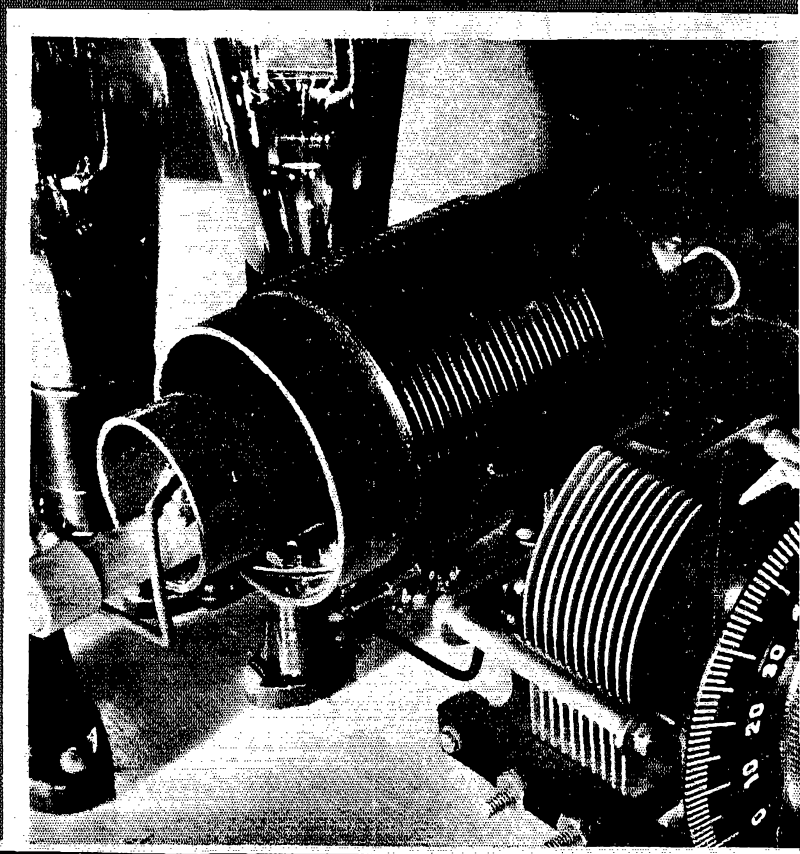


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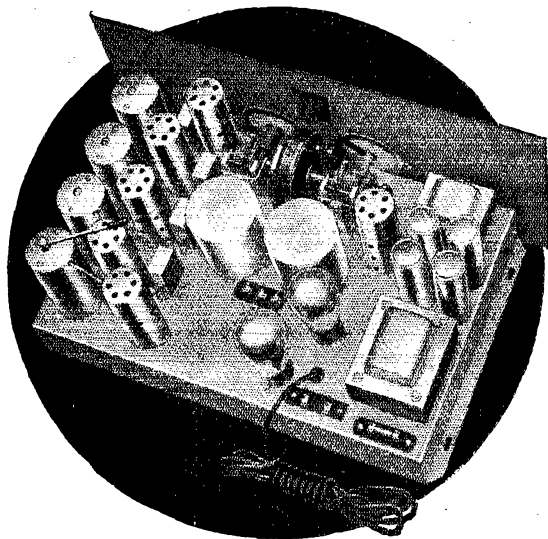
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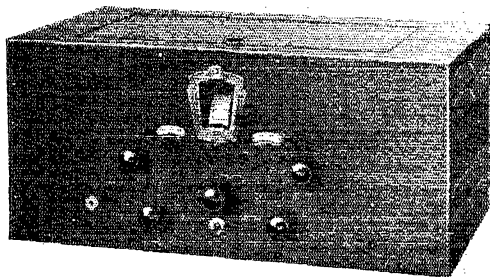
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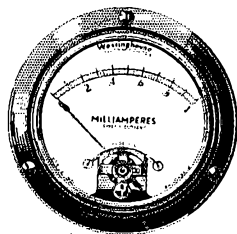
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# QST

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

devoted entirely to

## AMATEUR RADIO



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AUGUST  
1933

VOLUME XVII  
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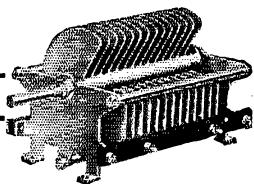
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# The American Radio Relay League



• 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 prerequisite. Correspondence should be addressed to the Secretary.

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# THE EDITOR'S MILL

AN IMPORTANT contribution to amateur radio is occurring in Chicago this year. A large group of local amateurs representing *World's Fair* all the affiliated clubs in the vicinity, under the chairmanship of Section Communications Manager Fred J. Hinds, is making a monumental effort to display amateur radio to the visitors at *A Century of Progress*. Crack stations on c.w. and 'phone are in operation for the public to see, and local 5-meter communication as well. There is a comprehensive exhibit of manufactured amateur apparatus, an historical display of famous amateur gear, attendants constantly on hand to tell the visiting public about amateur radio. For visiting amateurs there is a club room in which to meet the gang and chew the sock, an opportunity to see what will doubtless be this year's most famous amateur stations, and during August a bang-up ham convention.

All of this has required a tremendous amount of real hard work. Those of you who have served on committees to stage an ordinary convention know what a job it is. This affair lasts for five months and, what with the months of preparation and the clean-up effort at the end, several dozen of the best Chicago amateurs will have devoted themselves for over a year to this opportunity to display amateur radio to the public and to hold open-house for the visiting ham! It is truly a notable achievement, one for which we must all feel grateful to the Chicago fellows. The combination of this exhibit, the convention, and the fair itself should be irresistible to every amateur who can visit Chicago this summer.

WE EXPECT that in the near future there will be some interesting changes in amateur regulations.

**New Regulations** The Commission is contemplating inaugurating the long-obvious economy of combining amateur station and operator licensing, as we have long urged.

This was impossible when these functions were in the hands of separate establishments, with the licenses issued each with no particular respect to the other. Now it is only logical that they be combined, with a single application form, a single examination, and a single resulting document that not only attests the authority of the holder to maintain an amateur station but also authorizes him to operate it or any other amateur station. From our standpoint the plan will have much to recommend it. For the average amateur it is absurd to have these interdependent licenses expiring at different times with the constant annoyance of new applications to file, "affirmative showings" to make, and so on. The single

three-year document, which A.R.R.L. proposed to the Commission some time ago, should make an immense saving of time and administrative effort for the government, of time and annoyance for the amateur.

League officials have been in close touch with the administration during the development of these plans. It is too early to outline them in detail but we may expect in them no lowering of the standards of amateur radio; rather, improvement should result. Although every branch of the government is trying these days to simplify procedure and save money, the League knows that any dropping of the bars would work serious injury upon amateur radio. We stand for the personal examination of applicants, the passing of an honest test of qualifications, demonstrated code knowledge by every amateur, enforcement of reasonable regulations.

With so many of us on the air, there is nothing else to it: we must have a reasonably high standard. Things are looking up a bit in that respect. We believe that prospects are now excellent for a somewhat more rigid examination of qualifications than we have had in the past and for some visible cooperation from the government in the policing of our bands against flagrant abuses.

It may also be said that the Commission views with favor the A.R.R.L. Board's proposal for opening some more territory to 'phone and for modifying the regulations governing plate supplies, and we may expect some such amendments to be announced in the near future, possibly at the same time as the changes in the licensing procedure.

It is altogether likely that, when we get new licensing regulations, they will provide that every licensed amateur is automatically

**Portables** authorized to operate a portable station under the same call as his normal station, complying only with some simple rules when in the field. We have made an interesting discovery. There are something like 37,000 amateur station licenses in existence in the United States now. Of these, approximately 10,000 are for portable stations! The answer, of course, is 60-megacycle work. We knew there was immense interest in 5-meter experimentation but we had no idea it reached these tremendous proportions. Our perplexity that membership in our League was not growing as rapidly as the list of licensed stations is now answered and offset by the great pride we can take in this demonstration of the way amateurs tackle a new field. It's a healthy sign and shows that we are continuing to live up to our traditions. Certainly we ought to get somewhere this summer in 5-meter work with 10,000 portable licenses in existence!

From the government's standpoint these separate licenses for portables are sheer duplication of administrative work. Since an amateur ticket does not license specific equipment but only authorizes the holder to do certain things in return for his assumption of responsibility and demonstration of ability, there is no good reason for not combining the right to have a portable with the license for a permanent amateur station. A simple rule for identifying the transmissions of the portable station in fact makes possible the simultaneous operation of a portable and a permanent station under the same call, perhaps indeed communicating with each other. We are all in favor of this simplification. A.R.R.L. for years has preached at Washington the principle that an amateur applicant ought to be adequately tested as to his capabilities, made to assume full responsibility under law and regulations, and then given blanket authorization to do everything permitted an amateur without any stipulations of apparatus and with a minimum of procedural red tape. The right to operate a portable station, provided only certain special rules are complied with, ought to be included.

BECAUSE the Commission has not had the funds and personnel to examine the holders of temporary amateur operator licenses within the one-year life of such ticket, they have again had to resume the practice of renewing temporaries pending examination. Although our League believes that the "temporary" is much abused and that many a punk is hiding behind a temporary who ought to be ferreted out and either made to qualify or get off the air (and we have campaigned to that effect for several years), we have recently been obliged to defend the other

### Temporaries

## Message Reception Solution

ONE of the six stations (W7DEF, W8GHI, W6ABC, W9JKL, W5MNO, W7PQR) received the message. They will be listed and all but one eliminated.

The message was received at 10.01 AM, since the problem states that it was received while W5MNO had the curtain down to keep the sun out of his eyes. Therefore, since W7DEF worked every day in a shoe store, he could not have received the message. That eliminates W7DEF.

W8GHI was only on the air from 9 to 11 PM every night, therefore he could not have received the message from W7DEF because the message was sent in the daytime. That eliminates W8GHI.

The message was sent at 10 o'clock and received at 10.01, a total elapsed time of one minute, or a speed of 30 words per minute. Since W6ABC couldn't copy over 15 words per minute, the speed of the message eliminates him.

W9JKL was near sighted, therefore he couldn't have noted the time across a room. That eliminates him.

W5MNO was in bed eating crackers; so he couldn't have received the message.

side of the fence and say to the Commission that if they are unable to provide examinations within a hundred miles of the holder during the life of his license, they must renew it. Otherwise many a deserving amateur would be driven from the air through no fault of his own.

We also discovered that some of the inspectors were telling applicants for temporaries that they were not entitled to them because a little later in the summer, say in the next three or four months, there was going to be an examination within a hundred miles and the applicant could then appear — in the meantime doing without. As a result of our pointing this out at Washington, a 30-day limit has been placed on this practice. That is to say, if there is to be an examination within 100 miles of the applicant within the ensuing month, he is told to wait and appear for examination; otherwise, he is eligible for his temporary.

IN ADDITION to *QST* and the *Handbook* the League has produced this year a couple of booklets which

**A.R.R.L. Booklets** we believe will be found most instructive and valuable. We intend before the year is out to produce a few more in a series which is now getting sufficiently extensive to be called a "Radio Amateur's Library." One of the important functions of A.R.R.L. is to make absolutely-reliable information available to its members at nominal cost. In preparing these booklets it will be our policy to select subjects upon which further light is badly needed, to give them complete treatment to an extent impossible in the pages of *QST* or the *Handbook*, and to sell them at nominal prices. We hope that you, the gang, will find them well worth while and by your support make possible the continuation of the series.

K. B. W.

The remaining station, W7PQR, received the message because he was out of a job and could be on the air at the proper time with no restrictions to prevent him from doing the receiving.

## For Our Foreign Readers

To those of you who use the British Pound Sterling as a basis of remittance, we are glad to report that, as not for many months past, the rate of exchange covering remittance to the United States is again favorable. As we go to press with this issue of *QST*, the pound is practically at par at \$4.86. We believe that this will be good news to our many prospective new members, and particularly to those who have let their A.R.R.L. membership-*QST* subscription lapse because of the then-existing exchange ratio.

# A Simple 1750-Kc. Auxiliary Transmitter

A Set for Old-Timer and Novice Alike

By George Grammer, Assistant Technical Editor

**A**LTHOUGH the impression seems to be prevalent that simple little 1750-kc. transmitters are intended solely for beginners, they have their place in the Old Timer's scheme of things, too. There are times when the chase for bigger and better DX begins to pall, when the vagaries of transmission conditions in our long-distance bands become tiresome; times, in fact, when it would be a distinct relief to sit down to the set knowing that the hurry and bustle and QRM would be absent and a CQ would bring an answer from some one — perhaps but a few miles away, perhaps a hundred — who would have the time and the inclination to do a little rag-chewing. In other words, there occasionally comes over most hams a desire for peaceful companionship, far removed from the strain of battling in the noisy traffic of our more populous bands. To confirmed c.w. men who own no microphones and have no wish to sit in the high places customary for satisfactory five-meter work, there is only one possible answer — the 1750-kc. band. The c.w. territory in that band offers just the right atmosphere.

No doubt the reason why there is less c.w. utilization of the 1750-kc. band is that most amateurs build their transmitters for maximum effectiveness on the higher frequencies. Crystal sets usually start out with 3500-kc. crystals, and it is a nuisance to provide additional coils and change them for occasional 1750-kc. operation — besides, another crystal would be needed. Self-excited transmitters for the higher frequencies usually have tank coils made of copper tubing, which material, if used for 1750-kc. coils, becomes cumbersome. Most of the bother can be avoided by building a separate low-power set for 1750 kc. only. Since tubes and parts are inexpensive — and comparatively few parts are needed — the cost will impose little strain on any pocketbook. The set can be fed from the regular transmitter's power supply.

A suggestion for a simple "auxiliary" 1750-kc.

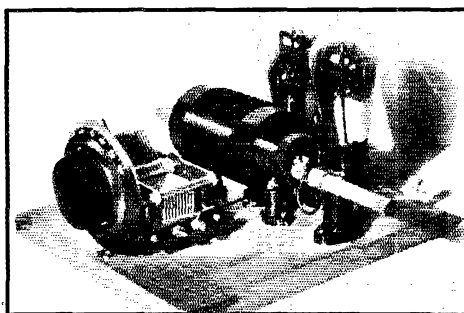
transmitter is shown in the photographs. The circuit, a chokeless push-pull Hartley with series plate feed, is given in Fig. 1. Although not at all difficult to build and operate, the set has an output of about 20 watts and, with a well-filtered power supply, gives a note which should satisfy the most exacting. One of the features of the design is that no adjustments need be made to the oscillator; the circuit values have been chosen so that the tubes are properly excited and operate efficiently. There are only two tuning adjustments to be made — oscillator frequency and antenna coupling. Furthermore, the transmitter will operate nicely if one tube is removed; in that case it becomes merely a series-fed Hartley oscillator. The output power will be reduced under those conditions, of course.

## HOW TO BUILD IT

The baseboard on which this particular oscillator has been laid out measures nine inches wide by ten inches deep. The tuning condenser, a Cardwell Type 123-B, is set at the front center, mounted on a pair of small metal angles. Immediately behind the condenser is the tank coil, which is bolted to a pair of small porcelain stand-off insulators (the No. 22 size made by E. F.

Johnson) suitably spaced on the baseboard. The coil is wound on bakelite tubing and has 22 turns of No. 12 enamelled wire, the turns being spaced out with heavy string to make the total length of the winding  $2\frac{1}{2}$  inches. The ends of the coil are held in place by short machine screws passing through holes in the tubing. After the coil is finished it should be given a coat of clear lacquer or collodion to hold the turns in place and to keep out moisture.

The stand-off insulators on which the tank coil mounts are also pressed into service as terminals for the tank connections (short pieces of copper strip inside the tank coil connect the ends of  $L_1$  to the insulator studs) and as part of the supports for the grid condensers,  $C_2$  and  $C_3$ . The ends of these condensers facing the rear edge of the board



AN INEXPENSIVE PUSH-PULL 1750-KC. TRANSMITTER FOR LOW POWER

*This chokeless circuit uses the minimum number of parts for successful operation.*



also are supported on small stand-off insulators so that the condensers are held firmly in place and cannot vibrate. The plate by-pass condenser,  $C_2$ , is fastened to the baseboard by wood screws and is midway between the two grid condensers. The two grid leaks,  $R_2$  and  $R_3$ , have their pigtails clipped short and are soldered in place between the rear terminals of  $C_3$  and  $C_4$  and the rear terminal of  $C_2$ . From this point a wire goes directly to the center-tap resistor,  $R_1$ , and thence to a clip connector on the rear edge of the baseboard. A plan view photograph shows these connections perhaps more clearly than they can be described.

The connections from the plate terminals of the tube socket to the ends of the tank coil are crossed over as shown in the photograph. To keep the wiring from getting too "bunched up" it is well to put the tube sockets in the positions indicated. In other respects it is hardly likely that differences in lengths of leads which theoretically should be balanced will have any appreciable effect on the operation of the oscillator, particularly at this comparatively low frequency. The filament connections have been kept at the rear in this layout so the wiring will be separated from the r.f. circuits. The positive plate voltage terminal is connected to the center of the tank coil and the front terminal of  $C_2$  by a wire which runs under the baseboard. The "minus-B-key" terminal is not connected to anything in the set; it is there simply for convenience in making the external connections.

The remaining point of interest in the transmitter is the method of coupling to the antenna. Variable coupling is secured by sliding a coil of small diameter in and out of the tank coil—

this job. The clamps are mounted on somewhat larger porcelain stand-off insulators which also serve as the antenna and ground terminals, being connected to the ends of the coupling coil by short pieces of flexible wire. Note that to secure maximum variation in antenna coupling  $L_2$  should

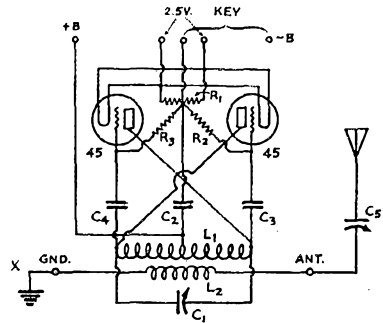


FIG. 1—THE PUSH-PULL SERIES FEED HARTLEY CIRCUIT USED IN THE 1750-KC. TRANSMITTER

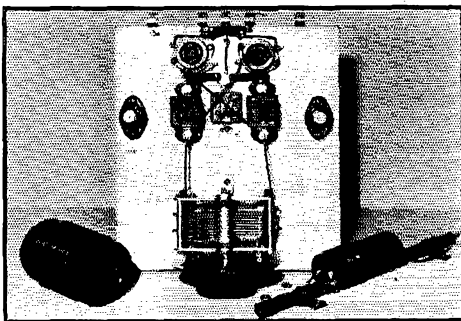
- $C_1$ —500- $\mu$ fd. variable condenser (Cardwell 123-B).
- $C_2$ —0.02- $\mu$ fd. mica condenser (Aerovox Type 1450).
- $C_3, C_4$ —0.001- $\mu$ fd. mica condensers (Aerovox Type 1450).
- $C_5$ —250-500- $\mu$ fd. variable condenser, any type.
- $R_1$ —20-ohm center-tapped resistor.
- $R_2, R_3$ —100,000-ohm, 2 watt resistors, non-inductive (I.R.C.).
- $L_1$ —22 turns No. 12 enamelled wire on  $2\frac{1}{2}$  inch bakelite tube; turns spaced with string to make length of winding  $2\frac{1}{2}$  inches.
- $L_2$ —20 turns No. 16 enamelled wire on  $1\frac{1}{2}$ -inch bakelite tube; no spacing between turns.

not be in the center of the sliding system but must be set off at one end as in the photograph.

#### TUNING

If the coil specifications have been followed exactly and the same type of tuning condenser is used, the 1750-kc. band will be found in the vicinity of 75 percent of the full capacity of the condenser. In any case, however, it will be necessary to check the frequency by means of a calibrated monitor or frequency meter. The first step in the tuning process is to set the frequency inside the band with the antenna coupling very loose; that is, with the coupling coil pulled out as far as it will go. The rest of the procedure is simply a matter of tuning the antenna system to resonance and determining the degree of coupling which gives the greatest power output with good frequency stability. The tuning method will of course depend upon the antenna system in use.

It is an easy matter to get in the 1750-kc. band if one has a regular 3500-kc. Zepp antenna, the length of which ordinarily will be between 125 and 132 feet. Provided the feeders are not more than a half-wave long (approximately 65 feet) the two feeders may be tied together at the station end and connected to a tuning condenser,  $C_5$ , having a maximum capacity of 250 to 350  $\mu$ fd. One of the regular feeder condensers will



THIS VIEW SHOWS SOME OF THE LAYOUT DETAILS

The construction of the antenna coupling coil and its dowel mounting also is shown.

a method reminiscent of the loose-couplers of long ago. The coupling coil is wound at one end of a piece of bakelite tubing which is bolted to a half-inch wooden dowel arranged to slide back and forth in clamps made from half-inch-wide brass strip. Towel rod clamps would do nicely for

do. The rest of the circuit will look like the antenna circuit in Fig. 1, with one end of  $L_2$  connected to ground — a cold water pipe, preferably. A radio-frequency ammeter or small auto head-light bulb can be inserted in the ground lead at "X" to indicate maximum current.

Alternatively, a second wire approximately 120 feet long may be substituted for the ground connection, with perhaps better results, especially if it is difficult to secure a low-resistance ground. If the regular antenna is not a full 3500-kc. Zepp, it may be necessary to use a different method of tuning. In that case the essential thing is to be sure that the total length of wire used (feeders tied together count as one wire) should be about 125 feet, including the length of the ground lead. If this condition can be fulfilled series tuning can be used just as shown in Fig. 1. If the total length of wire is less than 125 feet, however, it may be necessary to cut out the tuning condenser and tune the system by means of a tapped coil which replaces  $C_2$ , thus raising the fundamental wavelength of the system. As a general rule it will not be difficult to arrive at a combination which can be tuned to resonance with the oscillator.

While adjusting the coupling and antenna tuning for maximum antenna current a constant check should be kept on the frequency and the note. Tightening up the coupling is likely to affect the constants of the oscillator circuit to an extent sufficient to shift the frequency considerably, and  $C_1$  should be readjusted should this occur. The coupling should not be too tight because a swinging antenna will cause the frequency to waver and make the signal difficult to read. The monitor will tell very accurately just how far one can go in taking power from the transmitter.

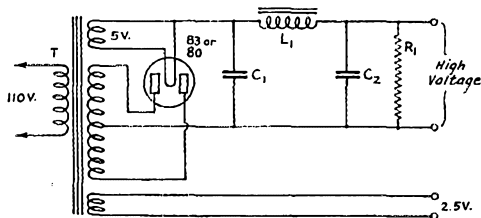


FIG. 2 — SUGGESTED POWER SUPPLY CIRCUIT

T — Receiver power pack transformer delivering 2.5 volts at 3 or more amps., 5 volts for rectifier tube, and having a high-voltage winding for 350 volts each side center tap.

$L_1$  — 30-henry, 100-ma. filter choke.

$C_1, C_2$  — 8- $\mu$ fd. 500-volt electrolytic condensers.

$R_1$  — 25,000-ohm, 25-watt resistor.

It is helpful to have a milliammeter in the plate lead so the plate current can be read. If the oscillator has been built according to instructions, the plate current with the antenna disconnected will be about 20 milliamperes with 400 volts or so on the plate; with the antenna coupled the plate current should rise to 80 or 100 mils.

## FOLLOW THE SPECIFICATIONS

It should be borne in mind that the circuit specifications given in Fig. 1 have been worked out for Type 45 tubes and they should be followed exactly if the set is to work well. The grid-coupling-condenser and grid-leak sizes have been determined experimentally to give the right amount of excitation and the right operating grid bias. Tubes with different characteristics than those of 45's will not necessarily work with the same values. Type 10 tubes, for instance, would require lower-resistance grid leaks, and this in turn might mean that grid r.f. chokes would be needed to prevent undue loss of excitation in heating of the leak resistors. Use the 45's.

It might also be mentioned that the design of this transmitter is not especially well adapted to quick band-changing, nor is it certain that the same grid condenser values would work well on higher-frequency bands. As pointed out in the beginning, the set is an easy-to-build and inexpensive outfit to be used as an auxiliary transmitter or perhaps as a "first" set for a beginner who wants to get started on 1750 kc. Other designs, already described in *QST* and in the *Handbook*, are better adapted to high-frequency work.

## POWER SUPPLY

A final word about power supply should be in order. Any well-filtered supply capable of delivering 100 milliamperes at 350 to 400 volts will be satisfactory. It should not be much greater than 400 volts because the operation of the tubes is likely to become unstable. Good regulation is an advantage. If the regular transmitter power supply voltage is too high — generally the supply for the oscillator and buffer stages in a transmitter will do a good job — a power supply may be made quite cheaply from broadcast receiver parts. Fig. 2 shows the wiring of a typical power supply which will be entirely adequate.

Since it's easy to do, why not give 1750 kc. a buzz occasionally? Get acquainted with a new bunch of fellows — it's worth while. And, looking at the thing from another angle, it may actually be necessary to have a 1750-kc. set this coming fall and winter for traffic handling over moderate distances when the peak of the sun-spot cycle washes out "local" work at night on the 3500-kc. band.

## Northwestern Division Convention

Hotel Imperial, Portland, Ore.,

August 18th-19th

**S** PONSORED by the Rose City Amateur Radio Club the convention this year has been prepared with the idea of giving full value to those attending with a good program from beginning to end. The fee is \$4.00; ladies, \$2.00. Write to R. C. Ripke, Secretary, Room 615, Imperial Hotel, Portland, Oregon, for further information.

# New Pentagrid Tubes and Coil-Switching in the Amateur-Band Superhet

Constructional Details of an Economically Designed Receiver

By H. B. Allen, Jr., W3BJM\*

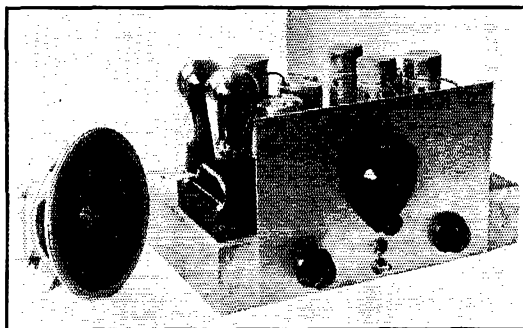
**T**HE practically universal acceptance within the last year of the superheterodyne type receiver as the standard for amateur work represents a new phase in amateur communication. The regenerative autodynes even when they are tuned radio-frequency receivers have, more or less, outgrown their usefulness. Present conditions demand the receiver which combines ease of operation, high sensitivity, a high order of stability and, above all, selectivity. The superheterodyne fills these requirements admirably, indeed so much better than our "pets" of yesterday that comparison is out of the question.

When the receiver about to be described was in the process of design, it was decided to see just how inexpensive a handband superhet could be made without sacrificing, in any way, the desirable features mentioned above. Several receivers were assembled using the more promising variations in circuit design. A final model was then built combining the most desirable features and at the same time those parts were omitted which were found to contribute nothing to the ultimate performance. The result is a receiver whose cost is surprisingly low and whose performance is of a really high order.

Essentially it is a compact, single-dial control superheterodyne for both 'phone and c.w. that makes six tubes do the work of eight and incorporates a pre-selector to minimize r.f. image interference. Built around the 2A7 tube, it employs this new pentagrid as combined oscillator-first detector, 58's in its two-stage i.f. stages, another pentagrid as combined second detector-beat oscillator, a pentode power output tube and

a power supply rectifier. Another departure from the conventional is the elimination of the familiar plug-in coils. A switching arrangement allows the user to listen back and forth on two bands at will by the mere flip of a knob on the panel. The inclusion of more than two bands in such a receiver was felt to be unwarranted in view of the

almost universal habit of one- or two-band operation in the average station and the additional cost and complication which would be inevitable with switching to cover everything with band-spread tuning.<sup>1</sup> Provision could be made, however, for a switching arrangement to cover a greater number of bands or even for complete coverage from 15 to 200 meters.



AMATEUR TWO-BAND OPERATION ON C.W. AND 'PHONE, WITH SIX TUBES DOING THE WORK OF EIGHT

Interesting features are two-range coil switching with band-spread tuning, pentagrid first and second detectors, simplified economical construction. The vernier dial is the tuning control, with the combined volume control and power switch lower left, the coil switch lower right, and the c.w. beat oscillator and "B" supply switches lower center.

## THE HIGH-FREQUENCY CIRCUITS

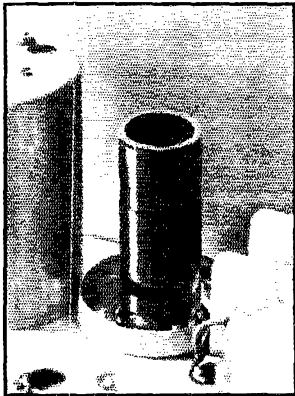
The carrier circuit, that portion of a superheterodyne receiver which is tuned to the frequency of the desired incoming signal, is unique in design in that the antenna, pre-selector and first-detector coils for the two bands are all wound on the same form. The antenna coil is located at the center with a pre-selector winding (one for each band) on either side of it, and the corresponding first-detector coils placed near the extremities of the coil form. In other words, the pre-selector coil for each band is between the antenna coil and the first-detector coil.

The pre-selector circuit may be understood by reference to Fig. 1. At "A" is shown the conventional r.f. amplifier ahead of the first detector circuit. That portion of its circuit shown by

<sup>1</sup> A logical suggestion is that the two-band switching be combined with plug-in coils as a compromise between the nuisance of straight plug-in coils and the complication and inflexibility of completely built-in coil switching. Each set of plug-in coils could cover two neighboring bands, for instance. — Editor.

\* 5380 Germantown Ave., Philadelphia, Pa.

the light lines has been dispensed with in this receiver and the remaining coil and condenser combination or "pre-selector" circuit electromagnetically coupled to the antenna coil on one



THE PRE-SELECTOR AND FIRST-DETECTOR COIL ASSEMBLY WITH THE SHIELD REMOVED

side and to the first detector coil on the other side, as shown at "B." It performs similarly in both arrangements, the difference being that instead of a gain in the r.f. amplifier tube being realized, some loss is introduced by the pre-selector circuit. This is not actually detrimental to the overall sensitivity because of the tremendous amplification available in the high-gain i.f. amplifier. The same improvement in the selectivity of the receiver is thus secured with a saving of a tube and its associated equipment.

The coils are wound on a three-inch length of one-inch outside diameter Bakelite tubing that is

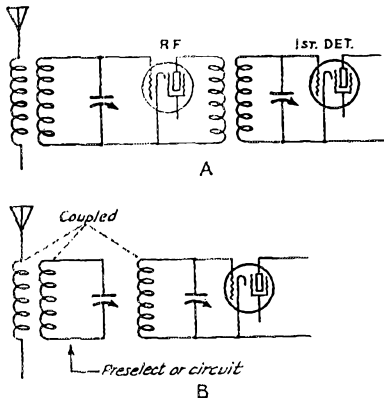


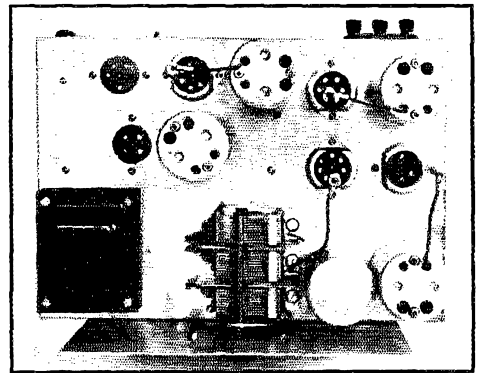
FIG. 1 — DEVELOPMENT OF THE PRE-SELECTOR CIRCUIT USED FROM THE USUAL TUNED R.F. STAGE

long enough to leave room for a mounting bracket. The tubing should be heavy walled (about 1/16 inch) to provide a rugged form which

is reasonably free from distortion and shrinkage. As seen from the photographs, the antenna-pre-selector-first detector or input coil is mounted just to the right of the three-gang variable condenser and directly over the band selecting switch. This location is important in that it provides for the shortest leads and more or less isolates these circuits.

The oscillator coil is somewhat similar in design to the input coil, the tickler being wound in the center with a grid coil on each side, on a two-inch length of one-inch diameter Bakelite tubing. It is mounted under the chassis directly beneath the variable condenser and opposite the 2A7 detector-oscillator tube socket. It is important, also, that leads from this coil be kept short as undue coupling to other circuits would be likely to spoil the effect of the desired electron coupling provided in the 2A7 tube.

Care should be taken in arranging the circuit particularly with the output plate and oscillator anode leads of the 2A7. Excessive coupling be-



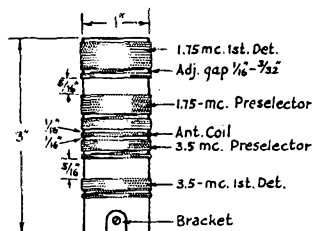
PLAN VIEW OF THE RECEIVER WITH THE TUBES REMOVED

The shield immediately to the right of the tuning condensers houses the pre-selector and first-detector coil assembly, the pentagrid oscillator-first detector socket being directly behind it. From right front to rear are, in order, the first i.f. transformer, the first i.f. tube socket and second i.f. transformer. To the left of the last are the second i.f. tube socket, second i.f. transformer, pentagrid second detector socket and pentode audio socket. Immediately in front of the second detector socket is the i.f. transformer that furnishes the c.w. beat oscillator tuned circuit. The rectifier socket is to the left of this, with the power transformer front left.

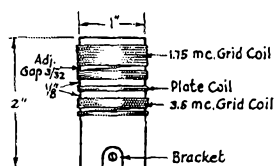
tween these leads is quite detrimental to the operation and performance of the tube.

Reference should be made to the sketches of the coils, Fig. 2, and to the complete circuit diagram, Fig. 3, for information as to the number of turns and spacing between coils. In these sketches, the coils shown are for the 1750-kc. and 3500-kc. bands. Other bands would be spaced on the coil form at the same distances as shown, only the number of turns being changed. The starts and finishes of these windings are brought

through small holes in the tubing and terminate in lugs at the bottom of the form. All coils are close wound except for a 3/32-inch gap left in each of the pre-selector and first detector windings and the oscillator secondaries, to permit adjusting the inductance as will be explained later. The gap is made in the coil by winding on a few turns, then leaving a space of 3/32-inch, and continuing the winding. No. 32 enameled wire is used for all coils.



A



B

FIG. 2—CONSTRUCTIONAL DETAILS FOR THE CARRIER-FREQUENCY AND OSCILLATOR COILS FOR TWO BANDS

Those for other band combinations would be similar.

The variable condenser is a remodeled three-gang broadcast type condenser of the midget variety and is very rugged in construction. All but one stator plate in each section were removed, making a three-gang, three-plate condenser, the individual maximum capacities of which are approximately 30  $\mu\text{mfd}$ . None of the rotor plates was removed since this would tend to make the rotor assembly less rigid and therefore likely to lose its alignment. A condenser with built-in trimmers should preferably be used, that type of trimmer being generally well constructed. Each section of the variable condenser is shunted with a 25- $\mu\text{mfd}$ . moulded mica type condenser soldered directly to convenient lugs. These condensers are used for band-spreading and therefore should be made from first grade selected ruby mica; the cheap variety is likely to change in value with varying atmospheric conditions.

#### THE 2A7

This completes the frequency conversion portion of the receiver except for the 2A7 tube.

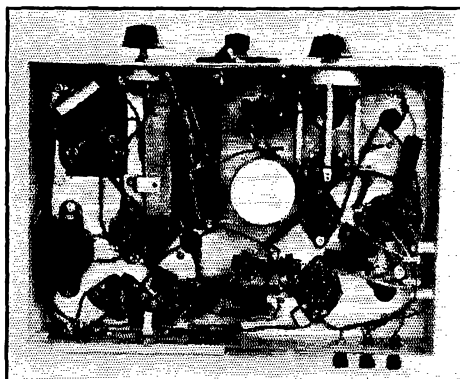
This tube has only recently come into general use. Its principle is not entirely new, but a word about its construction and operation might not be amiss. Briefly, it is an electron-coupled oscillator and first detector combined in one envelope. The oscillator portion of the tube is quite similar to the conventional triode, comprising a cathode, control grid and a grid-like structure which is the plate or anode. The associated circuits are quite the same as those used with an ordinary triode oscillator. When in an oscillating condition, a cloud of negative electrons forms near the oscillator plate and constitutes a "virtual cathode" for the detector portion which is like the ordinary screen-grid tube and is composed of a control grid, screen grid and plate, all surrounding the oscillator portion. The electrons in the negative cloud are attracted to the highly positive detector output plate but are controlled by its

2A7 OPERATING VOLTAGE COMBINATIONS			
"B" Supply	Output Plate	Screen	Osc. Anode
250 v. ....	250 v.	100 v.	150 to 200 v.
250 v. ....	250 v.	80 v.	125 v.
250 v. ....	250 v.	75 v.	100 v.
175 v. ....	175 v.	65 v.	100 v.
100 v. ....	100 v.	50 v.	100 v.

grid on which is impressed the incoming signal, thus effecting the desired modulation.

In connection with the use of the tube several values of recommended operating voltages are listed herewith and the group corresponding to the voltage of the power supply used should be adhered to as nearly as possible. Improper voltage proportion is likely to reduce the conversion gain and in some cases cause instability.

Particular note should be taken of the oscilla-



THE UNDER SIDE OF THE CHASSIS, SHOWING THE SHIELDED OSCILLATOR COILS NEAR THE CENTER, THE COIL SWITCH TO THE RIGHT AND THE VOLUME CONTROL TO THE LEFT

The other parts are arranged as convenient.

tor anode voltage, which is generally lower than the plate voltage and should be supplied through a dropping resistor as shown in the diagram. This is important for stable operation, especially at high frequencies. A one-watt carbon type resistor may be used for this purpose and is not particularly critical, any value between 20,000 ohms and 40,000 ohms being quite suitable.

The method of connecting the grid leak around the tracking condenser in the first detector circuit may seem unconventional but was found to produce the best results. If, in this circuit, the grid leak were connected around a grid condenser in the ordinary fashion, the grid would swing "free" with the low end of the grid leak insulated from ground by the tracking condenser. This would cause "blocking" and intermittent oscillation on signals of even moderate volume.

#### THROUGH THE I. F.

The i.f. amplifier following this frequency conversion stage is a conventional two-stage amplifier using 58 tubes and is tuned to a frequency of 465 kc. The transformer coils are of the universal "criss-cross" type and are wound with Litz wire. They should be loosely coupled to provide a high degree of selectivity. In wiring care should be used in by-passing the various "hot" leads; otherwise instability will result. By-pass condensers should be soldered to the sockets and chokes, or as near to them as possible, to make the by-passing most effective.

Following the i.f. amplifier is the combination second detector and electron-coupled beat oscillator, which is another unique feature of the receiver. Here again the versatile 2A7 tube performs the work previously requiring the use

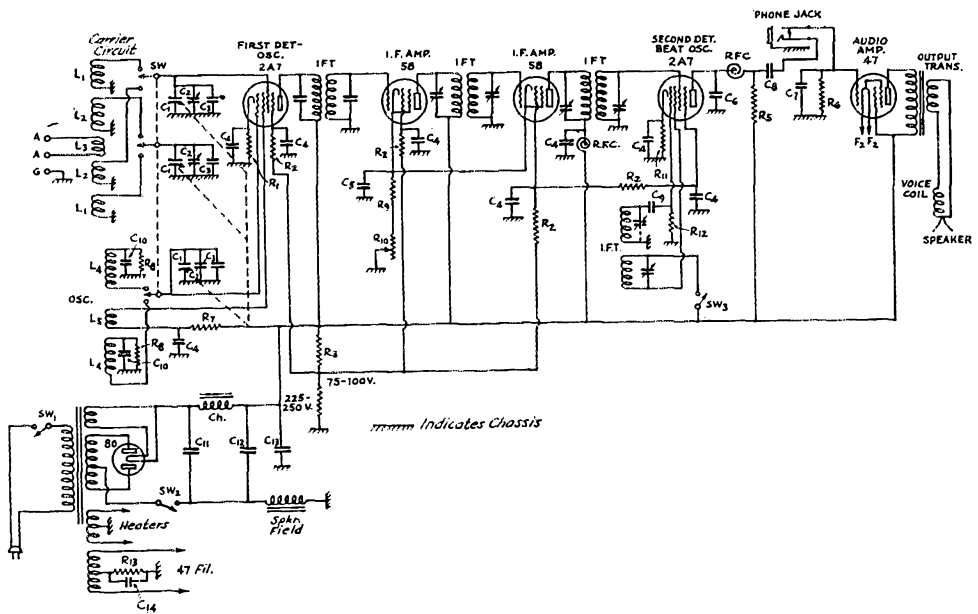
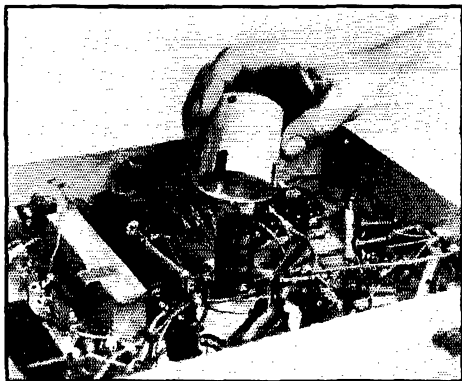


FIG. 3 — COMPLETE CIRCUIT OF THE RECEIVER

- C<sub>1</sub> — Three-section variable tuning condenser, 30  $\mu$ fd. max. per section.
- C<sub>2</sub> — Tuning condenser trimmers.
- C<sub>3</sub> — Moulded mica band-spread condensers, 25  $\mu$ fd. fixed.
- C<sub>4</sub> — Tubular by-pass condensers, .02  $\mu$ fd. 400-volt.
- C<sub>5</sub> — Tubular by-pass condenser, 0.1- $\mu$ fd., 200 volt.
- C<sub>6</sub> — Detector plate filter condenser, 250- $\mu$ fd. fixed.
- C<sub>7</sub> — "Tone" condenser, .002- $\mu$ fd.
- C<sub>8</sub> — Audio coupling condenser, .05- $\mu$ fd.
- C<sub>9</sub> — Beat osc. grid condenser, 150- $\mu$ fd.
- C<sub>10</sub> — Moulded mica osc. tracking condenser. See coil table.
- C<sub>11</sub> — Dry Electrolytic filter condenser, 4- $\mu$ fd.
- C<sub>12</sub> — " " " " 8- $\mu$ fd.
- C<sub>13</sub> — " " " " 8- $\mu$ fd.
- C<sub>14</sub> — Audio by-pass condensers, 10  $\mu$ fd. 50-volt electrolytic.
- R<sub>1</sub> — First detector and oscillator cathode bias resistor, 400-ohm, 1-watt.
- R<sub>2</sub> — Screen-grid filter resistors, 25,000-ohm, 1/2-watt.
- R<sub>3</sub> — Bleeder resistor, 40,000-ohm, 1-watt.
- R<sub>4</sub> — " " 60,000-ohm, 1-watt.
- R<sub>5</sub> — Second detector plate resistor, 200,000-ohm 1/2-watt.
- R<sub>6</sub> — Pentode grid resistor, 500,000-ohm 1/2-watt for 47 tube; 250,000-ohm 1/2-watt for 2A5 tube.
- R<sub>7</sub> — Osc. plate resistor, 40,000-ohm 1-watt.
- R<sub>8</sub> — Osc. grid leaks, 100,000-ohm 1/2-watt.
- R<sub>9</sub> — I.f. cathode bias resistor, 750-ohm 1-watt.
- R<sub>10</sub> — Volume control with built-in a.c. switch, 75,000-ohm.
- R<sub>11</sub> — Second det. and beat osc. bias resistor, 5000-ohm, 1-watt.
- R<sub>12</sub> — Beat osc. grid leak, 100,000-ohm 1/2-watt.
- R<sub>13</sub> — Pentode bias resistor, 400-ohm 2-watt.
- SW — 3-gang, two-position band-selector switch.
- SW<sub>1</sub> — 100-volt switch (mounted on volume control — see R<sub>10</sub>).
- SW<sub>2</sub> — High-voltage cut-off switch "Transmit" and "Receive."
- SW<sub>3</sub> — Beat osc. switch 'Phone — "C.W."
- RFC — 12-millihenry universal type r.f. chokes.
- IFT — Tuned primary and secondary 465-kc. i.f. transformers (any standard type).
- CH — 30-henry 50-ma. filter choke.

of two tubes. The tuned circuit of the beat oscillator makes use of an additional i.f. transformer of the same type as is used in the i.f. amplifier itself and is plate tuned. It is adjusted by backing off the grid trimmer to minimum capacity (or disconnecting it entirely) and tuning the plate trimmer only to provide the desired beat with the i.f. signal. By using the "offset" method of adjustment previously introduced in *QST*,<sup>2</sup> it will be found that the beat note is much louder on one side of zero beat than on the other, giving the effect of "semi-single-signal" reception. Examination of the diagram will show that the oscillator is merely a version of the familiar type of circuit, so no trouble should be experienced in making it work well. Care should be taken with the shielding and wiring, however, to prevent radiation that would tend to overload the i.f. amplifier and therefore reduce the gain. The circuit should be



A PEEK AT THE OSCILLATOR COIL ASSEMBLY UNDERNEATH THE CHASSIS

arranged to reduce to a minimum possible coupling into the i.f. plate or grid leads.

