75.00. New 7½ watt tubes $1.00 pair. New 250 watt transformer $65 each side. $20.00 for entire wind list. Harry Wiedeman, 6407 Central Ave, Tampa, Fla.

FOR sale—Aero two tube short wave receiver—15-100 meters. Karas condensers, Marco dials, UV1212 transformer. Write Andrew Bohn, 109½ Lincoln Ave, West, Fergus Falls, Minnesota.

ONE-HALE and one KW Navy Transmitters; ¼ KW portable field type; 64 feet sectional poles; small one cylinder ¼ KW 500 cycle power outfits; also four cylinder models with AC and DC outputs; ½ to 5 KW motor generators; ½ KW 500 cycle transformers easily tapped $12.50. Westinghouse 27.5-500, 1200 cycle transformers $18, 6-400 volt model $15.00. SE 1012 receivers unused minus condensors $20.00. Wavesmeters direct reading calibraion no cal. $5. Photographs of our Navy Material. Henry Kienzle, 501 12-850 volt. 143 ampere dynamotors $18. 6-400 volt model 110 volt single phase motor $65.00. 2500 volts 2 kw. Generators $200. Want used Portable typewriter, stock forms, all different. Write for prices and samples. SELL, Kennedy Universal receiver, nearly new, fifty dollars. A.T. apparatus, $6 John Longley, Courier Ave., Manhew, N. J.

POSTPAID and guaranteed brand new, B.E.L. makes—Transmitting Inductances, Type L, double unit with glass coupling rods and clips, $8.95; 50 watt sockets, $1.95; "P" Transmitting Inductances 100, 150, 200, 250 watts, 10 to 11 meters, $3.75. General Radio Waveformers, Type S, 14 to 224 meters, $19.25. Write for complete list. G. F. Hall, 585 West Hoster St., Philadelphia, Pa.


WANTED—Radio Corporation transformer UP1016, S. A.

TWO new W.E. fifty watters, $24.00 each. Few peanut tubes $2.00 each. 2BX7, Levy, 2050 6th Street, Brooklyn, N. Y.

ARE you tired of concerns who subcontract your work and then refuse to stand behind it? Take a look at our new listing. We advertised this issue. They'll stand up where others fail. Order DeForest transmitting and receiving tubes from us ship quickly. Latest Amateur Call Book 75c. No. 20 Stand-off Insulator, $2—use it for supporting wiring and instruments, etc. Get details of our Silver Plated Short Wave Inductances. E. F. Johnson, SALD, Waseca, Minnesota.

HEADQUARTERS for Hams—Immediate deliveries on Mueller 150-watt input tubes $15.00. RCA 5-watters $8.50. General Waveformers $10.00. Tung-Sol 500 cycle condensers $10.00, 500 volt condenser $18.75. Any type, any price. First quality, first delivery. New "Ham-list" 4c. Robert Curtis, 1109 Eighth Avenue, Fort Worth, Texas.

CURTIS-Griffith 250-watt power-filament transformers 350-550 each side $10.50. Thoradora power-filament transformers for 7.5-watters $6.50. Thoradora power transformers (275 volts 1500 amp.), $660.00 side $16.00. Edgewood Inductance 6-inch turn 12e; 4-inch 10e; 2½-inch 7c. Aluminum square foot 35c. Lead slugs $1.25. Edgewood Inductance C3 4-inch $1.00. Complete line of transmitting tubes and filtering condensers. Posts to address. S. E. & P. E. Arcane, W. H. Griffin. 1717 Main Ave, Fort Worth, Texas. QSL cards, two colors, government post cards, $1.90 per hundred. White cards, $1 per hundred. $1.40 per hundred sheets and envelopes, pad form. Postage 10c. Free samples, SDT, 207 Parker Ave, Mount Vernon, N. Y.

Q S B ?—$8.00 list Dudlow wound chokes. 50 henry, 150 milliamperes only $2.95. Fleenham filter condensers. 1000 v. 2 mf. $2.25; 1000 v. 4 mf. $4.50; 2000 v. 2 mf. $4.25; 2000 v. 4 mf. $6.50; Corwico No. 12 enamelled wire, $0.10 100 ft.; Pyrex insulators, 3½" $0.43, 7½" $1.50, 12½" $2.99; USL S. L. F. condensers .00035, single $1.25, double tandem $2.50; CP, aluminum $1.60 ft. Metal grids. Tube and plate leads at opposite ends, $0.95. All sizes unmounted honeycomb coils. Low prices, write for our new "Filter Base List" and add some new items if desired. Shipments made same day. Send your name for our bargain list. D. L. Moon, 3844 Boulevard, Jersey City, N. J.

R. A. M. S. HAMS: Here are some of our holiday specials. Power Transformers, Guaranteed No. 25, single phase, $15.00, 600 cycle, 2 kw, 120-120 volt, $20.00. Slightly used 500 cycle generators, $15.00. Red ham stationary "Ham-list" generators 600 and 8 volts $18. 6 volt input dynamotors output 400 volts 15. Slightly used 800 cycle generators $1,000. 1½ kw 1020 volt, $20.00. 900 cycle dynamotors 16 volts drive 15. 120 volt dc drive 500 cycle new motor-generators ½ kw and 1 kw $25.00 each. All new, $12.50. Electrode 75 watt grid leaks 10,000 ohm $1.75. Complete line of transmitting and receiving apparatus, at lowest prices. Many exceptional bargains. Send for list. Articles sent COD if not received in 10 days. Several home used items: 2AW4, 2AW7, 1128 Springfield Ave., Irvington, N. J.

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QSL cards—150, two colors, $1.20; 150 government cards, $2.50; Ham stationary, radiogram blanks, etc. H. M. F. Lee, Manchester, Penn.

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ACCU precise millimeters, 0-100, $2.00, 0-300, $3.00, 0-400, $3.25. Motor generators, 500 volt, 160 watt. RCA UWX01-A, $1.19, UWX10a, $6.90, UWX20a, $1.19, UWX30a, $3.95. Power, filament transformers, Silver Marshall for UWX10a, $2.25 for UWX20a, $9.00. Power coils 30 henrys, 100 milliamperes $2.50, 300, 150 milliamperes, $4.75. Imported 30 watters, $1.49, Fifties, $9.00. Grid leaks for fifties, $1.34. Rectifier elements, aluminum lead, pair, 1”x4”, 5c, 1”x6”, 10c. Calibrated wavemeters, 17-160M, $5.00. QSL cards, $1.00 per 100, two colors. Free samples, rack catalogue free. William Green, 207 Cathedral Parkway, New York City.

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FOR sale—1 G.E. 750 watt 1000 volt transmitting tube. 2 RCA 250 watt transmitting tube. 2 W. E. 305 D tubes also sockets. 2 Thordarson microphone transformers, 1-1/2 volt A.C. Jewell voltmeter, 1 two button W.E. microphone, $200.00 list. 3 RCA 250 watt tubes with grid leads broken suitable for rectifiers. Miscellaneous unmached coils. Will sell all or part. Name your price. W. P. Brink, 1442 E. Park Place, Ann Arbor, Michigan.

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DODGE Radio Shortcut. See display section page 82 C. K. Dodee, Mamaroneck, N. Y.

Q R A SECTION

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BHR—M. C. McCarroll, 32 Laurel Ave., Wellesley Hills, Mass.

WY—Miles Weeks, 40 Norfolk Road, Brockline, Mass.

BLS—Michael Kaplan, 5450 77th Street, Long Island, New York.

MRL—Edward N. Dingler, Jr., 3718 Livingston St., N. W., Washington, D. C.

LDI—John Anderson Brandson, Westerly, Greeneville, Tenn.

AEK—V. H. Thurmond, Gray County State Bank, Paris, Texas, 75460.

GND—San Francisco Radio Club, 454 Right St., San Francisco, Calif.

SAD—Adanti, 33 Sheridan St., Auburn, N. Y.

SWK—K. Kelvin Kearney, 15880 Other Drive, Detroit, Michigan.

SCP—H. L. Durlinger, 502 Caroline St., Peoria, Illinois.

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<th>Price</th>
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</thead>
<tbody>
<tr>
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<td>$15.00</td>
</tr>
<tr>
<td>75-90 Meter band</td>
<td>$15.00</td>
</tr>
<tr>
<td>35-45-45 Meter band</td>
<td>$49.00</td>
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We will state the frequency of the crystal accurate to better than a tenth of one per cent. All crystals guaranteed.

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Kit contains 2 AERO Coils, 17 to 50 meters each, 1 AERO Antenna Coil Mounting Base, 1 AERO Grid Coil Mounting Base, 2 AERO Essential Choke Coils.

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KEY 9018 KIT
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Completely interchangeable with either of above kits. Range 90 to 180 meters. Contains 2 coils and mounting base.

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And in the Amateur field Burgess Batteries stand out like a beacon light. From the days when the "Ham" game was all there was to radio right up to the present—Burgess has been a name to conjure with.

The four Burgess Plants:
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Freeport, Illinois
Niagara Falls, Ontario
Winnipeg, Manitoba
Amateur Radio Work in New England Flood

By Davis S. Boyden+ and Robert D. Russell†

THE breaking down of all lines of communication between the New England flood areas and the rest of the country has again brought vividly before the people the great emergency service of which the radio amateurs of the nation are capable.

While scattered reports on the morning of November 4 told of devastation unheard of in New England, operators at the First Class Station, Boston, did their best to establish communication of any kind with the stricken territory in Vermont.

Once again rose our great brotherhood of the other, to reassure the people of this country, and of other countries, that they were ready then, as always, to give their all, for the common good. Almost immediately the Army and Navy called upon their reserves enrolled in this great multitude of radio amateurs to handle messages.

When the call came and the wires were down it was found that the amateur units were not only ready to try to establish communication—they were already in communication with points in the devastated area.

Few persons outside the stricken area realize how heavy the rain preceding the disaster was. It has been estimated that about seven billion tons of water fell in the drainage area of the Connecticut River alone, and this on top of one of the wettest Octobers the river valley has ever known. Then the usual downstream trend of the water was given in the report of the New England Weather Bureau.

"The disturbance developed over the Virginias and Carolinas Wednesday night, November 2, 1927 which emerged into a tropical storm moving generally north from Ohio. In the succeeding 24 hours it increased in energy and moved northward from Hatteras to Western New England. The central part of this storm crossed northward over western Connecticut and Massachusetts early Friday morning with the barometer 29.08 at Concord, N. H. and Quebec where it merged with another continental disturbance from the Lake region. High pressure over the maritime areas obstructed the passage of this disturbance, and forced it northward. The movement of the storm brought in large quantities of warm, moist air from the Atlantic Ocean, which was followed by the cooler air from the West, causing the torrential rain which followed. The rainfall has been officially reported from western Massachusetts in amounts as high as seven inches. High winds were general along the coast from Hatteras to Eastport, Maine, with highest velocity of 52 miles per hour at Portland, Me. The most intense rainfall occurred in central Vermont, central and southern New Hampshire, and western Massachusetts and Connecticut.

The flood conditions produced by the storm completely crippled communications, transportation and power service. The story of the loss of lives and property has been told by the press. It was the amateur radio operator and his station in this great emergency who provided the only rapid means of communication between the stricken area and the outside world. With practically no warning these operators were called upon to provide the necessary communications. The traffic occasioned by the flood undoubtedly would have exceeded the capacity of the normal communication systems.

The manner in which these amateurs tackled the herculean task is worthy of much praise. Some stations were put completely out of commission and many of those intact were without suitable power to operate their transmitters; but almost everyone was turned to operation on the forty meter band, others in the 80 meter band. While 40 meters was necessary for operation during daylight hours, it was virtually useless for local work because of the low drinking. On the other hand 80 meters during daylight hours was not satisfactory while at night it was absolutely necessary. The order of reconversion of these transmitters and antenna systems to successfully meet the immediate demand is a tribute to the ability and ingenuity of the amateur. Once again on the air they were confronted with a huge amount of traffic of the most important character, relief, assistance, railroad, press, personal assurances, etc. Exactness and dispatch were essential. It is astonishing the number of hours of continuous operation by many stations during the interruption of commercial communications which covered periods ranging from three to ten days.

Many exciting and perilous situations were encountered by the amateurs located in the affected areas. In Montpelier, Vermont, 1-BBJ Thursday, November 3 about 3 P.M., realizing the gravity of the situation left the Machine Works where employed, for home in his Chevrolet. The water had risen to such depths in the street that he was unable to proceed, so turned back and parked car in a high ground and attempted to walk. He had gone but a short distance when due to the depth and violent flow he was obliged to take refuge in a nearby house. Here he was marooned until the gray of dawn on the morning of the 4th when he left the house from the second story window and by boat landed on high ground. Now to get on the air as quickly and efficiently as possible. There were two active amateur stations in the city 1-BBJ and 1-BEB. They got together and decided that the latter's station

+1st. Lieut. Sig. Res. Radio Advisor on Amateur Matters to the First Corps Area Signal Officer, nuSL.
†Lieutenant (jg), USNR. Volunteer Communication Officer, First Naval District.

If interested in participating in the Army Amateur Net being formed in various parts of the country, send your application for appointment as Army Amateur Radio Station to A.R.R.L. Headquarters and it will be forwarded to the attention of the proper Corps Area Signal Officer via the Army Amateur Representative (or Radio Advisor) of that Corps Area. It is not necessary to enroll in the Signal Corps to get the Army Amateur activities. A QSL-card will put you in line for A.R.R.S. appointment if you have the interest and are qualified.

Address your request for information concerning or enrollment in the U.S.N.R. to Communication Division, Office of Naval Operations, Washington, D. C. Your District Commander will then be asked to get in touch with you. As soon as you are enrolled properly you can take part in the radio drills.

Q S T F O R J A N U A R Y , 1 9 2 8

P. E. Handy, Communications Manager
1711 Park St., Hartford, Conn.
being nearer the greatest number of broadcast receivers, upon which they depended for A and B battery supply, should be the first station to get going and at about 4 P.M. 1-BBB was on the air and in contact with S-BTO at Binghamton, New York. 1-BBB then turned to his own station and with the cooperation of the Electric Power Company succeeded in restoring power service to his transmitters telephoned the message to my wife so that she received it about the time my train was due. I am writing this letter to let you know of what great value the amateur operators were to me and the others whose messages he got through.

