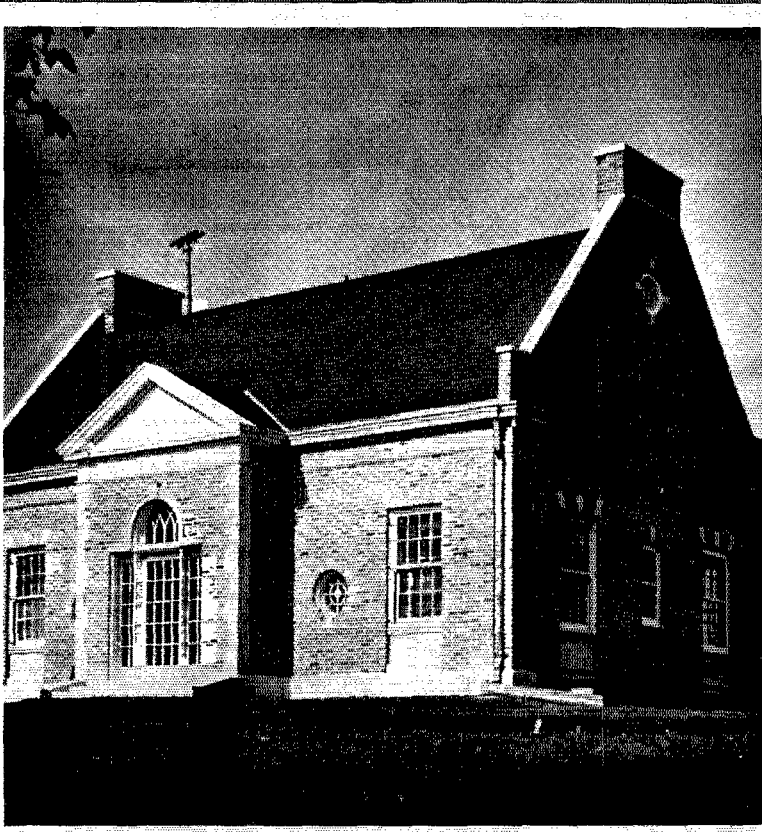
august, 1938
25 cents

QST

devoted entirely to

amateur radio

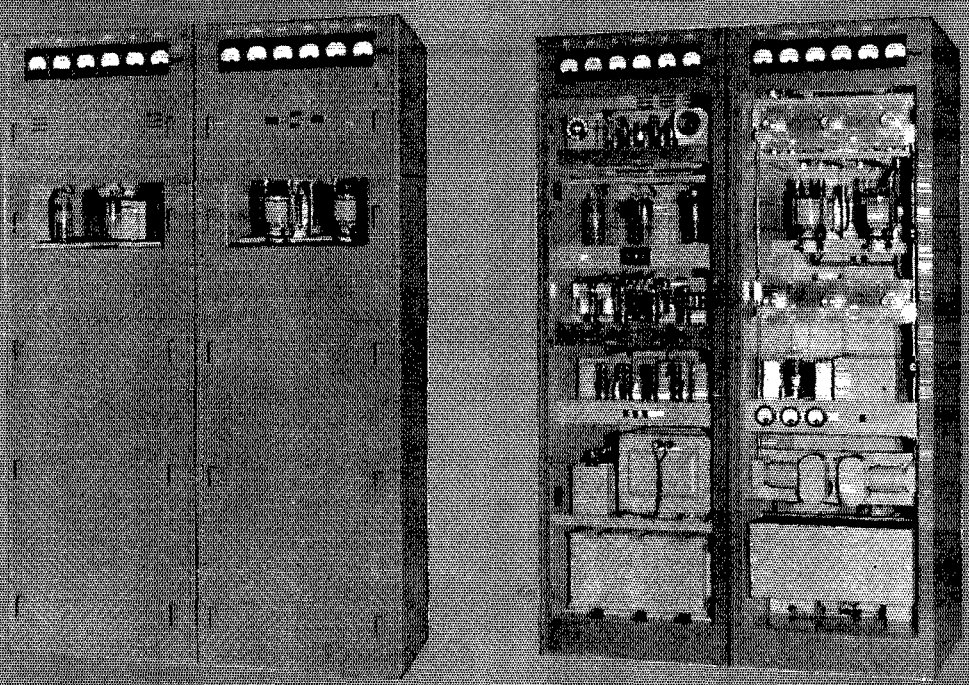


In this Issue—

A Three-tube Superhet

Improved Stability with E. C. O.

A 250-watt 56 Mc. Rig



COLLINS 203C

The 203C Transmitter has been adopted by numerous commercial airlines and governmental agencies for service in which an unattended multi-frequency transmitter is remotely controlled and operated over a telephone line. Output power of 1000 watts is instantly available on any of ten unrelated frequencies between 2000 kc and 20,000 kc by means of the Collins Autotune System. A single tone pair (the least expensive type of telephone line) serves to control completely the transmitter at a distance up to 30 miles—starting and stopping the transmitter, selecting telephone or telegraph operation, shifting to any of the ten frequencies, and carrying the telephone and telegraph signals.

Salient engineering features include positive internal pressure and air filter to insure a dust free interior, removable front and rear panels to expedite maintenance, and a thoroughly shielded oscillator compartment to permit both break-in reception and high keying speeds. Concealed tuning controls prevent accidental detuning, but are easily accessible for initial adjustment.

Several items such as automatic overload indication at the control point, a modulation limiter, and a complete complement of fifteen instruments combine with other features of the 203C to assure operation of the radio circuit with the same degree of reliability as that of a land-line dial telephone system.

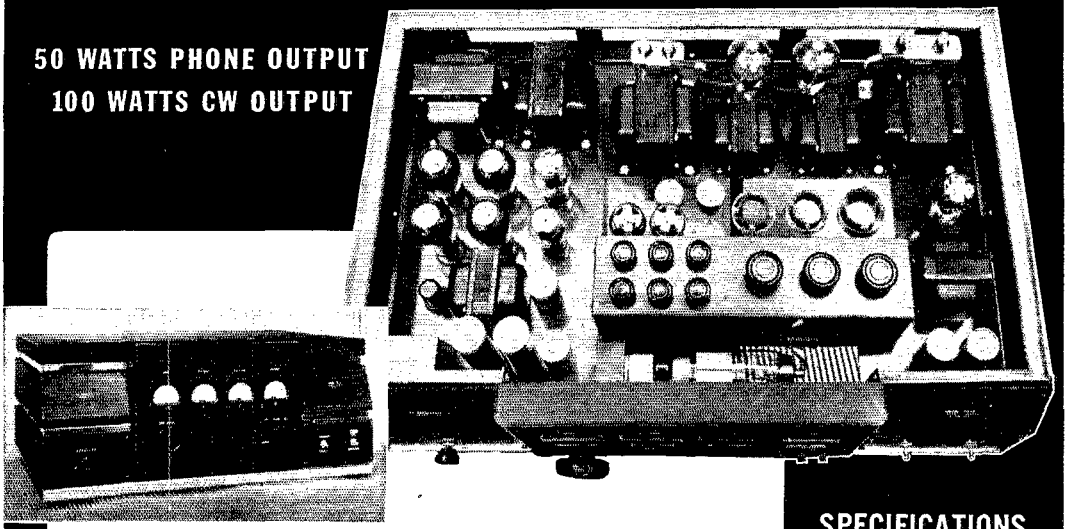
COLLINS RADIO COMPANY

CEDAR RAPIDS, IOWA - NEW YORK, N. Y.: 11 WEST 42 STREET

Introducing — the hallicrafters

MODEL HT TRANSMITTER

50 WATTS PHONE OUTPUT
100 WATTS CW OUTPUT



An Approach to an Ideal in Transmitter Design

While many are models of workmanship, the home-built or kit-assembled transmitter necessarily suffers from lack of proper facilities for testing and correlating the component parts. Holding a license to build amateur transmitters, the Hallicrafters engineers vizualized an ideal amateur transmitter, with adequate power at conservative ratings, simple to the point where even a novice could operate it — ruggedly built in the commercial style — and set to work to build it.

The result — the Hallicrafters Model HT. Entirely functional in design and marking a bold departure from conventional transmitter construction, the Model HT is, nevertheless, a close approach to the ideal transmitter its designers set out to build.

Conservatively rated at 50 watts Phone Output and 100 watts CW Output, in operation its output is equivalent to that of kit-constructed transmitters of 75 or 100 watt "input" phone rating.

Utter simplicity, compact, orderly design, convenience and versatility in operation, and absolute dependability are among the desirable characteristics of this new transmitter. Generously oversized transformers and other components are used, and its design was based on the most advanced type of tubes.

See the Model HT at your Hallicrafters dealer, or write for complete information.

See the Hallicrafters Exhibit at the National A.R.R.L. Convention Chicago, September 3, 4, 5

All Hallicrafters Equipment Sold on Liberal Down Payment Terms

SPECIFICATIONS

MODEL HT-1
50 Watts Phone Carrier (slightly reduced at 30 MC)
100 Watts CW Output

Frequency Range—*4 in 3 Bands between 10 and 160 meters, crystal controlled on one frequency per band.*

Frequency (Band) Switching *by single control in front panel switching all circuits. Individual tanks, knob controlled, inside cabinet and adjusted for particular frequency for that band.*

R.F. Tubes—*2—6A6, RK47.*

Modulator—*Tubes, 6J7, 6J5. 4—6L6. Modulation Capacity 100%. Fidelity — plus or minus 2 DB, 80 to 8000 cycles.*

Rectifiers—*2—5Z3, 1—80, 2—866.*

Meters—*3, for adjustment and checking of operation.*

Controls — *All necessary controls on front panel.*

Cabinet—*Rigid steel cabinet of attractive design with adequate ventilation.*

Output Terminals—*From adjustable pick-up coils on separate final plate tank coils. Proper pick-up coil and plate tank automatically selected by Band Switch.*

Dimensions—*29¾" wide, 11¾" high, 19¼" deep.*

MODEL HT-2—*For CW only, less modulator and 1—5Z3 rectifier tube.*

★

the hallicrafters inc.

2611 Indiana Ave., Chicago, U.S.A. Cable Address, "HALLICRAFT" Chicago

World's Largest Builders of Amateur Communications Equipment

WHY DIVERSITY RECEPTION?

WHAT THE *SKYRIDER DIVERSITY* DOES FOR AMATEUR RECEPTION!

All amateurs are more or less familiar with the principles of Diversity Reception. The idea of using two or more receivers with individual antennae for the reception of short wave signals is not new. Receiving stations built by the commercial radio companies to operate on this principle have been phenomenally successful in the reduction of fading and improvement in the quality of reception.

However, Diversity Reception as practiced commercially, where each receiver is individually tuned, the second detector outputs being tied together across a common load, and the signals combined after rectification, is not practical for amateur communications work, where ease and rapidity of tuning to a number of signals is essential.

The SKYRIDER DIVERSITY is the result of several years of intensive experimental work, directed toward one object — the development of a means to provide the highly desirable advantages of Diversity Reception for the amateur in practical and easily operable form. It is the first receiving system to offer these advantages with a single tuning control — entirely practical for amateur operation — and consists of two complete r.f., i.f. and second detector circuits with a common r.f. heterodyne oscillator, common AVC and one audio amplifier.

The principal advantages of Diversity Reception as offered by the SKYRIDER DIVERSITY are as follows:

1. Reduction of fading to negligible proportions.
2. An increase of Signal Strength over any single receiver.
3. Improvement of Signal-to-Noise ratio over any single receiver.
4. Reduction of Heterodyne Beat Note Interference.

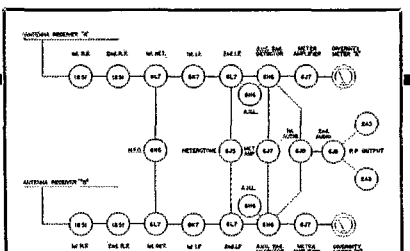
While it has been generally understood that proper Diversity action could be obtained only with widely separated antennae, experience has proved the contrary. Fair Diversity action can be obtained with paralleled antennae separated as little as 10 feet, although it is desirable, where circumstances require antennae in such close proximity, to have them at right angles to one another or in different planes, as one horizontal and the other vertical.

The Diversity action of the SKYRIDER DIVERSITY is clearly demonstrated by the two diversity meters, which indicate the fading effect in the two separate circuits. Under normal conditions in long-distance, high-frequency reception, they will rise and fall from zero to plus 9, rather rapidly, but will seldom rise or fall in unison. In fact, they give the illusion of being oppositely geared together — as one falls the other rises and vice versa. Meanwhile the signal level meter on the main panel, reading the combined signal strength from both antennae, shows that the resultant output of both receivers remains practically stationary and indicates the improvement effected by the Dual Diversity System.

It is with a real sense of achievement that the Hallicrafters offer Diversity Reception to the amateur with the SKYRIDER DIVERSITY. For a more complete discussion write for reprint of *QST* articles by J. L. A. McLaughlin and Karl W. Miles on Diversity Reception.

See the SKYRIDER DIVERSITY at the National A.R.R.L. Convention

Chicago Sept. 3, 4, 5, 1938



TUBE LAYOUT OF SKYRIDER DIVERSITY!

the hallicrafters, inc.

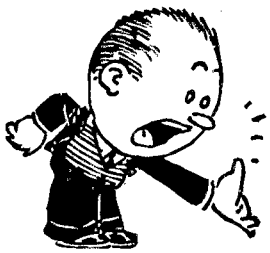
2611 INDIANA AVE., CHICAGO, U.S.A.

Cable Address, "HALLICRAFT" Chicago

"World's Largest Builders of Amateur Communications Equipment"

QST *devoted entirely to*
AMATEUR RADIO

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



AUGUST
1938

Volume XXII
Number 8

★

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The Contents

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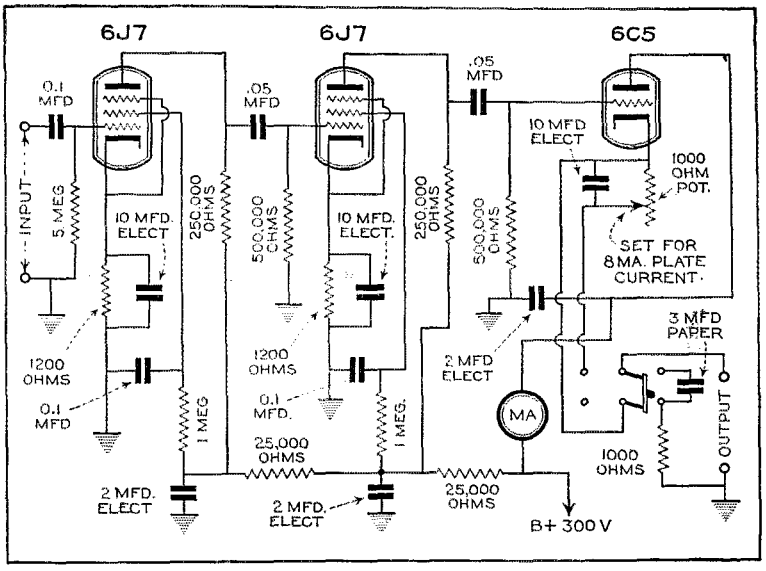

Kandid Ken-O-Talk, No. 9

• Standardization of Low Level Audio Equipment •

Many manufacturers of commercial transmitters are working toward the standardization of low level audio amplifier and exciter units. By doing this, it is possible to build almost any type of transmitter with only two high level stages to worry about. Usually these stages are simple and straightforward, so the really difficult part of building a unit, once done, never has to be duplicated. It is a standard part, carried in stock.

Many amateurs find their greatest pleasure in building new "rigs" from time to time as advances or changes are made in power and driver tubes. There is, however, very little pleasure in slaving over a fussy low level, high gain circuit every time a change is made.

The circuit shown above possesses numerous advantages over the conventional pre-amplifier. The first two stages are of the standard resistance coupled type, but the output stage is somewhat different. This stage is of the type sometimes called a cathode follower. The plate is connected directly to B plus and the load is connected in the cathode circuit. From an arrangement of this sort, a low impedance output may be obtained.

The principle of operation is degenerative, that is, a signal of approximately one hundred volts peak may be applied to the 6C5 grid. The cathode, not being tied to ground, follows this voltage to such an extent that the grid is never positive with respect to cathode. The available output voltage is therefore less than the input voltage.

An output of eighty volts peak into the primary of a driver transformer, designed to carry 10 MA D.C., may be obtained with the D.P.D.T. toggle, shown above, thrown to the left, and the output fed into the primary of transformer type T-261. Ample power is available to drive 6L6's to sixty watts output, or 807's to eighty watts. The output of the preamplifier is low impedance so the line may be run any desired distance to the modulator chassis. This allows the driver transformer to be at the grids of the power tubes.

If a low impedance line with no D.C. in it is required, the toggle switch is thrown to the right. This line may be worked into impedances as low as five hundred ohms, making it ideal for coupling to class A input transformers.

The gain of this amplifier is approximately 80 D.B. Its flexible output possibilities make it suitable for driving a low power modulator stage, or for coupling to the driver of a high power modulator stage.

Erratum— *In Ken-O-Talk #6 the by-pass condenser from screen of the 6J7 to ground was omitted. This condenser may be a 0.1 mfd. paper type.*

F. P. Kenyon

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

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation 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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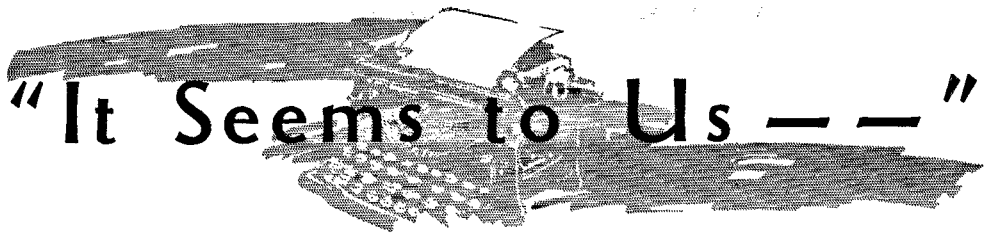

"It Seems to Us — —"

OUR mail the other day contained a letter from a ham who said: "I'm pleased to see that things came out fairly well at Cairo, although I'm afraid that short-wave 'phone in the 7200–7300 band may bring about trouble. Listeners in this country may squawk when they cannot hear the announcements of such foreign 'phones."

Wowwwwwwww! Let them, we say; let them squawk their bleeding heads off if they want to. Whose band is it, anyhow? We'll answer that: it's ours. Since the Washington Regulations took effect in 1929 there hasn't been a single non-amateur station with a thoroughly legal right to use a frequency between 7000 and 7300. After September 1st of next year, the extra-American regions (meaning chiefly Europe) may put broadcasting stations between 7200 and 7300 if they want to, but even in these regions the whole band remains available for amateurs, and nobody can complain if amateurs "interfere." And in the American region—north, central and south—the whole band remains exclusively an amateur band, just as it always has, ours and ours alone.

This invasion was made by European governments at Cairo on the premise that there wouldn't be appreciable transocean interference and in the mistaken belief that most European administrations would throw their amateurs out of the 7200–7300 portion. That is both bad engineering and wishful thinking, and is a prime example of the folly to which overzealous non-technical administrators can be carried. They did it in the face of plain warning from the American administrations that amateur radio on this side would continue full blast in these frequencies. They elected to exercise their sovereign votes to try it nonetheless. It's their funeral; let them do the worrying.

American short-wave broadcast listeners might as well understand right now that they cannot expect to hear international programs on these American amateur frequencies. They can listen for them if they want to, but when the interference comes from our operating it will be just too bad: we won't care. There are plenty of other broadcast frequencies for them to listen to, if they yearn to be propagandized.

As a matter of fact, it is probably safe to say that there will be but small use of 7200–7300 for broadcasting, even in Europe. We hope that the amateur societies in every country outside the Americas are already making representations to their governments to retain the frequencies exclusively for amateurs. Australia and New Zealand probably will want none of this kind of broadcasting at amateur expense; we doubt if South Africa will. The chief difficulty, of course, will be in Europe, but even there we are reasonably confident that many countries will continue the whole band for amateurs. That means European interference to the transmissions from the countries that elect to use the band for broadcasting. All the uses we have heard discussed are long-distance broadcasting. Some of the smaller European states that have been unable to find a high-frequency channel may put their chief reliance on a frequency chosen from the European amateurs' band but most of the employment will be for auxiliary uses by the bigger countries. For instance, England has displayed some interest in using such frequencies for broadcasts to Egypt and India. As far as interference to us on this side of the water is concerned, it is interesting to note that the band will be useful only during the evening in Europe, say up to midnight in England. After that, there won't be audiences. So the European stuff should be ending about 7 P.M. Eastern Time or 4 P.M. Pacific Time, and at that hour it's daylight all the way across the Pacific. The interference possibilities to us therefore do not seem serious. And we doubt very much if any of the totalitarian states of Europe will even try to use such frequencies for bombarding South America with propaganda. They are already well entrenched elsewhere and they will know that the normal operations of American amateurs on these frequencies will make public reception utterly impossible.

We repeat that these are our frequencies and that every American amateur will have an uninterrupted right to their use. Their use for broadcasting in other regions will be a wholly unwarranted invasion. We hope that no American amateur will hesitate, out of misplaced sympathy for broadcasting, in making any legitimate use of these frequencies that he pleases. If we do that, we'll find that "it can happen here" too. Moreover, our signals, at the optimum paths over which we communicate to get through our own QRM, will have plenty of punch to override broadcasting interference, so our cue is not to get out of this end of the band but quite the contrary. And if some of our high-power ham rigs just happen to get on some of the frequencies used for broadcasting (as they inevitably will), that also is just too bad. We'll blast 'em off the air! We'll mow 'em down! And serve them right; bad luck to them, anyway!

K. B. W.

A Three-Tube Super for Portable or Emergency Work

Superhet Performance with Regenerative Receiver Economy

By George Grammer,* W1DF

In portable emergency receivers light weight and low battery drain usually are paramount considerations, and at first thought only the regenerative receiver seems able to meet these specifications. But newer tubes and components have changed this picture, and it is now possible to get greatly improved performance in the portable set without losing the advantages so long associated with the old standby receiver. The set described here will out-perform a three-tube regenerative receiver, costs about the same, is equally light and compact, and is easy on both "A" and "B" batteries. Something to think about—and build—for that emergency station.—EDITOR.

THE regenerative receiver has had a long and honorable history in portable emergency work, but changing conditions are bound to cause it to be displaced just as it has already been displaced in regular station operation. For portable use where, nine times out of ten, the chief source of power is a 6-volt storage battery, the regenerative set offers the advantage of low battery drain in addition to light weight, compact construction and low cost. But inadequate selectivity and cranky tuning are serious objections to this type of receiver, especially during an emergency when nerves already are under a strain to which shortcomings in equipment should not be allowed to contribute.

The greater selectivity and smoother operation of the superhet-type receiver make it imperative that it be given consideration for portable use as well as in the home station. If the superhet can be made as economical, both in battery drain and in dollar cost, as the regenerative receiver it certainly deserves a place in our emergency picture. The receiver described here represents an attempt to initiate something along these lines, and on the whole it meets any reasonable specifications for a portable emergency receiver much more completely than does the ordinary regenerator. It has only three tubes; the regenerator also requires three, if adequate audio volume and freedom from antenna effects are to be obtained. The "A" current drain, therefore, is no greater than that of the regenerative set. It does its best work with only 90 volts of "B" battery, and the "B" drain is only 15 milliamperes which, in normal operation, means a battery life of well over a year. It can even be used with a single 45-volt "B" block, although the audio output is somewhat reduced. It can be built, with tubes, three sets of coils, for about $16, which certainly compares favorably with the cost of a three-tube regenerative set. It does not suffer by comparison on the questions of size and weight. Finally, it has regular superhet selectivity and stability, simple and straightforward circuits free from any critical adjustments, and is easy to construct and operate.

There is, of course, nothing particularly new in the idea of making a three-tube super. It happens, however, that until recently there have been no really suitable double-purpose tubes. For our purposes, the 6K8 [1] is a great improvement over the oscillator-mixer tubes previously available, since it has a more stable oscillator section and lesser pulling effects than the older tubes. The 6C8G double triode has a 0.3-amp. heater instead of the customary 0.6 amp., and furthermore has separate cathodes for each section, thereby affording more freedom in circuit design. In the line of components, the new permeability-tuned i.f. transformers with high-stability fixed-mica trimmer condensers offer compact construction, high gain, stability comparable to air-tuned

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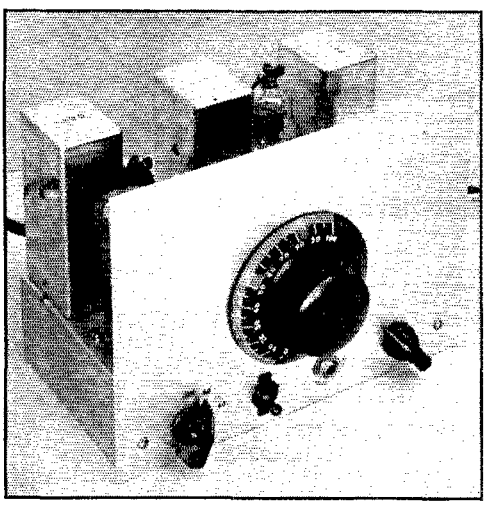


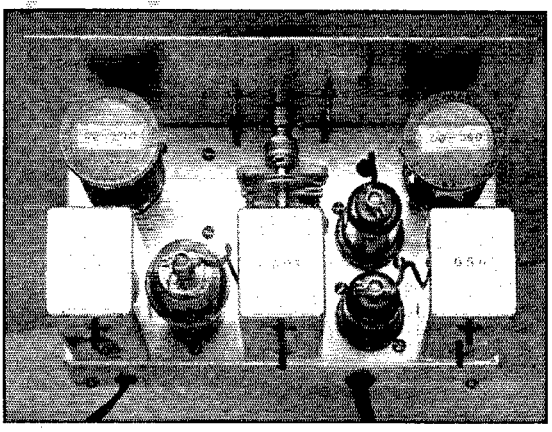
THREE-TUBE SUPERHET FOR PORTABLE EMERGENCY USE

Filaments are heated by a 6-volt storage battery; "B" power is from one or two blocks of "B" batteries. The set is designed for the 1.75-, 3.5- and 7-Mc. bands.

[1] *QST*, April, 1938.

units, and low cost. The combination of new tubes and new components makes it possible to build something worthwhile for the frequencies of greatest interest in portable emergency work—1.75, 3.5 and 7 Mc. This receiver has been built for these bands only, and neither the layout nor circuit are recommended for operation at higher frequencies. The lack of preselection makes image response bad at 14 Mc. and higher, and while this reponse could be reduced by using a higher-frequency i.f., it was felt that for the purpose for which the receiver was designed the higher selectivity afforded by a 460-kc. i.f. more than compensated for the poorer image ratio. At 7 Mc. and lower, images do not cause much trouble.

Basically, the receiver is conventional, and therefore reliable, in design. It consists of the 6K8 oscillator-mixer, a 6K7 i.f. amplifier at 460 kc., and the 6C8G combined second detector and beat oscillator. The audio-output is taken from the plate of the second detector.



TOP VIEW OF THE THREE-TUBE SUPER

The permeability-tuned i.f. and b.o. transformers are along the rear edge of the chassis. Plug-in oscillator and detector coils, with separate tuning controls, are used.

RECEIVER CIRCUIT

The complete circuit diagram of the receiver is given in Fig. 1. Partly to simplify construction and eliminate separate padders on each coil, which would have added an appreciable item to the cost, the antenna circuit is not ganged with the oscillator. C_1 must, therefore, be separately tuned to resonance with the incoming signal if maximum signal strength is desired. The second reason for having the input tuning control separate was to permit its use as a volume control, thus eliminating the conventional bias-control resistor. With the 6K8 mixer, the slight detuning effect over the working range on C_1 is no more than, if as much as, would be the case with grid-bias control of the i.f. or mixer stage.

The input coils are wound on four-prong forms. The antenna winding is adjusted for low-impedance input and is not grounded in the receiver. Antenna connections are made to a pair of flexible wires running out from the back.

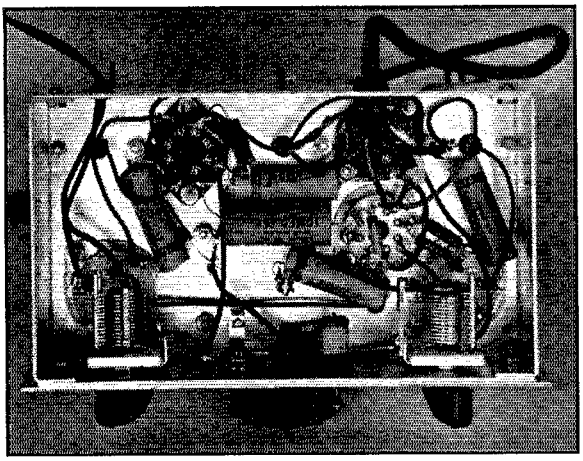
In the oscillator section, C_2 is the padding or band-setting condenser and C_3 the band-spread tuning condenser. The coils are adjusted to give practically complete spread of each band over the tuning dial. The circuit is the familiar tickler arrangement, preferred in this case because it permits grounding the cathode. The coils are wound on five-prong forms, two prongs for the tickler, one for ground, one for the grid connection (junction of the upper end of L_2 and the stator plates of C_2) and the fifth for the band-spread tap to C_3.

On the 1.75- and 3.5-Mc. bands, C_3 is connected across the whole of the oscillator grid coil, with a jumper in the coil form to make the necessary connection. On the 7-Mc. coil, C_3 is tapped down as indicated in the coil table for desired spread.

In the i.f. amplifier both transformers are the interstage type, since the output transformer works into a plate detector. The plate-type detector was used for several reasons, chief among them being the fact that it does not load its input circuit as does a grid-leak detector, thus making for better selectivity; the plate current is negligible, reducing battery drain; and it can handle fairly large signals so that reasonable audio output can be secured without additional audio amplification. The bias resistor, R_4, is by-passed by an electrolytic condenser, C_9. In the plate circuit a rather large by-pass, C_{10}, is used to cut down high-frequency response and thus reduce hiss and heterodynes. It has practically no effect on a normal 1000-cycle beat-note, however, nor on the intelligibility of speech.

The second 6C8G section is the beat oscillator, using a permeability-tuned transformer made for the purpose. The grid condenser and leak are built into the transformer. The plate is fed through the b.o. on-off switch and a 50,000-ohm dropping resistor, R_5, the latter serving both to reduce the current drain and to cut down the output of the oscillator to a value suitable for good heterodyning. Although not shown on the diagram, small capacitive coupling between the b.o. and the second detector is provided by a short length of wire, soldered at one end to the cathode terminal of the beat-oscillator section and with the other end twisted for a few turns around the lead from the 6K7 plate to T_2. This additional coupling is not strictly necessary, since there is some stray coupling between the two stages, but proves helpful in practice.

In the "A" battery circuit, one side of each heater is grounded; the others are connected in parallel and to the plus-A wire in the battery cable. Parenthetically, humless reception can be obtained with a 6.3-volt filament transformer



COMPARATIVELY FEW PARTS ARE NEEDED IN THE RECEIVER

In this bottom view, the detector tuning condenser is at the left and the oscillator padding condenser, with its band-setting "stops," at the right. Antenna connections are the twisted leads going through the rear edge of the chassis at the left.

instead of the battery. In the "B" circuit, screens and plates are operated at the same voltage. This not only gives best tube performance, but saves on resistors and by-pass condensers and simplifies the circuit.

There is no on-off switch on the set, either for the "A" or "B" batteries. It was considered that this switching can be grouped more conveniently with the transmitter switching in a coördinated design of which this receiver is one unit.

CONSTRUCTION

Since no standard chassis of suitable size was available, a chassis was made up in one piece from 1/16th-inch aluminum. Dimensions before bending are given in Fig. 2. Wherever a bend is to be made the aluminum should be scribed rather deeply on both sides so that the bends will be along the right lines and will approach a right angle as nearly as possible. A bench vise will be useful in making the bends. The small lips on the short side pieces should be bent down first then the longer sides, and finally the short sides should be folded under with the lips inside the long sides. Machine screws through the lips will make a tight and quite rigid job.