Grid-bias power detection is employed using the screen-grid portion of the 2A7 tube. Connections are made in the same way as in any ordinary power detector circuit, the operation of the tube in this manner comparing favorably with a 57 tube. One point to be noted here is the cathode bias resistance. If its value be too high, it will not permit oscillation when beat-note reception is desired; too-low resistance will cause insensitivity and low signal volume. Values as high as 10,000 ohms may be used but 5000 ohms seems to be optimum.

The second detector is resistance coupled to a pentode output tube which may be either a 47 or a 2A5. This is connected in the usual manner except that a 'phone jack is provided to open the circuit between the coupling condenser and the

pentode grid when headphones are plugged in, thus permitting headphone reception from the second detector output with comfortable signal volume. Loud speaker reception from the pentode output is also provided for. The speaker used is a six-inch dynamic that gives an excellent account of itself, both from the standpoint of quality and "quantity" of signal reproduced. This speaker, as does the general run, has an output transformer mounted directly on the frame, obviating the necessity of providing space for one on the chassis and assuring a correct impedance match. Another reason for selecting a dynamic speaker is that the field may be used as a filter choke, making unnecessary any external excitation and at the same time providing additional plate supply filtering.

As a tone control (which more correctly might be called a "high" eliminator), a .002- $\mu$ f.d. condenser is connected from the grid of the pentode to ground. This tone control could be made adjustable by the use of a larger condenser in series with high resistance, but by attenuating the frequencies above about 2500 cycles it was found that very little was lost in the fidelity of voice reproduction while the noise, which falls for the greater part in the upper band of audio frequencies, is reduced very materially. Thus intelligibility, which is the important thing, is considerably improved. With this condenser as shown, a receiver operated under extremely adverse conditions (racket from trolley cars, power lines, etc.), could be used with a fair degree of success whereas it was next to impossible to hear signals without it.

The power supply is built into the chassis, making the receiver complete and at the same time eliminating wiring from an external power pack. The transformer lies flat on the chassis with the winding and lugs protruding through for convenient connection. A transformer which supplies 350 volts at 50 ma. to the first filter condenser, together with the necessary filament windings, is quite suitable. A 30-henry 50-ma. choke, used in conjunction with the speaker field, and 20- $\mu$ f.d. of electrolytic condenser form the filter. Hum level is extremely low and is unnoticeable even on headphone reception.

#### CONCERNING CONSTRUCTION AND ADJUSTMENT

Some notes on the mechanical construction will assist in laying out a receiver of this type. The chassis, which measures 13 by 9 by 2½ inches, is made of sheet steel, although aluminum or brass could be used as well. If steel is used, however, it should preferably be cadmium or nickel plated to prevent rusting. The top and sides are cut in one piece and the sides folded down and riveted at the corners with small flaps. This makes a sturdy foundation on which parts can be mounted neatly and rigidly. The photographs show layout of the various sockets,

<sup>2</sup> "What's Wrong With Our C. W. Receivers?" June, 1932; and "Receiver Selectivity to Match Present Conditions," Aug., 1932, *QST*.



holes, etc. This need not be followed to the letter but should be closely approximated because any arrangement which places the final i.f. stage or the detector in too close proximity to the receiver input is likely to cause feed-back with its resultant oscillation and distress to the builder. The sockets used are of the familiar wafer type which make a neat job and do not require much space. The coil mountings may be small brass brackets but in any case the coil should be

voice coil is quite satisfactory. A vacuum tube voltmeter might be used for this same purpose or, alternatively, a good high-resistance d.c. voltmeter can be connected across the second detector plate resistor, thus measuring the rectified carrier. With the last, an unmodulated signal can be used. The method of aligning the receiver is fairly simple and if instructions are followed there should be no particular difficulty. Assuming an oscillator on hand which tunes to 465 kc. the i.f. transformers are first aligned, the procedure being the same as that given in previous *QST* articles. The strength of the oscillator signal should be down to prevent overloading or double peaks. An extremely simple "attenuator" adjustment is the variation in coupling of a length of wire between the oscillator and i.f. amplifier, this coupling being reduced by moving the wire away from the i.f. circuit as the transformer tuning is brought to peak. When this part of the receiver is aligned and working OK, we can start on the high-frequency input circuits.

Here again the test oscillator would be of valuable assistance, although in its absence a heterodyne frequency meter on the signal from a strong unfading station may be used for the purpose. The tuning condenser dial should be set to the place you wish the high-frequency end of the band to start, probably ten or fifteen dial divisions from the minimum capacitance end. The oscillator trimmer is then varied until the desired signal is heard, the dial readjusted for maximum response and, finally, the first detector and pre-selector trimmers varied until the loudest signal is heard or a peak reading is obtained on the output meter, as the case may be. The band-changing switch is then thrown over to the other band and, without touching the trimmers the

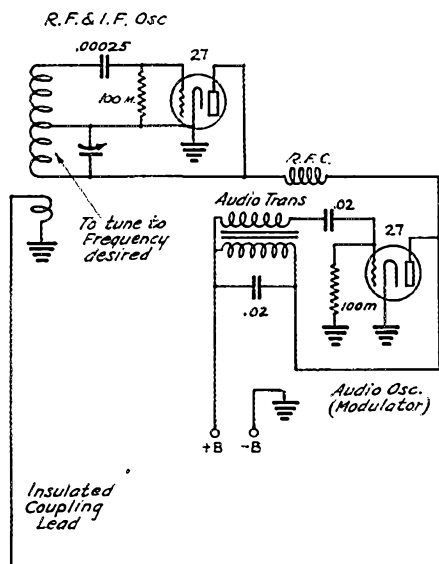


FIG. 4 — A SUGGESTED ARRANGEMENT FOR A MODULATED TEST OSCILLATOR FOR ALIGNING THE RECEIVER CIRCUITS

mounted rigidly to assure permanency of alignment and calibration. The coils are shielded with aluminum cans (diameter at least 2 inches) which should make a good electrical and mechanical contact to the chassis.

The wiring, especially those circuits carrying r.f., should be rigid (No. 20 solid push-back wire is used) to prevent frequency instability. Little more need be said on the construction as one generally likes to incorporate his own ideas. Then, too, there are often parts around the shack which are adaptable but necessitate small changes in general design.

In aligning the r.f. circuits it is well worth the time and few extra parts to build a small modulated oscillator with coils to cover the intermediate frequency and also the high-frequency band or bands for which the receiver is intended. The circuit for such a modulated oscillator is shown in Fig. 4. An output meter of some sort is also a material aid to precise adjustment. This may be a rectifier type a.c. voltmeter, which can be used to measure the audio output voltage. A 0-3 a.c. voltmeter connected across the speaker

COIL DATA				
Coil	1.75-mc.	3.5-mc.	7.0-mc.	14.0-mc.
$L_1$ — 1st detector . . . . .	62 t	26½ t	12 t	5¾ t
$L_2$ — Pre-selector . . . . .	60 t	26½ t	12 t	5¾ t
$L_3$ — Antenna . . . . .	8 t	8 t	8 t	8 t
$L_4$ — Osc. Grid . . . . .	49¾ t	21¾ t	10 t	4.9 t
$L_5$ — Osc. Plate . . . . .	10 t	10 t	8 t	8 t
Osc. Tracking Condenser $C_{10}$	.001 $\mu$ fd	.001 $\mu$ fd	.003 $\mu$ fd	.005 $\mu$ fd

dial reading for the high-frequency end of this band is noted. If it falls within a few degrees of the other band, all well and good; if not, it will be necessary to adjust the gap left in winding the oscillator coil until this condition is obtained. The gap may be moved a turn at a time with the thumb-nail — or an orangewood stick makes a handy instrument. Moving the gap toward the

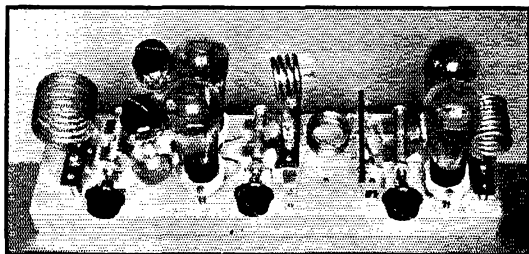
(Continued on page 72)

# "Five-and-Ten" Oscillator-Amplifier Transmitters

By D. A. Griffin, W2AOE\*

PERHAPS the uninitiated might infer from the title that we intend to enter into a dissertation on the art of mass sales at low prices. Although most amateurs undoubtedly are familiar with the emporiums flaunting these

During the past two years a great deal of progress has been made developing equipment for use on five meters. This will continue as time goes on, with the pathway to improved results clearly indicated. Transmitters free from frequency modulation or drift and receivers of the super-heterodyne type unquestionably deliver results unobtainable otherwise. Without doubt, then, an increasing number of amateurs will put such equipment into use.



THE BASIC "STRAIGHT" OSCILLATOR-AMPLIFIER TRANSMITTER FOR 56 AND 28 MC.

The oscillator (right) is high-C with a push-pull TNT circuit and is inductively coupled to the push-pull neutralized amplifier (left). The coils shown are for 28-mc. operation.

On the other hand, the ten-meter band has suffered from a serious case of sleeping sickness. Five years ago, exceptional DX records were hung up<sup>1</sup> with equipment which to-day would be termed mediocre, what with the recent rapid strides in tube and apparatus development. However, we now find signs of a healthy awakening of interest in our 28-mc. territory. A few patient experimenters are making contacts and a considerable number of twenty-meter DX harmonics has been heard on this band.

famous words as meccas affording inexpensive means of adding to their collection of wire and haywire, "five and ten" conveys a more important meaning to the progressive experimenter.

And now that a goodly portion of the 28-mc. band has been opened up for 'phone use, together with the fact that the last year has brought about the wide-spread use of stable

superheterodynes with extremely sharp i.f. amplifiers (the S.S. super works very well at 28 mc.), transmitter improvement is certainly in order. If we are to take advantage of the high selectivity and gain of such receivers, the transmitted signal necessarily must be pure d.c. and free from drift. Frequency modulation must be eliminated if modulation is to be applied.

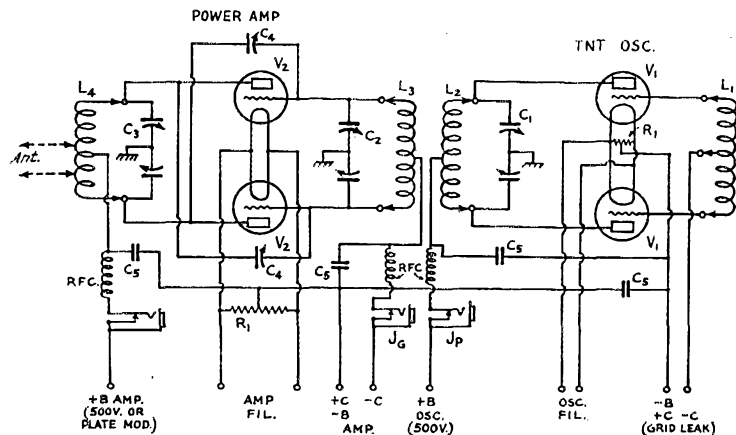


FIG. 1—CIRCUIT OF THE BASIC OSCILLATOR-AMPLIFIER UNIT

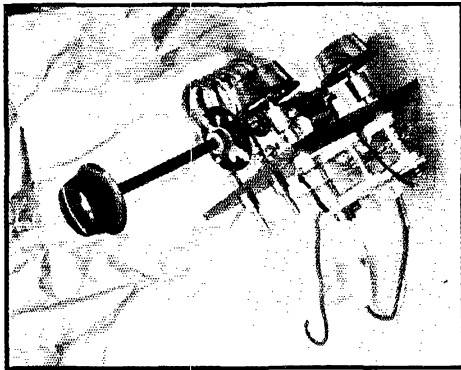
$L_1$ —1-inch inside diameter, 8 turns for 28 mc., 4 turns for 56 mc.  
 $L_2$  and  $L_3$ —1-inch diameter, 4 turns for 28 mc. and 2 turns for 56 mc.  
 $L_4$ —2-inch inside diameter, 6 turns for 28 mc. and 2 turns for 56 mc.  
 All above coils made of 3/16-inch copper tubing.  
 $C_1$ —Double-section midget condenser, 140- $\mu$ fd. per section.

$C_2$ —Same, 100- $\mu$ fd. per section.  
 $C_3$ —Same, 35- $\mu$ fd. per section, double-spaced.  
 $C_4$ —Single 35- $\mu$ fd. midgets, double-spaced.  
 $C_5$ —R.f. bypass condensers, 0.001- $\mu$ fd. or so.  
 $R_1$ —75-ohm filament center-tap resistors.  
 RFC—Hammarlund CH-8 r.f. chokes.  
 $J_G$  and  $J_P$ —Single-circuit closing jacks.  
 $V_1$  and  $V_2$ —Type 10 tubes for voltages indicated. Other UX type tubes may be used with reduced plate voltage.

\*3 Oak Ridge Ave., Summit, N. J.

<sup>1</sup> Particularly the A. R. R. L. Cape Cod-New Zealand 28-mc. tests reported in QST of January, 1929. — Editor.

The purpose of this article is to describe the design of medium-powered stable transmitting equipment that is readily adaptable for use on both 28 and 56 mc. Because of the relatively high



A PLUG-IN GRID TUNING AND NEUTRALIZING UNIT CONVERTS THE TNT OSCILLATOR TO A NEUTRALIZED BUFFER AMPLIFIER

circuit efficiency required at 56 mc., we find equipment suitable for 56 mc. to aid materially in securing really good efficiency at 28 mc. As has been pointed out previously, our 56-mc. requirements for some time to come may be relatively simple. That is, the simple oscillator-amplifier type of transmitter will be sufficient. The special type of superheterodyne useful at this frequency employs an i.f. amplifier with fairly broad selectivity, so that the slight frequency modulation set up with the simpler type of oscillator-amplifier transmitter will not cause any serious difficulty.

Experimental work was started with a simple oscillator-amplifier shown in Fig. 1. The results checked with the theory very nicely, the stations worked on 56 mc. reporting "normal" signals. The transmitter was then shifted to 28-mc. c.w. and interesting improvement became apparent. W2JN, twelve miles distant, was worked with an R5 signal both ways, both stations employing superheterodynes. Only once have signals as

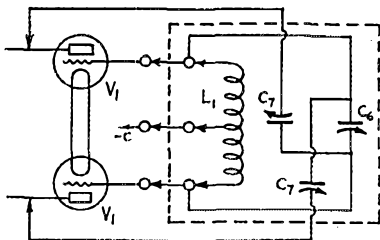
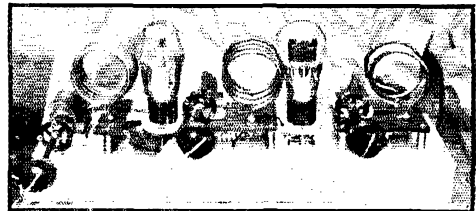


FIG. 2—CIRCUIT OF THE ADAPTER UNIT

$L_1$  is the grid coil used in the oscillator,  $C_6$  is a 50- $\mu$ fd. midget variable and the neutralizing condensers  $C_7$  are each 20- $\mu$ fd. midgets. Flexible leads with clips connect to the plates of the respective tubes. Further details are given in the text.

strong as R2 to R3 been reported between these two points on 56 mc., probably because of the range of hills intervening. W2TP, twenty miles away and without such screening, reported an R6 28-mc. signal using a Single-Signal Super. Considerable frequency modulation was noted when tone was applied, but a very good signal was reported when the super-regenerative receiver was used. This indicates that to get started easily on 28 mc. for local work, super regenerators for reception and simple m.o.p.a. transmitters are the immediate answer. And there is the promising possibility of DX work with this equipment too. However, the better type receiver will be handicapped if the signals are of the wobbled type.

The basic oscillator-amplifier unit is interesting in that it was designed to be completely universal. Both grid returns are brought out separately to binding posts, for instance, and both filament circuits are also brought out independently. With this arrangement, any UX-based tubes may be employed in the oscillator or amplifier. Either the final amplifier or both oscillator and amplifier may be keyed in the center tap, or it is possible to grid-modulate the amplifier by connecting a microphone transformer into the jack provided to measure the grid current. Class B plate modu-



THE EXCITER UNIT CONTAINS AN ELECTRON-COUPLED OSCILLATOR (LEFT) AND A DOUBLER (RIGHT)

This unit mounts below the other and is coupled to the buffer input by a low-impedance transmission line.

lation also may be employed without trouble, since the amplifier tank condenser and the neutralizing condensers are double-spaced to withstand voltage peaks. The outfit may be readily shifted from five to ten meters, or *vice versa*, merely by changing the coils, reneutralizing the amplifier, and tuning to a suitable antenna system.

To secure greater stability on 28 mc. and, at the same time, to provide sufficient excitation for the final amplifier on 56 mc., it was evident that a buffer amplifier would be necessary ahead of the final stage. To convert the TNT oscillator into a neutralized buffer amplifier, the rather novel gadget pictured in Fig. 2 was developed. G.R. 274-D plugs were mounted in a piece of bakelite 4 inches square so as to fit into the jacks used to plug in the TNT grid coil  $L_1$ . Since these plugs

are designed to take another similar set of plugs on the top, the grid coil may be connected right back into the circuit on top of the bakelite panel. The 50- $\mu$ fd. condenser,  $C_6$ , then tunes the grid coil. The 20- $\mu$ fd. neutralizing condensers,  $C_7$ , are cross-connected underneath the panel so that short flexible leads from these condensers connect directly to the opposite plates by means of clips fastened to the stubs on the plate-tank condenser stators. By removing the grid leak and substituting fixed "C" bias, and plugging in this grid tuning-neutralizing unit, the TNT oscillator is changed into a neutralized amplifier in a few moments, its circuit being similar to that of the final stage.

With the TNT oscillator converted to a neutralized buffer amplifier, the next step was the construction of a suitable driver unit. The ideal method, crystal control, was considered, but the complexity of the circuit was discouraging, unless 20- or 40-meter crystals were employed. Simplicity of design indicated the use of a self-controlled oscillator-doubler arrangement. The Type 59 in the familiar electron-coupled circuit, doubling in its plate circuit and driving a 46 doubler, was finally selected after considerable experimentation with a number of tubes.

Cathode oscillator bias is employed instead of the conventional grid-leak-condenser method. This resistor prevents the plate current from creeping if the tube is loaded to the limit, the bias increasing automatically when the plate current tends to go up. As the plate circuit works into a relatively constant load, no trouble is encountered with frequency shift after the initial adjustment is made. The 46 doubler is of conventional design, with the exception of the use of a cathode bias resistor. At 56 mc., without the cathode

resistor the plate current would creep badly. In a minute or so it would draw over 100 ma. and cease to function as a doubler. The 300-ohm cathode resistor holds the plate current to a 60 ma. limit and sufficient output to drive the buffer amplifier at 56 mc. is obtained.

The problem of coupling the driver unit to the buffer-amplifier unit, with the two mounted in a rack and with approximately ten inches in height separating them, was taken care of by use of the low-impedance line coupling method recently described in *QST*.<sup>2</sup> With a pick-up coupling coil ( $L_8$ ) of slightly smaller size than that used for the TNT oscillator-grid coil on 56 mc., coupling to the 46 driver plate tank is not particularly critical. The clips on the buffer grid coil are connected two turns in from each end of the eight-turn coil for 28 mc., or three-quarters of a turn in from each end of the four-turn coil for 56 mc. Both buffer and final amplifier neutralize easily, although to do a good job of neutralizing a thermo-galvanometer or similarly sensitive indicating device is necessary. On both 28 and 56 mc. the final amplifier is operated as a true Class C amplifier, with 70 watts input at 28 mc. and 40

watts at 56 mc., the buffer amplifier bias being adjusted to secure maximum output at 56 mc. When we consider that there is as great a difference in frequency between five and ten meters as

there is between ten meters and the audio spectrum, the drop in tube and circuit efficiency is readily appreciated.

For operation on 28 mc., the oscillator generating circuit works at 7 mc., the plate circuit doubling to 14 mc. The 46 then doubles to 28 mc.,

(Continued on page 28)

<sup>2</sup> *QST*, May, 1933, page 31; and June, 1933, page 34.

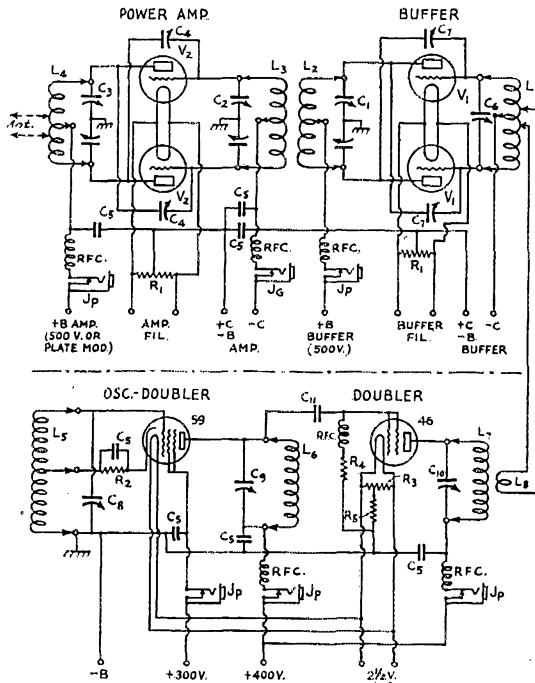


FIG. 3—COMPLETE CIRCUIT OF THE FINAL R.F. ASSEMBLY

Circuit values additional to those given in Figs. 1 and 2 are as follows:

- $L_4$ —7 turns, 2 1/4-inch inside diameter, tap at third turn from ground end.
  - $L_6$ —2 1/4-inch inside diameter, 5 turns for 28-mc. output and 3 turns for 56-mc. output.
  - $L_7$ —3 turns, 2 1/4-inch inside diameter, for 28-mc. output; 2 turns, 2-inch inside diameter, for 56-mc. output.
  - $L_8$ —2 turns, 1-inch inside diameter. Mounted inside  $L_7$ .
- All above coils made of 3/16-inch copper tubing.  
 $C_8$ —325- $\mu$ fd. midget variable.  
 $C_9$  and  $C_{10}$ —140- $\mu$ fd. midget variables.  
 $C_{11}$ —Grid coupling condenser, 100- $\mu$ fd. mica fixed.

# Ten-Meter Band Hot!

Many Stations Report Successful Contacts—28,000–28,500 Kc.

'Phone Band Officially Opened to All

By Clark C. Rodimon, Managing Editor

PROBABLY more hours have been spent in hunting for signals on our ten-meter band with less success than on any other part of the ham spectrum. Yes, we have done our share. At the moment we seem doomed for an era of ten-meter QSO's (hence our desire to hasten scraps together for August *QST*) or our hunch is "seven sheets to the wind." We have been listening on ten meters for signals for the past five years, have heard a signal drop in and out before an identification was possible, but all in all it has been a mighty discouraging bit of listening. Just four days ago a W3 told us he heard our signal on ten last summer but didn't get around to telling us about it! That one meagre report would have kept us at it for another few months at least. Just two days ago — June 25th, we were aroused from some lethargic listening on 14 mc. for the elusive J signal (another pastime of ours) when the telephone rang and it was W1DF telling us that W9DZX was coming through R7 on "ten." In less time than it takes to tell it we were hearing this signal — honestly, this one signal coming through in all that expanse of stillness was about the keenest thing we ever heard — even though the signal was a rough r.a.c. After considerable calling W9DZX was raised with our 14-mc. set — though the queer part is that W9DZX on a hunch went up to 14 mc. to see if anyone would answer him there! While working DZX we ran across W9HBD coming through R7 with a p.d.c. crystal signal — and that did cap the climax! W1DF heard W9EF R9.

Right here and now we want to know just how long this has been going on. We actually believe that if we had not heard this activity with our own ears it never would have been reported. Why is it that this dope doesn't come in? It is red hot news — something that is the most intriguing bit of work we have had anything to do with since preliminary five-meter work two years ago when its local aspects turned up. What's more — ten meters will more than duplicate 5 meters for local work — and without going to a mountain top to accomplish the feat.

A brief résumé is in order of what has been done on ten meters. Its DX possibilities are immense. In years gone by all continents have been worked from U. S. A. with much inter-continent work between F8CT and W2JN, as well as between South Africa and U. S. A. The tests made

at W1CCZ will be recalled where for a whole week W6UF was contacted during daylight with maximum signal strength at both ends — and with ZL2AC listening in to both ends of the conversations!

## SUCCESSFUL TEN-METER STATIONS

The rig at W9HBD starts out with a crystal and 247 on 80 meters and winds up with a WE-211-E on ten meters. This tube, it will be recalled, is the one with plate and grid chokes in the base and the same variety that used to cause so much trouble when we went down to the "short waves" (in the vicinity of 110 meters)! This shows that with care any ordinary equipment can be used — just care in design and tuning up with low voltages. The antenna is a vertical fundamental which also acts as a guy wire to a pole mounted on the roof of the garage. W9HBD says, regarding recent work, "— tuned her down to 10 meters Saturday, June 10th for test with W2TP. He heard me QSA 5 R7 but I couldn't locate the band with my receiver so he reported back on 20-meter 'phone. No more efforts were spent on this band until June 25th, when signals sounded very strong on 14 mc. While QSO W2TP we decided to try 10 meters once more. The result was a perfect 40-minute QSO which you fellows heard in Hartford. Also heard W4CJ testing 'phone previously."

W9HBD is old 9AZX of DX days in '24 and '25, and has been reported by W9BGO and W5BTW.

"Bill" Short, W9EF needs no introduction to any 28-mc. story. He has been plugging at this band for five years that we definitely know of. He has done considerable DX with Europe on this band and is still at it. W9EF says, "— tell the gang that if 20 meters is alive with signals it is almost a sure barometer that 10-meter conditions will be okay."

W9EF writes that on June 25th at 10:45 a.m. C.S.T. he raised W2TP with signals R9 at both ends. W2TP then used 'phone for the first 'phone contact W9EF has had. W8EXX and W4UC were also heard as well as a W3. The power input at W9EF is 160 watts, which feeds into a 65-foot antenna. About 15 feet of the present 65-foot antenna is vertical and the remainder is horizontal. A full-wave indoor antenna is used for reception, the receiver being a two-circuit regen re-

ceiver with 2 stages of peaked audio. In closing W9EF says, "I honestly believe there is a big field in 28-mc. work. Patience will be required and if only a reasonable number of stations will give this band their attention their work will be rewarded. The old guard has been hammering away for a long time, have found out many interesting facts, but some new blood injected into the cause will add more stimulus to the work and help pep up the boys who grind away Sunday after Sunday with practically no encouragement from the rest of the amateur fraternity. Let's give ten meters an honest trial."

Another old-time 28-mc. man showed up on Sunday, June 25th, with a husky signal, and speaking of results, W9DZX says, "Heard W2TP R7 working W9HBD. Nearly all morning harmonics from WAZ were R5. 11:05 a.m. C.S.T. heard W9IFG R3 calling W9EGG but believe it was a harmonic. At 12:10 p.m. I worked W2TP and was reported R9. Later I called CQ and was answered by a NDC signal about 28,180 kc. who faded out before he signed. Nothing more was heard. A card was received from WICKF reporting my signals on this band."

"The antenna at W9DZX for transmitting is 16½ feet long, voltage fed and horizontal in the attic. Another horizontal wire is strung up ¼-wave away and transmit in either direction, using the back wire as a reflector."

The receiver at W9DZX is a simple 2-tube affair using 235 detector and 224 audio with plug-in tube-base coils. There are power leaks around which about ruin reception on 7 and 14 mc. but hardly affect 28-mc. work, but automobile ignition is a bad actor.

W1DF, operated by George Grammer, Asst. Tech. Ed., QST, has done considerable listening on this band — using an FB7 receiver with home-made coils. On June 25th the following stations were heard: W8DW, W9DZX, W9HBD, W9EF and W8AUP (?). On the evening of June 26th stations heard were: W4ZH, W4ZF, W4BHA, W4EG and NY1AB. It is known for a fact that NY1AB was on 14 mc. at the time, and from the signal strength of the others they are also suspected of being harmonics of 14 mc., with the exception of W4BHA who was R8.

#### MISCELLANEOUS

From W8DYY we learn of his activity on this band, having been reported in Europe last year by G5QA. W8CTE reports having carried on a schedule with W7BAC on 28 mc.

On June 26th W1SZ heard NY1AB on 28 mc., having heard NY1AB on 14 mc. just a few minutes previously. A short call on 14 mc. and NY1AB verified our suspicions — he was transmitting on 14 and it was his second harmonic that was coming through R7! NY1AB is rigging up a final amplifier for 28-mc. work, using a diamond antenna pointed at New York.

On July 4th W1SZ rigged up a crystal control set and QSO'd W9EF, the final stage being a pair of 10's in push pull, exciting a fundamental vertical antenna.

From the R.E.F. we learn that the F stations are on ten meters every day at 0800, 1230 and 1830 GMT.

Apparently many stations have shown varying amounts of activity on this band at different times, harmonics are getting through as well as fundamental signals, but we have heard very little of it here at QST. We wish that all who are active or who are interested in this band would send in reports or communications to the Experimenters' Section, QST, 38 LaSalle Road, West Hartford, Conn.

## Flash—OK1AW Reports Successful 28-Mc. Work

JUST as we go to press we receive some real news from Europe — and are managing to squeeze it in. Seems as though the ten-meter band was opening up simultaneously all over the world.

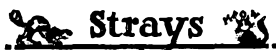
OK1AW reports about 50 QSO's in six countries (see Calls Heard) since May 16th. The main transmitter used has an input of 35 watts and is crystal controlled. Both 'phone and c.w. are used, with the 'phone being reported R8 in France and England. OK1AW is on every day and reports that F8CT is R8 at 1930 GMT and starts fading until 2110 when F8CT is R2-3. OK1AB, OK2VA and OK2SI are also active on this band. The receiver at OK1AW is a simple detector and one stage audio.

There's no telling what will happen between now and next QST but one can expect anything — and the point is, we want to hear about it to report the good news. All that seems to be lacking now are stations at the correct distance for consistent QSO's — should this band be populated by stations from varying distances we feel confident that QSO's could be effected at about any time!

## Rocky Mountain Division Convention

Acacia Hotel, Colorado Springs, Colo.,  
August 26th-27th

PIKE'S PEAK Amateur Radio Association is sponsoring this convention and has prepared a program to enable all delegates complete enjoyment during the two days with business sessions the first day and social activities on the second day. Bring your ladies! Further information may be obtained from Carl C. Drumeller, Secretary, 411 N. Cedar St., Colorado Springs, Colo.



W4AUW says he uses his buffer stage to polish up his tuning inductances. Ow!

# The Tool-Box 56-Mc. Transceiver

A Hand-Portable Five-Meter Station with a New Type Antenna System

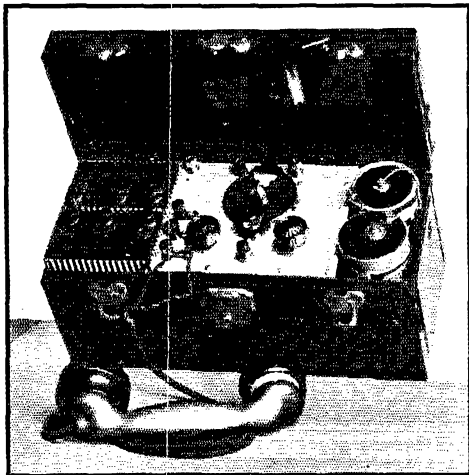
By Thomas P. Leonard, WIAUJ-WICTM,\* and Calvin F. Hadlock, WICTW-WIFFR\*\*

WHEN new apparatus is developed for use on any of the lower frequency amateur bands, knowledge of it spreads rapidly from one section of the world to another by means of DX rag-chews on the air. This does not, however, hold true of five-meter apparatus. Because of the limited range, when improvements are made on this band the information is spread locally but, unless it is printed in *QST*, the rest of the country is not likely to hear about it.

There are two new developments that have justly become very popular around this section and which the authors feel are too good to be kept secret from the rest of the five-meter enthusiasts throughout the country. Hence we are going to pass along the dope. The first of these is a transceiver that works surprisingly well and is really portable. When this is used in connection with a new antenna system, the second item of equipment, astonishingly good results are obtained.

\* 1170 Mass. Ave., Cambridge, Mass.

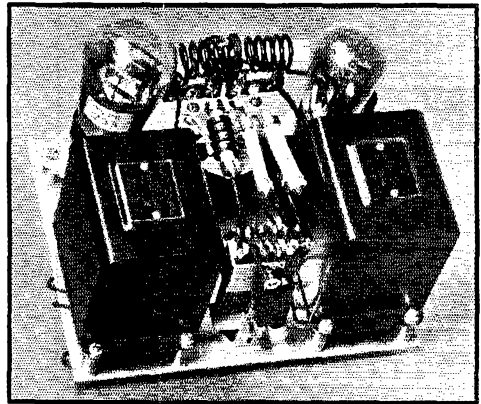
\*\* 19 Garfield Terrace, Malden, Mass.



THE COMPLETE TRANSCEIVER FITS IN A "DOLLAR-STORE"

Type Tool-Box Having Inside Dimensions of  $13\frac{1}{2}$  by  $5\frac{1}{2}$  by  $6\frac{1}{2}$  inches. Centered on the  $6\frac{3}{4}$  by  $5\frac{1}{2}$ -inch aluminum panel is the midget vernier dial for tuning, with the send-receive switch immediately below it. The knob to the left is for volume control and that to the right for the filament switch. Microphone and telephone receiver are combined in the W.E. handset, which fits into clips on the back of the case when not in use. The special Pickard antenna system used with the set may be rolled and packed in a small canvas bag. As the finishing touch, the proper licenses could be fastened to the inside of the cover.

One of the new transceivers is shown in the photographs. R. S. Briggs, W1BVL and W1ZZAW, of Dorchester, is the one who introduced this unit to the gang. The present arrangement is very nearly identical to his and he should be given full credit for the development. The circuit and specifications are given in Fig. 1 and the construction is shown by the photographs. It is entirely self-contained, with the exception of the mike and antenna. The "mike," a Western-Electric hand-set telephone unit, is pushed into two phosphor bronze clips on the back of the case



ILLUSTRATING THE ASSEMBLY OF EQUIPMENT ON THE BACK OF THE PANEL

Details of the arrangement are given in the text.

when not in use, while the antenna system may be rolled up and tucked away wherever convenient. Inside the case, left to right, are two Type 5308 45-volt Burgess "B" batteries, the transceiver unit proper, and the two dry cells for lighting the filaments and supplying the mike current. Five small slender flashlight cells, which provide bias for the Type 233 tube, are hidden in the corners around the two dry cells. The minimum inside dimensions for the case should be  $13\frac{1}{2}$  inches length by  $5\frac{1}{2}$  inches width by  $6\frac{1}{2}$  inches inside height with the lid closed. Of the three binding posts near the top of the panel, the left-hand one is for a simple four- or eight-foot antenna, while the other two connect to a two-turn pick-up coil between the two tuning coils and are used for the two-wire feeder of the special Pickard antenna system.

The midget dial is, of course, for tuning. The



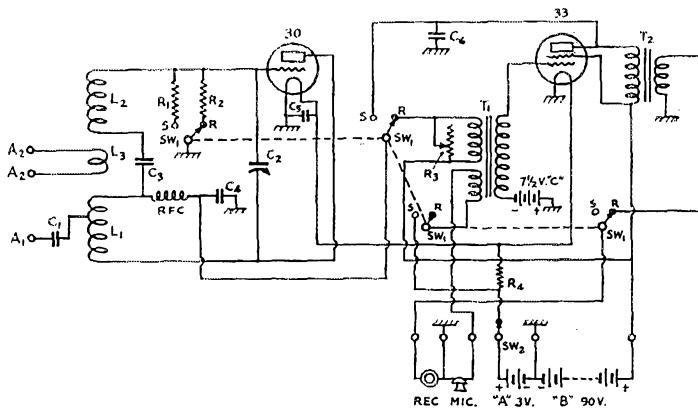


FIG. 1 — CIRCUIT AND SPECIFICATIONS OF THE TRANSCEIVER

- C<sub>1</sub> — .001- $\mu$ fd. mica condenser.
- C<sub>2</sub> — 3-plate midget condenser, two stator and one rotor, double-spaced (National STN-6).
- C<sub>3</sub> — 100- $\mu$ fd. midget mica condenser.
- C<sub>4</sub> — .004- $\mu$ fd. mica.
- C<sub>5</sub>, C<sub>6</sub> — .002- $\mu$ fd. mica.
- R<sub>1</sub> — 10,000-ohm 1-watt (transmitting grid leak).
- R<sub>2</sub> — 100,000-ohm 1-watt (receiving grid leak; may require variation).
- R<sub>3</sub> — 10,000-ohm variable resistor (volume control).
- R<sub>4</sub> — 2-ohm filament supply resistor.
- L<sub>1</sub>, L<sub>2</sub> — each 5 turns about 5/8-inch diameter, No. 14 enameled wire (adjust to cover the band).
- L<sub>3</sub> — 2 or 3 turns, same diameter (coupling should be slightly adjustable).
- RFC — Radio-frequency choke, 2 1/2-millihenry (National R-100).
- SW<sub>1, 2, 3, 4</sub> — Sections of four-pole double-throw jack switch.
- T<sub>1</sub> — Audio transformer with extra winding for microphone (see text).
- T<sub>2</sub> — Output transformer (to match telephone receiver).

knob at the lower left is a volume control, while the other knob at the lower right operates the filament switch. The three binding posts at the lower left go to the hand-set telephone unit, the middle one being common while the other two go to the microphone and the receiver. In the lower center is the knob which operates the four-pole double-throw jack switch, which changes the unit from a transmitter to a receiver.

Underneath the panel are the two transformers, one on each side of the four-pole double-throw switch. Two Isolantite sockets are used for the Type 230 and 233 tubes, this type of socket having more grip on the tube prongs than fiber, which seems to "give." There is consequently less danger of the tubes falling out during transit, since the tubes are mounted upside down.

Between the tubes is a tuning condenser which is just large enough to cover the band. Mounted on the condenser are two double-terminal lugs on which are soldered the two tuning coils. In the middle of the set can be seen the two grid leaks and the r.f. choke, connected between the coils and the switch. Five fixed condensers complete the circuit, C<sub>1</sub> being a midget mica condenser mounted directly on the terminal lugs between the two coils. The dial is connected to the tuning condenser with a flexible coupling and a bakelite

shaft to eliminate body capacity. The aluminum panel in this model is only 5 1/2 by 6 3/4 inches.

Reasonable care should be used in selecting and laying out the parts, but there should be little trouble in getting the outfit to work properly. Good tubes are essential; poor results will be obtained with inferior tubes. When the outfit is working properly as a transmitter, it should be possible to light a 6-volt dial-light bulb with its loop placed in the field between the two

coils. When the mike is spoken into, this bulb should flicker considerably.

The transformers can be purchased, or adapted in the following manner: T<sub>1</sub> is any ordinary interstage audio transformer with the addition of a 300-turn microphone winding; T<sub>2</sub> is a 7000-ohm-to-15-ohm speaker output transformer (for use with the low-resistance telephone receiver).

When putting the receiver into operation, a strong hissing sound should be heard in the earphone. It will be noticed that no super-regeneration oscillator tube is used; super-regeneration is produced in the detector tube by the use of a lower value of grid leak than usual. To insure that the detector super-regenerates properly, condenser C<sub>3</sub> should be a good mica condenser, condenser C<sub>4</sub> should be mounted and grounded directly at the r.f. choke, the filament by-pass C<sub>5</sub> should be mounted directly at the filament terminals and tuning condenser C<sub>2</sub> should be mounted well away from the chassis. In one instance where the tuning condenser was mounted with screws to the panel, insulated only by washers, the receiver would not work. As noted under Fig. 1, the value of resistor R<sub>2</sub> may require some variation from that given, although it has not been found especially critical. If these precautions are

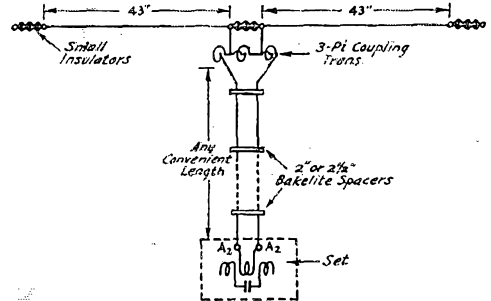


FIG. 2 — ARRANGEMENT AND DIMENSIONS OF THE PICKARD ANTENNA SYSTEM USED ON THE 56-MC. BAND

taken there should be no trouble experienced in getting the receiver to operate properly.

There is another point that might be mentioned. This type of receiver radiates strongly when operating and it is recommended that it be used only for portable work. The type of receiver using a separate i.f. tube would be preferable for a fixed station — to reduce interference to other stations. Otherwise this receiver seems to be



WIAUJ-WICTM OPERATING THE TRANSCEIVER WITH THE PICKARD ANTENNA SYSTEM

nearly the equal of the type with a separate super-regeneration tube, although slightly more fussy to get going.

Fairly good results can be obtained by connecting a four-foot wire at *A*. Much better results can be obtained, however, by connecting the feeders of the special antenna at *A*.

#### THE PICKARD ANTENNA SYSTEM

The second piece of apparatus is the antenna system with its special coupling transformer. The system was designed by Dr. G. W. Pickard, who is well known to hams the world over. This antenna certainly is a definite improvement over any other system that has been commonly used on the five-meter band. The system consists essentially of a half-wave antenna with untuned feeders, an impedance match being effected by using a coupling transformer between the feeders and the antenna. This transformer consists of three "pi" coils with three turns in each. The three coils are placed side by side and make an auto transformer of nine turns wound continuously in the same direction, with feeder coupling taps taken off across the middle three turns.

To wind this coil, take some heavy insulated wire, such as the No. 14 rubber-covered used for open house wiring. Start from the inside and wind a three-turn spiral, taking a tap off at the outside. The inside diameter should be about a half-inch and the outside diameter of the coil about 2¼ inches. Continuing on in the same direction from this tap, winding inwards, make another three-

turn coil beside the first one and from the end of this coil (the inside) take off the second tap. Continue on from this point, winding outwards in the same direction, another three-turn "pi," producing three coils of three turns each, lying side by side.

Then tie the whole thing securely with string. The antenna is connected to the two taps while the feeders are connected to the two ends of the coil, as shown in the schematic diagram. For the 56-mc. band, the length of each of the two halves of the antenna should be somewhat less than four feet because of the loading effect of the center coil, about 43 inches being usually correct. The feeders should be spaced about 2 to 2½ inches for No. 14 wire. If smaller wire is used, the spacing should be decreased in proportion. The set end of the feeders connects to the two- or three-turn pick-up coil previously described. The feeders can be of any length necessary.

A considerable number of these sets are already in use around Boston and many more are under construction. Following is a list of some stations which have these transceivers in operation: WICTM, W1FFR, W1GGG, W1DRK, W1EMD, W1ZZAW, W1BNT, W1HAW, W1DZI, W1VA, W1HC, W1CG and W1EUZ. There are probably many others. Some of the "DX" worked with these outfits is as follows: WICTM to W1CTW (about 11 miles); W1EMD to W1KH (about 16 miles); W1DZI to W1CSP (approximately 20 miles); and W1ZZAW to W1DPP (about 31 miles).

## Pacific Division Convention

Hotel Saint Claire, San Jose, Calif.,  
September 2nd-4th

SANTA CLARA County Amateur Radio Association *knows* how and the prepared program confirms the assertion. The price: \$3.00. Arrangement with the hotel management makes it possible to obtain accommodation as low as \$1.00 per person when several occupy one room; single room, one person, \$2.50. The speakers: Earl R. Meissner, Dr. Terman, Frank Jones and Ralph M. Heintz. Write E. R. Booker, Chairman, P. O. Box 734, San Jose, Calif.

### Club Directory Available

A directory of the local amateur radio societies affiliated with the League, showing their times and places of meetings, is available to members upon request, enclosing three cent stamp, please. Address the Communications Manager. Traveling amateurs will find this list helpful in visiting other clubs.

# An Electronic Divertisement

## Exposing a New Principle and Its Practical Application

By Alfred H. Miller, Jr., W3BJL\*

**T**O TRACE properly the development of wireless telegraphy it would be necessary to go back some hundred years, to Michael Faraday's discovery of electro-magnetic induction. However, that would require more time than is available so we will have to skip over all that for the present. For the same reason we shall quietly pass over all the early struggles of such men as Maxwell, Hertz, Marconi, Alexanderson, De Forest and a host of others.