The principal stations operating and the amount of flood traffic handled may be indicated approximately by listing figures compiled from replies received in answer to a letter written to stations in Stations in New England supplemented by personal requests to other active amateur stations in the affected areas. The Radio Advisor replies hereon is not a complete report and that some unreported stations undoubtedly did creditable work. Comments of a personal and additional information will be appreciated so that the final report may be as complete as possible.


Messages received at this station were delivered by Roy Scovil. Messages to nearby towns were routed to the First Relief Expedition after receipt of same. Left to right: Ralph J. Harris of 1BB, Montpelier; 1BBI, George Wallstrom; H. B. Jones, who was a radio up during the war. His father, H. J. J. Jones, was Acting Post and Field Administrator, Montpelier, during the flood emergency. Although Mr. Jones had been out of the brass-pounding game for some time, he was of great assistance to the local amateurs.

Extracts of a letter to the A.R.R.L. from Col. Earl D. Church of The Travelers Insurance Co. go further to show this and are included in this story with his permission.

"My first contact with your League was an unusual one. I was marooned in Barre, Vermont, arriving there November 1. All telegraph and telephone wires were down, railroad tracks were washed away, bridges in every direction were gone, and so far as communication with the outside world was concerned, we might just as well have been isolated on a small island in the middle of the Atlantic.

"It was due home the next night at seven o’clock and feared the consequences if my wife got no word from me and did learn of the distressing and dangerous situation I might say some dozen or fifty of us were in the same fix in the Barre hotel, and every half hour alternated in making trips to the telegraph and telephone offices. On inquiry, I learned that there was an amateur radio operator there by the name of G. E. Cruckshank, 188 South Main Street, Barre, Vermont, operating under the call letters of 1BDX. This boy was one of three caught the afternoon before in a cellar when a wall gave way and completely flooded it, and barely escaped with his life, the other two being drowned and it being impossible to get their bodies for two days afterward. He had been working steadily for nearly two days, notwithstanding which he not only willingly offered to try and get a message to Hartford for me but also went to the hotel and pleaded up fifteen or twenty more messages of people who were in the same position as myself. He worked all Friday afternoon trying to get these messages through.

"He reached someone in Providence, who in turn
1AHV, 1IN to 1APK, 1ES to 1AW. Message delivery was by messenger, telephone and telegraph. Many were relayed by radio—some being given to WBZ, WBB2, and WEF for broadcasting. In the emergency situation to get word collected but two were undelivered for lack of correct address. 1SL between schedules raised several stations causing QRM on important channels and directed traffic to QSY. Many other stations not in communication with stations in the flooded districts assisted in delivering important messages by radio. 1BBJ, 1BDX etc. Stations approached in this connection showed readiness to cooperate and fine amateur spirit in promptly and gladly complying with the request to QSY.

In reporting the flood communication work from U.S. N.R. standpoint Lt. Russell writes as follows:

"At the time of this crisis the master control station, NTRA, was temporarily disabled, necessitating aid from two section commanders, Ensign John M. Wells and Frederick Best, both of the Volunteer Reserve.

"About 2:30 on the afternoon of November 6th, Wells received a telegram from the District Communication officer requesting him to relay a Red Cross message to Montpelier. At that moment neither the transmitter or receiver at 1-ZD was in commis- sion. However, 1-ABJ, the operator, and one other schedule was arranged for 5 p.m. When that hour came round, 1-ZD and 1-AKX were again in communication, and the latter station reported success in delivering the message by the emergency service which had just been opened, then transmitted the answer for the DCO by long distance, receiving another message in return. 1ARK successfully delivered this message also, reporting back on the 7 p.m. schedule.

"While this was going on, 1-BIG, roaring forth with a splendid record during the early part of the Vermont flood of any message for 1-BBD, and at one time there were seven calling that station advising him of the rush message at 1-BGI. 1-ACH, whose reliable work is worthy of considerable mention, in holding up 1-BBD long enough so that he (1-ACH) could relay the message successfully. That ended the eventful career of that message as far as we are concerned.

"Both 1-UE and 1-ACh did excellent work in cooperating with the Naval Reserve stations. Because of his proximity to Boston and also on account of his splendid performance in early part of the Vermont disaster, 1-ACH was assisted by Navy personnel at his station who kept the telephone hot with messages to Boston.

"It is not likely that the next emergency will be in New England. Emergency service is one of the primary functions of the Army Amateur Radio System. At all times in the United States, to towns in the United States, together with the county in which each is located.

QST FOR JANUARY, 1928
DANGER! Take Heed!

Once again it becomes evident that some of us are riding for trouble. The unfortunate thing about it is that certain individuals are riding for trouble, for personally, they may bring the whole amateur fraternity in for a share of the unpleasantness and disrepute which are the counterpart of the disruption of a situation. They bring on a crop of trouble. While the circuit breakers haven't actually tripped out yet, the symptoms of high heat and intermediate failure indicate that trouble ahead unless some of us do some much needed tuning and readjusting of transmitters promptly on receipt of this letter.

No doubt, dear reader, you have a most excellent reputation in your local community based on character and everyday performance. How would you feel if someone very close to you ran amuck and through pilfering and violence brought your name into disrepute? That's the way all good A.R.R.L. members must feel about the few rough-shod amateurs who persistently operate off-wave or adopt a defiant careless attitude concerning any B.C.L. or QRM they may cause.

Let's change the scene and consider further. What if you either intentionally or unintentionally broke some law which brought disgrace and undeserved punishment to your family and friends as well as yourself? It is not nice to contemplate your feelings under these circumstances is it? The worst of it is that you and I may actually be in a position similar to this one and not know about it.

Trouble is brewing on two counts. Here are the facts in brief. (1) Complaints against more than thirty different U. S. amateur stations guilty of causing severe interference and interruptions in handling Naval traffic have been filed with the A.R.R.L. by the District Naval Communications in just a few weeks. Literally hundreds of reports have been observed off-wave in the government point-to-point Public Service band, 8900 to 9650 kc. (37.48 to 37.66 meters). (2) The Federal Radio Commission refer to the B.C.L. complaints of amateur radio station interference as numbering up in the hundreds. Literally dozens of complaints roll in to the Commission daily right at a time when the Commission is trying to do its utmost for the listening public in improving the conditions for clear broadcast reception. The view that if the transmitting circuit complies with the general tenor of the license it is the listener's hard luck is coming to be shared but feebly by the Commission. Clicks of amateur QRM are increasing at a terrifying rate. The situation is again very serious. We are in danger unless we can show immediate improvement.

It all means that it's time to take account of ourselves, time to heed the handwriting on the wall, time to cooperate by becoming a trouble-shooter for our own stations and opening our eyes and ears. Public opinion is a powerful friend and also an equally powerful enemy. The prestige and goodwill gained for the amateur when he renders a valuable and spectacular help in emergencies may be slowly undermined by the constant little irritations of ordinary interference. Thus both situations we have pointed out can be cleared up at once. It is almost certain that a drastic policy of license suspensions and cancellations must be invoked against offenders. Attention may be called to the fact that the Radio Act of 1927 provides still heavier penalties for malicious interference. Quiet hours have been invoked "whenever interference exists." From now on it would not be surprising to see the Federal Radio Commission issue regulations to read "six P.M. until midnight" instead of 8:00 PM until 10:30 PM as at present. Ignorance of the situation is not taken into account by courts of law. There is no excuse for law-breaking that gets by. Neither is there the break-down in regulation that would have such a comment a year ago—unless, of course, the Federal Radio Commission is the authority in this country—an unquestioned authority responsible for set up suitable regulations and see that they are enforced in time of interest, or necessity requires.

The picture of what threatens is not at all pleasant to look at you will agree.

In an indirect fashion we have been conscious of a situation that was becoming increasingly difficult at this desk. Some amateurs have written for help in clearing up key clicks. More frequently one will come from the amateur just after the Radio Supervisor shut down his station or made it observe quiet hours. The OM now wants to know what he can do to fix his set so the trouble will be eliminated and so he can get the restriction removed. We have had no idea that things were so bad and departments in Washington told us the same story. To local cases, one involving key-clicks and the other involving non-selective B.C.L. disregarded locality were also called to our attention by the local Broadcast Listeners' Association and that brought the situation home to us with a vengeance.

Perhaps some of the blame for the trouble may be given the set manufacturers. Many of them are not too careful to assure the receiving sets have an antenna connection directly to the grid or grid coil of the first r. f. tube or in some cases the detector line. This could just as well have a loosely coupled magnetic pickup from the antenna. The quantity production saving of a few cents dictates that a close coupled auto-transformer arrangement shall be used despite the fact that such an arrangement is much more sensitive to power leaks, static, key thumps etc. Super-hets with high plate voltage on the oscillator get into trouble readily when the oscillator harmonics beat with our short wave signals. Too-long antennas make other good qualities of the set ineffective. Then non-selective sets must be faced just as it stands, however. Fixing the blame does very little good. There are two sides to almost every argument. Sometimes key clicks from the amateur station are a factor in ruin reception for a whole community. In other cases the receiving set is a power line which supplies a ham transmitter together with a wide ranging urban B.C.L.'s causes high frequency energy to practically blanket reception in a given neighborhood through induction or conduction to the several installations.

The worst of it is that the last person Mr. Average B.C.L. wants to complain to is you and I. Human nature doesn't work that way. Friend R.C.L. may call on the local radio store from which he bought his set, he may call on the local newspaper, magazines, radio service men, broadcasting stations, light and power companies, telephone companies, police department, municipal officials and so on down the list. He seeks to locate the authority to "have this stopped." He wants to know that rights he has and what rights the amateur station owner has but first of all he wants the trouble stopped regardless of whether he owns a blooeping single circuit, a hunk of galena, or a really good neuromy of the common five-tube variety. If familiar with radio matters, friend B.C.L. may call write A.R.R.L. Headquarters or the proper Department of Commerce official (Radio Division). We get many such letters. More likely some letters may reach members of the U. S. Senate and House of Representatives. From all that he will write the Federal Radio Commission, known to him through numerous press releases. The Commission's public think is to improve conditions in broadcast reception. The pressure of public opinion brought to bear on the Commission is bound to re-
suit in special attention being given this subject. If amateurs continue to cause interference complaints to reach the Commission (which prove in most cases to be the fault of the amateur in question, in interference cases) we have not the slightest doubt as to the final outcome. Regulations that clamp on the lid will be impartially issued to govern those who have the temerity to interfere

Our first duty to ourselves is to stop these complaints to the Federal Radio Commission from dictating that carrier frequency transmissions on the part of amateur bands so that interference with Naval traffic handling stations cannot occur and so that an official channel can be designated. The Federal Radio Commission will not be necessary. Carelessness on the part of many, and wilful law-breaking on the part of a few may make it possible for low-powered stations to jeopardize the enjoyment of all amateurs. Individually we must accept responsibility in clearing up only interference caused by our own stations but also in seeing to it that interference is not the same with their local interference—notifying all off-wave stations heard and asking them to get into the nearest amateur band, bringing pressure to bear on backward stations through organization. As an organization we must tackle these problems by sending indications of off-wave operation out from the Official Observers in greater numbers. Section Managers should appoint an additional number of competent Official Observers in each Section. Affiliated clubs can help a great deal by local policing of the air to improve the off-wave situation. Club interest in committees containing representative members from the ranks of the A.R.R.L. and local press can work to good advantage in taking care of code-interference in congested localities, resulting in the establishment of authority only those cases which turn out to be something besides code interference. Such committees will prevent complaints from going to the local paper by applying a remedy right at the source. We earnestly request those of you in positions of responsibility to get this machinery to work in our clubs and in your Section A.R.R.L. organization.

Making friends with our neighboring B. C. L.'s is a good start and a real first step in reaching alone. Don’t wait until complaints are brought to you. Make a canvass of your immediate vicinity. Inquire regarding interference conditions. Often as not you can give Mr. B.C.L. some dope on his outfit that is news to him and in return he will tell you of any code-interference is troubling him or not. Cooperation pays big dividends sometimes. It is most convenient to really know the man next door. He can often help you in checking on kvelvicks or QRM when a new transmitter is built or something is changed in the present layout.

Trouble exists. If a key click bothers, a 1½ to 2-kilocalm break between the key and the set (key assumed to be in new, H.V. or in center tap) with across the key, or between the corners off the wave frontway by applying the voltage gradually thru the cushioning inductance makes the beat disappear. 100 to 500 ohms resistance in series with it (or a variable resistance) adjusting to the optimum values of C. E. and L. and P. 126, 127, 128. "Radio Amateur's Handbook" contain plenty of further information on thump elimination. September and November 292, QST also give good suggestions on this business of hearing key thump. The key writer has had excellent results with the simple thump shunt described above. If troubled with r.f. energy in addition to a key click现象, assign some duty to build and place wave traps in the antenna or ground leads to B.C.L. sets. Such traps are simple combinations inductance and capacitance and further to be in lead between set and antenna or ground of suitable dimensions to tune to the wavelength of the amateur station. A.A. Putnam has in the power line leads at the transmitter in B-eliminators, moving antennas to right-angle positions, low antenna, and construction of a shorter or shorter noisy plate supplies may also prove necessary. Inexpensive wave traps have proved the most helpful solution in many cases, and there is evidence saved labor in re-constructing non-selective amateur arrangements in B.C.L. sets, aside from the fact that most B.C.L.'s object to having any changes made in such a manner. Tuning a wave trap construction and installation will be mailed study to anyone who writes to order for it and shipped to him. A wave trap, a very surprising results have been obtained with the use of a properly build wave trap even with adjacent sets, parallel antennas, single-circuit tuners etc. Remember—a key thump filter arrangement (or a slight change in the keying circuit as it now is) plus a wave trap for such B.C.L. sets as need them will do the necessary in almost every case unless there are special conditions, obsolete oscillating receivers and so on. Get your dope today if you need it! How to get your dope to us again.

There is not the slightest excuse for anyone being caught out of the band. Besides the standard frequency wave traps and pluses or other meters available. If you haven’t any you can easily borrow one or build it from Handbook specifications. To reach the Naval Commission on the useful part of the dial for greatest accuracy. Check any wavemeter you may have as frequently as possible for wave frequency transmissions—it is liable to get knocked out of adjustment like any other measuring instrument.

If you just think your wave is not correct, make sure. Be sure if you rate it on a wave shorter than 7090-8000 meters you are well on the right side of NAA and within the band. Use the fact that NAA is crystal-controlled and works on exactly 9000 kc. (8.1 meters) for your guidance.