The top-view photograph shows how the parts are fitted on top of the chassis. The oscillator and detector coils are readily identified in this view. The tube just to the right of and behind the oscillator coil is the 6K8 mixer, this position being chosen for the tube so that the oscillator circuit leads would be short and therefore less likely to be "floppy." The band-spread condenser is in the center, mounted directly on the chassis; the stator connection from it drops through the chassis to the coil socket. Along the back, from left to right, are the first i.f. transformer, T_1, the 6K7, the second i.f. transformer, T_2, the 6C8G, and finally the beat oscillator transformer. The adjustment screws on the transformers project to the rear where they are readily accessible. Mounting them in this way necessitated drilling holes on the right-hand sides (from the front) of the shield cans to bring the grid leads

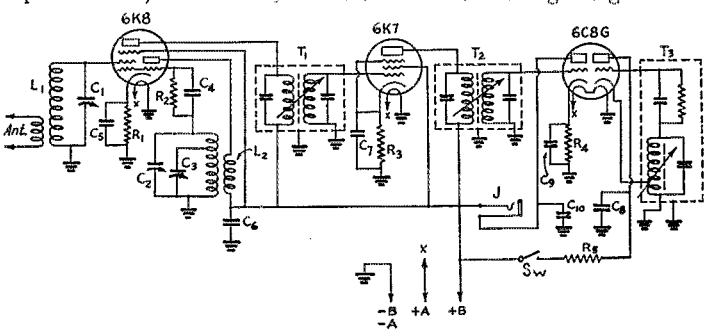


FIG. 1—CIRCUIT DIAGRAM OF THE PORTABLE 3-TUBE SUPERHET

C_1, C_2—100-μμfd. midget variable (Hammarlund HF-100).
C_3—35-μμfd. variable (Hammarlund MC-35-S).
C_4—100-μμfd. midget mica.
C_5-C_8, inc.—0.1-μfd. paper.
C_9—10-μfd. 25-volt electrolytic.
C_{10}—0.005-μfd. mica.
R_1—300 ohms, ½-watt.
R_2—50,000 ohms, ½-watt.
R_3—500 ohms, ½-watt.
R_4—10,000 ohms, ½-watt.
R_5—50,000 ohms, ½-watt.
T_1, T_2—460-kc. permeability-tuned i.f. transformer, interstage type (Sickles 6504).
T_3—460-kc. permeability-tuned b.o. transformer (Sickles 6577).
Sw—S.p.s.t. toggle switch.
J—Open-circuit jack.

L_1—1.75 Mc.: 70 turns No. 24 enamelled, close-wound, on 1½-inch form. Antenna coil 10 turns, ¼ inch from grid coil.
3.5 Mc.: 45 turns No. 22 enamelled, close-wound, on 1½-inch form. Antenna coil 6 turns, ¼ inch from grid coil.
7 Mc.: 18 turns No. 22 enamelled, close-wound, on 1½-inch form. Antenna coil 4 turns, ¼ inch from grid coil.

L_2—1.75 Mc.: 41 turns No. 22 enamelled, close-wound, on 1½-inch form. Tickler 13 turns, ⅛ inch from grid coil.
3.5 Mc.: 17 turns No. 22 enamelled, close-wound, on 1½-inch form. Tickler 6 turns, ⅛ inch from grid coil.
7 Mc.: 8 turns No. 22 enamelled, length ½ inch, diameter 1½ inches. Band-spread tap 6th turn from ground. Tickler 4 turns, close-wound, ⅛ inch from grid coil.

Note: L_1 coils wound on Hammarlund SWF-4 forms, L_2 coils on SWF-5 forms. Band-spread condenser, C_3, connected across whole of L_2 on 1.75 and 3.5 Mc.

out close to the tubes. Metal tubes in the first two stages avoid the necessity for tube shields and thus conserve some space. No shield is needed on the 6C8G.

In the bottom view, the first detector tuning condenser is at the left at the front edge of the chassis. Next to it is the 'phone jack (insulated from the chassis), then the beat-oscillator switch and, at the extreme right, the oscillator band-setting condenser. To facilitate rapid and accurate setting of this condenser for each band, it has been provided with a home-made gadget which stops the condenser at the proper setting. A disc about the size of a penny cut from thin sheet brass, with its rim smoothed down with steel wool, is soldered to the end of the condenser rotor shaft. A piece of half-inch wide brass strip, 1/16th inch thick, is fastened to the mounting angle on the condenser by a machine screw and projects slightly to the rear of the disc. A U-shaped spring made of thin phosphor bronze strip about 1/18th inch wide is soldered to the brass piece. At the free end of the spring a V-shaped projection rides against the edge of the disc. When the proper setting of the condenser is found for a band, a small notch is filed in the disc so that the "V" fits into it. When the condenser is turned, the disc slides along the spring until the "V" slips into the notch and locates the desired setting.[2] The "band-locater" is simple to make and is a worth-while addition to the set, although it is not absolutely necessary.

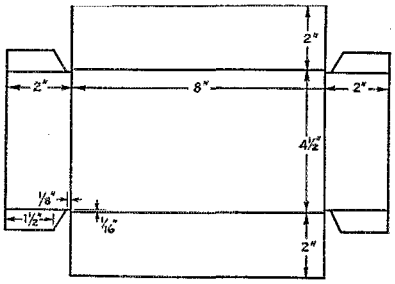


FIG. 2—CHASSIS DIMENSIONS BEFORE BENDING

The chassis is made of 1/16th-inch aluminum. The lips on the left- and right-hand side pieces are bent down at right angles, then the sides folded down to form the chassis.

The coil sockets are directly under their respective condensers. The socket at the left near the rear edge is that for the 6C8G, and that at the right is for the 6K7. These two sockets are the ordinary bakelite wafer type. The others are isolantite (National CIR) for more stable operation at the signal frequency, and for greater rigidity in the case of the coil sockets.

The location of by-pass condensers and resistors should be apparent after a little study of the bottom view. Grounds may be made to any convenient points on the chassis. There are comparatively few parts and hence not a great deal of wiring.

The panel is 8½ by 6½ inches, and is made of 1/16th-inch aluminum. With the exception of the tuning dial, none of the controls is mounted on the panel itself but on the front edge of the chassis. The dial, however, must be fitted to the tuning condenser after the panel is fastened in place. A fairly large hole should be drilled in the panel at the point where the tuning condenser shaft will be. The dial may then be taken apart and the mechanism connected to the condenser shaft and used as a template for locating the mounting holes. After drilling, the panel and dial mechanism may be reassembled to the chassis and condenser, and there should be no trouble with binding because of off-line shafts. It may be necessary to saw off a quarter inch or so of the condenser shaft to accommodate the dial coupling behind the panel. This type of dial, a National Type A, 3⅜-inch, is particularly recommended because of its good vernier ratio and large tuning knob, both of which mean less fatigue over a long period of operating. The full-vision feature is also helpful in making quick estimates of the position of a signal within a band.

Complete coil data are given in Fig. 1. The oscillator coils are fairly high-C as compared with the detector coils. In the case of the 1.75- and 3.5-Mc. oscillator coils, where the band-setting and band-spread condensers are simply in parallel, the coils were adjusted to give full spread, resulting in the use of less padding capacity on 1.75 Mc. than on 3.5 Mc. since a greater capacity change is needed to cover the range on the former band. On 7 Mc. practically full capacity of the band-setting condenser is used. The high-C circuits result in better stability, evidenced chiefly by lowered pulling effect of first detector tuning.

The 1750–2050-kc. and 3500–4000-kc. bands are spread over about 90 divisions of the 100-division dial. The 7000–7300-kc. band occupies about 65 divisions, which can be increased, if desired, by moving the tap for C_3 a fraction of a turn toward the ground end of the coil. This spread is adequate, however, since the number of kilocycles per dial division is actually less than on 3.5 Mc. because of the greater width of the latter band.

LINING UP

Preliminary adjustment of the receiver includes both lining up the i.f. and beat oscillator and finding the proper settings of C_1 and C_2 for the bands. A test oscillator is desirable for the former. Such an oscillator usually can be borrowed from a service-man friend or the local radio shop if nothing suitable is available in the regular station equipment. If the station receiver has a

(Continued on page 60)

[2] Older readers will remember that a similar arrangement was used on the R.E.L. receiver of about 1930.

A 250-Watt Output Crystal-Controlled 28- and 56-Mc. Transmitter

Low-Frequency Technique Applied to Ultra-High Frequencies

By Abe Hass, W2KPX*

NOW that the u.h.f. spectrum has been definitely allocated among the various services, the amateur may proceed to construct transmitters adapted to his particular frequencies, without fear of having to discard equipment at short notice. With this optimistic outlook we can now face those problems which often were conveniently shelved. That the Heaviside layer rarely reflects ultra-high-frequency waves, that the noise level in the neighborhood of these frequencies is extremely high, that occupancy near our bands by government and commercial interests is increasing, are all facts which demand consideration in the design of u.h.f. equipment.

The trend of the times for 56-Mc. is crystal control. QST has had several descriptions of low-power crystal-controlled 56-Mc. transmitters, portable and otherwise, but here is one which should satisfy the man who wants to put out a hefty signal on "five." It uses standard tubes and components in time-tried circuits. Furthermore, it includes both 56- and 28-Mc. output, so that its builder can get a taste of two almost totally-different kinds of operation.—EDITOR.

Since we do not normally rely upon skip effect for gaining distance on 56 Mc., it becomes evident that the ordinary working area is dependent upon power output. Overcoming the high noise level in the vicinity of the receiver requires a strong signal, which in turn necessitates sufficient power output from the transmitter. To keep within the limits of the amateur bands we must have something better than the self-excited variety of transmitter, which does not have the necessary stability. The final outcome will be a decidedly more elaborate job, but the results unquestionably make the expenditure and effort well worth while.

The transmitter to be described has been in use at W2KPX for the past several months and has given an exceptionally good account of itself. It is a self-contained r.f. unit, making a compact supplement to the regular low-frequency rig. The whole affair is mounted on a standard 10- by 23-inch chassis. A top and front view of the unit is shown in one of the photographs, giving a general idea of the layout. From left to right we have first the crystal-controlled oscillator, then an RK-49 tube acting as a doubler or quadrupler, depending upon the output frequency desired. The next stage consists of a single 809 doubler, in turn followed by a pair of 809's in push-pull as a straight amplifier. The final or power stage consists of a pair of HF-100's in push-pull.

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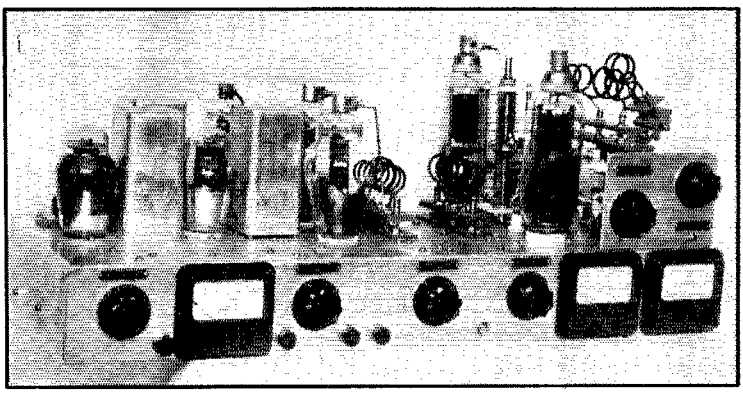
CIRCUIT AND CONSTRUCTION

The r.f. circuit diagram is given in Fig. 1. The oscillator tube is a 6V6G in the straight pentode circuit. Crystal control was chosen because of its inherent stability, a quality essential to the proper performance of a transmitter of this type. Every amateur knows the benefits obtained by having a rig with good stability, a subject which has been dwelt upon in practically every issue of *QST*. As shown in the photograph, the components in this stage above the chassis are



THIS 56- AND 28-MC. TRANSMITTER IS COMPLETE ON ONE CHASSIS. Normal input on both bands is 300 to 400 watts, but inputs as high as 600 watts have been used on 56 Mc.

the tube, crystal, miniature lamp, and tank coil and shield; all other components are placed underneath. This arrangement was used to make the leads as short as possible, consequently reducing stray capacities and inductances to a minimum. It may be well to mention at this point that the same care was exercised in the layout of the complete unit. The oscillator tank coil housed by the shield can is wound on a six-prong isolantite coil form which plugs into a mycalex socket mounted beneath the chassis. The shield can is fastened in place by means of four one-quarter inch tapped rods mounted on the chassis so as to fit the inside corners of the can.

The second stage is capacity-coupled to the oscillator through a 200-$\mu\mu$fd. condenser. For ten-meter output a 7-Mc. crystal is used in the oscillator and the second stage acts as a doubler. For five-meter output, either a 7- or 14-Mc. crystal may be used. With the former the RK-49 is operated as a quadrupler, and if the 14-Mc. crystal is used the tube is worked as a doubler. Since a reserve of driving power is available by utilizing the 14-Mc. crystal and doubling in the second stage, it is preferable to do so. For 2½-meter operation it is highly desirable if not essential to use the 14-Mc. crystal.

In this stage, like the preceding one, very little can be seen above the chassis. The tank coil is similar in construction to that of the oscillator. From the circuit diagram it will be noticed that the output circuit of this stage uses a split-stator condenser and coil combination. The lower portion of the coil is unused at the present time but provides a source of r.f. voltage if it is ever desired to neutralize this or the following stage.

The output of the RK-49 is coupled to the 809 doubling stage through a 100-$\mu\mu$fd. condenser. The tank coil is

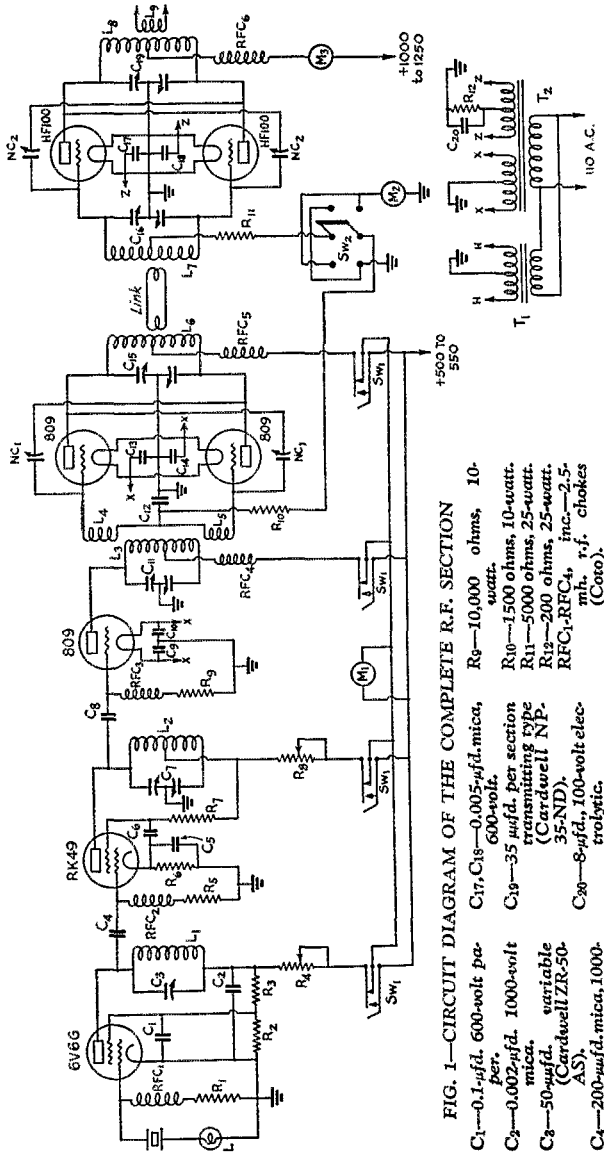
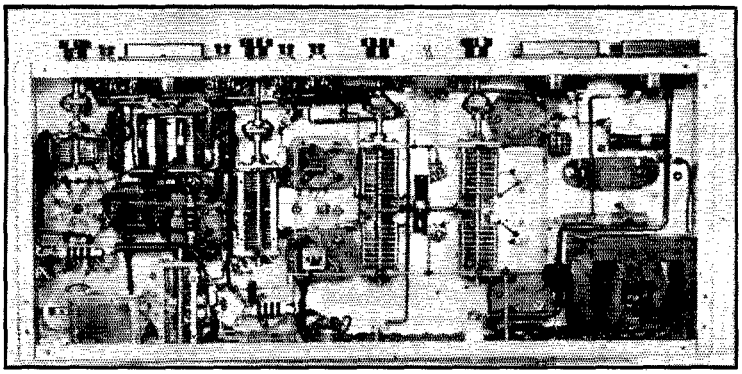


FIG. 1—CIRCUIT DIAGRAM OF THE COMPLETE R.F. SECTION

C_1—0.1-μfd. 600-volt paper.
C_2—0.002-μfd. 1000-volt mica.
C_3—50-$\mu\mu$fd. variable (Cardwell ZR-50-AS).
C_4—200-$\mu\mu$fd. mica, 1000-volt.
C_5—0.002-μfd. mica, 1000-volt.
C_6—0.1-μfd. 600-volt paper.
C_7—50 $\mu\mu$fd. per section (Cardwell ER-50-AD).
C_8—100-$\mu\mu$fd. mica, 1000-volt.
C_9, C_{10}—0.005-μfd. mica, 600-volt.
C_{11}—35 $\mu\mu$fd. per section (Cardwell ER-35-AD).
C_{12}—500-$\mu\mu$fd. mica, 1000-volt.
C_{13}, C_{14}—0.005-μfd. mica, 600-volt.
C_{15}, C_{16}—30 $\mu\mu$fd. per section (Cardwell ET-30-AD).
C_{17}, C_{18}—0.005-μfd. mica, 600-volt.
C_{19}—35 $\mu\mu$fd. per section transmitting type (Cardwell NP-35-ND).
C_{20}—8-μfd., 100-volt electrolytic.
NC_1—15-$\mu\mu$fd. variable (Cardwell ZT-15-AS).
NC_2—Twin neutralizing condenser with insulated coupling between units, 10 $\mu\mu$fd. per section (Cardwell ES-10-SD1.)
R_1—25,000 ohms, 1-watt.
R_2—20,000 ohms, 2-watt.
R_3—10,000 ohms, 10-watt.
R_4—4000-ohm slider, 25-watt.
R_5—50,000 ohms, 2-watt.
R_6—350 ohms, 10-watt.
R_7—15,000 ohms, 10-watt.
R_8—1500-ohm slider, 25-watt.
R_9—10,000 ohms, 10-watt.
R_{10}—1500 ohms, 10-watt.
R_{11}—5000 ohms, 25-watt.
R_{12}—200 ohms, 25-watt.
RFC_1-RFC_4, inc.—2.5-mh. r.f. chokes (Coto).
RFC_5, RFC_6—35-μh. r.f. chokes, Ohmite Z-2.
M_1—0-300 d.c. milliammeter.
M_2—0-100 d.c. milliammeter.
M_3—0-500 d.c. milliammeter.
T_1—6.3-volt filament transformer.
T_2—6.3- and 10.5-volt double-winding filament transformer (UTC).
Sw_1—S.p.d.t. push-button switch, locking type (Yaxley 2008L, one section used).
Sw_2—D.p.d.t. toggle switch.
L—Dial lamp, 60-ma.



THE BELOW-CHASSIS VIEW SHOWS A NEAT LAYOUT AND WIRING JOB

Particular care has been used to keep the wiring symmetrical and stray capacity and inductance low.

through the base ample clearance was allowed to reduce the capacity to ground and to prevent arcing over. The grid coil for the final stage is similar in construction to the buffer plate tank. Shields were fabricated for both coils, but in operation it was found that coupling between these coils and the plate tank coil of the HF-100's was imperceptible, and the shields therefore were discarded. Coupling between the buffer plate and amplifier grid circuits is through a one-turn loop at each end, with a line made up of two No. 10 wires spaced approximately 1/16-inch apart.

of the same type as the two preceding ones, but coupled to the following push-pull buffer stage through a fixed inductance wound on the tank-coil form. This type of coupling eliminates a grid tuning condenser, and with a slight amount of pruning of the grid coil very satisfactory results can be obtained. The neutralizing condensers are mounted beneath the chassis between the tube sockets. Adjustments can be made from above by means of a fibre or bakelite neutralizing rod through holes cut in the chassis. The condenser shafts are slotted to fit the rod.

To the right of the buffer tubes is the tank coil for the stage. This coil is mounted on a mycalex strip having five banana plugs, fitting into a similar jack strip bolted to the chassis. Where the jacks go

The final or power stage uses two HF-100's in push-pull. These tubes were chosen because of their high ratio of transconductance to inter-

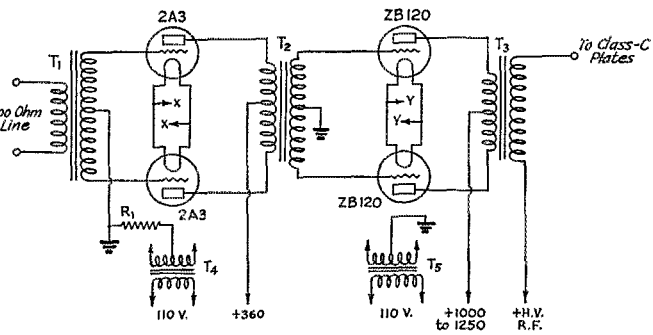


FIG. 2—MODULATOR AND DRIVER CIRCUIT DIAGRAM

R_1—800 ohms, 10-watt.
T_1—500-ohm line-to-grid transformer (UTC-PA135).
T_2—Class-B input transformer (UTC-PA53AX).
T_3—Class-B output transformer, variable ratio (UTC-VM4).
T_4—2.5-volt filament transformer.
T_5—10-volt filament transformer.

COIL DATA

For 28-Mc. Output with 7-Mc. Crystal:
L_1—17 turns No. 20 d.c.c. close-wound on 1½-inch form.
L_2—14 turns No. 20 d.c.c. on 1½-inch form, length 1⅛ inches.
L_3—6 turns No. 20 d.c.c. on 1½-inch form, length 1 inch.
L_4, L_5—4 turns each coil, close-wound on same form with L_3, ¼ to ⅜ inch from L_3; outside ends to grids.
L_6, L_7—10 turns No. 12 enamelled, diameter 1¾ inches, length 3 inches. Link 2 turns 1⅜-inch diameter inside coil at center.
L_8—8 turns No. 10 enamelled, 1⅞-inch diameter, length 4½ inches.
L_9—2 turns No. 10, 1⅞-inch diameter, length ½ inch.
For 56-Mc. Output with 14-Mc. Crystal:
L_1, L_2—8 turns No. 20 d.c.c. on 1½-inch form, length 1 inch.
L_3—4 turns No. 20 d.c.c. on 1½-inch form, length ½ inch.
L_4, L_5—3 turns No. 22 close-wound on same form as L_3, spaced ¼ to ⅜ inch from L_3.
L_6, L_7—6 turns No. 12 enamelled, diameter 1 inch, length 3 inches. Link 1 turn in center.
L_8—6 turns No. 10 enamelled, diameter 1⅛ inch, winding length 4½ inches.
L_9—2 turns No. 10 enamelled, diameter 1⅛ inch, length ½ inch.
Note: Coil diameters for self-supporting coils are outside measurements. L_1 and L_2 on National XR-20 forms, L_3 on Hammarlund CF-6 forms.

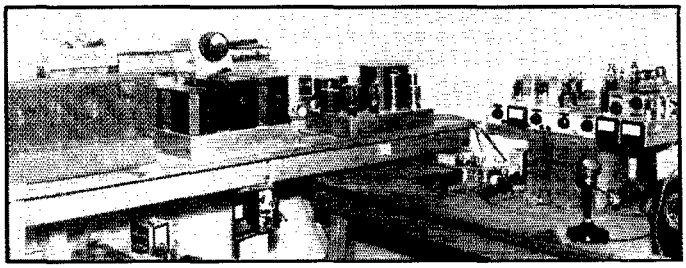
electrode capacitance. This means that the tubes are easy to drive, and at the same time, because of the construction and low capacities, they can be operated at full ratings at ultra-high frequencies. Particular care was exercised in laying out this stage so that good overall efficiency could be obtained, especially to keep stray capacities comparable to the tube capacities. The two neutralizing condensers are ganged in one assembly and mounted in a vertical position; this was done because the tubes have side grid connections and such a mounting resulted in the shortest possible leads.

The variable antenna link has worked admirably. It has advantages over the usual type by allowing for smooth control and having a plug-in arrangement for different sizes of link coils. Once the required conditions are determined the position of the link is maintained by a locking device. Locking is accomplished by a reducing shaft-coupling (⅜" to ¼"). The ¼-inch side fits on the link shaft and the ⅜-inch side on the panel bushings; by using set screws any position may be fixed.

A view of the layout beneath the chassis is given in a second photograph. The two filament transformers mounted on the rear edge supply all the tubes. While the rig was still in the experimental stage a third transformer was tried for the 809 tubes. This proved to be unsatisfactory since any position available was so situated that the introduction of the transformer caused severe unbalance. The final outcome was a transformer with two separate windings (extreme right in photograph) supplying the 809's and the HF-100's. It will be observed from the photograph that all the tank condensers are insulated from the front panel by means of an isolantite coupling. These couplings were used to insulate the condenser shaft from ground in the case of the series-fed tank circuit in the first stage, and to give a good layout and to compensate for any misalignment in the panel bushings in the other stages. In the second stage the tuning condenser has its control coming through the back of the chassis, but subsequent to the taking of the photographs the control was brought out through the front by means of a flexible shaft.

It may be well to mention at this point that ground returns are not dependent upon contacts to the chassis, because these may be a source of annoying difficulties at ultra-high frequencies. A No. 10 copper bus running almost the full length of the rig on both sides of the split-stator condensers, and having all ground connections soldered to it, has proved to be most satisfactory for this purpose. In the final stage it will be noted that the cathode bias resistor is by-passed by an 8-μfd. condenser. Among some amateurs it is believed that the cathode bias resistor for a push-pull modulated amplifier need not have a by-pass condenser, a belief which seems to have been founded on audio amplifier practice. However, such is not the case, and experience shows that the cathode bias resistor of a modulated r.f. amplifier requires a by-pass condenser of at least 8-μfd. to prevent degenerative effects.

Fig. 1 also shows the switching arrangement which enables reading the plate currents of all tubes with the exception of the HF-100's. By using one meter and four push-button locking-type switches one can read the plate current of any individual tube or of all the tubes collectively. This has a distinct advantage over any plug-in arrangement by making tuning more rapid, and also during operation of the unit by allowing a quick check on any difficulties which may arise. The grid currents of the buffer or the final stage may be read through one meter by utilizing a double-pole double-throw toggle switch as shown in Fig. 1.



POWER SUPPLY AND AUDIO UNITS ARE ON SEPARATE CHASSIS

This layout at W2KPX is used in preference to the customary rack so that changes can be made without difficulty.

ADJUSTMENT

The tuning procedure does not differ from that used with a transmitter designed for the lower-frequency bands. If a wave meter is not part of the station equipment it would be advisable to construct an absorption type with a neon indicator which can be roughly calibrated against a receiver. This will prove invaluable when quadrupling in the second stage, since it is important to distinguish between the third and fourth harmonics. Other than that no difficulty should be experienced in tuning the transmitter, and it will suffice to give the plate and grid currents under normal operating conditions.

Plate and Grid Current Readings

56 MEGACYCLE OPERATION

(With an applied plate voltage of 500 volts to exciter portion of transmitter.)

6V6G—Oscillator—Combined screen and plate	40 ma.
RK49—1st doubler—Combined screen and plate	70 ma.
809—2nd doubler plate current	75 ma.
809's Buffer plate current	150 ma.
HF-100's Final amplifier plate	250 to 300 ma.
809's Buffer grid current	40 ma.
HF-100's Final grid current	45 ma.

28 MEGACYCLE OPERATION

(The voltage for exciter portion is reduced to 360 V.)

6V6G	38 ma.
RK-49	40 ma.
809	65 ma.
809's	120 ma.
HF-100's	250 to 300 ma.
809's (Buffer grids)	40 ma.
HF-100's (Final grids)	45 ma.

(Continued on page 64)

Which Directive System?

Factors Influencing Choice of Directive Antenna Arrangements

By Hugo Romander, W2NB*

THE many varieties of antennas having more or less directional characteristics which have been described in radio publications in the past few years undoubtedly has led to confusion for many amateurs as to which design is most applicable to their individual needs and locations. A brief comparison of a few antennas of related design might therefore help a bit in making an intelligent choice, this comparison including two of the antennas described by Mr. J. D. Kraus in his very excellent article in the January, 1938, issue of *QST*.[1]

Referring to Table I, first and foremost is the simple doublet, this being the reference antenna with which all other antennas are compared. No mention need be made of the method of feed, so that this reference doublet may be either center or end fed, or single-wire fed, or simply fed from a bottle. It is of interest to observe that if this antenna is center-fed, it may be much shorter than a half wavelength without appreciable sacrifice in efficiency *provided* the losses in the wire are kept small by using larger-sized wire and improved insulation in both antenna and feeders. From a practical standpoint, this will permit shortening an antenna to about 0.2 wavelength before voltages and currents become so high that reasonable sizes of wire and the best insulation available absorb an appreciable portion of the power. Incidentally, antennas shorter than a half wavelength and hung horizontally, let us say, have a horizontal pattern somewhat broader than that of the horizontal doublet, making its "coverage" around the compass better than that of the doublet.

Choosing an antenna system is something like choosing a tube line-up for a new transmitter—there's an embarrassment of riches. The author here discusses some pertinent points in connection with simpler directive arrays.—EDITOR.

The second item in the table is our old friend the double Zepp, or two coaxial half-waves in phase. The gain of this antenna is 1.9 db, a rather small improvement when one considers that the length of the antenna has been doubled to obtain it. The third item is the double 230° Zepp with its gain of 3.0 db.[2] Here the extra length is more worth while, since a longer antenna costs little more if one has the space available. This antenna multiplies the effective power by 2 in the broadside direction, as compared with the simple doublet.

Then there is the 1-section W8JK antenna. With this antenna there is introduced the added complication of at least two spreaders to form a "flat-top" antenna. The possible gain of 4.1 db in either broadside direction may be slightly discounted by the fact that very low radiation resistance with consequent high currents and voltages will cause some loss, but nevertheless the improvement is well worth striving for in locations where space is limited to such a short structure. If the longer 2-section W8JK antenna can be installed, however, the mechanical difficulties are practically the same but the possible gain would then be 5.5 db—equivalent to increasing the power in a simple doublet to 3.55 times its original value. Here again the radiation resistance is very low and currents and voltages are high, with resultant loss in power which must be minimized by using generous-sized wire and the best-quality insulators. Gain in both broadside directions is the same and is accomplished by restriction of the lobes of radiation in both the horizontal and vertical planes.

Finally we come to the double 230° Zepp with reflector (or director). The very attractive gain of 7 db possible with this antenna together with the fact it is of the "flat-top" variety, makes it the logical competitor to the 2-section W8JK antenna, hence a direct comparison between these two antennas is of particular interest. For the sake of brevity, let's call the double 230° Zepp antenna the D230 antenna, hence the double 230° Zepp with reflector may be called the D230R antenna. Since the 2-section W8JK antenna is really two double 158° Zepps[3] operating out of phase, we might abbreviate this by calling it the 2D158 antenna.

* 200 Mt. Pleasant Ave., Newark, N. J.

[1] J. D. Kraus, "Directional Antennas with Closely-Spaced Elements," *QST*, January, 1938.

[2] H. Romander, "The Extended Double-Zepp Antenna," *QST*, June, 1938.

[3] This figure refers to the active portion of the two-section beam in which the inner ends of the elements are folded back to meet the transmission line, i.e., the element length is approximately 30 feet for 14 Mc. The antenna also can be constructed readily to have 180-degree radiating members, but the difference in performance will not be appreciable. —EDITOR.

The outstanding difference between these two antennas lies in their directional characteristics. Assuming both antennas are supported horizontally, the D230R obtains its 1.5 db extra gain over the 2D158 by suppressing radiation in one broadside direction. One might expect nearly 3 db extra from this, but the 2D158 gets an extra

TABLE I

Antenna	*DB Gain Backwards*	*DB Gain Forwards*	*Percentage Power in Single Doublet to Give Equal Signal*
Single Doublet.....	0	0	100
Double 180° Zepp...	1.9	1.9	155
Double 230° Zepp...	3.0	3.0	200
1—Section W8JK...	4.1	4.1	257
2—Section W8JK...	5.5	5.5	355
Double 230° Zepp with reflector.....	−7.0	7.0	500

boost from the fact its vertical pattern is narrower than that of the D230R. This fact places the 2D158 at a further disadvantage to the D230R where high angles of radiation are desired, but since the flat-top type of antenna will not generally be used for frequencies lower than 7 Mc., this point will probably not be of much importance.

Another point to consider is the loss due to low radiation resistance. Since the spacing between elements across the flat-top is 0.2 wavelength for the D230R, as compared with 0.125 wavelength for the 2D158, the radiation resistance of the D230R will be considerably higher. This will result in less copper and dielectric loss for the D230R, all other factors being equal. However, compared with the single doublet (S180), the radiation resistance of the D230 and the D230R is quite low and precautions against line losses are important.