Instead, let us take up the subject of this article, namely, *The Romantic Life of the Electron*, and its practical application to amateur radio. Strange as it may seem, this subject is not entirely new, dating back as it does to the time of William Shakespeare. Besides being somewhat of a writer, Shakespeare was an ardent experimenter, and records recently brought to light would seem to indicate that William was one of the first. When he was not busy writing, the records show that he could always be found in his laboratory. Early one bright September morning, Tuesday the 18th, 1621, to be exact, Shakespeare discovered what we now know to be electrons. His first observations were somewhat of a surprise, and as this is not a discourse on eugenics or psychology we cannot go into all the details. However, let me assure you that some aspects of his discovery are quite interesting.

The fact that impressed him the most was the startling romantic tendencies of these busy little people. Further experiments and observations of the electrons enabled him to reach the conclusion that the electrons mated very early in life, settling down to domestic harmony in a perfect state of monogamy. They remained this way always, until their sad but final decomposition. No divorce, love-nests or scandals ever disturbed their peaceful existence.

Curious to exploit his discovery still further, Shakespeare one day succeeded in separating an electron from its mate, to observe the reaction. The separated male was placed in the company of several very attractive, and as yet un-mated "lady electrons." True to William's expectations, the separated male ignored the seductive sirens and remained in a corner, pining in vain for his lost mate. This gave Shakespeare the idea for a new story, and he dashed out of his lab to write the now famous "Romeo and Juliet."

Here the record ends abruptly. Shakespeare

\* 6429 Cherokee St., Mt. Airy, Philadelphia, Pa.

finished the story of "Romeo and Juliet," but before he could return to his laboratory to finish the experiments, he was stricken with fever, and quietly passed out of this life. His last thoughts were turned towards the problems of the electrons.

The records reached this country in some unknown manner, and remained hidden until my esteemed friend, Dr. Twadington X. Quagmite, found them covered with dust, in an attic in New Rochelle early in 1879. Dr. Quagmite, well known in scientific circles, both here and abroad, is Professor of Xerophthalmia at Bologna University.

He has spent (or should I say mis-spent) the last 52 years in furthering the early experiment of William. As Shakespeare was made immortal by his writings (so I think), Dr. Quagmite will go down in history for his contributions to amateur radio.

Knowing that the main characteristic of the electrons was their constancy, Dr. Quagmite gathered some few hundred males and females



(Photo Courtesy Dr. Quagmite)

MILLY THE AMPERE—HENRY THE CHOKE  
Magnified 50,000  $10^6$ -6 diameters

together when they were quite young. These he introduced to each other, an action, by the way, entailing much patience and diplomacy. When the couples were all happily married and settled down into what is known as an electronic marriage, Dr. Quagmite quietly and on tip-toe, late at night, would sneak up on a young couple and deftly, with his tweezers, imprison them. The young husband went into one bottle and the blushing bride into another. In this manner over a period of years he has caught and bottled some five or six thousand electrons.

If this method seems cruel to you, this ruthless breaking up of homes, please try to overlook the Professor's actions, and forgive him in the interest of science. The Professor has confided to me, with tears in his eyes, that the reproachful look of these tender little people has often tempted him to give up his experiments, but then he sighs and says, "Science must advance, and as an ardent pupil I feel it my duty to carry on, regardless of my conflicting personal emotions." A real trouper, the Professor, with him the show must go on.

If you have not already guessed it, Dr. Quagmite had at last found a use for this romantic tendency of the electron. Let us turn for a minute from the Professor to radio.

How many of us have just settled down for a swell QSO, adjusted the old cans, opened up the log and raised a station, only to be called to the 'phone? Very annoying, isn't it? Well from now on, thanks to Dr. Quagmite, your worries are ended. With the aid of this simple (?) hookup and a few odds and ends of junk lying around the shack, you can free yourself forever of this trouble.

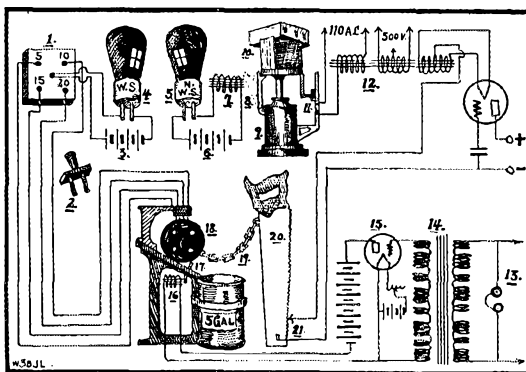
To begin with we have a small block of wood, which may be the bottom of a cigar-box, a small section of the dining room table, or the piano; in short, any small wooden object that is handy. It is mounted on the operating table within reach of the operator. The block had five contacts, 5, 10, 15, 20, and a center one. When called to the 'phone, make a hasty calculation of the approximate speed at which the other station is working you and take plug (2) inserting it into center of block. We will assume the incoming signal speed to be about 15 words per minute. Of course the other speeds could be used but we will use 15 for the explanation. The other contact of plug (2) is then inserted into the hole (15).

For the present disregard the numbered circuit and follow the center circuit, comprising battery (3) and the tube W.S. (4) This tube and its companion N.W.S. is the result of Dr. Quagmite's research. In the tube (4) marked W.S. (meaning Window Shade) is imprisoned a ravishing female electron, pining for her mate.

When the center contact is closed, battery (3) energizes small motor in top of tube which raises window shade exposing fair damsel to view of her mate in opposite tube (5) N.W.S. (meaning *no* window shade). Mate, of course having nothing to do all day but look out the window spies her immediately. Knowing that he cannot reach her, and feeling very depressed, mate rests elbows on window sill and gazes longingly at the fair vision across the way. This action on his part closes contacts on window sill energizing circuit composed of battery (6) and electromagnet (7) releasing catch (8) allowing platform of hydraulic jack (9) to descend slowly. At this

point it might be wise to mention the fact that the platform of the jack is weighted down by the old "B" batteries (10), incidentally, about the only use that I have ever found for them. As platform descends, sliding contact (11) closes circuit in primary of power transformer (12) turning on the power for the transmitter.

We are, of course, still talking on the telephone, but the transmitter is now all turned on, filaments lit and ready for operation. Now we turn to the output of the receiver (13) it not being necessary to show the whole receiver. Shunted across the fones or speaker, is a new transformer called the "dit-dar-dit-dar-dit . . . dar-dit-dar"



transformer (14). The secret of this transformer is very simple when once explained. If you will be kind enough to notice, the windings are wound in the form of that well known signal, dit-dar-dit-dar-dit . . . dar-dit-dar. The received signals are of course passing through this transformer all the time, in a very weak condition. However, when the station working you gives the final signal dit-dar-dit-dar-dit . . . dar-dit-dar, the primary and secondary circuits being wound, and consequently tuned to resonance a much larger amount of current is induced into the secondary. This strengthened signal then passes through amplifier (15).

At this point I would like to mention that in early experiments a push-pull amplifier was used, but further trials showed that a single 245 would answer the purpose just as well.

Return for just a minute to the four circuits on the left. Remember we have plugged in the square block, at the approximate speed of the station being received, which in this case was about fifteen. The amplified signal has now passed through the 245 tube (15) and energized electromagnet (16) which releases trigger (17) allowing hollow iron ball (18) to roll down incline into tank of water. A five-gallon tank will be of sufficient capacity for our purpose. By closing the circuit at the left we have opened a small valve

(Continued on page 70)

# Amateur Radio at A Century of Progress

**F**OR one solid year the World's Fair Radio Amateur Council has been working night and day to put over the amateur exhibit at the World's Fair. The result is well worth their effort. Two thousand square feet of exhibit space were secured in the Travel and Transport Building. On long counters all along the four sides of the exhibit hall are arranged the exhibits of the various radio manufacturers. In the center of the hall are located the transmitters of W9USA-W9USB, most-discussed of amateur stations at the present time.

Among the exhibitors whose products are displayed on the long counters are the A.R.R.L., Bliley, Burgess, Chicago Transformer, Eveready, Instructograph, Johnson, Kenrad, Lincoln, Littelfuse, McMurdo Silver, Midwest, National, Raytheon, RCA, Sangamo, Shakeproof and others whose exhibits were in the process of being mounted at the time this information was compiled.

The two transmitters and the two operating positions of W9USA and W9USB are located in the center of the Exhibit hall. The largest rig has an input of 1000 watts, while the smaller one is rated at 200 watts output. This installation operates on either c.w. or 'phone. National and Silver receivers are used at the two operating positions. A safety power switch is included in the center of the table for emergency use; likewise, a duplicate switch is installed at the information desk as an extra precaution.

W9USA and W9USB are on the air 24 hours daily, keeping reliable schedules in nearly every state. As a result of the fine cooperation received from amateurs contacted daily, traffic from World's Fair visitors is being delivered in a business-like manner and as soon after filing as possible. No rubber stamp messages are accepted. At this time an average of 100 messages per day is being transmitted over W9USA, with the messages received running about the same amount. Traffic for Chicago and suburbs, including people visiting the Fair, is delivered immediately, while other traffic to the state of Illinois is transmitted over a state network. Operators on duty at W9USA are W9HYI, K7VH, W9CYD, W9BYL, W9AIO, W9VS, W9DOU and W9CGV. Ed Wilcox, W9DDE, is communications manager on the Council, while Forrest Wallace, W9CRT, acts as traffic manager of the stations, in addition to his other duties on the Council's publicity staff. Laddie Smach, W9CYD, is chief operator.

The radio amateur exhibit is located on the second floor of the Travel and Transport Building, near the 31st Street entrance to the Fair. At this writing, the first of July, this exhibit has been viewed by 40,000 persons. Amateurs from every

state in the Union and from Canada, Jamaica, Panama, Hawaii and Alaska have placed their calls and signatures in the registration book. The remaining months of the Fair, and in particular the World's Fair A.R.R.L. Convention during August 3d, 4th and 5th, should see many other thousands of amateurs viewing this extensive and elaborate amateur radio project.

Last minute news from the World's Fair Radio Amateur Council states that the following world famous radio men have been definitely scheduled to speak on the program of the World's Fair A.R.R.L. convention August 3rd, 4th and 5th: Fred Schnell, W9UZ, Don Wallace, W6AM, F. Dawson Bliley, Bliley Crystal Co., Kendall Clough, Clough-Brengle Laboratories, Art Collins, Collins Radio Co., L. A. Hammarlund, Hammarlund Mfg. Co., James Millen, National Co., Prof. J. W. Fox, Iowa State College, McMurdo Silver, H. F. Waring, Chief Engineer Milwaukee Police Radio, A. J. McMasters, G-M Laboratories, H. D. Hayes, U. S. Inspector in Charge 18th District, A. A. Hebert, A.R.R.L., and others whose names are equally well known will be added up to the time the convention begins.

—C. B. D.

## "Five-and-Ten" Oscillator-Amplifier Transmitters

(Continued from page 20)

driving the neutralized buffer amplifier on the same frequency, which in turn excites the final stage. To shift to 56 mc. the oscillator generating circuit is shifted to 14 mc., doubling in the plate circuit to 28 mc. The 46 now doubles to 56 mc., followed by the two neutralized stages on 56 mc. Various combinations of doubling and tripling were tried, but the set-up outlined gives the best results. The coupling coils between the buffer and amplifier stage are set at right angles, closer coupling resulting in decreased output.

With this arrangement, immediate improvement in results was noted. W2TP reported the signal "QSA5 R8 crystal" on 28-mc. c.w. with the S.S. receiver. "Broadcast quality" was the report on 56-mc. 'phone using a Class B 210 modulator with a good speech amplifier system. Although lack of time has prevented any hunt for 28-mc. DX to date, this can be expected to follow as the number of active amateurs working on this band increases and time is taken to do some intensive listening in.

## Strays

W8BOR says he's been hearing a good many Ed Wynne notes lately — the kind that break and jump from one tone to another!

# Modernizing the Long-Wave Receiver

By Hugo A. Bondy, W2CMY\*

**I**T MAY seem somewhat trite, in these days of ultra-high-frequency development, so much as to suggest thinking of the low frequencies. However, to the amateur who is interested in what goes on at sea (and most of us are) and to the ex-commercial who likes to keep an ear peeled to the doings of the old gang on "600," a good long-wave receiver is a source of great enjoyment. Despite this interest, however, one seldom encounters a receiver of this description in a ham shack.

Those receivers that have been built have generally fallen far below expectations, usually because of the low-gain low-output vacuum tubes that have been with us in years past. But with the new types now available it is possible to construct an excellent long-wave receiver with a minimum amount of gear.

In designing this receiver the following standards were set as those to which the receiver would have to conform:

1. A.c. powered and self-contained.
2. Tuning range from the high-frequency end of the broadcast band (200 meters) to the longest commercially-used wave length (19,000 meters). This wide range was desired to cover the long-wave stations transmitting press, stocks, weather reports, time ticks and transoceanic traffic.
3. Loud speaker output comparable to that of a broadcast receiver.

With these three points in mind, the problem was tackled from several angles. Honeycomb coils were decided upon in the early stages of development, as the most effective means of doing the job. Tapped inductances would have proven too bulky, and they would not have given the degree of control over sharpness of tuning that is essential in 600-meter work and which is gained through the use of the honeycombs. A standard back-of-panel mounting is used for the coils. A stage of t.r.f. was tried in the early models but was dispensed with finally as being unnecessary.

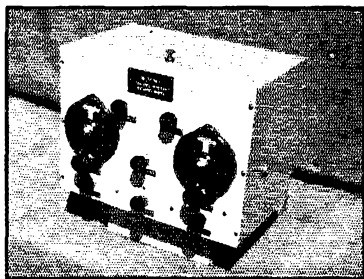
The receiver is self-contained in a can made of 1/16-inch aluminum, whose dimensions are 13 inches wide, 10 inches high and 8 inches deep. The receiver is assembled on a steel chassis of the

midget broadcast receiver type, a three-inch deep sub-base cavity housing the power transformer, filter chokes and the filter condensers in addition to the usual sockets, resistors, etc. The entire cabinet has been finished with French grey Duco.

The diagram is shown in Fig. 1. It is, in itself, nothing startling. Use is made of the now ancient and venerable three-circuit tuner with regenerative detector using a 58 and a power audio stage with a 47 in the socket. The constructional details should not require much explanation and any amateur should experience no difficulty in duplicating the job.

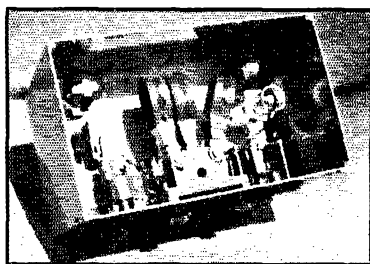
Provision is made for either series or parallel tuning in the primary circuit, the switch  $SW_1$  being provided for this purpose. This is a multiple affair consisting of a s.p.s.t. switch and a s.p.d.t. switch assembled together. For wavelengths between 200 and approximately 4000 meters series tuning is used while for longer wavelengths parallel tuning is employed. In the case of the medium waves the purpose is

to tune below the fundamental wavelength of the antenna and the added inductance of the primary or antenna coil. In the case of the long waves



THE LONG-WAVE RECEIVER IN MODERN DRESS AND WITH NEW FEATURES

The venerable three-circuit tuner using honeycomb coils is combined with new type a.c. tubes and a built-in power pack. The vernier dials operate primary and secondary tuning while the upper small knobs control the primary-secondary and tickler coupling. The other controls are regeneration, volume, tone and the power switch.



SHOWING THE LOCATION OF THE HONEYCOMB COIL ASSEMBLY AND ABOVE-BASE COMPONENTS

The screen-grid detector in its shield is at the right.

with parallel tuning, the function of the condenser  $C_1$  is to tune above the natural wavelength of the antenna and coil combination.

For stand-by purposes, as when the receiver is left tuned to the 600-meter band (585 to 615 meters, to be exact), the coupling between  $L_1$  and

\*123 Phelps Road, Ridgewood, N. J.

$L_2$  is made tight by means of turning the "coupling" control to the right. For traffic copying on 600 in QRM (which is always with us, as on 40) and in QRN, the coupling is made loose by swinging  $L_1$  to the left. A definite ratio exists between the degree of coupling between the primary and

secondary circuits and the amount of capacity used to tune the primary circuit. When shifting from tight to loose coupling the capacity of  $C_1$  must be increased to hold the signal, and *vice versa*.

As a rule the position of the tickler  $L_3$  is set for the particular set of coils in use, and the degree of regeneration or oscillation is controlled by means of the screen-grid series resistor  $R_3$ . The resistor method of oscillation control provides smooth operation with a minimum of detuning effect.

The means of controlling the volume in this receiver, though not exactly orthodox practice, was found to do the job very nicely. In fact it was tried on a short wave receiver as well. There too,  $R_2$  functioned with success as a cathode series resistor.

A goodly sized sky wire is required with any long-wave receiver, an 80-meter Zepp answering this purpose very nicely.

This receiver has been in operation, at W2CMY during the past winter, with exceptionally good results. WAX, WOE, WPR, VPN, VQI, VRT, CLA, NBA, and NAX have put in R9 signals with a high degree of consistency, at night all winter long. Not infrequently we have been honored with signals from KSE and KPH, on the West Coast. All of which, for 600 meters — with all of its QRM — isn't so bad.

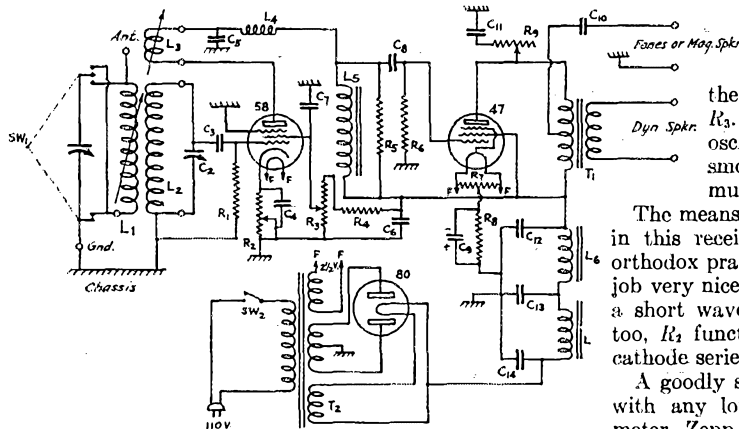


FIG. 1

- $L_1, L_2, L_3$  — Honeycomb coils. (See table.)
- $L_4$  — R.f. choke, 250-mh. (Hammarlund RFC 250).
- $L_5$  — Audio coupling impedance 800-h. (or audio transformer with primary and secondary in series).
- $L_6, L_7$  — 20-h. 80-ma. filter chokes.
- $C_1, C_2$  — .001- $\mu$ fd. (43-plate) variable condensers.
- $C_3$  — 250- $\mu$ fd. mica grid condenser.
- $C_4$  — .1- $\mu$ fd. 300-v. (tubular type) by-pass.
- $C_5$  — .001- $\mu$ fd. mica by-pass.
- $C_6$  — 1- $\mu$ fd. 150-v. by-pass.
- $C_7, C_8$  — .1- $\mu$ fd., 300-v. tubular.
- $C_9$  — 5- $\mu$ fd. 50-v. (43-plate) electrolytic by-pass.
- $C_{10}$  — 2- $\mu$ fd. 300-v. coupling condenser.
- $C_{11}$  — .3- $\mu$ fd. 300-v. (tubular) by-pass.
- $C_{12}, C_{13}$  — 8- $\mu$ fd. 500-v. electrolytic filter condensers.
- $R_1$  — 5-megohm 1-watt grid leak.
- $R_2$  — 5000-ohm potentiometer (gain control).
- $R_3$  — 50,000-ohm potentiometer (regeneration control).
- $R_4$  — 60,000-ohm 1-watt (divider resistor).
- $R_5$  — 250,000-ohm 1-watt (plate coupling resistor).
- $R_6$  — 1 megohm 1-watt (grid coupling resistor).
- $R_7$  — 15-ohm filament center-tap resistor.
- $R_8$  — 500-ohm 1-watt bias resistor.
- $R_9$  — 250,000-ohm potentiometer (tone control).
- $T_1$  — Output transformer (pentode to speaker voice coil).
- $T_2$  — Power transformer (250 v./5 v./2½ v.).
- SW1 — D.p.d.t. primary tuning condenser switch.
- SW2 — S.p.s.t. power switch.

HONEYCOMB COIL COMBINATIONS				
Wavelength Range	$L_1$ (Turns)	$L_2$ (Turns)	$L_4$ (Turns)	SW1
250 to 700 meters	75	50	35	series
450 " 1500 "	150	100	75	"
700 " 2200 "	200	150	100	"
1100 " 4000 "	300	250	150	"
2200 " 4700 "	200	300	150	parallel
2500 " 8500 "	500	500	200	"
3000 " 15000 "	750	750	300	"
6000 " 21000 "	750	1250	500	"

NOTE: Choice of  $L_1$  is dependent on the length of antenna used.

### Midwest Division Convention

September 2nd and 3rd, Melbourne Hotel, St. Louis, Mo.

WHO remembers the first big convention held in St. Louis in 1920? Some of the men who helped put over that convention are in charge this year; moreover, it is the concerted effort of the Hannibal Radio Club of Missouri; Mound City Radio Club, the O.B.P., St. Louis Amateur Radio Club all of St. Louis and the South Missouri Amateur Radio Asso. The official convention will be held on Saturday and Sunday but as Monday is a Holiday the Committee will make special efforts to entertain those desiring to stay over. A special invitation is extended to the ladies. Hebert of A.R.R.L. and Schnell of Chicago will speak. Harold Gray of the Byrd Expedition will relate the Antarctic experiences. Remember, trips galore, entertainments a plenty, and all for \$3.00. Register in advance and participate in a special prize. The Royal Order of the Wouff Hong ceremonial will be given Saturday night and the big banquet on Sunday night. Write to Dr. Chas. L. Klenk, Chairman Convention Committee, 3148 Haliday Ave., St. Louis, Mo.



# Automatic Overload Protection and Push Button Control

By E. and C. Seiler, W8PK-W2EB\*

THE system of automatic overload protection and push-button control to be described was developed as the result of blowing up too many dollars worth of radio equipment during the past few years at W8PK and W2EB. On one occasion back in 1925 we were working a pair of 204-A's in a self-rectified circuit on 20 meters. The tubes were beginning to show signs of weakness under the strain of 2500 volts and the grid wires shorted to the filament. The tubes blew up and so did a perfectly good 2-kva. transformer. At another time a fifty-wattter which had had its base removed in 1924 for some 5-meter work (removing bases of tubes was an old Spanish custom in those days) and which had to have a copper tack driven into the glass envelope at the point where the plate lead protruded — yes, the plate lead broke at the point of exit during the process of removing the base — took a deep breath of autumn air through the hole made by the copper tack. The filament wilted — and so did a 750-v. transformer. On still another occasion we blew up four 210's, three milliammeters, a plate transformer and a pair of rectifier tubes. After this loss we started using crude fuses in the high-voltage leads. They were not very satisfactory, however, because it took time for the fuse to burn out and even though the time was but a few seconds, we kept on losing equipment.

Three years ago we decided to put to work a system of control for starting and stopping the transmitter and have it automatically shut off the power supply in the event of an overload. The system is fool-proof throughout and has never missed fire except when the battery went dead. Three relays are required to do the job, as shown schematically in Fig. 1. The 110-volt a.c. relay is a General Electric Type G-2; the other two are Western Electric R-207 and R-699 relays. Two small Yaxley push-buttons are needed, one (start) making contact when pressed, the other (stop) breaking contact when pressed. A 22½-volt "B" battery is used to operate the R-207 relay; since this relay will operate with only one

milliampere through the winding the "B" battery lasts at least a year even though the control is used every day. The 60-ohm potentiometer was made by putting a 20-ohm rheostat in series with a fixed 40-ohm resistor.

When the "start" button is pressed the R-207 relay operates, closing the two sets of contacts which are normally open. This causes the relay to lock through one set of its own contacts and

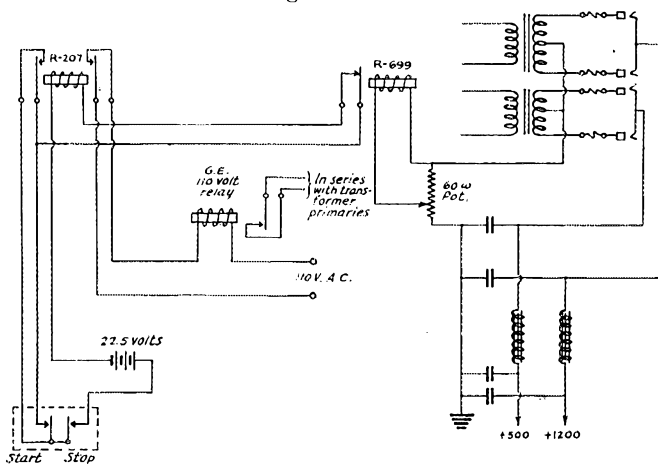


FIG. 1 — THE PUSH-BUTTON CONTROL CIRCUIT

The potentiometer setting determines the current at which the overload relay, R-699, will operate and shut off the primary power.

through the normally-closed contacts of the R-699 relay. The 110-volt relay operates under control of the second set of contacts on the R-207 relay. The R-207 relay can be released by pressing the "stop" button or by the opening of the contacts on the R-699 relay when an overload occurs.

The 60-ohm potentiometer is the means of adjustment for different overload currents. Practically the total plate current of the complete transmitter flows through the resistance. For example, the potentiometer may be adjusted so that the relay will operate when, let us say, a 300-ma. current flows through the resistance. Now if for any reason a current of 300 ma. or more flows through the potentiometer the R-699 relay operates, opening its contacts and in turn releasing the R-207 relay. The 110-volt relay, being under control of a pair of contacts on the R-207 relay, also releases and shuts off the power supply.

\* 60 Rolling St., Lynbrook, L. I.

Additional protection is provided when operating on 'phone. This protection consists of two more relays which are connected into the circuit as shown in Fig. 2. Class B modulation is used for the 'phone job, and to make certain the load is always on the Class B output transformer before plate voltage is applied to the audio system, the

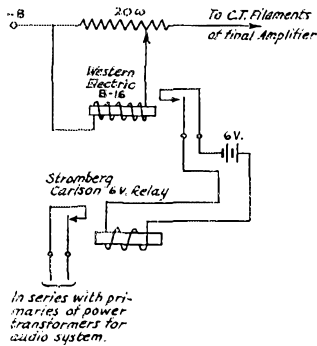


FIG. 2 — A CONTROL CIRCUIT FOR CLASS B MODULATORS

To prevent possible voltage breakdown in the output transformer should the modulator receive excitation with the Class C amplifier load removed.

control relay B-16 is connected in the last amplifier stage. Since a few seconds are required for the crystal to start and for power to appear in the final amplifier the output transformer would be unloaded during this interval. However, no damage can be done to the output transformer when using the automatic control since the voltage cannot be applied to the audio system until after the final stage is drawing plate current. When 'phone is used the potentiometer is set to take care of the additional current required by the audio system.

This system has been in constant use at W2EB for three years and has not given a moment's trouble. It has prevented plenty of grief and saved lots of equipment. We are now using it at W8PK, where it is proving to be equally reliable.

### Silent Keys

It is with deep regret that we record the passing of these amateurs:

Milton E. Adams, W9AQQ, Minneapolis, Minn.

Scott Biggs, W5AXG, Jackson, Miss.

Edward P. Getter, ex-8AIM, Dayton, Ohio

Wm. E. Maguire, W6CFA, Olinda, Calif.

Sylvester Miller, ex-9UR, Aurora, Ill.

Headley Peake, W3DDE, Big Stone Gap, Va.

Chester Tworkowski, WSECD, Detroit, Mich.

### NEW REGULATIONS!

THE Federal Radio Commission on June 23d enacted complete new amateur regulations.

At request of the A.R.R.L. Board, effective immediately the 160-meter 'phone band is widened to read 1800-2000 kc., and the bands 28,000-28,500 kc. (a fourth of the 10-meter band) and 400-401 mc. are opened to 'phone for all amateurs. You may GA with voice on these frequencies anytime you wish.

The remaining regs are effective October 1st. Highlights:

Station licenses only to those who qualify as operators and who own or control apparatus. Separate operator licenses for those who have no station, but no separate station license for non-operators.

As per Board's recommendation, adequately-filtered d.c. power supply required on all stages on frequencies below 14,400 kc. (all wave lengths down to and including the 20-meter band). Tone-modulation permitted above 28 mc. (10-meter and 5-meter bands — and  $\frac{3}{4}$  m.).

Every licensee entitled to operate a portable without special license, under same call, per simple new rules. No more separate portables.

Amateur mobile authorized on aircraft only, on 56-mc. and 400-mc. bands only.

No change in communication ("traffic") regulations.

No change in existing licenses until they expire, but new license system for newcomers and for renewals as either op or station license expires. Station and operator business combined in one application, one examination; all papers to be graded in Washington; ultimate result, one combined station-and-operator license issued from Washington, term 3 years.

Extra First Class license abandoned when expired. New op licenses endorsed Class A, Class B or Class C. Class A is unlimited, i.e., includes unlimited 'phone. Class B is c.w. plus limited 'phone, like present First Class. Classes A and B only by personal examination as now, compulsory within 125 miles airline of the 20 district offices (see list, p. 33, QST, December 1932, or *License Manual*) or of Washington, St. Louis, Pittsburgh, Nashville, Oklahoma City, San Antonio, Columbus, Des Moines, Cincinnati, Cleveland, Schenectady, Winston-Salem. Outside that range, eligible for Class C by mail, same

(Continued on page 42)



# STRAYS



Everett L. Battey, W1UE, and Miss Louise Hyneck of Hartford, were married on July 1st. The A.R.R.L. Ass't C.M. will continue to be on the air from W1MK and W1UE. All hands please note that a 100% ham picked RM NITE for the big doings. The whole field organization gang extends best wishes to "Ev," the latest member of the Hq. staff to join the ranks of the benedicts.

Miss Lillian M. Salter, well known to all hams who get C.D. bulletins as LMS, is talented in musical interpretation as well as extremely competent in handling details of A.R.R.L. communications organization. Miss Salter played the wedding march.

If your receiver gets an overdose of r.f. whenever the transmitter goes on the air, try connecting a neon lamp between the antenna and ground terminals on the receiver. When the gas in the bulb ionizes it tends to minimize the r.f. voltage getting in at the receiver input terminals. Possibly the operation of the bulb can be improved by removing the resistor in its base. This suggestion comes from Lieut. Hansen of Byrd Expedition fame.

Needless to say, the neon bulb won't be of much help unless the receiver itself is completely shielded.

Two new songs from W1EOP:

1. The A.C. Song: "Ho, HUM, Spring is here now."
2. The Class B Song: "It ain't worth a thing if it ain't got that SWING."

One of our favorite errors (or is it the printer's favorite?) cropped out again in June *QST* — "serious" filament operation in "Transformerless Plate Supplies." Yep, we heard about it from the gang!

One of W8DJE's SWL friends claims that DJE is always coming on "all of a thudden."

W9EDI, taking the examination for his Extra First ticket, forgot the penalties for various violations of laws and regulations. So he wrote, "Too darned much to take a chance."

He got his license!

VE1AV had the tough luck to lose his home by fire not long ago, and along with it went a collection of QSL cards that had been accumulated over a period of six years. The OM would appreciate it if any of the fellows with whom he has QSO'd in the past would send along duplicates.

Copper cans from defunct Merphon 5-5-5 and 8-8-8 condensers make excellent coil cans when cleaned, especially for sets using plug-in coils, since the cans are plenty large. (Same goes for the aluminum cans used on other makes of condensers.)

W1ALE recommends the following formula for putting photos on QSL cards by the method described by W9ANZ in *QST* for March, 1932:

- A. 1 part potassium ferricyanide  
5 parts water
- B. 1 part citrate of iron and ammonium  
5 parts water

Dissolve the two chemicals separately and then mix in a dark room. The rest of the process is the same as that used by W9ANZ.



And now we have "the heaviest ham" in the Roanoke Division. W. N. Bray, W4BYA (left) and Charles H. Stout, W4CS (right) are reputed to be first and second largest hams in North Carolina, and they challenge amateurs throughout the entire U.S.A. Mr. Bray's weight is 320 pounds, and Mr. Stout's is 280 pounds.

It pays to advertise, perhaps. One would-be ham, who had connected his code-practice audio oscillator to a loud speaker, called a few practice CQ's one evening, was overheard by a couple of hams riding by, and had an entirely unexpected "personal" QSO.

W4NI had an argument about electricity with his physics instructor at school, and finally won his point by taking the *Handbook* to school and proving it!

## Correction

The honeycomb coil in the 100-kc. electron-coupled oscillator described in the Experimenters' Section, June *QST*, should have 250 turns, not 750 as specified.

# More on QSL

## A.R.R.L. QSL Forwarding System Extended to Canada—Notes on the System in the U. S.

**E**VER since we announced the inauguration of a new and improved method for the distribution of foreign QSL cards to League members in the United States, our Canadian members have been asking when such service was to be extended to Canada. More than that, many of them immediately volunteered their services for the work, in that same spirit of coöperation that typifies so many other aspects of amateur radio. So now we are pleased to inform our Canadian fellow-amateurs that, effective immediately, the district-distribution of QSL cards sent to League Headquarters by foreign amateurs will apply to Canadian hams as well as those in the United States.

The new A.R.R.L. District QSL Managers for the five Canadian districts are as follows:

- VE1 — J. E. Roué, VE1FB, 84 Spring Garden Rd., Halifax, N. S.
- VE2 — R. E. L. Johnson, VE2BO, 536 Grosvenor Ave., Westmount, P. Q.
- VE3 — Bert Knowles, VE3QB, Lanark, Ont.
- VE4 — Dr. J. J. Dobry, VE4DR, Killam, Alberta.
- VE5 — E. H. Cooper, VE5EC, 2024 Carnarvon St., Victoria, B. C.

In announcing these appointments we want to express our thanks not only to the men named, but to the many other Canadian amateurs who similarly volunteered for the work; it is a matter of regret that we haven't got enough jobs to hand around! Selections, in each district, were made in the order of receipt of the application.

Now, just to go over the details of the system, for those who may not have seen the March article.

Every Canadian amateur who wishes to receive foreign QSL cards should immediately despatch to the QSL Manager for his particular district one stamped, self-addressed envelope. Make sure the envelope has the necessary first-class Canadian postage. On the outside, in the regular place, should be your name and address. Your *call* (this is important) should be printed prominently in ink in the upper left-hand corner of the face of the envelope. In order to make it easier for the QSL Manager to maintain the system, it is earnestly requested that a standard-size envelope  $9\frac{1}{2}'' \times 4\frac{1}{2}''$  be used. Anything smaller than this is too small for most of the cards that will be received.

After you've sent your envelope to your QSL Manager, the rest of the system "works while you sleep." When we receive a batch of foreign QSL cards here at League Hq. (we get around 80,000 a year now) we sort them and send all VE1's to Mr. Roué, all VE2's to Mr. Johnson,

etc. They, in turn, insert the cards into the envelope you have provided, and when the envelope has enough cards in it to bring it up to the weight limit, or sooner if the cards aren't coming in for you very fast, they'll seal it and drop it in the mailbox. When you get an envelope of cards, you should promptly send your QSL Manager another envelope to fill the empty gap in the file. OK?

### FOR U. S. AMATEURS

Since the publication of the original article on the system, it is quite likely that there are many new amateurs on the air and who, needless to say, are anxious to know if they have been heard in foreign climes. As we have already intimated, the system just outlined for Canada is already in effect in the United States. District QSL Managers for the United States are as follows:

- W1 — Jack Keim, W1VP, 287 Warren St., Needham, Mass.
- W2 — H. W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.
- W3 — E. L. Thompson, W3CQS, 312 College Ave., Salisbury, Md.
- W4 — T. G. Smith, W4ATZ, 815 Telfair St., Augusta, Ga.
- W5 — Shelton Stanton, W5ACA, 2627 Milan St., New Orleans, La.
- W6 — C. E. Spitz, W6FZQ, Box 1804, Phoenix, Ariz.
- W7 — L. Q. Kelly, W7BPC, 4919 So. Prospect St., Tacoma, Wash.
- W8 — F. W. Allen, W8GER, 324 Richmond Ave., Dayton, Ohio.

*(Eight district hams please note this is a change of address for Mr. Allen since the original article was written in March — A. L. B.)*

- W9 — H. C. DeMuth, W9FJB, 1411 Dempster St., Evanston, Ill.

Amateurs desirous of receiving foreign QSLs should send a 3c self-addressed envelope of the size mentioned (known as No. 8 at postoffices) to their respective QSL Managers and the system will run as indicated.

### NOTES

Before we finish this squib we want to mention a few things that are turning up in this QSL system business.

First, there are many dozens of cards on hand at each of the QSL Managers for the U. S. for amateurs who haven't sent in envelopes. Better do it, OM's, whether you expect cards or not. Lots of times you'll find that you are getting across even if you didn't know it. Many of these foreign QSLers, you know, are listeners, so the fact that you haven't worked anybody doesn't mean that cards aren't trying to find you!

Second, in a number of instances where a

*(Continued on page 74)*

for the

# EXPERIMENTER



## Concentric Cable Feeders

**A**T A recent meeting of the Transmitting Amateur Association of El Paso the Program Committee gave a demonstration of concentric cable feeders using a full-size 7000-kc. antenna fed through a twelve-foot feeder, the rig being supplied with power from portable transmitter W5GI.

In arranging this demonstration it was thought desirable to construct the apparatus from standard material and in such a manner that it could be used as a working model for anyone interested in installing a concentric cable feeder system. The feeder was designed in accordance with the data given in an article by True McLean in the October, 1932 issue of *QST*, so the theory need not be gone into here. There are, however, several unique features involved in the mechanical construction of the feeder that are worth describing in detail.

For the outer conductor a ten-foot length of standard  $\frac{3}{4}$ -inch steel tube or thin-walled conduit was used. The inner conductor was a piece of No. 2 hard-drawn copper wire whose outside diameter is very nearly the required  $\frac{1}{4}$ -inch. The spacers were made of hard wood of just the right outside dimensions to slip easily into the steel tube. A hole was drilled in the center of these spacers just large enough to permit the No. 2 wire to pass

through with a snug fit. The wire was then "tinned" on each side of the spacers to prevent them from slipping. These wooden spacers were placed about twelve inches apart on the straight runs and three inches apart in the 90 degree bends.

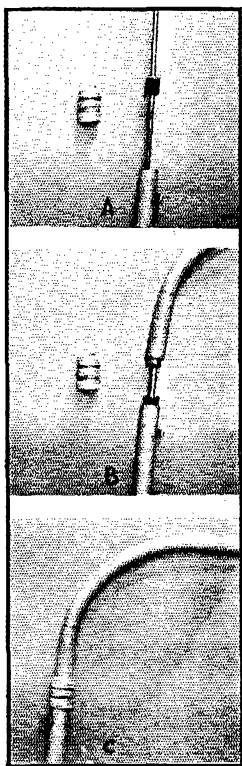
The bends were made from sections of the steel tube and were formed on a bender that electrical contractors use for that purpose.

No attempt was made to fish the center conductor around the bends as it was found much more convenient to make each bend a separate unit and couple a straight length of tube to each end of the bend in the following manner: A small hole was drilled in the center of each inner conductor to be joined and a small copper dowel inserted to hold the conductors in line when they were ready to be soldered. The threadless connectors (see photo) were slipped over the end of the straight section of tube and the center conductor was slipped out far enough to give working space. The two ends were fitted together with the dowel referred to above holding them in line. They were then soldered fast. The coupling was slipped into place on the bend and the straight section shoved home in the opposite end of the coupling, which was then screwed down hard, completing the job.

The upper photograph, A, shows the center conductor protruding from the outer tube, exposing one of the wooden spacers. The coupling is at the left. Photo B shows the two ends of the center conductor in place and ready for soldering. The coupling has been left off to give a better view of the spacers. At C is the completed joint coupling the 90-degree bend to the straight tube. While the tubing used in the demonstration was of steel and gave excellent results, it is possible to obtain hard-drawn copper tubing and standard aluminum conduit in sizes from  $\frac{1}{2}$ -inch up. Fittings and bends for these are also available and any machine shop will turn out spacers from hard rubber, bakelite, maple or other suitable insulating material for a very small sum.

The writer believes that hams will find that the concentric cable feeder constructed along the lines as outlined above will find many applications, and will take its place along with the Zepp as a popular system of feeding a remotely-located radiator.

— L. G. Wainman, 512 Myrtle Ave,  
El Paso, Texas



THREE VIEWS SHOWING HOW THE JOINT IS MADE IN THE BEND

The upper photograph also shows one of the home-made wooden separators which space the inner conductor from the outer pipe.

## A.C.-Operated Pre-Amplifier

The circuit shown in Fig. 1 is not original at all, but inasmuch as it has served to operate both dynamic and condenser-type microphones "all

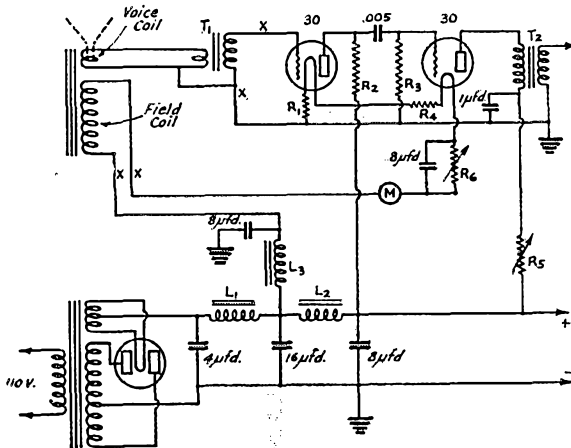


FIG. 1 — A.C.-OPERATED PRE-AMPLIFIER WITH DYNAMIC MICROPHONE

- $R_1$  — 75 ohms.
- $R_2$  — 100,000 ohms.
- $R_3$  — 250,000 ohms.
- $R_4$  — 40 ohms.
- $R_5$  — 250,000-ohm variable resistor.
- $R_6$  — 5000-ohm variable resistor, wire-wound.
- $L_1$  — 45-henry, 125-ma. choke.
- $L_2$  — 45-henry, 40-ma. choke.
- $L_3$  — 30-henry, 85-ma. choke.
- $M$  — 0-100 d.c. milliammeter.
- $T_1$  — Microphone transformer.
- $T_2$  — Output transformer to 500-ohm line.

a.c." — with ridiculously low hum — I offer it for what value it may have to "ye hamme." Use can be made of the power supply already operating the main speech amplifier.

The idea is simply this: Rectified and filtered

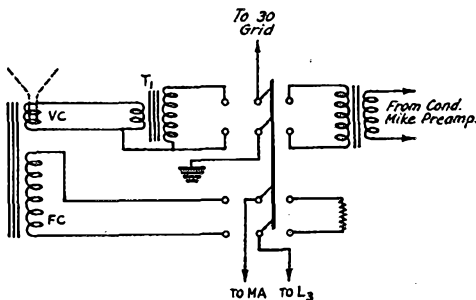


FIG. 2 — A SWITCHING ARRANGEMENT TO USE THE AMPLIFIER OF FIG. 1 WITH A CONDENSER MICROPHONE HAVING AN ADDITIONAL STAGE OF PRE-AMPLIFICATION

d.c. from the plate supply is reduced in voltage by suitable resistors to furnish power for the filaments of Type 30 or other low-voltage pre-

amplifier tubes. Filament current is adjusted by varying  $R_6$  until the milliammeter,  $M$ , reads the correct value for the tube filaments — in the case of 30's, 60 mils. Since the filaments are in series,  $R_6$  always should be adjusted for rated current flow of one tube; furthermore, the tubes in the amplifier should all be rated to take the same filament current. Resistors  $R_1$  and  $R_4$  provide the grid bias for the two tubes;  $L_3$  is a decoupling choke. The other circuit values are those usually to be expected in similar amplifiers.

If a twin d.p.d.t. switch is inserted at the points marked "X", arranged so that a resistor of 1800 ohms replaces the field coil of the dynamic speaker (or a resistor having the same value as the field coil resistance), a condenser microphone can be used in place of the dynamic. Fig. 2 shows this more clearly. A single stage of condenser mike pre-amplifier is all that is required in addition to the two stages shown. If the condenser mike is sensitive enough it might be used directly, with suitable switching of the head connections.

If the filament of the condenser mike pre-amplifier is also in series with the other filaments, the milliammeter should still read 60 mils.

An arrangement of this sort reduces materially the cost of operating and maintaining a condenser or dynamic microphone. It has been used by W9BHM and W9AAI for a number of years. Its recent inauguration at W9JHY has sold me 100% on the idea.