When any of us operate below the band we are in danger of impairing the efficiency of Naval communications channels. Put yourself in the position of a crystal-controlled station obliged to operate on a fixed frequency with thousands of words of important traffic to be made, while some unworthy hams send a long drawnout CQ DX. There are no Naval stations working in our district. The Navy has no means of getting a hold to us and as you will read elsewhere in this issue, very helpful in securing adequate privileges from the International Radiotelegraphic Commission. A B.C.L. station that has become so valuable and helpful surely must not be trampled upon by any inconsiderate amateur. The Navy stations are entirely justified in objecting to any amateur operation in their band. As we have said before, the A.R.R.L. is going to act for the good of the majority and take suitable measures to bring conciliators into line if it becomes necessary. If each and every one will cooperate as has been suggested it will not be necessary to consider further steps for self-government and protection of our privileges. The folks who have been abusing their privileges are held for certain trouble on the distant radio. Presenting a case on all these matters. It’s up to each and every one of us to get busy collectively and individually—for after all it’s a personal problem. Every reader is asked to consider that he is being addressed personally and to put his shoulder to the wheel in making a general checkup of conditions. We are putting out the R.C. and L. and P. 126, 127, 128, 129, 130, 131, 132. V. B. Handy.

OFFICIAL BROADCASTING STATIONS

Changes & Additions

(Local Standard Time)

19Z (37.5) 4CK (49) 7 pm, Mon. Fri.; 8CN (40) daily except Sun, 7 pm, 2 pm Sat.; 9BNW (38.2) Wed., 1030 pm, 1764.4 Wed., 1045 pm; 9DNG (83.3) Wed., Fri., 950 pm; 9AV (125) 7 pm, Tues., Fri., (85) 7 pm, Fri., 9D5 (40.8) 715 pm, Tues.

ARMY AMATEUR NOTES

SECOND CORPS AREA—In order to test the proficiency of operators the following contest, open to all active A.A stations in the area will be held during January, 1928. The contest will consist of 5 minutes of each of the bands in the Second Corps Area C.S., on 77.8 meters. Three messages will be sent on three separate nights, and will be repeated at stated times during each night in order to give all parties an equal chance to send them. The test messages will be both in code and plain. One of the code messages will contain an answer which shall be sent to the C.S. of the Net to which the A.A station is assigned. Credit will be based on a point system, and the operator with the greatest number of points will win the ten prizes it is hoped will be offered. It is proposed to give 25% of the total points as credit to
the amateur writing the best essay on a subject to be announced in the next issues. Credit will also be given for keeping the weekly Net schedules.

2CP, the new N.C.S. of the N.J. auxiliary net has stirred things up, and most of his stations are keeping schedules. 2AOP and 2AAT are the most active. 2ALS, 2HW, 2AFV, 2APD, 2ARM, and 2PF are also active in the various Nets. 2EV would like to obtain more active stations for the Manhattan Net.

FIFTH CORPS AREA—The old Net was re-organized, and a trial made on Nov. 18, but apparently without much success. 8GZ, the NCS, was not on the air at the time. It is hoped that activities will go forward with a bang with the coming of better radio and more tests. All interested in the work should get in touch with Capt. Glessner, Signal Officer, 4th Corps Area, Fort Hayes, Columbus, Ohio, or with 8BYN. QSO with the NOS, 8GZ, will also help matters.

EIGHTH CORPS AREA—The NCS, 8AIN, was on the air regularly during the month, and its signals appear to be getting out very well, since call cards were received from many distant points.

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**BRASS POUNDERS' LEAGUE**

Cot. Orix. Del. Rel. Total

8BAU 31 59 302 1018
6ALH 432 307 101 930
8CBT 122 101 466 789
7FL 197 312 676
6ppHR 139 121 244 504
8EU 38 50 382 476
8CNX 137 122 241 477
6DBM 35 334 35 494
6BIX 110 263 22 295
8AYK 42 19 316 377
1BRI 291 158 12 371
9BKV 48 33 252 333
7YD 273 36 4 318
1APR 82 129 129
8EBB 189 60 58 307
1HP 30 59 214 285
6GUE 11 19 256 277
8ST 101 97 71 272
1MKS 102 82 86 256
9LV 14 54 194 262
9DZX 14 67 140 261
6BYY 100 151 251
8BBN 8 3 204 251
9BON 34 32 18 123
9RTK 63 24 134 221
2AFV 15 23 170 217
6CF 51 41 129
6CZC 3 13 194 210
8AMU 35 22 148 205
6ATG 32 38 135 200
9RAM 7 35 158 200
1KX 32 64 79 175
7AIP 39 79 131
6AMM 60 76 12 148
8UE 6 90 37 133

8BAU takes the honor position this month by consistent relaying work—more power to him. From 21st place to 1st in one month is some accomplishment. The whole list contains the very names of our traffic handlers, stations famous for emergency work, for consistent schedule keeping. 1KY, 7ABM, 6AMM, and 8UE "months in the B.P. for some very worthwhile performance in making message DELIVERIES.

A total of 200 messages—or just 80 deliveries—will elect you to membership in the B.P. O.M. Why not keep some regular schedules and organize some traffic routes, or solicit good medium-length and short the stations you work to put you on this honor roll?

Two stations have been licensed in the Virgin Islands. These are up 4AAN and up 4ACF. Of these, 4ACF, who sends this information, is the only active one present at.

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20-METERS

5AVS (Fort Worth, Texas), "GWZ and 5AVS are now on 20 and 40 with an 852. Our best QSO on 20 is with fuOCDL, Duals Radio Station, French Cameroun, West Africa. We keep a schedule with him Thursdays and Saturdays at 6.15 pm CST. He is on 20-meters flat with a 500-cycle note. It takes 1½ minutes for him to get his gasoline-driven generator started after one signs off. This has caused some amateurs to lose a QSO with him as they were so patient and didn’t listen long. fuOCDL is the only African heard here on 20 and he is often R7!

4GA (Los Angeles, Calif.), (rec’d via 1ABA on 20-meters) "Have had two-way communications on 20-meters with egGYV, oz2AC, oz2AX, xuxWNP, n7KN, ch6BDL, ch6CLJ, nc5OQ, nc6CS, n7PA, n7QW, OH, with 8BYN. QSO with the NOS, 8GZ, will also help matters.

4AYU (Genella, N. Y.), "Have worked 2nd, 4th, 5th, 8th and 9th districts as well as the first Canadian district but have been unable to QSO tho 6th and 7th on 20 though I have heard and called them. I only use 20 in the daytime but have worked both day and evening with good reports. I find it easier to QSY to 20 and get decently steady sig. than to do the same on 40. With my 210’s I could go down to 15 or even 10 meters just as easy. I do have an actually rather loose

parasitic oscillations with the two 210’s in parallel since I shortened the leads so the grid leak and condenser are in the plate blocking condenser box direct to the tube socket connections. The center tap lead is only 4½ long and the tuning condenser leads in proportion. For 20-meter work now only cannot have his r.f. leads all over the shank. I can duplicate my 20-meter daylight work with the same load (44 watts) on 80-meters and for a few hours at night, working 6’s and 7’s in addition though no foreigners. Re Mr. Redfern’s report in late QST—QSO 200 WKBK Oct. 30 from 7.11 to 7.30 pm. His sigs were R8 with a decided ripple, nearly all the dots missing."

9EF (Hammond, Ind.), "Of late 20-meters is dead after 5pm CST. South American signals are getting weaker while European signals are increasing in intensity. I wish more European stations would announce 20-meter QSO with the U. S. A. around 1200 or 1800 GCT (our early morning) I should be glad to schedule any eg station for early morning 20-meter relays. xoML is to be complimented on the wonderful consistency of signals. Can work from 6am until dark. f0AZ is great from 1600 to 2100 GCT when he retires usually."

1SZ (Hartford, Conn.), "Am now using UX-222 with that foreigners with the country at the ears. Have heard no more DX with the addition but much easier to copy what I do hear. Schedules at various times of the month were kept with egGFA, eg6DU, WNP, f0A2K, zn2AK and old reliable 9EFH. Still keeping an eye out for at2KT and at1B on Sundays around 1300 GCT. At1B in the 1200 to 1330 Sundays. Signals do not QSS now as compared with summertime's. At 20, 30 and 40, hours have dropped until signals cannot be heard after 5am EST. South American stations are slipping off altogether, though Europe and Africa still comes thru well. f0A2Z recently made first contact on 20. The "our" and "us" hams do not bother me a bit any more. Have given up listening every minute of the night for them. They just do not break thru to my station. When first f0A2Q x6DU was heard rounding Cape Horn but at last QSO he was safely in South America and able to give me the thrill of which amateur radio on 20 meters was the only method of communication."

Our apologies for omitting some of our usual C.D. subjects in the last issue, the regular Radiotelegraph Conference together with the story of amateur work in the New England Flood made unusual demands on our space. An announcement about Commander Doyott’s Expedition (G.M.D.), our page of Section Managery, a article explaining how to get on the roll, a report on the Burress Plane Tests, and a bunch of Traffic Briefs must be held until next month. Our story of WNP work is still in the pipeline for and items concerning VOQ and KFLF also may be looked forward to with interest.

QST FOR JANUARY, 1928
Western New York—SCM, C. S. Taylor, K-7L, has promised theARED to map this month by the efforts of several amateurs who handled messages during the Vermont condens. A station got about the news and notified the Red Cross in Boston through YB and Western Union. Many other amateurs handled press reports when all other communications failed. The WJC 13, J-3, has received more mail than ever before and schedules are on the increase. Mr. Crossley of XGE desires to know just what data, if any, was collected by hams who attend the next A.R.R.L. Atlantic Div. Convention next June. Please write him, gang.

SADE is working hard on schedules and handling traffic. Traffic will be even more intense next week, and will be hot after schedules. SAHC worked 4NP and ne-8SWG at Labrador. SAIL can get traffic thru to England and YM. SAKCI worked WNP, ef, and sked. Traffic is slight due to school and YL's. SBFG papers. The Rochester Radio Club is humming along. SAKC worked WNP, ef, and ne-8WG at Labrador. SAII can get traffic thru to England and YM. SADE handled traffic, but now with 15 watts. SAQG is in operation but at the time are training operators. SAH has a 20 meter Hertz but ND on 40 so he says. SBRM is on regular schedule, but no regular skeds are kept. SBIL is away at school. SBMJ worked all districts and says he's got a couple of recruits lined up for traffic. SBSP is handling a lot of New England traffic. SDML also handled traffic. SCN1 is changing to 20 meters. SCYR handled heavy traffic with lots of work done. SAIA is doing 4FT with 23 watts input. SCDB handled traffic during the flood with his new transmitter. SPOC did work for individuals delayed by the flood. SPOC has some form of traffic for Rochester newspapers. The Rochester Radio Club is humming again with a new President, SKT, who is hot after the super worked Iowa. New England handling traffic. SFU is after schedules. He has worked no SKC.

Traffic: SAD-48, SAHI 98, SAKG 46, SADG 6, SAWU 6, SAUY 91, SCBM 18, SBFQ 10, S8QX 6, S8MJ 40, SQBJ 2, SCAJ 8, SCNT 80, SCYR 47, SCYR 11, SDML 18, SCFQ 39, SDML 60, SDML 1, S8K 8, S8P 4, S8P 7, S8B 2, 8DB 41, 8DB 11, SUL 10.

MD-DEL/D. of C—SA6M is off temporarily due to a fire burning up his entire outfit. He will be back in a couple of months with 2 50 watters in a self-rect. circuit. 3BRW and 3HCX have applied for an ad. They should be ready to handle the work. 3CFX is hampered by not having a sked south. (Get in touch with your RM, OM). 3ASO opened for business and said (I am sure) that when he takes time away, he will QRT. 3PU is back on 40 and 80 meters. 3CE got his commercial license and is very proud now to say he is not having as much trouble in listening. 3CGC was only on to keep his sked with 3QY. 3SWT is on whenever possible but no regular skeds are kept. 3ADE and 3ALQ are active and yarin' to go.

Traffic: 3CFX 37, 3ASO 12, 3PU 4, 3CE 3, 3CCG 86, 3BBT.

Eastern Pennsylvania—SCM, H. M. Wallace, SAJE—Our new RM, 3QP, is well under way in Philadelphia, and turned in an excellent report. You Philly stations should give him a hand, and you will start something. SEU, our mighty Wsmston RM, leads the tilt pushers again. A new one turned up in Scranton—5BRBS, FB, OM. 3MP will get on if he can keep his sked. SDM is DXing up cash for a new bus. Hill 3BMS can't hear Asia! And SMB thinks I am on 4011 west side! Every 'three' on 40 reports to be the first "3" to WAC. 3HH is one of the many. Hill xWJ keeps tcf moving nicely. The ole XJal is blasting out of 3NP and 3S8M. 3S6S is on the job with early morning skeds. 3AWT knocked out BPL home. 3BQF doesn't have much time. He is waiting for WPY and his sked is kept by SKR. Receiving conditions were punk for 3AV. The QRB drops for 3QY so an xtal is in order. Hill 3QW is on 12 meters. The sked works well. 3SQF has a full fledged power house behind his sigs. Hill Low power and 20, are baying out for 3AWK. 3QP is busy on 80 but drops to 40 now and then. 3NF works skeds on 80 now. 3BME is handling all the routine work. SBWB, include sum 15F, OM. 3SNP still handle a few. It's tough that the rest of the reports were LATE. Therefore, they cannot be included. Let it be a lesson. The SCM.

Traffic: SEU 470; SAVK 377; 3AWT 204; SAKB 102; SAKD 141; 3QY 126; SBN 116; SBCG 88; SBBC 48; SBBN 48; SBBN 7; 3NP 84; 3SQF 24; SBRE 11; 3SQG 35; 3HD 31; 3BMS 28; 8BBS 27; 3BQP 16; 8BIR 18; 3BFL 14; 3LG 13; 8VP 8; 8DCS 8; 8AVL 7; 3NPR 7; 3S8M 20.