To sum up the comparison between the D230R and the 2D158 antennas, the 2D158 will be most practical where space does not permit the longer D230R, where a bi-directional characteristic is desired, and where QRM from the opposite direction to a desired signal being received by the antenna will not be a serious factor. The D230R will offer definite advantages where space permits its larger dimensions, where transmission and reception in one general direction only is acceptable, or where transmission and reception in two opposite sectors is desired and is accomplished by bringing a separate transmission line into the operating room from the reflector to permit quick change of tuning from reflector to director,[2] and where QRM from a direction opposite to the desired direction is a serious factor. Perhaps one should also give consideration to the possibility of causing less QRM to others by the use of a unidirectional antenna.

The A.R.R.L. National Convention

PLANS for the A.R.R.L. National Convention and amateur radio equipment show to be held at the Sherman Hotel in Chicago over Labor-Day week-end, September 3d, 4th and 5th, are progressing rapidly and at this early date point to the finest amateur convention ever held. The convention is to be conducted by the Chicago Area Radio Club Council, which sends us the following announcement of their plans:

Judging from advance ticket reservations and from comparison with the large convention held here two years ago, all indications are that a record crowd of between 4000 and 5000 amateurs from all the states and several foreign countries will be on hand.

The Convention Committee has outlined a program which will cover all phases of amateur radio and will include educational, entertaining and official matters. Under the educational part, the outstanding speakers in every branch of amateur radio have been invited to speak. Already such prominent men as Frank Lester, W2AMJ, on U.H.F.; Ted McElroy, the speed champion; W8JK on antennas; Fritz Franke on airways radio, and others, have indicated they will be on hand. By convention time the program will be enriched, no doubt, by the presence of such men as Dr. Lee de Forest, John Reinartz, Boyd Phelps, Dave Evans, etc. There will be demonstrations of television, receivers, transmitters, and many group meetings for 'phone, cw, DX, uhf, AARS, NCR, and many more.

The finest entertainment ever shown at an amateur convention is planned. The floor show from the Hotel Sherman's famous College Inn will be on hand, there will be stars from N.B.C., C.B.S. and M.B.S., as well as stars from local broadcast stations, and the hit of the '36 show, SMITH, will again be on our program. A big Saturday night informal party will be held, and on Sunday evening a huge banquet with additional novel types of entertainment. Many side trips to Chicago manufacturers' plants are planned.

Mr. K. B. Warner, Secretary of the League, who has accomplished more for amateur radio than any other man, will be here in person to discuss with us the various problems of the League.

The League part of the program will be held on Sunday afternoon when you will be able to see

(*Continued on page 66*)

1938 Paley Award Goes to W9MWC

LAST June 9th Robert T. Anderson, W9MWC, of Harrisburg, Ill., was presented with the second annual Paley Amateur Radio Award by William S. Paley, president of the Columbia Broadcasting System, at a presentation luncheon at the Waldorf-Astoria in New York.

W9MWC was chosen for the award on the basis of his work during the 1937 Ohio River Valley flood, as reported in the May, 1937, issue of *QST*. In making the presentation, Mr. Paley made the following citation:

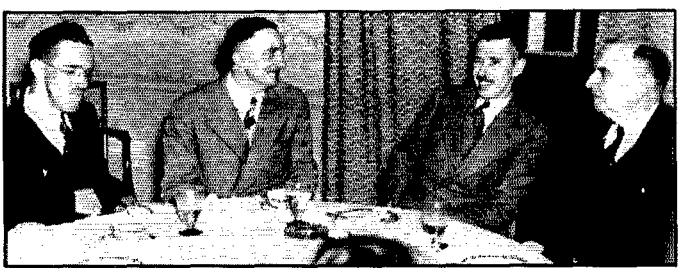
"On behalf of the Board of Awards, I present this to you . . . for meritorious performance during the 1937 Ohio River flood from January 22nd to January 25th . . . for proceeding with your amateur short wave equipment from Harrisburg to the relief of the isolated inhabitants of Shawneetown, twenty-three miles away . . . for transporting this equipment in the height of a blizzard, in a small open boat, over great areas of water running at flood force . . . for setting up your transmitter in a raging storm at 12 degrees above zero and establishing the first communication direct with relief agencies . . . for the exercise of extraordinary perseverance and ingenuity at the risk of your own life in bringing relief to eleven marooned people near Junction, sending food and supplies to the 1500 isolated inhabitants of Shawneetown and bringing about their eventual evacuation . . . for coöperating unceasingly with the military and civil authorities through more than forty hours of intense activity without sleep and then again manning your station and again serving the entire southern Illinois area with the transmission of official communications throughout the duration of the emergency . . . and finally, because throughout these activities, you exemplified the highest standards of amateur radio operation."

W9MWC accepted the award "as a representative of that great body of hams whose world knows no boundaries and whose proudest and happiest moments are when they are able to render service in disasters or emergencies." Following the acceptance speech, Vice-President George W. Bailey again assumed responsibility for the permanent trophy on behalf of A.R.R.L. and expressed amateur radio's appreciation to Mr. Paley for his recognition, stating that in the search for the winner of the award many good deeds are brought to light that might otherwise have escaped attention.

The presentation ceremonies, in which a number of dignitaries participated including Rear-Admiral Waesche, Commandant of the U. S. Coast Guard and Captain Hooper, the Naval Director of Communications, were broadcast over the C.B.S. Network.

The award is made annually to the U. S. or Canadian radio amateur who, in the opinion of an impartial Board of Awards, has contributed most usefully to the American people. The Board of Awards consisted this year of the Hon. Norman H. Davis, Red Cross Chairman; Lieut.-Commander C. P. Edwards, Chief of Air Services for the Dominion of Canada; Dr. J. H. Dellinger, Chief of the Radio Section of the U. S. Bureau of Standards; Prof. A. E. Kennelly, Professor Emeritus of Electrical Engineering at Harvard University, and Rear-Admiral Waesche. The first Paley Award, given last year, went to Walter Stiles, Jr., W8DPY, for his work in the 1936 Pennsylvania flood.

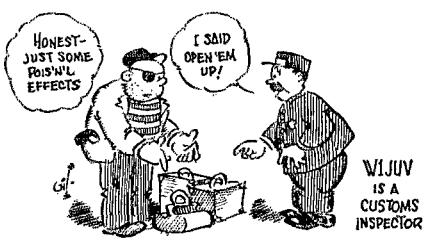
According to the St. Louis *Post Dispatch*, Anderson "performed an act of heroism during the flood of last year which will be remembered for a long time along the Ohio River." It will be remembered for a long time by the radio amateur fraternity, too, for Anderson's performance is unquestionably one of the most outstanding in amateur history. —*C. B. D.*



HANDY, BOB ANDERSON, WARNER AND WDRC'S DOOLITTLE TALK IT OVER

The Cover

THIS month the picture is of the new Maxim Memorial Station now being completed at Newington, Conn. Scheduled operation of W1AW is to begin early in September.



56 Mc. Goes on Annual Frolic

"Five" Opened Wide for DX During May and June

TRUE to form, the month of May 1938 saw the 56-Mc. band take its annual DX-fling. This makes the fourth consecutive year that five meters has opened for long-distance work during May. But this year the splendid performance of the band surpassed all previous accounts and continued into the month of June. It was the most widespread 56-Mc. DX Party yet noted, with some 150 stations figuring in the 900–1500 mile QSO's, and many more stations being logged over equal distances!

We wish to extend sincere thanks to the operators who submitted reports on the unusual conditions. Unlike last year, reports were plentiful, the following sending very complete information: W1ALP AUN EKT IJ KZH HXE JKT JRS DFY HDQ GIJ EHT JBF JVA KUB CLI KBL KH BPI KJT CBG W2IEK HKU HZL DVC KFB COK KTF HBO KBG IXY AOE GME W3QV DNU EZM FVS DOD BZJ FX W5AJG BHO EOO W7FPN GLH W8OKC CIR NED MST AGU PK RVT PBX EFW PNU MSK QDU QFV W9ZGD TZQ BRY ARN CCY LNV LEZ VSX USH ZJB RBK UIZ NY H. W. Swanson and Eugene Schraut.

June 5th was the banner day, and most of the reports received cover that Sunday's activities. However, let us review the preceding days of the unusual series before covering in detail results on the 5th. July *QST*, page 59, carries a preliminary summary of the 1938 five-meter DX spree.

According to reports **May 12th** started the ball rolling, with the West Coast getting in the first licks. F. W. Linklater, W7FPN, writes, "A letter from W7AQJ, Vancouver, Wash., tells of five opening up so that W6's came in like locals on May 12th. He worked five stations—W6IOJ, W6MKS, W6DNS, W6AVR and W6GZE—and has 'heard' cards from others. Several Portland, Oregon, stations were reported being heard, but only QSO was W7ABZ to W6IOJ." The longest distance represented in this work is W7AQJ-W6MKS/W6DNS (San Diego) . . . close to 1000 miles!

May 15th was apparently the first DX day in the east with W4EDD, Coral Gables, Fla., rolling up an impressive list of QSO's with the W1's, W2's, W3's and W8's.

May 19th is the next day for which DX was reported. W5EHM, Dallas, Texas, seemed to be the star performer, working a bunch of W8's and W9's. Conditions were good this date between W5 and W8-W9 and between W8 and W9.

On **May 22d,** W5AJG, Dallas, Texas, found the band open from 8:00 to 8:30 P.M. CST. He heard W9CLH and W9ANA.

May 27th found the band open (according to W9NY) from Wisconsin to the east coast from about 7:45 to 8:45 A.M. CST, and to W5 at 5:30 and 7:30 P.M. CST. In the evening W8QDU had a short contact with W5EHM. W8QFV also heard EHM. W9CCY, Council Bluffs, Iowa, heard and called (not sure of contact) W5EHM at 5:32 P.M. CST.

On **May 28th** "five" opened up in the southeastern part of the country and W4EDD made contact with W5EHM. East-West contacts between W9's and the east coast were quite numerous, as reported in July *QST*.

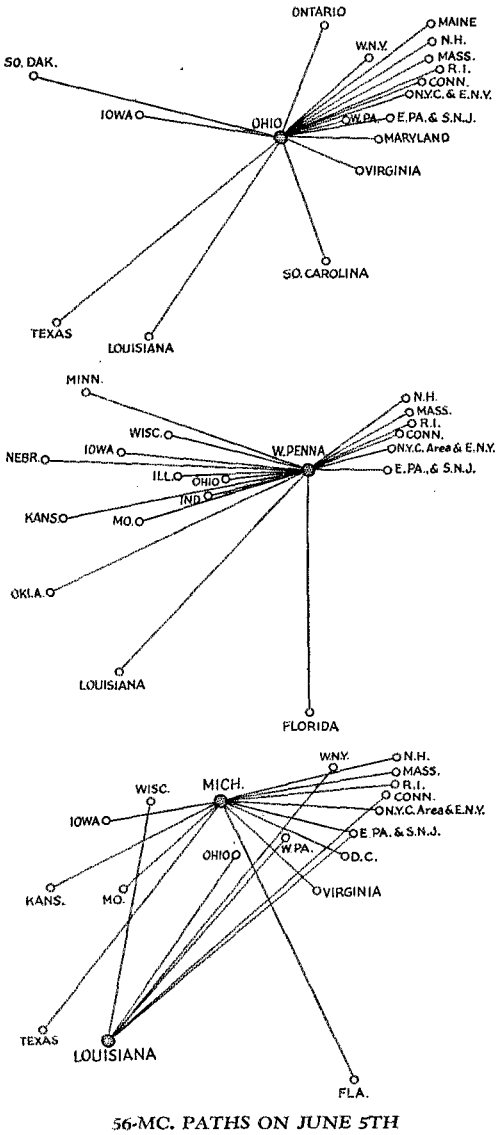
May 30th W8QDU (Michigan) had a good contact with W5EHM, and heard W8CIR, Pittsburgh. W8QFV (Ohio) also logged W5EHM. From this date on through June 6th we find DX reported for each day.

May 31st: W9NY reported 56 Mc. open to W5 for a few minutes at 1:30 P.M. CST, and open to the east coast and W5 at several other times. W9RBK, Kentucky, worked W5EHM at 1:00 P.M. **June 1st:** W8RVT, Springfield, Ohio, worked W5EHM at 1:05 P.M. and again at 1:25 P.M. EST. W9RBK worked W5EHM, 1:00 P.M. W5AJG worked W8EUX, W8CIR and W8OPO from noon to 12:16 P.M. CST. He heard W9ISM at 4:48 P.M. **June 2d:** W1HDF, Elmwood, Conn., worked W9ALE, Chicago, at about 8:00 P.M. EST. HDF also heard W9ALE between 10:00 A.M. and noon. W9RBK worked W3HKM, 1:20 P.M., heard W1EYM. **June 3d:** W8QFV, Blacklick, Ohio, worked W1IZY at 6:30 P.M. **June 4th:** W8QFV heard W1IZY, 10:40 A.M.

June 5th

And now we come to Sunday, **June 5th!** This was the real history-making day. Paths taken by five-meter signals on the 5th are indicated in several representative diagrams appearing with this write-up. It will be noted that the coverage was extremely widespread. Stations in some thirty states participated in the work.

Signals covered distances in excess of 1500 miles and practically all reception and contacts were over distances greater than 900 miles. Among the outstanding DX contacts were those between W9USH, Brookings, S. Dak., and W2JCY, W2KTC, W2MO and W2DB, all close to 1300 miles. W9ZJB, Kansas City, Mo., spanned 1100 miles in contacts with W2HWX and W2ISY. Reception was reported of signals between Texas and New England (about 1560 miles), between Nebraska and Eastern New York state (1400 miles) and between Florida and New England (1300 miles). The diagrams give a striking



56-MC. PATHS ON JUNE 5TH

picture of distances and directions covered. W7EYN, Seattle, Wash., was reported heard by several operators in the Philadelphia region. Quoting from the "Atlantic Division Emergency News": "It has been reported by W9CCL that Sunday, June 5th, while the band was open he heard VK2NO. It has also been reported that the east coast had worked G5ML and G5BY." Although no *definite* reports have been received of such extreme DX as VK, or G, W1HXE heard a station signing G5ML during the morning period. W1EKT, Wakefield, Mass., was informed that W6FN and W6ITH were heard in that vicinity, but he did not personally hear them.

On June 5th, 56-Mc. was open first from about 7:30 to 11:30 A.M. CST, with activity peaking between 8:45 and 11:00 A.M. CST. The bulk of work was between the East Coast and W8-W9, with some W4's and W5's reported by the northeastern states.

Reported open next from 2:00 to 10:30 P.M. CST, the band's activity peaked again between 4:45 to 8:00 P.M. for East-West work, with W4's and W5's again reported in the northeast. 9:45 to 10:30 P.M. CST was reported by W9NY and W9ZGD as best for W5 in Wisconsin.

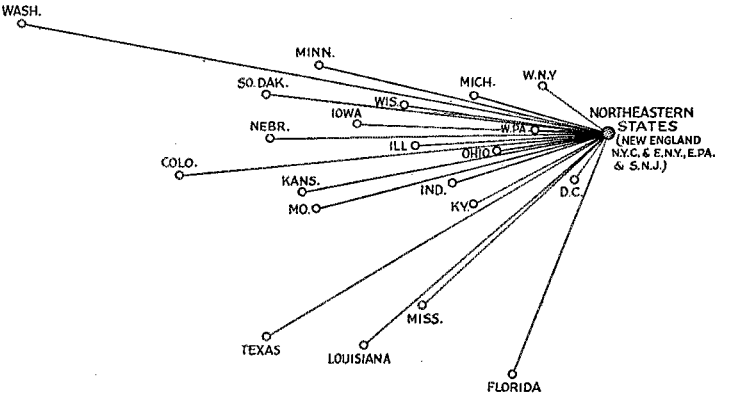
W3FVS observed that the DX peak occurred at sunset. W9NY found that in the morning period reception started with W8's and drifted to the east coast; in the afternoon-evening, reception started with the east coast and drifted somewhat closer.

Mr. J. A. Pierce, W1JFO of Cruft Laboratory, Harvard University, provides interesting data on E layer activity, measured at low frequencies on June 5th, which coincides with the 56-Mc. performance. He reports, "Our 3.5-Mc. pulse measurements show abnormal E layer reflection on June 5th from about sunset to 2050 EST. This abnormal reflection began before the end of the normal daytime E layer reflection so that we can set only an approximate time for its beginning. Abnormal reflection of this sort is very common at this time of year. The interesting thing, however, is that the intensity of this reflection, and presumably the ionization density at the lower boundary of the E layer, increased to a very high value between 1912 and 2035 EST. During this period the reflections were the strongest, as indicated by the observed number of multiples, that have occurred in at least the last two or three months. It is interesting to note that this period checks quite well with the time when the long-distance signals were being heard, and I think it is probably one of the first good correlations between E layer activity measured at low frequencies and 5-meter transmission."

The extraordinary conditions followed heavy thunderstorms in many localities. Rapid fading was extremely prevalent on DX signals, often making it difficult to get a station's call letters. The strength of local signals dropped below par during the DX periods, long-distance signals many times equalling the locals. Very short skip was noted on 28 and 14 Mc. at the time 56 Mc. was alive with DX. The most outstanding signal reported in the East was W9CLH, Elgin, Ill. A minimum of fading was reported on CLH and strength was very good. W8JIN, W8RSS, W9ARN, W9FEN, W9FP and W9NY are also reported as having outstanding signals. W1GYT, W1JQA, W1KEE, W2MO and W3EZM are named as outstanding signals by W9's.

An interesting point brought out by the various reports is that a high location, in the clear, is not

a necessity for successful 56-Mc. work. For example, W8QFV, who worked several W1's and W2's and heard scores of DX stations during the May-June periods, is surrounded on three sides by a cliff. W1HXE, who logged 68 DX stations in three and three-quarters hours, writes, "My location is one of the very lowest in the city, a little higher than our recent flood level, completely surrounded by large hills in every direction. The location and antenna are so low that I have a hard time working nearby towns of Lowell and Haverhill, nine miles away." Practically all operators who succeeded in making contacts or hearing DX were located at their regular home QTH's with normal set-ups.



56-MC. PATHS ON JUNE 5TH

According to reports received the following-listed made DX contacts on June 5th. In this list and later "heard" lists it is likely that errors in call letters have occurred because of difficulty in logging calls due to QRM, fading, poor enunciation, etc. However, all calls have been checked against the latest amateur call book and no calls are listed unless they appear in that publication.

Stations That Made 56-Mc. DX Contacts June 5th

W1AGR AUN BJE CMP EHT EKT EYM IAH IGJ IJ (Five W9's) IJG IUI IUR IVA IXP IYT IZY JFK JHL JKT JLI JQA JQO JUJ (Seven QSO's) JUN JXN JZE JZN KAD KCG KEE (Many QSO's) KEK KEM KH (W8 & W9) KIB KIC KJT (Six W8's & W9's) KNN KPM KUD KXF KXK LAB MJ QV W2ANM COK (Eight W8's & W9's) DB DMM GAH GHV HWX HYJ HZL ISY IXY JCY JLY KHK KHR KLZ (Ten QSO's) KNV KTC LAH LEY MO W3AIR AYF BYF (Four W9's) BZJ (Three W9's) CUD (Two W9's) DOD (Three W8's) ERA EZM (Ten W8's & W9's) FLL FOP FSS FVR (Three W9's) GEF GHO GQK (Two W9's) GQS MV NU VX W5AJG (Six W8, W9) ETQ ZS W8AGU (Three W9's & W5) CIR (Two W1's, Two W2's, Seven W9's & W5) CLS (W5 & W9) DSU EGQ EID GU JIN JLQ LL MST (W5 & W9) NED (Two W1's, W9 & W5) NF NKJ OIA OJF OPG ORA OTG PNU (Seven W1's, W2's, W3's) QDU (Six W2's & W3's & W5) QFV QKI RRH RSS RVA RVP RVT (Thirteen W1's, W2's, W3's, W8's) VO (Four W1's, One W2, Two W5's, Two W9's, One VE3) W9AHQ AHZ ARN (Fourteen W1's & W2's) CCY (W2) CLH (Many QSO's) FEN FP GGH GKO HPP IVC JRM JUE LLC (W1's, W2's) LNV (Six W1's, W2's & W3's) LVK LYI MXK NY OLY (Four W2's, W3's) OVK PQH QFX QHR RBK TMM (About ten QSO's) UIZ (Four W8's) USH (Four W2's) VSX (W1, W2) WLX WTV WWD YGS YGZ YMG YSV ZGD (Sixteen W1's, W2's, W3's) ZJB (Two W2's, Six W8's) ZPJ ZSS ZUX W1DCG.

The power input at several successful stations will be of interest. W5AJG ran 50 watts, crystal control; W8PNU 30 watts, long lines; W8RVT 300 watts; W8AGU 250 watts, c.c.; W2COK 65 watts, long lines; W3BZJ 75 watts, c.c.; W3EZM, 150 watts, c.c.; W9LNV, 25 watts; W8CIR 250 watts, c.c.; W9ARN 100 watts. It will be noted that moderate powered stations shared DX with those of higher power. High power was not a necessity. The opinion of most five-meter observers is that stations having stable signals (preferably crystal control) get through best. There are exceptions to the rule, of course, but quite a number of the stations making DX contacts during May and June used crystal.

Following "the big Sunday," June 5th, five-meters continued to open up on various days through the whole month of June. **June 6th** saw a considerable amount of activity. W8QFV, Ohio, worked W1DWR, W2LEY, KLO, FZA, JCY and LFM between 6:47 and 7:10 P.M. He heard W2ITU, DTE and IRY. Between 5:20 and 5:55 P.M. CST, W8RVT, Ohio, worked W2HJE, FZA, HYU, KYY, HKE and LFL. W8NED, Pittsburgh, reports the band open for about 10 minutes at 7:42 P.M. CST, W8CIR working a W9 at 7:45 P.M. W9RBK, Newport, Ky., heard W1JLK at 7 P.M. Between 5:30 and 6:30 P.M. CST, W2HBO, Ridgewood, N. Y., heard W8RVQ and other W8's; reports signals not as strong as on June 5th. W1KJT, Middletown, Conn., worked W9WLX, W8EGQ and W8RSS on the evening of the 6th. W1IJ heard W8EGQ at 5:30 P.M. CST.

June 8th, W9CCY, Council Bluffs, Iowa, heard W8ANT and W8AGE about 10 A.M. CST.

(Continued on page 70)

What the League Is Doing

League Activities, Washington Notes, Board Actions—For Your Information

F.C.C. Notes The Federal Communications Commission is engaged in revising all of its regulations with a new uniform printing, a new numbering system, etc. Work has now commenced on the revision of amateur regulations and the League is being given an opportunity to participate in the discussions. The basic structure of our rules will not be changed, but we may well experience some new requirements based upon the observations of the monitoring stations in recent years. When the new regulations appear, late in the summer, they are expected to contain the new provisions for amateur emergency communication requested by the A.R.R.L. Board, the long-expected revision of the portable rules, and the removal of television transmission from the 1.7- and 56-Mc. bands.

There is going to be some delay in shifting our 1715–2000 band to 1750–2050. The frequencies between 2000 and 2050 kc. have to be cleared for our occupancy and the whole question of moving us is tied up with moving part of the police system, on whose behalf the original idea of moving us was generated. These stations will have to be given due notice before their frequencies are changed, so that it will probably be autumn before we are shifted.

There were about 49,600 valid amateur station licenses in the U. S. A. on June 30th, the end of the government's year, comparing with 47,444 a year previous, indicating that we maintain our steady progress.

The Commission has ruled that amateur portable-mobile stations may be operated on board American vessels, on frequencies above 28 Mc., in American waters and on the high seas—at any place except in foreign waters.

Just how pure is the plate supply of amateur transmitters supposed to be? The Commission engineers say that it is supposed to have no modulation whatever; they do not recognize any percentage tolerance of ripple. Monitoring stations are not supposed to get too "technical" and cite a fellow for having a modulation hum 100 db down from the signal, something that can be heard only with the volume control wide open. But if it can be heard at normal volume it's too much, they say.

Our Board's proposal that the Commission appoint some amateur deputy inspectors to assist in the policing of the amateur bands is viewed with considerable favor in some quarters of the Commission. The proposition is now under study and we hope for more definite word on it soon.

Exec. Com. Minutes Continuing the publication of minutes begun last month, we present now the minutes of the several meetings of the A.R.R.L. Executive Committee held between the last two meetings of the Board of Directors:

MINUTES OF EXECUTIVE COMMITTEE MEETING

No. 148

July 10, 1937

Pursuant to special call, the Executive Committee of the American Radio Relay League, Inc., met at the headquarters office of the League in West Hartford, Conn., at 9:40 A.M., July 10, 1937, under the chairmanship of Vice-President George W. Bailey. Other members present were Treasurer A. A. Hebert, Communications Manager F. E. Handy, Secretary K. B. Warner.

On motion of Mr. Hebert, formal approval was given the holding of the following A.R.R.L. conventions:

Oklahoma State (West Gulf Division), Tulsa, Okla., July 17–18, 1937, auspices Tulsa Amateur Radio Club.

Rocky Mountain Division, September 4–5, 1937, Colorado Springs, Colo., auspices Pike's Peak Amateur Radio Association.

South Dakota State (Dakota Division), September 4–5, 1937, Sioux Falls, S. Dak., auspices Sioux Falls Amateur Radio Club.

Central Division, September 4–5–6, 1937, Detroit, Mich., joint auspices Central Division Radiophone Association, Detroit Amateur Radio Association, Motor City Radio Club.

Hudson Division, Asbury Park, N. J., September 23–24–25, 1937, auspices Jersey Shore Amateur Radio Association.

Midwest Division, Kansas City, Mo., October 9–10, 1937, joint auspices Heart of America Radio Club, O.B.P., and Kaw Valley Radio Club.

Northwestern Division, Sunrise Park, Rainier National Park, Wash., August 28–29, 1937, sponsored by Director Gibbons.

On motion of Mr. Handy, affiliation was granted by unanimous vote to the following societies:

Olney Amateur Radio Club (re-affiliated)	Philadelphia, Pa.
The Amateur Radio Communications Society	Verona, Pa.
New Bedford Amateur Radio Association	New Bedford, Mass.
Four Lakes Amateur Radio Club	Madison, Wis.
Palo Alto Amateur Radio Association	Palo Alto, Calif.
100 What Club	Modesto, Calif.
Co-Goth Radio Club	Cozad, Gothenburg, Nebr.
Tempe Amateur Radio Association	Tempe, Ariz.

On motion of Mr. Handy, the affiliation of the following societies was regretfully terminated for non-compliance with the regulations of the Board, with a statement of the League's willingness to re-affiliate if and when said clubs again comply with the Board's regulations.

Shamokin Radio Club	Shamokin, Pa.
San Bernardino Radio Club	San Bernardino, Calif.

Raritan Valley Radio Club.....South River, N. J.
St. Joseph Valley Amateur Radio Club.....Mishawaka, Ind.
Highland Park Amateur Radio Club.Highland Park, Calif.
Walnut Valley Radio Club.....Arkansas City, Kan.

Mr. Handy gave an extended report of his search for a location for the new headquarters station W1AW, describing many possible sites investigated in three towns and the eventual selection of a most favored one in the town of Newington, distant approximately 4.5 miles by road from the headquarters office. The members of the Committee had inspected most of these sites and all the Committee members had carefully inspected the favored site. Mr. Handy pointed out that the Board's request for additional facilities above those that had been appropriated for, particularly in the matter of directive antennas, meant that the cost of the station must be expected to go over the Board's appropriation, which itself was less than the minimum estimated cost of the station. The proposed location was on a isolated site in Newington, of approximately 7 acres extent; the tax rate was 24 mills; zoning difficulties had been adjusted satisfactorily; power would have to be run in a distance of 0.2 to 0.3 mile on poles already existing; a water line would similarly have to be run in. After extended discussion, on motion of Mr. Handy, it was unanimously voted that the Communications Manager is authorized to conclude negotiations with Miss Elsie Starr, of Hartford, Connecticut, for the purchase of a site of land in Newington by the League, subject to complete survey and search of title, being 7 to 7.5 acres, at a price of $300.00 cash per acre, for the purpose of the Hiram Percy Maxim Memorial Station; the said piece being described as running about 350 feet on the east or front along Main Street, Newington, bounded on the south for about 900 feet by Orchard Lane, on the north for about 860 feet chiefly by property belonging to John Schwager, and running west on property of Elsie Starr to a certain distance to make between 7 and 7½ acres, the west line being approximately 350 feet in length. The Secretary was directed to arrange immediately for a search of title.

The Committee engaged in extended discussion of the desirable type of operating building. Mr. Handy presented preliminary sketches by an architect which were, however, regarded as entirely unsatisfactory. The Committee believed that an appropriate building should be of colonial style, disposed to present its longest elevation to the highway, and so planned as to permit future enlargement. After the discussion, the Communications Manager was requested to bring in definite plans and specifications for a station building along the lines discussed.

The Committee discussed a dilemma brought about by the Board's action in voting to hold a national convention next year and to hold the Board meeting at the same time and place. A constitutional limitation made it impossible to hold the Board meeting other than in the month of May, a most disadvantageous time to hold a national convention. Moreover, it has been developed that the San Francisco Exposition was not to be held until 1939. After extended discussion, on motion of Mr. Hebert and by unanimous vote, the Secretary was directed to present this matter to the Directors by letter for their further consideration, and to solicit a mail expression from each.

The meeting adjourned at 11.30 A.M.

K. B. WARNER,
Secretary.

MINUTES OF EXECUTIVE COMMITTEE MEETING

No. 149

November 1, 1937

Pursuant to the requirements of by-laws the Executive Committee of the American Radio Relay League met in the Headquarters office of the League in West Hartford, Conn., at 1:45 P.M., November 1, 1937 with President Eugene C. Woodruff in the chair and Vice-President George W. Bailey, Treasurer A. A. Hebert, Communications Manager F. E. Handy and Acting Secretary A. L. Budlong present.

The Acting Secretary read a letter from the Trenton Radio Society of Trenton, N. J., suggesting that individual members of the League be permitted to contribute towards the building of the Headquarters Memorial Station and requesting the publication of their letter in *QST* to stimulate such response. In the ensuing discussion members of the Committee were unanimous in expressing doubt as to the advisability of such action, for a variety of reasons. The Acting Secretary was, therefore, on motion of Mr. Bailey, instructed to convey to the Trenton Radio Society the Committee's regret that it did not believe such a plan would be feasible.

On motion of Mr. Handy affiliation was granted by unanimous vote to the following societies:

The 56-Mc. Minutemen.....Massachusetts
The Mike & Key Club of Ithaca..Ithaca, N. Y.
Kalamazoo Amateur Radio Club..Kalamazoo, Mich.
Greater Cincinnati Amateur Radio Association.....Cincinnati, Ohio
Northern Alberta Radio Club....Edmonton, Alberta, Can.
Azalea City Wireless Club.....Palatka, Fla.
The Chair City Radio Association.....Gardner, Mass.
VE Operators' Association.....Toronto, Ontario, Can.

Ratifying previous informal agreement among a quorum of members of the Executive Committee, the Committee, on motion of Mr. Hebert, approved the holding of the following conventions:

Maritime Division Convention at Halifax, N. S., September 4–5–6, 1937, auspices Halifax Amateur Radio Club.

Southwestern Division Convention at Tempe, Arizona, October 23–24, 1937, auspices Arizona Section Radio Club.

Massachusetts State Convention at Boston, Massachusetts, October 2, 1937, auspices Eastern Mass. Amateur Radio Ass'n. and South Shore Radio Club.

The Acting Secretary announced that the Headquarters had recently been in receipt of a letter from Mr. Philip E. Haller, Secretary, Chicago Area Radio Club Council, stating that the clubs of the Chicago area, through the Council, had unanimously voted to request the Board of Directors of the American Radio Relay League that the national convention be held at Chicago on September 3, 4 and 5, 1938 under the Council's auspices. The letter set forth that the Council is made up of twelve of the most active clubs in the Chicago area; it listed a tentative convention committee of nine individuals, five of whom had served on the convention committee of the Central Convention Committee in 1936; it stated that at the present time $500.00 is available in the Council's funds, pointed out that for the convention in 1936 the Council, then having no funds, had been successful in obtaining more than $6700 and estimated that $12,000 would be required to finance a national convention and that it was felt this amount could be obtained if the convention were held in Chicago; it also set forth the advantages of Chicago as a location for the convention. In the ensuing discussion it was brought out that the Board has already voted to hold its annual meeting next year in May at Hartford, as usual, and to postpone until then further discussion of a national convention. The President also read to the Committee a six-page opinion from the General Counsel detailing past actions of the Board with respect to the general subject of national conventions and rendering the opinion that the authorization for the holding of a national convention as contained in the 1937 minutes of the annual Board meeting is not only ambiguous but also illegal and that it is not possible to hold a national convention without an amendment to the by-laws of the League. After further discussion, however, it was the sentiment of the Committee that, considering both the Board's recent expression on the subject and the bid of the Chicago Council, the Committee considered it advisable to come to an immediate decision on the latter owing to the fact that a delay until the Board meeting in May, in the event of a decision to hold a national convention in 1938, would give insufficient time for adequate preparation and publicity. On motion of Mr. Hebert, therefore, the Acting Secretary was directed to place the matter again before the Board of Directors for a mail expression with

respect to the formal bid of the Chicago Area Radio Council and, at the same time, to ask directors to express themselves on the subject of whether or not they would be in favor of amending the League by-laws on the subject of national conventions at the 1938 meeting of the Board.