— M. C. Bartlett, W9JHY

## Screen-Grid Detector Coupling

Homemade detector couplers using old audio transformers as audio chokes do not always

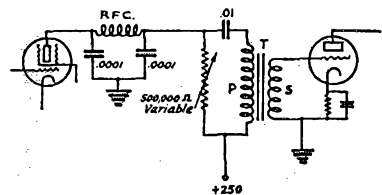


FIG. 3 — SCREEN-GRID DETECTOR COUPLING USING A VARIABLE RESISTOR AND AN AUDIO TRANSFORMER

perform as they should; the following letter from Pensyl Mawby, of Trenton, N. J., offers a suggestion which may help in cases where trouble has been encountered:

"I never bought one of those nice, expensive 500-henry chokes used to couple a 35 or 24 detector to a 27 audio; my dollars had to be stretched over too many miles. As per suggestions in *QST* I tried all sorts of old audio transformers, including single stage, p.p. transformers, output audio

chokes, etc. with only fair results. I also tried the 250,000-ohm plate resistor without much success.

"In desperation I tried the circuit shown in Fig. 3. The volume was very much better; the sensitivity was marvelously better. English and German b.c. 'phones are easy to listen to and identify as never before (without antenna, only water pipe to one post and radiator to ground).

"Maximum sensitivity seems to be reached by using 6 to 8 megs. as detector grid leak and high resistance at  $R$  in the detector plate circuit. Quality is then not at its best. By reducing the value of  $R$ , sensitivity is less, quality is improved and tube noises are less. It is a simple matter to pick up a very weak carrier with high  $R$  and then adjust for best results."

A really good audio transformer — one having large primary inductance — should be used. Mr. Mawby's transformer is a Samson Symphonic.

### An Anti-Blinker

Here is a scheme which may help out hams who find themselves the object of their neighbors' complaints that the lights are blinking.

The transmitter at W4GQ draws quite a bit of

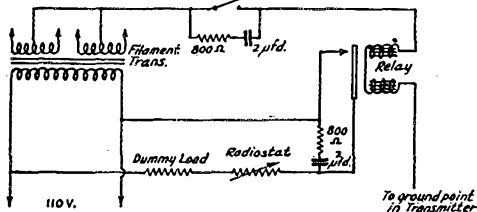


FIG. 4—ANTI-LIGHT-BLINKING CIRCUIT FOR HIGH-POWER TRANSMITTERS

The dummy load consists of electric heater coils taking approximately the same power as the plates of the keyed tubes. The Radiostat (or heavy-duty rheostat) gives a fine adjustment of load. The 800-ohm resistors and 2- $\mu$ fd. condensers prevent clicks by eliminating sparking at the key and relay contacts.

power from the 110-volt line, as it uses a 204-A in the final stage, with a 203-A for exciting buffer, both of which stages are keyed simultaneously in the center tap. Consequently, when the key was pressed lights all along the line took a sudden dip, and the filament voltage on the transmitting tubes dropped about ten percent. It was quite impossible for anyone to read while the transmitter was being keyed because of the blinking lights, so the following scheme was adopted:

A dummy load consisting of two 660-watt electric heater coils in parallel was put in series with a Bradley Radiostat (heavy duty) and run through the contacts of a reverse-action relay. This was a 150-ohm telegraph relay with double-action armature. In telegraph use the rear contact screw has a piece of fiber in place of the contact point, and is used only for a back-stop. The contact screws were reversed, so that with the coils energized the contact was broken. Also a

heavier pair of silver contacts was soldered on instead of the lighter contacts.

By reference to the diagram Fig. 4, it can be seen that when the key is pressed the d.c. in the center-tap lead actuates the relay coils, releasing the dummy load from the line. When the key is released the transmitter load goes off and the dummy load immediately takes its place. The Radiostat should be adjusted so that the filament voltmeters have the same reading when the key is down as when it is up. When so adjusted, and when the relay contact spacing and tension spring are adjusted to give quick action, there will not be time for the electric light filaments to cool perceptibly during the action of the relay. Result: No blinks, and steady transmitter filaments. When once set the unit may be forgotten. The same switch which cuts the power to the filament transformer during listening periods also disconnects the dummy load, so there is no avoidable waste of current in the dummy.

One word of warning! Don't use a relay with too high d.c. resistance, as it will introduce bias to the transmitter. The 150-ohm relay works very nicely here.

This arrangement has been in use at W4GQ for some time, and works perfectly with any power used. A broadcast receiver in the next room, approximately 15 feet from the transmitter, operates with no interference at all. The only indication that the transmitter is being operated is a dip in the lights when beginning a period of transmission and a brightening back to normal when the transmission is concluded.

— A. H. Davis, W4GQ

### Remote Switch

The drawing of Fig. 5 shows a home-made switch built by Frank Robison, W6HDX, for the purpose of changing the length of his antenna — in this particular case to change the length so the fundamental wavelength would be shifted

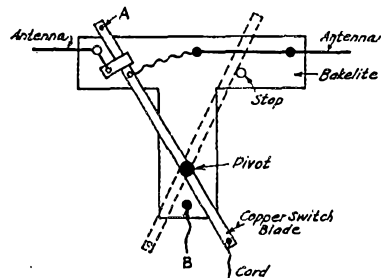


FIG. 5—A SWITCH FOR CHANGING ANTENNA LENGTH

Similar switches can also be used in other applications where the most satisfactory electrical location is mechanically inconvenient.

from 40 to 80 meters and *vice versa*. A copper switch blade is pivoted as shown on a bakelite

"T," the ends of the antennas being fastened at the ends of the arms of the "T." One wire is connected to the blade by a short piece of flexible wire; the other antenna connects to the switch jaw, also a piece of copper. A coil spring is fastened between the points marked *A* and *B*. A cord is fastened to the end of the switch blade so the switch can be operated from the ground. A jerk on the cord carries the blade slightly past the vertical position and the spring pulls the blade over to the opposite side, much in the manner of the small snap switches used on lighting circuits.

The uses of a switch of this type are not necessarily confined to changing the length of an antenna; for instance, for antenna changeover when the feeders are located close to a transmitter which is remotely controlled; or for operating lightning switches without opening the window, etc.

### The Goyder Lock

A variant of the oscillating amplifier known as the Goyder "lock-system" has attained considerable popularity in Europe, according to a letter from J. Fleurbaey, ON4ZA, who used a transmitter of this type in the March International Contest. Described briefly, the amplifier is simply a TNT oscillator with its grid coil loosely coupled to a crystal oscillator or doubler tank; to get crystal control the oscillating

the TNT oscillator so that zero beat is obtained at exactly the same spot on the monitor dial.

3. Couple the grid coil of the TNT oscillator to the tank of the crystal-controlled driver and turn on the latter.

4. Retune, if necessary, until *only* a crystal-controlled signal is heard in the monitor, all tubes being "on." When this condition is reached the two oscillators are "locked" and the crystal has control.

At ON4ZA the oscillating amplifier is a European-type 203-A with about 100 watts input. The oscillator tube is a 47, used with a crystal having a fundamental frequency in the 7-mc. band. The input to the oscillator is 7 or 8 watts, and the oscillator tank is coupled to the TNT grid coil for 7-mc. work. On 14 mc. a 46 doubler, running with about the same input as the crystal oscillator, is used, its output being coupled to the amplifier grid.

It should not be necessary to point out that a transmitter of this sort should be monitored *constantly*, and that it should be carefully checked every time it goes on the air after having been idle for a time. Frequency creep caused by tube heating often is enough to allow the tubes to get out of synchronism, which not only destroys the crystal-like character of the signal but may result in off-frequency operation.

## Straits

Forced to do some soldering on the roof when his antenna lead broke off, W2BNJ saved the day (there was no way to heat a soldering iron on the roof) by using a can of Sterno bought at the local five and dime store. The joint to be soldered was held in the flame until hot enough to melt solder, which was then allowed to run in the joint. This worked on a cold winter day, and may help some hams who run into the same kind of emergency.

Phone men who cause interference with neighbors' telephones might try placing a .002- $\mu$ f. fixed condenser across the mike button in the telephone, suggests W9TE. Such a condenser is already incorporated in the handsets. (Some telephone companies are rather prejudiced against unauthorized alterations in their circuits. — Ed.)

VK2JZ has a good stunt for getting 28-mc. reports. His 28-mc. transmitter, a push-pull 45 out-fit with its own power supply and antenna, is keyed by a relay in parallel with the keying relay on his 7- and 14-mc. transmitter. Therefore every transmission on the last two bands is duplicated on 28 mc. — without additional effort — putting a signal on that band much more frequently than would be possible otherwise. If more hams would do something similar there would be plenty of sigs for listeners to pick up.

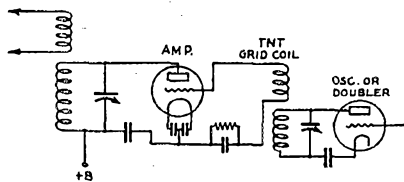


FIG. 6—TNT OSCILLATING AMPLIFIER

Values may be those ordinarily used for TNT circuits. The crystal oscillator and doublers do not differ in any way from those which have been described previously in QST.

amplifier is tuned to the same frequency as the crystal oscillator or doubler and because of the well-known tendency of two coupled oscillators to "lock" at the same frequency the crystal tube takes control. The result is a signal with all the characteristics of crystal control but obtained without neutralization and without worry of getting adequate excitation for the amplifier, since it supplies its own excitation. A simplified diagram is shown in Fig. 6.

ON4ZA gives the following as the tuning routine:

1. With the power amplifier switched off, adjust the crystal oscillator (and doubler, if one is used) for maximum stability. Pick up the crystal signal in the monitor and adjust to zero beat.
2. With the crystal oscillator switched off, tune





# Amateur Radio STATIONS



## W6AQA, Los Angeles, Cal.

WITH long-wave receiving equipment on the desk and the screened-in rack-mounted transmitter and speech equipment with tricky dials and tube guards, W6AQA looks like a young broadcasting station. Nevertheless, all the transmitting equipment is home-built — patterned after the W. E. style of construction — at the expense of several months of patient work. The r.f. end of the set, in the right-hand rack, consists of a 10 oscillator, 10 neutralized buffer and 203-A final amplifier. Appropriate power supplies are mounted on the same rack. The left-hand rack contains a three-stage speech amplifier, meters and controls. The modulator, a pair of 845's in parallel, is in the upper deck of the r.f. rack.

The cabinet at the left on the desk contains the short-wave receiver; next to it is an IP-501 Navy receiver with its amplifier. The mike is a double-button broadcast type.

Says W6AQA, "I have always thought it a darned shame that so many amateurs are satisfied with a station layout that looks like the



W6AQA

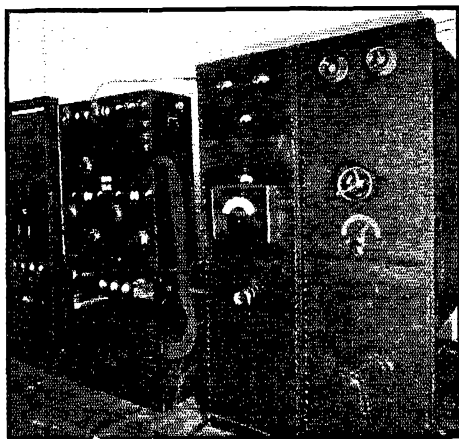
remains of a spaghetti factory after a cyclone. . . . With radio parts selling at the lowest wholesale prices ever, a commercial-appearing job can be produced for practically the same cost as a layout that encourages the rats to move in."

## W3BLZ, Morrisville, Pa.

THIS formidable array of racks and panels which constitutes the transmitting end of W3BLZ is, quoting Franklyn J. Wolff, the owner, "commercial in looks but 100% amateur in construction, being built up from panels, parts

and odds and ends purchased at attractive prices from the defunct Universal Wireless outfit."

Built for 75-meter 'phone, the r.f. part of the transmitter (in the center) has the usual crystal-controlled oscillator, buffer and modulated amplifier, and in addition has a linear r.f. stage with



W3BLZ

an 851. The modulated amplifier is a Western Electric 242; the modulator, a W. E. 212-D. The panel at the far left contains a thermostatic control unit for the crystal. Since the photograph was taken a 14-mc. transmitter has been built in the upper part of this panel, using the same modulating equipment as on 75 meters.

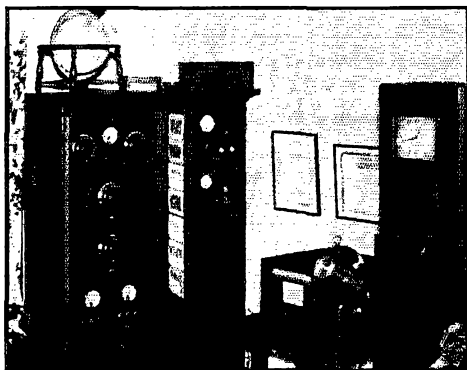
The speech equipment is not visible in the photo, but consists of a W. E. condenser microphone and pre-amplifier followed by a W. E. speech amplifier ending up in a 211 which excites the 212-D modulator.

W3BLZ's 75-meter 'phone has been heard in New Zealand, Australia, England and in various parts of Europe. Stations worked include everything that can be heard.

## W6IBK, La Jolla, California

ALTHOUGH W6IBK has not been very long on the air, the station has a neatness and business-like appearance about it that some builders achieve only after years of haywire. 'Phone operation on 160 meters is the chief activity. The r.f. part of the set uses 46's in all

three stages — oscillator, buffer, and modulated amplifier — and is housed in the left-hand part of the large cabinet. The right-hand compartment contains a remote-control unit for the BCL re-



W6IBK

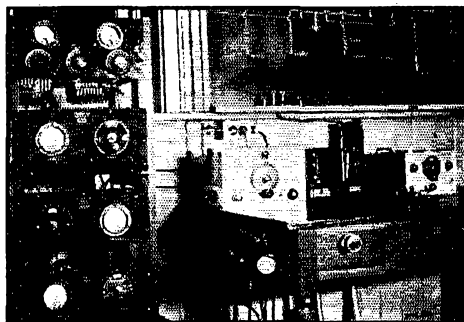
ceiver, a microphone control panel, and a loud-speaker for the short-wave receiver, the latter being a National FB-7. The mike is mounted on a floor stand which carries an auxiliary switch operating a send-receive relay in the microphone control panel so that the transmitter can be turned on and off without reaching for the control panel. The modulating equipment is mounted in the cabinet on which the land 'phone is sitting and is therefore not visible in the photo. Two 46's in Class B are driven by another 46, which in turn gets its signal from two stages of speech amplification with a 57 and 56.

During the brief existence of W6IBK its signals have been heard in Hawaii, and many stations in the 6th, 7th and 9th districts have been worked, all on 160-meter 'phone.

#### W8AJK, Morgantown, W. Va.

W8AJK is located in the Physics Department of West Virginia University, at Morgantown, West Virginia.

The transmitter is a three-tube affair, consisting of a 10 crystal oscillator, a doubler using a 10,



W8AJK

and an 852 final amplifier. By means of switches it is possible to operate on either 40 or 80 meters without changing inductances. Both the doubler and final amplifier are neutralized. A rectifier-filter power supply is used for the Type 10 tubes and is housed under the crystal oscillator. A motor-generator located in the room below and remotely controlled from the transmitting table furnishes volts for the 852 and filament voltage as well. For 20 meters a small push-pull 10 outfit is used, the circuit being the reliable TNT. Not much work is done on 20 because of too bad QRM from automobiles. The transmitting antenna is a half-wave 80-meter Zepp located between two buildings and about 70 feet high.

The regular receiver, at the left of the table, is an electron-coupled oscillator with an r.f. stage and a pentode output. It is entirely a.c. operated. On the right is a self-contained set (*QST*, May, 1932) used for portable work and for monitoring the transmitter. It is calibrated and serves as a frequency check. Frequency settings are made with the aid of General Radio frequency meters.

While the station is used largely for demonstration and experimental work, quite a bit of rag-chewing and general ham work is done. Reports on the station's signals are always satisfactory.

#### W2ENR, Schenectady, N. Y.

HERE is a glimpse of some of the Schenectady gang operating W2ENR, the station of the Schenectady Amateur Radio Association. Besides



W2ENR

functioning in normal club activities, the station works in the Naval Reserve Net each Friday night, being operated by members of the local communication reserve unit.

The transmitter, loaned by W2BWF, has a crystal-controlled oscillator using a Type 10 tube, two buffer stages with 865's, and an 860 final amplifier, this last operating with about 1500 volts on the plate. Provision is made for doubling into 40 and 20 meters. The receiver is a three-tuber having a detector and two audio stages using 201-A's.

Grouped around the set are W2EFM, W2LU, W2CJP-ZZK, W2DTS, W2AZH and W2CAZ.

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# • I . A . R . U . N E W S •

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Devoted to the interests and activities of the

## INTERNATIONAL AMATEUR RADIO UNION

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

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Conducted by Clinton B. DeSoto

### Official:

Elected by a unanimous vote on the part of a majority of the membership, the *Českoslovenští Amatéri Vysílací* (C.A.V.) becomes the 23rd member of the Union. This organization represents an amalgamation of the formerly competitive Czechoslovakian societies, the K.V.A.C. and the S.K.E.C., and is truly national in character. Its inclusion on our membership roster will be of value to the Union not only because of the amateur spirit displayed in overcoming differences of opinion and tradition for the common good of our art, but because of the added strength lent by the society itself.

At the annual general meeting held in Prague on March 25th officers for the current year were elected as follows: president, Col. J. Skála, OK2VA; vice-presidents, Ing. J. Bísek, OK1BK, and P. Motyčka, OK1AB; honorary secretary, Prof. V. Vopička, OK1VP; assistant secretary, Zd. Václavík, OK2SI; honorary treasurer, M. Paulik. There are eight other officers on the board. The total membership is 242; the number of licensed stations 79. The address for QSL's and general correspondence is: C.A.V., Praha II, hl. postal box 69.

Proposal No. 13 of Calendar No. 9 by the R.S.G.B. has also been adopted by the membership. This proposal provides that in the future full details regarding the status of all societies applying for membership shall be published in the Calendar at the time of their proposal for election. Thus the findings of the Headquarters' preliminary investigations concerning all applicants will be made available to members, and a more considered vote can be rendered.

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### DX:

A remarkable set of DX conditions has prevailed on the 14-mc. band for the past several weeks, the time of writing being June 20th. At all hours of the day and night signals can be heard here in New England, and reports indicate that this situation is prevalent throughout the United States and presumably the world. The greatest DX is heard in the morning hours, of course, with J's and other Asiatics coming through from 8 a.m. to noon, eastern time, according to W8CRA. In case you've forgotten, the Japanese are restricted as to operating times, the allowed periods near these times being 1300-1500 and 1700-1900 G.C.T.

From then on the skip gradually lessens, until after midnight on some nights we here in New England are able to hear W8's and W4's quite satisfactorily. The antipodes come in best during the noon and early afternoon hours, as is to be expected, Europeans falling into the late afternoon and early evening. South American's and W6's occupy the balance of the evening, until the W9's and W5's begin to slip through. And so it's been going, day in and day out.

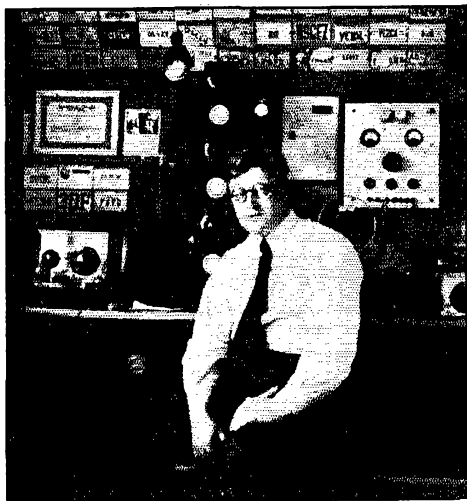
The most noticeable general observation to be derived from all this is that 14 mc. is beginning to closely resemble 7 mc., with certain added advantageous characteristics. Signals are no longer comparatively weak, as they have been for the past couple of years; they are strong, banging through in resounding fashion. This means most to the 'phone gang, for they are more dependent upon strong signals than c. w. stations. Twenty-meter 'phones are now being heard literally around the world. Such stations as K6BAZ, YV2AM, X1G and two or three Britishers are

being heard everywhere and are working everything. There are numerous others in their class. We're expecting a lot of new 'phone WAC's to be coming up in the very near future!

It's not only on 14 mc. that this change in conditions is noticeable. W2AOE reports that many of the second district gang are hearing middle western W's on ten meters as well as twenty, both harmonic and fundamental signals. And they're doing it consistently, too, so it's not merely a freak of an hour's duration. Again we repeat, there are a tremendous amount of new things to be learned in the ever-changing aspects of our present radio conditions, and as the largest organized body in the field, amateur radio has a splendid opportunity to once more contribute in highly significant fashion to the development of the radio art by careful, methodical investigations and orderly collation of these changing conditions.

#### Corrections:

In the March issue of *QST* we published a photograph of VK4JB. That was all right, except for the fact that we captioned it as belonging to



OK2MA, ANT. MACHAN, SLEZSKA OSTRAVA 1312, CZECHOSLOVAKIA

Recently WAC on c.w., this QRP station has already worked five continents on 'phone

VK8JB instead of VK4JB. We regret the error, and apologize to the actual owner of the station, Mr. O. E. Alder, 16 Old Sandgate Road, Albion, Brisbane, Queensland.

We'll excuse ourselves by calling it unconscious chivalry, but it seems we exaggerated somewhat in describing the activities of Miss Austine Marshall, VK3YL, in the April issue. It develops that it was not the transmitter that took first place at the Melbourne Radio Show, but a home-

made push-pull transmitting condenser tested at 6000 volts. Then, too, she is the only YL in Melbourne to have passed the A.O.C.P. exam; there are a number of other successful Aussie YL's and XYL's in other sections of the country. We call to mind Mrs. C. R. McKenzie, VK2GA, Mrs. E. L. Hutchings, VK3HM, Miss Marjorie L. Hutchings, VK3HQ, and Mrs. D. Fanning, VK4DH.

#### General:

The R.S.G.B. 56-mc. tests from the Crystal Palace conducted by G6QB and G6NF were the most successful yet staged, over 100 stations assisting and remarkable results rewarding their efforts . . . . . Signals from the Palace were heard R9 by G5CV in an airplane 130 miles distant, while a reception report of 150 miles was received from a ground station . . . . . Old NJ2PZ will be back on the air in August, writes John F. Grinan from Jamaica . . . . . The new call to be heard on all bands will be VP5PZ . . . . . In connection with the unusually good reception of Japanese stations in eastern United States recently, the stations normally heard, numbering about 15, seem bunched about the following frequencies: 14,020, 14,100, 14,200, 14,300, 14,380 . . . . . The Senior B.E.R.U. Trophy was won by ZL4AI, reports J. Clarricoats secretary of the R.S.G.B. . . . . The Junior Trophy was awarded to VS7GT, and the receiving award to 2BLG, now G2DV . . . . . D4UAN is now using the call D4UAY, while DE1365 has inherited 'UAN, we are told by W2ABS . . . . . Across-the-Pacific 3500-kc. signals are being heard by the score in VK and ZL . . . . . Eric W. Trebilcock, Moonta, South Australia, reports that K6, K7, W and VE stations to the total of 54 were heard during April and May on this band . . . . . W9USA-W9USB operating frequencies: 3505, 3560, 3630, 7010, 7120, 7260, 14020, 14240 kc. 'Phone: 3907, 3960, 3995 kc. . . . . Operating 24 hours daily, these stations are always open for a contact . . . . . New Zealand's Radio family, the Kirby-Camerons, now boasting ZL4CL, ZL4DT, ZL4FN (sisters), ZL4BJ (OM of ZL4CL), is soon to be augmented by the licensing of the mother of the three sisters, and the brother of ZL4BJ . . . . .

#### New Regulations

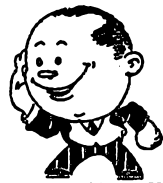
(Continued from page 32)

privileges as Class B. Class C much like present Temporary; good for three years but subject to personal examination if op gets into trouble. In general, easier on the qualified and active amateur, tougher on the unqualified and inactive.

Complete text of new regs and detailed interpretation will appear in our next issue. Don't miss it.



# CALLS HEARD



**OK1AW, A1. Weirauch, Mestec Kralové, No. 9, Czechoslovakia**

28,000-kc. band

d4ten f8ct (fone) f8hs f8gq f8pk f8rq f8yg fm4aa fm8cr fm8ih g2bm g2fn g2oa g5fv g5ml g5sg g5pj g5qy g5vb g5xt g6bc g6fo g6nk g6oy g6wl g6wn haflg la3r on4bz pappx sm6wl su8hl lej lep fyq

**W1DF, George Grammer, A.R.R.L. Hq., 38 La-Salle Road, West Hartford, Conn.**

28,000-kc. band

(Heard between June 25 and July 3. Asterisks denote fundamental signals, rest harmonics from 14-mc. band)

w2tp\* w3cij w4zh w4zf w4bhi w4eg w4mi w8bti w8bvp w8dw w8dtn w8edc w8efw w8enf w8fgc w8gaf w8hus w8mi w8wa w9dzz\* w9ef\* w9eqg\* w9ffq\* w9gvr w9hbd\* nylab ve3zb

**10035, E. Albonico, Palmi (Calabria) Italy**

28,000-kc. band

(Harmonics of 14- and 7-mc. signals heard between May 2nd and 30th)

w8rl ear227 ear16 ear185 d4abw d4uac on4bz on4my f8ny f8pz f8fk hb9x g2bm haf6a

14,000-kc. band

w6byb

**Mark H. Churton, Box 16, Helensville, New Zealand**

3500-kc. band

(Heard between March 9 and May 4)

w1dbm w2bxu w2ewu w4pl w4bns w5cld w6abc w6afz w6ak w6apb w6axe w6bdd w6blp w6btz w6bxi w6byf w6byz w6cas w6cam w6crx w6cuj w6dio w6dyj w6dyl w6ec w6edz w6exb w6fbh w6fbq w6fyf w6fyn w6gvo w6gxe w6hdx w6hpn w6wq w6yai w7abd w7ape w7awh w7awi w7aqx (fone) w7bo w7bn w7bss w7czz w7lu w7ts w9bym w9eyn w9gnk w9jqw w9lmp w9lxj w9my

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

14,000-kc. band

w6cd w7hp celai ce1lk cm2do cm2fa cm2rz cm2sv cm2wa cm2wd cm9ri hc2ev hc2jm jlee k4aop k4sa k5aa lu2fc lu3de lu3oa lu4bi lu6dg ny2ab py2ak py2bx py2qa py3aj py3ap py3aq py4ac py4ad t2rc au1de ve2bb ve2bg ve3no ve3si ve3wa vp2mo vp2mr vp2yb vp5dd vp5gm vp5nh v87gt vu2al vu2cs vz1a yioht yv2am yv3lo zc6cn zd2a zsh zsf kn2 xx1aa

**VK3WL, Jack deCure, 35 Higginbotham St., Coburg, N. 13, Melbourne, Australia**

14,000-kc. 'phone band

w2alk w3ia

**W2BYD, C. A. Froebel, 1006 East Grand St., Elizabeth, N. J.**

7000-kc. band

zs2a xfa2 kalhr j1dm j2ce

3500-kc. band

fm8ih k6baz k7ff k5aa

**W6EXQ, Ralph R. Heiges, 1572 West 48th St., Los Angeles, Calif.**

14,000-kc. band

ear38 ear96 ear136 ear185 ear225 ear226 f8eo f8ex f8gg f8hy f8pz g5by g5hb g5la g5ms g5sy g5vl on4au on4fe pa00g

**Thomas A. Cirimo, 1012 Morris Street, Utica, N. Y.**

14,000-kc. 'phone band

cm2jm cm2ma vo8aw oa1b x1u x1g x3b yv2am

**Edward C. Lips, #237 Fairland St., Pittsburgh, Pa.**

14,000-kc. 'phone band

cm2jm cm2rz g5bj g5by g5ml k6baz ve4hm x1g x1u yv2am

**Eric W. Trebilcock, 784 Hare Tce, Moonta, South Australia**

3.5-mc. 'phone band

z11hu z12ax z12li z13bo

3.5-mc. c.w. band

k6acw k6baz k6daf k6vg k7acz k7pq ok2rp ve4bb ve3dr w2diu w4nc w5afw w5mn w5px w6si w6axq w6blp w6brv w6bav w6bvz w6bcqm w6dbg w6dep w6dks w6dna w6dnp w6dpo w6dqa w6dyj w6etm w6evd w6exh w6fii w6ftx w6gwo w6hew w6hhm w7abd w7aiu w7auq w7aws w7ben w7bt w7cfm w7lj w7ml w7mm w7qi w8bow w9auh w9bjw w9esl w9idw w9yb z1at z1be z1bo z1ca z1cd z1ce z1ci z1da z1db z1de z1dh z1di z1dj z1dl z1dm z1dn z1fg z1fk z1gc z1lg z1gp z1hh z1hq z1hu z1qby z12ab z12ai z12ap z12aq z12bd z12bh z12bi z12bm z12br z12bv z12cz z12cp z12cv z12cy z12dz z12fh z12fi z12fp z12gb z12gc z12gk z12gp z12gs z12gw z12gz z12hq z12hr z12ja z12jj z12ji z12jy z12kl z12kk z12kn z12kp z12kt z12kv z12lh z12li z12lp z12lw z12lx z12mb z12mg z12mm z12mo z12mp z12mq z12mr z12ms z12mw z12mx z12nd z12nh z12nj z12nm z12nn z12nt z12nx z12nz z12ob z12oe z12oo z12ac z12ad z12ag z12ah z12aj z12av z12ax z12be z12bo z12bz z12cb z12cc z12ca z12cd z12ch z12dp z12fi z12fp z12fs z12fz z12ga z12gb z12gc z12gd z12gh z12gn z12gp z12gr z12gt z12gu z12ha z12hc z12hd z12hf z12hk z12hq z12jb z12ab z12ad z12ap z12bp z12bq z12bx z12bt z12bo z12ca z12cj z12ci z12ck z12cl z12bd z12dd z12dy z12fe z12fg z12fk z12fl z12fm z12fo z12fq z12fs z12fw z12fx z12fy z12fz

## Strays

If your dynamic microphone sounds too "boomy," try putting a condenser in series with the voice coil and mike transformer primary. W9EQZ finds that a 1- $\mu$ f. condenser does a good job in his installation. The amount of capacity needed will depend upon the impedance of the microphone, of course, so it would be advisable to experiment a bit.

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W7CIC suggests visiting your local postoffice and giving them your complete QRA with call letters. This should take care of those QSL's which arrive with only "W—, Blankville, Mo." for an address. (A senseless way of addressing a card, incidentally.)

# THE COMMUNICATIONS DEPARTMENT



F. E. Handy, Communications Manager  
E. L. Battey, Assistant Communications Manager

## Advance Warning

ON GOOD authority we have it that the Federal Radio Commission has just received 10 new AGSX (single-signal type) receivers for monitoring station use. These receivers have band-spread coils for the amateur bands only. The implication is obvious. The new receivers have good frequency calibration and are more mobile than the "heavy" equipment which Uncle Sam uses for checking frequencies with great precision. With the new receivers it is a simple matter to roam about the vicinity of the amateur bands and "nail" all types of violations with facility. This type receiver, rightly handled, instantly shows up defective signals, a.c. notes, undue broadness, frequency instability, and lop-sided modulation (fones) etc. It will make fast, direct checking of broadness, frequency-modulation (wabbulation) and the like, in accordance with the state of the art, (and Par. 381-382 of our regulations) possible. The F.R.C. is therefore completely in readiness to enforce its new amateur power supply regulation which becomes effective October first . . . and we are also told on equally good authority that the instructions for regular attention to what goes on within the amateur bands, by the monitoring stations, have already been issued from Washington. Very shortly, individuals who either purposely or carelessly violate regulations, and thus imperil the utility and enjoyment of the amateur bands for all amateurs, are going to get in trouble with the Federal government.

— F. E. H.

## 28 Mc. Request

"All active U. S. and Canadian 28 mc. stations requested to be on between 1100 and 2000 Greenwich (i.e. ending at 3 p.m. EST) each Sunday, and 1700 to 2000, week-days. There is much activity on 28 mc. at present, and many inter-country contacts."— Davies G2OA Wallasey, Eng., via W2ADQ.

On July 2 W8DHU heard the following 28 mc. stations between 10.10 a.m. and 11:37 a.m.: W9FFZ, W9EFK, W9DZX, W9EQG, and W9EF. Every Sunday, all day, is the time to sked the 28 mc. gang. See you there?

The following contribution by Mr. N. I. Hall, W8TI, wins the C.D. article contest prize for this month. Your articles on any phase of amateur communication activity are likewise solicited and may win you a bound Handbook, or three logs, or message pads (see announcement page 56, March 1933 QST). Send yours today. — F. E. H.

## Gaining Code Speed

By N. I. Hall, W8TI \*

WHO wants to increase his code speed? The answer is unanimous. All of us! The only reason we don't is that we hate to practice. But suppose we can increase it without practice. Sounds fine but how do we do it? Suppose that your operating speed is ten w.p.m. and that A.L.L. of the other hams send fifteen w.p.m. or above. If you were even half a ham, it wouldn't be long until you were doing fifteen w.p.m. with the rest of them. If you'll grant me that, I'll prove to you that gaining code speed is fun and not a drudgery.

We are all looking for something to take the monotony out of the ordinary QSO. What could be better than improving both our sending and receiving speeds. Get your fist warmed up by calling and chewing the rag with operators faster than yourself. The next time you tune over the dial for a CQ to answer, wait until you hear one which is right up to the limit of your receiving ability or even a little above. Go back at him just as near his speed as you can send and still send code that sounds like English. Too many hams use the slogan that "Good 'slow' code is better than poor 'fast' code" when their slogan should be "Good 'fast' code is better than good 'slow' code."

If you are one of the fellows who can't send as fast as you can receive, buy yourself a three or four dollar second hand bug. That is a small price when compared with the satisfaction you will get out of it. Or for those who are mechanically minded, make your own bug from one of the models described in QST. It's really easy. I made one myself, which proves it. Hi.

Receiving is every bit as easy as sending. Just make it a rule to talk to the operators who send fast enough to give you some real practice. When you get a good operator, instead of giving him a report on his sigs and saying 73, get him to chewing the rag about gaining code speed, his sending, how he holds the key, etc.

Let the other fellow tell you to slow down if you are sending too fast for him or for the receiving conditions. Remember the "Q" signal for send slower is QRS, not QRM or QRN. No one was ever called a "lid" because he sent too fast, if he sent good code.

\* (ORS-00-AARS) 129 S. Walnut St., Morgantown, W. Va.

## Systematic Operating

By Adolph Moon, W6CIR\*

**RE CQ:** To follow the A.R.R.L. procedure of calling CQ three times and repeating *three times* is quite right. I find times when one does not even have to call that long. For instance, following that procedure, I sometimes find three or four stations answering. Surely this means that I have called too long. There is, of course, a limit to the number who will QRX to reply, and *if one calls too long most listeners will start tuning for someone else.* Repeating the call but *twice* is suggested for minimizing QRM and resulting in communication more quickly. While this depends on the time one is working, I have found it works out when most QRM is present, and surely that is the time to minimize QRM.

**POOR SIGS:** Remind stations you work that it is a violation of the regulations if they have broad, frequency-wabulated signals. Well-filtered p.d.c. power supply is required to make self-controlled transmitters comply with the regulations, and really produce a sharp p.d.c. note. If r.a.c. is necessary for economy, comply with the regulations by rebuilding the set into an M.O.P.A. by adding a small oscillator (with independent d.c. power supply) to excite the present oscillator as an amplifier. This will greatly sharpen the signal, and the note can be nearly as stable as with crystal control, while frequency can be adjusted to any part of the band. Help the Official Observers in eliminating all signals heard in violation of the regulations, by informing operators of such stations, and offering to help them.

**WATCH FREQUENCY:** Anyone with a self-controlled transmitter is "playing with fire" in trying to set this close to the edge of an amateur band. The slightest misadjustment, or frequency creep due to tube heating, antenna changes, voltage variations, etc., may throw such a transmitter off frequency. It is not safe to go closer than 20 or 25 kc. of a band edge with even the best self-excited transmitter. Even then, a constant check on the frequency should be maintained by an accurately calibrated monitor or frequency meter, checked often against the s.f.t.

**THE ABUSED SK. QRZ?** How many SK's I have answered to find the one who SK'd continuing the same QSO — just because of the haphazard practice of using SK before absolutely certain that the QSO is at an end — or because influenced by a conversational "after-thought" to ignore good procedure and prolong a QSO. Here are two remedies: (1) QRZ has come much into use because of this abuse of SK. QAV? (Are you calling me?) is even more appropriate. It is used in this manner when terminating a QSO . . . "R CU 73 W6EDT de W6CIR SK QRZ? W6CIR AR." This method, now widely used, is very effective. I have QSO'd six times in succession without a CQ necessary, just by following this method. (2) The second remedy, making for snappier QSOs, less QRM (and avoiding necessity for such expedients as QRZ? or QAV?), involves the immediate correction of the abuse of SK. **USE SK, AND USE IT PROPERLY.** Be sure a QSO is at an end before sending SK. If you have sent SK, show yourself a really good operator by sticking to it, and avoiding further communication. Transmit no "after thoughts." A very small amount of self-training will accustom you to the proper use of SK. It is just as easy to formulate good operating habits as to drift into sloppy operating methods. An example of the proper use of SK follows:

W6EDT de W6CIR R QRU SHALL I QRT OR QTC? K.

W6CIR de W6EDT QRU ALSO 73 CUAGN K. (Notice no SK is sent yet. EDT still has to listen to W6CIR's reply. Now W6CIR answers indicating, by using SK, that he does not intend to have any further conversa-

tion with W6EDT but will immediately tune his receiver to see if anyone is calling.)

W6EDT de W6CIR R 73 SK W6CIR AR.

Let's all get together OMs, and make our work snappy and systematic. It makes for less QRM, more QSOs, and more enjoyable amateur radio.

## M.O.P.A. Work

By Wm. F. Stewart, W5MU-W5CSQ\*

**I**N THIS day of temperature-controlled crystal transmitters, the following operating procedure may seem a bit radical, but after consideration it might take on an entirely different aspect. As in the case of most stations, two kinds of work are done, namely: traffic and rag chewing. For the former a *particular frequency is chosen and used for all schedules* and calls to clear traffic. For rag chewing *the entire band or bands are used, choosing any particular frequency that may be desired, within those assigned amateurs by the F.R.C., of course.* Experience indicates that special care and proper use of reliable frequency measuring equipment are necessary to avoid causing QRM in changing frequency, and in avoiding any possibility of off-frequency operation.

By use of the frequency meter-monitor it is possible to tune the oscillator to any desired frequency. The amplifier stage is tuned and then the antenna circuit. Checking again with the frequency meter, final adjustments to the oscillator may be made without seriously affecting the tuning of the amplifier and antenna circuits. Thus, in the course of a few seconds we have tuned to any predetermined frequency and now ready to operate.

The reasons for these sudden migrations over the band are many. (1) For instance, on the present frequency of the transmitter you have heavy QRM, therefore, move to another frequency on which not quite so many are operating. (Just try and find one. Hi.) (2) Again, you hear W1MK QSO with W6USA and you desire to QSO W1MK. Find W6USA, and as the conversation is drawing to a close, quickly turn the transmitter to W6USA's frequency and call W1MK after you hear his SK. Results — about 95% answer. Another instance. You hear W9ABC calling CQ. Set your transmitter on his frequency and when he signs give him a buzz. If you raise him, only one channel is necessary for both stations.

All this "fluttering" about requires the most stable of transmitters and the most accurate of frequency measuring equipment. Do not the present designs of Hi-C oscillators, Lo-C amplifiers, electron-coupled frequency meter-monitors, and super-het receivers fill the bill? Why then, be limited to one or two spots in the band when so much is available? With the advent of the electron-coupled exciting stage for the M.O.P.A. this rapid and accurate changing of frequency presents interesting possibilities.

## Traffic Briefs

John Payne, WICCP-BSF, is radio operator on the Yacht *Onwego*, WEEY. Although there is no high frequency transmitting equipment aboard, John expects to do some listening on the ham bands.

ON4ZA, HQs station of the Vlaamsche Radio Bond, will continue experimental 'phone transmissions on the 3500-kc. band Sunday mornings during August and September. During September tests will be conducted from 0200 to 0230 G.C.T. each Sunday on 3890-kc. ON4ZA will listen for W and VE amateurs in the 3900-4000-kc. 'phone band. Address reports to V.R.B., P.O. Box 65, Ghent, Belgium.

\* Box 583, Rocklin, Calif.

\* Box 346, Muskogee, Okla.

## Expeditions

AT THIS writing, we are able to list five ship stations, of some three hundred licensed to operate on frequencies above 1500 kc. by the Federal Radio Commission, authorized to communicate with amateurs, under certain restrictions. These ships are:

Name	Call Letters	Licensee	Location
Mizpah	KFZT	E. F. McDonald, Jr.	Chicago
Atlantic	WQBG	Gerald Lambert	New York
Four Winds	KGDU	Stanley Harris	New York
Ramah (5530 kr.)	WCEN	Dr. Forbes	Cambridge, Mass.
Aldon	KDLP	Donald Primrose	Baltimore

The yachts thus licensed operate on the group of frequencies above 3000 kc. with A-1 or A-2 emission, as follows:

*3105	*4140	5515	6170	8240	11025	12360	16460	22025
3115	4145	*5520	6180	8250	*11040	12375	16480	22050
	1150	5525	6190	8260	11055	12390	16500	*22080
	1160	5530	6200	*8280	*11070	*12420	16520	22100
	1185		*6210	8290	11085	12435	*16560	22125
			6220	8300		12450	16580	22150
			6230	8320			*16660	
				8330			16680	

\* Primarily for calling.

The Ellsworth Trans-Antarctic Flight was granted an aircraft license for the plane NR-12269, the following frequencies being authorized, and the call assigned, KHNR: For calling, (kc.) 500, 3105, 4140, 5520, 6210, 8280, 11040, 14240, 16560, 22080. For working, (kc.) 457, 3115, 4150, 5515, 6230, 8300, 11025, 12450, 16580.

## VOQH

On June 20th the Bartlett Northeastern Greenland Expedition sailed from Staten Island, with W2UN (Robert Moe, of Brooklyn) aboard as radio operator. On the evening of June 22nd radioed reports (via W2NV 14203 kc. fone — 14288 kc. c.w.) gave the ship's position as off Sambre Island, near Halifax. From there they proceeded to Brigus, Newfoundland, on the 24th, where they were to lay over for a week or ten days, thence to the Labrador coast, and on to Hudson Strait, Fox Basin, Gulf of Bethia, Lancaster Sound in Baffin Bay, and finally through to Cape North. The purpose of the expedition is to explore and study various localities in northeastern Greenland. The party, all seasoned explorers, includes Bill Pritchard, Peary's old stand-by, Cap'n Bob's brother Bill, Junius Bird from Rye, and Norcross, who travelled from New York to Brigus, Newfoundland, by train, to join the party there.

Schedules already arranged by the operator of VOQH, the Morrissey's station call signal, are with W2NV (F. S. Miller, 35-21st St., West New York), VO8Z, Ernest V. Jerrett, Brigus, and VO8AW, James Moore, Jr., Carbonear, Newfoundland; also WHD Mon. & Thurs. 6 p.m. E.S.T. after leaving Brigus. VOQH uses 1500 watts on a pair of '04As on 7500 kilocycles, or just above the 7000-7300-kc. band. The operator listens for amateur station on the 14,000 and 7000 kilocycle amateur bands.

This is the seventh time Cap'n Bob Bartlett has gone North with an amateur aboard to operate the radio equipment. He has never relied on other than amateur communication. Ed Manley back in 1926, having been assured the cooperation of the American Radio Relay League, undertook the first trip as radio operator on the Morrissey. They were never out of contact with the rest of the world. He stuck with the ship for five years; then Paul Oscanyan, 2ZA, made the voyage, and now Bob Moe of W2UN occupies "Spark's" berth. Bob Moe will be glad to work two way with any amateurs he can hook, in addition to those he skeds. He listens mostly in the 7 mc. band of course. Valentine of W2GX has worked VOQH using 14-mc. phone. The best time for working VOQH (7500 kc.) on 14 mc. is right after the daily 6 p.m. E.S.T. sked with W2NV is concluded.

## NX1XL

Communication with amateurs is still requested by the University of Michigan Expedition in Greenland, NX1XL. Fred W. Albertson, chief operator at W8AXZ, at the University, explains the procedure used on schedule with NX1XL each Saturday night at 8:00 E.S.T. W8AXZ calls NX1XL on 7020-kc. from 8:00 to 8:10 and then listens on 7500-kc. from 8:10 to 8:20, then if no signals are received W8AXZ calls again from 8:20 to 8:30 and proceeds to send messages "blind." Due to the location of NX1XL, contact with the States is difficult, and for that reason any amateur contacts will be doubly valuable. Be on the lookout for this expedition, and notify W8AXZ when heard or worked.

## Traffic Briefs

The Allegheny Valley Radio Association and the Amateur Transmitters Association of Western Penna. are holding a Western Pennsylvania Hamfest at Memorial Park, New Kensington, Pa., on Sunday, August 6th, starting at 2:00 p.m. E.D.S.T. An interesting program including lunch is planned, and all amateurs are invited. W8CPE, W. G. Darrall, Springdale, Pa., is chairman of the 'fest. Drop him a line advising if you will be present.