Pennsylvania—SCM, G. L. Crossley, XGE—After the letter was sent to all the ORS in this section during the month, the SCM actually received a few new reports this month. There were 7 stations that did not report. SCGO auctioned off his ships and now has a UX281 with rectifiers. SAML handled traffic but for no time due to DX. SAK1 has helped organize a radio club at Altoona. SCKR likes the lower 80 band for working. SBWG is QRV. SBW blew his 80 watt experimenting but is on now with 15 watts. SAQG is in operation but at the time are training operators. SAH has a 20 meter Hertz but ND on 40 so he says. SBRM is on regular schedule, but no regular skeds are kept. Ask the RM. OM, SDFY is using fone now and is helping to train new ops. SGI had some BCL trouble. 3BRM found they found out they could not set down his antenna because of school. 3SD is on 20 and 40 with 250 watts xtal. 3SCF says a BCL trouble is down his antenna but it is up and running again. SAKCI expects a 3CFR to arrive in the near future and receivers during Xmas vacation. 3DOQ's aerial was taken away, he will QRT. 3PIT operates day and night and says if 40 meters is tough that the rest of the reports were LATE. Therefore, they cannot be included. Let it be a lesson. The SCM.

Traffic: SGI 277, SAVU 205, SCFO 187, SAK1 65, SDFY 46, S8DE 24, S8CF 14, SBGW 11, S8CR 10, S8BR 10, S8DF 9, 3GQ 9, S8VE 8, S8AQ 7, 8ARC 2, S8DOQ 84, XFE 184.

Central Division

Indiana—SCM, D. J. Angrus, 9CQ—Much better reports this month helps the standing of Indiana. SCM. 3B8X moved from Akron, Ohio to Rockville, Ind. and is going again. 9ADJ is on with 2-112s and a B-eliminator on 40. 9BGZ says that he hopes Santa doesn't run out of 892a. 9CNQ is experimenting on 20 with some success. 9BQ has moved from Anderson to Indianapolis. Ind. 9A9 is putting in 216B. 9BBD says as 9B1J wanted his "8" tube back before they blew. 9BY1 is on both 41 and 79 meters. 9BKM has a new set of Cardboard condensers and will try 40 meter Hertz and says it did wonders to his signals. 9DDZ is going after a commercial ticket. 9AGZ is back on the air and is going strong on 40. 9CIQ is going strong on 49. 9AXO is coming on with a new 5Watt station, completely rebuilt. 9AMZ is getting sound results with voice on 20 meters. 9AVB is coming on with a new station and trying for an ORS. 9BIA is changing to 180 meters for fun. 9AJL had his MG repaired and is on again, 9AAI and 9BKJ are conducting the code school for the Fort Wayne Radio Club. 9BGC is experimenting with master oscillator control. 9DUK has a beautiful new panel outfit. 9CRB is a new ham in Muncie on 40 meters. 9BDDJ is on 113, 9B82, 9BQY 14, 9DDZ 3, 9BMC 30, 9BRY 4, 9BJK 9, 9CNQ 25, 9BBZ 17, 9ASK 26, 9RAPA 15, 9DJF 17, 9BFT 13, 9DKW 20, 9RS 5, 9DSC 26, 3CRV 9, 9XFT 2, 9CRH 5, 9CQY 8, 9AXO 11, 9DAO 30.

Michigan—SCM, Dallas Wise, SCEP—9CSI is the new RM for the Detroit area. Get in touch with him for schedules. 8NP is on regularly now and regularly for traffic. 3DOQ was rebuilding but turned in a fine report anyway. Still with Michigan's star radio man. 8KN, Lansing High School, wants schedules with other schools, 8C8T please note. 8ASO works Miami College community. 8AGQ just put in a new antenna blown down and blown blocking condensers. 8BRS handled quite a bit of traffic for the Philippines. SAMS is lining up a Philippine route.
also. Capt. Baldwin SDLK handled a 344 word message from WNP via 1FL and now has set parking on 20, 20 and 80 meters crystal controlled. 9CE is on position now and has daily schedule with SAYB, SACU operating. 9CB on the 1FL, SCLG 20 handle 15 on his crystal controlled outfit on 403 meters. SML and SBY are busy with BCLAs for any Ham working Radio control. SML seems to hear OK on 20 meters. Edson Co. SDNJ of Bay City reports loads of DX but no traffic. SDIV has no trouble finding an ear on 18 and 40 meters and is used to being business as big transformer and now is on with low power. The Grand Rapids gang are hard at work on the 1926 ARA I am supposed to be there with the SDIV. Save the pennies, fellows, X and put up on a real time. SZZs 80-foot steel mast developed fallen anchor during the last big blow so now it is getting up. The Southern Mich. gang will all be present at the Monroe Hamfest January 22nd. Big feed and some real long DX antenna. The program is far. SCWK is still rebuilding. SZZ says the school message is keeping them busy.

Traffic: SZZ 34; SAYB 8; SNN 6; SKN 5; SASO 14; SAIM 2; SRS 12; AMS 3; SHKX 35; SCLG 18; SCAU 4; SCOM 3; SZZ 36; SCEF 8; SDEY 97; SNU 6; 9CSI 15.

OHIO—SCM, H. C. Storck, SBYN—Well, Gang, it seems you are going to allow SDMB to cup the traffic prize without any real competition. He leads OPG on 404, which sure is great business, but whoa—look at this boy SBAU—WOW! He kicks in and out like a 20 and 80 meter now. I have reported since the old rubber stamp days—1010. SDIB may fall down next month—but if he doesn’t—well, give him his due. For he has been in two months in succession now, the there has been no report yet from the RM. SCFL, a wonderful thing is going on in the ham band. This month with 113, followed by the SCM with 112. SCQW comes thru with a but had tough luck as the filament of his 20 and 80 meter has been broken in shipment. SALU, SBAS and SAVB handled sending on a non-handled 34. SALU wants all the ORS to come thru with information asked for. SBS is on 80 mx and looking for DX. SDVY has good location for set and hopes to get out. SCNO, the OW op, is progressing nicely, but is receiving no DX. DCCO, the best is yet to come—you have the YL field to yourself—don’t get discouraged as ORS, SCMB is trying 20 again. SQQ and SCMBs traffic work now the football is once more. HI! SJB has a new short wave receiver. SAVB got all his traffic on 20 and says it is getting better right along down there. SAPZ is putting in a M. O. circuit. SGB will have DC plate supply soon. SAYO is getting traffic on 20. SBNW reported a radio. WNO has all the people having SBS and others are "sore" about the Conference. It, or OR? SAEU is putting in Xtal control, SDPE is in training for basket-ball and Can’t stay out late. SAVB says 10 is a great luck of the world! but SDIV runs a close race, still he says he is going to get the 852 out under SDMM’s name. SCZM has been sending one of me 852. SPL has another crystal—tace! SGL is still without a plate transformer also has rebuilt his receiver, and is living in hopes. SDQZ is QSW. school is back, 9iZ is back, with a mercury arc. SDMX is still on 20 and trying tone. SDIA has been QSW. also. SBEV has a new call on the 40 meter. Also, SBEV is back with the OHIO gang again. Welcome, OM. 8RRM has been vacillation and various DX calls. SCLG 20 on 20 and wants schedules. SARW has been "chief of staff" but has been sending a new package and couldn’t hammer brass after he sent. SAVX has been very QRV, but SQD’s the Burma airfield. SQQ is using a "Zep" antenna now. The SCM has been on 40 and 80. SDON and has enjoyed quite a few QSOs with the OHIO gang. IOU, SCLG is doing his best to get things going—working hard. Give him a lift, OM’s, and let’s get more schedules going. If you make your own, remember it is the SCM. Don’t forget to turn in your totals to SALU if you are in the contest. Let’s hear a little more standard practice on the grid positions and don’t get many superfluous signals. Another admonition is not to keep schedules. If you make them—keep it to the minute. Is this what you call the Grand Prize? Next month will tell. Let’s Go!

Traffic: SBAU 1010; SDBM 401; SCFL 118; SBYN 112; SDIH 78; SHQY 64; SAIU 38; SBAS 37; SAVX 86; SCONZ 85; SDKN 54; SCWY 56; SCM 24; SQQ 23; SJB 20; SAVB 16; SAPZ 14; SQQ 14; SAYO 12; SBNW 9; SGOH 9; SAEU 8; SDFP 7; SDMN 6; SBSY 4; SLG 4; SQDZ 2; 9GZ 1.

KENTUCKY—SCM, D. A. Downard—8ARU—9BWS is working up in the mountains but manages to get home every week end to pound brass for a short time. No Ham Working Radio control. 9BWS has been porting a egxQV on 20 meters. 9CGW forgot to throw his antenna switch but worked WNP and got R-4 on his wade by doing this. 9BAS is making an old timer out of a little fellow in Madison that he has confined to his bed paralyzed for five years. 9BAZ is still having trouble with his mercury are rectifier and is looking for one of the new fangled ones. 9BAY has a new tube. They report code via the ether to a couple of beginners. 9KZ had the good luck (7) to burn his foot and now has to learn. 9ARU is on the air on 29, 40 and 80 meters.

Traffic: 9SWR 140; 9CRD 74; 9BAU 49; 9BZQ 29; 9DQW 11; 9MN 10; 9BWJ 2; 9AZ 1.

ILLINOIS—SCM, W. E. Schweitzer, 9AAW—The SCM is happy to see the way reports are still increasing and the interest the gang are taking in the section’s traffic report contest as mentioned in last month’s Illinois report. It has been suggested that inasmuch as some sections have more stations than others, it would only be fair to these sections to revise the reporting rules to be in proportion. Let us work the contest out in this way, each section sends a report from the list of the number of stations in its section, then take the number of stations reporting, and multiply by ten. The contest should then award the most stations report in proportion to the number of stations in its district. This will afford an equal opportunity for each section for such an award. The section has the most active supporters in the league. 9AAW has been operating with AC supply. The 85 cycle and DC supplies are being dropped. 9ARL has been experimenting on 20 meters this month. 9AF4A worked WNP consistently. 9AFF reports average. 9AGG starting soon. 9AGG reports traffic picking up and reports 9CX to have been on schedule with 9CAD. 9ALK is keeping schedules with 9BI Tuesdays and Thursdays. 9AFP handled 5 floors and reports from the Traffic Manager he wants the gang to report their schedules to him so he can organize the section in the national hookup. 9AWX has election of new station each month. Regularly, even after a heavy Thanksgiving dinner. 9AEP is operating 9AF with a bunch of college hams. 9FTU reports 9AVY moved to the sixth district with the call 6GN, and 9BBU a new station operated by an old ham, 9AFZ. 9CEC reports 2D this month. 9CIA worked up and to last month. 9CMK is a new op working in the 80 meter band. 9CZ is operating regularly. 9CN is making trouble keeping DX. 9CQ has been a real bummer. 9DII reports that the weather is not going south. 9CNB, operating on 41 meters reports, his L tube gone west. 9CNN is keeping schedules with commercial precision. 9CRB has a new 70 and 80 meter antenna. 9CUCU worked WNP and is keeping skeds with 4VZ. 9CWO worked 32. 9CYN is installing a new 210 A tube with a report of R5. 9CSSL was QSO with England. The station is decorated with a new DC generator. 9CI is keeping a schedule with 9NWW. 9DGU reports QRM bad in all bands. 9DUX has a schedule with 9DUL. 9DSU is having QRM from school work now. 9DWH is keeping a schedule with 9DPW is QRV with railroad work. 9DUX has five schedules and also has changed his antenna to a new location. 9DUX is working on his station after the CTRA banquet. 9DXQ was not very active this month. 9DAI has six schedules, and will be operating on 80 meters with a 500 watt amplifier. 9DFAJ has a schedule with 75 and 80 watts to tickle the antenna. 9DFS was QRV with basket-ball and other things. Hi. 9EGX is planning to QRPX before he controlled. now E9E has been working mc’s and np’s with a 210. 9ELR is operating in the morning hours. 9BNL is a new arrival in the 80 meter band. 9BNL has worked some sixty stations since he got his license a month ago. 9ERH is a new arrival in the 80 meter band. 9ERH has been QSO’ing with 9BWX 1921. 9EG is operating on 80 with spans of 20 and 40 meters. 9IZ is using a 210 and a Hertz. 9IAK is using an interferences. 9IAK is using an ancient 204 hit a couple of amateurs. 9IZ is using 210 B and a Hertz. 9IAK is using an ancient 204 hit a couple of amateurs. 9IZ is using 210 B and a Hertz.
Day by day fo-AZ about R6 on 20 meters at 2 pm.

The Chicago Radio Traffic Association held its second annual banquet at the City Club, Chicago, November 22. One feature has not been a regularly featured annual Chicago affair. Superintendant Beane acting as toastmaster for the 147 speakers. Director Clyde Darr, 8ZK, came all the way from Detroit, a 147 member, all with the same old A.R.R.L. spirit. With musical selections rendered on the piano and violin by the Chicago Public School students, attended by all. Howard Thomas, OLY and Harry Irons, 9VDY, deserve to be complimented for the way they put it on.

Traffic: 9DZ 261, 9AZX 147, 9BFX 144, 9NV 91, 9AFZ 86, 9APY 79, 9GZ 68, 9AEJ 62, 9CCZ 59, 9AO 56, 9ACU 56, 9CNY 57, 9BLZ 52, 9BFX 52, 9DFZ 33, 9EZ 32, 9CZL 34, 9DZS 34, 9CSU 82, 9CN 20, 9AFF 22, 9EIO 24, 9DY 23, 9CKH 22, 9AQA 21, 9BLL 20, 9BWL 18, 9AOL 18, 9ACF 16, 9DSU 14, 9ALX 11, 9AKB 10, 9BKB 9, 9BEN 8, 9ECK 8, 9ERL 8, 9CSU 8, 9UX 7, 9AHJ 7, 9CYN 7, 9AGG 6, 9GF 6, 9BN 5, 9CN 5, 9BHT 4, 9HEK 4, 9QDF 4, 9BKG 2, 9KA 1.