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The Committee proceeded to an examination of the nominations for director and alternate director in the 1937 elections, its action in each case being herein detailed below by divisions.

Atlantic Division

For director, the Committee found petitions in good order for Roy C. Corderman, W3ZD, Walter Bradley Martin, W3QV, and Edward L. Thompson, W3CQS and, upon motion, all three candidates having been found eligible, ordered their names to be listed on the ballots to be sent to members.

For alternate director, the Committee found petitions for Gilbert Crossley, W8YA, Hunter J. Lohman, W8OC, Raymond E. McComber, W3CZE and Herbert M. Walleze, W8BQ. Upon examination, Messrs. Lohman and Crossley were found ineligible in the opinion of the Committee under the terms of the League's by-laws but Messrs. McComber and Walleze were found eligible whereupon, upon motion, the Committee ordered their names listed on the ballots to be sent to members.

Canada

For Canadian General Manager, the Committee found petitions in order for M. J. Caveney, VE3GG, Leonard W. Mitchell, VE3AZ and Alex Reid, VE2BE. Messrs. Mitchell and Reid were found eligible under the terms of the League by-laws but Mr. Caveney was declared ineligible because of the fact that League records disclosed he had not been, as required, a member of the League continuously for four years prior to the time of receipt of his nomination. The Committee thereupon, upon motion, declared Messrs. Mitchell and Reid eligible and ordered their names listed on the ballots to be sent to members of the League in Canada.

For alternate Canadian General Manager, the Committee found petitions for Alex Lariviere, VE2AB and John C. Stadler, VE2AP. Thereupon, both candidates being found eligible, the Committee, on motion, ordered their names listed on the ballots to be sent to Canadian members.

Dakota Division

For director, the Committee found petitions in good order for Frank A. Vowles, W9BBL, Earl R. Thornburg, W9EU and Fred W. Young, W9MZN. Mr. Thornburg was found to be ineligible, but both Mr. Vowles and Mr. Young were declared eligible and, upon motion, their names ordered to be listed on ballots to be sent to members.

For alternate director, the Committee found petitions in order for Adolph A. Emerson, W9ITQ, W. F. Soules, W9DCM, and Fred W. Young, W9MZN. The Committee was in receipt of a written communication from Mr. Young withdrawing his name as a candidate for alternate director. Upon examination it was found that both Mr. Emerson and Mr. Soules were ineligible under the terms of the by-law requiring continuous League membership for a period of at least four years prior to the receipt of their nomination, whereupon the Committee declared "no election" for alternate director in the Dakota Division.

Delta Division

For director, the Committee found a petition for but one candidate, the incumbent, E. Ray Arledge, W5SI but was obliged to declare Mr. Arledge ineligible under the terms of the by-law requiring continuous League membership for four years prior to the time of nomination. Thus, there is no election for director in the Delta Division.

For alternate director, the Committee found a petition for but one candidate, E. H. Treadaway, W5DKR. Whereupon, Mr. Treadaway being eligible, he was, on motion, declared duly elected as the alternate director of the Delta Division for the 1938–1939 term.

Midwest Division

For director, the Committee found a petition for but one candidate, the incumbent, Floyd E. Norwine, Jr., W9EFC. He being found eligible, the Committee, on motion of Mr. Hebert, declared him duly reëlected as the director of the Midwest Division for the 1938–1939 term.

No petitions were received for alternate director.

Pacific Division

For director, the Committee found a petition for but one candidate, J. L. McCargar, W6EY. He being found eligible, the Committee on motion of Mr. Bailey, declared him duly elected as director of the Pacific Division for the 1938–1939 term.

For alternate director, the Committee found a petition for Elbert Amarantes, W6FBW and none for any other person. Whereupon, Mr. Amarantes being found eligible, he was, on motion of Mr. Handy, declared duly elected as the alternate director of the Pacific Division for the 1938–1939 term.

Southeastern Division

For director, the Committee found a petition for but one candidate, the incumbent, Bennett R. Adams, Jr., W4APU. He being found eligible, the Committee, on motion of Mr. Bailey, declared him duly reëlected as the director of the Southeastern Division for the 1938–1939 term.

For alternate director, the Committee found a petition for Mr. S. J. Bayne, W4AAQ, the incumbent and none for any other person. Whereupon, Mr. Bayne being eligible, he was, on motion of Mr. Hebert, declared duly reëlected as the alternate director for the Southeastern Division for the 1938–1939 term.

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The Committee then proceeded to an examination of the matter of Headquarters Memorial Station, W1AW, first examining the plans submitted by architects for the proposed structure. After discussion, on motion of Mr. Bailey, the Committee voted to select and approve the plans and specifications dated October 25, 1937, as submitted by Isaac A. Allen, Jr., and Charles A. Allen, Architects, of Hartford.

Mr. Handy reported that he had been in receipt of a number of sealed bids from various contractors for plumbing, heating, electrical work, and station building and grading, and proposed that these bids be opened and examined. This was done. Extended discussion thereupon took place on the whole question of the proposed new W1AW, it being brought out by the President that the Board in its recent mail vote had expressed itself 11 to 6 in favor of proceeding with the new building on the basis recently outlined by Mr. Handy in his letter accompanying Secretary's Letter No. 358. It was found that the lowest bid in each case totalled more than the amount previously estimated by Mr. Handy. After extended discussion, the Committee although mindful of the favorable expression of a majority of the Board, was of the belief that the question should be resubmitted to the Board for additional expression of opinion on the basis of actual bids now available, both because the bids appeared to exceed the previous estimate and in response to demand from several directors for the specific bids. On motion of Mr. Bailey, and by unanimous vote, the Acting Secretary was directed to present this matter to the directors by letter for their further consideration and to solicit a mail expression from each.

Without action, the Committee discussed a proposed QSO Party (for League members only) proposed by Mr. Handy to be held some time after the first of the year, and listened to a brief résumé of the Segal-Smith hearings from the Acting Secretary, who had been in attendance.

The meeting adjourned at 6:45 P.M.

A. L. BUDLONG,
Acting Secretary.

MINUTES OF EXECUTIVE COMMITTEE MEETING

No. 150

December 20, 1937

The Executive Committee of the American Radio Relay League, Inc., met at the headquarters office of the League in

West Hartford, Conn., at 2 P.M., December 20, 1937, with full attendance: President E. C. Woodruff in the chair, Vice-President G. W. Bailey, Treasurer A. A. Hebert, Communications Manager F. E. Handy and Secretary K. B. Warner. Assistant Secretary A. L. Budlong was also present.

Constituting itself a committee of tellers as prescribed in the by-laws, the Committee proceeded to an examination of the ballots cast in the 1937 elections. To aid in this work it appointed as clerks of the Committee C. B. DeSoto, Byron Goodman, C. C. Rodimon, D. H. Mix, Charles Brunelle, E. L. Battey, H. A. Bubb, Grace Heley, and Catherine Craig. Carefully opening and counting the ballots cast, the committee found as follows:

Atlantic Division

For Director:

For Roy C. Corderman, W3ZD	281 votes
For Walter Bradley Martin, W3QV	679 votes
For Edward L. Thompson, W3CQS	79 votes
Invalid ballots	42

For Alternate Director:

For Raymond E. Macomber, W3CZE	540 votes
For Herbert M. Walleze, W8BQ	495 votes
Invalid ballots	42

Canadian Section

For Canadian General Manager:

For Leonard W. Mitchell, VE3AZ	114 votes
For Alex Reid, VE2BE	202 votes
Invalid ballots	31

Alternate Canadian General Manager:

Balloting had taken place between John C. Stadler, VE2AP, and Alex Lariviere, VE2AB, but after the listing of the names on the ballots, Mr. Stadler withdrew his name. Accordingly, upon advice of the General Counsel, the balloting by the members was disregarded and not counted, and Alex Lariviere, as the only eligible candidate, was declared duly elected as Alternate Canadian General Manager for the two-year term of office commencing at noon on January 1, 1938.

Dakota Division

For Director:

For Frank A. Vowles, W9BBL	57 votes
For Fred W. Young, W9MZN	127 votes
Invalid ballots	11

Whereupon, the count being completed, the clerks retired from the meeting with the thanks of the Committee. Secretary Warner withdrew from the meeting for the purpose of preparing a statement of certification by the Committee of Tellers, and Assistant Secretary A. L. Budlong assumed the recording.

The Assistant Secretary presented a telegram just received from C. D. Tuska calling attention to a "New York Times" item, mentioning that the new headquarters station was being erected to the memory of Mr. Maxim as founder and first president of the League; Mr. Tuska requested that if this statement resulted from any press release by the League, a list of papers to whom sent be furnished and a correction issued stating that Mr. Maxim was only a cofounder. No action was taken by the Committee, it being the sentiment of the members that since the policy with respect to Mr. Tuska had already been defined by the Board at its 1937 meeting, the matter was one for routine handling by the headquarters.

The Committee received from the Assistant Secretary the file of Director responses on the subject of a 1938 national convention (Secretary's Letter No. 362). It was found that the following had expressed themselves in favor of holding a national convention in 1938 and had pledged themselves to vote for such amendments to the by-laws as might be necessary to bring this about, at the next meeting of the Board: Messrs. Adams, Arledge, Bailey, Blalack, Caveness, Hill, Jabs, Mathews, Noble, Norwine, Stockman and Woodruff—total, 12. Opposed to making a decision at this time and in favor of leaving the question until the next Board meeting: Messrs. Gibbons, Groves, Martin and Reid—total, 4. Mr. Culver had requested a copy of counsel's opinion on this subject before making a decision and his expression had not yet been received. Of the 12 in favor of a 1938 national convention, 11 favored acceptance of the bid from the Chicago Area Radio Club Council; Mr. Hill believed this should be left until the Board meeting for decision.

The Committee proceeded to an examination of these expressions, in order to determine if it is now possible to forecast the action of the Board next year on the subject. It was found that a two-thirds vote of the Board—12 votes—is required to amend by-laws. The Committee felt it had to bear in mind in its deliberations that Mr. Jabs would not be present at the meeting next year but would be replaced by Fred W. Young, W9MZN; Mr. Budlong reported he had undertaken to obtain expressions on the national convention question from both candidates in the Dakota elections prior to the election and that the new director, Mr. Young, had expressed himself as opposed to making a decision on a 1938 national convention at this time.* It was also determined from Cushing's Manual that the President may vote when his vote will make or break a tie, but not otherwise. These two considerations indicated that the vote as of the next Board meeting would be 10 in favor to 5 opposed, two votes short of the two-thirds majority required to amend by-laws; on the matter of awarding the bid to Chicago there would be only 19 votes in favor, a bare majority. After discussion, therefore, on motion of Mr. Hebert, it was unanimously voted that the Executive Committee, feeling that the future action of the Board with respect to a national convention in 1938 cannot now be forecast and that the matter must be left for consideration of the Board at its next meeting, and feeling, therefore, that no decision can be made at this time with respect to acceptance of the bid of the Chicago Area Radio Club Council for the holding of such possible convention, instructs the Secretary so to advise the Council in a letter which will fully explain the reasons underlying the Committee's action; and that the question is scheduled in the agenda for the determination of the Board at its 1938 meeting.

Mr. Warner here returned to the meeting and resumed the recording, whereupon Mr. Budlong withdrew from the meeting. The Committee thereupon executed a certificate filed in the archives of the League, declaring Walter Bradley Martin duly elected as director, and Raymond E. Macomber as alternate director, of the Atlantic Division; Alex Reid duly elected as Canadian General Manager; and Fred W. Young duly elected as director of the Dakota Division; all for a term of two years, commencing on noon on January 1, 1938.

On motion of Mr. Hebert, approval was granted by unanimous vote for the holding of a New England Division Convention at Hartford, Conn., on May 21–22, 1938, under the auspices of the Hartford County Amateur Radio Association.

On motion of Mr. Handy, and by unanimous vote, approval was given on application for affiliation from the Dells Region Radio Club, Wisconsin Dells, Wis., subject to the approval of Director Mathews and to be effective upon date of the receipt at this office of such approval. On the further motion of Mr. Handy, and by unanimous vote, affiliation was granted the following societies:

Queen Anne High School Radio Club . Seattle, Wash.
Winnipeg Radio Club . . . . . Winnipeg, Man., Can.
Southeastern New Mexico Amateur Radio Club . . . . . Carlsbad, N. M.
Albuquerque Communications Club . . Albuquerque, N. M.
Loyalist City Amateur Radio Club . . St. John, N. B., Can.

Mr. Handy reported satisfactory progress on W1AW, contracts signed, builders working, ground broken, footings in, foundation to be finished in ten days, all work estimated to be completed by April 1st. At Mr. Handy's request, the Committee gave him counsel on certain matters:

Language for the memorial tablet was discussed and agreed upon.

*After his election, Mr. Young explained that his belief that the subject should be deferred to the board meeting did not mean he was opposed to such conventions, and at his request this information was conveyed to the other members of the board.—*Secretary.*

On motion of Mr. Bailey, it was unanimously voted that the Communications Manager is authorized to have appropriate iron bars placed on all the windows at an estimated cost of $140.00, and to install screens on doors and windows, and to install a cornerstone bearing the date of the building, and that the Board of Directors is requested to appropriate additional funds for these small extras at its meeting next May, over the previous authorization.

On motion of Mr. Bailey, the Communications Manager was authorized to depart from the approved design so as to arrange for six windows at the rear of the building instead of five as shown on the sketch, provided this modification can be made without additional cost.

On motion of Mr. Bailey, the Communications Manager was authorized to arrange for appropriate public liability insurance for the W1AW property.

There being no further business, the Committee adjourned at 5:11 P.M.

K. B WARNER,
A. L. BUDLONG,
Secretaries.

MINUTES OF EXECUTIVE COMMITTEE MEETING

No. 151

March 5, 1938

The Executive Committee of the American Radio Relay League, Inc., met at the headquarters office of the League in West Hartford, Conn., at 10:00 A.M., March 5, 1938, with the following present: President E. C. Woodruff in the chair, Vice-President G. W. Bailey, Treasurer A. A. Hebert, Communications Manager F. E. Handy and Acting Secretary A. L. Budlong. Preceding the meeting, the President and Vice-President had paid a visit to the site of W1AW, accompanied by the Communications Manager and Acting Secretary, for the purpose of inspecting work done up to this time.

Mr. Budlong presented to the Committee information collected by a headquarters committee which had made a study of possible candidates for A.R.R.L. nomination for the Paley Award. After discussion and an examination of the facts, on motion of Mr. Bailey, it was unanimously VOTED that the League's nominee for the Paley Award for 1937 is Robert T. Anderson, W9MCW, of Harrisburg, Ill., for his services in the Ohio River flood emergency of 1937.

On motion of Mr. Hebert, applications to hold A.R.R.L conventions were approved as follows:

Maritime Division, at St. John, N. B., September 3–4–5, auspices of Loyalist City Amateur Radio Club.

Hudson Division, at New York City, June 17–18, auspices of a special convention committee approved by Director Hill.

On motion of Mr. Hebert the Committee by unanimous vote RATIFIED its previous informal approval of the following conventions:

West Gulf Division, at Carlsbad, N. M., August 25–26–27, auspices the Southeastern New Mexico Amateur Radio Club.

Atlantic Division, at Washington, D. C., June 24–25, auspices the Washington Radio Club.

Roanoke Division, at Winston-Salem, N. C., September 3–4, auspices the Winston-Salem Amateur Radio Club.

On motion of Mr. Handy, affiliation was GRANTED by unanimous vote, to the following societies:

Hamfesters Radio Club, Inc.....Chicago, Ill.
Enid Amateur Radio Club.....Enid, Okla.
Salisbury Amateur Radio Operators Club.Salisbury, N. C.
Baton Rouge Amateur Radio Club.....Baton Rouge, La.
Fostoria Wireless Association.....Fostoria, Ohio
The Oakland County Radio Club.....Pontiac, Mich.
The York Radio Club.....Elmhurst, Ill.
Ventura County Radio Club.....Ventura, Calif.
South Eastern Nebraska Radio Club....Auburn, Nebr.

On further motion of Mr. Handy, reaffiliation was GRANTED the Fall River Amateur Radio Club, of Fall River, Mass., which had been disaffiliated last year when it fell below the required standards regarding percentage of League members but which had since complied with such requirements and had applied for such reaffiliation.

Mr. Handy rendered a detailed report on the status of W1AW; he informed the Committee, among other things, that completion of the building had already been delayed about two weeks beyond the original contemplated date of April first by a prolonged spell of bad weather. The Committee thereupon discussed both W1AW and other matters without, however, taking any formal action thereon.

There being no further business, the Committee adjourned at 1:03 P.M.

A. L. BUDLONG,
Acting Secretary.

ECW8CMP Honored

At the banquet of the Hudson Division convention in New York on June 18th, Dr. Woodruff, our president, was awarded the gold Marconi Memorial Medal of Service by the Veteran Wireless Operators Association. The presentation was made by Mr. William J. McGonigle, president of the V.W.O.A. The citation states that the award is made to Dr. Woodruff "for his outstanding work in amateur radio, as an amateur and as an elected representative of amateurs for many years." Through him, the citation continues, the V.W.O.A. wishes to recognize "the splendid achievements of amateurs in furthering the progress of radio and the heroic efforts of many amateurs in time of emergency."

The V.W.O.A. is an organization of professional operators which has long had the custom of recognizing meritorious service rendered by wireless operators on land or sea. Earlier recipients of their gold medals have included Marconi, Anne Lindbergh and many an heroic sea-going operator. The presentation to Dr. Woodruff was broadcast over a nationwide N.B.C. net.

Northwestern Division Convention

August 27th and 28th at Sunrise Park, Rainier National Park, Washington

THE thirteenth annual convention will again be held at Sunrise Park, Rainier National Park. Registration fee is $2.50 which includes a banquet Saturday evening. A pre-registration prize for registering before August 1st will be given. Information will be needed when you send in your registration as to whether or not you will want a cabin and whether with or without bedding. Cabins accommodate two persons and cost $2.00 without or $3.00 with bedding per night. Cabins are paid for at the Park. The Park can be reached by stage from Yakima and Tacoma for those who are not traveling by automobile. There is an admission fee of $1.00 per car, regardless of the number of occupants.

Mail, express, telegraph, telephone or get your ticket and information from Harold W. Johnston, W7DXF, P. O. Box 527, Pendleton, Oregon, who is the convention secretary.

Remember the dates—August 27th and 28th.

With the Affiliated Clubs

AT the 1938 Meeting of the A.R.R.L. Board of Directors it was voted "to create a recognition of the affiliated clubs having 100 per cent League membership by periodically listing in *QST* those affiliated societies whose entire membership consists of members of the League." Accordingly, an "honor roll" of affiliated clubs possessing this qualification has been established. The first listing is presented this month.

The Affiliated Club Honor Roll

All members of these clubs are A.R.R.L. members

Bridgeport Amateur Radio Association, Bridgeport, Conn.
Chester Radio Club, Chester, Pa.
Huron Radio Club, Huron, S. Dak.
Kaw Valley Radio Club, Topeka, Kansas
New Orleans Radio Club, New Orleans, La.
Northern Nassau Wireless Association, Manhasset, L. I., N. Y.
O.B.P., Chapter No. 1, St. Louis, Mo.
Pendleton Amateur Radio Club, Pendleton, Oregon
The Portland Sevens, Portland, Oregon
Trenton Radio Society, Trenton, N. J.
Valley Radio Club, Eugene, Oregon
York Radio Club, Elmhurst, Ill.
York Road Radio Club, Glenside, Pa.

AFFILIATED CLUB STATIONS

A study of the files of active affiliated-societies reveals many club-owned and operated amateur radio stations. In order that operators at club stations may better know other club-groups "on the air," we list here the calls of stations operated by A.R.R.L.-affiliated organizations. If the call of your club station does not appear, send us a QSL-card telling us so. Supplementary lists will appear from time to time. Keep an up-to-date list at the operating position of your society's station to further radio contacts between the affiliated bodies.

VE1LC	Loyalist City Amateur Radio Club
VE1MK	Halifax Amateur Radio Club
VE2DN	Les Amateurs Canadiens-Francais de la TSF
VE3AJV	Frontier Radio Club
VE4AAA	Saskatoon Amateur Radio Club
VE4JI	Winnipeg Radio Club
VE5EZ	Victoria Short Wave Club
W1ACT	Fall River Amateur Radio Club
W1AQ	Associated Radio Amateurs of Southern New England
W1BKQ	Worcester Radio Association
W1BWY	Springfield Radio Association
W1CBA	Connecticut Brasspounders Association
W1GB	New Haven Amateur Radio Association
W1FTS	Hoosac Valley Radio Club
W1INM	Providence Radio Association, Inc.
W1IXF	New Bedford Amateur Radio Association
W1JHT	Bridgeport Amateur Radio Association
W1JJO	Holyoke Amateur Radio Club
W1JRQ	Tri-State Amateur Radio Club
W1JUD	Trinity College Radio Club
W1KVI	The Portland Amateur Wireless Association
W1MX	M.I.T. Radio Society
W1ZO	Fellsway Radio Club
W2AOC	Williamsburg Radio Club
W2GYR	Intercity Amateur Radio Club
W2GZP	Mid-Hudson Amateur Radio Club
W2HHE	Bronx Radio Club
W2HJ	City College Radio Club
W2JC	Bloomfield Radio Club
W2JIQ	Tuboro Radio Club
W2JLJ	The Tri-County Radio Association, Inc.
W2SV	Sunrise Radio Club
W3ADO	Amateur Radio Club of U. S. Nava Academy
W3BKQ	Chester Radio Club
W3BKX	Frankford Radio Club
W3DBI	Petersburg Short Wave Club
W3EDU	York Amateur Radio Club
W3ESR	Peninsula Amateur Radio Club
W3GKI	Tri-States Radio Club
W3GWN	The Staunton Amateur Radio Club
W3HEB	Greater Camden Amateur Radio Association
W4AWO	Lake Worth Radio Club
W4CIQ	Mobile Amateur Radio Club
W4CUE	The Birmingham Amateur Radio Club
W4CZU	Charlotte Amateur Radio Association
W4DUG	Tampa Amateur Radio Club, Inc.
W4EXU	Salisbury Amateur Radio Operators Club
W4NC	The Winston-Salem Amateur Radio Club
W5DPA	Houston Amateur Radio Club
W5DYR	New Orleans Radio Club
W5FPO	Short Wave Amateur Club of America
W6MGJ	Helix Amateur Radio Club
W6OT	Oakland Radio Club, Inc.
W6SV	Santa Clara County Amateur Radio Association
W7ADF	Casper Radio Amateurs' Club
W7AJW	Portland Sevens
W7AOK	Broadway High School Radio Club
W7BMW	Pendleton Amateur Radio Club
W7BPY	Queen Anne High School Radio Club
W7COE	Electric City Radio Club
W7DK	Radio Club of Tacoma, Inc.
W7EPN	Olympia Radio Club
W7GN	Roosevelt High Radio Club
W8APJ	Bluffton Radio Club
W8HXT	Ludington Amateur Radio Association
W8IEC	Gratiot County Amateur Radio Association
W8INE	Boys' Club of St. Marys Amateur Radio Society
W8KYC	Marietta Amateur Radio Society
W8LMT	The Mohawk Valley Brass Pounders
W8MRM	Motor City Radio Club, Inc.
W8NLG	Detroit Amateur Radio Association
W8NTD	Lycoming Radio Association
W8ODJ	The Buckeye Short Wave Association
W8ON	Jamestown Amateur Radio Association
W8OVE	Cleveland Heights Amateur Radio Club
W8QLU	Mike & Key Club of Ithaca
W8QWH	The Amateur Radio Communications Society
W9AIU	Egyptian Radio Club
W9IXR	Northern Wisconsin Radio Club
W9KEM	Hannibal Amateur Radio Club
W9MWJ	Tri-Town Radio Amateur Club
W9NAA	Rose Tech Radio Club
W9OKY	Pikes Peak Amateur Radio Association
W9QHA	Elkhart Amateur Radio Club
W9TFA	Hamfesters Radio Club, Inc.

(*Continued on page 76*)

Improving the Stability of the E. C. O.

New Circuits Provide Greater Frequency-Generator Isolation

INTEREST in electron-coupled oscillators for transmitter frequency control is definitely increasing. And, as always, when an idea takes root in amateur circles, improvements usually are not long in coming to the front. In this case, we have two versions of an electron-coupled oscillator circuit which promise improved stability in the frequency-generating section and greater independence between this circuit and those which follow it.

The circuit resembles that of a push-pull, or perhaps more closely, that of the push-push arrangement. The operation apparently differs from that of either, however.

A Two-Tube E. C. O.

By H. N. Beveridge, VE2KX[1]

THE circuit shown in Fig. 1 was developed during some experimental work on 28 Mc. last summer while attempting to secure satisfactory frequency stability with an electron-coupled oscillator at that frequency. It will be noticed that the circuit somewhat resembles a push-push arrangement. The plate circuit is tuned to twice the frequency of oscillation, therefore it is unnecessary to shield this circuit from the grid circuit. With the frequency-generating circuit operating at 14 Mc., it is possible to obtain sufficient output from a pair of 59's to drive an RK-23 at 28 Mc. with frequency stability approaching very closely that of a crystal-controlled transmitter. The improvement over the usual single-ended circuit is decidedly marked.

In the final arrangement, the oscillator and RK-23 amplifier were assembled upon one chassis, as shown in the photograph, to form an exciter which might be used to drive a higher-power final amplifier. The oscillator was completely enclosed in an aluminum box to shield its output circuit from that of the RK-23. Careful shielding is extremely important here if self-oscillation is to be avoided when the RK-23 is operated as a straight amplifier at 28 Mc. Within the shield box are the oscillator grid and plate coils and the two oscillator tubes. The coils for the oscillator, with the exception of the plate coils for 28 and 1.7 Mc., are wound on discarded tube bases. The 28-Mc. coil is self-supporting, while the 1.7-Mc. coil is wound on a 1⅜" diameter receiving coil form. The amplifier tube and plate coil may be seen outside the shield box at the right-hand end of the chassis. A link is provided to couple the output to an antenna coupler or a following stage.

All tuning condensers are located beneath the chassis. The controls, left to right, are: The oscillator band-spread tuning condenser; oscillator padding condenser; oscillator plate tuning condenser; amplifier excitation control, and amplifier plate tuning condenser. The oscillator padding condenser is a two-unit gang of the type used frequently in small broadcast receivers. The band-spread condenser is tapped across a small portion of the oscillator grid coil at its center to permit tuning over a range of 25 to 50 kc. either

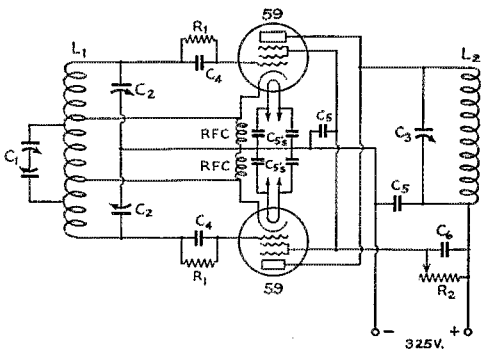


FIG. 1—THE ELECTRON-COUPLED CIRCUIT USED BY VE2KX

An amplifier is capacity-coupled to plate circuit.

C_1—*75 μμfd. per section.*
C_2—*350 μμfd. per section (broadcast-receiver, two-unit gang).*
C_3—*100 μμfd.*
C_4—*250-μμfd. mica.*
C_5—*0.01-μfd. paper, 600-volt.*
C_6—*0.1-μfd. paper, 600-volt.*
R_1—*60,000 ohms.*
R_2—*50,000 ohms.*

L_1—*1.7-Mc. output—90 turns No. 28 enam., 1⅜" diam., close-wound; cathode taps at 30 turns from each end; bandspread condenser across ½" of winding at center.*

3.5-Mc. output—30 turns No. 28 d.s.c., 1⅜" diam., close-wound; cathode taps at 10 turns from each end; bandspread condenser connected across ⅛" of winding at center.

7-Mc. output—20 turns No. 28 d.s.c., 1⅜" diam., close-wound; cathode taps at 7 turns from each end; bandspread condenser connected across approx. 3 turns at center.

14-Mc. output—12½ turns No. 20 d.c.c., 1⅛" diam., close-wound; cathode taps at 4 turns from each end; bandspread condenser connected across 1⅛-turn closely-coupled loop at center.

28-Mc. output—9½ turns No. 16 d.c.c., 1⅛" diam., close-wound; cathode taps at 3 turns from each end; bandspread condenser connected across ⅝-turn closely-coupled loop at center.

L_2—*1.7-Mc.—45 turns No. 28 enam., 1⅜" diam., close-wound.*

3.5-Mc.—23 turns No. 28 enam., 1⅛" diam., close-wound.

7-Mc.—18 turns No. 28 d.s.c., 1⅛" diam., close-wound.

14-Mc.—6⅝ turns No. 16 d.c.c., 1⅛" diam., close-wound.

28-Mc.—5 turns No. 10 enam., ¾" diam., ½" long.

[1] P. O. Box 57, Lachute Mills, Que.

side of any frequency determined by the setting of the padding condenser. At 14 and 28 Mc., the band-spread condenser is connected across a loop tightly coupled to the grid coil at its center. At the lower frequencies connection is made directly to the turns of the grid coil itself. The excitation control is in the form of a variable series resistor in the oscillator screen circuit.

The socket for the RK-23 is also sunk below the surface of the chassis and a short cylindrical shield extends from the chassis level to a line even with the lower edge of the plate of the tube. All by-pass condensers and r.f. chokes are located underneath the chassis. Closed circuit jacks are provided for each circuit so that a milliammeter may be plugged in any of them for tuning or checking plate or grid currents.

In tuning, C_1 and C_2 determine the frequency. C_3 should be tuned for the dip in plate current. During last winter, about 200 contacts were made on 28 Mc.

An E.C.O. of High Stability and Output

By William Guimont, W9JID[2]

IT is the purpose of this article to describe a new type electron-coupled oscillator which was developed during the course of some work with the e.c.o. in connection with the construction of a transmitter for traffic work. It has proved to be superior in stability to the commonly-used single tube arrangement and the use of tubes such as the 6L6 permits appreciably greater power output from the oscillator than is normally obtained from an oscillator of this type. The circuit is shown in Fig. 2. A single-section 260-$\mu\mu$fd. condenser provides the necessary high capacity in the grid-screen circuit. A 25-$\mu\mu$fd. condenser in parallel with this permits a change in frequency of about 50 kc. without change in the setting of the main tank condenser. Since the oscillator has been built up as a separate unit and installed on the operating table this small change in frequency is about all that can be used, because a greater change will necessitate retuning the other stages of the transmitter located, in this case, several feet from the operating position.

In the course of adjustment, it was found that best stability is obtained with a small amount of excitation, therefore the cathode tap is placed very close to the center-tap of the coil. Although 6L6's have worked out very satisfactorily, it is possible that RK49's would be slightly better.

It will be noticed that a tube keying system is included in the circuit diagram. This keying system is highly recommended and has resulted in absolutely clickless keying even when working break-in close to the operating frequency.

[2] Highway 3, Champlin, Minn.

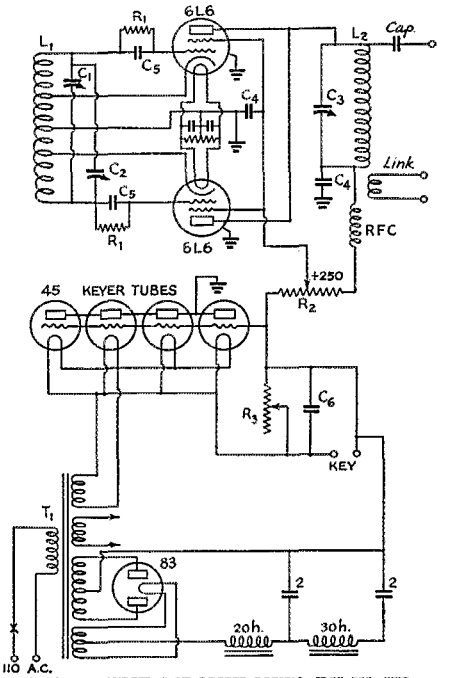


FIG. 2—THE CIRCUIT USED BY W9JID

A single-section tank condenser is used. The tube keying system eliminates all key clicks.