The Electric City Radio Club (Great Falls, Mont.) will hold its annual hamfest on Tuesday, August 22nd. It will be an all-Montana get-together and amateurs everywhere are invited. There will be no registration fee, only charge being the cost of the banquet (which will not exceed seventy-five cents). A representative from A.R.R.L. HQs is expected, and a bang-up good program is planned. Those who intend to take in this pow-wow should notify W7BUJ, Walter Lundy, 1511-8th Ave., No., Great Falls, Montana.

Any amateur locating a 204A, serial-30317 (stolen), is requested to inform J. W. Stafford, Instructor of Electrical Communication, Purdue University, Lafayette, Indiana.



MISS FLORA CARD, W6EK. FLORA HAS THE HONOR OF BEING THE FIRST YL EVERTO BE APPOINTED ORS IN THE LOS ANGELES SECTION

She well deserves it, as she is an excellent operator and has a flock of FB schedules.

YLs and YFs holding ORS appointments are: Frances Rice, W3AKB; Elizabeth Zandonini, W3CDQ; Gertrude Mary Stokely, W5AYZ; Ethel Henderson, W5BKG; Ruby LaRue, W6BRI; Margaret Steneri, W8DEJ; Thelma Zimmerman, W9JYO and Mrs. L. W. Mida, W9LW.

About WIMK QSL Cards. WIMK QSLs to all stations that send a card. However, upon sending WIMK a QSL, an immediate reply should not be expected since all cards are accumulated over a period of about one month, and are then acknowledged "in a bunch." Routine detail work makes it impossible to fill out and mail



QSLs on hand each day. The policy of accumulating a bunch and QSLing all at the same time has proven most effective.

## LDTE

An American scientific expedition known as "Expedition of Explorers Associated" is off for the Arctic on the Norwegian boat *Norkap II*. Radio equipment aboard, under call letters LDTE, will be operated by H. E. Mallinckrodt, ex-W1DHA. The expedition will depend on amateur radio for communication; the 14 mc. band will be used. All amateurs are requested to watch for LDTE and assist the party wherever possible. Please report reception and all contacts to A.R.R.L.

"CQ Rush Urgent N C de W6ERM" . . . this is what W4AAQ, Birmingham, Ala., heard on the 7-mc. band at 9:45 p.m. P.S.T. January 12th. One hour and forty-five minutes later the message was aboard a train out of York, Pa., traveling "Special Delivery mail" to its destination. W4AAQ raised W3AQN of York, who, after being unsuccessful in raising North Carolina, hopped onto his "bike" and rode two miles to mail the letter on the first train south . . . and this at 2:30 in the morning! Service, plus!

The following is quoted from April, 1927, *QST* and still holds true: "Let's get at this 'es' business. For the one hundredth time — ES IS TAKEN FROM THE AMERICAN MORSE CODE AND IS ALWAYS COPIED '&' — nothing else! Cut this line out and paste it on your tuner panel until you remember it. It's enough to say, 'Best 73's es CUL' in letter writing, but when a man hears 'es' on the air and then transcribes it in those letters ON HIS MESSAGE BLANK, he is going too far. 'Es' should not be written for '&' any more than 'KK' should appear on the blank to denote parenthesis, 'OS' for a colon, or 'AF' for quotation marks." That was printed in 1927 — this is 1933, and we find that the misuse of "ES" has grown in direct proportion to the increase in number of amateurs! Let's make our operating correct in every detail; the next time you hear "ES" used on the air copy it as "&," not as the word "AND." And when you send "ES" you are sending "&," not the word "AND."

The first meeting of the San Francisco Phone Club was held over the air on the 1.7 mc. band at 8:30 p.m., May 5th. W6BWZ, acting as master of ceremonies, called the following stations to order: W6ARH, GQK, HRL, GYO,

EQA, GDQ and DZQ. W6DZQ acted as secretary. The second meeting was held at W6EQA's shack with the following present: W6BWZ, DZQ, EQA, HRL, GDQ, FLQ, ENM, BU, EUK, GYO and DJI. More members are joining every meeting. It is estimated that there are about 15 regular 1.7 mc. 'phones in San Francisco. No dues are charged, which gives everyone a chance to join. W6AKU was chosen to represent the club at the Associated Radio Amateurs, another S.F. club. W6ARH was elected "official bartender." Hi.

—W6DZQ.

## BRASS POUNDERS' LEAGUE

(May 15th-June 16th)

Call	Orig.	Del.	Rel.	Total
W3CXL	423	307	1197	1927
W6ETL	146	214	1218	1578
W6PQ	609	186	420	1215
W8E	76	31	932	1039
W6CDA	17	96	774	887
W2EKM	73	60	584	887
W8DSD	97	134	582	813
W8AWX	75	19	683	777
W2ADQ	345	405	5	755
W4KEH	81	27	616	724
W9AE	75	64	576	718
OMITB	280	131	300	711
W6CKO	4	31	604	639
W3ZZBA	630	—	—	630
W6EDW	69	186	366	621
W6BMC	6	11	600	617
W6BPU	40	121	448	609
W6ALU	129	155	296	580
W3BWT	75	53	363	521
W9ZZAF	98	113	292	503

### MORE-THAN-ONE-OPERATOR STATIONS

W3BFQ	54	129	1482	1665
W5QW	192	76	986	1254
W6EWC	275	154	768	1197
KA1HR	245	229	590	1084
W6HHM	12	105	511	628
W2DIU	22	7	510	539

These stations "make" the BPL with totals of 500 or over. Many "rate" extra credit for one hundred or more deliveries. The following one-operator stations make the BPL for delivering 100 or more messages; the number of deliveries are as follows: Deliveries count!

W6HM, 258	W1FEX, 126	W3ALX, 102
W6QC, 240	W3CI, 118	K7PQ, 102
W9JZY, 183	W6EIL, 114	W9PQ, 101
W7BEX, 154	W6DKM, 109	More-than-one-opr.: W1MK, 157
W4AEJ, 147	W2ATM, 109	
W1UN, 128	W9GBP, 103	

A total of 500 or more, or just 100 or more deliveries will put you in line for a place in the B.P.L. Make more schedules with reliable stations. Take steps to handle the traffic that will qualify you for B.P.L. membership also.

## Relative Standings of the Ten Highest Sections — May-June

Messages Per Station (25%)	Stations Reporting Traffic (25%)	Gain or Loss (Traffic Reports) (25%)	Traffic Total (25%)	Standing Based on Average of All Four Ratings %	Section Communications Manager
P. I. 240.1	Los Ang. (680)* 108	N. C. +14	Los Ang. 7135	E. Penna. 50.	Wagenseller, W3GS
Ariz. 202.8	Mich. (624)* 79	Ont. +14	E. Pa. 5261	Los Angeles 50.	Martin, W6AN
E. Pa. 195.0	Va. (150)* 63	Nev. +7	Wash. 3447	N. Carolina 42.5	Wright, W4AVT
Hawaii 191.2	N. C. (140)* 56	Tenn. +5	E. Bay 3037	Washington 35.0	Belliveau, W7AYO
S. Tex. 172.6	Wash. (374)* 55	Mo. +5	W. N. Y. 2897	Philippines 32.5	Thompson, KAIXA
M.-D.-D. C. 169.0	Ohio (868)* 53	E. Mass. +4	M.-D.-D. C. 2873	Michigan 30.	Conroy, W8YH
Alaska 165.4	Mo. (324)* 50	Aita. +4	Ohio 2818	M.-D.-D. C. 27.5	Ginsberg, W3NY
East Bay 137.7	E. Pa. (528)* 48	NVC & LI +3	P. I. 2401	Missouri 27.5	Cannady, W9EYG
W. Pa. 97.3	Ill. (890)* 46	Mich. +2	San Fran. 2374	East Bay 25.	Houston, W6ZM
W. N. Y. 90.5	W. Pa. (604)* 37	M.-D.-D. C. +2	Mich. 2218	Ohio 22.5	Tummonds, W8BAH



EASTERN PENNSYLVANIA has a slight lead on L. A. this month, making the top-of-column position nationally on the basis of placing three times in the highest group, while L. A. topped the country in two columns. L. A. also maintained her over-100 traffic-reports in a summer month when the country dropped 229 reports from the previous month. North Carolina again showed a fine gain-in-reports and Ontario led in similar fashion. Without respect to national standings shown in the above table, the following Sections lead their Divisions: E. Penna and W. N. Y. (tied), Michigan, No. Dakota, Tennessee, N. Y. C.-L. I. and N. N. J. (tied), Iowa, Eastern Mass., Alaska, East Bay, Virginia, Colorado, Alabama; Southern and Northern Texas (tied), Ontario leads Canada. During the May 16-June 15 month, 1340 stations originated 15,562; delivered 13,527; relayed 44,011; total 73,100 (87% delivery) (54.6 m.p.s.)

\* The Section A.R.R.L. membership (approx.) is shown parenthetically, so that the degree of reporting activity may be indicated by comparison.

## ELECTION NOTICES

To all A.R.R.L. Members residing in the Sections listed below:  
(The list gives the Sections, closing date for receipt of nominating petitions for Section Manager, the name of the present incumbent and the date of expiration of his term of office.) This notice supersedes previous notices.

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

Due to resignations in the Washington and New Hampshire Sections nominating petitions are hereby solicited for the office of Section Communications Manager in these sections and the closing date for receipt of nominations at A. R. R. L. Headquarters is herewith specified as noon, August 15, 1933.

Section	Closing Date	Present SCM	Present Term of Office Ends
Washington	Aug. 15, 1933	John P. Gruble (resigned)	.....
New Hampshire	Aug. 15, 1933	V. W. Hodge (resigned)	.....
Mississippi	Aug. 15, 1933	Wm. G. Bolder	Jan. 15, 1933
Arizona	July 10, 1933	Ernest Mendoza	July 15, 1933
Eastern N. Y.	Sept. 15, 1933	R. E. Haight	Sept. 16, 1933
Eastern Mass.	Sept. 15, 1933	J. A. Mullen	Sept. 16, 1933
San Diego	Oct. 16, 1933	Harry A. Ambler	Oct. 20, 1933
British Columbia*	Oct. 16, 1933	J. K. Cavalaky	Oct. 20, 1933
Vermont	Oct. 16, 1933	Roy Gale	Oct. 20, 1933
Western N. Y.	Oct. 16, 1933	Don Farrell	Nov. 4, 1933

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

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

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

(Place and date)

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

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

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

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

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

— F. E. Handy, Communications Manager

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

## ELECTION RESULTS

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

Maine	John W. Singleton, W1CDX	May 25, 1933
Northern Minnesota	Robert C. Harshberger, W9JIE	June 15, 1933
Quebec	John C. Stadler, VE2AP	June 15, 1933

## DIVISIONAL REPORTS

### ATLANTIC DIVISION

**MARYLAND-DELAWARE-DISTRICT OF COLUMBIA** — SCM, Harry Ginsberg, W3NY — W3BAK, W3SN, W3CJS, RMs. W3BWT, Chief RM. W3DQ and HI are testing on 56 mc. The Westminister Amateur Radio Club reports four Girl Scouts in code class. Fellows, this

is my final report. If my successor receives the coöperation you gave me, this Section can't help being in front! District of Columbia: W3CXL schedules W9USA. W3BWT continues to make HPL. W3CDQ attended Roanoke Div. Convention. W3AJL has antenna trouble. W3JNR is finally working. Maryland: W3BND is back in ORS line-up. W3CQS makes the Worlds Fair at "Chi." W3CJS is RM for Baltimore. W3SM used 'phone and c.w. for traffic. W3HT is putting 150 watts on c.c. MOPA. W3CIZ shows increase in traffic. W3FK reports for first time since 1929. W3BGI was QRL installing WNEB on a private yacht. W3LA is looking for work. W3CDG changed receiver to a.c. W3WU is building 250 watt c.c. rig. W3BXX is moving rig to quarters apart from the house. W3ZD is QRL Convention. W3BHE had trouble with grid coil in P.P. T.N.T. W3ADV regrets missing the SCM when he visited Cumberland. W3AFF does a little work at WTBO. W3DG is chasing 56 mc. signals in his "Chev." Delaware: W3BAK's daughter Jeanne is going to Buffalo and has invitation to Chicago Convention. W3DQG reports for first time.

Traffic: W3CXL 1927 BWT 521 BND 78 CQS 53 CJS 47 BAK 42 SM 35 DQG 34 HT 31 CIZ 28 FK 22 BGI 15 LA 14 CDG 11 WU 6 BXX 5 ZD 4.

**SOUTHERN NEW JERSEY** — SCM, Gedney M. Rigor, W3QL — W3KW has moved back. W3ZX moved to new quarters. New ORS: W3AOV and AWL. W3AZZ and DGF are interested in ORS. W3AVJ is on 7 mc. Storms dropped W3BYM's pole. W3AWV wants to play checkers over the air. W3APV has fine total. New hams: W3DHX and DCQ. W3AEJ is always on deck. W3CQO sends first report. W3ZI is working hard on A.A.R.S. W3UT is DXing on 14 mc. W3BEI is QRL auto receivers. Please answer this query: "Are you in favor of having some kind of hamfest in Southern New Jersey this fall or winter?" Write W3AKI for nice QSL cards.

Traffic: W3CXV 1 CQO 3 GU 5 ZI 15 DGF 2 DBD 8 BYM 5 AWV 10 CWL 20 APV 59 AEJ 39 AOV 16 AZZ 14 BYR 7 BWR 3 IS 1 QL 3 AKI 8.

**WESTERN NEW YORK** — SCM, Don Farrell, W8DSP-GYV — W8BWY closed for summer. W8JV changed QTH. W8BLO has new c.c. rig. W8EWC is QRL school. W8FYG received QSL card from Hong Kong, and he hasn't been on the air. HI. W8JE is high traffic man. W8AWX handles a large amount. W8FDY says W9USA coming through FB. W8DSS has overtime work in his shop. W8BFF cancelled schedules for summer. W8GWT reports new ham in Penn Yan, W8JQE. W8DSP has relay rack completed. W8DHU finds conditions poor. W8DME bought new camp on Owasco Lake. W8DHQ keeps a few schedules. W8CJJ had the honor of being host to Ross Hull. W8DBX is working! W8GWS has new a.c. monitor. W8DMJ has a new steel windmill tower 62 ft. high. W8AED says WX too hot. W8AGS has portable JSB. W8AFM is building new Secondary Frequency Standard. W8FMX will be on with portable IDN August 15th from Boy Scout Camp at White Lake. W8BFG reports DX terrible. W8BR was visited by gang from Oneonta. W8EBK has an 'O4A. W8GPT sends nice traffic reports. John Walrath reports but failed to send his call letters. W8GPV will take traffic for Binghamton. W8FYF is joining A.A.R.S. W8CQW reports that exW6CLJ received his 8th district call. W8JGX. W8FFU is QRL baseball. W8GWP says no one has traffic for Rome. W8GWZ worked HAF3BZ. W8JTN and JJJ report for first time. W8AKX is disgusted with 14 mc. W8EFC is on 'phone. W8CP uses '46 in final. W8AOW and DSP schedule W9USA. W8FEG is handling traffic on 1.75 mc. 'phone. W8CDB has new 56 mc. outfit. Anyone who cares to arrange tests on 56 mc. please write the SCM. The Mohawk Valley Brass Founders of Utica are looking for new members; if interested, write the secretary, F. R. Barnum, 1118 Seymour Ave., Utica.

Traffic: W8JE 1039 AWX 777 FDY 371 DSS 139 BFF 100 GWT 51 DSP 36 DHU 24 DME 22 DHQ 19 GJJ 18 DBX 8 GWS 7 DMJ-AED-AGS 6 AFM-BLH 4 FMX 1 BWY 56. EBK 48 GPT 29 W8 — 26 GPV 24 GWY 21 ECF 11 FYF 12 CWQ 8 FFU 4 GWP 1 JV 15 JJJ 4.

WESTERN PENNSYLVANIA — SCM, C. H. Grosarth, W8CUG — W8CPE has been assigned WLQF for A.R.R.S. on 3497 .5kc. W8HEE is pounding them out. W8CQA's schedules keep him busy. W8EIS reports by radio. W8DLG spent 100% time on 'phone! W8CMP lost his schedules. W8HGG is moving. W8GUB reports his highest total so far. W8AVY enjoyed a fishing trip. W8IMJ has a job. W8GTL uses '10s. W8IXO reports a new club, the Valley Amateur Radio League of Donora. W8CFR finally got that pole up. Everything in W8AJE's shack blew up in two weeks time! W8GBC lost his fifty watter. W8BWL has been in training at Phila. Navy Yard. W8CUG, KD and DLG attended convention at Buffalo. W8IOH, and 10I of St. Marys are Clayton and Fred Wise, respectively.

Traffic: W8CPE 340 HEE 320 CQA 135 YA 122 EIS 106 CUG 93 HGG 73 GUB 30 KD 19 HMJ 16 GTL 8 AYQ 3 GBC 1.

EASTERN PENNSYLVANIA — SCM, Jack Wagen-seller, W3GS-BF — W3ZZBA, ALX, CI and BKQ all make the BPL, W3ZZBA handled all the Chester Fair tlc. W3ALX is now ORS. W3AQN has a portable, W3DTZ. W8FLA delivered a lot from the forestry gang. W8CMF is after ORS. W3ADE QTA skeds for summer. W8ITS re-built xmitter and recvr. W3ABZ is motor-cycling. W3BIJ reports for Beacon Radio Club. Bad YL QRM at W8ASW. W3ASY reports for first time. W3CL was at Navy Yard for two weeks. W3ZZV has a 75 watter. W3AQI skeds W9USA daily. Thanks to W3CL, W3ADM is now reporting. W3BKQ is handling World's Fair tlc. W3AKB changed to other end of band. W3BF is on 56 mc. The Shamokin Club is now A.R.R.L. affiliated. W8JXC is installing MOPA. W3BEV has trouble on 20. W8DAV reports xtal trouble. W8IWT moved to basement to escape heat. W3BUI and BLS hitch-hiked to World's Fair. The York Road Radio Club has six members on 56 mc. W3AZT hunted the hidden x mitter from an autogvov.

Traffic: W3ZZBA 630 AAV 50 ALX 316 AZF 218 AQN 244 ADE 124 MC 310 TX 8 ABZ 215 BIJ 1 AZY 5 CI, 459 DIX 6 ZVZ 51 AQI 52 BPX 8 ADM 259 BEY 209 BKQ 1665 AKB 162 BF 32. W8EOH 18 FLA 158 CMF 8 TNA 26 ITS 26 ASW 1.

#### CENTRAL DIVISION

INDIANA — SCM, Arthur L. Braun, W9TF — W9MQQ is pinch hitting for W9TE as SCM this month, W9TE being on a vacation. W9NJB is call of Kokomo Radio Club. W9CYU is building new power supply. W9HPQ worked NY2AB. W9AXH likes 'phone. W9LQE is planning on '03As P.P. in amp. W9CKG plans on a vacation. W9AEA is building e.e. rig. W9HYU is listening on 28 mc. W9KYM and HML keep a few schedules. W9DET has portable MTB. W9LLV has new e.e. rig. W9NCT and MBZ are new hams. W9EPT worked VK2XU and VK3RQ. W9MYC is at Brazil. W9HKH handles W9USA traffic. W9MSZ hears DX on 7 mc. W9NIJ is portable call of FVL. W9NCT has a pair of '03As. W9JZP is coming on with vertical antenna.

Traffic: W9AET 718 JOQ 87 CTT 36 HPQ 7 AXH 6 TE 17 AIP 12 CKG 6 KYM 95 DET 4 LLV 7 LMT 132 JFA 28 EPT 21 BKJ 5 DJJ/LUC 19 JRK 86 HML 87 FQ 30 EEO-AUT 12 KDD 5 CKB 74 GFS 19 HKH 55 MQQ-MSZ 5.

KENTUCKY — SCM, Carl L. Plumm, W9OX — Monthly Kentucky QSO party will be inaugurated August 13th. W9AUH takes first place. W9ETT is eligible for ORS. W9BWJ has things up his sleeve (?). W9CNE avoids noise on 14 mc. W9ARU paid visit to W9USA. W9OX resumes place on air after moving. W9JYO is slowing up. W9IFM has c.e. job going. W9CIM will have more time next month. W9ICE is on ice for summer. W9KCZ is going "phone." W9ELL is spending two weeks on Great Lakes. W9RAZ is back in the "home-port." W9KTO is adding a couple 50 watters. W9HUP is new station. W9FQQ is back from Capitol. W9KKG is in Louisville for summer, under call DKD. W9EOM moved to Pineville.

Traffic: W9AUII 122 ETT 115 BWJ 49 CNE 41 ARTI

35 BAN 28 JYO 22 OX 20 IFM 17 CIM 12 ELL 11 BAZ-KTO 2 ERH 15.

MICHIGAN — SCM, Kenneth F. Conroy, W8DYH — W8HKT wants USNR-ers. W8DVC and PP played 45 holes of golf and tied. W9CE says the U.P. gang are QRL Hamfest. W8CPH has lots of traffic — automobile! W8COW swims and gazes. W8BMG is getting the boilers heated for more steam in fall. W8WR hooked K6VG on 3.5! W8FDO awaits the return of DX WX. W8GSP will use JLT at Boy Scout camp. Read W8HSH's radio column in *Ann Arbor Daily News*. W8GDR is visiting his brother, (JH) and rest Marquette gang. W9CSI is putting the Choke into R F Choke. W9FBC will look for the gang at Chicago. "Three point two IS okay" — sig W8CUX AR. W8JO scored 819 in Field Day contest. W8CUP collects a flock of reports for us. W8DCQ joins AARS. W8BBX had the rig set up at local YMCA for exhibit. W8HNB is now HBZ at the Lake. Owosso hams write W8AFH for 56 mc. schedules. W8BJG returns! W8IHN hates to have his YL go on a one-month vacation. W9ADY is newest ORS. W8CSL makes his debut. W8ELD experiments with e.e. W8CRP has new e.e. rig. W8EMC sports a card from EAR233 — 7 meggies. W9EGF is sending code practice. W9EEM boasts of portable, NGT. W9BBP's light bill decreased 1000% — no charge for moonlight! W9FSK: And you call it house-cleaning? So is W8FX. W8BJ is new Editor of the DARA Bull and is to be congratulated on the FB bulletin. Copies free to all stations reporting to SCM. W8DYH on 16th each month. W8FTW leads the state! W8DZ got a job! W8BTK hooked XU1U in Hong Kong! W9LLD reports the Lake Superior Radio Club going full swing. W9CGP reports W9ANT, GPM, IRL, ISC, CGP, DAB and DPQ joined USNR. W8IPY, ING and IEZ are first reporters.

Traffic: W8FTW 457 DZ 300 AEQ 131 FX 126 DVC 88 BJG 74 BBX 69 BJ 57 HOT 49 CFM 47 GDR 27 EMC 23 EDO-JO 22 BMG 19 IFO 18 CUP 17 AW-ELD-IEQ 16 CEU 15 CFZ-ETP-HUD 13 GQB-GRB-IFE 12 IHN 9 INQ 8 CPH-EHD-JX 7 COW-CUX-HNB-NR 6 AYO-BJT-DSQ-EGI-GSZ-QT 5 DED-IA 4 CRP-GBB-HOO 3 CTD-DCQ-GSP-IEZ-IIP 2 ABH-AKN-CSL-DYH-ECG-FOV-GRN-HHW-HKT 1. GUC 226 IDB 40 EVC 15 CPY 14. W9IJI 31 ADY 20 BRP 11 CEX 10 CSI 9 FSK 8 CE 6 EEM-VI 4 EGF 3 IOV 2 CWR-EQQ-HXB 1.

OHIO — SCM, Harry A. Tummonds, W8BAH — Chief RM W8DDS — District 6 RM W8BBH: W8CXF peddles ice. W8HTI has portable JQO. New e.e. rig at W8GLC. W8IZQ wants AARS blanks. 56 mc. at W8GSO. District No. 3 RM W8APC: W8ESN, EVS, EYP, HRB, GJS, ELP, DPN and EVV were reported by APC. M.V.R.A. is planning hamfest for Sept. 23-24. W8GOD has a job. District 7 RM W8VP: W8GME reports JNL new ham. Too hot for radio at W8EQB. W8VR has FB-7. District 2 RM W8BKM: W8EEZ is new ORS. W8UX has commercial job. District 8 RM W8CGS: W8FSK has a pair of '60s. W8BKE spoke on amateur radio before Circleville Rotary Club. W8LDY reports for Queen City Radio Amateurs, Cincinnati. W8BTI worked 7 consecutive VKs and 2 LUs at one sitting. District 5 RM W8FGV: W8HCS had over 300 QSOs last month. 110' degrees hot in shack at W8BMK. District 4 RM W8EEQ: W8WE joins ARRL. W8DEM is rebuilding. W8MHM wants schedules. W8ICC schedules JET. "QRL work," reports W8ANZ. Something popped at W8PO. District 1 RM W8DVL: New 56 mc. club started at Cleveland. Present at first meeting: W8HC, W8DXB pres., Ex-W8CUX, Ex-W8BAZ secy., W8HFZ, FBK, BKB, BAH and Wm. Langkals. The West Tech High School Radio Club put on a real hamfest at Cleveland. Hams Limited have announced a Hamfest for Euclid Beach this summer. W8RN and GVL have been visiting the gang. W8ACZ is checking prehistoric sigs. W8GNP will migrate to higher frequency. W8ENT is back. W8EFW reports following graduates from Heights High School: W8CPS, (GPB, GJJ, IVF, EPW. W8AUM graduates from Lorain High School. W8RAC is remodeling. W8FJE reports club station off air. W8BYD is looking for commercial job. First report from W8IRM. W8BMX reports by telephone.

W8ISK is going to put in new receiver. W8ZZB is on 1.7 mc. 'phone. W8FFK says C.H.A.R.C. meets at his home every Wednesday night. W8CQU keeps real schedules. W8BAH schedules W9USA 6:30 p.m. daily E.S.T. W8HRI is QRL summer. W8FGP is rebuilding. W8EEW is at Muscle Shoal. W8HYZ has c.c. rig. W8EBY reports from Nashville, Tenn. W8FJX is on KUTM, William P. Reiss.

Traffic: W8DDS 815 BBH 294 GQD 223 FGV 167 EEZ-EQ 118 BAH 136 PO 96 GQU 92 FFK 47 DVL-EQB 44 QSO 43 BKM 41 APC 59 IOC 41 ZZB 35 ISK 34 UX 28 HEY-DEM 25 BPC-IZQ 23 GDC 19 IRM 17 BAC 16 HCS-AUM 15 HTI 13 ELC-ACZ-GVL-VR 12 BMK 11 ANZ 10 HMH 8 BYD 7 FJE 6 ESN 16 EVS 3 FYP-HRB 1 GJS 18 ELP-DPN 3 EVV 1 AOJ-FSK-WE 4 EFW-ENJ 2 CXP-GNP 1.

ILLINOIS — SCM, F. J. Hinds, W9APY-W9WR — RMs W9CRT-W9DDE-W9ERU, W9FZN has an SS built by GKU. W9BPU was heard in Australia. Alton Radio Club has call W9NLU. W9JZY keeps schedules perking. W9HQH has QRM from W6s on 7 mc. W9KSB's antenna came down. W9ISR has c.c. W9IWIY is installing a '52. W9FOD has '04-A in final. W9LW is looking for quite spot on 7 mc. W9ETP gets out on 14 mc. W9KEH's trunk lines work fine. W9NDB has '45 Hartley. W9NDO wants ORS. W9LVQ is working on power pack. W9BIN blew another '45. W9AND schedules HVA for sick friend having relatives in town. W9AAK bought crystal number 3. W9KIM applies for ORS. W9ICP, a husky lifeguard, rescued the first damsel of the season. W9ILG is one of W9USA ops. W9IWX visited W9USA. W9IEP likes portable contests. W9IYP is moving to Champagne. W9PA handled American Air Race traffic. W9NIU and CHM are new traffic men. W9HMB's portable is NLL. W9HUX has new bug. W9HNK is on Ill. State Net Number 1. DX good at W9EMN. W9ERU says Jan. QST Autodynes popular in Rockford. W9UU visited FCW. W9MSG says 7 mc. is awful. W9MLH is building c.c. rig. W9DBO and LNI attended Sterling Hamfest. W9DCI would like to hear from hams who are Kappa Sigma. W9DGK is working on 56 mc. receiver. Dog days at W9DOU. W9ILH, DZU, and EZV are keeping World's Fair schedules. W9CUH says what could be finer than his new single signal and pair of '04-As. W9KA is moving for hundredth time! W9LMH, WR and MNV are rebuilding. W9LSP is looking for reliable schedules. W9LOJ says no traffic on 14 mc. W8GLY visited W9BRX. W7CGK is visiting hams in Aurora, including W9AAR. W9ACU is on 'phone. W9AYB is on 14 mc. 'phone. W9DDE plans a 1000 watt crystal rig. W9AAW, CRT, CN and FGU are hard at work on World Wide Radio Amateur Convention to be held at Medinah Athletic Club, Chicago, August 3, 4 and 5.

W9KEH 724 JZY 239 HKC 115 DOU 192 ERU-KIM 79 HMB 77 HNK-IWZ 57 ENH 54 FCW 49 PA 41 LLH 40 MLH 35 HQH 30 CZL 29 MNB 23 LSD 24 ACE 22 ICN 20 AFN 17 BPU-CUH-IEP 15 DZU 14 AVB-EMN-LMH-NDO 10 BIN-NIU 8 BRX-FTX 7 APY-DBO 6 DCI-ILG-MNV 5 CHM-DGK 3 HUU-HUX-LOJ-MOE-SG 2 WR 1.

WISCONSIN — SCM, Harold H. Kurth, W9FSS — The SCM enjoyed a 37 day cruise on Lakes. W9HGG is going on canoeing trip. W9GPQ handled nice total. W9GFC is planning West Coast trip. W9FGX invites SCM to visit Wausau hams. W9IFV-DIT is Activities Mgr. of NWRC. W9DNU handled W9USA traffic. W9HMS is going well with traffic. W9EHD is looking for summer work. W9JCW marks "hi" after best DX worked. W9ATO is teaching Boy Scouts how to become ops. W9KJR is QRL YL. W9HYA received extra first. Ex-9EMD is now W9NQF. W9IQW was at Wausau Convention. W9DRO is spending summer in Arlington, Minn. W9FIH is putting up new mast. W9GVF works a ZL or VK before breakfast daily. W9IHG is buying parts for c.c. rig. W9PTH is looking for cheap '03A. W9DJA has new aerial. W9BQM is visiting his brother. W9BJF is in Montana. An OT, F. K. Foster, is back with call W9NFB. W9HTN is back in Fond Du Lac. W9KTK is learning to CQ on violin. W9JVD has new bug. W9GEX is an ex Navy op. W9KXA is fishing for DX. W9ERZ has new MOPA. W9CCI is building portable. W9FAV says QRL

work. The Fondy and Sheboygan clubs plan a joint club outing. W9DXV sends one of his breath-taking letters. W9NAV is working. W9DTK cruised for four days on U.S.S.C. No. 412.

Traffic: W9HGG 395 GPQ 226 GFC 121 FGX 54 IFV-DIT 3 DNU 93 HMS 89 EEQ 16 JCW 32 ATO 56 KJR 43 HVA 24 NQF 9 IQW 17 IBY 9 HSK 119 AXU 2.

#### DAKOTA DIVISION

NORTH DAKOTA — SCM, Wm. A. Langer, W9DGS-IFW — W9EVQ visited Jamestown gang. W9MGR was a visitor at EVQ. W9IGR has new c.c. rig. W9KBE and HJC continue to pound brass. W9JZJ reports visits from KRS, GNS and DUB. W9DYA and JAR are awaiting licenses. W9DPT finds a few minutes for ham radio. W9DM has charge of Walthalla Boy Scout camp. W9KZL is building new 'phone rig. W9DGS is QRL summer school.

Traffic: W9DGS 270 HJC 207 EVQ 93 IGR 26 MGR 18 KRE 16 JZJ 14 DYA 8 DPT 2.

SOUTHERN MINNESOTA — SCM, Norman Beck, W9EPJ-CGR — RMs, W9BKK and W9L.N. W9BN wants Chicago schedule. W9AIR is recuperating from strenuous year. W9BNN reports FB SMRA hamfest in Heron Lake. W9BKK has temperature control on crystal. W9EPJ is building receiver. W9HGN schedules west coast. W9JFH has new c.c. job. W9KDI-KUY took exam. W9HCC is back with 500 watt. W9GLE says QRN bad. W9FCC is up north in back woods. W9CCP is trying to get good sky wire up. W9DEI graduated with B.E.E. W9HCW is awaiting license. W9LDQ reports for Lambertson gang. W9YC and ERT closed for the summer. W9KGA visited hams at Milwaukee. W9CSJ is QRL YL. W9LOG is on 1.7 mc. 'phone. A YL has W9GMD's power supply. W9GBZ worked K6 on 3.5 mc. W9EYS was held up and robbed. During tornado a garage was carried away and cut down. W9CKU masts! W9IXQ won first prize at 'fest.

Traffic: W9BN 221 ERT 157 AIR 135 BNN 72 BKK 40 EPJ-HGN 32 DRG 28 JFH 23 KDI 14 HCC 11 GLE 6 FCC 5 JBA 4 CPP 3 DEI-YC 2 LDQ 1. (Apr.-May W9LOG 19 ERT 14).

SOUTH DAKOTA — SCM, Carrol B. Miller, W9DKL-GIO — W9CFU received limited comm'l pilot's license. W9GYG is at Ft. Crook, Nebr. W9IQD took exams. W9IQZ found ex-9DRB and ex-8ANO in Jack Mills' dance orchestra. W9ALO is trying high frequencies. W9HAT reports HSY worked K6. W9FOQ went to World's Fair. W9CDW is at Redfield. W9ANO visited FOQ and DKL. Redfield Amateur Radio Club is planning a hamfest for fall. Pierre Amateur Radio Club is planning a convention. Let's make it a Dakota Division Convention next spring. How?

Traffic: W9DKL 23 IQZ 19 ALO 14 FOQ 7.

NORTHERN MINNESOTA — SCM, Robert C. Harshberger, W9JIE — The Section takes this opportunity to thank Palmer Anderson, W9DOQ, for his work as SCM. Beginning September 16 all QRS in this Section will be required to handle at least 20 messages per month. W9FNQ is off for summer. W9DJW is playing with ants. W9FTJ hopes for an '03A. W9BRA's portable JPS located at an island scout camp. W9HNS' hospital provides up to date QRN apparatus. W9IPN has new SW3. W9HDN takes Chgo. traffic for LUSFV. W9JIE, SCMing for first time, sends 73 to the gang. St. Paul hams can 'phone reports, TOWER 4957.

Traffic: W9JIE 103 HDN 97 IPN 50 HNS 35 BRA 23 ISA 6 FTJ-DJW 2.

#### DELTA DIVISION

MISSISSIPPI — SCM, Wm. G. Bodker, W5AZV — W5VJ is rebuilding completely. W5AXQ is on 14 and 7 mc. for the summer. W5CQJ is struggling with MOPA. W5BZG has c.c. W5UM sends nice report. W5DGV and DBI are new hams. W5APP is recuperating from a broken leg. YLs have W5BIO well in hand. W5AUF will move to Louisville, Ky.

Traffic: W5UM 2 DGV 3 AHA 8.

ARKANSAS — SCM, Henry E. Velte, W5ABI — W5BDW has '52 TPTG. W5ABL has FBX. W5CIQ sends

first report. W5CR is now at W9FVM. W5CVO is at Siloam Springs. W5BED and BUX visited the SCM. W5BDB has c.c. rig. W5CEO, NJ and ANZ are rebuilding. W5JK is going to use portable DM1. W5AHP traded his station to ATK for a motorcycle. W5BZK has 4 stage c.c. rig. W5DFY is new station in Little Rock. W5DI is active.

Traffic: W5BDW-ABL 19 BED 7 BDB 44 JK 12 BZK 22 CLQ 2 ABI 36.

LOUISIANA — SCM, W. J. Wilkinson, Jr., W5WF — A club has been started in Shreveport. W5BZR, CMQ, DGE and AQC were in Shreveport. W5CFF is traveling. W5CTR likes rag chewing. W5DKR is new ham. W5BID has nice schedules. W5KC is handling traffic. W5AVO and CTO are QRL. W5BI has been laid up. W5CXQ spends his time on c.w. W5CEN 97% bull. W5BYX applies for ORS. W5DLI-CZJ is La Place Radio Club. W5CFG is a Real Silk salesman. W5CW has an '04-A. W5AKW is home for summer. W5CFG is SOS (Shreveport's Official Snooper). W5AYZ had as visitors W5AHK, BKV, CDG and WF. W5CAX is back from Chicago. W5PY is recuperating from operation. W5DJX will soon be on at Barksdale Field. K6FYF is at Barksdale Field. W5QH is president of SARC. W5AYA and CIG will be on 'phone. W5FR and his OW are on. W5EB is on 3.5 mc. W5AFW is doing fine work as RM. W5AKT lost his temporary ticket. W5CUR is in Shreveport. W5BDJ is on 7 mc. Builders this month: W5BYQ, KE, ACV, A0Z, CRE.

Traffic: W5BYX 154 AFW 131 BID 24 AYZ 9 KC 6 BI 5 CTR 5 DLD 2 AEH 1.

TENNESSEE — SCM, F. F. Purdy, W4AFM — New appointments: RM, W4AEP. ORS, W4AEP, AQD, AYU. New hams: W4BYQ, BXD, BUO, CDB, CBS, ADQ, CCN, AQV, UU. On air with new rigs: W4FG, ATU, AFI, EM, FK, 14 and 3.9 mc. 'phone: W4OI, ADT, BXD, BWH, SW, ARL. Wanting state traffic schedules: W4AFI, AXO, AFM, BVP, ZP, BGQ, CBS. W4HA sold rig to BXP. W4CU and AYQ have new receivers. W4ABY is QRL police radio. W4AGW, the OW, and AYE are busy selling BCL sets. W4BNT will be on soon. W4NA is a railroader. W4VT is president of Memphis Amateur Radio Club. W4BCA wants a good receiver. W4ALM has YLitis. W4TD has an e.c. oscillator. W4AMI is home from college. W4BRP was hit by repression. W4AOD is soliciting parts for new rig. Delta Division Convention will be held in Memphis October 20-22. The SCM is going and would like to hear from any East Tennessee hams interested in making trip. W4AFM, AYU and AAD attended Roanoke Convention at Bluefield. The personnel of Tennessee's bulletin, "Barkwaves" is W4BOZ Editor in Chief, W4BBT Assistant Editor, W4PL Cartoonist and W4AFM Office Boy and Janitor. If you want your copy, send a traffic report to the SCM each month. Little Eva deserted W4MU and has taken a great fancy to W4OV. W4AQD, AXN, AAD and AFM are planning a visit to W9USA in August. W4LU has been traveling around the country. W4AAO is encamped at Tremont, Tenn., with the CCC. W4EX is our chief tube blower. W4RO as chief RM does fine work for Tenn.

Traffic: W4RO 114 AFM 73 HA 60 BOZ 55 AAD 46 ALM 40 OV 33 AXO 32 BQK 28 AFI-CCN 20 EX-ZP 19 AYV-PL 16 BUC 14 BGQ 12 BXD 10 CBS 9 VT-CU-AEP 5 AYU-BBT 4 CBU 3 AQD-ADQ-CDB 1 LU 4.

#### HUDSON DIVISION

EASTERN NEW YORK — SCM, Robert E. Haight, W2LU — W2ATM leads with FB traffic schedules. W2BLU is second high. W2BJA is out after 17 months of illness. W2BLL uses portable FDW. W2UL, CC and CL bid W6CXW Bon Voyage on 7 mc. as he sails for Japan. W2KW is going strong. W2CFU sports an FB7. W2CBN joined VCR. W2QY hopes to be with the boys at Natl. Glider Meet at Elmira. W2FPH is welcomed to our section. W2FUR makes nice report. W2BTQ hangs his shingle for traffic. "Sky hooks down again," says W2CJS. W2ANV reports A.A.R.A. meetings adjourned for summer. W2SZ and ENY haul in sky wires. W2EQD was assigned portable FVI. W2FUM is new ham. "Things

kinda quiet on Hudson," reports W2BZZ. W2DDW reports via two page letter for Mid Hudson Amateur Radio Club. New officers: pres. W2BJX, W2BCO vice-president, Archie Smith treasurer, W2DWO secretary. W2CGT is rebuilding. W2ANX moves to new QTH. W2AEG is taking a YL for better or worse. SARA held annual picnic and married hams trimmed single hams in ball game. W2CJP is active on 7 mc. W2BIA schedules Chicago for Worlds' Fair traffic.

Traffic: W2ATM 294 BLU 120 BJA 106 LU 76 BLL 57 UI, 30 FUR 20 KW-CFU 17 CBN 12 QY 7 FPH 3 BTQ 2 CJS-ANV 1.

NORTHERN NEW JERSEY — SCM, Walter A. Cobb, W2CO — W2FL visited the World's Fair and operated W9USA. W2BPJ also threatens to check up on the Century of Progress. W2DPB reports the Rutherford Club coming along FB. W2ABT schedules K5AB. W2EKM has been appointed RM and ORS. W2TP prefers to handle traffic via 'phone. W2CZJ is busy with amplifier jobs. W2BXM is making preparation for fall. W2DIU got personal with a rattler and landed in hospital. W2CQT is active on traffic. W2DGU sends 'photo of extremely neat station. W2EAM moved to new location. W2EOH QSOed VP2MR, Fiji Islands. W2ELJ wants South Jersey schedules. Westfield is represented by W2FNK. W2DV requests ORS appointment be placed on ice. W2FR and DYR are experimenting with 23 and 56-mc. 'phone. Recent visitors at Ocean County Club: W3BJM, UD, TA and W2BO. W2BQV and APQ intend to use summer for rebuilding. W2FR received portable FVG. W2FLO is newcomer. Bottom fell out of W2SN shack stove. W2FLP is striving to make TNT perk properly. W2CST has three stages of speech amplification. W2BYR got new transmitter working. W2ECO is back from his honeymoon with sister of W2CFW. W2FUY is new in Jersey City. W2DMU and FGJ had hard luck when lightning struck both outfits. W2ABX is celebrating his return to the air. W2EUB contacted Illinois on 1.7-mc. 'phone. W2EMU is missing from his usual haunts. W2BLQ made transmitter at Dickinson High School work, using W2FNX. W2EQS blows rectifier tubes. W2CHH has ideal receiving conditions. All ORS who want to keep this Section active please help W2BPY when he requests help for the Section bulletin. W2CO is exercising his tonsils over the facilities of the American Airways Radio network. ExW2VQ paid a flying visit to the old home town. W2ZC has gone on a shooting trip out west, then to Calif.; he has installed 1-kw. 'phone which will be operated by W2AWL to contact ZC from W6CNE.

Traffic: W2DIU 539 BPY 78 ABT 42 TP 33 DPB 32 CGG 27 JC 25 CJX 22 ELJ 22 EIC 16 CIM 9 CIZ 8 RXM 7 EJK-ESX 4 EKM 887 FR 108 DYR 144 BYD 36 CQT 33 SN 21 EDV 12 EQS 10 FNK-CTT 4.

NEW YORK CITY AND LONG ISLAND — SCM, E. L. Baunach, W2AZV — W2BNJ took part in June field day using portable ZZDI. W2DBQ is Brooklyn RM. W2BRB uses grid modulation. W2BNL is on 3.5 mc. W2PF went to World's Fair. W2CCD is operating W2KW. W2DUP has new QSLs. W2CBB went in for P.A. work. W2CHK is c.c. on 3938 kc. W2CAU has troubles with S.S. receiver. W2BNY is on 56 and 28 mc. W2EZO reports new stations, FLR and FRL. W2DOG turned his shack into a hotel. W2EPJ can't get spark coil effect out of his modulator. W2BJ has daily schedule with W6CUU. W2EAF is operating portable W2FYF. W2BPJ is operating W3BGA. W2FWZ is on 1.7-mc and 56-mc. 'phone. W2EXO worked Spain. W2EYQ, DBE and EGA took final exams. W2CEH bought an FB7. W2FFN is putting up new sky hook. W2FHB and FDQ are always on. W2FOG and FBP visited EYQ. W2OV is rebuilding c.w.-'phone job. W2CLM summer QRA will be Shoreham, L. I. W2FIS worked K5AA. W2RZ is recovering from sunburn. W2ELB went in for higher power. W2AGC and BVT get out FB on 56 mc. After seeing the A-1 operators club W2BEG has started the Z-1 operators club. W2EYS worked W6. W2KJ and OJ merged stations. W2FF handles traffic from W9USA. W2AAK and CUD moved up N. Y. State. W2TI, AOB and AAZ are

recovering from convention. W2AWT went to a wedding in his first tux. W2FRK is new man. W2BJV is heard again. W2ELK says WX too hot for radio. W2DQW is on radio vacation. W2BAH is trying to beat depression. W2LQ is both a father and an uncle! W2ETZ joined C.C.C. W2WD has 56 mc. osc. in attic and mod. in cellar. W2AZV wrote this report in a canoe in New York Bay. W2DTT built crystal oven described by W9GEX in June QST. W2CIH reports the following: xW2BVZ is QRL college. W2DWW got A.C. converter. W2BKU got Ford out of storage. W2EFZ is in Montana with C.C.C. W2DRM got message for Hong Kong. W2ELE is on 14 mc. W2EUS has new c.c. rig. W2DMT works in a radio store. Among the new hams are: W2FLK, PCT and FQI. W2DUH is on 7 mc. W2CLE is Stuyvesant H.S. call. W2CIH is president and HOP vice-pres. of Textile H.S. Radio Club, W2EXP.