WISCONSIN—SCM, C. N. Crapo, 9VD—The past month has been an eventful one for the SCM. Nov. 22 brought a 150 pound baby girl, Jewell Audrey. 9FY is now back on the air and in Milwaukee and will find you always on the job and always ready to QRS. 9DLD is sending schedule charts to all stations with whom he has schedule with. He has a list of his schedule list with all stations he has skeds with. 9DLQ's skeds are working fine and he can QR5 to all his skedes. 9KJP's Kootwyck, Holland, on 20 meters and the next day worked it. 9SO is on both 20 and 40 meters now. DX was good this month. 9FY's chern rectifier is on the bum so he is thinking of changing to kerosenes. 9HPW worked a Calif. Station for the first time. 9HVT has skeds with 9VL and 9OLQ. He is QR5 at St. Norbert's College and operating WHHY. 9HIB has a little more life as his total shows Ford (1915). H. 9AEB says the two R. F. wires that run out around the porch, light the porch dome every time he turns it on. 9AEB has sked 9DTC on 9DTK Mon., Wed. and Fri. at 5:30 pm and is arranging schedules with 9ARC on 78 meters. 9FEC has worked all U. S. and Canadian districts but outside of hearing a lot of foreigners, hasn't been able to QSO any yet. 9EHD's total this month is pretty small but that is on account of having so many examinations. He has been trying very hard but so far, the results are rather poor. 9BAW has a low total because he hasn't been on due to extensive control. 9BID reports nothing new or exciting. 9AHE is on both 40 and 175 meters. 9EGW operates on 20 without schedules. 9EYH has opened up operation and was up on 40. 9CVF is back on the air after an absence of several years. (Welcome, OB, perhaps we'll see you at the club occasionally now, SCM.)

Traffic: 9LY 223, 9LDD 223, 9DTK 221, 9DLQ 120, 9XH 72, 9SO 70, 9BY 63, 9BFW 57, 9BTT 57, 9BIF 41, 9ABM 39, 9AZN 27, 9EFC 23, 9HED 12, 9WO 18, 9BAY 16, 9APF 9, 9ACE 5, 9AKB 3, 9COT 1.

DAKOTA DIVISION

S. O. MINN.—SCM, D. F. Cottam, 9HYA—Through the persistent efforts of a few hard working amateurs, there is now a Radio Club in Minnesota, the "White Birch Club," operating under the call 9KRT. There is some real ham spirit in this new organization and a good deal of thanks is due 9BIF for the fine way the new, well-organized club is functioning. A number of students are learning the code and also the deeper mysteries of the air. We have been 6 cancellations this month. More traffic is higher. It will skeds up and handle more traffic in an hour than you can in a week without skeds. 9BTW, a new ham in the section, is high traffic. 9BIF is on 20 meter and his best DX was "XEN-OSQ." 9XI has a good staff of ops and is QSO the world. 9DHP has one sked and has boosted his traffic a lot. His QRB is 20.4 and he wants another sked with Oregon or California to handle his west traffic. Oh yes! He has an 855 on the air and he is working it overtime too. H11 H11 9BHZ praises his new mercury. He says it is the best rectifier you can buy. 9CMO, 9CMO. 9CIX has a new 250 watt in a Hartley circuit. 9AIR sez he blows up too many stoppers with 500-cycle output. He has a very small, intense but silent storm but is sg again now. 9HYA has a new batch of work and has been very busy during the last two months. 9AMAI is on "U" but he ops at 9X1. He sure and listen for 9ERT. With their staff of ops the station should be heard often. 9D行使 is here and he expects QRM. 9DBW has been making various changes and has been busy broadcasting the news received from Headquarters.

Traffic: 9BTW 48, 9XI 48, 9BHP 42, 9CIX 20, 9EFO 12, 9COY 13, 9ELX 13, 9ELX 12, 9EKB 10, 9KEK 8, 9AILA 6, 9AIR 4, 9QDF 4; 9DBW 2.

NORTHERN MINNESOTA—SCM, C. L. Barker, 9BU—This Northern Minnesota Section has an ORS membership of 29 stations now. Last month, we brought up the subjects of cancellations in this Section and we are going to live up to those statements. Out of the 29 ORS, there are 9 stations who are going to lose their ORS appointments because some have gone 11 months without reporting. Some of these will be dropped before the next report. 9DLY has a new batch of work and is going to a larger organization. 9OM, 9OM. 9CIX has a new 250 watt in a Hartley circuit. 9AIR sez he blows up too many stoppers with 500-cycle output. He has a very small, intense but silent storm but is sg again now. 9HYA has a new batch of work and has been very busy during the last two months. 9AMAI is on "U" but he ops at 9X1. He sure and listen for 9ERT. With their staff of ops the station should be heard often. 9D行使 is here and he expects QRM. 9DBW has been making various changes and has been busy broadcasting the news received from Headquarters.

Traffic: 9BTW 48, 9XI 48, 9BHP 42, 9CIX 20, 9EFO 12, 9COY 13, 9ELX 13, 9ELX 12, 9EKB 10, 9KEK 8, 9AILA 6, 9AIR 4, 9QDF 4; 9DBW 2.

SOUTH DAKOTA—SCM, F. J. Beck, 9DB—Traffic dropped off somewhat this month, which is rather unusual. The Y.M.C.A. Radio Club of Sioux Falls, has received a number of prizes for the convention and have the program nicely arranged so everything is set for our 7th annual convention. 9DGR is beautifully arranged, plus a few skeds turned him in high traffic man this month. 9DWN was very QR5 work and says tfls not so good. 9BSK at School of Mines handled a fine bunch of messages in spite of no skeds and QR5 studies. He reports, 9DNZ and 9DIZ are coming on the air again soon. 9GDT is a silent club when summer comes and the BCL work lets up so he can run the xmitter at least once a week. 9NMS says 40 and 80 bands are the bank for QRM. 9DLY is on 20 and 80 and wants skeds. 9BIF is back with us again and on with 15 watts and lining up a bunch of new ham to handle some ORS. 9AIRP, 9DNS and 9DES are active but no traffic report. 9ID is the call of Nick Jensen (Exc-DEM) Sioux Falls.

Traffic: 9DGR 127, 9DW 64, 9KB 32, 9DB 14, 9NM 9.
TENNESSEE—SCM, L. K. Rush, 4KM—Activities in this section have improved considerably in the past month. A number of new stations are on the air and there is room for several new ORS in this state. Quite a bit of activity has been going on in the Knox Amateur Radio Club and have quite a large membership. 4FI craves a record of your schedules as he is the Route Manager and still continuing. 4KS is using 204-A and teasing the plate with 3000 d.e. fm a mercury arc tube. 4BO is still "mussing around."

4PP uses a 250 watt and has a very next station. 4ABZ is getting out fine with his 882 and is on the air regularly handling traffic. 4HK is a new station and has the same luck as 4FI, will be on soon. 4KP, 4DG, 4GI, and 4SP are all on the air looking for traffic. 4PD is at 07 and took his transmitter with him when the floods came. 4AW is going strong and suits with a "fire.", 4KM and 4KK are still hanging around 20 on working QSL's, sa, sh, on and oz's regularly.

ARKANSAS—SCM, W. L. Clipperd, Jr., 5API-5ACA—Amateur activities in Arkansas the past month were almost nil, but we can always depend upon a few old timers to keep the ball rolling. 5SSS received a bad smash on the head when a pole which he was putting up on 500 cycles fell on him. 5XZ and 4ZAA promises to be back soon. We certainly hope to lose 5SS, which is leaving for Texas. 5SS's all get together, fellow, and see if we can beat out our previous records this next month. All Arkansas amateurs who have not communicated with the RM or SCM please do so.

Traffic: 5API 14, 5AYA 6, 5SSS 3, 5JK 2.

MISSISSIPPI—SCM, J. W. Gault, 5AKP—Reports were light this month. 5AJJ, if you want to keep the ORS, you will have to report every month. 5FQ is working lots of stations on 40 meters and is getting so he can count them. 5QZ leaves for work in Calif. and is carrying his 350 watter along. 5yd reports copying an important message from 1YD during the flood in Vermont. He was Norwich's first contact after the flood. The message was delivered from 5YD by telegram to the Dept. of Justice, Washington. D. C. FB, OM. 5AKP blew another UX210 but is back on with a new one. 5AYB who was an Instructor at the Harvard Univ. Radio School during the early part of the world war, cx1AVT, has been appointed by the War Department to gather in this neck of the woods as he receives and transmits at 30 per without any trouble.

Traffic: 5AKP 56, 5API 12, 5FQ 12, 5YD 30, 5AYB 38.

LOUISIANA—SCM, C. A. Freitas, 5UK—The message total has dropped somewhat this month, but is still a little above the general average. Route Manager reports to me that the L. H. S. is improving and that he hopes to soon have a network of stations all over the state. 5IE is not very enthusiastic about the "20" band. He hears the same stations every day and most of his traffic is on 49. 5AOZ shows the right spirit. Although his ORS application was rejected, he writes me a very sorry to hear that I did not pass my ORS examination but I suppose it is for the best as I am very unfamiliar with the theoretical points of radio but a lot of it is coming to you. 5KC reports he was QSO ee4CP on the "40" band. All the holes in this section want to thank Headquarters for their efforts at the International Radio Conference and to congratulate them for the results obtained. Although our hands were somewhat cut, we are being very thankful that we were not entirely eliminated.

Traffic: 5PM 105, 5UK 38, 5IE 26, 5EB 21, 5AOZ 18, 5NS 19.

HUDSON DIVISION

NEW YORK CITY & LONG ISLAND—SCM, F. H. Maridon, 2CNR—Manhattan: 2ANX hopes to be back on the air soon. 2BCB is on 20 meters during the day and 90 after midnight. 2BNL is on 40 and 80 meters now. 2EV has been appointed Aest. to the Section Manager and is making this his first report to HQ.

Brons: 2BBX is doing good work on 20.8 meters now. 2CXY operated 8WK for a while but is back on.

Brooklyn: 2AVR has a mercury arc now and says it is the berries. 2BAZ changed from LCH to TPTG and is working foreigners now. 2DOM has schedule with New Mexico and wants others to contact 2A. 2CSB with his xtal on all waves. 2CRB is on 37.7 meters. 2CTY is on 20 meters or below most of the time. He expects to put in UX213 if it is putting in UX213 for rectifying in place of his 4 year old slop jars. 2WZ has been 8AOE at Prince George, X. J. while at school there. 2EZ is going to put in keronitors when his slop jars freeze. 2ALS is now in Long Island City and is going again on 40 and 80 meters. 2AQN is still at 2ASV with some undetermined contact. 2BSL is working TPTG on the place of Hartley and says the Queens Radio Club Station 2ATF is now on the air.

Richmond: 2AFV is handling some Auskie talk now and is on regularly on 20, 40 and 80 meters. 2AKR reports two new bands, 2WT in New Brighton and 2WF in West Brighton. 2ARK is operating the 3/4 Gulf Oil now and away most of the time.


NORTHERN NEW JERSEY—SCM, A. G. Wester, 2WR—A large number of this month's traffic has been going to amateurs in the Midwest and the Section is coming back into its own again. 2CP, one of our RMs, is having fine success in getting traffic from schedule points of the country. He has a hard job getting the ORS in Monmouth, Union and Middlesex Counties to get lined up for traffic distribution. 2RMU, jobs for RMs is a stunt vacant and reports Dec. QST for the territories. 2CPD and 2CYY have resigned from amateur radio and have given up their ORS certificates. 2CDJ of Jersey City has been appointed an ORS and is working some traffic. 2AT is away on another trip which keeps that station silent. 2CP takes honors for traffic, making 32 SFM, 30 PGW, 24 UX, 2B, 216, 2EY seems very much put out by the new regulations for 1929 but let's not kick until the time comes. 2GC is on every night with a different operator and wants some schedules on 88 meters. 2EC reported by ship off Hong Kong.China on 37 meters, 2KA finds it hard to get time to operate but wants to get in on some schedules. 2KS very QRV in a BC station. 2AVK asks that I convey to him his old friend 2AI the 9th district for the first station worked with 8 CE 0 and wants others. 2BRB OSR, 2IDT, 2I 3D M A large transformer on 500 cycles but that 2IE was responsible for the act. 2IS is off due to blown filter condensers. 2ADL worried over what they did to us at the hands of amateurs in New York. 2AOP has too much BCL work. 2AOP maintains schedule with 2CP for all Newark work. 2GX has been appointed to Ensign in the Bronx for 2 CYY and will build a new transmitter of 250 watts for NRRC. Our YL station, 2BY, has installed a 210 and was QSO the 9th district for the first station worked with the new power. 2AAT is very badly in need of schedules and hopes some of the amateurs will get in touch with him. 2WR will be on the air Jan. 1 and thereafter.

Traffic: 2AT 6, 2CP 215, 2CWF 7, 2EY 2, 2JJG 3, 2CF 2, 2KA 5, 2AJSZ 4, 2ALM 6, 2AGN 2, 2CTQ 4, 2CXX 22, 2AIV 17, 2ADL 30, 2AOP 56, 2GXY 81.

EASTERN NEW YORK—28OW is now an aviator in space time. He was QSO of 83F who was using phone on 300 watts. ———-MIDWEST DIVISION——-

EBRASSA—SCM, C. B. Diehl, 9BYG—Route Manager's Report: Everybody has been QRX on account of bad weather conditions and also the Radio Commission but expect more activities from now on.

It is with regret that we learn that OCNF is forced to resign his radio work and retire from his position on account of ill health. On his recovery, 9QV is having another stroke of work on his farm but says it can't last always. 9EWEW is also having a stroke of good work on his railroad and

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between that and "observing", he is a busy man. 96BL is rebuilding with Xsl. 9CJJ missed Thursday night's meeting, most of the others were up in the A. P. office where he works. 9CDB turns in an excellent total this time and also inquires about an award. He also feels he can handle an ONS appointment now. The SCM is busy with Army work and hasn't much time to be on the air.

Traffic: 9QY 6, 9BEW 2, 9BYG 6, 9BQQ 7, 9BQR 3, 9CDB 14.

IOWA—SCM, A. W. Kruse, 9BKV—Only half of the ONS reported this month. All ONS who have failed to list few months will be cancelled by the time this appears in GST unless they get busy and handle traffic and report same to the SCM on the 26th. We have a good bunch of non-ONS who work and orders are given to them for helping to keep the section on top. Thanks for your fine work. OMs. 9BKV is using a battery operated transmitter and brands the Section in traffic. 9BWN comes second and he reports some traffic in Des Moines. He is trying to try and reorganize the Capitol City Radio Club. FB. 9CZC had bad QRM from the Telephone Company's motor but he manages to keep a good bunch of skeds. Watch 9DGW's smoke next month! He has applied for ONS. 9BQJ is handling traffic this month and all month on the air. Cell time. Something is radically wrong when only four reports come in from one club. The following stations reported:

9BQJ, 9DKY, 9DLD, 9BEU, 9CJL, 9DQH, 9CJQ, 9CGH, 9DQF 6, 9BQK 21, 9BGW 25, 9BLL 15, 9BQV 15, 9CQH 13, 9FIU 13, 9DMD 9, 9DQF 4, 9BQJ 12, 9BZD 25, 9DLH 8, 9BQJ 3, 9DQF 12, 9BQK 3, 9BQJ 16, 9DQF 7, 9DQH 11.