A Stabilized E. C. Oscillator

By John Scoville, W7FUW[3]

I HOPE that the diagram of Fig. 3 and the brief description which is to follow will be of benefit to those hams who may find themselves in circumstances similar to mine. I work hard to get the little rig perking right and sit down to try to work someone, only to listen on my frequency just in time to hear some guy say something like this: "Ok, OM, and tnx fer the call. Rig hr is 999 watts to a pr of 250TH's." Well, the evening is conked for me then and I can twiddle my thumbs. I don't blame the fellow with 999 watts, for I'd have that much too if I could afford it, but it is surely tough on the fellow with a small outfit. Well, the upshot of it is that I turned to the electron-coupled oscillator to solve my problem. Here is a description of the results which followed my efforts.

I tried the standard oscillator first. It worked fairly well and I received "xtal" reports about half of the time. But, I couldn't work break-in and did not even attempt 'phone because most e.c. rigs I have heard are not so hot. Then I tried push-pull e.c.o. with no better results until I arrived at the idea of the circuit shown in Fig. 2.

[3] Lakeview, Oregon.

Its success is dependent chiefly upon the unique construction of the grid coil.

In this special circuit, a pair of 24A's is used. The grids are in two separate circuits and the plates are connected in parallel. Because of incomplete internal shielding, 6L6's will not work satisfactorily. The types 802, RK-25 or 807 should be satisfactory if greater output from the oscillator is desired.

The construction must be very solid and the frequency-generating and output circuits very well shielded. In our construction, we took two 4" by 7" by 5" cans, which we happened to have, and soldered the bases together, bottom to bottom. Then we mounted the parts inside with the tubes and grid circuit components on one side of the partition and the plate circuit components on the other side. One reason for the necessity for complete shielding is that for 1.7-Mc. output, the frequency-generating circuit works on some frequency between 900 and 1000 kc. which might

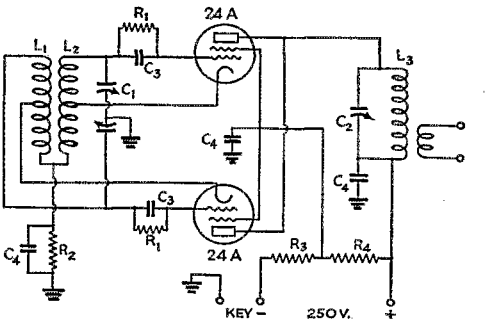
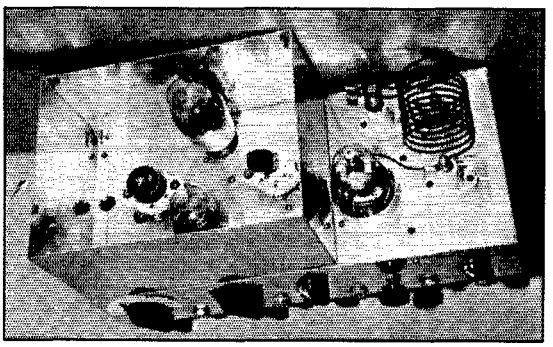


FIG. 3—THIS CIRCUIT, BY W7FUW, IS SIMILAR IN ESSENTIALS TO FIGS. 1 AND 2, BUT A SPECIAL TYPE OF GRID COIL IS USED

C_1—350 μμfd. per section.
C_2—100 μμfd.
C_3—250 μμfd.
C_4—0.25 μfd. or larger.
R_1—30,000 to 100,000 ohms.
R_2—200 ohms.
R_3—75,000 ohms.
R_4—30,000 ohms.
L_1, L_2—(See text).

1.7-Mc. output—approx. 45 turns each coil No. 28 d.s.c 1½" diam., 1½" long.
3.5-Mc. output—approx. 25 turns each coil No 28 d.s.c., 1½" diam., 1½" long.
7-Mc. output—approx. 12 turns each coil No. 28 d.s.c., 1½" diam., 1½" long.
14-Mc. output—approx. 6 turns each coil No. 28 d.s.c., 1½" diam., 1½" long.

L_3—1.7-Mc.—55 turns No. 28 d.s.c., 1½" diam., 1½" long.
3.5-Mc.—30 turns No. 28 d.s.c., 1½" diam. 1½" long.
7-Mc.—20 turns No. 20 d.s.c., 1½" diam., 1½" long.
14-Mc.—10 turns No. 20 d.s.c., 1½" diam. 1½" long.



THE COMPLETED EXCITER UNIT SHOWING SHIELDING OF OSCILLATOR

The RK-23 amplifier circuit is conventional.

easily get into neighboring broadcast receivers. If one desires, the grid circuit may be operated at 450 kc. and the fourth harmonic picked off in the plate circuit. The output should be sufficient to drive a buffer such as ours, in which a pair of 6L6's is used.

The construction of the coils L_1 and L_2 requires special attention. Both are wound on the same 1½" diameter form. L_1 is wound first, then L_2 is wound over L_1 but *in the opposite direction.* Grid connections are made to the top ends of both coils. The wire with which the coils for the higher frequencies are wound must be small enough to permit space-winding, otherwise the capacity between coils may result in reduced output.

To check the operation, the plate circuit should be tuned to resonance as indicated by the buffer grid current. Then, touch the oscillator grid caps, one at a time, with a finger. The output, as indicated by buffer grid current, should decrease by the same amount for each tube. If one of the tubes is removed, the circuit will still oscillate, but with much reduced output and stability. If each circuit is adjusted, with one tube at a time, so that the same frequency falls at the same dial setting with either tube, the output will be highest, but the stability will not be maximum. If one of the coils is adjusted so that the same frequency falls at a slightly different setting of C_1 the stability is greatly improved and approaches very closely that of a crystal. The two circuits lock together, one pulling one way and the other the other. Loading, or tuning any condenser except that in the frequency-generating circuit, will have no more effect upon frequency than it would with a crystal oscillator, and the oscillator may be keyed as readily for break-in work. There will be less drift in frequency from changes in temperature if a high value of tuning capacity is used in the grid circuit; otherwise, there seems to be little advantage in the higher capacity. Changes in electrode voltages seem to have no practical effect upon the frequency although they do have influence upon the power output, of course.

This oscillator has been used on all bands from 1.7 to 28 Mc., 'phone and c.w., and I have yet to receive anything less than a T9 report. It has solved my problem when I have found myself blanketed out and it has enabled me to finish many a QSO which would have been lost otherwise. So I am passing it along to other hams.

• ARMY-AMATEUR RADIO SYSTEM ACTIVITIES •

THE Florida nets of the Fourth Corps Area A.A.R.S. are particularly interesting because of the numerous times they have furnished emergency communications during the annual hurricane season. Members of these nets are veterans in emergency work, which dates back over a period of ten years, with many instances of outstanding individual accomplishment. These years of experience have taught the members of the Florida nets the necessity of proper organization and preparedness, hence they keep their net organizations active during all except six weeks of the year. Drills are attended regularly each week, not particularly for the individual pleasure derived, but because the members realize that this preparation will be rewarded by more efficient operations during emergency and a better service to the public.

In order to provide several channels for moving traffic in and out of a stricken area, there are four nets operated in the state, two on 'phone and two on c.w. In addition key stations are equipped to operate on c.w. on a National Guard frequency of 4035 kc., in addition to the two special A.A.R.S. frequencies of 3497.5 and 6990 kc. Each net is state-wide and is under the supervision of its Net Control Station, which is responsible to the State Net Control Station.

In the present set-up, W4AWO/WLRO/WXKJ, located halfway down the east coast of Florida, acts as State Net Control Station, exercising general supervision of net activities and shouldering the responsibility of drill reports to the Fourth Corps Area Headquarters. This station is located in a storm-proof building with a transmitter on 80-meter c.w., another on 80-meter 'phone, and another on 40-meter c.w. Power for all three is supplied by a 2½-kilowatt gasoline-driven emergency power supply. There is also maintained at this station a two-ton White truck, equipped as a complete field station with a combined 'phone and c.w. transmitter of 150 watts, another 2½-kilowatt generator and the necessary sectional masts, cots, blankets and medical supplies needed to equip and maintain an emergency station in the field.

A second portable unit of lower power is maintained at this station, arranged so that it can be placed in any available car or truck together with its 350-watt gasoline-driven power plant and dispatched to any point where it may be needed.

The National Guard Officer of the state, W4COS, acts as Second Alternate State Net Control Station. The Military Department of the state has equipped six National Guard armories with complete stations which are operated by qualified amateurs who are members of the National Guard. Through arrangements with the Adjutant General's Office of the state, these stations operate as a part of the Army Amateur Radio System, when not operating on the special National Guard frequency. In this manner coordination of the nets is maintained and duplication of effort is avoided.

W4WS, located in Deland in north-central Florida, is Third Alternate Net Control Station for the state. This station controls the 75-meter 'phone net on 3910 kc. Members of this net are experienced 'phone men, familiar with the job of effectively handling pertinent information to and from the storm area through the semi-tropical static usually encountered during emergencies. This net is responsible for dispatch of general information as to conditions in an affected area.

Another net, similar to the 80-meter 'phone net, operates on 1820 kc. in the 160-meter 'phone band. W4CQJ at Lakeland in central Florida is the Net Control Station of this net, which provides a second channel for general information to and from a stricken area. The duties of this net are similar to those of the 75-meter net and their members are "static eaters" of renown.

W4CNT is the Net Control Station of a 40-meter c.w. net, operating on 7290 kc. This net is most effective during daylight hours when conditions on both the 80- and 160-meter 'phone bands are very limited and distances such as the 500 miles between the state capitol and southern Florida must be covered.

W4AWO is the director of the c.w. net on 3875 kc., which handles traffic of an exact nature which must be transmitted with speed and accuracy. This net handles emergency traffic pertaining to National Guard details and supplies.

Certain stations in each net, with facilities to operate on frequencies of other nets, are designated as cross net stations, and act as liaison between nets. Close contact is maintained between the A.A.R.S., N.C.R., and Coast Guard.

Monday evening, September 5th, marks the opening of the 13th A.A.R.S. season. With the opening of the new season we wish to welcome the new members as well as the old. The beginning of each season finds many new members, and we hope that by joining our system each new member will find added pleasure in his hobby.

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The following cryptogram is presented for those interested in these problems. Solutions received by the Liaison Officer, A.A.R.S., 3441 Munitions Building, Washington, D. C., will be acknowledged by mail.

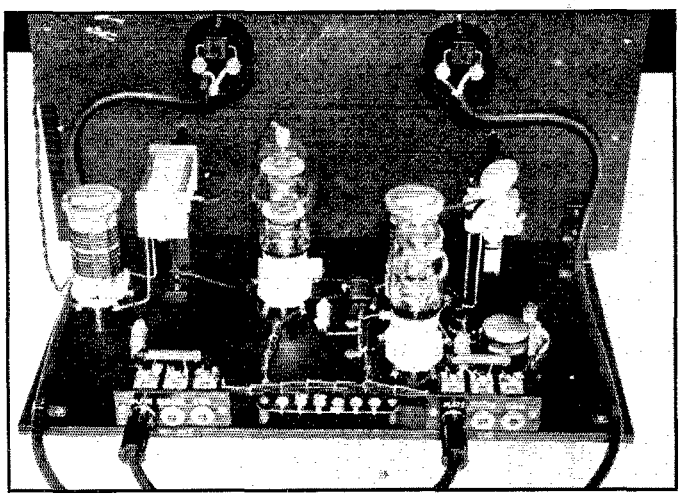
ANRMO BOSMY THLFO YNITR ISIEN IXXXX

A Four-Band 75-Watt Output 'Phone-C.W. Transmitter

Class-B Modulated Outfit of Low-Cost Construction

By Frederick F. Sylvester, Ex-W2ACU* and Richard S. Briggs, W1BVL*

THE construction of a complete 'phone and c.w. transmitter covering the popular amateur bands does not represent a complicated problem. However, the cash outlay for materials becomes of major importance when the power of the rig exceeds 30 or 40 watts. The transmitter outlined here is capable of delivering in excess of 75 watts of good quality 'phone or c.w. signals on all bands from 3.5 to 28 Mc., and the actual cost of all material, including the rack, panels, hardware, tubes, and component parts, exclusive of the microphone, approximates $75. It is interesting to note that the transmitter affords approximately 1-watt output per dollar invested. Upon examining the circuits, the reader no doubt will find that he already possesses many of the parts required.



BEHIND THE PANEL OF THE OSCILLATOR-BUFFER UNIT
All wiring is above the baseboard. Oscillator at right, buffer-doubler at left.

The rack and panel assembly is constructed of material obtainable at any lumber yard, and the physical dimensions are exact duplicates of standard metal racks designed for amateur use. The panels, each 8¾ by 19 inches, and bottom boards are of tempered Masonite; either ¼-inch or ⅜-inch stock may be used satisfactorily. Thinned black lacquer on Masonite will give a finish resembling the crackle found on commercial metal panels.[1] Use of chromium-plated screws on the front panels adds greatly to the appearance.

There are three units in the rack. The lower contains the speech amplifier and modulator, the center section consists of the crystal and buffer stages, and the upper unit houses the final amplifier. Through the use of plugs and jacks, only four meters are necessary for complete measurement of grid, plate and screen currents of all stages from the crystal through to the final, as well as the modulator.

The power supply consists of three separate plate supplies in one unit which, for convenience, may be placed beneath the table or desk on which the transmitter and receiver are located. On and off switching of the various filaments and plate supplies is accomplished through the use of toggle switches, either installed in the front panel of the power supply, or through remote control by connection cables through a small switch-box which may be located close to the operator.

OSCILLATOR AND BUFFER

The crystal stage, which uses a type HY60 beam tetrode, operates efficiently as a straight crystal oscillator, crystal oscillator-doubler, or crystal oscillator-quadrupler. Three crystals, two chosen so that their harmonics fall within the higher-frequency bands, are necessary, as well as three sets of coils, for covering the four bands. The crystal oscillator is inductively coupled to an HY61 buffer or buffer-doubler, with tight coupling and an untuned secondary to eliminate the grid tuning condenser in the buffer stage. This method of coupling also insures stability of both the crystal and buffer stages and at the same

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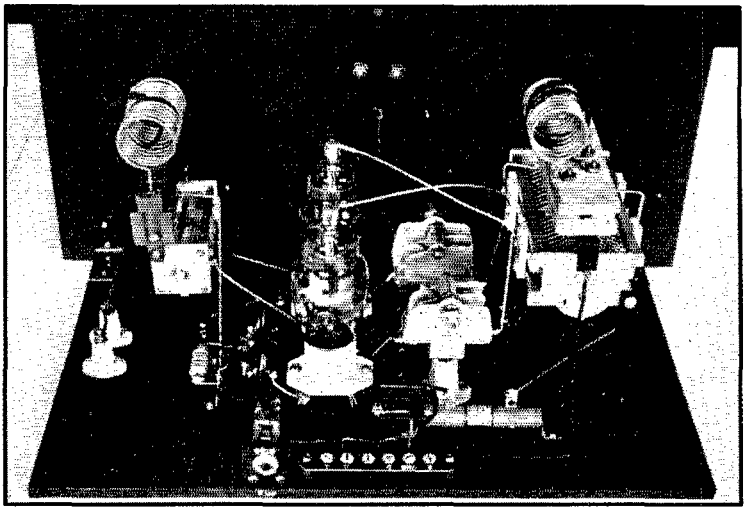
[1] Masonite panels cut to relay-rack size, finished in the customary black crackle or wrinkle, are available from many dealers in amateur equipment. — EDITOR.

time gives good coupling efficiency. Three coils are needed in the buffer stage.

When operating on crystal frequency, straight amplification is employed throughout, while on crystal harmonic frequencies, the crystal and buffer stages are doubled or the crystal quadrupled and the buffer doubled, as the case may be. More than sufficient excitation is obtainable for the final amplifier on each band since the tubes used in the final stage drive easily with as low as 17 ma. grid current per tube. The HY61 working as a buffer-doubler will drive the grid current of the final to well over 45 ma.



CONSTRUCTION OF THE FINAL STAGE IS SIMILAR TO THAT OF THE EXCITER

The tubes are HY25's, operated at 700 volts.

The Class-C amplifier utilizes two HY25 high-μ triodes, requiring but 45 volts of grid bias with 750 volts on the plates. Better than 75 watts of r.f. output is obtainable from these two tubes with an input of less than 125 watts. The final stage grid tank is link-coupled to the plate tank of the HY61 buffer through a variable link, providing easy adjustment of the excitation for the Class-C stage. As in the case of the crystal and buffer stages, the final amplifier requires three sets of coils.

The modulator, shown in Fig. 2, employs a 76 speech amplifier, transformer-coupled to a pair of 45's in Class A. These in turn are transformer-coupled to a pair of HY25's operating in Class B. More than sufficient gain is available when a carbon microphone of the single or double-button variety is used. However, for use with crystal or velocity microphones, an additional speech amplifier having a voltage gain of about 1000 is

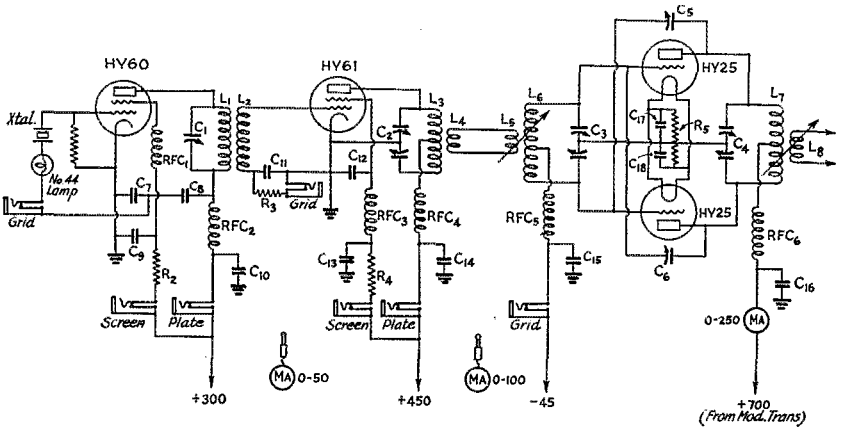
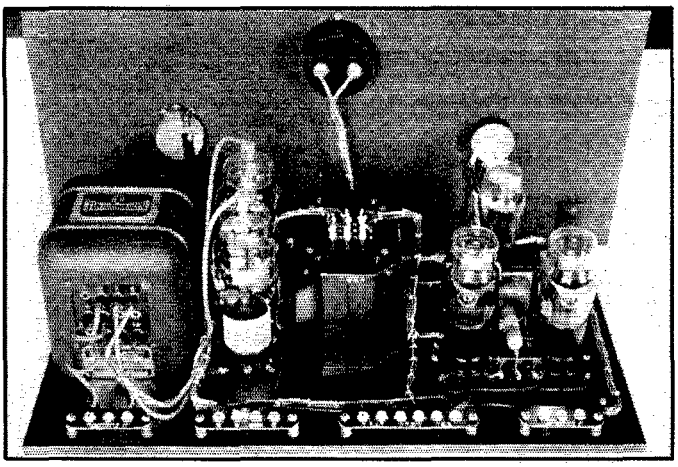


FIG. 1—THE R.F. SECTION OF THE TRANSMITTER

C_1—100-$\mu\mu$fd. variable (Hammarlund MC-100S).
C_2, C_3—Split stator, 100 $\mu\mu$fd. per section (Cardwell EU-100-AD).
C_4—Split stator, 100 $\mu\mu$fd. per section, transmitting type (Hammarlund MTCD-100-B).
C_5, C_6—Neutralizing condenser, 4–6 $\mu\mu$fd. (Cardwell NA-6-NS).
C_7—Fundamental output, 250-$\mu\mu$fd. (minimum) mica.
Harmonic output, 100-$\mu\mu$fd. (maximum) mica.
C_8–C_{15}, inc.—0.002-μfd. mica, postage-stamp type.
C_{16}—0.002-μfd. mica, 1000-volt.
C_{17}, C_{18}—0.002-μfd. mica, postage-stamp type.
R_1, R_2, R_3—50,000 ohms, 1-watt.
R_4—75,000 ohms, 1-watt.
R_5—30-ohm wire-wound (25-watt), center-tapped.
RFC_1–RFC_5, inc.—2.5-mh. r.f. choke (National R-100).
RFC_6—35-μh. solenoid choke (Ohmite Z-2).
See coil table for data on r.f. coils.



THE SPEECH-AMPLIFIER AND MODULATOR

Enough gain is provided for carbon microphones. The Class-B tubes are the same type as is used in the Class-C amplifier.

required to drive the modulator to full output. Inasmuch as many amateur operators use some form of carbon microphone, including transceiver handsets, the writers felt that designing the unit with available material would be entirely satisfactory, since good quality is obtainable with the newer types of inexpensive carbon microphones. Both gain and tone controls are provided on the front panel of the modulator unit. The tone control provides a simple means of reducing the hiss produced by carbon microphones. To make the speech section universal in application, no microphone transformer is shown. In case a carbon microphone is used, the transformer can be built into the unit, its secondary being connected across R_1. A crystal-microphone pre-amplifier can be connected to R_1.

Plug-in jacks provide instantaneous change-over of the two meters assembled on the crystal-buffer section front panel, permitting permanent installation of the Class-B plate-current and final-amplifier plate-current meters. Continuous metering of modulator and final amplifier assures complete control as well as safe operation of the transmitter.

POWER SUPPLY

The power supply consists of two 750-volt and one 500-volt plate transformers. The circuit is given in Fig. 3. Rectifiers for both the final-amplifier and the modulator plate supplies are 866 Jrs. operated as full-wave rectifiers. Condenser-input filters are used in both cases. Plate supply for the crystal and buffer stages as well as the speech amplifier is obtained from the 500-volt transformer with an 83 rectifier. The bleeder resistor across the low-voltage power supply is tapped to form a voltage divider supplying the proper

COIL TABLE

	L_1	L_2	L_3	L_4	L_5	L_6	L_7	L_8
3.5 Mc.								
Turns	28	25	30	4	4	28	26	5
Wire size	18	22	18	18	18	16	10	10
Coil diam., in.	1½	1½	1½	1½	1¼	1¼	2½	2½
Coil length, in.	Close-wound			⅜		5	4	
7 Mc.								
Turns	16	11	15	3	3	16	16	4
Wire size	16	22	16	16	16	14	14	10
Coil diam., in.	1½	1½	1½	1½	1¼	1½	1½	1¼
Coil length, in.	2¼	1½	2¼	½		4	4	
14 and 28 Mc.								
Turns	11	7	10	3	3	10	8	4
Wire size	16	22	16	16	16	14	14	14
Coil diam., in.	1½	1½	1½	1½	1¼	1¼	1¼	1¼
Coil length, in.	1¾	1½	1¾	½		3	3	

Note.—L_5 and L_6 are interwound. For 3.5 Mc. the coils are wound with no spacing between pri. and sec. Link coil L_8 is wound at midpoint of L_7. Link coil L_9 at center of L_{10}, coupling is variable. Oscillator and buffer coils are wound on Hammarlund SWF6 coil forms; final grid coils are mounted on National PB5 plugs; final plate coils on General Radio 678P plug bases.

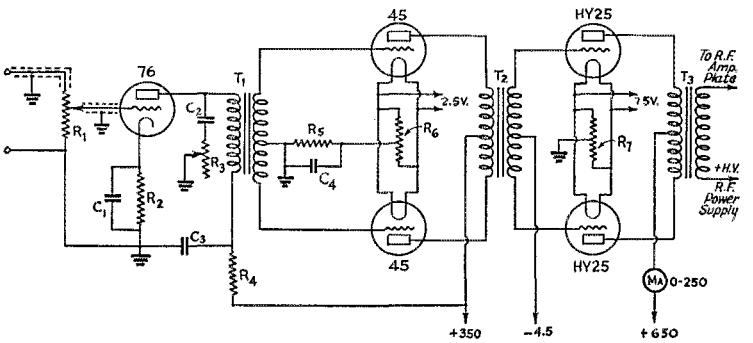


FIG. 2—MODULATOR AND SPEECH-AMPLIFIER CIRCUIT DIAGRAM

R_1—*500,000-ohm potentiometer.*
R_2—*3500 ohms, 1-watt.*
R_3—*50,000-ohm variable.*
R_4—*5000 ohms, 10-watt.*
R_5—*750 ohms, 10-watt.*
R_6—*20 ohms, center-tapped, 10-watt.*
R_7—*30 ohms, center-tapped, 25-watt.*
C_1—*5-μfd., 25-volt electrolytic.*
C_2—*0.01-μfd., 600-volt paper.*
C_3—*2-μfd., 450-volt electrolytic.*
C_4—*5-μfd., 100-volt electrolytic.*
T_1—*Audio transformer, single plate to push-pull grids (Thordarson T-3391).*
T_2—*Class-B input transformer (UTC PA-53-AX).*
T_3—*Class-B output transformer (Thordarson 11-M-75).*

voltages to the various stages. For maximum efficiency, 300 volts is applied to the crystal stage, 450 volts to the buffer stage, and 350 volts to the speech amplifier.

Although the bill of materials for construction of the transmitter is quite specific, it is not necessary to use the exact parts named. The wide variety of manufactured components makes it possible for the amateur to choose equivalent parts of other brands. As previously mentioned, probably a large percentage of the parts used are already available and may be put into service without undue complications.

TUNING

In tuning the transmitter for 80-meter operation, the complete set of higher inductance coils is inserted throughout. The crystal stage tuning is conventional. Resonance is obtained with the crystal plate condenser approximately at three-fourths full capacity. Considerable dip will occur at resonance and the crystal stage plate current should approximate 25 ma. In tuning the crystal stage the 0–50 ma. meter plug is inserted in the crystal plate-circuit jack provided at the rear of the exciter unit chassis.

To tune the buffer stage, the 0–100 ma. meter is plugged into the grid-current jack at the rear of the final-amplifier chassis. The grid circuit will tune to resonance at approximately three-fourths total capacity, and the resonance grid current will be approximately 60 ma. Upon applying plate voltage to the final amplifier, the grid current will drop to approximately 40 ma. At this point the final amplifier must be neutralized. Neutralization is most easily checked by rotating the final tank condenser and noting the reaction on the grid current. When the neutralizing condensers are properly adjusted, there should be little or no reaction on the grid current reading with plate tuning. After neutralizing, plate voltage may be applied to the final stage. It is generally advisable to apply plate potential with caution, taking note of the no-load plate current, which should approximate 30 ma. for the two HY25's. The final-stage plate tank will tune to resonance (minimum current) at approximately seven-eighths total capacity.

Excitation to the final amplifier stage can be checked by observing the d.c. grid current. For 'phone operation, this grid current should not be less than 30 ma. and not greater than 50 ma. To adjust the excitation the link-coupling may be varied or, even better, a variable screen resistor may be used in the buffer stage to act as an excitation control. Condenser C_7 in the crystal oscillator circuit must be higher in value when the circuit is operating as a fundamental oscillator

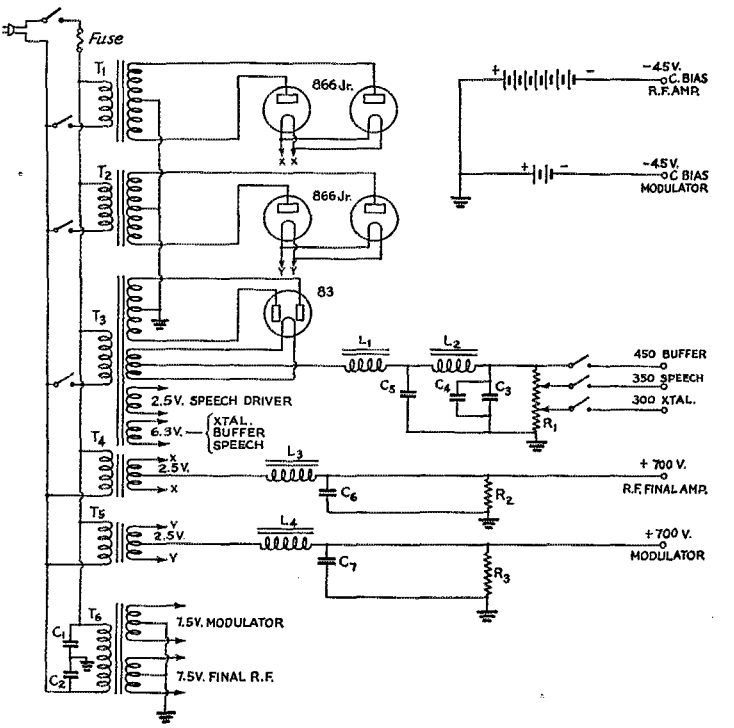


FIG. 3—POWER SUPPLY WIRING

T_1, T_2—*Plate transformer, 750 v., 300 ma. (UTC 20462-A).*

T_3—*Plate and filament transformer, 500 v., 200 ma. (UTC 20757).*

T_4, T_5—*Filament transformer, 2.5 v., 10 amp. (Thordarson T-5455).*

T_6—*Filament transformer, two 7.5-v., 5-amp. windings (Trutest K-2544).*

L_1, L_2—*20 henrys, 200 ma. (UTC 20462-F).*

L_3, L_4—*20 henrys, 300 ma. (UTC 20462-G).*

C_1, C_2—*0.1-μfd., 600-volt paper.*

C_3—*8-μfd., 500-volt (working) electrolytic.*

C_4—*0.25-μfd., 600-volt paper.*

C_5—*16-μfd., 500-volt (working) electrolytic.*

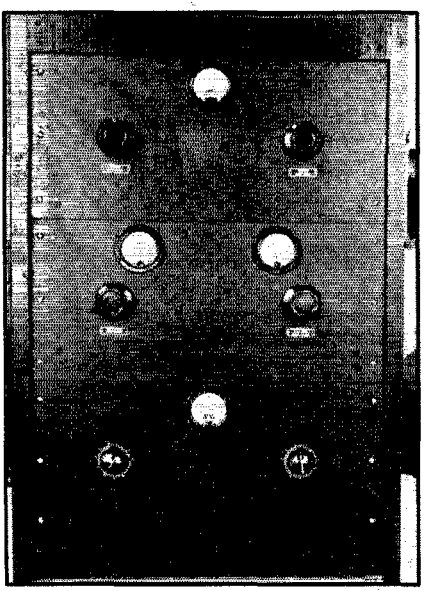
C_6—*2-μfd., 1000-volt paper.*

C_7—*4-μfd., 1000-volt paper.*

R_1—*50,000 ohms, 100-watt (IRC Type HAA).*

R_2,R_3—*100,000 ohms, 100-watt (IRC Type HAA).*

than for harmonic operation (see Fig. 1). When operating the first two stages on harmonics of the crystal, a large number of frequencies may be obtained in the final amplifier stage through using the crystal as a straight oscillator, oscillator-doubler, or oscillator-quadrupler, and by using



THREE RACK-TYPE PANEL UNITS COMPRISE THE R.F. AND MODULATOR OF THIS 75-WATT OUTPUT 'PHONE AND C.W. TRANSMITTER

Power supplies are not included in the home-made rack, but may be installed in any convenient location.

the buffer stage either as a straight amplifier or doubler.

Various methods of arriving at the final frequency are easily worked out and, through the use of three crystals, practically all of the amateur bands, both 'phone and c.w., can be covered. When operating on harmonics of the crystal, care should be taken to check the frequency at which the crystal tank is operating. This may be done by use of an absorption frequency meter or through comparative calibration, knowing the size of the inductance and the approximate condenser setting. The set of coils having the lowest inductance will tune both the 20- and 10-meter bands.[2] With doubling in both the crystal stage and the buffer, the operating settings of tuning condensers will be approximately one-fourth to one-third their maximum value. The antenna network is coupled to the final tank through the link coil provided.

The plate current to the final stage should be adjusted to 150 milliamperes by means of the antenna coupling and tuning, giving a power input of 105 watts. This represents a load of 4670 ohms for the modulator. To deliver the required audio power for modulating the Class-C stage, the modulator tubes should have a plate-to-plate load of 7200 ohms, operating at 700 volts on plates and with the grids at $-4\frac{1}{2}$ volts. The Class-B output transformer should therefore have a primary-to-secondary impedance ratio of 7200/4670, or 1.55/1; the corresponding turns ratio is 1.25/1. On the transformer specified, this ratio is most closely matched by connecting terminals 8 and 11 to the modulator plus B, 7 and 12 to the Class-B plates, 1 and 6 to the Class-C stage, and joining 2 and 3 together. The idling plate current of the Class-B tubes should be 25 ma., and on speech the current should rise to approximately 100 or 110 ma. with full modulation.