Traffic: W2ADQ 755 BJ 106 ELB 97 BNJ 59 DBQ 46 BPJ 42 EYQ 41 CHK 39 EYS 33 AAK 31 AZV 25 FIS 23 FF 22 DUP 22 CCD 15 EGA-BAS 16 AWT 12 ELK 6 BMH 5 DOG 4 DQW 3 LB-FRK 2 LG-LR-CUD-AGC-EAF-BVT-CJM 1.

#### MIDWEST DIVISION

NEBRASKA — SCM, Samuel C. Wallace, W9FAM — W9DMY says R.R. business picking up. W9DFE is going run swimmin' pool this summer. W9ISJ is playing with antennas. W9EWO is making plate transformers. W9FWW is going on vacation to Wyo. W9BCX expects to have '51 going by fall. W9DI is swinging back into brass pounding. W9NPI is new station at Mitchell. W9DHA reports from Ft. Crook. W9EW and IFZ-AFD report new Omaha radio club, Amateur Radio Operators Club. W9FAM enjoyed Convention at Lincoln.

Traffic: W9DMY 30 DFF 19 ISJ 15 EWO 14 FWW 9 BCX 6 DI-AFD 5.

KANSAS — SCM, O. J. Spetter, W9FLG — RMs, W9KG and W9CFN. W9FLG schedules W9USA. W9GBP leads the state. W9FRC blew 888's. W9ESL is binding his QST's. W9IEL goes to Tulsa for the hamfest. W9FFO is getting five amps into zepp. W9GK is OP at W9FFO. W9MUY reports 7 mc. freakish. Oklahoma City loses W5AEI-BXD and Parsons, Kansas gains; his new call is W9NSD. W9LGV reports hot WX. W9AIVP calls off schedules. W9BSK is building c.c. rig. W9DMF has MOPA. W9BDB has gone c.c. W9HWW and NI, PB are rebuilding. W9CVN has new antenna. W9AWP, ABG, DMF and MPL are sending code practise. WARC is giving crystal to lucky ham at next meeting. W9IQI has a W.E. 276A. Amateurs from Iola, Chaute, Buffalo, Colony Moran, and Mildred met at Iola Sunday June 4 and organized a radio club. W9AHR worked five consecutive YKs and ZIs. W9LFN wants to know how to rejuvenate a '52. Don't forget the Kansas State Convention September 9th and 10th.

Traffic: W9GBP 435 FFO 48 AWP 46 FRC 41 IEL 36 BYM 18 AHR 17 PB-LGV 9 ABG 8 KDO 4 MUY 3 ESL-IQI 2.

IOWA — SCM, George D. Hansen, W9FFD. RMs, W9ABE, W9BPG. W9ZZAF leads with exceptionally good total. W9ABE says things slow. W9HPA graduates this month. W9ACL winds up A.A.R.S. season. W9FFD is moving to Sioux City. W9CWG is going to Chgo. W9DUN has new YL at his house. W9IO closed down for summer. W9ELV is working on SS receiver. W9FYC says no schedules this summer. W9BVF taught radio to ten boys in his class. W9GWT is getting World's Fair traffic. W9GXU gets a few. W9DUE is installing transmitter he won at Cedar Rapids. W9CYL has new masts. The following report with no traffic: W9FYX, ERY, FXX, AFQ, DFZ, GMM, NDN, GTH, BPG.

Traffic: W9ZZAF 503 ABE 84 HPA 58 ACL 54 FFD 51 CWG 41 DUN 28 IO 26 EIV 24 FYC 22 BWF 19 GWT 11 GXU-DUE 10 CYL 7 FXX 2.

MISSOURI — SCM, C. R. Cannady, W9EYG — RMs, W9FTA and W9BMA. Activity CUP contest for 1933-34 BEGINS this month with W9CJR leading! Traffic counts 25%; other activity 75%; GET IN ON THE FUN! St. Louis Amateur Radio Club: W9FTA is QRL

Convention work. W9DGI-W9EOW (new xtal job) is on 7084. W9GCT returned to St. Louis (from Michigan). W9GDU signs until fall. W9FIX has a new c.c. rig and fine results. W9HWE, W9HWD, and W9HVN entered portable W9MAW in the Field Day but ND on DX. W9BGE, of the OBP, says class "B" is sure FB. W9EFC's total holds up well. W9FZJ puts more time on radio now school is out. W9LWG has PP 45's on 14 mc. W9ENI is back from Purdue and active. W9KEI promises reports each month. W9KHV increased power. W9HEL and W9HIP are still doing FB. W9KEI worked a K6. W9HWP gets out better with H.V. W9IJW comes back with the. W9GTK-ENK continues through summer QRM. W9LLN back on 3.5 after 160 meter fone trial. W9LLN's brother got call of W9NNF. W9FAB wants an 852. W9IJZ has a new c.c. 160 meter rig. W9LLI sticks to 160. W9NCG is new ham. W9CCZ is still having YL trouble. W9GUY has a new c.c. 40 meter rig. W9LTH is on 3.5. W9BMA and W9GCG make the grand total for Kansas City Scoring with NO TRAFFIC! What's wrong, we should have a higher percentage? State News: W9GQY reports for past several months! W9BAU renews ORS. W9CRM has railroad QRM. W9BGS will be inactive until Sept. W9DLX had visits from W9INI, HVV, LBO and IYU. W9DHN is back from school. W9HNM can't find any tie. W9LCG reports 5 meter fone work in St. Joseph. W9AAN was in Colorado two weeks. W9IBM-NOY turns in first tie report — FR! Visitors at W9AIJ — W9FJV, NGS, NIH, LBA, etc. W9LBA sends the first traffic report from Brookfield! W9ECE is another QRT for summer. The Hannibal Amateur Radio Club has several members taking ops exam soon. W9CXB continues active. W9HUG-LTN has c.c. rig going now. W9FVM is back from school. W9LXO is slowing up a lot. W9FYU, EHS and EYG have moved and are resuming activity.

Traffic: W9CJR 94 FJV 86 GBC 47 ECB 28 EFC 27 CRM 25 KHJ 24 AIJ 23 KEI 18 CXB 16 GTK 14 FIZ-DLC-EYG 11 LBA-ASV 10 FYU-BGE 9 AAN-FVM-ENF-EHS 8 DHN-HUG-FYM 6 JXG-HCP-GPJ-ENK-HWE 5 FEH-LLJ-MVO-JXJ-EME-IGX 4 CON-KSU 3 DCB-AHH-BYN-JPT-LTN-IJW-GLY 2 IXX-IUR-LBM-NOY-HNM 1.

#### NEW ENGLAND DIVISION

WESTERN MASSACHUSETTS — SCM, Earl G. Hewinson, W1ASY-W1RB — W1EFM leads in traffic. W1BNL is passing the summer at WTAG. W1EFQ is interested in 'phone. W1DQJ moved to Chicago. Five G's using portables were reported by W1COI during June Field Day. W1ADF says the BBP picnic held at Prospect Lake was a great success. W1BPT is going to use 0.7 watts input in his portable. W1DWW is radio instructor for a local ham. W1ASY worked K6VG on 3.5 mc. W1APL has his QSOS at the swimming hole. W1EOB says traffic picking up. W1BVR is a hard working RM. W1FK is laid up. W1FNW will get class B going soon. W1CJW has gone in for crystal "busting." The Wachusett Air Relay held its first annual ball May 25; the club also cooperated in Wachusett Air Show.

Traffic: W1EFM 108 BVR 75 EOB 59 APL 42 ASY 41 DVW 30 BPT 27 FFJ 19 ADF-AJD 18 ARI-COI 15 DJQ 12 CJZ 9 EFQ 7 BCB-BNL 6 CWP-FNW 2 CJK-FCL 1 CJR 82.

EASTERN MASSACHUSETTS — SCM, Joseph A. Mullen, W1ASI — W1AGA leads the section for traffic activity. Close behind him comes W1EVJ. W1ABG says schedules going haywire. W1KH is running around with his portable BKH on 56 mc. W1VW is sporting portable GSD. W1BYY is tossing traffic with Canada. W1BFR has a new 211E. W1JL has trouble with his transmitter. W1DFS handled QRR traffic with W1CEL. W1BZO is looking for job. W1EVJ is c.c. on 3579 kc. W1EVE is going to Maine for summer. W1BO heard 6 continents and worked 4 in one night. W1ALP is suffering from summer fever. W1WU and BMW are QRL business. W1BJA keeps schedules. W1CCP is on 1.7 mc. 'phone. W1AJ and CTG report for first time. W1GHB is going to 7 mc. for the summer. W1BNU and DZQ are experimenting on 56 mc. W1UG is using a W1BO receiver. W1CGM and AKN

are building portable rigs. DID YOU SEND IN YOUR REPORT ON THE TRAFFIC CONTEST? WIASI is handling Boston end of Cape schedules.

Traffic: W1AGA 191 EVJ 174 KH-BZO 98 ASI-DFS 94 BBY 42 ABG-BMW 31 WV 28 1ZQ-CCP 24 CTG 23 BFR 21 GHB 9 BJA-JJ 7 AJ-WU-BO 3 EVE 9 ATX 2 BNU 3 UG 25 CEL 41 ACH 40.

CONNECTICUT — SCM, Fred A. Ells, Jr., WICTI — W1MK tops the list. WIDOW got a job. The Bristol Radio Club is all set for 56 mc. W1FGV blew an '03A. W1AMG has receiver trouble. W1ERU says conditions rotten. W1GC is thinking of 14 mc. DX. All W1BEM's traffic was foreign. W1DGG bought a sail boat. W1AKI says things quiet. W1AFB and FIO report by radio. W1APW is QRL work. W1CIG hopes to operate at W3DH this fall. W1CJD and YF were on the Conn. River with W1CKF for Portable Field Day and worked AUT and AJB. W1BFS is pounding nails instead of brass. Any communications for W1FDM should be sent via FBV. W1GGX reports via his brother. AMG. W1DMK was sick in bed. W1HD had BBU's 56 mc. portable out on Field Day. W1FTM sends dope on Waterbury gang. W1CNU put up new antenna. W1EEY delivered a rush message from W3AAJ to W1UE. W1EAO won a Grass "Eagle" at the hamfest at Cape Cod. W1ES is worrying about QRM when BDI moves within sight of his shack. W1CUX worked VK, ZI and EAR. W1BIB-ECE is on 56 mc. W1BQS got an Extra First Ticket. Bulkeley High School, Hartford, boasts W1FVR, GKM, GUC and HAG. The Boys Club of Weaver High has W1GML.

Traffic: W1MK 416 DOW 100 FGV 90 AMG 70 ERU 65 GC 41 BIQ 36 BHM 18 DGG-AKI 17 AFB-APW 16 F10 15 CIG 14 CJD-BFS 12 FDM 9 CTI 6 GGX 5 FTM 4 CNU-EEY 3 EAO-ES 1.

MAINE — SCM, John W. Singleton, W1CDX — W1BOP handled traffic for the HMS Danae. W1CRP is new RM for Portland. W1CFG is moving to Manchester. N. H. W1BEU handled emergency traffic. W1BPY has a nice total. W1CDX has taken unto himself a wife. W1GKC wants schedule with Rangeley. W1AGL handled a few. W1BNC is slowing up for the summer. W1BLI is going strong on 14 mc. W1APX is rearranging schedules. W1GLR reports for first time. W1FJP is new ORS. W1BTA reports things quiet. James Moore (W8AHN) has moved to Portland. W1BGZ has a commercial ticket. W1QH will use his portable 'YX from Cadillac Mountain this summer. W1FNP has a novel QSL card.

Traffic: W1BOP 115 CRP 89 REU 64 BPY 53 CDX 32 GKC 28 AGL 27 DHH 25 DKO-DIJ 20 HNC 17 EFA 15 BLI 7 FJP 5 APX 4 GLR 8 FKH 5 BTA 3 EOP 8 EZR 2 FNP 6 EF 38.

RHODE ISLAND — SCM, Stanley W. Atkinson, W1AFO — Let's give our new Route Manager, W1EOP, plenty of support. W1CAB is lining up the Naval Reserve for fall. W1GSJ believes e.c. oscillator superior to c.c. W1DAH has moved. W1DSZ reports many beginners on 7 mc. W1EI bangs away on 3.9 mc. 'phone. W1AGB keeps two schedules. W1FUB swears by e.c. circuit. W1FAH has a new receiver. W1DBA moved three times in three months. W1FNE is an old timer with a new call. W1ARK has an FB 56 mc. outfit. W1AXS works plenty of 14 mc. DX.

Traffic: W1EOP 13 AXS 11 AFO 10 CAB 8 GSJ 7 FUB-FAH 5 FNE-ARK 4 DSZ-EI 3 DBA-AGB-DAH 2 AWE 7.

VERMONT — SCM, Roy L. Gale, W1BD — W1BNS resigns as RM. W1BJP had a visit from VE2FE, W1EJF and CUN. W1FPS has rebuilt. The SCM was visited by W1ATF and BMS. W1EFC graduated from high school. New W1BJP 23 BD 7 ERJ 3 FPS 1.

NEW HAMPSHIRE — SCM, V. W. Hodges, W1ATJ — W1UN holds the lead. W1AXL has YLitis. W1EIQ is trying MOPA. W1DLW is working on portable. W1ESB uses a WE242A. W1APK is building new shack. W1AVL is QRL golf. W1BMM erected new Hertz. W1DMI says, "fishing." W1FEE reports activities at Dartmouth College. W1CCM is feeling better. W1ERQ has pair of '10s. W1AVJ has c.c. '04A. W1AVG moved to Henniker.

Traffic: W1UN 336 FEX 293 ERQ 33 DMI 16 EZT 12 BGL 8 EES-AXL 2 ESB 1.

## NORTHWESTERN DIVISION

OREGON — SCM, Ray Cummins, W7ABZ-CBB — Biggest convention ever held in Division's history will take place in Portland, Oregon Aug. 18 and 19th under sponsorship of R.C.A.R.C. Coos Bay club reflected officers: pres. W7DCI, secy.-treas., W7CRK, W7BLJ visited Coos Bay. W7BNI goes to N.G. camp. W7WL had a visit from CUV. W7DEA and AVB are brothers. W7CRK and BWD are deep sea fishermen. W7DMK and portable W6GSF are new hams. W7COQ has an FB '10 rig. W7AOI is pulling in DX. W7AQX has QSO-ed W9EDW more than 200 times. W7AIP is rebuilding. W7BZS is on 1.7-mc. 'phone. W7PL is working 'phone and c.w. W7DP schedules WY and AVP. W7BO and KR attended N.W. track meet. Northwestern Director, W7KVV, moved to Portland, to take job with United Airlines. W7AIG returns from trip to Idaho. W7BEE is new secy. of Pendleton club. W7APE took MY's job as chief radio op of steamer Lumberman. W7ZZZ moved to Baker with C.C.C. W7QY-K7CFQ was unable to contact his SCM in Alaska so shipped report to ABZ thru HD. W7BUB applies for ORS. The Astoria gang had portable RTT going on Saddle Mt. on International Field Day. W7AYV is new OO. W7AQY, and APF have c.c. rigs. W7LT cancelled schedules. W7DIU is bell hop at R.C.A.R.C. club rooms. W7AXJ says Oregon A.A.R.S. going FB. W7AOI is going 14-mc. 'phone. W7BHT has portable DNA. W7AKY is eyeing hi-power situation. W7AKU breaks loose with report. W7BTF uses portable CTA. W7CHB received heard card from Moscow. W7AMF is cussing QRM. W7ASG takes in Century of Progress in Chi. Who has seen W7SY's ORS certificate? W7ABZ has been VERY QRL.

Traffic: W7AXJ 255 CEJ 243 WR 205 LT 116 AYV 113 DP 74 HD 58 DDZ 56 CXK 44 AMF 36 QY/K7CFQ 35 AQY 23 BUB 17 AOI 15 COU 12 CBA 10 BWD 11 AHJ-BOO 8 COQ-ALM-WL 7 ABZ-AZO-AKU-CTA 6 APF-ANX 4 DAE-AJX 2.

MONTANA — SCM, O. W. Viers, W7AAT-W7QT — W7AQN is star trafficker. W7FL is in Butte. W7AMA moved to Spokane. W7ASQ, BWH and BSU changed QRA. W7CCR, GBM, BJZ and BEZ took in Spokane Hamfest. W7AOD says BJZ has FB-X. W7BDJ has MOPA. W7BZZ is visiting BMX. W7AHF has portable DNT. W7CEG-DBD is QRL ranch. W7BVE applies for ORS. W7CTP is new ORS. W7COX is going strong. W7AAT, touring with dance band, saw BDC, JC, EC, BLY, AXG, CAL, BYE, BDS, and CBP. W7MZ and BKM are in Glacier National Park with portable CQU. W7CFE likes 7 mc. DX. W7CRC is new station in Whitefish.

Traffic: W7AQN 290 FL 25 CCR 39 AOD 16 BMX 38 CRH 18.

IDAHO — SCM, C. R. Thrapp, W7AYH/CKO — W7AVP leads in traffic. W7DKD is all district portable of AVP. W7APK/BFO moved to McCall. W7BCU is vacationing. W7CHT worked VK. F8PZ, K6. W7CAP, AT and CHN visited AYH. W7CHN moved to Mont. W7BAW has new '52. Nampa Radio Club suspended until fall. W7CMD is opr. at KFXD. W7AYP and DLS are on CCC WUBJ district station with ACP as chief opr. W7BRY is selling out.

Traffic: W7AYP 156 BAA 42 BCU 32 CAP 9 CHT 6 BRU 2 AYH 1.

WASHINGTON — Acting SCM, Stanley Belliveau, W7AYO — W7BB continues FB schedules. W7BKE is new ORS. W7BGH works DX. W7BCS likes his doublet. W7CNC and APS send nice reports. W7CLR leads Spokane gang. W7CDC has 50-watter final. W7BEV says Class "A" prime modulation is FB. W7CFY changed to MOPA. W7CHU, CJN, AKL, AHT, OC and CDD shove traffic. W7HS made trip to the coast. W7AWX has FB 'phone. W7ADS has '52 final. New portable for W7CQI is DOW. OO W7KO is on the job. W7BHH will operate CLN part of summer. W7AUP has portable DPH. New ham in Yakima is W7DNE. W7AZI finished new rig. W7RL applies for ORS. A wind storm gave W7CZB's mast a ride. W7CHH helps out in Vancouver. W7CPD's transformer burned up. W7AHQ handled death messages to Alaska. W7CZY is building c.c. job. W7WV kicks thru



with a fine total as usual. W7ABU graduated from high school, congrats OM. W7DKP is a new Tacoma ham. W7BRC has fishing fever. W7BSX BPLs. W7BCC says deliveries are sometimes embarrassing — hi. YLs sure keep W7BCV busy. W7AFC leads the section. W7AWF is c.c. on 3811.5 kc. Daylite saving time ruined W7IG schedules. W7DGH and BIW work out fine. W7BG says that not enough fellows are making use of QSL bureau for this district, which is handled by W7BPC. W7LD rebuilt. W7CND has been vacationing. New MOPA at W7BFL. W7ACY clicked a J3. W7AYO has almost enough money saved for new '03As. W7BUW is home from WSC.

Traffic: W7AFC 380 BSX 343 IG 254 CQI 264 WY 231 CLR 225 BB 206 BCC 161 BFL 121 CDC 116 CZB 111 BEV 83 BHH 75 HS 71 ACY 59 AHQ 56 APS 53 BKE-CFY 52 BWS 50 CNC 48 RL 38 CJN 37 CHH-APR 35 AAF 29 CHU 28 CIV 23 AWX 20 CPD-AWF 15 BCV-LD-OC 13 DGH 12 AHT 10 CZY 9 CXL-BRS-BIW-ADS 8 BRC-BCS-AKL-BG 6 CTS-BGH 5 KO-AU-PCD 4 CND-CDD-AZI 3 ABU-BUW 2.

ALASKA — SCM, Richard J. Fox, K7PQ — K7CNP is north bound. K7CKT is on at Colbowa. K7ATD will leave for years vacation. K7CLL wants a Federal tube. K7VS will help K7BAQ get on the air. Old W7FF will be on from K7DJA. K7BNW and K7DJA took unlimited 'phone exam. K7ANQ moved to 3500 kc. K7TF burned up MG. L. R. Huber, former A.R.R.L. Director, is now K7AHK at Seward.

Traffic: K7PQ 210 TF 2 ARL 27 TD 29 ATF 91 ANQ 142 PQ 209 AHK 289 DNW 302 FF 353.

#### PACIFIC DIVISION

SAN FRANCISCO — SCM, Byron Goodman, W6CAL — W6PQ BPLs as usual. W6CFV has a honey of a total for first report. W6EKC may join club. W6GKO was in Pope Valley with portable. W6DO claims "radio 24 hours a day." TL W6CIS schedules K7 on 3.5 mc. W6AZK schedules K6GUA. New ORs: W6GIS and EKQ. RM W6BTT and ABB are rearranging schedules. W6BEG, with BNA and jet, reports. RM W6BVL has commercial ticket. W6HIR is going to Washington. 1.7-mc. 'phone catches W6ATO's fancy. "Super" trouble at W6IU. W6MV is letting his hair grow. W6ZS was caught in the clutches of vacation. W6BIP claims a better QTH than WB. W6AVX uses '10 in final. W6DTR summers in Hawaii. W6DQH is moving to Berkeley. EC oscillator works fine for W6FCX. W6AAR is in Fresno. W6BCA is getting '66s. New power supply at W6CAL. W6BIM takes a crack at 56 mc. W6CBN uses the crystal oscillator in June QST. At W6GQA, the spirit is willing but the flesh is weak.

Traffic: W6PQ 1215 CFV 343 EKC 207 GKO 105 DO 101 CIS 84 AZK 40 GIS 38 BTZ 36 ABB 26 BEG 24 BVL 23 HIR 17 ATO 15 MV-IU-EKQ 14 ZS 13 BIP 10 AVX 8 DTR 7 DQH-FCX 5 AAR 4 AYW-BCA-CAL 2.

HAWAII — SCM, C. D. Slaten, K6COG — K6DYC is back on the air. K6AJA is organizing BC station in Hilo. K6BFL worked Finland. K6BAZ is now WAC. K6IOO is a new call. K6HOO is active in traffic. K6ETF is rebuilding. K6ACW is YLing. K6BIH has new call, IQL. K6GQF is coming on with c.c. K6GRV has new location. K6CCO puts out an R9 signal. K6BWW is active.

Traffic: K6EWQ 1197 GUA 454 GRV 124 HOO 91 CRT 80 DV 48 DSF 34 GQF 23 ACW 22 EDH 16 CIB 15.

SANTA CLARA VALLEY — SCM, Bruce Stone. W6AMM — W6HM is in Canada for the summer. W6YG and W6YL are closed down until fall. W6FBW is active after illness. W6DBB is new editor of the bulletin. W6CNN is moving traffic. W6AZC is wearing out maps routing traffic. W6QR is recovering after disastrous fire. W6GUJ and CSI are new reporters. W6GOZ will sign INR while in the hills. W6DSE is using an e.c. oscillator. W6HZW has good L.A. schedule. W6AOD, CNI and others spent a week-end on Loma Prieta experimenting where there were power leaks. W6CDX says 9 to 11 p.m. is FB for ZLs and VKs on 14 mc.

Traffic: W6HM 332 FQY 172 YG 110 FBW 74 DBB 52 CNI 38 YL 33 AZC 24 QR 18 GUJ 14 GOZ 10 DSE 9 CSI-HZW 8 AOD-BSO 5 CNI 7 CDX 1.

ARIZONA — SCM, Ernest Mendoza, W6BJF-W6QC — New hams: W6LIB, IGC, IFH, IGJ, IJR, ILM, IOG, IQY, IIF, IIG, HUZ and HUU. Ex-6DTU is now W6HDG. W6HBQ has portable IIE. W6FGG returned from vacation. W6CLL has portable W6IFT. W6HCX was a visitor in Tucson. W6CVW's ambition is to hook Europe. W6GFK has moved to Coachella, Calif. W6BJF is relief op at the scout camp. Clayton Williams is at W6QC. W6IJQ and QC keep daily schedules. W6HAX had his set down for couple weeks. W6BRI has been QRL. W6CQF is having trouble. W6IUY (Mrs. W6DSQ) is a new Phoenix ham. W6LJR found that transmitter works much better when turned on. Hi! The Arizona Shortwave Radio Club is going to elect officers.

Traffic: W6ALU 580 QC 409 CVW 14 CQF 8 HBQ 3. SAN JOAQUIN VALLEY — SCM, G. H. Lavender, W6DZN — W6BHQ is going to make BPL. W6CIE is in Modesto, Calif. with portable CP. W6FFU and GIV have c.c. W6FZA is taking portable GCB to the mountains. W6FRH thinks he may hibernate until winter. W6DQV is active U.S.N.R. and A.A.R.S. W6CVT keeps four schedules. W6GFR's '45s are the berries. W6AME is busting thru. W6ENA is a C.C.C. op at Sacramento at WUBA. W6GXL is going c.c. We welcome W6AAR to our Section. W6FYM has portable HEK. W6DQR is a C.C.C. op at WUBD in Fresno. Modesto Radio Club elected officers: W6COJ pres., W6AME vice-pres., W6FYM secy.-treas. Turlock Radio Club had a red hot hamfest — W6AN, our Director, was there with all the news from HQ. The SCM is in the mountains at a logging camp with portable W6WJ.

Traffic: W6BHQ 90 CP 49 FFU 36 FZA 22 FRH 20 DQV 18 CVT-AME 16 GIV 7 FYM-GFR 4.

EAST BAY — SCM, S. C. Houston, W6ZM — CRM, J. H. MacLafferty, Jr., W6RJ. W6CDA leads the Section. W6HHM is handling one end of Ninth Corps Area C.C.C. net. W6GMX is out at one of the camps. W6ZX came to life again. W6RJ has single wire Hertz for each of his frequencies. W6RF is active U.S.N.R. W6AKB schedules K6HCO, K6CCO and JICE. W6AF is QRL railroad. W6FII is alternate 2nd district NCS for U.S.N.R. W6FAC blew out transformer. W6HRN is going to Santa Cruz for summer. W6CIZ is rebuilding transmitter. W6YM has closed for summer. W6HH has replaced '47s with '46s. W6EJA says 1.7 mc. 'phone is going strong. W6IT is prepared to give frequency measurements to any of the gang. W6DHS has been working 3.5 mc. DX. W6AQ has been pounding out a few, and has added EXE to the staff. W6EKB is on 1.7 mc. 'phone. W6AAT tried to break into the Circus with a delivery. W6CYE, EDO and AIJ send good reports. W6CAZ is on 3.9 mc. 'phone.

Traffic: W6CDA 887 HHM 628 ZX 294 RJ 269 RF 243 AKB 196 EDO 129 AF 120 FII 42 FAC 33 HRN 32 CIZ 25 YM 21 CYE 11 HH 19 EJA 13 IT 13 DHS 12 AQ-EKB 11 AAT 2 AIJ 21.

PHILIPPINES — Acting SCM, Newton E. Thompson, KA1XA — KA1HR now has c.c. KA1UP and 1CO are installing c.c. Next meeting Philippine Amateur Radio Assn. will be held at KA1JR.

Traffic: KA1HR 1064 LG 264 CO 71 JR 66 XA 43 TS 37 NA 116 MR 20 KA4GR 9 OM1TB 711.

SACRAMENTO VALLEY — SCM, Geo. L. Woodington, W6DVE — W6FEJ has gone to the C.C.C. at Challenge. W6GSP and GCM are associate editors of Section dope sheet. W6ETM and HEM are new operators at WUBC, C.C.C. station at Marysville. W6GUK has moved into new shack. W6FPH has trouble with MOPA. W6GBB is setting up a pair of 211Es PP. W6CIR is building SS super. W6CDC has returned from a 'round the world cruise. W6GHP is new traffic man. W6BHM has been QRL cherries and apples. W6CUM is building c.c. rig. W6CRN is QRL 56 mc. W6GDD joined U.S.N.R. W6FKM is pounding away. W6DGS is home from college. W6KD paid BHM a visit. W6IQH, IOZ, INT, and IVM are new hams. W6GVM's portable is IUF. W6GDJ sends good report. W6ELC moved to L.A. W6FLR is going to New York. W6CKH has c.c. job. W6ENC is going to college. W6BYB worked G15QX. W6SK reports the



U.S.F.S. operate on about 3100-ke. 'phone and c.w., listen on 3.5 mc., and often call hams for tests. W6GZY worked a K7. W6CKO has new FB7. W6AK has closed for summer. W6GKK is looking for schedules.

Traffic: W6CKO 639 AK 80 GAC 21 DVE 9 BYB-SK 8 CGJ 9 GHP 5 GKK-HLQ-GZY 3 GCM 2.

NEVADA — SCM, Keston L. Ramsey, W6EAD — W6HCE is coming on with fifties. W6HHY, GGO, DSD and UO are rebuilding. W6BTJ is winding power transformer. W6AJP broke his collar bone. W6AAX is pounding traffic at Forestry Conservation Camp in Idaho. W6BYR's 'phone is heard. W6FUO is going to try for unlimited 'phone. W6HGX has '45s P.P. W6HZC has three stage c.c. job. W6EAD has new transmitter.

Traffic: W6FUO 47 AJP 40 GFT 16 GGO-BTJ 14 HDD-GUR 8 HHY 5 HCE 3.

LOS ANGELES — SCM, Francis C. Martin, W6AAN — Fourth of July featured hamfest at Crystal Lake by San Gabriel Valley Short Wave Club and picnic at Montebello by South East Radio Experimenters Association of Bell. Tom Nykirk succeeds himself as president of Pasadena Short Wave Club. Following report news: W6ACL, BVN, CYS, DUT, DVV, DZI, ERL, ESA, EWC, ING, ON, SN. Thomas (W6CEC) and Ethel (W6BVN) Harwell late of Phoenix, Arizona, are now in our Section. W6CVV is at Boy Scout Camp in San Bernardino Mountains. W6DVV puts 400 watts on new rig. W6BHP and RZ are 28 mc. pioneers. W6EYJ works Sacramento on 28 mc. W6AEU buys new high voltage supply. Broken legs at W6ING and FRB! W6CGP has new '52 rig. W6ADH is settling down in L.A. New 50 watters at W6DLN and EK. Visit with Utah Amateur Radio Club at Salt Lake City reported by W6GXM. W6ETJ and BVZ handled amateur station at Radio show in L.A. W6BMC and FGT consolidated for summer. E.C. oscillator in receiver at W6FZL. W6ESA is laid up in bed. W6FT is looking for bootlegger who is using his call. Two visitors at W9USA in near future will be W6BIF and FEW. W6DVT has already left for the Windy City Exposition. W6CTZ worked her first VK. Vacation trip takes W6EDW to S.F. It has been suggested by W6CYP and ESK that extra credit be given for X station contacts in Spanish. New ORS: W6FKF and DQP. Drunk driver smacks W6AZU clear off the air! Radio camp at Balboa Beach this summer with W6DOP, AYQ, FWN, CLX and DOZ. W6DWP takes over Sixth District A.A.R.S. for summer with FEO as Alternate. Nominations for BPL include W6ETL, EDW, BPU, DKM and EIL.

Traffic: W6ETL 1578 EDW 621 BPU 609 DKM 319 ADH 297 BZF 295 FMY 261 FGT 236 EII 223 AFO 200 GEX 192 NF/CFN 183 AZU 181 CUM 146 BZI 128 FKF 108 CVF 103 BVZ 82 HXU 80 GXU 41 MK 74 AKW 65 DBC 63 EDZ 55 GNM 52 ETJ-EQW 50 FFN 46 HT 37 AFU 35 AAN-EUV 26 EGS-FWN-RZ 23 GFG-YR 22 DWP 21 CUY-ESK-FEO 20 DYQ 19 BCC-FAR-LC 18 GJA 17 HCN 16 BLZ 15 FEW 9 GMA 14 JCY-DYJ-FVD-GSL 13 DZC 12 CYP-CGP-HAE-TE 11 EYJ-FNG-FVU-HEW 10 BGN-DH-DLN-EGC-ILV 8 DOP-IDZ 7 CVV-DJS-DTX-GLZ 6 EGG-FZL-HXP 5 BER-BFL-BHP-DRQ-WT 4 CTZ-DOK-HEX-KA 3 AM-BGF-DEH-FGQ-FDM-HOS-IDM-MA 2 AGF-CPM-DSP-EK-EMJ-ETX-FTV-GNZ-HOE-IRD-ZZA 1 BCE 7 IIK 2 HBG 6.

SAN DIEGO — SCM, Harry Ambler, W6EOP — W6BMC leads and makes the BPL. FWJ is leaving for the east coast. Luck, OM. W6DQN will be back in Sept. W6BGL is QRL base ball. W6EFK is down to one "sked." W6FQU worked VK with a pair of 45s. W6ITL is Mrs. W6BHV. W6ITP and W6ISG are new hams in S.D. and W6IPA and W6EVL at Laguna Beach. W6GVU is resuming sked with KA1HR. W6BLZ skeds Phoenix. W6AXN worked VK. W6DLR has a new station. ExW8BHD is now W6HWH. Welcome, OM. W6BCF is east on vacation. W6BAM worked Japan. W6EOP has a new portable. The San Diego club meets every other Monday night. Picnics are planned.

Traffic: W6BMC 617 FWJ 144 DQN 103 BGL 60 EFK 53 FQU 31 BHV 13 GVV 12 BLZ 8 AXN 3 DLR 4 HWH 2 BCF 1.

## ROANOKE DIVISION

WEST VIRGINIA — SCM, C. S. Hoffmann, Jr., W8HD — The highest traffic station this month and winner of the crystal prize given by W8GB was W8BOW. The third and last crystal will be given by W8GB next month. W8ELJ passed Extra First exam. W8HD passed unlimited 'phone. W8BOW was heard in Australia on 3.5 mc. W8HD, EIK and ELO relay W9USA traffic on daily schedules. W8CDV is trying 14 mc. W8DMF has 560 watts input. Ex-K6DJU is living in Charleston. Ex-W8CAY is radio opr. on ship bound for Germany. W8JM is doing fine work with 1.7-mc. 'phone. W8BDP is operating at WMMN. W8BOK has a 90-ft. mast. Following 1.7-mc. 'phones are heard on Sunday afternoons in W. Va.: W8BOK, JM, AYK, ESQ, HBL, GDF, HRO, EP, CXU, AHZ, CDE and HOJ. W8TI is experimenting with 3-phase. W8CMJ works usual amount of fine schedules. W8DSJ is temporarily at Steubenville, Ohio. W8DFC worked W6BC. W8BEI and EAG are trying 58-mc. 'phone.

Traffic: W8BOW 166 EIK 140 HXE 84 CMJ 63 JM 34 HD 24 EWM 19 BKG 15 BWK 14 EL 19 DFC-ELO 4 FQB 3 TI-CDV 1.

NORTH CAROLINA — SCM, G. H. Wright, Jr., W4AVT — Another record breaking month for number of reports. Keep it up, gang. Remember, each ham who reports gets a free copy of "The Tar Heel Ham." FLASH! New ham in Raleigh, Lacy Dawkins, W4BZK, scored 100% on License Exam! W4AGO, AKC, GA, GZ, and BKG are on again. W4CFH is portable of AIS. W4QI and CS are on 3.9-mc. 'phone. W4BHR finds it hard to move traffic. W4RX is QRL custom radio building. W4MR is QRL depression. W4BYD is building MOPA. W4BWE is QRL vacation. W4DQ is QRL Red Cross Work. W4BV has 1.7-mc. 'phone. R.I. visited W4AAE's shack. W4AYH has '46s P.P. W4GW is on N.R. trip. W4AXZ gets kick out of 14-mc. 'phone. W4MI is using a '10. W4ACW is now in the "fifth stage." W4PEY is at Montreat. W4ABN's 14-mc. 'phone works FB. W4AMC is QRL YL. W4BLU likes to chew the rag. W4ET is on duty with C.C.C. W4CEB is ready to QSP. W4AHH is QRL fishing. W4AAK sends report of Fort Bragg activity. W4ADZ and BX get RM appointments. W4EG is new OBS. W4ANZ is arranging schedules. W4RWV, TP, and ATS are rebuilding. W4BXB is adding '03A. W4CQ is active in U.S.N.R. W4MB is on week-ends. W4BHP worked a W6. W4BHA hooked a ZL. W4LD worked on ON. Greensboro club station is adding a 50 watter. Ex-9DXR visited W4CP. RM Hege reports for W4NC. W4BTR, AZD and BXX are on 7 mc. W4ANU burnt out power transformer. W4JB got commercial license. W4AOA and BOH are attending summer school. W4DW and HV have new c.c. rigs. W4UB is building c.c. job. W4VI sold out. W4AVT has new 67 ft. mast. W4BV, BX, and DW get ORS. New calls: W4CDQ, CEN, BTX, CHF, CGO, BTV, CEL, CFL, BDW, BXF, BXB, BZK, CFR, SB, BJZ, CGK, CGL, and CDD.

Traffic: W4AIS 55 NC 48 AOA 22 TP 17 BRK 13 CS 11 CP 14 BHR-JB 10 BXX 9 BX-TO-MI-BPU 8 BV-ACA-EG 7 A7S-ACW-AMC-IF-DW 6 BHP-BLU 5 QI-RWE-AZD-HX 4 BVD-RPO-ZH-BHA-LD-BRJ-OG-BIU-CDD 3 RX-BYA-CAY-ABT-PFA-PGL 2 JR-MR -AYH -AIV -AGD -AIT -AOE -ADZ -BKT -AVT-BWD-OC-PA 1.

VIRGINIA — SCM, R. N. Eubank, W3AAJ-WS — New reporters: W3AWY-BFQ-MT-ADJ-AMB-BUY-CZJ -CGR -DDY -CPN -FE -OM -BTM -BXN -GZ -HV -API-BLE-BDZ-BEB-BTR-AKZ-ACN-BRQ-BGX. QRL: W3AKN -ATY -CVU -ACN -BLE -REP -BRD -CKM -BZ. New transmitter: W3BPA-MT-CZX-BTW-CLF-API-DOG-BUR. New receivers: W3BSM-BYA. Unlimited 'phone tickets: W3CZJ-BAD-CFV. Rebuilding: W3GY-BSM-APU-CZJ-BAD-BJX-CSI-CGR-FE-BZE-BTR-CNY. Working DX: W3RPI-AEI-CHE-DAM-BSB-APF-AG-BEB-BDZ-NE-CVQ-CYB. On daily schedules: W3BGS-NT-BFW-BTM-CFV-GE-ASK -CXM -FJ -HRY -BYA -CMJ -BRQ -HRA -CBA-CVN. Want schedules: W3BAD-AUG-GZ. Handled important traffic: W3CDW-BUY-CXM-FJ-BNH-BXN.

New calls: W3DDY, DSH, DKU, DFS, DQT, DON, DRK, AGE, CBA, CYX, CZD, DOG, CYK, CWS, CXY, CXN, CXQ, CZG, DBV. Back home: W3ALS, AEV, DAO, AII, CIE, BEN, AJK, Palmer, BUR, W3AYR is at sea. Want Danville-NC-Va Hamfest soon: W3BZ-BIV-DFU. How? W3QN is secy-treas. R. S. W. Club. W3CHE schedules K5AA and VP5CC. W3AAJ announces Traffic Contest Aug. 16 to Nov. 15 inc. BIG PRIZES. See Va. Bull. Reorganizing or forming new clubs: W3FE-RZE-CLH-AGY. W3BAI won transmitter hunt. (30 mins.) W3AKZ has new shack. Big 56 mc. field day July 3-4 by W3BRA-BEK-AGH-BWA-BDW. Official Broadcast Daily 11:10 p.m. E.S.T. by W3BTM, 3850 kc. Traffic leaders: W3NT, CXM, BNH. W3BFW has 1st class ticket. W3BHC is in reforestation. W3FJ will be at N.G., Va. Beach July 15-30. W3AUG-COO-CVF-DKJ cooperate on real traffic station. W3CWX, W3TJ's wife has been very sick. Sorry. W3HV blew power transformer. W3AG worked three new countries. W3CMT and BWA are on 56 mc. W3DCU worked 26 states. W3CSI is new ORS. Virginia Bulletin is sent monthly by W3AAJ to stations reporting traffic — or 30¢ a year. W3AAF rebuilt for '03A. W3BOW and AJA report. W3CSD is also W9HXJ. W3CYU's receiver is haywire. W3DCU is new ORS. W3DEH is c.c. on 3515 kc.

Traffic: W3NT 358 BNH 126 CMJ 84 OM 39 FJ 37 AEI 20 CHE 18 ADJ-BPI 11 CDW 10 BYA 9 RGS-CZJ 8 AMB-DDY 7 WUY 5 FE 4 BRA-CPN 3 JIG-CST 2 APU 1 BKN 11 COO 1 BM 7 CVN 45 COJ 18 AG 7 AFP 5 CXM 301 AAJ 113 BTM 49 CFV 38 BIV 28 BJX 17 BAI 14 BFW-QN 11 BPA-CZX 9 CFL-GE 8 BRY 7 ASK 6 CLH 4 BFQ-CGR 3 BAN-BSM-MT-BSB 2 AUG 12 GZ 4 HV 6 DCU 35 BEB 12 NE 6 API 3 BDZ 2 BLE 1 DEH 4 CLV 17 BRE 2 CLD 6.

#### ROCKY MOUNTAIN DIVISION

COLORADO — SCM, T. R. Becker, W9BTO — QRN hit W9ESA this month. W9BYH has 66 ft. tower. W9LIU got c.c. rig perking. W9GVN is taking cruise on U.S.S. Arkansas. W9LYE uses '10 in final. W9CJJ moved twice in a month. W9HRI moved his junk to basement. W9FRP threatens to get married. W9RJ spends his time planning outfit. W9AAB, our Director, is visiting in the East. W9FA is trying to get power out to his ranch. W9BYK says '83s are NG for him. W9CBU is trying to make a dollar. W9KGR has new rig almost finished. W9IPH mastered the X cut crystal. W9AQN is selling out. W9BQO has quit the game. W9FYF's father has been ill. W9APR is yelling at the Radio Patrol Cars. W9JIM has new 'phone. W9GQP received replacement on power transformer. W9JGA is on 14-mc. 'phone. W9HDI and EHC operated portable from hilltop at Austin Bluffs during field day. W9FXQ got himself a wife. W9JAV is rumored to have gotten married, too. W9NKI, NHI, MXA, MOU, MVVI, NIT, NKQ and NJW are new hams. W9LIU and KNZ moved. W9JCQ is awaiting new antenna. W9HDI lost his stick in wind. W9EXV has been out on the coast. W9EYN is doing earnest traffic work. W9IQS tried 1.7-mc. 'phone. W9EPN and KZS have been QR!.. W9DNP got a 400 watt bottle. W9DYP has trouble getting crystal to perk on 14 mc. W9LFE has a '52. W9AMS has been wondering where one can get a job. The P.P.A.R.A. is now meeting at the Three Eagles Ranch on the Cheyenne Road on the 1st and 3d Thursdays of each month. The P.P.A.R.A. will have charge of the Convention this year. It will be held at the Acaia Hotel corner of Tejon St. and Platte Ave., Colo. Springs on August 26 and 27th. W9CDE keeps A.A.R.S. going. W9GKK asks help in organizing a Colo. net to handle traffic from American Legion Convention at Durango Aug. 16, 17, 18. W9KKY took a message in German. W9JFD, KKY and IFD are going to put in c.c. W9CKD was a Loveland visitor. W7ASX was in Denver visiting. W9NQV was at the hamfest. W9GLG is working DX. W9MHN is trying to get a portable. W9CXG was a visitor in Leadville. W9HIR has new receiver. W9BYC is using '10 for DX. W9FYK is QRL school.

Traffic: W9ESA 485 GIG 11 GNR 92 CDE 9 NQV-

KKY 3 JFD 5 IFD 16 EHC 7 IPH 36 LYE 34 BTO 11 GVN 26.