MISSOURI—SCM, L. B. Laizure, 9RR—Director Questions are out of traffic this month and all month on the air. Something is radically wrong when only four reports come in from one club. The following stations reported:

9BQJ, 9DIQ, 9DLD, 9BEU, 9CJL, 9DQH, 9CJQ, 9CGH, 9DQF 6, 9BQK 21, 9BGW 25, 9BLL 15, 9BQV 15, 9CQH 13, 9FIU 13, 9DMD 9, 9DQF 4, 9BQJ 12, 9BZD 25, 9DLH 8, 9BQJ 3, 9DQF 12, 9BQJ 16, 9DQF 7, 9DQH 11.

NEW ENGLAND DIVISION

VERMONT—SCM, C. T. Kerr, 1AJG—To have the honor to choose the most important feat ever accomplished by Vermont amateurs is indeed a pleasant one. And to those earnest young men who filled the gap to the full, we simply say, "Well done, Hams." Few people in the stricken towns knew that the amateur could connect them with the outside world but we did. And wise to the fact the boys were doing SOME business. I think that the remark "You spoiled my program last night" will not be heard for a long time. 1B3J handled 311 mens comprising all phases of relief work and to him goes the honor of high traffic man. Think of men! He delivered 168 mens. Great work. O. 1B3J also turned in a good showing. 11B3J handled real stuff too, including U. S. wx Bureau reports. 1B3J had 327 mens. Kept 12 schedules, and for 7 days was at the key from 7:30 A.M. to 7:30 P.M. He also comprised all phases of relief work such as Red Cross, Signal Corps, AP, etc. SOME service, OM. Our tireless ONS FM 1N is still on the only source of communication in his Town for four days and cleared 124 mens. He was the connecting link between RR op and his station, impressively.

Traffic: 9QY 236, 9BWN 251, 9CZC 210, 9DGW 157, 9EHH 53, 9EHN 51, 9FQJ 60, 9DZQ 49, 9BAT 26, 9DGA 19, 9CJL 16, 9ZAM 3, 9CAZ 3.

KANSAS—SCM, F. S. McKeever, 9DNG—Hear ye! Hear ye! The honorable 9DQJ of Independence, Kans. Oscar King, our traffic representative, has the largest message total between dates of Jan. 1st and April 1st, 1928. The SCM will be the judge. Who will come out on top in the time to make preparations and schedules, follows!

9BHI in jumping forward with leads and bounds. 9BQH and 9BUT and 9CNC are active in traffic handling. 9CET has put up a good showing and handled traffic. 9AFT and 9BHR promise more activity in the future. 9CV says he will soon have a new FB low-loss transmitter going. He does not need it as he worked on. os, cf, os and ed this month. 9DU has been a real gem. He keeps on all month but you can't keep a good ham down long. As usual, 9CQF turned in plenty of traffic. 11B3 and 9HLK and 9CM are away and 9DNG are all at college but the latter is on occasionally anyway. 9BKV is still having trouble finding schedules. How about it, fellows?

Traffic: 9LM 2, 9DQG 22, 9DQZ 22, 9CKV 45, 9CFW 6, 9BHY 15, 9CNC 20, 9CV 28, 9HL 61, 9AER 1, 9BE 20, 9CFN 20, 9DGM 12, 9CBU 7.

KANSAS—SCM, F. S. McKeever, 9DNG—Hear ye! Hear ye! The honorable 9DQJ of Independence, Kans. Oscar King, our traffic representative, has the largest message total between dates of Jan. 1st and April 1st, 1928. The SCM will be the judge. Who will come out on top in the time to make preparations and schedules, follows!

9BHI in jumping forward with leads and bounds. 9BQH and 9BUT and 9CNC are active in traffic handling. 9CET has put up a good showing and handled traffic. 9AFT and 9BHR promise more activity in the future. 9CV says he will soon have a new FB low-loss transmitter going. He does not need it as he worked on. os, cf, os and ed this month. 9DU has been a real gem. He keeps on all month but you can't keep a good ham down long. As usual, 9CQF turned in plenty of traffic. 11B3 and 9HLK and 9CM are away and 9DNG are all at college but the latter is on occasionally anyway. 9BKV is still having trouble finding schedules. How about it, fellows?

Traffic: 9LM 2, 9DQG 22, 9DQZ 22, 9CKV 45, 9CFW 6, 9BHY 15, 9CNC 20, 9CV 28, 9HL 61, 9AER 1, 9BE 20, 9CFN 20, 9DGM 12, 9CBU 7.

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times to get out in the usual good fashion. IBIG lost his good note, but found it again. HI.

Traffic: 1HIG 125, 1BFZ 72, IGY 66, 1AQG 43, IAEZ 18, IAFT 11, IAJS 6.

EASTERN MASSACHUSETTS—SCM, E. L. Bat- tery, IUE—Wenz, there was plenty of activity this month, much of which was aroused by the flood disaster in Vermont and Western Mass. The following are the highlights:

1FL, IACH, IKY, ISL, IASJ, IAXA, IUE, 1APK, 1IN, 1BZQ, 1LM, IAGS, 1AAG, 1IG, IRY, IAB, 1WJW, IJFR, and IJAH.

IHF had sent us a good deal about the work, but will say that 1FL and IACH kept about the most consistent communication with the flood areas.

1FL stood 12-hour continuous duty from Nov. 1 on.

IKY has been appointed RM and sent in a good report right off the bat. FB. Traffic figures were quite high this month with fluctuations in the HFL, TVW over the Ors, and IAXA, which was assigned as he is QSW at W.U. at Rahway, N.Y. IABA is still in the DX group but handles some traffic.

1AWB has a temporary spot on 20 meters using 261A with B batts. 1AKS uses remote control with separate transmitters for 20, 40, and 80. 1BKV sticks to 20. 1ACA is again handling traffic. Things are picking up at 1IG in both traffic and DX. 1HY worked 20-AIN two afternoons in succession. 1AAG is lining up some sets which will be an IBS soon. 10G has been QRW at the Y.M.C.A. and with Radio Service work. 1LML can be found handling traffic most any night. The 160 meter band has been observed by 1BYW who has a station with n6G3. A bunch of the follow went to the Worcester Convention and had a fine time. IAXA is still working in between serious schedules. 1BZQ likes his new TP-TG circuit. 1APK kept some hours during the flood. 1FL, at request of Signal Officer, established a message center between Washington, D.C. and New York flood area for traffic, IIN, although non-Ors, sent in a good report. 1BFD participating in the East 2 West day communications school keeps his circuits quite occupied. The 60 ft. mast at 1ADM came down which handicapped activity. 1BZQ says, "Let's hope and pray that old floods next month, Hi. 1AGS works Europe and every night, every morning but he says no one has any traffic. Why don't we run some, OB? 1BMS passed his commercial license.

Traffic: 1ACH 317, 1AIG 183, 1LML 176, IKY 175, 1UE 185, 1BZQ 120, IACA 90, IAXA 64, IAGS 58, ISL 52, 1APK 50, 1IG 44, IASY 44, IADM 36, 1IN 118, 1RK 27, 1KH 25, 1ABA 22, 1YW 20, 1AGS 16, 1NK 9, 1BDV 5, 1YQ 4, 1AWB 4, 1IOG 1, 1ON 1, 1BY 1, 1BMS 1.

CONNECTICUT—SCM H. E. Nicholls, IBMB—This month another chapter in the history of our worth to the general public as amateurs in the calamity that occurred to our neighbors to the north. Many have not yet fully realized what we have done. We have many of our members who have sensed the fact that they were doing something more than just playing with a wireless set and also realized the valuable service they could render in time of emergency. We were always on the alert to perform our duty in such times as this and in that way, show that we have a real reason for existence other than our own pleasure.

1MK leads the list this month for traffic handled and reports having 17 different stations lined up for traffic. 1ATC is working consistently 20 recently and was surprised to think he could work at such a short distance on this wave. 1BMH reports that they have in New Haven handled on a little of the Vermont traffic from the flooded area and we are very glad to commend them for it. IMH says he is on the job the best of the time but doesn't seem to hear the SCM. Well, OM, be patient.

1OS reports things very FB at Danbury and turned in a good report. 1HQC is working to get all booked up and ready to go as soon as he has been moving things a bit due to cold weather. 1IV and 1ZL have been so busy at WTCC that they have been unable to work for us but hopes to soon. 1CPT and 1BWM have been keeping the other in working condition at Norwich and have maintained schedules in their area...and all are in this sector of the state. The others have been doing some good DX, 1MO is held down by business and can't keep schedules. 1BQL is doing antenna experimenting also.

Rhode Island—SCM, D. H. Fancher, 1BVW—ROCKYRAY 1111! A 1007 report again this month. Every Ors got in his report and got it in on time! That is not all either. There are two stations that are keeping busy sending the SCM their activity reports every month. And one more thing. 1CKB and 1AMU are back on the active list again.

1EL is experimenting with his gizmos. Got a good one, OM, and let's go. 1CKD has been to see with SCEP. He handled some flood traffic and QSOed some of it via Western Union. FB, OB, 1AQG is keeping all his transmitters and schedules in good shape. 1JNZ is seeing to it that all his operators are in good shape and is in this month's column. 1BZQ has covered their locations very efficiently. This is very encouraging to see the stations take the initiative in this way and we thank you fellows for doing it. IVE is handling quite a bit of the local traffic when the SCM is out for the evening and is very prompt in delivery to him. He will be an Ors very soon and has ambition for an A- Appointment. Clifford Fraser handled 79 flood messages this month.

Traffic: 1ADG 2, 1BLF 4, 1ASD 8, 1ADW 7, 1TD 10, 1AEZ 9, 1ATG 18, 1BM 20, 1BJK 22, 1ILF 23, 1BHM 26, 1IMY 27, 1BW 42, 4OS 47, 1AFB 50, 1AOF 63, 1VB 68, 1IIC 158, 1MK 266, IEE 11, IVE 76.

WESTERN MASSACHUSETTS—SCM, A. H. Carr, 1BD—IAAC is on regularly on 38 and 76 meters and handled several of the flood messages 1AAL, our former RM, has moved to 63 Calder St., Pawtucket. 1BFS is still the Ors and has Brownie as an Ors in his Section. All 1AAL's friends around here will be able to work him from now on as he is on the boat band. We all wish you the best of luck, Brownie.

Al Hyde, 1GR, 19 Caro St., Worcester will act as Sutton Ors. 1BFD reports that if you all got the kick out of the Worcester hamfests that we did. The Worcester Radio Assn. appreciates the wonderful support that all gave to the time and undoubtedly, we'll have another one.

1AJK says he will be on for the rest of the winter now. He stood 12th in the Navy Day broadcast reception. 1IAQ says that new one is easier and will pull off for a nickel. I wonder if more of you don't feel the same. 1AKR is working on all bands now and is QSO about getting things for the E's with one of the flood mages but says he was too late for the bulk of traffic when he got home. IAN says that the Ors, in general, respond to the requests and is quite a good number for a new Ors. 1ANL, 1AJK, 1BOE, and 1BQK made the honor list in the Navy Day contest. 1ADO, a non-Ors, helped us along by sending in a report. It was not that bad. He did that. 1AOH says he had a fine trip to N.B. as guest of no-IDU and got lots of big trout and plenty of fresh filet. He will be back as he is in Florida now for the winter. IAP lost about 850 worth of radio stuff in the recent floods but was enough to rig up a little nifty rig and 1WQ handled some flood mages. We wish you all a Merry Christmas and a Happy New Year.

Traffic: 1AAC 48, 1AAL 86, 1AJS 48, 1AJM 43, 1AKZ 22, 1AMS 1, 1AMZ 18, 1AMF 13, 1IALD 17, 1IAQ 4, 1APL 76, 1AQF 20, 1AQM 44, 1AWW 39, 1BJS 6, 1BD 22, 1WQ 11.

NEW HAMPSHIRE—V. W. Hodge, SCM, IATJ. More reports were due and this month than ever before; 12 stations reporting. Practically every station handled urgent traffic with stations in the Vermont flooded area.

Traffic handled and reports equal to the emergency. New Hampshire also was well represented on the Navy Day Honor Roll by 1II, 1ITF, and 1AAS. 1LAD succeeded in making the HFL in time. The morale of the members after the keeping TEN-sked days. St. Paul's School, 1IAS, is on again. 1JK and 1AVJ are on duty. 1AOV has been active.

A good report was received 1AAS and 1ANS are doing their share. 1BIK claims the low power record for N. H. by working 1ATQ in Stow, Mass. 1AOZ is working 76 and 35meter bands and 76 meters, 50 meters, and 1A60 handled some flood mages. We wish you all a Merry Xmas and a Happy New Year.

Traffic: 1AAC 48, 1AAL 86, 1AJS 48, 1AJM 43, 1AKZ 22, 1AMS 1, 1AMZ 18, 1AMF 13, 1IALD 17, 1IAQ 4, 1APL 76, 1AQF 20, 1AQM 44, 1AWW 39, 1BJS 6, 1BD 22, 1WQ 11.

QST FOR JANUARY, 1928
QST FOR JANUARY, 1928

NORTHWESTERN DIVISION

REGON—R. H. Wright, SCM, 7PP—7EO has built a regular, two-meter later on, and 7AJN and 7PF are on regular minus a few tubes. 7BX is fighting chirps. 7AKK from YL, but it's all over now so he is a brass traffic totals. Things look good up 7JF's way now. 1ST and 7ABB came to the top by keeping skeds. 7MU is a new ham, using two 216-B tubes, one 711 tube in TGTP cut. with plug in for coils on all bands. 7JO, 74CJ 35; 74Q 14; 7ABF 13; 7AEF 11; 7AKE 6; 7EO 4; 7PS 3; 7AJN 1; 7PP 1; 7NP 1.