[2] Care must be used to keep the circuit capacity low in order to achieve this with the tuning condensers specified. To avoid possible difficulties on this point, the authors suggest using split-stator condensers having 150 $\mu\mu$fd. per section and reducing the coil inductance slightly to compensate for the higher minimum capacity.—EDITOR.

Maritime Division Convention

Saint John, N. B., September 3rd, 4th, 5th

THE Loyalist City Amateur Radio Club is staging this year's A.R.R.L. convention. With Labor holiday excursion rates in force during the period of the convention it should make it possible for amateurs and their friends to take advantage of the reduced fares. Nova Scotia and Newfoundland amateurs and friends may travel from points in Nova Scotia via D. A. R. and Digby and thus enjoy the pleasant sail on the Bay of Fundy, via the Str. *Princess Helene.* The banquet will not take place till after arrival of the boat at 6 P.M. Atlantic Standard Time.

The Clifton House Hotel is the headquarters for the convention and the registration desk will be ready to receive the visitors at 2 o'clock Atlantic daylight time. Special guests and speakers will include His Worship the Mayor and an A.R.R.L. representative. Various contests and presentation of the Brown-Holder DX Cup, for which QSL cards are required. On Sunday a boat trip on the magnificent St. John River to attractive picnic grounds. Dinner will be provided. Monday, September 5th, five-meter hunt and visits to points of attraction. Hotel accommodation at reduced rates. Further particulars may be obtained from Secretary, H. C. Fowlie, 245 Rockland Road, Saint John, N. B.

Midwest Division Convention

Omaha, Neb., October 29th and 30th

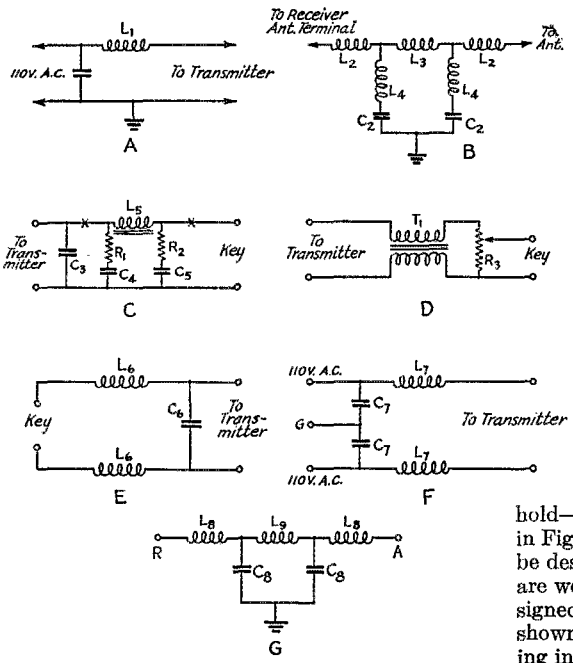
Hotel Paxton is the place.

Watch for the publicity or write W. H. (Bill) Graham, Suite 212, Hotel Paxton, Omaha, Neb.

How Would You Do It?

On Eliminating B.C.L. Interference

THE subject of Problem No. 18—that of elimination of interference with local broadcast reception by the amateur transmitter—should be of vital interest to all of us. A transmitter which causes general interference in the neighborhood is not only a source of difficulties between its owner and otherwise friendly neighbors, but it also may create ill-will and antagonism against the entire amateur fraternity as a group. The solutions submitted do not bring out new principles but they do demonstrate the fact that the precautions recommended for the past several years do not involve complication and that they *are* effective.



A—A simple line filter designed to prevent feeding r.f. from the transmitter back into the power lines. B—A low-pass r.f. filter to be inserted in series with the antenna of the b.c. receiver. It eliminates the necessity of tuning a wave-trap. C and D—Two types of lag circuits for eliminating key clicks. E—A key-click filter of the r.f. type. F—Another power line filter. G—A simple low-pass r.f. filter for the b.c. receiver.

C_1—*0.25 μfd.*
C_2—*25 μμfds.*
C_3—*0.006 μfd.*
C_4—*0.5 μfd.*
C_5—*0.5 μfd.*
C_6—*0.01 to 0.05 μfd.*
C_7—*0.1 μfd.*
C_8—*500 μμfds.*
R_1—*100 ohms.*
R_2—*100 ohms.*
R_3—*500–25,000 ohms.*
L_1—*See text.*

L_2—*18 turns No. 28 d.s.c. 1⅜" diam.*
L_3—*29 turns No. 28 d.s.c. 1⅜" diam.*
L_4—*24 turns No. 28 d.s.c. 1⅜" diam.*
L_5—*Primary winding of bell-ringing transformer.*
L_6—*2.5 millihenry r.f. chokes.*
L_7—*180 turns No. 12 enamelled, 1¼" diam.*
L_8—*33 turns No. 24 d.s.c. 1⅝" diam.*
L_9—*54 turns No. 24 d.s.c. 1⅝" diam.*

First Prize Solution

By Eugene L. Fegley, W8MPB*

YOUR Problem No. 18 in the June issue of *QST* hit me plumb on the nose. After spending a lot of time and dough on equipment and building the rig, I found that I had key clicks, blanketing and feed-back into the power lines. Otherwise the ole rig worked swell!

First of all, I started to work on the feed-back which was helping to blanket the b.c.l. receivers in the neighborhood. At A is the hook-up I used. The coil is wound on a large General Radio ceramic form, and the wire size is No. 12. This coil had enough impedance to act as a choke and it stopped the feed-back. Now to make this a good job and be sure that no r.f. was getting past the choke, I grounded the ground side of the power line close to the transmitter and by-passed the hot side to ground. This did surprising things in helping get rid of a lot of blanketing.

The feed-back now gone, the blanketing came next. After a little search, I found in the *Handbook* data on some low-pass filter systems. Perhaps this was just the thing I was looking for! So I built one just to see if the durn thing worked and—lo and behold—it did! The diagram and coil data are given in Fig. B. I might add that the filter system must be designed for the lowest frequency used. If you are working on 160, the filter system must be designed for complete cut-off at 1600 kc. The one shown in the diagram is recommended for working in several bands.

Now for the key clicks which were really doing some damage. I used two types of filters, but the second one was the one that did the best work for me. In Fig. C is the one I tried first, and it helped, but it just didn't come up to what I thought it should. The second was simpler, and really worked the best for me. I use blocked-grid keying and a b.c. power pack supplies the necessary voltage. The transformer is a Bell telephone transformer which came out of a connection box. The variable resistor was adjusted until the oscillator began to draw plate current, or rather adjusted until the highest-biased tube started to draw current. In my case it happened to be the

* 1415 Scott St., Williamsport, Pa.

oscillator. The diagram for the one I'm now using is shown in Fig. D. Now the filter of Fig. C is a really good one. The choke there is the primary of a bell-ringing transformer. The 0.006-$\mu\mu$fd. condenser across the input of the filter may be tried although, in some cases, it may not be needed. The *X's* are for r.f. chokes. The filter may be built without them since they are needed only in extreme cases.

The stuff I've just described worked very well for me, and would probably give someone else a galloping start towards getting his troubles ironed out. I spent two days getting my difficulties eliminated, and now think that it was well worth the work involved. Now the rig can be used on all bands without causing my neighbors any trouble and, of course, it saves me the cost of replacing a window if some enraged neighbor should get to the breaking point and toss a brick through the shack window!

Second Prize Solution

By David Davidson, W1GKM**

WHEN a ham moves to a new location and finally gets the rig on the air, he is naturally inquisitive about the question of interference with his new neighbors' broadcast reception. Of course, the best way to find out is to inquire, but, in the case of the b.c.l., it is sometimes better not to trouble trouble. The ham's own b.c. receiver affords the most convenient object of preliminary tests. If the interference can be eliminated from it, any complaints from outside will very frequently come from those owning receivers of inferior design.

In the writer's case, the first bit of interference at a new location was with the family's own set. Although a certain amount of tolerance was extended, inevitably there came the time when a certain favorite program was to be heard and operation had to be curtailed. The interference experienced was of the click type; the clicks were evident on the "make" and "break" of the key. The b.c.l.'s, who are in great numbers, had not yet complained, possibly because operation had been confined chiefly to the early morning and evening hours or because the interference was drowned out by local broadcast stations.

However, participation in dx and ss contests, etc., would involve evening operation, and silent hours looked none too good. Briefly, the situation was this: The transmitter, with a type 10 final, was being keyed between filament center-tap and ground. The keying leads were about 20 feet long, parallel to the a.c. line which supplies the transmitter. These could not be altered. Various ideas were investigated and tried unsuccessfully. Finally an arrangement of a condenser and two r.f. chokes was tried, and this cleared up the clicks in the home receiver. This filter is described in the last several editions of *The Radio Amateur's Handbook*. The diagram is shown in Fig. E. Condenser values from 0.01 μfd. to 0.05 μfd. were tried and all worked equally well.

The results were so satisfactory that a test was arranged with the nearest b.c.l. The test revealed that he was getting interference, but had not noticed it until it was called to his attention, because he was a devout listener of the local b.c. station. The key-click filter successfully eliminated the clicks in his receiver also. The average b.c.l. is probably of the same type, a local-station adherent; the irate one is the dx-er or the one with the ancient tuner who has all faith in it.

The values of chokes and condensers should be consistent with the voltage and current of the keying circuit. The arrangement can be built into a wooden box and furnished with appropriate terminals. Suffice it to say, attacking the problem before the b.c.l. can does save time, trouble and jangled nerves. Above all, it tends to make a potential friend of ham radio out of an otherwise hostile b.c.l.

** 34 Essex St., Hartford, Conn.

Problem No. 20

Sooner or later most c.w. operators come to the realization that provision for break-in operation has many advantages. Our Hero thinks so, too. Keying of the crystal oscillator is imperative if one is to work break-in near his own frequency, but unfortunately, most keyed oscillators may be detected by their characteristic chirps. These chirps may make it difficult to copy the signal of a high-selectivity receiver and may also cause unnecessary interference, if the chirp is sufficiently pronounced, at stations near the transmitter. A few of us seem to be able to produce a perfect signal even though the oscillator is keyed.

Our Hero wants to know a sure-fire method of avoiding a chirpy signal while keying his crystal oscillator.

Honorable Mention

By J. Dawson, W4DNA***

YOUR Problem No. 18 which appeared in *QST* for June is one which I have overcome by the use of proper filters. The idea is not new by any means, but it worked to complete satisfaction to all concerned in my case.

Looking through the *Handbook* I discovered a power-line filter circuit which I thought might work. It is shown in Fig. F. I hunted around and found a nice straight broom handle, and sawed off two lengths, each 8½ inches long. In each of these, I bored mounting holes ½ inch from each end and then bored additional holes, the size of the wire used, 1¼ inches from each end. After boiling the forms in paraffin, I wound each with 180 turns of No. 12 enamelled wire, leaving a short length at each end for making con-

(Continued on page 84)

*** 1936 49th St., So., St. Petersburg, Fla.

Results, First "A.R.R.L." QSO Party

By E. L. Battey,* W1UE

THE First A.R.R.L. QSO Party, held in January, 1938, was enthusiastically received. "For A.R.R.L. Members only," it was a "family gathering," a reunion session for older members, a get-acquainted period for others. Old friendships were revived, new ones made. The spirit of the affair was one of sincere good fellowship.

"Enjoyed it, and contacted many fellows I had not QSO'd for years. A fine way to reopen old acquaintances of the air."—W2EC. "Had an FB time. Met lots of new fellows."—W9HEN. "One thing that I especially enjoyed was the meeting with a good many old-timers that I have missed for several years."—W9CWW. "Had lots of fun. Met a swell bunch of fellows."—W6EXH. "This party got W3QV and me together after years of separation and, as he said, 'It was worth the party to meet up again with one of the old gang.' "—VE3DC. "It gave a real chance to make many new friends. I worked stations I had not worked for years. It was a great pleasure to renew the friendships of the past."—W8DED. "Had nice chat with W6FQU, whom I had not worked for some time. That was worth more than all the rest of the party to me."—W6OUU. "Sure enjoyed meeting lots of old pals."—W6PFR, ex-W7DBP. "Not a winner, but friends were made and enjoyed the party."—W8FCG. "The contest was plenty of fun and I renewed many acquaintances. Ran into W8JA/3 who was formerly in Ohio when I was W8CFL. I had not heard from him for about 8 years, and it was a pleasant meeting after so many years."—W3CFL. "Worked many old friends and enjoyed every bit of the work."—W9AB.

SCORING

Simplicity was the keynote of the rules for this QSO Party. Only contacts between A.R.R.L. members counted. Participants exchanged (1) the name of the League Sections in which they were located, (2) their A.R.R.L. membership expiration dates—month and year. One point was scored when this information was completely transmitted and acknowledged, one point when the information was received and logged. But one complete exchange of data was permitted with any member. The sum of points made by contacts was multiplied by the number of different A.R.R.L. Sections (and continents outside field organization territory) in which at least one member had been worked and at least a one-way exchange effected. Either voice or telegraph, or both, could be used as desired—with any combination of frequencies. The party ran through a 33-hour period on the week-end of January 8th–9th, participants operating any 20 hours of the 33 for contest credit. The ease of taking part and keeping score was lauded by participants as adding to the enjoyment of the party.

HAL PRATT, W1EZ, HAS PROVIDED VERMONT CONTACT FOR MANY W.A.S. ASPIRANTS

A fellow to contend with in operating contests, he made second highest score of all participants in First "A.R.R.L." QSO Party.

THE WINNERS

Call letter pins were offered to the highest scoring members in each of the 70 League Sections and to the member leading each of the six continental areas. Sixty-eight awards are being made, the victors being G6QX K6CGK VE1EP VE2DR VE3GT VE4AHE VE4GE VE4QZ VE5QP W1BFT W1EOB W1EVJ W1EZ W1HYP W1IQF W1IZU W2DIJ W2IBT W2JKH W3BWA W3DGM W3FBM W3FQZ W4AGI W4BSJ W4CXY W4CYC W4CZA W4DWB W4EFM W5ASG W5CJP W5EGP W5FBQ W5FZD W5GHF W5WG W6CIS W6EXH W6FYR W6KFC W6MDI W6NCO W6NMZ W6OCQ W6OXQ W6UO W7CYU W7FFQ W7GLH W8CMH W8JTT W8LCN W8MOT W8OFN W9CWW W9DMY W9GBJ W9LEZ W9LQU W9MN W9MUX W9QRM W9TSQ W9UBB W9VKF W9YCR and W9YEZ. Congratulations to these winners!

OUTSTANDING SCORERS

Thirty-seven operators made scores of over 10,000 points. The highest score was rolled up by

* Assistant Communications Manager, A.R.R.L.

Hal Bubb (W1JTD) operating Headquarters station W1AW, of which he is Chief Operator. Hal made contacts with 197 members in 61 sections for a total of 24,034.

Another well-known "Hal"—Hal Pratt, W1EZ—made the second highest showing, 22,568 points from contacts with 202 members in 56 sections.

And, believe it or not, still another "Hal" placed third! Dr. Harold E. Stricker, W8OFN, a familiar call in "SS" and other contests, came through with 180 member-contacts in 59 sections, or 21,240 points.

What fatal charm hath this name "Hal"?! At any rate, these lads have the "contest touch" and they deserve a big hand.

Claimant to the fourth highest score is none other than our old contest shark, Vic Clark, W6KFC —19,942 points, 169 members worked in 59 sections. Among the other high scorers are W8AQ, 17,499; W3FQZ, 17,056; W9RQM, 16,907; W1BFT, 15,184; W4CYC and W5WG, 14,976; W8MOT, 13,728; W4BSJ, 13,536; VE3GT (highest scoring VE), 13,248; W4APU, 13,158; W5KC, 12,954; W8LCN, 12,576; W1EOB, 12,446; W9MUX, 12,054.

CHARLES A. PINE, W9CWW, KANSAS WINNER

A ham for over 16 years, CWW is an ardent DX and contest enthusiast.

GENERAL

Three hundred and sixty-nine League members submitted logs in the First A.R.R.L. QSO Party. Leaders in number of member-contacts were: W1EZ 202, W1AW 197, W8OFN 180, W6KFC 169, W3FQZ 165, W9RQM 160, W8MOT 156, W8AQ 154, W1BFT 146, VE3GT 145, W4BSJ, W4CYC and W5WG 144, W3ECA 140. Leaders in sections worked: W1AW 61, W6KFC and W8OFN 59, W8AQ 57, W1EZ 56, W9RQM 53, W1BFT, W3FQZ, W4CYC, W5WG and W8DOD 52, W4APU, W5KC and W8NBK 51, W7GLH and W9VKF 50. There was a small amount of radiophone operation reported. W2JDG, W6IWU and W9ZTF used voice exclusively. The bulk of party operation took place in the 3.5-, 7- and 14-Mc. c.w. bands.

In analyzing the reactions of those who submitted reports, a one word common desire in connection with the First "A.R.R.L." QSO Party is evident—ANOTHER! OK, gang, see you there!!

SCORES

First "A.R.R.L." QSO Party, January 1938

(Scores are grouped by Divisions and Sections. . . . The operator of the station first-listed in each Section is winner for that Section. . . . Asterisks denote stations not entered in contest, reporting to assure that stations they worked get credit. . . . Listings show score, number of A.R.R.L. members worked, number of Sections worked. . . .)

ATLANTIC DIVISION]]

E. Pennsylvania

W3DGM	111395	133	43
W3BES	1040	138	40
W3ECA	10610	140	38
W3EEW	10368	111	48
W3GDI	10034	114	44
W3ATR	7788	89	44
W3GHM	7728	92	42
W3GUB	7524	114	33
W3EDC	6336	96	33
W8HKS	6020	86	63
W3GJY	5328	74	35
W3DGC	4088	73	28
W3ADE	3480	60	29
W3ECP	2668	58	23
W3AOC	2204	58	19
W3DPU	1850	37	25
W3BGD	1656	36	23
W8ATF	1554	37	21
W8EU	520	20	13

Md.-Del.-D. C.

W3FQZ	17056	165	52
W3BKZ	11844	126	47
W3FPQ	11094	129	43
W8JA-3	6055	97	35
W3GKZ	5544	77	36
W3BXG	5320	70	38
W3CXL	3219	56	29
W3HC	2914	47	31
W3GAU	987	27	21
W3DRD	84	7	6

S. New Jersey

W3FBM	7056	98	36
W3BYR	5270	85	31
W3ECG	3172	61	26
W3AWH	1536	32	24
W3GCU	288	12	12

Western New York

W8JTT	11074	113	49
W8DOD	9672	93	52
W8PWU	5508	81	34
W8RCP	3200	50	32
W8GWT	2912	46	32
W8DHU	1800	50	18
W8QKM	1440	36	20
F8FCG	1404	39	18
W8CSE	676	26	13
W8QBB	600	20	15
W8DSU	8	2	2

W. Pennsylvania

W8MOT	13728	156	44
W8NCJ	9568	104	46
W8FIP	8740	95	46
W8KUN	8550	114	38
W8QES	7910	114	35
W8GON	3658	59	31
W8OMF	1160	29	20
W8HSN	406	15	14
W8HKU	280	14	10
W3GEO*	2	1	1

CENTRAL DIVISION

Illinois

W9MUX	12054	123	49
W9TKN	6435	82	39
W9VES	5950	89	34
W9WEN	5805	68	43
W9TH	4464	63	36
W9ZII	4012	59	34
W9TRH	3584	56	32
W9IVD	3036	46	33
W9SXL	2790	47	30
W9EUZ	2340	45	26
W9CEO	1176	28	21
W9ZNW	1050	25	21
W9TZQ	264	12	11
W9TZL	112	8	7
W9NIU	8	2	2

Indiana

W9LQU	9020	111	41
W9SDC[1]	3894	59	33
W9AB	1218	29	21

Kentucky

W9MN	11704	133	44
W9BAZ	6162	79	39
W9RBV	4884	74	33
W9ZJS	3300	55	30
W9WMI	3038	50	31
W9CDA	2970	50	30
W9FBJ	1160	29	20
W9EDQ	120	10	6

Michigan

W8CMH	10584	108	49
W8DED	8280	92	45
W8NUV	7920	110	36
W8OQF	3888	54	36
W9LDC	3540	59	30
W8GP	1120	28	20
W9YX[2]	8	2	2

Ohio

W8OFN	21240	180	59
W8AQ	17499	154	57
W8NBK	10914	107	51
W8BYM	5244	57	46
W8CBC	5032	74	34
W8PIH	1680	42	20
W8PEN	1564	34	23
W8LGM	1176	28	21
W8MQC	1080	27	20
W8NKU	810	27	15
W8PBX	736	23	16
W8RGK	736	23	16
W8LVH	546	21	13
W6ONE-8	408	17	12
W8PGI	308	14	11
W8FNN	216	12	9
W8QHV*	2	1	1

Wisconsin

W9RQM	16907	160	53
W9PTE	6450	81	43
W9VDY	5320	70	38
W9RLB	4056	52	39
W9UIT	3762	57	33
W9SJF	3648	57	32
W9ZFT	2940	49	30
W9LTD	1656	36	23
W9QGD	232	15	8

DAKOTA DIVISION

North Dakota

W9UBB	10464	109	48

South Dakota

W9YEZ	2184	42	26
W9ZCC	600	20	15
W9WUU	220	11	10

No. Minnesota

W9YCR	6560	80	41
W9HEN	2632	47	28
W9DNY	2352	42	28
W9KYE	1100	25	22
W9IGZ	60	10	3
W9ZTF	54	9	3
W9ZQQ	32	4	4

So. Minnesota

W9VKF	11750	118	50
W9VIP	2212	40	28
W9EPJ	1360	34	20
W9YNQ	242	11	11
W9KUI	8	2	2

DELTA DIVISION

Arkansas

W5ASG	6200	78	40
W5GSM	1518	33	23
W5GDI	1050	25	21
W5GAS	855	23	19
W5DNX	336	14	12
W5CFQ	192	12	8

(*Cont. on Page 56*)

[1] Two oprs., W9SDC and W9TWC. [2] W9SDG opr. [3] W1JTD opr. [4] HQs staff member, not eligible for awards.

HINTS and KINKS for the Experimenter

Another Device for Obtaining Proper Capacity Ranges on Different Bands

USE of a split-stator condenser for a circuit requiring a wide range of capacities, and switching the sections of the condenser automatically with a four-pin plug-in coil, is suggested by W7GDB, Harold Johnstone, 427 W. Gold St., Butte, Mont.

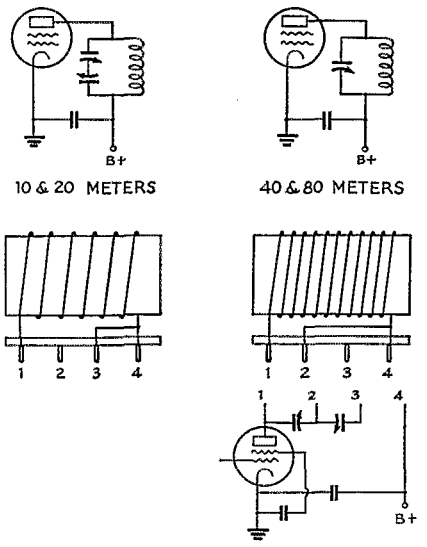
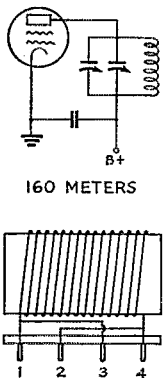


FIG. 1—THREE-CAPACITY RANGES WITH A SPLIT-STATOR CONDENSER

The three sketches at the top of Fig. 1 show the manner in which the sections of the condenser are used in a plate tank circuit. From the diagram at the top left in the figure, it can be seen that both stator and rotor of this condenser should be insulated from the base or chassis upon which the condenser is mounted and, in addition, that the condenser should be well separated from the panel unless the latter provides thorough shielding. An excellent method of mounting this condenser would be the use of standoff insulators as mounting feed and of an insulated shaft with flexible coupling for the purpose of adjustment.

The condenser used by W7GDB in this arrangement has a maximum capacity of 100 $\mu\mu$fd. per section. On 10 and 20 meters, this gives a maximum capacity of approximately 50 $\mu\mu$fd. across the tank circuit, and a minimum capacity of approximately half the single-section minimum capacity. For these bands, furthermore, the insulation in the condenser provides a longer leakage path than on the lower frequency bands. The maximum and minimum capacities on 40 and 80 meters are the values for a single section. On 160 meters, the sections of the condenser are connected in parallel, resulting in a maximum and minimum capacity on this band double those for a single section, or 200-$\mu\mu$fd. maximum capacity on 160 meters.



The sketches in the middle of Fig. 1 show the manner in which the four contact pins of the coil are utilized for switching the condenser sections, and the circuit at the bottom of the figure shows the corresponding socket connections. As will readily be seen, this method will work equally well with tube-socket plug-in coils as with the type shown.

Simple Modulation Indicator

THOSE 'phone amateurs using plate modulation and desiring a negative peak overmodulation indicator will appreciate the gadget diagrammed in Fig. 2. This unit may be set to indicate modulation up to 100 per cent; in other words, to give a warning signal when a peak of a predetermined amplitude up to 100 per cent is reached in the modulation.

In Fig. 2, R_1 is the bleeder across the modulated amplifier plate supply, while R_2 is a potentiometer in parallel with the portion of R_1 between ground and the adjustable tap. R_2 serves two purposes—that of a vernier control on the portion of R_1 used, and that of a convenient method of adjusting from the front of panel the tap from the audio transformer primary for the proper voltage above ground on the modulated amplifier plate-supply. T_3 is an audio transformer with primary connected in series with a rectifier between the modulated amplifier B+ connection and the adjustable tap on R_2. The polarity of the rectifier tube connections is such that the voltage at the B+

connection of the amplifier must be negative with respect to the voltage of the R_2 tap to cause a warning flash of the modulation indicator. This indicator, a simple neon bulb with the resistor removed from the base, is shown connected across the secondary of the audio transformer.

The neon bulb is mounted in an old Readrite meter case with a frosted glass; this makes the small flashes more noticeable. The meter glass may be given a frosted appearance by grinding the surface just as crystals are ground to frequency.

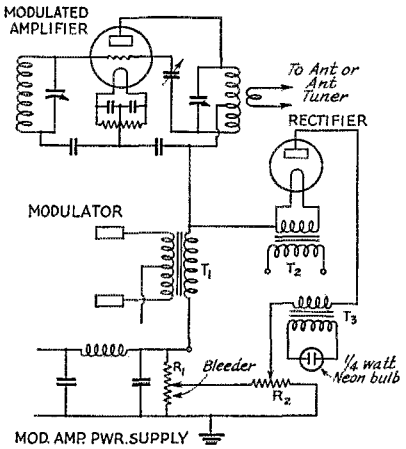


FIG. 2—A NEGATIVE-PEAK MODULATION-PER CENT AND OVER-MODULATION INDICATOR

If the tap on R_1 is set at a point one-fourth the distance from the ground end, the control R_2 may be used to set the modulation percentage for indications at any value between 75 and 100 per cent. However, on many 'phone transmitters, the plate voltage used for the modulated amplifier limits this range, for the voltage across R_2, if the tap on R_1 is set at one-fourth the voltage in a transmitter with 2000-volt supply, may be as high as 500 volts. Unless a heavy duty potentiometer or a slider-type resistor mounted on the front of the control panel is used, then, care must be taken in limiting the range to a safe value for the control.

A suitable rectifier for use in this indicator is an '81 tube, with filament supplied by a 7.5-volt transformer having insulation to stand more than double the plate supply voltage. Although the inverse peak voltage on the rectifier tube will be higher than rated value, the current through the tube is so limited that the overload is not serious.

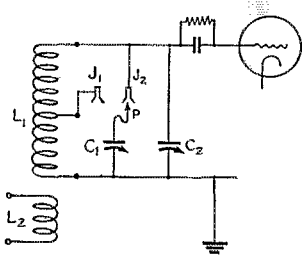


FIG. 3—GENERAL COVERAGE AND BAND-SPREAD TUNING BY USE OF PLUG AND JACKS

If the potentiometer or slider resistor used for R_2 is linear (that is, if the resistance between tap and end varies proportionately with movement of the tap or rotation of the knob), this control, once the tap on R_1 has been permanently set, may readily be calibrated for the modulation per cent at which flashes will occur.

—Ray Harland, W7FRA
Moscow, Idaho

Plug and Jacks for Changing from Band-spread to General Coverage

ALMOST every ham would like to have a receiver that would cover the complete short-wave spectrum, yet would give complete dial spread of the amateur bands. In some receivers this is accomplished by winding separate coils for each purpose; however, this procedure involves quite a bit of expense, and the inexpensive and thoroughly practical kink diagrammed in Fig. 3 is offered as a better solution.

Five- or six-prong coil forms are necessary for the windings, and small trimmer condensers should be provided inside the coil forms—air trimmers are preferable but mica may be used. Hammarlund XP53 or similar forms are satisfactory—the large coils are easy to handle and have adequate space inside for the trimmer condensers.

The winding is made so that resonance of the coil alone falls a few kilocycles higher in frequency than the ham band to be spread. The small trimmer condenser in parallel with the winding is then used to set the high-frequency edge of the tuning range so that only a slight margin higher than the high-frequency end of the band is available on the dial.

In the immediate vicinity of the coil socket, two banana-plug jacks are mounted in the chassis in such a position that connections to the grid pin and the coil tap pin lugs of the socket will be short and direct. Making the band-spread tap on the coil is an experimental job, as the position of the tap depends on the capacity of the condenser used for tuning and on the width of the band to be covered. The tuning condenser stator is connected with a flexible wire to a banana plug.

All that is needed to make the receiver full coverage tuning rather than band-spread is insertion of the plug in the jack connected to the grid-pin lug of the coil socket. The cost of the arrangement is only a few cents, results are excellent, and the convenience is comparable to that of sep-plug-in coils for band-spread and general coverage.

—Dr. Roy R. Campbell, W4DFR
Lenoir City, Tenn.

• I. A. R. U. NEWS •

Devoted to the interests and activities of the

INTERNATIONAL AMATEUR RADIO UNION

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

Conducted by Byron Goodman

Results '37 DJDC Contest

BECAUSE the DASD's DJDC Contest has become quite a popular event throughout the world, we are listing some of the scores of the 1937 contest and the rules for the 1938 affair. (If we've got it wrong it's because we don't read German very well!)

Some of the high scores:

D4CDM	865,878	W3GGE	61,578
D3DSR	820,798	W3GKM	52,668
YM4AA	671,207	W3AGV	47,376
D3CFH	622,080	W4CEN	47,872
D4QET	562,095	W4DCZ	26,520
D4SNP	375,342	W4DTR	23,376
D4BUF	351,302	W5FI	702
G2ZQ	55,157	W6IES	23,232
G6YR	53,352	W6GPB	1,760
GM6NH	81,130	W7FEC	45
OK2OP	58,431	W8MAH	47,124
LU8EN	87,516	W8DHC	39,032
ZS1AH	62,424	W8JMP	21,420
VK2ADE	179,758	W9TB	128,592
VK3MR	118,048	W9VDY	4,096
VK2JX	91,290	W9TXG	1,680
VK2TI	82,376	VE1EP	52,122
VK3KX	56,355	VE2DF	3,192
W1TW	129,143	VE3AU	28,112
W2GVX-1	123,690	VE5MZ	1,872
W1RY	95,494	K5AY	41,820
W2AAL	58,968	NY1AE	31,780
W2CJM	56,466	CM2OP	5,427
W2CYS	52,530		

Rules for This Year's DJDC

The DJDC 1938 is based upon radio contacts between European amateurs at one side and overseas amateurs on the other side as in 1937. The traffic consists of two parts:

1. DX-QSO between Europe, Germany included, and serial numbers.
   There are two classes of DX-QSO:
   (a) Overseas-Germany.
   (b) Overseas-Non-German Europe.
   QTC reports can originate only from DX-QSO as under (b).
2. QTC-QSO between Europe outside Germany or overseas at one side and Germany at the other side.

Time: The four weekends of August, starting with the 6th. Each weekend from Saturday, 1200 GT to Sunday, 2400 GT.

Frequency bands: All amateur bands. There is a special band scoring this time. The German amateurs are unable to transmit on 56-Mc., 3.6–4-Mc. and 1.75-Mc. bands. *Off-band working causes disqualification.*

DX-QSO contacts between Europe, Germany included, and overseas. The idea of the DJDC is to get a maximum number of such contacts. Six-cipher serials are to be exchanged. The first three characters show the RST (or RSN) with which the other amateur has been received; the last three give the number of the DX-QSO. The first DX-QSO has the number 001, then 002, etc.