UTAH-WYOMING — SCM, C. R. Miller, W6DPJ-W6ZZZ — W6EXL and W6BSE went to Utah National Guard camp as radio operators. W6DPJ and W6APM are running Army station WUBL at Fort Missoula, Montana. W6DPO is doing the same at WUBK, Pocatello, Idaho. W6GQR is interested in A.A.R.S. Most of skeds at W7COH are off for the summer. W7COV fools the gang with his W7 portable back east. W6HWI is on regularly. W6GQM has new MOPA. U.S.N.R. work keeps W6BXTX busy.

Traffic: W6DPJ 26 APM 14 DPO-GQR 9 HWI 8 FRN 6 ZZZ 7. W7COH 46.

#### SOUTHEASTERN DIVISION

WESTERN FLORIDA — SCM, Eddie Collins, W4MS-ZZZ — R.M. W4ACB-PCN. The hamfest at W4KB's went over great. W4ZZAO and ASV have new ops tickets. Ex4TY was home on vacation. W4BGA works VKs. W5ZZR, W3ADO and W6HET left for the fleet. W4QK is on again. W4QU is QRL USNR. W4CDE is stepping out FB. W4CFF is newest ham in Pensacola. W4AGS and BPI are rebuilding. W4BMJ is awaiting R.I. W4AXP is going FB. W4AQY was married last month! W4UW-W5NO is married too. W4AUA keeps USNR going in Tally. W4BSJ has worked 16 countries. W4ACB is getting PCN ready for FNG camp. W4BKV bats them out. W4VR is looking at an FBX. W4BFD has started c.c. rig. W4BOW has wonder receiver. W4AUW and AUV are going to move to 3.5 mc. W4BGB seems to be Pensacola's only 3.5 mc. station. W4ZZP had FB time in portable contest. W4ABK wins all the prizes at hamfests. W4AQ is QRL BCL sets. W4MS hooked 14 VKs and 3 ZLs on 7 mc. lately. W4BFD QSO'ed first VK. W4BKD made 90% on op. exam.

Traffic: W4BSJ 8 AQY 4 AXP 3 MS 6.

EASTERN FLORIDA — SCM, Ray Atkinson, W4NN — New Sarasota hams: W4CCR, CFO, CGA and CFP. W4BMV and PBL are also at Sarasota. W4AYO is going to Chicago. W4ALP reports that BOT is on 14 mc. W4BNR schedules ANI. W4PQ works nights. W4TZ has trouble with his eyes. W4AFV is active AARS. W4AI operated portable at Indian Rocks. W4AWS is back from school. W4AKJ will operate from BKI. W4AJX has contacted 62 countries. W4DZ was in portable contest. W4BN has moved to Tampa. New Tampa hams: W4CDX, CEO and ATB. W4HY burned up his power transformer. . . . W4AZB reports several Florida stations out of band. W4UX has new 1 KW c.c. job. W4PK has two 250 watters in final. W4TK and HZ have 250 watt jobs. W4BFR has new receiver. Mrs. W4AGB will soon be on. W4NN is building c.w. rig. W4DU is increasing power. W4ANY and AWE are active 'phones. W4WS is on 3.5 mc. W4ACZ has single signal receiver. W4BAM is on c.w. W4VP reports traffic conditions rotten. W4BDM reports traffic. W4BIN blew his power supply. W4BNI has unlimited 'phone ticket. We hear that W4AGR needs a barber. W4AGP ground 7 mc. crystals. W4DT is grinding crystal for new rig. W4BRB has gone to New Jersey.

Traffic: W4BGL 74 NN 38 VP 21 AKJ 18 BNR 17 ALP-AGB-AJX 14 BIN 9 BNI 8 BAM 6 BOT 1.

ALABAMA — SCM, L. D. Elwell, W4KP — W4APU leads in traffic. W4GL is Activity Manager for Mobile gang. W4FB, AYD and GP are awaiting R.I. W4BLL has new 40 ft. masts. W4BSA is looking for spare transformer. Mobile Club has new clubhouse. W4BXXV will be on with 50 watts. W4BOU and BVH crashed their motor cycle. W4DS is back after operation. W4AAQ now has '10s. W4BJA is QRL work. W4BPY is starting in traffic. W4AJY is working DX. W4BTU worked a VE5. W4BCV is back from Miss. W4AWM moved to Atlanta. W4BSQ is training YF as an op. W4AUP has an extra op. W4BZG handled important traffic. W4BTN-BRX is helping out in the B'ham Club. W4AJP and BSL complain of WX. W4JY is an old timer.

Traffic: W4AJY 9 BPY 26 AAQ 13 APJ 165 BZG 21 BTU 2 OS 13 BAI 21 BOU 7.

GEORGIA-SOUTH CAROLINA-CUBA-ISLE OF PINES-PORTO RICO-VIRGIN ISLANDS—SCM, Chas. W. Davis, W4PM — W4IR is our best trafficker. W4BWN operates on 3633 and 7266 kc. W4VX reports Chattahooches Radio Club of Columbus going strong. W4BH is on 14 mc. W4BRG is handling traffic from Boy Scout Camp, Parriss Island, S. C., with portable W4CFG. W4CE of Columbia, S. C., is operating W3CVN now.

Traffic: W4IR 89 BWN 51 BQX 19 ATZ 6 BRG 12 VX 8 BHJ 5.

#### WEST GULF DIVISION

SOUTHERN TEXAS — SCM, David H. Calk, W5BHO — W5BKE resigns as O.B.S. and R.M. W5AFQ reports QRN bad. W5MN changed QTH. W5BNJ is going to 14 mc. 'phone. W5ADZ is vacationing in Monroe, La., and working W5FR. W5YL rebuilt transmitter. W5DLN is fifth dist. call of W9GUR. W6ZZAM reports from San Antonio. W5DJV, DHK, and DGC are new hams. W5CHM, CNX, BZO, CAZ and CQE went to Palacios for field-day contest. W5CAV has schedule with XFAZ. W5ON and BRC scheduled the SCM on 'phone while he was out in west Texas on vacation. W5ABH and BUV visited the SCM.

Traffic: W5MN 58 CVW 20 AFQ 14 BKE 9 YL 7 BNJ 3 OW 1254. W6ZZAM 16.

NORTHERN TEXAS — SCM, Glen E. Talbutt, W5AUL — W5BII noses CMJ out of first place. BII schedules W9USA. W5CJI is new ORS. W5ANU works on tomato farm. W5ARS is new RM. W5CCD is going c.c. W5CAV's pet hobby is eating! W5AJG is QLZ. W5BCW is FB OO. W5BFI is rebuilding. W5BTS is new reporter. W5AVF is home from commercial job. W5BKH is QRL. W5IT, IA and BXY want ORS. W5BBQ and BJX have Extra-Firsts. W5AMK reports for Cen-Tex A.R.C. W5BZT is in C.C.C. Army. W5PJ received WAC! W5CPB-CPT passed Exam. W5CHJ is using portable CHK. W5APW is on 4 mc. 'phone. W5NW and the YF are going to World's Fair. W5DO reports the Jacksboro gang located a runaway boy by radio! W5AUL is working early a.m. 3.5 mc. schedules. The Section has been divided into Districts, each with a Route Manager to promote activity. Only stations sending reports will be mentioned in this report or receive the Section bulletin.

Traffic: W5BII 163 CMJ 162 CIJ 65 ANU 63 ARS 57 IT 46 CCD-AUL 32 CAV 25 AJG 20 BCW 15 BFI 13 BXY 10 BTS-AVF 6 BKH 2.

### CANADA

#### MARITIME DIVISION

NOVA SCOTIA — SCM, A. M. Crowell, VE1DQ — VE1ER holds five schedules. VE1CY reports enjoyable field day. VE1EX says schedules gone west. VE1EY is good for P.E.I. traffic. VE1BV is on 14 mc. VE1BM reports via radio. VE1AL now QRL highlanders. VE1CK is QRL exams. VE1BN is observing quiet hours. VE1BM schedules VE1EY. VE1AG has new MOPA.

Traffic: VE1ER 86 EP 25 AL 13 CY 8 BM 7 EX 2.

#### ONTARIO DIVISION

ONTARIO — SCM, H. W. Bishop, VE3HB — The SCM on vacation visited VE3JI, AD, DW, and HP. VE3BI is ORS applicant. VE3AD, JI, and DU kept the SCM in touch with his family while he was in Ottawa. VE3GT and JI made good score in portable contest. VE3WB, RI, RX, SO, ER are new hams. VE3LI handled a life or death message. VE3LY is handling tourist traffic. VE3SG is an old timer. VE3WK complains of conditions. VE3DU, KC, LW, FD and other London hams went out with a portable on field day. VE3IR, PM, GA and 9AL are rebuilding. VE3HE worked South Africa on 14 mc. 'phone. VE3SH has low power e.c. MOPA. VE3SM is an ex marine op. VE3JT schedules ID. VE3NX has new 7 mc. rig. VE3GI and GL are QRL exams. VE3LN blew transformer. VE3OO and HP are on vacation. VE3NU has "XTLITIS." VE3IB's crystal works! The wide open spaces have called VE3RL. VE3CF QSY'd to chicken coop. Have you seen the picture of Mrs. VE3DW, the

farmerette? VE3NO wants schedules in a.m. Monday, Wednesday and Friday. VE3QB wants schedule with Toronto. VE3DJ, NB, QV, LZ, RT, MJ, YY, XJ and NO are experimenting on 56 mc. VE3WN is an old op. VE3GC is QRL YL.

Traffic: VE3NO 53 DW 36 HP 33 AD 20 LI-JI 15 WV-TH 14 HB 13 IB 12 LY-DU 11 QB 10 WK 8 GI-GL-WB 6 GT 5 JT-OF 3 QU 2 ER 1. VE9AL 11.

#### QUEBEC DIVISION

QUEBEC — SCM, J. C. Stadler, VE2AP — VE2BE worked ZL and VK on 14 mc. 'phone. VE2CU is running frequency stability tests. VE2GK is operating on the Lady Rodney. VE2AC is rebuilding. VE2CH has increased power. VE2EE needs Asia for WAC. VE2CX returned second in local contest. VE2FE has moved to shack of his own. VP4CF visited local hams. Twenty-two local hams attended the Malone hamfest. VE2CA and BG won prizes in the DX contest at Malone. VE2AP is now the SCM.

Traffic: VE2FE 9 CX 4 AP 15.

#### VANALTA DIVISION

ALBERTA — SCM, C. H. Harris, VE4HM — VE4AH, EA and HM are on 56 mc. VE4BJ got "J" QSL. VE4BZ has fine traffic total. VE4FC is going north. VE4FO is OBS. VE4GM is visiting England. VE4FR and GT are on weekends. VE4GY is QRL farm. VE4EX is new YL ham. VE4TZ has gone east. VE4LX is ORS. VE4AW, JK, GD, JC and IW are on 14 mc. VE4AX and JW are on 7 mc. VE4FI, BW, and HW are c.c. VE4HQ is on 3.9 mc. 'phone. VE4CY has YLitis. VE4KQ is QRL exams. VE4JX worked a "J." VE4CG is QRL Army Signals. VE4JD is QRL Naval Reserve. VE4JI is building SS receiver. VE4KI has gone to Vancouver. VE4IO is resurrected. VE4FG is Calgary YL. VE4NC is QRL flying. VE4CJ has new receiver. VE4DX is on vacation. VE4AF and EO were visited by VE4KC, II, CT, LD, IN, NN, FK, and BZ; AF and EO invite others to drop in.

Traffic: VE4BZ 109 LX 39 EO 32 MG 20 AX 11 HM 10 FI 5 AW 3.

BRITISH COLUMBIA — SCM, J. K. Cavalsky, VE5AL — VE5FG is visiting Pacific coast hams. VE5HI and EW are in new quarters. VE5GQ is trying 1.7 mc. 'phone. VE5DR did construction job on VE5AL's new shack. Two camp stations will be on the air this summer, operated by VE5BC, GS, DB and DH. VE5GD is getting real DX. VE5EV is building new receiver.

Traffic: VE5AC 28 EP 37 EE 27 AL 23 HQ 314 AM 5 GI 15 CG 4.

#### PRAIRIE DIVISION

MANITOBA — SCM, Reg Strong, VE4GC — VE4BT left for M'pls. VE4AG obtained commercial license. VE4LB visited VE4GC. VE4FU likes 1.7 mc. at the lake. VE4L has PP '45s. VE4DK is adding filter. VE4BG is rebuilding. VE4MW has been on vacation. VE4NF and MV are on 'phone. VE4DZ, LS and GQ are on 7 mc. VE4CD has c.c. VE4FT worked seven out of eight DX calls. VE4DJ worked eight VKs. VE4DU gave the M.W.E.A. a talk on modulation. VE4JF is active. VE4MY is building a portable. VE4LH has an FB c.c. signal. Heard in QRM M.W.E.A. contest: VE4KU, IP, and KX. VE4HP discovers '46 filaments are vertical not horizontal.

Traffic: VE4FT 21 MW 10 GC 12 DJ 12 FP 5 MV 4 CI 2 IP 3.

SASKATCHEWAN — SCM, Wilfred Skafie, VE4EL — The SCM attended the Saskatoon Hamfest and reports: Under the rainy conditions I expected the 'fest would turn out a failure. However, am glad to say it was a howling success; the howling took place during the festivities! All told 52 turned up which was 11 more than we have ever before had at a Hamfest. The R.M. and myself brought home four of the prizes. I donated two prizes for the best reporting during last year. One new idea which evolved was the formation of a separate traffic net on 1.7 mc. 'phone. VE4BB, our RM, made a nice speech which was well received.

Traffic: VE4BB 100 MH 63 GR 50 AU 24 AT-EL 23.



# CORRESPONDENCE

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

## Till Death Do Us Part

R3, Box 34A, Albuquerque, New Mexico  
Editor, *QST*:

I received my first *QST* the same day my station license was issued, and I aim to have *QST* just as long as I am a ham — probably till I make Silent Keys. Hi!

Many radio magazines ballyhoo "wonder sets" for the ham to build — modulated oscillator 'phones and such column-filling stuff. I'm glad there is a magazine like *QST* which constantly stands for the betterment of amateur radio and its usefulness to the general public. . . .

I could rattle on all day but will say adios, mis amigos.

— D. Elmo Dorrak, W5BNT

## Twisting the Lion's Tail

106 Maxwell Ave., Rochester, N. Y.

Dear Ed:

Who is this guy Lamb who has been twisting the lion's tail for the past two years or so?

First he comes out and knocks all the old receivers into the old garbage can, now he comes out and puts a crimp in the old crystal hook-up with a new fangled screen-grid warbler. Is there no stop to him?

I got my transmitter finished the other day and now I find that it's obsolete. Bought a new factory-made receiver and that's out of date. Has that man no respect for the depression?

If he keeps it up Warner won't have to wait much longer for that transmitter with the polished brass knob to bend those 56-mc. waves around the old ball.

More power to him and *QST*.

— Edward Stanko, W3HWQ

## "Nor Custom Stale—"

1113 8th Ave., N. W., Puyallup, Wash.

Editor, *QST*:

Listen, all you old timers, a beginner speaks:

Nothing to get off my chest. Why write? Just this: I want to see a letter in the columns of *QST* that contains a boost instead of a knock.

I have read the past history of amateur radio, as set forth in the *Handbook*, a dozen times.

What stirring times it recounts! The first transcontinental relays and the Great Migration down the wavelength spectrum! How I've wished I had been born about ten years sooner!

But the best thing about this hobby of ours is that it is a live one. You don't have to look backward. What a thrill to be one of those who contacted Lyman in his plane during the first 56-mc. airplane tests! Or just sit down in your own shack and work your first VK!

When I was still trying to figure out just how fast ten words a minute really was, I used to have horrible visions of my first QSO. "— and for goodness sake get off the air. Scram! QRT!! I have no time to waste on fellows who can't even remember how many dots there are in the letter 'H'!"

But to my surprise it wasn't like that at all! The other fellows had plenty of time to work me and even the fast men with their "thirty-five-a-minute-bugs" would gladly change over to their hand keys and come down to earth, usually even before being asked. This "spirit of coöperation" that is so often spoken of on the editorial page is more than mere words. It really exists.

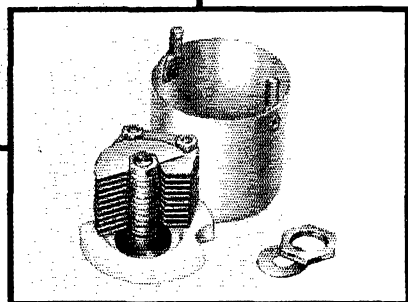
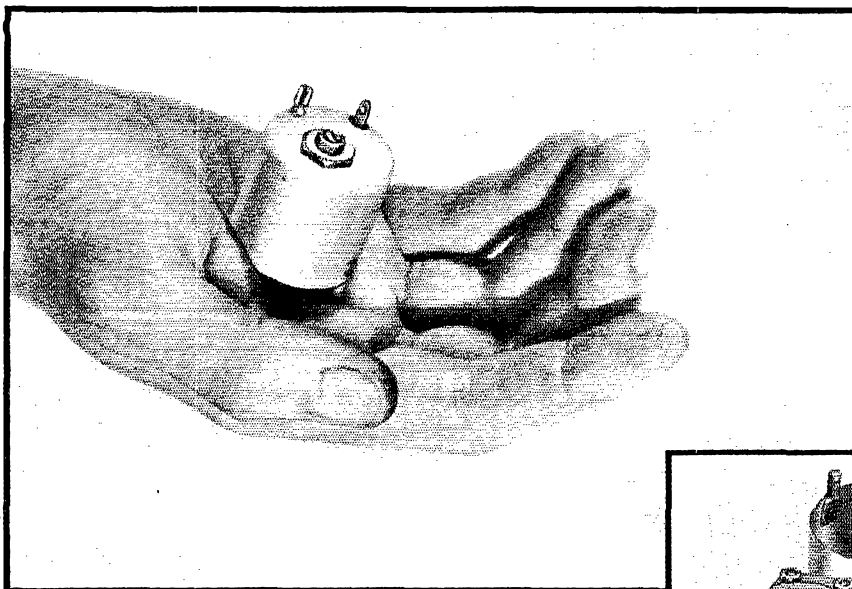
And speaking of the editorials, do we realize what a true mirror of amateur progress they are? Just look through some of your back issues and find out. In *QST* for October, 1931, W9BIR writes: "*QST* has been harping on 5-, 10- and  $\frac{3}{4}$ -meter stuff for the last six years or so, and of what use are they? No one seems to care or use these bands, . . ." Yes sir, I read the editorials first. Time has proved that the 5-meter band was worth "harping on" just as time will prove the wisdom of promoting interest in ten and three-fourths meters.

And one more thing. It's about the League.

Don't you "O.T.'s" get the idea that the "Young Squirts" don't realize what they owe to those who made Amateur Radio possible. I believe they do. And I'm in a position to know because I've helped a good many to get through their license examinations.

But I buy my *QST* at the newsstands. Terrible! I admit it. But it can't be helped — just yet. My transmitter is only a TNT with 180 volts on the plate. How I long to send away for a pair of 866's, etc. But N.D. The next \$2.50 that goes east is going to make me a member of the good old A.R.R.L!

— Llewellyn Joy, W7BZC



# STABILITY— IN A NUTSHELL!

NO MICA — for mica changes its dielectric constant with changes in temperature and humidity. NO BAKELITE — for bakelite creeps with age and introduces losses. NO DIRT — for dirt between plates will ruin the performance of even the most watch-like accuracy.

Look it over. 75 mmf's, air-dielectric, Isolantite insulated, protected from dirt and electrically shielded. And almost as small as a walnut —  $1\frac{1}{4}$ " diameter,  $1\frac{1}{4}$ " high.

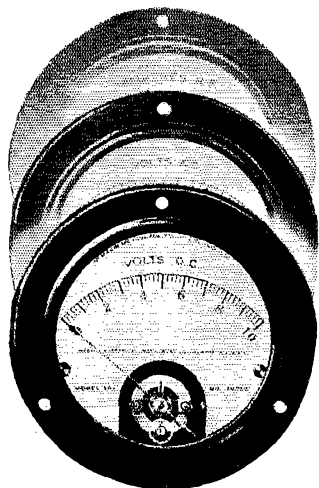
Lastly, it is built to the same high standard of quality that characterizes the fifty-two other models that make up the NATIONAL line of High Frequency air-dielectric transmitting, receiving, and padding condensers.



**NATIONAL COMPANY, INC., MALDEN, MASS.**

# WESTON PERFORMANCE

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*in a matched line*



**T**HERE is economy and satisfaction in equipping with accurate, reliable electrical measuring instruments. That's why amateurs the world over standardize on Weston Instruments in transmitting, experimental work and radio servicing.

The matched lines of Weston 2 and 3¼ inch panel meters provide Weston accuracy and dependability in a wide range of DC, AC, thermo-couple and rectifier type instruments. They are built to the high standards of design and workmanship for which Weston Instruments are known the world over, and are furnished in flush or surface type, as well as with rugged Bakelite cases if desired.

Keep your instrument costs down and improve results by equipping from the preferred Weston line. Full details on these and other Weston Instruments are yours for the asking . . . Weston Electrical Instrument Corporation, 602 Frelinghuysen Avenue, Newark, New Jersey.

## WESTON·JEWELL *Radio Instruments*

Weston Electrical Instrument Corp.      Name \_\_\_\_\_  
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Please send me further information on Weston-Jewell Service Equipment.

## Special Licenses for C.W.

Napa, Calif.

Editor, *QST*:

Regarding the suggestion that a special license be given qualified amateurs to operate on the 40-meter band, I believe that it should be defeated for the following reasons:

Those who prefer to use the 40-meter band would consider it unjust to be forced to move, since it belongs to all amateurs. . . .

Such regulation is too difficult to enforce.

Considerable expense and years of effort was necessary to obtain what we now have, so why give it away to please a few. . . . Why confuse and hamper our activities by more restrictions? Laws, rules and regulations are the bane of the age and a sure way to ruin the wonderful hobby is to impose useless and joy-killing regulations upon it. . . .

— H. A. Harrold, W6CZN

307 W. Sherman Ave., Peoria, Ill.

Editor, *QST*:

The letter from W6DXM in June *QST* makes my blood boil. Some of these hams get a fool idea and think they are benefiting the amateurs. I will oppose any such crazy idea as an unlimited c.w. license for any band till doomsday. . . . The first thing you know one has to have a college education to even operate an amateur station.

Amateur radio is supposed to be a hobby and let's keep it so. . . . Fellows, are you going to let a few steal our c.w. bands for their own pecuniary interest? I say no, and let's fight to a finish against any such unscrupulous idea as an unlimited c.w. license.

— Fred C. Roeger, W9BIR

Oceanside, Calif.

Editor, *QST*:

I have just read the letter in June *QST* from Mr. D. Galbraith, W6DXM, and am heartily in accord with the sentiments voiced therein.

The forty-meter band, due to its narrowness and peculiar suitability for DX-work, should be subject to limitations that will keep it from being overcrowded or covered by broad, wobbly signals.

— Fred J. Elser, W6GTU

Robinson, Kan.

Editor, *QST*:

Unlimited c.w. licenses — never! That is my answer to a query as to whether we amateurs should request the F.R.C. to issue such things. Would it be right to tell all new hams that they must operate on certain bands merely because they are new at the game and that the F.R.C. does not believe them capable of handling their equipment in the proper manner? . . .

Rather than asking for the issuance of any new privilege or special licenses every ham should read the F.R.C. rules and regs for amateurs and then *comply with them*. Then this amateur hobby

# The regs now require pure D C sigs!

Why write "love letters" to the commission about that R A C note when Choke and Condenser buys like these are available

## FLECHTHEIM CONDENSERS

Still the same high quality transmitting condensers giving the user excellent service.

	1,000 v.d.c. 750 v.r.a.c. r.m.s.		
TC-	100 1 mfd. List	\$3.00	Spec. <b>\$1.50</b>
	200 2 mfd. List	5.00	Spec. <b>2.50</b>
	400 4 mfd. List	9.00	Spec. <b>4.50</b>
	1,500 v.d.c. 1,000 v.r.a.c. r.m.s.		
T-	100 1 mfd. List	\$3.75	Spec. <b>\$1.87</b>
	200 2 mfd. List	6.50	Spec. <b>3.25</b>
	400 4 mfd. List	11.00	Spec. <b>5.50</b>
	2,000 v.d.c. 1,600 v.r.a.c. r.m.s.		
TH-	100 1 mfd. List	\$7.00	Spec. <b>\$3.50</b>
	200 2 mfd. List	12.50	Spec. <b>6.25</b>
	400 4 mfd. List	22.00	Spec. <b>11.00</b>
	3,000 v.d.c. 2,200 v.r.a.c. r.m.s.		
HP-	100 1 mfd. List	\$15.00	Spec. <b>\$7.50</b>
	200 2 mfd. List	25.00	Spec. <b>12.50</b>

## KENYON

transformers and chokes for every amateur and broadcast requirement. Look at these low prices.

BC-100	10 H 250 MA	\$2.30
BC-110	swinging	2.30
BC-210	15 H 150 MA	2.30

See July for other items

## JEWELL 2" METERS

We still have a few Jewell 2" Thermo couple R.F. meters. **\$4.95**

0-1A - 0-2A - 0-3A. Each.

And we keep right on selling those GRAMMER KITS **\$12.75** at

Everything furnished except tubes and baseboard.  
Power supply kit.....\$5.75  
Amplifier kit..... 7.50

## CARDWELL CONDENSERS

Now available in over 200 capacities, in a dozen models. Look at these low prices.

408-B	22 mfd. dbl. spaced	\$1.53
412-B	100 mfd. dbl. spaced	2.36
147-B	440 mfd. dbl. spaced	4.12
T-199	330 mfd. dbl. spaced	5.88
DT199	650 mfd. split stator	13.00
T-183	110 mfd. triple sp.	5.88
DT183	228 mfd. split stator	10.60

## THORDARSON

Condensers and chokes made by Thordarson have been used for almost 40 years. Here are a few samples of good values.

T-1998	27.3H 160 MA	\$2.94
T-5450	15 H 250 MA	2.94
T-2027	23.5H 300 MA	7.65
T-2073	26.5H 500 MA	9.95

## LEEDS' Special Buys

Inverted Electrolytics	4 mfd.	\$3.99
Inverted Electrolytics	8 mfd.	49
Cond. block	2-4 mfd. units at 600 v.	1.25
Super special	2 mfd. 1000 v. cased	1.15
Super special	4 mfd. 1000 v. cased	1.65

G.F. 50 Watt Socket — bakelite base; double phosphor bronze contacts.....**69c**

LEEDS 50 Watt Socket — porcelain base; double phosphor bronze contacts.....**95c**

## DEFOREST

503-A 511 and 545 tubes, now manufactured under R.C.A. supervision. Each.....**\$15**

## MORRILL CONDENSERS

Those who have used these high voltage condensers are more than pleased with the results obtained.

1,000 volts D.C.			
1014	1 mfd. List	\$3.50	Spec. <b>\$1.75</b>
1015	2 mfd. List	5.50	Spec. <b>2.75</b>
1016	4 mfd. List	12.25	Spec. <b>6.12</b>
1,500 volts D.C.			
1514	1 mfd. List	\$5.00	Spec. <b>\$2.50</b>
1515	2 mfd. List	10.50	Spec. <b>5.25</b>
1516	4 mfd. List	15.75	Spec. <b>7.87</b>
2,000 volts D.C.			
2014	1 mfd. List	\$12.00	Spec. <b>6.00</b>
2015	2 mfd. List	14.50	Spec. <b>7.25</b>
2016	4 mfd. List	22.00	Spec. <b>11.00</b>
3,000 volts D.C.			
3014	1 mfd. List	\$12.75	Spec. <b>\$6.37</b>
3015	2 mfd. List	20.00	Spec. <b>10.00</b>

Save your filter condensers by using a bleeder resistor. **Aerovox Resistors** are equipped with slider and the 200 w. size with mounting feet.

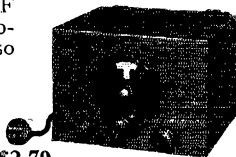
20000 ohm	50 w.	400 v.	\$8.85
25000 ohm	50 w.	500 v.	8.85
30000 ohm	75 w.	750 v.	<b>1.03</b>
1 — 50000 ohm	200 w.	1000 v.	<b>1.59</b>
1 — 100000 ohm	200 w.	1500 v.	<b>1.77</b>
2 — 50000 ohm	200 w.	2000 v.	<b>3.10</b>
3 — 50000 ohm	200 w.	3000 v.	<b>4.50</b>

Centralab Elf Midget Potentialmeters any size from 1000 ohms to 1 megohm. Each.....**49c**

## THE NATIONAL SW No. 3

is the world's finest T R F ham receiver. Why buy substitutes when the best is so reasonable?

3 models — 2 v. battery  
— 2½ v. A.C., or 6 v. A.C.  
— D.C. ....**\$14.41**  
Amateur band spread coils, **\$2.79**



With air tuned I.F. ....**\$31.16**

## NATIONAL FBXA

With crystal filter.....**\$42.92**  
All coil ranges..... 5.88

## NATIONAL SRR

5 meter receiver, list \$25, spec.....**\$14.70**  
National I.F. transformers, each..... 2.94

## Announcing our NEW Ultra HF super-regenerator. Designed by W2AOE

Employs stable shunt tuning, with 237 detector, 237 low frequency oscillator and 89 pentode audio amplifier. Tone control and regeneration controls provided. Works on batteries or A.C. supply without changes. Furnished with 5 and 10 meter coils at the new low **\$9.85** price of .....

With black crystalline finished metal cabinet...**\$10.85**  
R.C.A. tubes..... 2.52  
Sylvania tubes..... 2.25



## Collins Transmitters

Another popular line added to our stock. Write us for information and bulletin.

We do not publish a catalog. Lowest current prices quoted by return mail on all short wave apparatus. Hundreds of other items at Special Prices.



45 Vesey Street, New York City  
New York Headquarters for Transmitting Apparatus

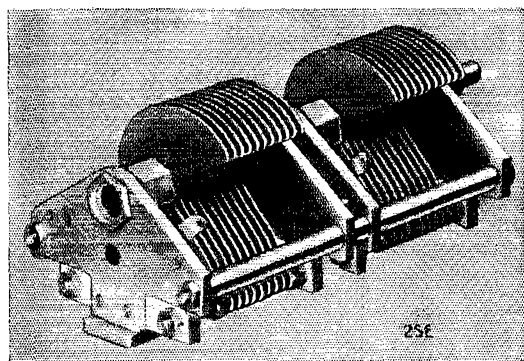
FEDERAL 108-A, 175 watt R.F. Amplifier, **\$34.50**. 102-A Modulator **\$34.50**

353 — 10,000 v. 2.5 amp. shielded mercury vapor rectifiers, **\$16.50**

Mail Orders Filled Same Day  
C. O. D. Orders Must Be Accompanied by 10% Deposit



## FOR SINGLE-CONTROL H. F. RECEIVERS



### NATIONAL 2 SE MIDGET CONDENSER

With Ganged Isolated Rotor

Designed specifically for single-control high-frequency T.R.F. and super-heterodyne receivers. The rotors are completely and effectively ISOLATED and insulated from each other. Construction is heavy, rigid, precise and permanent; electrical performance is constant. . . . Equipped with NATIONAL 270° s.f.l. (equicycle) plates. Made in all capacities from 50 to 335 mmf. per section. Standard model — equal capacity per section, clockwise rotation. Different capacity sections at slight advance in price.

### OTHER NATIONAL MIDGETS

For H. F. and Ultra H. F. Work

**SEU** Ultra H.F. Condenser. 270° s.f.l. plates. 15 to 25 mmf.

**STD** Double Ultra-H.F. Condenser. 180° s.l.w. plates. 50 mmf. per section.

**SE** H.F. Condenser 270° s.f.l. plates. 50 to 150 mmf.

**SSS** H.F. Condenser. 180° s.l.c. plates. 20 to 50 mmf.

**SEH** H.F. Condenser. 270° s.f.l. plates. 200 to 335 mmf.

**SS** H.F. Condenser 180° s.l.c. plates. 50 to 150 mmf.

TWELVE OTHER MODELS FOR EVERY  
H.F. AND ULTRA H.F. PURPOSE ARE  
LISTED IN THE NATIONAL GENERAL  
CATALOGUE NO. 210

*A Full Line of*

# NATIONAL

VARIABLE

## MIDGET H. F. CONDENSERS

of ours would need no commercialization. Think it over, gang.

— *Rollie M. Terrill, W9IQJ-ZZCH*

Lancaster, N. H.

Editor, *QST*:

I would like to answer the letter in June *QST* by W6DXM on "unlimited c.w. licenses." Our c.w. bands were assigned by the F.R.C. to all licensed amateurs regardless of class of license. In all sense of fairness to our brother hams we can't change our basic c.w. license law.

Some of you may ask "why not" when you read this, but if you will go back over 6DXM's letter you will note it reads "qualifications for U.C.W. license, same as U.P.O. license, to get on 40 meters. This license should require all holders of same to put out high quality signals, and it seems to me that if a person is willing to go to all this extra work, he is entitled to the extra privileges."

Now, I guess it's time to remind ourselves again, that we are compelled to do this extra work before we go on the air or send a single dot. The law definitely states filtered d.c. plate supply or equivalent effects. Why bother making additional laws if we can't live up to one already in existence? . . .

— *Dr. John A. Stewart, W1SK-W1AJT*

2732 Humboldt Ave., Oakland, Calif

Editor, *QST*:

It is with disgust and regret that I read the letter on "Unlimited C.W. Licenses" as written by W6DXM. No doubt Mr. Galbraith's intentions are the most sincere, but for what? As I see the letter, it is from a most selfish standpoint. . . .

Am I going to suggest that all the hams working on the frequency of the party I am about to call *get off the air* until I get my little bit done? I should hope never to be so selfish, and that is what the whole thing amounts to when you go to depriving the hams as a whole from using the bands allotted to them for the sake of a few. . . . All new hams cannot afford an elaborate outfit so let us not try to deprive them of the new small territory allotted to the hams as a whole unless we want to disrupt our organization.

— *Norman Isherwood, W6AMC-ZZCN*

Editor, *QST*:

I would like to say a word in support of Mr. Galbraith, W6DXM, concerning his letter in the correspondence section of June *QST*. I feel as he does that something must be done to stop some of the QRM on the 7-mc. band. . . . The only method apparent is to increase the technical qualifications of operators and the quality of the radiations from transmitters. For the latter, the proposal of the board for pure d.c. on all stages is a step forward. . . .

It wouldn't be a bad idea at all to require all operators on the 3.5 and 7-mc. bands to be required to have amateur extra firsts.

— *Bruce E. Montgomery, W9AHH-BYN*





**A.R.R.L. Letterheads.** Write your radio letters on League stationery—it identifies you. Lithographed on  $8\frac{1}{2} \times 11$  heavy bond paper. Postpaid. 100 sheets, 50c; 250 sheets, \$1.00; 500 sheets, \$1.75.



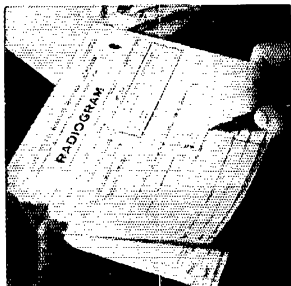
**Message Delivery Cards.** Neatest, simplest way to deliver a message to a near-by town. On U. S. stamped postals 2c each. On plain cards (for Canada, etc.) 1c each, postpaid.



## STATION SUPPLIES

**Message Blanks.** Most convenient form. Designed by the Communications Department of the A.R.R.L. Well printed on good bond paper. Size  $8\frac{1}{2} \times 7\frac{1}{4}$ . Put up in pads of 100 sheets. One pad postpaid for 35c or three pads for \$1.00.

**Log Books.** Book with heavy paper covers.  $8\frac{1}{2} \times 10\frac{3}{4}$ . Contains 39 log pages, like below, and 39 blank pages for miscellaneous notes. Also list of Q sigs, message number sheet and sheet of cross-section paper. 40c each or 3 for \$1.00. Postpaid.



**THE AMERICAN RADIO  
RELAY LEAGUE, INC.**

WEST HARTFORD, CONN., U. S. A.



# To Our Readers who are not A.R.R.L. members

YOU should become a member of the League! That you are interested in amateur radio is shown by your reading of *QST*. From it 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 the page opposite the editorial page of this issue. We should like to have you become a full-fledged member and add your strength to ours in the things we are undertaking for Amateur Radio. You will have *QST* delivered at your door each month. A convenient application form is printed below — clip it out and mail it today.

*A bona fide interest in amateur radio is the only essential qualification for membership*

AMERICAN RADIO RELAY LEAGUE  
West Hartford, Conn., U. S. A.

I hereby apply for membership in the American Radio Relay League, and enclose \$2.50 (\$3.00 outside of the United States and its Possessions, and Canada) in payment of one year's dues, \$1.25 of which is for a subscription to *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.

.....

.....

.....

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

319 Hermosa Ave., Long Beach, Calif.

Editor, *QST*:

I was greatly impressed with the suggestion in June *QST* made by W6DXM. His suggestion of having unlimited c.w. licenses would be a great advance in amateur radio. We have cast aside the spark in favor of the tube, we have brought our 'phone situation closer to modern ideas, why can't we do the same with c.w. and throw self-excited rigs and ancient ideas from our midst?

If we are to make room for future hams as well as ourselves, we must settle our 40-meter problem and make better use of 160 meters. Hundreds of stations on 7 mc. use that band for local QSO's. They battle the QRM and have unsuccessful chats with other hams. Using our 160-meter band for work within a radius of 1000 miles would add to our enjoyment from ham work and would clear up the situation on the other bands. . . . Let's give this band a chance to deliver us from our plight and to increase our fun in our great hobby.

— Ed. Woolcock, W6EZZL

## Mounties

Norman, N. W. T., Canada

Editor, *QST*:

I would like to state that of the many radio publications that I subscribe to, there is none that compares with *QST*, and I for one certainly like the technical articles. I may add that the S. S. Super which I built early in the winter from Mr. Lamb's articles has more than proved itself an ideal receiver. Here in the north a few miles from the Arctic Circle a sensitive receiver certainly is necessary. It is impossible to own a transmitter down here, but I spend a lot of pleasant evenings listening to those who are lucky, even if the CQ's are long. To those at headquarters I offer 73.

— J. A. English, Cst., R.C.M. Police

## Strays

Paul Holbrook, ex-KA1AF, now at W3ATY, Fort Monroe, Va., has installed equipment for recording 3500-ke. ham signals on phonograph record discs, and is willing to make records of the signals of anyone contacting W3ATY provided the ham getting the service will pay for the record and shipping charges — totalling about fifty cents per record. Cash in advance to P. O. Box 171, Fort Monroe, Va.

W2ETS claims to have the smallest shack in the world — 2 feet deep, 3½ feet wide and 8 feet high. It contains the transmitter, receiver and the OM himself when operating.

A punch for knocking out socket holes in sheet-metal radio chassis which should be a useful tool for hams who do much of this sort of constructional work is now being made by the Langelier Manufacturing Company, Providence, R. I. It operates on the same principle as the home-made punch described by W9HMQ on page 50, February, 1933, *QST*. The list price is two dollars.

# VACATION SALE CONTINUED THROUGH AUGUST

due to the requests of many of our out of town friends



**Multiple phone plugs** will take up to four sets of phones or speakers in series or parallel; very convenient. Why buy an ordinary plug when these sell for only 29c (list \$1.00)?

## KENYON TRANSFORMERS

K-40, 325 v. each side C.T., 40 MA 5 v. 2 amps. 2 1/2 v. 5 1/2 amps. .... \$ .95  
K-12-5, 550 v. each side C.T., 150 MA 2-7 1/2 v. 2 1/2 amps. ea. 1 1/2 v. 6.3 amps. — 2 1/2 v. 10 amps. .... \$3.95

Complete line of Kenyon in stock

## Copper tubing inductances wound and ends drilled free

Inside dia.	3/16"	1/4"	5/16"
1 1/4"	5c turn	5c turn	
2 1/4"	6c turn	6c turn	10c turn
3 1/4"	10c turn	10c turn	12c turn

## ACME SOLID ENAMELED COPPER ANTENNA WIRE

No. 14 (any length) per 100 ft. .... \$ .35  
No. 12 (any length) per 100 ft. .... \$ .55  
No. 10 (any length) per 100 ft. .... \$ .90  
No. 8 (any length) per 100 ft. .... \$1.30

## Push back wire (solid tinned)

No. 20 — per 100 ft. .... \$ .50  
No. 16 — per 100 ft. .... \$1.00  
No. 14 — per 100 ft. .... \$1.25  
No. 12 — per 100 ft. .... \$1.75

## BAKELITE TUBING (any length)

1" diameter 3c per inch  
1 1/2" diameter 4c per inch  
2" diameter 5c per inch  
2 1/2" diameter 6c per inch  
3" diameter 6c per inch  
1/2" solid bakelite rod 30c per ft.

## MORRILL FILTER CONDENSERS

2mid 1000 V.D.C. Working .... \$2.30  
2mid 2000 V.D.C. Working .... \$5.25  
2mid 3000 V.D.C. Working .... \$7.25

## REDUCED PRICES

2.5 V. 6 amp. C.T. (midget) .... \$ .80  
5 V. 3 amp. C.T. for '83 (midget) .... .80  
2 1/2—2 1/2 and 5 Volt C.T. .... 1.15  
2 1/2—7 1/2 and 7 1/2 Volt C.T. .... 1.35  
3 1/2—5 and 7 1/2 Volt C.T. .... 1.35  
5—5 and 5 Volt C.T. .... 1.35  
5—7 1/2 and 7 1/2 Volt C.T. .... 1.35  
Thord. 30 H 75 MA. .... .55  
Thord. 15 H 250 MA. .... 2.95  
Thord. 30 H 500 MA. .... 8.50  
500 H. plate chokes for Screen Grid detectors (each) .... \$ .95  
Gross cased 30 H 200 MA choke. .... \$1.95

## Gross Special Power Transformer

for use with '83 tube will give an output of 500 volts D.C. at 350 MA with choke input. Run your entire R.F. and Class B off this transformer. The regulation for the class B is about 5%, filaments are two 7 1/2 v. and one 5 v. Special .... \$5.75

A transformer having the same filament windings as above, at 300 MA having 750 volts each side of C.T. .... \$5.75

Special .... \$5.75  
750-1000 V. each side of C.T. 300 watts. Extra special. .... \$6.50

1000-1500 V. each side C.T. 300 MA. .... \$8.00  
High grade filament transformers shielded in metal cases, center tapped secondaries 2.5 volt 10 amperes for 866's.

10 to 12 volts at 8 amperes—either type .... \$2.35  
Special—10 to 12 volt 7.5 amp. filament transformer, extra special. .... \$8.85

## GUARANTEED TUBES

Heavy Duty Isolantite ton 866. .... \$2.15  
888 or 871. .... 1.15  
83 and 47's. .... .80  
281 Plain. .... .90  
210's. .... 1.30  
DeForest 46's. .... .60  
DeForest 250's. .... 1.35

## BLACK SHRIVEL FINISH SHIELD BOXES

Length	Height	Width	Price
6"	5"	5"	\$ .65
9"	6"	5"	1.25
10"	7"	1.60	
14"	8"	10"	1.90

## PRICES GREATLY REDUCED

Ward Leonard Vitreous Resistors 200-Watt Type 8 1/2" Long with Variable Sliders.

1000 ohms. ....	\$ .99
2500 ohms. ....	1.05
5000 ohms. ....	1.05
10000 ohms. ....	1.11
15000 ohms. ....	1.20
25000 ohms. ....	1.35
35000 ohms. ....	1.44
50000 ohms. ....	1.44
60000 ohms. ....	1.44
80000 ohms. ....	1.44
100000 ohms. ....	1.44

## HOYT ANTENNA METERS

Hot wire antenna meters, 1 1/2, 3 and 5 ampere ranges. Why do without antenna meters when you can buy them at this Special price? .... \$2.85

Hoyt perfectly damped meters at a price. These are not to be confused with the usual meter "bargains." 2" mounting hole, flange 2 3/4" diameter, supplied in the following sizes: 10 m.a., 50 m.a., 100 m.a., 150 m.a., 250 m.a., 300 m.a., 4 volt A.C., 10 volt A.C., 15 volt A.C., 10 v. D.C. Price each, \$1.40, 3 for \$3.75.

Hoyt 0-1 M.A. moving coil meters  
3" type \$3.95 2" type \$3.50  
(limited quantity)

Sprague 8 mid. paper case 450 v. electrolytic cond. .... \$ .40  
Majestic R.F. chokes .... \$ .15  
Bakelite dials 5" diam. .... \$ .15  
Bakelite knobs 2" or 2 1/2" diam. .... \$ .10  
1/4, 1/2 and 1 watt neon bulbs. .... \$ .40

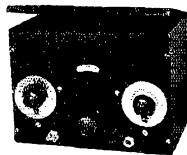
Tiny-mite 1/4" stand-off Ins. .... \$ .05  
Egg Strain insulators. .... 20 for .25  
Bee hive stand-off ins. Per doz. .... .50  
3" Isolantite spreaders. .... 10 for .35  
Jewel Pilot lights, red, green. .... .20  
Double-button mike transformer. .... .95  
5-meter oscillator coils. .... .65  
Frost 500,000 ohm Potent. .... .35  
5-slot wood choke forms. .... .96  
1 1/2 volt keying relays. Special. .... .55

## The "EAGLE" Three-Tube Short Wave Receiver

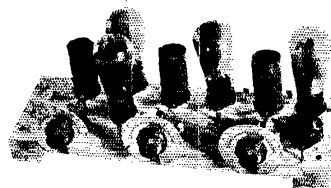
Only finest material used thruout — employs one '32 R.F., one '32 Detector and one '33 Pentode Audio — 15 to 200 meters — four coils supplied. The "Eagle" is economical — two dry cells will operate the filaments. See March or April QST for full description on this most excellent value in short wave receivers.