IDAHO—SCM, H. H. Fletcher, 7ST—Traffic is coming up, fellows. Let's have a big total next month and more reporting stations than ever before. 7ST and TABB came to the top by keeping skeds. They both made the BPL. Why can't more Idaho fellows do it? 7TAJ works hard in his house and cancelled THA and THK skeds, hence the low traffic totals. Things look good up 7JF's way now but he has a bad power leak. 7ACN ops at TK and 7TAH is in the thirteenth state. 7JQ traffic works hard in his power house. 7QA-1Y says QRM from YL, but it's all over now so he is a brass pitcher again. On one occasion, he was asked to announce that MacLafertry of 7GW has moved to Walla Walla. We surely hate to lose you, Mac. He will have to go on this air this month, tho. 7TAQ is a new sin at Sandpoint. 7ACL is a new stud at Mt. Home. 7AJA is knocking holes in the ether with a UX882. 7TB and TIO are on once in a while. Many reports wired received by radio, working with a seven call. 7NP, 7AJN, and 7PF are on regularly. 7MU is a new ham, using two 216-B tubes, one 711 tube in TGTP cut. with plug in for coils on all bands.

TRAFFIC:

7ST 272, 7ABF 174, 7TH 88, 7TF 38, 7ACN 16, 7QC 16, 7YA 16, 7QA 4, 7EE 2.

MONTANA—SCM, O. W. Viers, 7AA—Things are slowly picking up during the Fall and Winter season. 7JD has been waiting for a new quartz crystal and says things won't be very lively until it comes. 7JD reports that he is so busy at college, he has no time for radio at present. 7FL reports hearing WNP but has no time to make him hit. 7VL is using a 301A on 20 with 2.2 watts input and works lots of good DX. 7PB. 7AIP is getting ready for winter work. 7AHG has his station built in Red Lodge now and wants the gang to QSO. 7APW will soon be ready to go again after his misfortune with a fire destroying his home and station. 7AAK-AKP is a flock of birds just waiting to install two new transmitters the first of the year. With a UX210 and no antenna system on the transmitter, he worked several eastern stations and received R5 to 6 reports. 7ST 372, 7ABF 174, 7TH 88, 7TF 38, 7ACN 16, 7QC 16, 7YA 16, 7QA 4, 7EE 2.

PACIFIC DIVISION

SANTA CLARA VALLEY—SCM, F. J. Quenette, S9N—6XX and 6AMA kept the P. I. route hot this month. 6BVY with 251 mags led the section but reports with regret that oplAT is leaving the field. 6AMA is clearing his PI traffic daily through several U. S. stations. 6AMA also instructs code classes at SCCARA. 6AMA is on the 750 and 800 mags were laid up all month. Glad to know you are better, OM. 6ACU has just been appointed additional OQ for the section. 6CJ reports that he may leave any time for South Africa. The section will be minus a good station when he leaves. 6AJE hooked ARCY off the coast of Africa. 6BCE will soon have his 1000 watt going. 6MF and 6BYH hope to be back on the air soon. All ORS should keep an eye on the active stations in their vicinity and recommend ORS appointment on all worthy ones.

TRAFFIC:

6BVY 251, 6AMA 148, 6BMW 33, 6ACQ 25, 6GD 2.

SAN FRANCISCO—SCM, J. W. Patterson, 6VR—6CCR has rebuilt his TPTG and is at last getting the DX gigs he has been wishing for. 6PW with two UX210s is making a lot of the 50 watt station step by step. The proud possessor of a pair of healthy 852s, his 7.5 watt set has some excellent DX to its credit. 6CK is a new comer this month, which keeps him busy elsewhere. 7JO and 7ACQ are torn between love and duty—yes and school work. 7JQ traffic and reports are getting along nicely minus a few tubes. 7BX is fighting chirps. 7TAK, a regular sked with 7TQ and 7AX. exTTO of one of the real oldtimers, has an antenna that is exposed outside the radio bug again. He will be on better call TAKQ. 7AEP and 7AJM are new hams in town and are promising traffic stations. 7EXDYYV now completes his complete set of tubes. 7MC is fighting chirps. 7AKK from YL, but it's all over now so he is a brass pitcher again. On one occasion, he was asked to announce that MacLafertry of 7GW has moved to Walla Walla. We surely hate to lose you, Mac. He will have to go on this air this month, tho. 7TAQ is a new sin at Sandpoint. 7ACL is a new stud at Mt. Home. 7AJA is knocking holes in the ether with a UX882. 7TB and TIO are on once in a while. Many reports wired received by radio, working with a seven call. 7NP, 7AJN, and 7PF are on regularly. 7MU is a new ham, using two 216-B tubes, one 711 tube in TGTP cut. with plug in for coils on all bands.

TRAFFIC:

7ST 272, 7ABF 174, 7TH 88, 7TF 38, 7ACN 16, 7QC 16, 7YA 16, 7QA 4, 7EE 2.

PHILIPPINES—Acting SCM, J. E. Jimenez, oplAT—This report received by radio from oplAT and natBIX—oplHR again easily leads the section. Skeds were kept with op, oc, oh, nu, oplDR made good traffic with nu. Skeds have been exchanged in southern waters. oplDL also made a good showing by making the BPL for the first time. oplAT hands in a good report, but in order to cut costs and have more room for DX, oplDR says "Don't fall into the fifth rate of ham radio." 6BO is doing good work now. 6OB, oplCW, is back after vacation, using 7BO, likes MOPA fine. 6CAP is using TPTG and 852 tube on 29 quite a bit. 6GS will be on soon on low power. 6BHC is on regularly and doing good work.

TRAFFIC:

6AZM 3, 6DRH 14, 6ACP 32, 6CDU 23, 6JHP 16, 6BWS 2, 6ANO 16, 6DCQ 12.

HAWAI'I—SCM, J. A. Lucas, ohbBDL—This report received by radio from ohbBDL and nat6AD—Our annual dead-air season between Hawaii and the coast is with us again. Few stations are report and traffic totals are light.

TRAFFIC:

6AVL 49, 6CFQ 38, 6BDL 15, 6DCU 14, 6DPQ 8.

LOS ANGELES—SCM, D. C. Wallace, 6AM—Traffic totals are not so good this month, only three stations make the BPL. 6BIX says that conditions have been generally favorable and traffic good. 6DJJ handled a death message from eg-5ML to Australia and keeps some good schedules. 6DXR received his ORS certificate this month and has been great in building up the progress of the Radio Conference. 6AM handled some foreign business for the National Company and worked all continents. 6CQM sends in a good total and has been busy handling some messages to the Federal Telegraph Co. oplTS says "new TP and TG circuit sure PH for DX combinations with 75." We think if more fellows would get down on 30, it would make U. S. traffic duck soup. 6BVT sends in his first report all too he has been on the air over a
year. Says he is going to report every month now.
6BVU handled a "touch" message from AC. 6BVU tried to use FCF's dope on Split Hartley for 20 but couldn't make a go of it. 6CSW got tired of 40 after two years of it and is doing 75 now. 68F is in 20 permanently now and is getting out FR. 6CZT has two powers of kind power, 900 cycle and RAC, both FR. 6DGT had his Hertz going one night when 6DZV got on and the Hertz worked, thereby proving that a Hertz is good for more purposes than just an aerial. 6DEG has a fine antenna at his new QSA and is in a good research. 6ANN says 20 traffic is picking up. 6AKW finds wx very poor for hearing DX on 30 and lower bands there on the desert. 6DOT is keeping some good skeds. 6DEH is worried about his transmits which he has rebuilt. 6CLK reports that the Whittier Radio Club has three new members. 6JS, 7AJ, 6HS. 6AM, on the road. 6HRE, 6DPY and 6SK also report. 6SK sends in a good report. His airplane QRM makes him too busy to handle traffic but he gives us some dope later on the test which they are making. 6CHY says he is going to come back with two 60's soon. 6TS is back for the east but not on. 6HIB is still operating at KEVD. 6IUB is doing experimental work around Bakersfield. 6SEK got married and has a sked for a while. YLA has captured 6AQP. 6UFX had his 21st birthday Nov. 5 and his YL, 6HXA, gave him a party. Don't forget the next banquet of the Los Angeles Section Friday, Dec. 3.

Traffic: 6BJX 859, 6DEJ 149, 6DKK 101, 6AM 91, 6AQ 66, 6CUT 49, 6IBF 49, 4EIT 45, 6HRE 44, 6DPY 43, 6CNDZ 43, 6CMQ 40, 6COT 37, 6ALR 35, 6AQR 34, 6CHD 32, 6PTS 31, 6GMY 30, 6BVT 26, 6WUM 26, 6WSW 25, 6IUB 23, 6EGR 20, 6FQJ 19, 6DFQ 18, 6EGD 17, 6NW 15, 6ANN 7, 6AKW 10, 6DG 10, 6CNJ 7, 6CLK, 4BRO 2, 6CAQ 1.

SAN DIEGO—SCM, G. A. Sears, 6IQ—6BW1 leads in traffic this month. 6AMF has rebuilt and is now using TPTG. 6BAB blew another 50 and is now on with a new ORS. 6QCT, an old ORS, sends in his first report. 6OX is anxious for more skeds north and east. 6BQ reports 80 meters fine for traffic. 6ADY 80 meters with 6EAB. 6QCT reports here on 65DBA at 10 pm Nov. 6. 6QCT is still QRW school. 6BFK is now on with 50 watts. 6SJ has moved to 6BOT and will have an ORS in the Los Angeles Section. Sorry to lose you. 6QCT now pounds brass on the SS Yale. 6BYZ is again appointed RM and ORS.

Traffic: 6IWB 16, 6AJM 81, 6BAM 55, 6DGY 32, 6WZ 23, 6BQ 20, 6DAU 20, 6DG 14, 6CNK 5, 6SKB 5, 6DFB 5, 6SJA 1.

NEVADA—SCM, C. B. Newcombe, 6DUO—6BTJ worked 19G off the coast of Newfoundland on 50 meters. 6LB, the new station at Mt. Montgomery, is now on. 6QCT, a new ORS, sends in his first report. 6OX is anxious for more skeds north and east. 6BQ reports 80 meters fine for traffic. 6ADY 80 meters with 6EAB. 6QCT reports here on 65DBA at 10 pm Nov. 6. 6QCT is still QRW school. 6BFK is now on with 50 wats. 6SJ has moved to 6BOT and will have an ORS in the Los Angeles Section. Sorry to lose you. 6QCT now pounds brass on the SS Yale. 6BYZ is again appointed RM and ORS.

Traffic: 6IWB 16, 6AJM 81, 6BAM 55, 6DGY 32, 6WZ 23, 6BQ 20, 6DAU 20, 6DG 14, 6CNK 5, 6SKB 5, 6DFB 5, 6SJA 1.

SACRAMENTO VALLEY—SCM, C. F. Mason, 6CAS—Activities are picking up. A new relay station is coming on. The Radio Club is in 20, 40, 6LB 4, 6DUO 26.

Y HAVANA—SCM, C. R. Smith, 6ABM—F. B. Rogers, 6ADK. 6ABM has taken over the old HAVANA station and is doing a good job of handling traffic.

Traffic: 6Q5T 7, 3NM 1: 3AG 2; 3BG 13; 3CA 72.

ROANOKE DIVISION

V IRGINIA—SCM, J. F. Wohlfred, 3CA. 3CA works on 50 and 40 meters mostly. 5CM operates 5CM still. 61WAW, 6CCK, reports trouble getting xmitter to work on proper waves. Don't let it flop over in the other fellow's territory. OM. 5SR says the skeds are better and the traffic total is up.

Traffic: 6KU 57; 3NM 1: 3AG 2; 3BG 13; 3CA 72.

NORTH CAROLINA—SCM, R. S. Morris, 4JR—4EC is moving. 4VR has been appointed ORS. 4SJ is moving to the country. 4TS is building a 15 watt push-pull low impedance set. 4JR has added 4EC as another 20 meter. 4EC moves to Broadfordsville to get his oscillator amplifier. 4OH says YLA are H. 4MJ is giving crystal another try but is holding his MO-FA in reserve. 4OC has had his flood traffic. 4PR and 4BX are QRV business. 4ADK is beginning to get out now. 4AGD is in his shack and going strong with two 20's. 4NH has rebuilt his set and is now using tube rectification throughout.

Traffic: 4VE 38, 4JR 24, 4FM 15, 4EC 5, 4OC 4, 4NH 4, 4SJ 3.

WEST VIRGINIA—SCM, C. S. Hoffman, jr., 6BSU—6BD—The curtain seems to have come up for the fall season, with the old spirit of activity in traffic. 6VZ had schedules with 9DTK and handling maps. 6DCM had schedules with 6CIX and KOZ. 6SCNZ had schedules with 1PE and 2LZ. 6DDN had schedules with 6ACT. 6DCM and 6DDN are giving us some help. 6DCM had a lot of activity in Wheeling with 8AUL, 8ADI, 8UBU, 8BSU, 8DPO and 8BPA on. 4CVD is QRV school. 8DPO uses 20, 40 and 80 meters. 8ADI handled a death message. 6DPO is putting in 2-825s. Glad to hear from 8CLQ. The SCM wishes to thank 8AUL, 8BD, 8ACS for their special effort in bringing out the A.B.R.L. traffic relative to the Conference and to 8AWM for his personal efforts. It is hoped that the future will bring in as good a number of skeds and amounts of traffic handled as the past month.

Traffic: 8VZ 256, 6SCN 79, 8SACZ 10, 8UBU 14, 8CLQ 15, 6DCM 10, 6DPO 7, 8AGI 2, 8BSU 2, 8DNN 1, 8ADI 1.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, C. A. Stedman, 9CAA—Work seems to be picking up at the state if the fellows only want it. The traffic men are handling them in folks now while others that have a time are doing a fine job. 9BAM broke loose this month and put himself in the lead of the section as well as in the BPL. He adds that he is a little higher total is due this coming month.

Traffic: 90Q, 9AAM, 9RJ, 9TQ for January, 1928.
and keeps things going altho he is tied up most of the time. 6CNX of Ephraim, Utah, came thru with a report for a change. FB, 7DA of Wau is stillMovie and reports are being received from active stations in Wyo. What's the matter, gang, let's see some reports from you. The SCM feels that it will be necessary for some one else to take over his job as he doesn't have time to do the thing right.

Traffic: 6CNX 59, 6AK 10, 6DPJ 22, 6RV 24, 6IAJ 49, 68TX 64, 69QL 2, 6RM 1, 6BUH 6, 6DBE 3.