The general call for the contest is "CQ DJDC."

Amateurs who don't wish to participate are requested to avoid wasting time of the participants.

Only one DX-QSO is possible between the same stations per weekend and per frequency band. DX-QSO between European and German amateurs is not possible.

QTC traffic: Each DX-QSO between European

stations outside of Germany and overseas may be the origin of a QTC report for each of the two partners of the respective DX-QSO.

QTC reports may be sent to Germany (and Danzig) by QTC-QSO between Non-German and German stations. QTC-QSO may be arranged by foreigners with Germany as desired. Each time as many QTC may be transmitted as there are. Overseas stations may also send QTC reports in connection with DX-QSO.

The QTC reports are to be transmitted in the following manner:

1. Call of the station worked.
2. Local time of the DX-QSO in four characters (0001–2400).
3. The received serial.

The German partner of the QTC-QSO has only to verify the correct reception of the reports, e.g., 5 QTC OK. Points may only be claimed after such acknowledgment. From the above you will see: European amateurs can work QTC-QSO with Germans only. QTC reports never can show D- or YM-calls. Example: ON4AU reports to D . . . W6CUH 0515/589012. This means ON4AU has worked W6CUH at any day of the contest at 0515 his local time, when he received the serial number 589012. The serial with its first three characters means that W6CUH heard ON4AU rst 589; the latter three characters mean the 12th DX-QSO of W6CUH. At his side, W6CUH would be able to report this QSO in the following manner: ON4AU 2115/579005, which means that the QSO took place at 2115 W6 local time, ON4AU heard W6CUH with rst 579, and it was the 5th DX-QSO of ON4AU.

Scoring: For each DX-QSO may be claimed 4 points between Germany or Danzig and overseas; 2 points between Europe (except D, YM) and overseas.

Each correctly acknowledged QTC report counts two points.

The points of this scoring are summed up and, for European foreign amateurs and the overseas amateurs, multiplied by the number of the German districts, are indicated by the final letters of the call. There are 19 districts: final letters A, B, C, D, F, G, H, I, J, K, L, M, N, O, P, R, T, U, V. The 20th district is formed by YM4-Danzig. The characters 3 or 4 are not regarded.

Hence it follows: A station outside Germany which works no German QSO receives no points. European stations, therefore, are forced to send QTC to Germany, for they can work QTC-QSO only with Germany.

In U. S. A., Canada and Australia (W, VE, VK) each district forms a country of its own. The same applies to G, GI, GM, GW, etc.

Awards: There is no world-winner. The amateurs of each prefix zone are competing among themselves. The top-scorer of each country (district area) is awarded a certificate. Two awards are given if there are five or more participants.

Each competitor who submits his log in due time will get a verification card and a report on DJDC 1938 regardless of his result.

The amateur is the participant, not the station. If there is more than one operator, each one has to submit a log of his own.

Log: There are no entrance formalities for the DJDC; just send the DASD your completed log made up according to the sample. For the DX-QSO the log must show: Date, time, frequency band, worked station, serial number sent and received, and the points claimed. For the QTC, show what German stations received them and at what time the QTC-QSO started. The heading of the log must show the name of the competitor, address, call and an abbreviated description of the station. At the end, show the total score. Logs which reach the DASD after Nov. 30, 1938, can't be regarded. Each competitor is asked to send a log to: Contest Manager DASD e. V., Berlin-Dahlem, Cecilienalle 4.

LOG

DJDC 1938

Deutscher Jahres DX - Contest 1938.

Name, Address:

Final score:

Call:

TX: RX: Ant: Nr German Distr wkd:

Date Time	Freq band	worked Station	Serial numbers sent	Serial numbers received	points	QTC sent to D. . .
2154	14	W 2 GVX=1	569 001	578 005	2	D4BAF
2358	14	PY 2 AL	547 002	358 003	2	"
0235	"	D 4 BAF	...	...	4	2 qtc

(Examples for a European amateur)

Nr. German distr. wkd: Sum of points

The DASD must have the log not later than nov. 30th 1938! Play safe Om, send early!

Total:

(Please enter total also in heading of Log!)

I state that I have abided by the rules of the Contest and that my total score is true and proper. I know that I may be disqualified is I have hurt the rules of my license.

Signature

Send the log to: DASD Contest manager, Bln.-Dahlem, Cecilienallee 4

Strays

W7GDB says: "My power supply has so much hum in it that W7EMF calls it a 'BEE' supply."

— • • • —

In World Transcription Library record number 88 is "I Love You Truly."

W6LCD wonders whether there was a ham involved in the numbering.

— • • • —

W2KCN and W1KCN recently had an unique c.w. contact. It happened that both stations were on the same frequency—7117 kc. Both stations used low power—the input at W2KCN was 15 watts, and that at W1KCN was 12 watts.

OPERATING NEWS

Conducted by the Communications Department

F. E. Handy, Communications Manager **E. L. Battey, Asst. Communications Manager**

Visiting fellow hams can often be planned as part of vacation activity. Visiting A.R.R.L. Headquarters is also as popular an idea as ever this summertime. Until a member pays a visit to his Headquarters offices he can scarcely picture the full extent of the facilities set up for his benefit. The responsibility for representation of the whole amateur service in line with Board policy, facilities for giving technical information, editing your articles, development of equipment techniques, preparation of bulletin information for organized A.R.R.L. groups, machinery for placing your magazine in your hands promptly each month—all these and other specialized functions require the full time of nearly two score persons. The museum of apparatus used some years ago in amateur radio is alone a sufficient reason for a visit by the newer members of the fraternity. Your Headquarters is a very real place. Every amateur ought to visit it.

The new W1AW (Maxim Memorial Station), located on a seven-acre site about four miles south of the Headquarters offices, is itself the mecca of many amateur operators and visitors these days. The transmitters which you glimpsed on *QST*'s cover last month have now been moved to the station building. Installation is proceeding apace, with limited daytime operating during August. The full schedule of evening operating will start in September. Look in on W1AW and your organization Headquarters this month if you get a chance.

Warning. Every licensed amateur operator knows the penalties prescribed in the Communications Act—for violations of the Act—for violations of regulations made under the Act. The Act applies to all citizens. The Federal Communications Commission is increasingly active in collecting evidence against the few who infringe the rules.

Elsewhere in these columns we publish certain decisions of the F.C.C. in which you will note that, in addition to license revocations and suspensions, penalties of considerable cash fines are imposed on convicted violators. The prosecution of those that endanger the privileges of all of us by "bootlegging" or irresponsibility will be prosecuted earnestly by the F.C.C. A few words to the wise:

(1) If unlicensed, *don't* bootleg. You may not only be subject to prosecution and heavy fines, but may lose the chance to hold the valued amateur status and license.

(2) Licensed operators, who have earned the use of frequencies by simple and proper qualification, will help themselves and the whole fraternity "to keep amateur bands *for* amateurs" by reporting any and all unlicensed or bootleg operation to the F.C.C. for investigation.

(3) Don't allow anyone to operate *your* station unless he first shows you a valid license.

(4) Log completely and properly *every call* or transmission! It's a violation not to. (We recently examined the log of a leading DX man . . . which showed neither the power or finishing time of any of the QSO's. What sort of shape would that fellow be in if his log was called for any reason at all by F.C.C.!?)

(5) To all amateurs on vacation we suggest strict and early notification (to F.C.C.) where low-frequency portable operation is planned. Remember to take your license along if you expect to be allowed to operate at any ham stations visited.

A.R.R.L.'s June Field Day wins for itself classification with our major operating activities. Logs received show 25 per cent to 35 per cent more of the stations worked, in the portable (BT-X) class, than in previous events. Participation as shown by the number of logs is up proportionately. The "FD" has gone ahead in popularity with each passing year. A most important activity for clubs, some are already planning local contests in their groups for building self-powered equipment both to better their standing in the next "FD" and to aid in general communications emergency preparedness.

The scores this year will be printed so as to indicate which stations operated with but a single-transmitter-single-operator at a time. This is in order to properly credit all such entries, which are not to be compared directly with several-transmitter groups.

No August Field Day or low-power summer activity is announced this year. Experience has indicated that participation has never been close enough to the volume of June activity to justify this extra activity in the schedule. Like other big activities you can count on the Field Day as an annual event. Experience indicates July and August as the universal vacation months. Summer is also a good time for general rebuilding and tests and some local activities for those with the special enthusiasm so to prepare for bigger success in the next official activities! —*F. E. H.*

PRIZES FOR BEST ARTICLE

The article by Mr. R. E. Cosier, VE3ARB, wins the C.D. article contest prize this month. Each month we print the most interesting and valuable article received marked "for the C.D. contest." Contributions may be on any phase of amateur operating or communication activity (DX, 'phone, traffic, rag-chewing, clubs, fraternalism, etc.) which adds constructively to amateur organization work. Prize winners may select a 1938 bound *Handbook*, *QST* Binder and League Emblem, six logs, eight pads radiogram blanks, DX Map and three pads or any other combination of A.R.R.L. supplies of equivalent value. Try your luck. Send your contribution to-day!

Our Golden Opportunity

By R. E. Cosier, VE3ARB*

ONE has been able to read so much during the past few years, of criticism directed at the novice, breaking into this great brotherhood of "hams," that I am prompted to submit a few words which, I hope, will give new thought on what now is a problem to more than a few.

As we all know, essentially amateur radio is the exchange of thoughts and ideas by means of radio. These contacts should be not only friendly but helpful, everyone striving towards the ideal goal of human relationship—that of helping the other fellow—so lacking in the world as a whole, to-day.

The number of beginners within our ranks is ever on the increase, and that familiar QRS is heard more and more often. QRM is also increasing until one now hears many a proposal that beginners should be placed on 300 megs., or given a dummy antenna! In other words, the beginner should be isolated from those who believe they are above that stage.

I cannot help but think that these suggestions come from the experienced of our ranks who have forgotten their own early days. However, it is not my point to criticize ideas, but rather to suggest another line of thought.

The majority of beginners venturing into our fine hobby are conscientious and will quickly correct faults in their equipment when shown how. They strive to send good clear signals and of necessity must send slowly. Their copying also is slow.

For the operator who normally sends anywhere from 20 w.p.m. up, and his "bug" setting is 20 w.p.m. or more, to QRS is a trying and tiring procedure. But his signals are merely a blur of noise to the novice, who must treat them as he would QRN, not being able to even identify a call. Many the operator thus isolates himself from the less experienced, and, a golden opportunity! Let those operators stop a moment and think. Can the beginner be given a place with the experienced? Yes.

* 160 Hopedale Ave., Toronto, Ontario, Canada.

The beginner provides another great channel for furthering the ideals of amateur radio. From his ranks come those good fists that are a joy to hear. The future of our hobby is dependent on him. Therefore, the beginner should not be criticized, looked down upon, and dubbed "lid," but rather envied! He receives all those thrills and strivings undulled by repetition. He provides the opportunity for his more experienced fellow ham to be of service to others, to reap a rich reward in further enjoyment and happiness that must follow from his hobby. And that is not all. The veteran,[1] in showing the way to the beginner, also controls the destiny of amateur radio, *fostering* that true spirit and ensuring its continuance.

Shall we ban the beginner from our popular bands or shall we keep them near our frequencies and guide them?

Nothing but praise can go to the man who devotes his efforts and time to helping others. Sacrifice, tolerance and patience are required, but is it not worth while?

The beginner is one of amateur radio's biggest opportunities for carrying out the true spirit of our hobby. The experienced may reduce QRM by leading the way, giving our beginner a pattern[2] on which to build. That's the true amateur spirit —long may it continue!

[1] It is all too true that *personal responsibility* of the experienced amateur is the highest necessity for the fraternity as a whole. On every *individual*, and the veteran in particular, lies the hope of the fraternity for public understanding and appreciation of "the amateur."

[2] The veteran is apt to be too sophisticated in operation and too callous to the opinions of non-amateurs, and the need for consideration for fellow amateurs of other interests or of different operating abilities! All would do well by themselves and amateur radio also to study *operating*, and their own careless technique in particular—aim to set the right example—operate in a way you can justly take pride in—not sloppily or selfishly. Study Chapters 18 and 19 in the *Handbook*.

F.C.C. Disciplinary Actions

Violations of the Communications Act involving unlicensed operation are now under investigation by the Commission or pending in Federal Courts throughout the United States. The defendants in two of these cases were recently convicted of the charge of operating an unlicensed radio station in the ultra-high frequency amateur bands and without the required operator's license from the Commission. They were:

Theodore V. Fabian of Pittsburgh, Pa., who pled *nolle contendere* in the United States District Court at Pittsburgh on May 26, 1938, and was sentenced by Judge Gibson to pay a fine of $100 and costs, and was placed on parole for two years during which time he is required to report each month to the Probation Officer.

W8RUE, station license of T. V. Fabian, acquired subsequent to unlicensed operations was revoked also, under a decision of the Federal Communications Commission reported June 15, 1938, because of violation of Sections 301 and 318 of the Communications Act of 1934, as amended.

Samuel Alfred Trewella pled guilty to unlicensed 2½-meter operation, in the United States District Court at Washington, D. C., on June 8, 1938. On motion of defense counsel, Judge Adkins deferred sentence and referred the case to the Probation Officer for investigation and recommendation with regard to parole. Later he was sentenced for from four to eight months imprisonment and sentence suspended.

John Evans of Palmyra N. J. (W3ANH), on July 5th had his operator license suspended for six months. The inspector measured his 'phone station input with accurate instruments and found the power 1462 watts! Mr. Evans also failed to answer discrepancy reports. The log was not kept properly in accordance with the regulations. The operator was apprehended while actually operating with 1462 watts input.

A number of unlicensed 56 Mc. bootleggers have just been indicted in Atlantic City.

Gatti African Expedition—OQ5ZZ

The tenth Gatti African Expedition will be on the air from the Belgian Congo starting about middle August. Some of the purposes of the expedition are working in the Uele, where are the greatest herds of elephants and the only station capturing, taming and training the African elephant, study, movies, photos, collections among the Manbettu and research on the Mulahu, the mysterious and still unknown fifth anthropoid. The call OQ5ZZ has been assigned the party and operation will be in the 14-Mc. amateur band. A 75-watt radiotelephone transmitter receives its power from a 4-kw. lighting plant. Word to the base camp from the expedition's exploring parties will be on 3950 kc.

Bowdoin-Kent Island Expedition—VE1IN

The Bowdoin-Kent Island Expedition is on the air again this summer with station VE1IN. This expedition consists of scientists and students from Harvard University, Bowdoin College and other institutions. Aerial photography, meteorology, biology, oceanography and field radio research are included in the program. VE1IN works amateurs in the 3.5 and 14-Mc. bands, both 'phone and c.w. Much operation in past years has been on 3.9-Mc. 'phone.

Archbold New Guinea Expedition—PK6XX

PK6XX, the Archbold New Guinea Expedition, has been putting a good signal into the States, and quite a number of amateurs have been making contacts. At 4:55 A.M. EST, June 3d, W4DRD, Miami, Fla., had a two-way 'phone contact with KHAHX, the call used by the "Flying Laboratory" *Guba* of the expedition; at this time the *Guba* was on the first leg (San Diego-Honolulu) of the flight to New Guinea. On June 7th W4DRD again made contact, while the plane was 750 and 900 miles from Honolulu, enroute Wake Island. Again, on June 9th, W4DRD made two-way contact with KHAHX on the last leg of the flight, Wake Island-Hollandia, New Guinea. On all contacts KHAHX used 12,420 kc., W4DRD 14,246 kc. The plane was also contacted during flight at regular intervals by W6LYY and K6OQE. W2IWT, W5FIY and W9UJS were among others to make contact. W6ANU and W6PGE assisted W6LYY in maintaining an hourly schedule.

PK6XX, the base station at Hollandia, now maintains regular Saturday night schedules. 14,009-kc. 'phone is used mostly and W4DRD reports a solid S8 signal from 4:00 to 8:00 A.M. EST. W2BVB, operator at PK6XX, will confirm all stations worked, periodically, by message to A.R.R.L. so that Century Club credit may be allowed. Hollandia is a village of approximately 350 black natives who, prior to the expedition's arrival, had never seen electric lights nor the other wonders of electricity. Their astonished faces constantly appear in windows and doorway while the station is in operation.

Among others who have reported contacts with PK6XX are W6ITH, W9BEU, W5ACY, W7FEZ and W9FK-6. W9CVL reports that W2BVB/PK6XX says he will use the commercial call PO6ZA on 11,355 kc. W9FK-6 did some good work when several relatives and friends of the expedition party were at his station to talk with the base. PK6XX is on the air nearly every day and welcomes QSO's—watch 14,009 kc.

W1OXDA

Radio operator with Captain Bartlett's Expedition to the Arctic (W1OXDA) is Don Clark, W2DBS, instead of Harold Cooper, W21KT. See page 57, July *QST*, for complete details.

Briefs

In addition to the four winners mentioned in the June *QST* report on the 1937 A.R.R.L. Copying Bee, Harry Gross, W6FZL, also made perfect copy and has been awarded a bronze medallion in recognition of his accomplishment. Congratulations, OM!

R Stands for . . . ?

By Zeh Bouck, W8QMR*

REMEMBER the spelling books—I mean the first ones we ever had, just outside the nursery—where A stood for APPLE and B stood for BRONCHITIS? To this day I'm not quite certain what R stands for—and that may well be because some lads haven't quite been graduated from that same nursery.

Frankly, I'd say that R was the most misused term in ham radio—with the possible exception of CQ. But then CQ has two letters which give it somewhat of an advantage. It can be transmitted as CTK, TRQ, NNMA, KEGT, CMA, KETK, NNQ, TRTK, KEQ, CGT, NNTK, TRMA, NNGT, KEMA, TRGT . . . and occasionally CQ. Liberties taken with R are limited to ETE, AE and EN. However, the crimes against R are not so much those resulting from variations on the theme.

For some twenty years now—twenty-eight when I care to admit it—I've been trying to convince myself that R stands for RECEIVED—OKAY—that it is an abbreviation conveying the intelligence that everything transmitted has been received—copies beyond the doubt of an error. Or at least a reasonable doubt. But sometimes . . . well, I wonder.

When traffic isn't heavy, I delight in chewing the rag. I'm no stickler for formalities and set forms, but I usually open a QSO in the conventional manner—just as it is easier to start a game of chess with the Queen's Pawn opening or the Muzio gambit. And besides, this RST business makes sense—as does the QTH. However, I rarely tack on any dope concerning the weather. Weather as a topic of conversation should be used only as a last resort. Of course, when the WX is exceptional, it may be justifiably dragged in—as in the case I am about to relate.

I had just finished a sked with W8CSE, and he, somewhat sour on the QRN, hit the hay. I sent a short CQ. A W3 came back. I wasn't getting him very well, but feeling more or less obligated I returned with—

GE TKS FOR THE CALL OM—YOUR SIGS RST 379X HR IN LIVINGSTONVILLE NY—QRN BD BUT THINK I CAN PULL YOU THRU WITH THE XTAL ON THE HRO—THE XMTTR IS A CUPLA 6L6S IN THE FINAL WITH ABT 60 WATTS K

The W3 responded with two attention calls, called three times and signed three times (not at all necessary, but read on my friend, read on)—and then added:

R R R R R R

Subconsciously I glowed a bit. The ole 6L6s apparently were pushing through down his way—QRN and all. The W3 made a few BTs and continued—

OK SOLID

I had gained that impression when he sent the first R. About this time I had a vague idea that the SOLID might well describe some portion of his anatomy. A moment later I was convinced—

OK ON YOUR QRA (never QTH!) BEING IN LIVINGSTONVILLE NY OK ABT THE WX OK ON THE BD QRN OK ON UR FB RIG . . .

I wonder why he ever wasted time sending that R in the first place?

Then there is another chap I worked—a W8—under exactly the same conditions, *and my opening was identical with that of the W3 QSO.* The W8 also came back with—

R R R R

Again I was mildly pleased, and he went on—

YOUR SIGS FB RST 589X HR IN CLOSEVILLE NY —RIG HR IS . . . etc., etc. . . . WHAT R U USING?? WX BD HR HW IS WX UP UR WAY??? QRA? (once again, not QTH?) QRK?

About that time I lost most of my philosophy, not to mention patience, and cut it short.

I don't trust an R any more!

*Ex-2PI, ex-W4FCP, Livingstonville, New York.

O.B.S.

The following is a supplement to the list of A.R.R.L. Official Broadcasting Stations in October *QST* (page 50): W1EOB, W3GWQ, W8RBI, W9KHC, W9MOK, VE2HV.

How's DX?

How:

With a soft spot in our heart for the finer things in life, we're a pushover for odes, ballads, lyrics and such. It's a pleasure to present the result of a thunderstorm over New Jersey:

THE POSTMAN COMETH NOT

I've worked them all from east to west.
I've sent them all a card.
I've sent them two, and three, and four:
I've pleaded pretty hard.

I've worked my tongue off to the root
I've licked so many stamps.
I often wish I had them here—
I'd fill them full of amps.

I've only six more cards to go,
I've thought 'twas in the bag.
I've met the postman every day;
I've heard the same old gag.

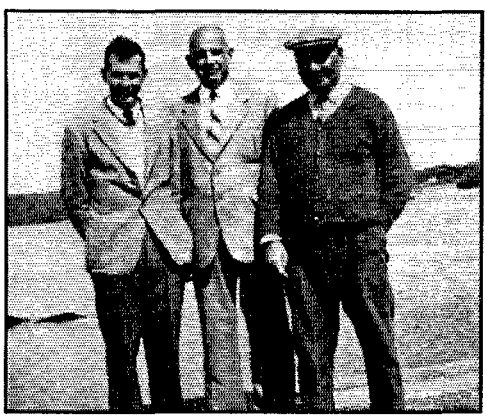
I've been so sure they'd come across,
I've hurried to the door.
I've gotten G and D and F—
I've gotten nothing more.

I've finally got my dander up,
I've lost all sense of trust.
I've sworn an oath, a mighty oath;
I'll work six more or bust!

—*W2GVZ*

Where:

One nice thing the Century Club has done for DX has been the reduction of QRM. Have you noticed how quiet the bands sound lately? But just let some juicy rare one open up, and the band really roars .. .. .. W8CRA was heard working CR8AA the other A.M., but we haven't any dope on the frequency .. .. .. W6ITH worked CR9JF on 10 'phone in April, but thought him a phoney. Reg received a card the other day .. .. .. Any station in Bulgaria is plenty rare, so leave it to W1SZ and W2CYS to grab off LZ1ID (14,360 T8c). The lad's under cover and QSL's, but we'll forward your card for you .. .. .. It really pays to get up these mornings. W6NRE grabbed off VR1AM (7165 T9x) at Ocean Island the other A.M. .. .. ..



VO3R, W1KH, AND VO3X, AT ST. ANTHONY, NEWFOUNDLAND

EL2R (14,405 T7) has had the boys chasing after him the past few weeks. According to the dope he gives, he's located about 50 miles east of Monrovia, is an ex-W2, is running 500 watts into a MOPA into a 10-wavelength Vee, and will QSL via A.R.R.L. So far we've received no word from him .. .. .. It isn't easy to be skeptical in this warm weather, but when someone gets on signing VR6AB (14,350 T6) and tells G6KP and G6RH that he's the portable outfit of VR6AY, with W1BES at the key, we have to take it with a grain of sodium chloride, especially since W1BES has been back in this country for some time .. .. .. We've had several inquiries as to the QTH of OY4C (14,325, 14,430 T6), but our only suggestion is to send your card care of the OZ QSL Bureau, and keep your fingers crossed .. .. .. According to TF3C (14,280, 14,420 T8), who should know if anyone does, the only active stations in Iceland are 5C, 5F, 5M, 5CD, 2Z and 3C, which leaves the burden of proof with the TF2AX reported last month and the TF5B (14,415 T8) worked this month by W1BGY, W2CYS, W8RQA, W2HHF and W3FQO and others .. .. .. W5HBE and W9WBT worked SU2AS (14,385 T9x) and are wondering about his address .. .. .. That's easy; cards for SU go care of the SU QSL Bureau, but if someone were to ask where to send a card for EQ4AC (14,030 T9), worked by W9TPH, we wouldn't have such a snappy answer .. .. .. And all we could do about AR8MK (14,365 T9) is pass along the QTH as copied by W8LYQ and W3FQO: Dan Lunnon, Posts and Telegraph, Damas, Syria. (Boy, we hope that's good!) .. .. .. W2CYS says he's heard YI2FK (14,310 T8c) calling "CQ USA" in the evenings, but in vain .. .. .. Borrowing again from that very excellent source, G6WY's column in the *T & R Bulletin*, we see that several G's have worked AC4YN (14,120) and that you can QSL PX1A (14,300, 14,415 T6) via the R.E.F. (France) .. .. .. This fellow FJ8AA (14,400 T9), worked by W2BHW, W9FS, VE5SW, W9CWW and W9ARL, may be OK. He says he's on Clipperton Island (remember?) and to QSL via the R.E.F. They worked him in the early ack emma .. .. .. Please excuse the error last month. We mentioned ZD2A and ZD2B as legit but QSL via R.S.G.B. They should have been ZB2A and ZB2B .. .. .. For those of you that care about such things, we have QSO lists from I7AA, K6NVJ and PK6XX, as well as those mentioned last month .. .. .. Speaking of I7AA, we have a letter from a friend of his, the fellow that supplied the list, which says that some muddle-head sent 7AA a card direct, with the result that his superior raised a fuss and 7AA has had to lay low for a couple months. If he receives any more cards direct he will be put off the air permanently. We weren't kidding these last couple of months when we said that these fellows deserve some consideration, so please don't send open cards blind or to fellows that you know or suspect are under cover .. .. .. W4TP has one that may or may not be OK: TZ5AA (14,375 T9x), and W3EVW's ZA1C (14,395 T7) falls in the same category .. .. .. W1JJL must have plenty on the ball. He received a QSL from XSV1SM (send yours to LU2CW) and, of all people, F2PX (FP8PX)! .. .. .. W2BHW has a couple of nice items: he says that he heard FO8AA (14,405 T8) working K6KKR in Samoa but couldn't find the K6. Our dope, from WCFT, was that there was no active station in Samoa, but it looks like the picture has changed. Rolf also worked VQ3HJP (14,405 T7) .. .. .. Another VQ is VQ4KTF (14,080 T8) worked by U1BGY .. .. .. W8OUK has an interesting couple here: ST6AL (14,290, 14,330 T9x) and CR1OZS (14,290, 14,400 T6) .. .. .. And YS1AP (14,430 T9), heard by W2HHF, looks like a fair-to-middling bet .. .. .. Some of the lads were a little suspicious about the three-letter G's they worked on Field Day. You'll notice that the calls all end in "P"—that's the British "portable" designation .. .. .. A few more in the "Guess What" category: EY7F (14,370), heard by W9UQT, and ZK6K (14,405 T7), heard by U1EH .. .. .. There have been

several stations on signing ZC6 lately, including ZC6PO (14,375 T9) and ZC6KF (14,325 T7), but we're not quite sure if they're legit or not. Cards have been coming through from ZC6AA and ZC6AQ, however .. .. .. EA7AV (14,005, 14,410) has been on, but we can't say whether or not a card to his old address in Cadiz will reach him or not. You know how those things are these days.

"HAM" WHYTE, G6WY, OF BECKENHAM, KENT, ENGLAND

The No. 1 DX Century Club man resorts to no tricks to work his DX. The driver unit (6A6-6L6G) drives either a 10-20 PA or a 40-80 PA, and the antenna is the old reliable 133' straight tap, aided and abetted on occasion by half-wave doublets on 10 and 20. The receiver is a homemade 8-tube regenerative s.s. super which, according to Jim Lamb (who has heard it), is one of the smoothest-working there is.

(In case you can't read some of those cards on the wall, they include AC4YN, FN1C, EA9AI, and such.)

When:

If a fellow were to go by the reports that trickle in here he might get the impression that 20 was the only band with any DX on it. We don't like to believe that, and that's why the dope from ZS1AN, via W3BGD, makes us feel better. ZS1AN says that he can hear W's down there on 3.5 Mc., which makes it a cinch for 7 Mc., and he relates how he has worked W6GRL on 28-Mc. sked when there wasn't another signal on the band. He seems to think the lads want everything their own way, and aren't willing to dig a little. So if you get tired of DX on 20, look around on one of the other bands for a while, and let us know how you make out .. .. .. Those Pacific Islanders are still on 7 Mc., except K6NVJ, who is waiting for replacement parts to arrive.

W9TJ, who used to work 'em with battery plate supply, has gone QRO, and some of his stuff includes ZD2H (14,300 T9), VK9DM (14,300), ZC6AQ (14,410), PJ3CO (14,430), and EL2A (14,370) .. .. .. W8OUK is in with some interesting material which includes LX1AO (14,340 T9x), LY1KK (14,380 T9x), YR5VV (14,405 T7), ZE1JI (14,375 T9), KA1AX (14,255 T8), U9ML (14,415 T9), OQ5AQ (14,350 T9), UX1CN (14,410 T9), and ZB1U (14,315 T9) .. .. .. W8RQA's contribution has U5KN (14,390 T5), CT2BE (14,405 T6), FY8AA (14,440 T7), SP1LN (14,390 T9), I1MH (14,430 T8), and SV1RX (14,400 T9x), as well as J2LL, J2JJ and J2KG at the high end .. .. .. W8PQQ reports FB8AB (14,390 T9x), FB8AD (14,310 T9x), VK9BW (14,400 T7), ZB1R (14,290 T9x), VS7RF (14,290 T9x) and PK1MF (14,390 T8) .. .. .. Down around Cuba, CM2AO grabs off OZ7PH (14,320), CN8AX (14,405), CT1ZZ (14,335), VQ8AB (14,300), XU8OL (14,340), and VQ8AS (14,315) .. .. .. W7GPY, who used to be W6PB, has been working KA1AP (14,150 'phone), OH5OD (14,400 T9), OK2PN (14,360 T7), KA2OV (14,155 'phone), and PK1RI (14,020 'phone) .. .. .. At W8DOD it's LX1AG (14,432 T8) and U5HE (14,405 T9), and at W8HGG it's CT3AB (14,030) and HR7WC .. .. .. W9CWW has VK9VG (14,110) and CT2BC (14,145) in his list, while W5EWZ sports PK1BX (14,020) and XU6LN (14,060, 14,270 T8) .. .. .. W2HHF has a nice group which includes SU1TM (14,280 T9), ES7D (14,075 T9), YU7LX (14,420, 14,370 T7), VS6AO (14,350 T9), FI8AC (14,405, 14,275 T9), UK1CC (14,275 T9x), and VP6RB (14,360 T9).

What:

Those of you that are interested in signal reports may be interested in some experiments we ran with W1SZ in connection with the New England Convention. We made a phonograph record with a constant c.w. signal on it and then faded in various forms of background noise and QRM, to see who could copy the most through QRN and QRM. The interesting thing, at least to us, was the fact that, in every case, the minute the QRN came on, the signal would appear to take a drop in strength. We knew this wasn't the case, because the signal was always fed in at a constant level, but nevertheless it sounded as though the signal was being attenuated at the same time that the noise was introduced. All of which leads us to believe that hams have trained their ears to have a sort of a.v.c. action that instantly takes care of noise peaks, reducing the response when noise gets bad. And it of course shows that the business of signal reports is even more of an old shoes proposition than ever we had dreamed. What we need is a real method of comparing signals that gives a fellow an accurate indication of how he compares with others on the band. How about some of you brains giving it a thought?

There's another thing you may or may not know. We were running some tests with the 1851 as the first r.f. tube in a superhet, and comparing the signal/noise ratio of it with other tubes. On 20 it showed a slight improvement, about 25% better, but the interesting thing was that it was easier to get a better signal-noise ratio by cutting down the audio pass band with the old-fashioned tone control. For example, the 1851 would improve the ratio by 25%, but cutting in the tone control could improve it by 75% or more (this with the crystal at normal adjustment). These weren't aural tests: they were all made with a standard signal generator and so are reliable. Give it a try.

One more thing. W8NJP dropped in the other day for a nice chin-fling about DX, and among other things mentioned that he thought it would be a good idea for clubs to get together on the QSL-card mailing business. For example, all the fellows bring their cards going to the larger countries to the meeting, and the official bundles them together and sends them to the proper QSL Bureaus, saving postage all around. It should be a good thing in those clubs that have majority of DX-minded amateurs.