"Eagle" Completely Wired and Tested... \$10.95

Three Tubes Tested in Your Receiver... \$3.00



## THE NEW "20-W JR." Crystal Controlled Transmitter Kit, \$10.95



This efficient little transmitter is very low priced, making it possible for anyone to use crystal control at less than it would cost you to get the parts together for a self excited rig of this type. The "20-W Jr." is simple to wire and get on the air and the most inexperienced operator will have success with it. The size of the transmitter is only 6" x 17" and is therefore suitable for portable use. Only one milliammeter is required for tuning the transmitter and jacks are provided for this purpose, for each stage. The plug-in crystal holder is supplied with the kit at no additional cost. The "20-W Jr." uses one '47 as crystal oscillator, one '46 as buffer or doubler and two '46's in the amplifier. One set of three coils is supplied with the kit for either 20, 40, or 80 meters, 50 cents extra for the set of 160 meter coils. When ordering mention your choice of coils. (Kit now supplied with metal chassis.)

80 or 160 meter X cut crystals supplied for only \$2.75 if purchased with the "20-W Jr." kit. Hoyt milliammeter if purchased with the kit only \$1.25

20% deposit with all C. O. D. orders. Remit by M. O. Include Postage.

**GROSS RADIO INC.** 51 VESEY ST., N. Y. C. TEL. BARCLAY 7-0161

# NEW JERSEY AMATEUR'S HEADQUARTERS

A COMPLETE STOCK OF EVERYTHING  
YOU NEED TO MAKE THAT RIG WORK

AUDIO & POWER TRANSFORMERS  
MADE IN OUR OWN SHOP

LET US SOLVE YOUR RADIO PROBLEMS  
SPECIAL ASSISTANCE TO BEGINNERS

## THIS MONTH'S SPECIALS

10 meter Coils for HAMMARLUND  
PRO. Pr. .... \$1.50  
BLILEY X-CUT CRYSTALS..... 4.50  
BLILEY CRYSTAL HOLDERS..... 1.50  
FEDERAL TUBES 108-A..... 34.50

WE STOCK WIDE RANGES IN SIZE OF  
BAKELITE TUBING, COPPER WIRE,  
RESISTORS, CONDENSERS, ETC.

**KALTMAN & ROMANDER**  
62 COURT STREET NEWARK, N. J.

## Standard Frequency Transmissions

Date	Schedule	Station	Date	Schedule	Station
Aug. 2	BB	W1XP	Sept. 1	B	W9XAN
	C	W9XAN		A	W6XK
Aug. 4	B	W9XAN	Sept. 6	B	W1XP
	A	W6XK		BB	W9XAN
Aug. 9	B	W1XP	Sept. 8	BB	W6XK
	BB	W9XAN		A	W9XAN
Aug. 11	BB	W6XK	Sept. 9	BX	W6XK
	A	W9XAN	Sept. 10	C	W6XK
Aug. 12	BX	W6XK	Sept. 15	A	W6XK
Aug. 13	C	W6XK	Sept. 17	C	W1XP
Aug. 18	A	W6XK	Sept. 20	A	W1XP
Aug. 20	C	W1XP	Sept. 22	B	W9XAN
Aug. 23	A	W1XP		B	W6XK
Aug. 25	B	W9XAN	Sept. 27	BB	W1XP
	B	W1XP		C	W9XAN
Aug. 30	BB	W1XP	Sept. 29	B	W1XP
	C	W9XAN		BB	W9XAN

## STANDARD FREQUENCY SCHEDULES

Time (p.m.)	Evening Sched. and Freq. (kc.)		Time (p.m.)	Afternoon Sched. and Freq. (kc.)	
	A	B		BB	C
8:00	3500	7000	4:00	7000	14,000
8:08	3600	7100	4:08	7100	14,100
8:16	3700	7200	4:16	7200	14,200
8:24	3800	7300	4:24	7300	14,300
8:32	3900		4:32		14,400
8:40	4000				

Time (a.m.)	Sched. & Freq. (kc.) BX
6:00	7000
6:08	7100
6:16	7200
6:24	7300

The time specified in the schedules is local standard time at the transmitting station. W1XP uses Eastern Standard Time, W9XAN, Central Standard Time, and W6XK, Pacific Standard Time.

## TRANSMITTING PROCEDURE

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

- 2 minutes—QST QST QST de (station call letters).
  - 3 minutes—Characteristic letter of station followed by call letters and statement of frequency. The characteristic letter of W1XP is "G"; that of W9XAN is "O"; and that of W6XK is "M."
  - 1 minute—Statement of frequency in kilocycles and announcement of next frequency.
  - 2 minutes—Time allowed to change to next frequency.
- W1XP: Massachusetts Institute of Technology, Round Hill Research, South Dartmouth, Mass., Henry G. Houghton in charge.
- W9XAN: Elgin Observatory, Elgin National Watch Company, Elgin, Ill., Frank D. Urie in charge.
- W6XK: Don Lee Broadcasting System, Los Angeles, Calif., Harold Peery in charge.

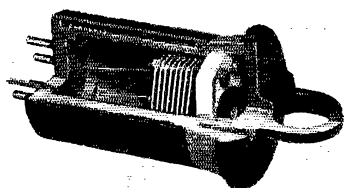
## WWV 5000-KC. TRANSMISSION

The 5000-kc. transmissions of the Bureau of Standards station, WWV, are given every Tuesday continuously from 12:00 noon to 2:00 p.m., and from 10:00 p.m. to midnight, E.S.T. The accuracy of these transmissions is to better than 1 cycle (one in five million).

—J. J. L.

## The New England Division Convention

CONVENTIONS may come and conventions may go, but New England Division Conventions always make a "go" of it, which is to say that this year's convention held at the Hotel



## 10 METERS

For the FB-7 and FB-X, NATIONAL offers a new pair of coils covering the range from 19 to 33 megacycles. Used in conjunction with the five sets of general coverage coils previously available, this additional unit permits the use of FB receivers throughout the range from 1500 k.c. to 33,000 k.c. Catalog Symbol FB-AA. List Price (per pair), \$10.00. (Usual Trade Discounts Apply.)

**NATIONAL COMPANY, INC.,**  
MALDEN, MASS.

# AN INTRODUCTION TO AMATEUR RADIO . . .

— for the would-be amateur

— for the ham who has a friend who wants  
to become an amateur

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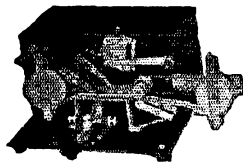


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Bond, Hartford, Conn., on April 28th and 29th, under the auspices of the Hartford Country Amateur Radio Association, was a huge success. L. A. Richmond, the chairman, started things going with an address of welcome making every one feel at home and then the open forum, which is becoming more and more a feature at many of the conventions, was well handled by Communications Manager Handy. During the discussions Lowery, W1AFB, RM for Connecticut; White, W1BOF, RM for Maine; Mullen, W1ASI, SCM for Eastern Mass., all gave interesting reports on conditions in their respective sections. John Stadler, VE2AP, a visitor from Canada and acting SCM for Quebec, gave a good outline of conditions in Canada which made us feel that radio is about one of the best binding links for international friendship. Bob Eubank, the very active SCM from Virginia was also a visitor and what a fellow he is for statistics.

George Grammer, Assistant Tech. Ed. and Jim Lamb, Technical Editor of QST, gave talks. Mr. F. S. Dellenbaugh, President and Chief Engineer of the Delta Mfg. Co. gave one of the best lectures of the session on "Rectifiers and Filters," and incidently, his "amplifiers" helped many of the speakers. Roy Corderman, W3ZD, President of Washington (D. C.) Radio Club who had made a careful study on "Radio Clubs" presented a symposium clearly outlining how to make a club successful. Mr. L. S. Fox, of National Carbon Co., knows his "Battery Facts and Fallacies."

The army was well represented by Lt.-Colonel Boyden and Lieut. Glodell, Jr. of the First Corps Area. Lieut. Glodell's wife and her staff of entertainers should have received a standing vote of thanks for the surprise entertainment they furnished during the banquet and it is hoped they felt repaid by the spontaneity of the applause. Lieut. John L. Reinartz and Lieut. Hebert represented the U. S. N. R.

Trips to Headquarters, W1MK, Pratt & Whitney Aircraft and Chance Vought plants were made and proved of interest to all. The banquet was one of the best with Director Bailey as the Toastmaster. Our worthy president, Hiram P. Maxim, gave us one of his inspirational speeches. Radio Inspector Chas. C. Kolster reported over 75 amateurs taking examination. Treasurer Hebert of the A.R.R.L. spoke on the wanderings of the fieldman. Thanks also go to "Woody" Darrow, Bob Chapman, Springfield Radio Asso., W1CM and several others for their parts in entertaining the guests.

Great credit is due to the convention committee for one of the best conventions ever held in this division. Springfield next year.

— A. A. II.

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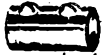
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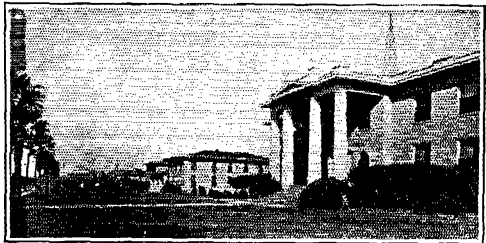
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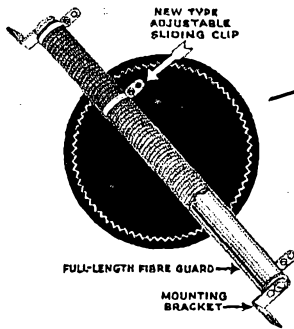
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The "tropical" filter condensers are sold by Morrill and Morrill, New York City.

## An Electronic Divertisement

(Continued from page 27)

in the iron ball, and closed the others. The valve remaining open as the ball drops, allows it to sink in the water at the rate of fifteen words a minute. As the ball sinks it pulls down on chain (19) drawing saw (20) along with it. (In case there should be any trouble in procuring the chain, let me suggest the use of the chain on the stopper in the family bath-tub.)

As the saw descends it makes contact at (21), which is in the transmitting circuit, said circuit already in an operating condition due to the action of the hydraulic jack (9). The teeth have been removed from the saw in somewhat the same manner as an Omnigraph, thus permitting a signal to be sent on the air. I would suggest that this pre-arranged signal be that old familiar one with which we are all acquainted: R OK TNX VY FER CALL-UR SIGS QSA 4 R 6-73 CUL SK CQ CQ CQ CQ CQ CQ (Your call inserted here). This will dispose of the station you were working in a polite, painless manner, and have you already on the air with a CQ to the good by the time you get back from the 'phone.

Dr. Quagmite is sitting here at my elbow as I write and I have asked him if he has anything more to say about his invention. He just blushed, and in his modest manner, disclaims any credit. . . . However, he is really very anxious to know how his invention is going to go over with the radio world, and I am sure if any one cares to write to him at the university he will gladly give any assistance or advice of which he is capable.

## World-Wide A.R.R.L. Convention

Chicago World's Fair, August 3rd, 4th, 5th  
PLANS for the greatest convention in the history of amateur radio are being rushed forward to completion in Chicago these days. Already an imposing list of nationally and internationally famous speakers have been invited, including such notables as Dr. Lee De Forrest, Commander Byrd, John C. Warner, Fred Schnell, Dr. Jordan Kenrad, Lieut. J. B. Dow, Herbert Hoover, Jr., Don Wallace, Boyd Phelps, McMurdo Silver, F. D. Bliley, W. E. Heising, and others. Fieldman Hebert will be the official A.R.R.L. Hq representative.

A partial list of the topics to be discussed by these speakers, who will be limited as to time and



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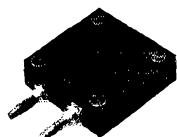
terial, with dozens of valuable and workable ideas gleaned from the practical station experience of successful amateurs. Chapters on workshop ideas, receivers, transmitters, amateur, phone QRM elimination, keying, power supply, and so on.

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Perhaps foremost in interest among the individual features of the convention is the Code Speed Contest, at which the World's Champion Radio Operator will be selected. It is open to all operators, both amateur and professional. A giant silver loving cup will be awarded to the champion by Rufus C. Dawes, President of the Fair, at a special ceremony in the World's Fair grounds. Theodore R. McElroy, now holder of the world code speed record will be on hand to defend the title he won during the contest in 1922 with a speed of 56.3 words per minute. The championship will be unquestionably authentic, since the convention committee has the backing of R.C.A. Institutes, the Candler System, Aeronautical University of Aviation Radio, and others. The preliminary trial is scheduled to begin at 9:00 a.m., Friday, August 4th.

The Committee is offering a prize of \$25.00 to the radio club having the greatest percentage in attendance. Delegates may order their tickets by mail in advance; in fact, they are urged to do so, in order that the committee may have information on which to base their plans. The entire convention fee is \$4.50. Send your reservations at once to Wm. E. Schweitzer, Chairman, World's Fair Radio Amateur Council, 3600 North Western Ave., Chicago — and be on hand August 3rd, 4th and 5th for the biggest event of your amateur career!

## New Pentagrid Tubes and Coil-Switching in the Amateur-Band Superhet

(Continued from page 17)

center of the coil *decreases* the inductance (increases the frequency) by virtue of decreasing the mutual inductance between an increasingly greater number of turns. Conversely, moving the gap toward either end *increases* the inductance (lowers the frequency) of the coil. When the oscillator circuits (which determine the dial reading) are correctly aligned, the same process is then repeated with the preselector and first detector coils. These are adjusted until each peaks at the same setting of the trimmer condensers for both bands. Of course this work should be done before the set is placed in a cabinet or a panel is attached so as to facilitate the adjustment of the coils. When all circuits are aligned, the coils should be given a light coat of collodion to prevent the turns from slipping or coming loose.

Anyone building a receiver of this type will most certainly be gratified with the results and

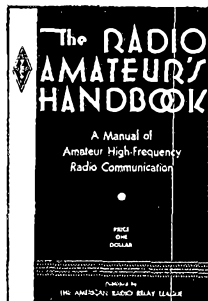
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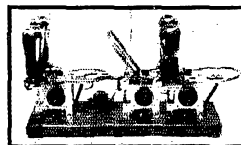
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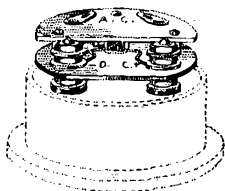
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Convert 0-1 MA to  
Universal Type Meter with  
**UNIVERSAL METER  
CONVERTER**



FOR 0-1.  
MILLIAMMETERS  
CONVERTER  
UNIT and DIAL  
**\$3.00**  
Postpaid

Dial Scale reads AC or DC. Volts 5, 10, 50, 100, 250, 1000. M.A. 0-1 AC; 0-1, 10, 25, 100 DC. Ohm range 0-100. Just mount Converter on terminals of your meter.

Complete Resistors and Shunts to read above ranges including 3 ohm ranges 0-1000, 0-10,000, 0-100,000, \$7.95. Specify make and model of meter when ordering.

Send for New Meter and Analyzer Bulletin

**UNIVERSAL METER WORKS**  
2208 W. KINZIE ST. CHICAGO, U.S.A.

**FUSSY HANDBOOKS**  
for FASTIDIOUS PEOPLE

The regular 10th Edition of the Radio Amateur's Handbook in cloth binding with gold lettering. \$2.00 postpaid anywhere.

**AMERICAN RADIO RELAY LEAGUE**  
West Hartford, Connecticut

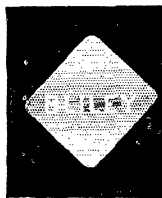
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Radiotelegraphy Radiotelephony  
Radio Servicing

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POWERFUL ACCURATE UNIFORM



A quality product throughout — 40, 80, 160M Xcut crystals supplied within 25Kc of specified frequency. \$4.50; 5Kc, \$5.50; 0.5Kc, \$6.50. 20M quartz crystals within 50Kc, \$12.75. Each crystal frequency within 0.05% of calibrated value. SS 465-525Kc mounted filter, \$6.50; 100Kc Std Fren. mounted bar, \$8.50, with instructions. BLILEY Molded Bakelite Holders for modern transmitters. 20-40M, \$1.50; 80-160M, \$1.50. With GR plugs spaced (3/4"), \$2.25. Quartz crystals manufactured to specifications from 20Kc to 15Mc.

Blileys are used by W9USA and on display at  
WORLD'S FAIR RADIO AMATEUR EXHIBIT  
**BLILEY PIEZO-ELECTRIC CO., ERIE, PA.**

will find that the interference problem is alleviated by no small amount. Selectivity of the order of "3-kc." on amateur phone signals is not difficult to obtain, with c.w. selectivity in proportion, and sensitivities of the order of a few microvolts should be the rule rather than the exception — providing the receiver is well constructed and the specifications have been followed.

**More on QSL**

(Continued from page 34)

considerable quantity of cards accumulates for some particular ham (who hasn't sent in an envelope) the QSL Manager has sent notification of the fact by radiogram, letter or telephone, requesting an envelope. In spite of notification, a number of hams don't do anything about it. We have told all QSL Managers that in cases such as this, it is not expected that they should clutter up their files with uncalled-for cards for months at a time, and that after fair and reasonable notification such hams may expect that any cards being held for them will be disposed of, or returned to the original sender.

Third, a small but steady percentage of hams forget postage. Please cooperate on this point, OM's. This system has been set up to enable you to get cards as quickly as possible. In turn, it is expected that John Q. Amateur will cooperate by supplying his own postage. Failure to do so means more grief for the QSL Manager, who has plenty already.

Fourth, many amateurs are neglecting to put their calls in the upper left-hand corner of the envelope as requested — or, for that matter, are not putting their calls on the envelope at all. The call must be there, gang — cards are sorted and filed by calls, and if no call is on the envelope the QSL Manager has to stop and dig through a callbook.

Fifth, quite a few hams are not supplying size No. 8 envelope. As a matter of fact, it is possible we will soon request a larger size, in order that a lot of these foreign cards with "oversize tread" can be mailed without bending. But at least nothing smaller than No. 8 should be sent.

In general, and except for occasional lapses on the part of some amateurs as enumerated above, the new system is working smoothly and speedily, and we honestly believe that we now have a QSL system which is about as close to perfection as it is possible to get it. No card is held here at League Hq. more than a week after it is received from abroad, and it is the custom of practically all the QSL Managers to send out envelopes to amateurs at regular intervals even if the weight limit has not been reached.

The U. S. QSL Managers unite in asking that we express their thanks to the many amateurs who have written them brief notes of appreciation for the service and who, in many cases, have volunteered their own services if they could be of assistance. FB gang! It helps!

— A. L. B.

# HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.

(3) The Ham-Ad rate is 15¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 25th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League takes the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and takes the 15¢ rate. Provisions of paragraph (1), (2), (4) and (5) apply to all advertising in this column regardless of which rate may apply.

Having made no investigation of the advertisers in the classified columns, the publishers of *QST* are unable to vouch for their integrity or for the grade or character of the products advertised.

OVER six pounds radio data, circuits, bulletins, 50¢ postpaid. Beyond Rockies 75¢. Kladag, Kent, Ohio.

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezoelectric crystals. Diamond Drill Carbon Co., 719 World Building, New York.

MICROPHONE and meter repairs. Low prices. Quick service. Sound Engineering Corp., 416 N. Leavitt St., Chicago, Ill.

QSL cards, two color, cartoons, message blanks, stationery, snappy service. Write for free samples to-day. WIBEF, 16 Stockbridge Ave., Lowell, Mass.

CODE machines, tapes and complete instructions for beginners or advanced students — both codes — for sale or rent reasonable. Rental may apply on purchase price. Extra tapes for all machines. Instructograph, 912 Lakeside Place, Chicago.

REBUILT microphones — good as new — many makes and types, at bargain prices. Write to-day for list. Also catalog of new microphones. Expert microphone repairs. Shure Brothers Co., 337 W. Madison St., Chicago.

CRYSTALS: \$1.35 Hipower oscillators, close to your specified frequency 3500-1700 kc. bands. Round \$1.60 exact calibration. 7000 kc. band \$4.25. 1" blanks 65¢. Finished blanks 95¢. Dust-proof plug-in holder and mounting, \$1. Set tested mounted I. F. crystals, 525 kc., 465 kc., etc., \$5.25. Grinding compound coarse, medium, fine 65¢, each 25¢. Prompt delivery. Hipower Crystal Co., 3807 N. Luna Ave., Chicago, Ill.

TRANSFORMERS, reactors made to order. Accurate, dependable. Special summer prices — buy now. Baker Engineering Laboratories, Ft. Wayne, Indiana.

VOIXOVOC Dynamic Microphones. Broadcast quality. With coupling transformer, \$9.75 postpaid in U.S. — Baker Engineering Laboratories, Ft. Wayne, Indiana.

QSL! SWL! "Buy Amateur!" Free samples. W8DED, Holland, Mich.

CALLBOOKS — Summer number of Radio Amateur Call Book has many new DX calls, 7 pages more W calls than last book, new NAA time sheets. Yours for \$1.00, or the next four issues for \$3.25. W9FO-610 S. Dearborn, Chicago.

QUALITY apparatus cannot be constructed cheaply. We announce complete line high grade apparatus guaranteed two years built in our own shops with years communication experience. Crystal oscillator 10 watts output complete with crystal tubes power supply matched antenna \$40.00. with crystal oven \$56.00. Write for details complete line. Radio Division, Newportland and Eustis Tel. Tel. Co., New Portland, Maine.

QSL, complete bound set (Dec. 1915 through Dec. 1932) except volume 1, unbound, lacking first issue. Also unbound Radio (published San Francisco) 1920-1930, lacking four issues. *QST* \$58; Radio \$20, plus transportation. Harold Reavis, 1180 S. Fair Oaks, Pasadena, Calif.

M-G set. Daylan, motor 110 v d.c., 60 cycles, 1/6 hp., 1725 rpm. output 500 v d.c. lamp and 7.5 v d.c., 1.75 amps. Excellent condition, \$25. Edison 2 volt cells, \$2. each. M & H, 512 Market St., Phila.

QSLs, 75¢ a 100, two colors. W9DGH, 1816 5th Ave., N., Minneapolis, Minn.

WANTED REL combined transmitter and receiver, catalog No. 135. BM/CWT, London, W.C.1, England.

QSLs, Samples for stamp. "Gil" Cartoon Service, West Hartford.

QUALITY ham equipment cheap. W9JUY, Bismarck, N. Dak.

W4QO selling out. 852 xtal transmitter and power supply. Parts all standard parts. Bargain, \$75. Write for list. 1223 Ashboro St., Greensboro, N. C.

346 illustrations, 164 pages. Short Wave Manual by Don C. Wallace. Send W6AM \$1 for author's autographed copy postpaid.

SELL — 4 new 866's, \$1.95; 3 RCA fifty-watt sockets, 85¢; transformer for 203A, \$3.50; other parts; stamp for lists. Howard (9DWA), 5526 Lake St., Chicago. (Phone Austin 1188).

SELL, trade 30H, 300M Acme choke, 2200V, 1KW transformer, 10 mfd., 6000v condenser. W9ERU.

WANT QSL printing press. W9KGG, Cairo, Mo.

CRYSTALS, x or y cut, guaranteed, 1750 to 4000 kc. 1" square, within five kc., \$2.50. 3/8 to 1", within ten kc. \$2. Wm. Threm, W8FN, 4021 Davis Ave., Cheviot, Ohio.

QSLs — SWLs — wall cards, etc. Satisfaction guaranteed. W3BHG.

TYPE 269 Weston 10 amp. external thermocouple 2 mills movement \$4.75. Dubilier .004 mfd. 12500 volts condenser, new \$4.75. Navy key, net \$1.25. Trade, sell. Want high power equipment. S. Bartelson, 1005 Sanders, Indianapolis.

HEY hams! Radio Bill has a complete stock of everything you want. Lowest prices. 15 Watt 210s, large plate, heavy filament, crown bulb — \$1.40; Heavy Duty Isolatite top 866s, finest obtainable — \$1.85; Monitors, accurately calibrated, 20, 40, 80, and 160. Neat metal cabinet, hinged lid, all four coils, tube, batteries and chart, complete — \$9.50; Heavy Duty Power Chokes-20 Henry, 250 milliamps, 8 lbs — \$2.85; 20 Henry, 150 milliamps — \$1.20; Transmitting bleeders and grid leaks, 100 Watt (9"x1") ct. 50,000 Ohm — \$1.30, 100,000 — \$1.40, with 6 sliding taps, 50,000 — \$1.75, 100,000 — \$1.85; X cut crystals, perfect oscillators, guaranteed accuracy 1/10%, 80 or 160 — \$2.85; Keying Relays, works on single dry cell, (make two, break one) — 65¢; De Forest 410s — \$1.19, 481 — \$1.15, 450 — \$1.19; Acme solid enamelled copper antenna wire, per 100 feet — No. 14 — 30¢, No. 12 — 43¢, No. 10 — 78¢; Extra Special!! DeForest 46s — 59¢. Shoot your orders in to — Bill Green, 698 West End Ave., NYC.

VIBROPLEXES, \$12. Rebuilt, \$6. up. Guaranteed. Shipped anywhere. Lydeard, 28 Circuit, Roxbury, Mass.

CLASS B transformers — for 46's, \$4.95 pair. Universal transformers for 2 or 4 46's, 210's, etc., \$7.75 pair. Write for details. W8UD, Douglas, Mich.

TRANSMITTING and receiving equipment manufactured to order. Holmes C. Miller, Radio Engineer, Box 105, Palo Alto, California.

203As brand new, Westinghouse or G. E. \$10. Counter-balanced Cardwell 166Bs, \$20. Heavy duty 866s, \$2.50. 872s. \$7.50. New RCA UX250s, \$1.75. Weston type 301 milliammeters (some new, all new condition, most all ranges) \$3.75. 204As, \$20. 212Ds, \$16. Instructographs, etc. E. Ewing, 1057 Pratt Blvd., Chicago.

TWO color QSLs, 50 cents up. W9GOF, Mishawaka, Ind.

HAM receivers of superior grade at popular prices; Alcoa aluminum cas, 5x6x9, \$1.45; monitors, \$9.45 complete. Bargain sheet free upon request. Edbern Radio Co., 2156 Cruger Ave., New York City.

TRADE new SW58 with tubes and National pack complete coils etc., for high grade camera. Send complete description of camera. Also have 2200V 1 kw d.c. pack with 8ML arc. W9ADS.

QSLs unbeatable! 200 two colors, \$1. W6FZQ, 2242 W. Jackson, Phoenix, Arizona.

COMET Pro, late '32, \$75. Two 211s, \$5. each. All ok. W8BWW.

SWAP Audels new electric library, 11 volumes, for transmitting equipment. Need power transformer for U3" operation. W8IZC, 47 W. Union St., Nanticoke, Penna.

TRADE Westinghouse thermometer hoods for ham xtals, parts for Vibroplex. K7ABQ.

LOOK like \$1,000.00. Relay racks, transmitters non-stretching hard drawn aerial wire. See April display, March hamad. Rectifier Eng. Service.

QSLs, 50¢ per 100. Samples. 2143 Indiana Ave., Columbus, Ohio.

IN stock: FB7s \$26.46, FBXs \$38.22, coils \$5.88 air dielectric condensers \$4.70 additional; SW3s \$14.40, coils \$2.79; Comet Pros \$79.38. Trade your National, Pro on the latest model. Guaranteed 866s \$1.95. Teleplexes, Omnigraphs rented, 75¢ week, \$10 deposit. Any apparatus. Write Henry's Radio Shop, Butler, Mo.

SELL, trade: SW3a, SW5a, Comet Pros, MGs, dynamotors, rotary converters, tubes, meters, transformers, anything. W9ARA, Butler, Mo.

SELL: QST's 1919-1933 complete; Radio News, Electrical Experimenter, Radio (Pacific) 1919-1923; singly or collectively; make offer. DeForest 250 watt \$10. Vibroplex \$6. Schumacker, 1917 54th St., Brooklyn, N. Y.

GUARANTEED crystals, \$1.35. Regrinding, trading. W4VK, Ripley, Tenn.

A.C. receiver, complete, \$15. Condenser mike, \$5. xtal smitter, \$15. W4AIS.

QSLs, two colors, 100, 75¢, 300, \$1.50. Samples. W8BPT, 1203 Stockbridge, Kalamazoo, Mich.

WANTED: Good 204A; National 3000 volt transmitting condenser: 500 mill modulation reactor; 500 mill filter choke; two 10,000 volt .002 transmitting by-pass condensers. Dr. D. B. Fordyce, Oswego, Kans.

QSLs. Samples free. W9IHM Press, Escanaba, Mich.

HAM apparatus bought, sold. Ennis, Route 1, Johnstown, N. Y. W8GPA.

SUPREME diognometer 400B, good condition. Best cash offer. Walter W. Burwell, Simonton, Texas, W5CZM.

QSLs 50¢ up. Samples, W6IID, 719 Shepard, San Pedro, Calif.

QSLs, 90¢. Also radiogram cards, calling cards, stationery. Samples. W9DGS, Jamestown, N. D.

WANTED: low or medium powered phone — cw transmitter, 20-40-80 meter bands. N. Janco, 2476 Grand Ave., New York City.

TRANSFORMERS — quotations given. Frank Greben, W9CFS. Accurate Radio Service, 2920 W. Cermak Rd., Chicago, Ill. Phone Crawford 2050.

BARGAINS — a.c. s.w. receiver, tubes and power unit, \$14; monitor, \$3; Bunnell side-swiper, \$3. 50 watt t.g.t.p. xmitter, DeForest, Weston, National, Acme Delta parts, panel rack mount, tubes, meters, etc. included \$65. Complete station as listed \$75. cash. Perfect workmanship. Everything guaranteed. W3KA, 429 Cuyler, Trenton, N. J.

SELL complete M.O.P.A. xmttr, REL model 215 with 210 last stage, Esco 500V motorgenerator, filter, tubes. New condition. First \$50. takes it. William Harry, Bloomfield Hills, Mich.

GENERAL Electric Dynamotors 24/1500 volts. 233 amperes, \$37.50, 24/750 200 mills \$25. (on 12 volts output 375) Westinghouse 27½/350 80 mills \$10. Mounted twins \$15. 500 watt 500 cycle 110-220 volts with exciters \$7.50. Henry Kienzle, 501 E. 84 St., New York.

QSLs. Get our prices and samples before ordering. Malezo, 1512 Eastern Parkway, Brooklyn, N. Y.

SWAP — Midwest Division Convention Tickets for \$3. per, September 2 and 3. Write Headquarters Melbourne Hotel, St. Louis, Mo.

GUNS wanted. Trade transmitting equipment for Winchester 52 or Springfield M1 or Telescope sight or what have you. Lowell Ecker, Sedan, Kans.

CLASS B all-band xtal fone and CW rig complete, \$75. Good spt. or portable rig. Very compact. W9DKF, Peoria, Ill.

QUALITY QSLs. T. Vachovetz, Elmford, N. Y.

QSLs, SWLs, W6DOU, Hayward, Calif.

CRYSTALS: Smith-Precision power. Closest frequency, \$2.01, exact \$2.51. Single-signal \$2.51. Postpaid, airmail. Accuracy .05%. Money-back guarantee. Over 2000 sold. W6BCX, Santa Maria.

CRYSTALS, \$2.01. W6BCX.

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OMNIGRAPHS, Teleplexes, Vibroplexes, receivers, meters, bought, sold, traded. Ryan Radio Co., Hannibal, Mo.

## EASTERN RADIO INSTITUTE, Inc.

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Offers courses in Marine Operating, Broadcasting, Aviation Radio, Servicing, Advance Service, Television and Public Address.

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Another triumph  
by Shure Engineers

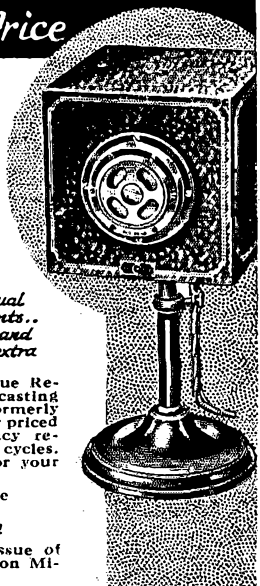
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# QST

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The American Radio Relay League  
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¶ "Advertising for QST is accepted only from firms who, in the publisher's opinion, are of established integrity and whose products secure the approval of the technical staff of the American Radio Relay League."

Quoted from QST's advertising rate card.

Every conceivable need of a radio amateur can be supplied by the advertisers in QST. And you will know the product has the approval of the League's technical staff.

● See Editorial April issue of QST

## For Your Convenience QST'S INDEX OF ADVERTISERS IN THIS ISSUE

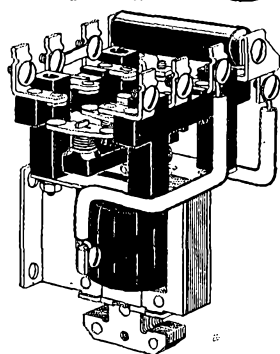
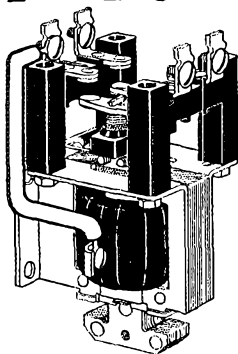
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# A. C. RELAYS

Made by

## Allen-Bradley



These A. C. solenoid relays are ideal for remote control of transmitters, for control of crystal ovens, and for any general remote control application except for keying. THESE RELAYS WILL NOT OPERATE IN KEYING SERVICE. Silver-to-silver double break contacts are used throughout.

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A117	1	Closed		3.00	4.00	A207	2	Open		3.50	4.50
A127	1	Open and Closed		3.50	4.50	A217	2	Closed		3.50	4.50
A137	1	Open		3.50	4.50	A227	2	Open and Closed		4.50	5.50
A147	1	Closed		3.50	4.50	A237	2	Open		4.00	5.00
A157	1	Open and Closed		4.00	5.00	A247	2	Closed		4.00	5.00
A167	1	Open		5.00	6.00	<p><b>Radiostat</b>—A stepless graphite compression rheostat for primary of 550 watt filament or plate supply transformer. Range 4 to 150 ohms. <b>Price \$6.50</b></p>					

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Enclosed find money order for \$..... for which please send me, shipping charges prepaid, the following items:

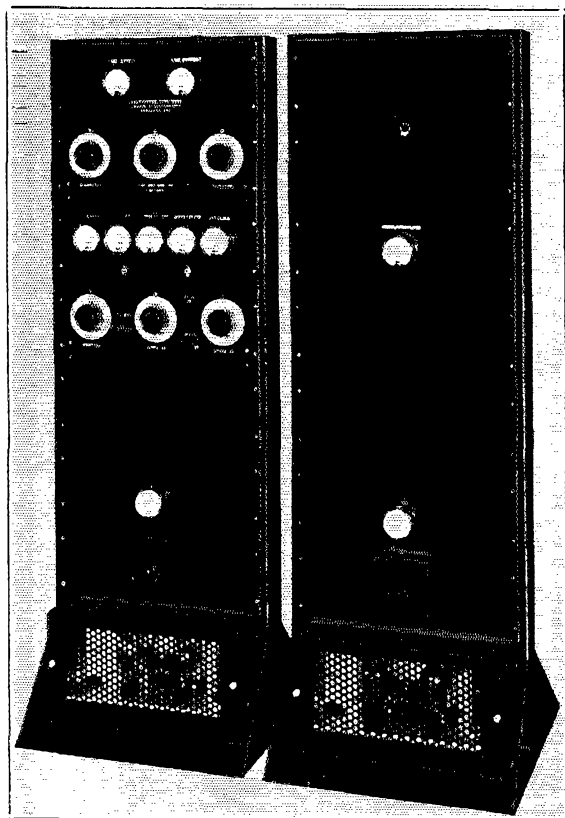
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# There Are Many Good Reasons Why YOU Should Use a Collins Transmitter

## EXCLUSIVE COLLINS FEATURES

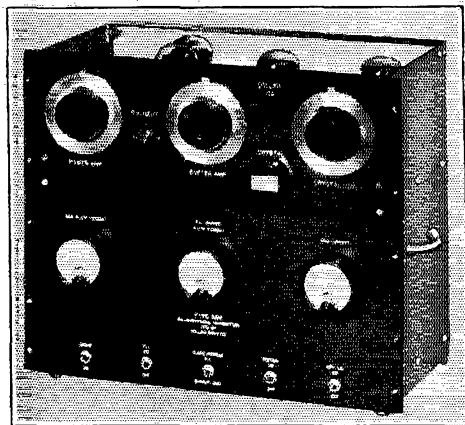
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- In the first place Collins outfits deliver far more actual power output than other transmitters using the same tubes.
- Secondly, the character of the signal, both telegraph and telephone, is instantly recognized by its superior quality.
- Further, the excellence of the design and appearance of *your* Collins transmitter will be a tribute to your taste and technical discrimination. Men who have had years of experience in the technical end of radio are installing Collins.
- And finally, the cost is surprisingly low. Collins transmitters are built under limited production methods, and outfits built singly from composite parts cannot hope to compete either in cost or in uniform quality.
- The soundness of these reasons is attested by the performance of hundreds of Collins Transmitters throughout the world.



Type 32B Transmitter

Two 46's final, modulated by two 46's Class B

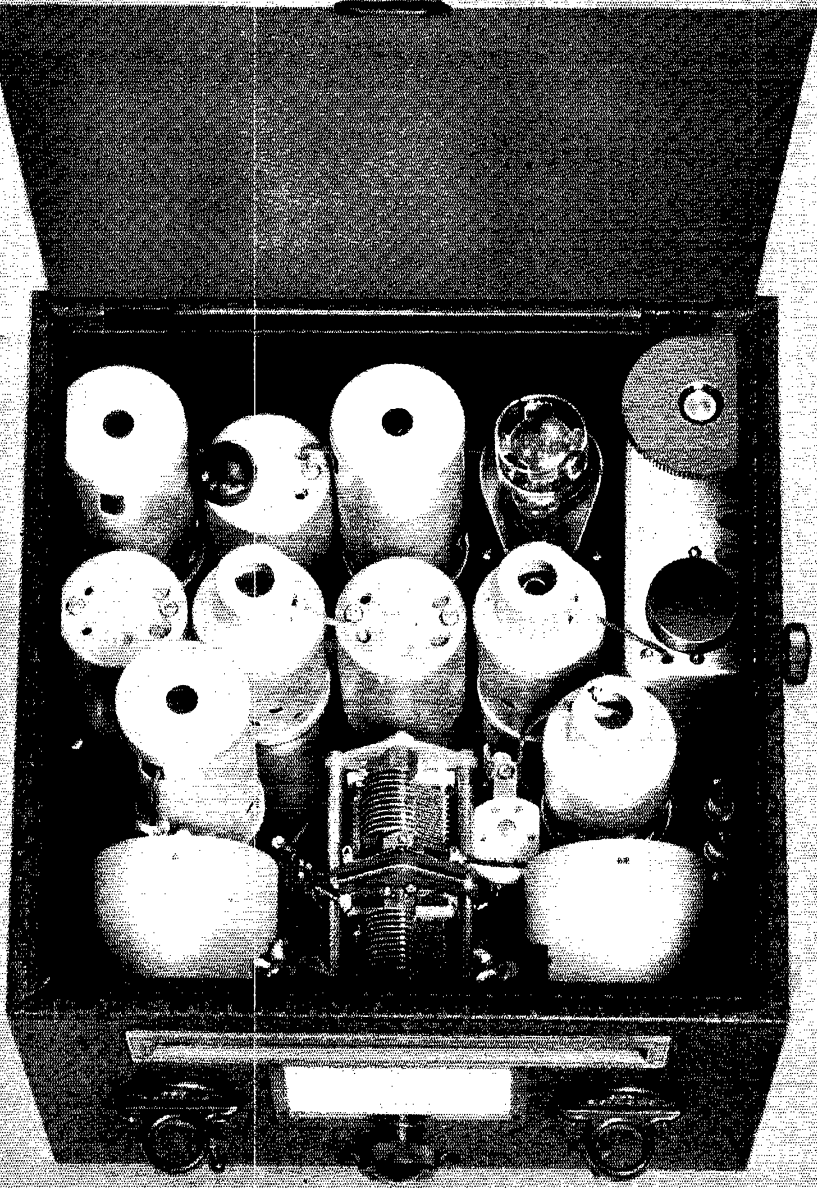
The 32B is on display at A Century of Progress in Chicago

Write for latest copy of "Collins Signal." Contains full details. No charge.

# COLLINS RADIO COMPANY

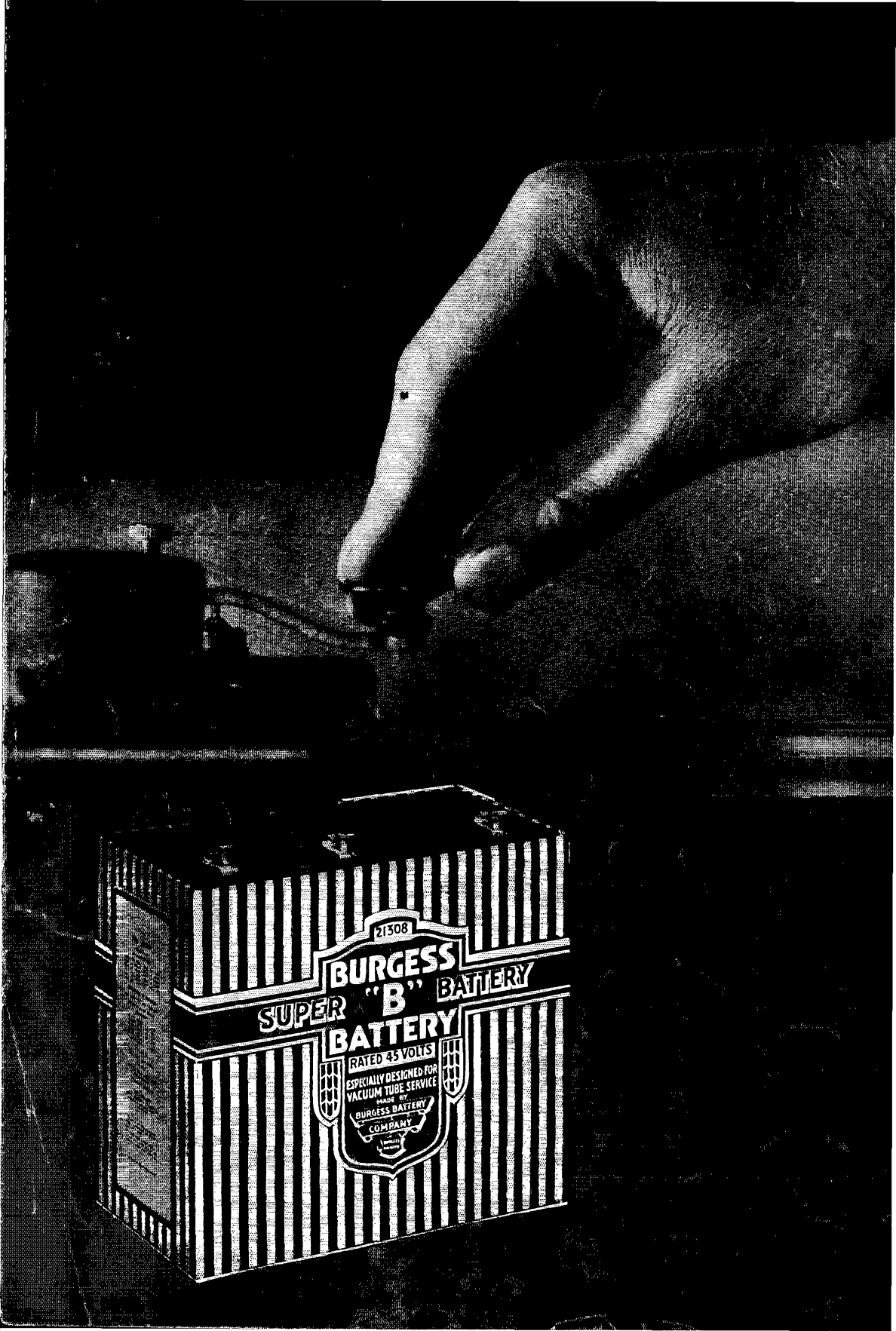
Cedar Rapids, Iowa

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**B**.  
**X**



21308

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COMPANY