SOUTHEASTERN DIVISION

LORIDA—SCM, C. E. Foulkes, 4LK—The Convention will be held at the Alexander Hotel, Jan. 19. SCM feels that as many of your followers as possible will attend as the Miami Radio Club is working hard to put this over in a big way so boost them all that you can. The SCM was very pleased to come to our fair state this month, 2KF from N. Y. C. 40Y from Spartanburg, S. C. and 4EG from S. C. Traffic was not very heavy this month but Nuns should help things along as this month has been bursting plenty of this month. He reports by WU. 400 handled some flood traffic from Vermont. 4AIO says business cuts into his shell will when he has to QRT business. Hi. 4KL has moved his shack. RL of 4LK has QKW football. 4ACZ is an old ham with a new call. 4WY has been acting as a traffic control board for 4K in regard to fading. 4MS's car got out of synchronism and jumped on him. That sure is too bad. OM. 40B has an Avisse for breakfast every morning. 4PL's sure fine business. My Ronnie Lies Over the Ocean as revised by 4TK—Bring Back, Oh, Bring Back My DX To Me. The SCM appreciates hearing from any active non-ORS, so send in your reports, OM's.

Traffic: 4CK 31, 400 21, 4AAO 24, 4KR 16, 4KL 18, 4ACZ 12, 4TR 11, 4BN 10. 4MS 6, 4OB 4, 4HY 4, 4TK 4.

ALABAMA—SCM, A. D. Trum, 5AJP—A most pleasant visit from our Radio Inspector seemed to have stimulated interest and activity this month although very few reports reached the SCM's office. 5AIX has started quite a bit of enthusiasm in Huntsville on amateur radio by putting an 885 on the air with a chem rect. 5AS reports a little slackness in his part but promises better next month. 5YB writes that the shack has been busting plenty of trouble with the note, however, its RS sie can be heard 'most everywhere. Birmingham reports a new handsomelook from our Radio Inspector. It seemed to have stimulated interest and activity this month although it reached the SCM's office.

Traffic: 5AKJ 2, 5ATB 9, 5AJY 14, 5AS 9, 5BY 54, 5AYS 14, 5AYL 23, 5ADE 10.

GA.—S. C. CUBA—SCM, H. L. Reid, 4KU—Georgia: 4GYV is doing nice work but has been too busy this month to carry on. 4RN hasn't missed out on sked with tas-AG since Aug. 4TO went to Birmingham Thanksgiving Day and then went to a party at the 5's. South Carolina: 4KZ at Greenville, turns in the only report for this state this month.

Traffic: 4TO 20, 4RN 18, 4KZ 2.

WEST GULF DIVISION

NEW MEXICO—SCM, L. E. Radka, 5TT—Four stations reported this month and traffic is picking up. 5APB is troubled with a bad power leak but managed to keep this month in traffic and handling. He hopes to tear holes in the ether with a new 75 watt. 5TV is a new station at Des Moines and reports for the first time this month. FB, OM, as we need more stations to keep things moving in this section. 5BH is the second to receive a 1RO has a schedule with 62D and is handling traffic for a change.

Traffic schedule is also being arranged with 9EAA, 5TT and 5L6 will have the college station on the air before the Christmas holidays.

Traffic: 5APB 17, 5TV 13, 5BH 12, 5BO 7.

SOUTHERN TEXAS—SCM, F. A. Sahn, 5K—Activity does not seem to be as great as could be expected this time of the year or around Christmas. Reports do not show it. 5ALA has changed his QRA back to Miranda and says that he will be going full blast at that place in a few weeks. 5AHF turns in a good report as usual. 4MS has shipped his QRS on the sea the winter and hopes to be on again in a few months. Our proximity to the Gulf causes a large number of our hams to become commercial operators and always remain faithful amateurs. 5PK is another one of our boys that has gone to sea. He will be on the Bussom when he gets back to the world. 4KW will report what 5PK is doing from time to time. FB, OMs. 5OR also writes that he is shipping out to a Mexican port and had trouble getting equipment for his set after burning some of it but he will be on strong again in a few weeks. The Bexar County Radio Club is rigging up a transmitter. They have it almost completed. This report was sent in by Fred Kush, the President. Traffic: 5ALA 5, 5AHF 7.

OKLAHOMA—SCM, K. M. Ebret, 5APG—The South Gulf Division is at last to have a Convention of its own. On Feb. 10 and 11th the first Gulf Div Convention will be held with full program of lectures, prize contests, discussions and stunts. Plan to be there, fellows. Any information regarding this may be had from the Section Communications Committee, who will see that your inquiry reaches the committee properly. interest is picking up with the return of 5AMO, 5PJ and 5AEO. A piece of glass the size of a quarter jumped out of 5DQ's 60-watter and he is too sick to report. 5ADO has never been right since he returned from Borger. 5ANL has rebuilt his xmitter commercial style using two 74A waiters and is keeping most of his schedules in fine style. 5ABO still working 180-meter tone and keeping skeds with 5ARX and 5BZL. 5YH keeps skeds with 5PJ and 5ANT and reports excellent reception from a new ham soon. 5AIR reports tfc total coming in on keeping skeds with 5FJ. 5AQB and 5NC. 5ARX is back on the air and 5AXG has increased his power. 5FJ is going strong on traffic, operating every afternoon and keeping skeds with 5ANT, 60D, 5AMD, 5AIR and 5OH. 5ANT is doing his stuff on skeds and also DX. 5AKA has been messing with TLC sets in Tulsa but promises to come home like a good boy and pound brass again. 5QL has at last become infected with the crystallita germ and handled some traffic when it was pushed on him. 5SW working DDX has a goosetip at times and challenges all comers for traffic. 5ADA has put away his dynamotor and gone back to the old reliable chokes. 5QLA has the latest ham, boasts of fine DX, having worked OA and OZ with RS report. Robert Troy, an amateur enthusiast of long standing and a 7TA and with his trusty 3/4 watt, is doing nicely. 5AJP is on very little account of pressing business.

Traffic: 5ATJ 2, 5ATB 9, 5AJY 8, 5AS 9, 5BY 54, 5AYS 14, 5AYL 23, 5ADE 10.

CANADA

PRINCE EDWARD ISLAND—SCM, F. W. Hynd- man, 1BZ—1AP has changed his QRA to Summerside. P.E.I. 1AA in Charlottetown is on the air again. 1TV, 1W can be reached at least December. ICO is moving to the third district.

Traffic: 1AP 31, ICO 17.

NEW BRUNSWICK—SCM, T. B. Lacey, 1EF—There has been considerable air in amateur activities in this province this past month. Many stations which have been more or less dormant this month have FB, OM, as we need more stations to keep things moving in this section. 5BH is the second to receive a 1RO has a schedule with 62D and is handling traffic for a change. There are three new amateur licenses issued for

QST FOR JANUARY, 1928

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VANALTA DIVISION

BRITISH COLUMBIA—SCM, E. S. Brooks, 5BJ—5AL takes the cake this month with a traffic report of 40. He keeps two skeds and uses an ancient VT2, 5GO has been appointed OBS for this section and will broadcast on 402 until further notice. He has quit 40 and is now using 80 exclusively. 5CT tries all bands and keeps skeds with 5AL on 80. He worked 1AP on 52.

SASKATCHEWAN—SCM, A. H. Asmussen, 4GT—Three newcomers were successful with their exams in Calgary and will be on soon. 4CO is not on yet. 4CL is QRM. 4IO is on with a quart bottle. 4IB has a new outfit with more power and is doing nice work and may be our best DX station. 4JJ is contemplating a big JUG, more power to you, OM. 4AL has moved his xmitter to the Lakeshore. 4HA has a big alick and says there is nothing like it.

ONTARIO DIVISION

ONTARIO—SCM, W. Y. Sloan, 9BJ—There is a slight increase in activity, especially on 525 meters. On 20 meters there seem to be four stations in this division that are not on the air yet. IAD has just got back from New York and Montreal—we learn that his financial affairs was absorbed by some friendly DX hound and he returned on 15 meters and has moved in from the bush to St. John city and is erecting a new antenna system and hopes to be on the air soon. His skeds don't seem to get out of his back yard and he finds it hard to QSO anybody, even locals. He is putting in some additional cutout希望 he will be able to get DX this year. 1AK is on every day and has handled quite a number of QSOs this month and has been QSO as 4AL. 1AXX on 20 meters had a lot of schedules this month but didn't finish them up on account of blowing his tube while working no-IAM who pretty near lives next door.

Traffic: 1AX 42, 1AK 49.

QUEBEC DIVISION

QUEBEC—SCM, Alex Reid, 2BE—There have been more stations on this division than ever before and it is very encouraging to see the boys showing such pep: there are a number of skeds being kept and several tops are wonderful work with his liver, having worked all U. S. districts, 5ED, the station of the Toronto Central Tech. School, is on the air and is operated regularly during noon hours from 12 to 1 o'clock daily on 40 meters. 3BK has been on the air quite regularly keeping a schedule with 5ED at Montreal. 2AZ is also a sked with 4VW at Winnipege on 525 meters. 3BJ has been in active operation this month mainly on 525 meters where the station gets in in a pretty good shape. A schedule is being kept with 2AL in Montreal on that wavelength, 9AL has heard wounding away on 42.5 meters crystal-controlled also on 40 meters and 3FC has done very little in the way of operation as he gets enough brass-wounding at 9AL. 5DB has been on occasionally mostly weekends. 3CW has been playing with antennas and has decided that he prefers the antenna and counterpart. 3EQ reports that he is beginning to reach out using 290A tubes on 80 meters. K-ent at it, OM. 3BG is also on 40 meters and is looking for contacts. 3DV has rebuilt and is getting good results on 40 meters. Southern Dist: 3DF has put in a new thing and his antenna system is very pleased with it, having worked much good DX since its erection. 3IA has completed his re-building program and is all set now for some DX. 3CH has been trying to persuade his set to work on 525 and is staying with it until he does. 3FU and 3DT in the district.

Eastern Dist: 3MP is our only reporting station in the East and he is doing very fine work on 29 meters. He is also interested in 825 meters and says that he will be reporting on that wave also.

Northern Dist: 3HP has been as usual on 29 and 49.45. He says that of late, DX has been very good and he has been getting many English reports.

Traffic: 9AL 17, 3CC 91, 3CS 26, 9BJ 20, 3DY 19, 3FC 17, 3BK 14, 3HP 34, 3AZ 6, 3CR 6, 3RL 5, WGN 4, 3IN 3, 3RT 2, 3DV 5, 3EL 1.

ONTARIO DIVISION

ONTARIO—SCM, W. Y. Sloan, 9BJ—There is a slight increase in activity, especially on 525 meters on Prayer Meeting nights. Central Dist: 3CJ has been forced to keep rather late hours lately owing to the ardent activities of his RCCL, friend and he has managed to send around some wonderful work with his liver, having worked all U. S. districts, 5ED, the station of the Toronto Central Tech. School, is on the air and is operated regularly during noon hours from 12 to 1 o'clock daily on 40 meters. 3BK has been on the air quite regularly keeping a schedule with 5ED at Montreal. 2AZ is also a sked with 4VW at Winnipeg on 525 meters. 3BJ has been in active operation this month mainly on 525 meters where the station gets in in a pretty good shape. A schedule is being kept with 2AL in Montreal on that wavelength, 9AL has heard wounding away on 42.5 meters crystal-controlled also on 40 meters and 3FC has done very little in the way of operation as he gets enough brass-wounding at 9AL. 5DB has been on occasionally mostly weekends. 3CW has been playing with antennas and has decided that he prefers the antenna and counterpart. 3EQ reports that he is beginning to reach out using 290A tubes on 80 meters. K-ent at it, OM. 3BG is also on 40 meters and is looking for contacts. 3DV has rebuilt and is getting good results on 40 meters. Southern Dist: 3DF has put in a new thing and his antenna system is very pleased with it, having worked much good DX since its erection. 3IA has completed his re-building program and is all set now for some DX. 3CH has been trying to persuade his set to work on 525 and is staying with it until he does. 3FU and 3DT in the district.

Eastern Dist: 3MP is our only reporting station in the East and he is doing very fine work on 29 meters. He is also interested in 825 meters and says that he will be reporting on that wave also.

Northern Dist: 3HP has been as usual on 29 and 49.45. He says that of late, DX has been very good and he has been getting many English reports.

Traffic: 9AL 27, 3CC 92, 3CS 26, 9BJ 20, 3DY 19, 3FC 17, 3BK 14, 3HP 34, 3AZ 6, 3CR 6, 3RL 5, WGN 4, 3IN 3, 3RT 2, 3DV 5, 3EL 1.

XVI

PRAIRIE DIVISION

ASKATCHEWAN—SCM, W. J. Pickering, 4FC—B. Fischman at Bateman is now working a fed 210 on 6 meters under the call of 4IC. 4IB reports rotten on 825, 4FC has put in remote control on his transmitter thereby saving on coal-oil consumption. 4IC is still going strong on 29 meters. 4HS is getting out on control on 20 and 40, and has 2000 volts on his UX-852. 4IY and 4HS has great rag-chewing party at 4HS shack on Oct. 4IY has got out, but is always on Wed. nights on 525 meters. 4AS is kicking out FB and 4AO is so busy trying to find a good QRA, hes out of RB, as he would like to.

Traffic: 4AF 9, 4GL 7, 4HA 2, 4FF 2, 4GT 5.

MANITOBA—SCM, Acting, D. B. Sinclair, 4TF—DX seems to be the most important activity in the province lately. 4BD's 250 is working FB. 4DF was QSO WNP and CT-CTO. 4IP and 4CT are new hams and get out well. 4EH has rebuilt and runs his set by remote control and has worked WN4 and W6T5. 4KF has moved and seems to get out much better. 4IV is on again, though on the road much of the time. 4FT says too QSO to start out again. 4JS is not a true amateur station.

Traffic: 4HE 8, 4IC 4, 4BP 3, 4CT 7, 4VF 3.

The first licensed station in Japan is a JXAX, which uses 10 watts antenna input on 38 meters. Mr. Kasahara, who sends this information, tells us that up to the time JXAX was licensed, all amateur bands in Japan were boot-leg. He also says that J1ZB and JMPR are the calls of the Inspector's watch outfit, and is not a true amateur station.

By radio from 1FW and 1BDI comes the news that the "beauty" of Mexico fanned to Manchester, Conn., for some time, using the call 1BIK. At the present time he is on a tour to Florida, carrying a portable outfit under the call WZ2A. Daily at 5 and 9 PM EST, he sends a TR transmission back to Bridgeport. He uses the upper end of the forty meter band.