Who:

Consolation for this month comes from G6QX, who has been visiting throughout the East. He says, "I now know something of the QRN problem, and would say that G is a paradise compared to W on that count; the QRM from electric razors, diathermy machines, neons, power leaks, etc., has to be heard to be believed. Never would I have believed it possible to get so many power lines on the average lot as I saw in some places, short of a vertical antenna some locations are simply impossible, and the gang is to be congratulated on having the love of the craft to stick it out" .. .. .. G2VZ, an engineer at BBC's Checking Station at Tatsfield, has had the pleasant (?) experience of listening on 10 and hearing his own call pirated! As far as he knows, the pirate has been active only on 10 and 40 .. .. .. It isn't all smooth sailing for some of these smarties that sign phoney calls. W3FLH worked a fellow signing I7AC who said he was at Ras Dascian, but when Bern went back at the mug in Italian he answered in English and Q signals! It must be frightfully disconcerting, what? .. .. .. Then there are the lads who insist on quick QSL cards. K6BAZ has the answer: to the request of a W2 the other morning he replied that he didn't know whether bird mail would beat

fish mail or not .. .. .. W3EYY claims some sort of record. With only 30% normal hearing, he has worked 69 countries, which would rate him about 230 countries with good ears .. .. .. We kinda like G8MF's attitude. He says that "if some of the boys over there had a little more patience and waited until I finished my QSO's, instead of busting in, I would be able to work more, but as it is many QSO's are interrupted and therefore prolonged. I always like to finish a QSO when started." (Jeeves, what have you done with that ECO?) .. .. .. Don't look now, but Mrs. W6QD just finished building a two-tube receiver of her own. Wonder why Herb doesn't let her use the big receiver once n a while? .. .. .. Donald Clark, W2DBS, took over as op of W1OXDA at the last minute, since Cooper couldn't go .. .. .. Gil, W1CJD, who draws those cartoons for *QST*, is down South America way on a boat, and pounded brass at HK1JB one evening. He's spoiled now, because he didn't have to touch the receiver all evening, there were that many fellows calling him .. .. .. W3EDP, who makes odd lengths of wire really put out, has forsaken 'phone for DX and likes it. He should; he's been working VR4AD, FI8AC, K6BAZ, VQ2GW, KA1AX, LZ7AN, U6WB, U9MJ, LX1AO, VR3A (QSL via G2SQ), and VP7NT, among others, for a total of 121 .. .. .. W6ITH tells that FN8E (7300 T8) at Kwangchowan is on frequently, and that J2MI says J9PA in the Marshall Islands also gets on .. .. .. On Field Day with only 15 watts input, W9RRS worked XU2AA (7300). Of course he was on a hill only 8500 feet high! .. .. .. W6HIP claims that he has received the largest QSL card ever, and he's probably right. It's from K7ESJ, and takes the form of a Lambert Conformal Conic (whew!) Projection map 13" x 33" .. .. .. VE3ADV, who is ex-G5UP, has been cracking DX with things like K6BAZ, U9MI, I1LD, FT4AG (14,350 T9), FO8AA (14,403 T9x), VR4AD and CN8AX .. .. .. W1CNU crawled out of the sack long enough to tell us that he has made up a rather complete loose-leaf booklet listing the DX he gleans out of these pages. He lists them by prefixes, with plenty of room for additions, and shows the reported frequencies after them. It works out well, according to Nick, although it's naturally a bit of a job. He doesn't depend on the frequencies entirely, but finds them to be fairly reliable .. .. .. W8JSU bet a local he could WAC with less than 40 watts, and won in two months. Asia was the toughest, as might be expected .. .. .. VK4CG (14,064) needs Nevada for WAS, as do most of us .. .. .. W8GER thinks he's the last QSL Manager to get close to the CC, but he's well on the way with YN1AA, CT2BO and the like .. .. .. W2IBT-6 passes it along that LU7AZ can be worked on about 3615 kc. if you get on around midnight .. .. .. VE3AU, who sort of bowls over the DX when he gets on, is back, and added ZB1H and LX1AS the first day .. .. .. I1IR (14,405) needs Nevada, N. D., S. D., N. M. and Wyoming for his WAS. He's 100% QSL, in case you haven't an I card .. .. .. W8WQ has been having good luck with his haywire rhombic, if reports of "only W coming through" in Europe on 40 watts can be considered anything but perfect. Some of the better stuff includes TA2BS, CT2BM, EA7AV, YR5CG, YU7XU and SV1RX .. .. .. We predict the finest DX conditions ever during the first week of July—we'll be 200 miles from the rig!

—*W1JPE*

Briefs

During the past winter VO2J, Carbonear, Newfoundland, did a nice bit of QRR work handling train orders when trains were snow-bound, with all telegraph and telephone wires down. More recently, when a motor-boat was astray between St. Anthony and Conche on the northeast coast of Newfoundland, the Newfoundland Amateur Radio Association through VO1J established communication with VO3X, St. Anthony. Appreciation of authorities was expressed to amateurs for establishment of communication when other means were not available.

—•••—

All VO stations when operating portable add the oblique stroke (DN) and the letter *P* to their home station calls.

MEMBERS, DX CENTURY CLUB

		Countries
H. A. Maxwell Whyte, G6WY	(No. 5)	134
Frank Lucas, W8CRA	(No. 1)	125
Jefferson Borden IV, W1TW	(No. 3)	124
Clark C. Rodimon, W1SZ	(No. 7)	124
J. Mahieu, ON4AU	(No. 40)	124
John Hunter, G2ZQ	(No. 6)	123
C. E. Stuart, W6GRL	(No. 15)	120
E. L. Walker, W8DFH	(No. 14)	119
Douglas H. Borden, W1BUX	(No. 2)	118
Don H. Mix, W1TS	(No. 9)	116
Reeve O. Strock, W2GTZ	(No. 12)	116
Walton H. Bostwick, W2GW	(No. 11)	114
Henry Y. Sasaki, W6CXW	(No. 4)	113
Harry G. Burnett, W1LZ	(No. 10)	112
Jean Lips, HB9J	(No. 13)	110
W. H. Alexander, W6KIP	(No. 28)	110
George Grammer, W1DF	(No. 29)	110
Keat Crockett, W9KG	(No. 16)	109
Onne L. Santti, W8DHC	(No. 27)	108
C. L. Williams, W8JMP	(No. 22)	107
Julius Wengler, W8OSL	(No. 23)	107
Francis J. Walczak, W8DWV	(No. 17)	106
John Marshall, W9ARL	(No. 18)	106
Fred M. Gillett, W6HX	(No. 21)	105
Paul de Neck, ON4UU	(No. 31)	105
A. Edward Hopper, W2GT	(No. 32)	105
Glenn H. Means, W6ADP	(No. 34)	105
John F. Dormois, W9GDH	(No. 41)	105
Arthur H. Bean, W7AMX	(No. 26)	104
Ralph H. Summers, W8OQF	(No. 30)	104
Ralph E. Thomas, W2UK	(No. 33)	104
William T. Caswell, Jr., W5BB	(No. 37)	104
Richard J. Cotton, W8LEC	(No. 25)	103
R. W. Weisbach, W9PST	(No. 35)	103
B. W. Benning, W4CBY	(No. 20)	102
Guy Grossin, F8RJ	(No. 8)	101
H. Hodgens, EI5F	(No. 19)	100
Jack Clarricoats, G6CL	(No. 24)	100
Robert Holmes, G6RH	(No. 36)	100
Wilmer L. Allison, Jr., W5VV	(No. 38)	100
Rolf Lindenhayn, Jr., W2BHW	(No. 39)	100
Roy W. McCarty, W9KA	(No. 42)	100

The following have submitted proof of contacts with 75-or-more countries:

J5CC	99	W4AJX	88	W6ITH	81
PAØXF	99	W8BOX	88	W8AU	81
W9EF	99	W6BAM	87	W9FLH	81
W1ZB	98	W9AEH	87	W1GCX	80
W3EVW	98	FB8AB	87	W3BVN	80
W1DUK	97	G2DZ	87	W3EPR	80
W6FZL	97	PAØQZ	87	W3FRY	80
W1WV	96	VE2AX	87	W3VX	80
W3EVT	96	W1RY	86	W8DGP	80
F8RR	96	W2HHF	86	W1GNE	79
W1CC	95	W8ADG	86	W5ASG	79
W1JPE	95	W1FTR	85	W8FJN	78
W3EDP	95	W8CJJ	85	W9UM	78
W3EMM	95	G6GH	85	G2TR	78
W6GAL	95	W4BPD	84	W1BFT	77
PAØQF	95	W4CCH	84	W1EWD	77
G5RV	94	W4CFD	84	W2GRG	77
W2GVZ	94	W8KTW	84	W5KC	77
W9ADN	93	W2CYS	83	W8BSF	77
W4CEN	92	W3AIU	83	SU1WM	77
W1ZI	91	W3GAU	83	W2DSB	76
W8EUY	91	HB9X	83	W6GPB	76
W3BES	90	G5QY	83	W8DOD	76
W4DRD	90	VE2EE	83	W8LZK	76
W2DC	89	SP1AR	82	G5BD	76
W3EPV	89	W1BGY	82	W1ICA	75
W8KKG	89	W8AAJ	82	W3CKT	75
VK5WR	89	W1ADM	81	G6ZO	75
W2CBO	88	W6GHU	81	PAØJMW	75
W3JM	88				

New Century Club members this month: W6ADP W9PST, G6RH, W5BB, W5VV, W2BHW, ON4AU, W9GDH and W9KA. Congratulations, all! The Century Club and "75-or-more" listings represent the only official *confirmed* countries worked list in existence. Send in your confirmations when you can qualify for at least 75 countries.

Kansas Emergency

Well, it happened! Out here in high and dry, mild climate Kansas. On the night of April 7th a good old "norther," like grandpa used to tell about, blew into Kansas, rain, sleet and snow in abundance, taking out an enormous number of communication lines in the state.

The gang got on the air immediately and went to work. W9ZMS at Wichita kept schedules all night with W9COP at Mulberry, dispatching Kans. Gas & Elec. Co. traffic. Some traffic was also handled for Phillips Petroleum at Bartlesville, Okla. The following morning a schedule was established with W9AEY at Beloit for the Cities Service and important traffic handled from there for some time. W9MFH, W5GSM/9. W9SIL and W9TFR handled press for the Wichita papers by working W9KFQ in Kansas City. Wichita was without wire communications of any kind for 24 hours. W9WIN, Wichita, worked W9ZAW, Ft. Scott, and did some relaying for the Frisco R. R. W8FWY and W9QQQ, Manhattan; W9TAI, Herington; W9AWB, Hutchinson; and W9FRW, Pratt, helped find some Rock Island trains that were stalled in the drifts out in the western part of the state. W9IQV, W9KST, W9RQE and W9TBR manned the Kansas State College Radio Club station, W9QQQ. W9DKI, Great Bend; W9SRS, Salina; W9VRZ, Pretty Prairie; W9RAT, Coffeyville; W9EYY, Ottawa; W9NJS, Winfield; W9FLG, Topeka, W9GXW, Concordia; W9QCH, Winfield, were heard passing traffic along. W9ADE, Abilene worked W9WQN, White City, dispatching for Kansas Power and Light. W9WQN was forced to use emergency power (batteries) for several hours due to failure of commercial lines.

With all the telegraph and most of the telephone wires down at Colby, W9YAH handled Western Union traffic with W9HO of Salina. W9YAH was also in communication with W9CDM, Concordia, W9KTE, Norton, W9UJW, Oakley, and W9YRS, Hutchinson, handling messages for the United Telephone Co., the Rock Island R.R. and Western Union. This was all on 7 Mc. W9JDY assisted in operating at W9HO. W9YRN, Salina, was alternate for W9HO. W9NQH, Abilene, assisted in getting information on the condition of telephone lines in his section of the state. W9ATI at Herington, together with other 1.75-Mc. 'phone stations, aided the Missouri Pacific R.R.

W9FWY, Manhattan, and W9ECF, Leonardville, acted as control stations for the Kansas Cyclone network, taking traffic from over the state and relaying to Kansas City, by W.U. and later via W9QQQ, Kansas State College. W9BOE, W9ELU, W9KST and W9UGL assisted at W9FWY. W9JWY, Lyons, on 3990-kc. c.w. raised W3QV ('phone) with a rush message for Salina. W3QV forwarded the message by W.U. Amateur radio was the only means of communication from Lyons for several days. W3QV sent a message to W9FDO, Kansas City, Kansas via W9FMZ, arranging a schedule for W9JWY, and advised A.P. that they could send their press into Lyons via W9FDO.

The most outstanding feature of the emergency work in Kansas was that although it was possible to raise stations in almost any particular part of the state, most of the fellows were listening, getting on the air only when they were called or had a message to handle. There was an absence of needless CQ's and QRM.

—*Maurice Lampl, W9UQX,*
Assistant S.C.M., Kansas

BRASS POUNDERS' LEAGUE

(May 16th—June 15th)

Call	Orig.	Del.	Rel.	Extra Del. Credit	Total
W1JYE	19	38	1618	28	1703
W4PL	6	92	1224	83	1405
W1KQY	7	35	1280	18	1340
W1LHE	6	18	1075	6	1105
W6IOX	26	51	874	48	999
W5BN	250	145	275	275	945
W7EBQ	13	51	768	62	894
W6LMD	4	9	724	6	743
W6DH	39	116	446	116	717
W7DUE	5	9	680	9	703
W6TTH	68	163	288	156	675
W6LUJ	70	141	283	137	631
W6JTV	74	210	146	168	598
W6LLW	26	52	474	38	590
W3SN	81	74	422	——	577
W3CIZ	39	89	345	89	562
K6NXD	308	51	152	45	556

MORE-THAN-ONE-OPERATOR STATIONS

Call	Orig.	Del.	Rel.	Extra Del. Credit	Total
W1GB	1770	——	——	——	1770
KA1HR	735	531	312	——	1578
W5DKR	185	150	325	325	985
W5OW	102	77	636	60	875

These stations "make" the B.P.L. with *total* of 500 or over. One hundred deliveries+Ex. Del. Credits also rate B.P.L. standing. The following one-operator stations make the B.P.L. on deliveries. Deliveries count!

W6IIG, 258 W7APS, 148 W6IMI, 117
W2KTR, 217 W6MTS, 147 W1KH, 114
W3QP, 217 W6KMM, 132 W6MDI, 110
W2WEL, 199 W2HOZ, 131 W1JCK, 100
W6HRH, 186 W5FMO, 125 W3EDC, 100
W6PFL, 148 W1KZT, 120 W6HSA, 100
W5MN, 120

A.A.R.S.

MORE-THAN-ONE-OPERATOR STATIONS

Call	Orig.	Del.	Rel.	Extra Del. Credit	Total
WLM (W3CXL)	126	104	2520	58	2808

A total of 500 or more, or 100 *deliveries* Ex. D. Cr will put *you* in line for a place in the B.P.L.

A.R.R.L. Headquarters Operators

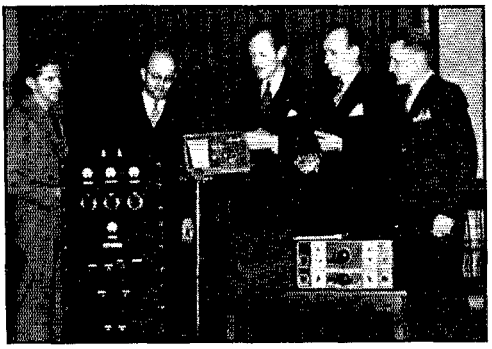
Hal Bubb, "Hal," Chief Opr. W1AW.

The following calls and personal sines belong to members of the A.R.R.L. Headquarters gang:

W1AL, J. J. Lamb, "jim"
W1AW, A.R.R.L. Headquarters Operators Club
W1BAW, R. B. Beaudin, "rb"
W1BDI, F. E. Handy, "fh"
W1CBD, C. B. DeSoto, "de"
W1DF, George Grammer, "gg"
W1EH, K. B. Warner, "ken"
W1ES, A. A. Hebert, "ah"
W1GS, F. C. Beekley, "beek"
W1JBJ, Thomas W. York, "ton"
W1JEQ, Vernon Chambers, "vc"
W1JFN, A. L. Budlong, "bud"
W1JPE, Byron Goodman, "by"
W1JTD, Hal Bubb, "hal"
W1LJI, Thomas M. Ferrill, Jr.
W1SZ, C. C. Rodimon, "rod"
W1TS, Don Mix, "don"
W1UE, E. L. Battey, "ev"

Hams Afloat

W2BSJ writes to say that he has been shipping in the Merchant Marine since 1926. At present he is on the S.S. *A. L. Kent*, KDLL. . . . W2BSJ is on the air with portable-mobile 56-28 Mc. rig. . . . W8MTE is operator on the S.S. *North American*, WTBA, of the Georgian Bay Lines on the Great Lakes. . . . W8SAC and W8JIO are also on the Lakes, on the Steamer *D. M. Clemson*. . . . K7GLZ is Chief Radioman on NRDS, U.S.C.G.C. *Spencer*. . . .K7BUK is operator on the S.S. *Cordova*. . . . W9LAF is a Navy man—he holds the rating of RM3c on the U.S.S. *Concord*. . . . W6ITY is operator on the S.S. *Robert Luckenbach*, W9BHP on the S.S. *Steelmaker*. . . . W9AKT is on Naval Reserve duty this summer (starting July) on the U.S.S. *Paducah*, NESC; he expects to have a 56-Mc. rig along, so five-meter operators along the shores of Lake Michigan should be on the look-out for him. . . . W5BVF has a berth on the S.S. *City of Joliet*, pounding brass as KUJR between the Gulf ports and Europe. He has visited several British amateur stations on his travels, among them G5GQ, G2FS, G6OS and G8KZ, where he is a frequent visitor. When in the States he is on the air at W5GPL, Galveston.



DELAWARE VALLEY RADIO ASSOCIATION OFFICERS

Left to right: William Hannah, W3EUH, Treasurer; Edward G. Raser, W3ZI, Secretary; Lieut. A. H. Waite, Jr., W3HKO, Chief Radio Operator of Byrd Antarctic Expedition II, and member of D.V.R.A. Board of Directors; Lester H. Allen, W3CCO, President; Edward B. Kerr, W3CCC, Vice-President.

The Delaware Valley Radio Association, Trenton, N. J., is undertaking a series of lectures and special events in an effort to better educate the general public as to the intrinsic value of amateur radio in the community. On March 1st the Association was sponsor of an educational lecture by Lieut. Waite, W3HKO, entitled "The Rescue of Admiral Byrd." The part played by amateur radio in providing communication with expeditions was explained and a demonstration of two-way amateur communication given. In the photo W3HKO is holding one of the portable tractor sets which was used to maintain communication at Little America.

Hamfest Schedule

August 7th, at Mt. Lebanon, Pa.: The South Hills Brass Pounders and Modulators of Pittsburgh will hold their annual hamfest at Clattys Driving Range, Bower Hill Road, Mt. Lebanon, Pa., on the afternoon of Sunday, August 7th. Among the principal speakers will be Walter Bradley Martin, W3QV, Atlantic Division Director. Plenty of good prizes and eats. Don't miss this big get-together!

August 14th, at Washington Crossing, N. J.: The Second Annual Eastern States Outing and Hamfest under the auspices of the Delaware Valley Radio Association will be held Sunday, August 14th, 10:00 A.M. to 8:00 P.M. (if rain, date will be August 21st). The place—Sullivan's Grove, Washington Crossing, N. J., 7 miles northwest of Trenton on River Road. Among the main attractions will be a Big Championship Baseball Game, Second District vs. Third District. $1.50 per person at gate; $1.00 each if paid before August 10th. Mail all reservations to W3ZI, 46 Marion St., Trenton. Come one, come all—OM's, OW's, XYL's, YL's, Hams to-be—a good time is in store for all.

August 20th–21st, at Valparaiso, Fla.: Jimmy Long's (W4KB) annual hamfest is scheduled for August 20th and 21st. This affair needs no introduction to the Eastern Florida gang and those in surrounding states. Be in Valparaiso at W4KB on the dates mentioned and you'll realize where this affair gets its popularity!

August 28th, near Cincinnati, Ohio: The Greater Cincinnati Amateur Radio Association and the Cincinnati U. S. Naval Reserve Unit announce their annual hamfest and stag picnic to be held August 28th at the Boone County Harvest Home Grounds, Florence, Ky. Big rag chew, red-hot program, lots of good food, contests, games, exhibits, fun for all, plenty of prizes! Advance registration $1.00; tickets at gate $1.25. Motor cavalcade starts 9:00 A.M. from the Naval Reserve station NEG-W8NC, Union Central Life Bldg., 4th and Vine Sts., Cincinnati. Information and registrations from W8BFB, 1974 Avonlea Ave., Cincinnati, Ohio.

August 28th, The Marin Radio Amateurs are holding their annual hamfest and picnic. This hamfest grows larger each year. A new trophy is offered for the softball tournament, an event that always meets with much enthusiasm. The gathering place is McNears Beach, out of San Rafael, Calif.

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 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 West Hartford on or before noon of the dates specified.

Due to resignations in the Oregon and Hawaii 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, Monday, August 22, 1938.

Section	*Closing Date*	*Present SCM*	*Present Term of Office Ends*
Santa Clara Valley	Aug. 1, 1938	Elbert J. Amarantes	Aug. 15, 1938
Ohio	Aug. 1, 1938	E. H. Gibbs	Aug. 17, 1938
Nebraska	Aug. 1, 1938	S. C. Wallace	Aug. 17, 1938
Western Mass.	Aug. 1, 1938	William J. Barrett	Aug. 17, 1938
New Hampshire	Aug. 15, 1938	Carl B. Evans	Sept. 1, 1938
Utah-Wyoming	Aug. 22, 1938	Townsend J. Rigby	June 15, 1938
Hawaii	Aug. 22, 1938	Otis Hill (resigned)	.....
Oregon	Aug. 22, 1938	Eugene E. Lovejoy (resigned)	.....
Nevada	Aug. 22, 1938	Edward W. Heim	June 14, 1938
Vermont	Aug. 22, 1938	Alvin H. Battison	April 15, 1938
So. Minnesota	Aug. 22, 1938	Webster F. Soules	April 16, 1938
Mississippi	Sept. 22, 1938	J. H. Weems, Jr.	Oct. 1, 1938
Tennessee	Oct. 3, 1938	B. G. Lowrey Smith	Oct. 14, 1938
Ontario *	Oct. 3, 1938	Fred H. B. Saxon	Oct. 15, 1938
Michigan	Oct. 3, 1938	Harold C. Bird	Oct. 15, 1938
Philippines	Oct. 3, 1938	George L. Rickard	Oct. 15, 1938
Kansas	Oct. 17, 1938	Harry E. Legler	Oct. 29, 1938

* 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.

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 the By-Laws.

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 in alphabetical sequence the names of all eligible candidates nominated for the position by A.R.R.L. members residing in the Sections concerned. Ballots will be mailed to members as of the closing dates 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. *Each candidate must have been a licensed amateur operator for at least two years and similarly, a member of the League for at least one continuous year, immediately prior to his nomination or the petition will likewise be invalidated.* 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 to the number of petitions that may be filed, but no members shall sign more than one.

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

—*F. E. Handy, Communications Manager*

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed in a number of Sections, as provided in our Constitution and By-Laws, electing the following officials, the term of office starting on the date given.

Maritime	Arthur M. Crowell, VE1DQ	June 15, 1938
Iowa	Clyde C. Richelieu, W9ARE	June 15, 1938
Los Angeles	Ralph A. Click, W6MQM	July 1, 1938
Western Penna.	Kendall Speer, Jr., W8OFO	July 10, 1938
Illinois	Leslie M. Dickson, W9RMN	July 10, 1938

Station Activities Page 72

CORRESPONDENCE

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

For Manufactured Gear

118 Soundview Ave., White Plains, N. Y.

Editor, *QST:*

Lately, there have appeared in your august publication several statements, evidently the brain-children of immature or irresponsible minds, deploring the use of factory-built radio equipment, and casting rather patronizing innuendoes against those amateurs that use such equipment. As an active amateur and member of the League, with an amateur background dating to 1912, and a commercial background dating to 1917, I take issue with such childish prattle.

At the outset let me make one point clear. I am *not* in the radio business, nor am I dependent for my livelihood upon anything even remotely connected with radio or any of its ramifications. Therefore I can establish quite definitely that I have no axe to grind in expressing these views.

I use a factory-built receiver and a partially factory-built transmitter in my station. What of it? I feel that I had my fill of messing around with various types of nondescript home-made apparatus years ago. In fact I have constructed some pretty fair rigs before some of our self-styled critics were born. Being a practical business man to-day, I now look at most things from a practical business viewpoint. I have long since given up the idea of being a Tesla or an Edison. I enjoy amateur radio for the pleasure of engaging in actual communication, and it ends right there. Such being the case, is it not only logical but prudent that I should equip myself with apparatus that I consider most efficient and dependable for the funds available for the purpose? As stated above, I have a factory-built receiver, and it happens to be one of the best. Now I challenge any of our "great experimenters" to produce an equivalent job at no greater cost. Do I hear any responses? Of course not; it can't be done. . . .

—*Richard C. Kleinberger, W2GVU*

Lansford, Pa.

Editor, *QST:*

Concerning VE4NM's letter in the June issue, I would like to sum it up in two words: "Sour grapes."

I myself have anything but a commercial layout, but I sure could go for one in a big way if—!!$!!

Personally, I drive an automobile which I made myself. No "robot-working," manufactured car for me! No sir! I might just as well travel by train.

—*Charles Olsefsky, W8RCL*

14-Mc. for DX Only

2014 N. Berendo St., Hollywood, Calif.

Editor, *QST:*

After reading W1WV's letter in June *QST* . . . all I can say is that I am fed up with the whole business of dickering around about the DX situation on the 20-meter band. My blood is boiling, my grid is leaking, I—I am at a loss for words.

After plenty of careful thought and consideration, I sincerely believe that, due to conditions as they are to-day and as they always will be, the 20-meter band should be restricted to contacts outside of the U. S. *only.* This plan cannot fail—it is foolproof. More enjoyable DX will be experienced. It will create a friendly international band. Hams from all over the world will "feel at home on twenty!"

—*Stanley R. Radom, W6KBY-MXZ*

García Gets D—X'ed

Calle 15 Num 1209 Vedado, Habana, Cuba

Editor, *QST:*

I desire for you to say to me what you feel if it happen to you? For two year ago I have five conts. and only need Asia for to get whack but not very easy for all days I try for hooking one. Six months back from now one evening I break sleep two o'clock in morning and see ow is sleeping soundly and loud I alight down from bed and snake to shack and seat in chair in front of operating mess. I put ears in cans but only I hear nothing and weirdly noise and no sig. Then I listen very thin sea queu and is very heavy to finally to fish him out the call. It is a XU' when he stop I start calling his call but so elated I forgot to close switch of plate of T55. I notice desk light don't wink and correct error. I burn seven-pound btu calling his call and stand buy and hear to see if he listened me. Sure! he whispers CM2AO! After the gm om tnx fer ur call he say my rst is 589x I know he is a liar and I am another I tell him he is 599x he say sure will qsll txn and please cheerio. I ascend back to bed but cannot sleep too much excitation. Next morning I send him

nice letter wid crd in envelope wid two special deliveries. For six months I wat but head so big I dont care for qso wid W Ve VK or Europe or S A or Afr. but he never send qsll. To-day in morning I have laundry boy transfer to Chinese languaje nice letter and go post Office to register when I come back I go front of stand of newspapers and by *QST* and read my XU is no Chink but damp peddler of contraband liquor in Washington, D. C. I am very mad I think I sell my rig for nothing but afraid to morrow morning I try agn. Cu agn.

—*S. E. Garcia, CM8AO*

About 56-Mc. DX

1426 South Wabash Ave., Chicago, Ill.

Editor, *QST:*

After having watched last night's scramble for QSO's on the 5-meter band I begin to think that better organization in handling things would increase enjoyment and results.

First of all, it may appear that the DX possibility is moving from east to west and stops with the coming of the darkness. If this is the case, then the DX possibility for an amateur in the east becomes zero while there is still a chance for the fellows on the western end to work further west.

I wonder if the broadcasting companies could be induced to broadcast for one-half of one minute, perhaps during the program change, to spread the news of the DX possibilities to the western territories, because the commercials benefit from the observation of the amateurs. . . .

After the east coast stations began to fade Chicago stations pulled the switches because they had something to "talk about," and because the excitement was over, while the real thrill might have been in store for them. . . .

—*Willy Hess, W9VPC*

The Maternal Angle

Apt. D2A, University Apts., Durham, N. C.

Editor, *QST:*

Not being a very good composer I hardly know how to start, but I would like to tell you how very much I enjoy your *QST*. I read every issue through. This is not very out of the ordinary and maybe you are wondering why I am writing this. Well, if you knew my mother you would think it is funny. She is the most lovable and understanding mother in the world, but when it comes to radio she is absolutely ignorant and uninterested. I have been trying for a long time to get her to pay just a little attention to my hobby, but to her it is completely boring. What I am trying to say is that it was your magazine that did the trick. I read her K6PGQ's article in March issue and W7FKC's article in June issue and now she is a regular enthusiast. Hi! She even sits up to midnight with me sometimes when I try to get a little DX on forty.

Thanks to K6PGQ and W7FKC and you for doing what I had almost given up as hopeless.

—*Charles P. Walton, W4FJS*

More on the SWL

929 First Ave., Salt Lake City, Utah

Editor, *QST:*

Three hours operation on 20-meter 'phone the other night brought seven SWL cards. Two had one-cent stamps tacked on for "return postage." All begged on bended knee, "Your my first Utah—," "B A Sport—," "Cause a miracle, QSL," etc.

I think the recent sentiment against the American SWL activity is well founded. Foreign SWL cards tell a good deal. They give a critical indication of the transmitting range, but as far as the signal reports given by the American SWL's, the amateur can do a much better job by operating a few hours. . . .

SWL is the first stage in the development of an amateur But why capitalize at such an early stage? If the SWL would use the dollars wasted on postage and cards to buy a good radio manual, and if he would put his "QSL energy" into earnest study, he could take the next step into Hamdom and become a respectable citizen.

A space on my wall is reserved. Above it is a cardboard tombstone. Every SWL card that finds its way into my mail box receives a pauper burial, and any postage for "return purposes" will help buy the four tacks that hold each card in place.

—*Wm. R. Turner, W6KOP*

2307 Winter St., Fort Wayne, Ind.

Editor, *QST:*

. . . I do not own or operate a station but I am a short wave *listener*. I am one of those listeners who has sent reports of station's transmissions and requested one of their call cards. I've always enclosed sufficient postage for mailing. I realize that to the operator it has become a large problem to send cards and answer all letters. If a rule was made that no QSL cards would be sent unless sufficient postage is furnished for cost of cards and mailing it would solve the problem. In the United States three cents in postage is sufficient for cost of card and of mailing. It only costs one cent to mail a card in the U. S., and this leaves two cents for the cost of the card. I believe it would be worth his while to answer the letter even if it did contain "pointless signal reports."

His phrase "pointless signal reports" interests me very much. To an operator who has owned a station a few years, they (signal reports) would mean very little, but to a beginner they are very important. These reports inform him how his transmission is received in places which he has never contacted. Well, this is all, and I hope the "listeners" will furnish sufficient postage when writing to an amateur station.

—*Jack L. Flauding*

621 Prairie Ave., Glen Ellyn, Ill.

Editor, *QST:*

In a recent letter W5BB said that something should be done about SWLs, especially b.c.l.s, who want a lot of cards to show off. I agree that there probably are many of this kind, however, there are some who are really interested.

I have just completed an 8-tube super (*QST* April '36) and I expect to use it when I get a license (which I plan to go after this spring). I have also put up antennas suitable for transmitting.

SWLing has given me a foundation for my knowledge (little that it may be) and there are many others who feel the same way. . . .

About the so-called "rubber stamp" SWL cards. Have you ever stopped to think that some SWLs couldn't afford anything better? I have seen many QSLs just as bad. However, I am not criticising them. Some of the QSLs I like best are of that variety. It is not the looks of the card but the message that counts.

And remember that we spend as much postage as you do.

—*Jim Tillotson*

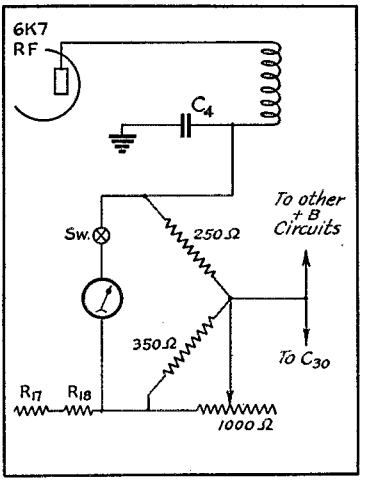
Ham Imposters

Vandalia, Ohio

Editor, *QST:*

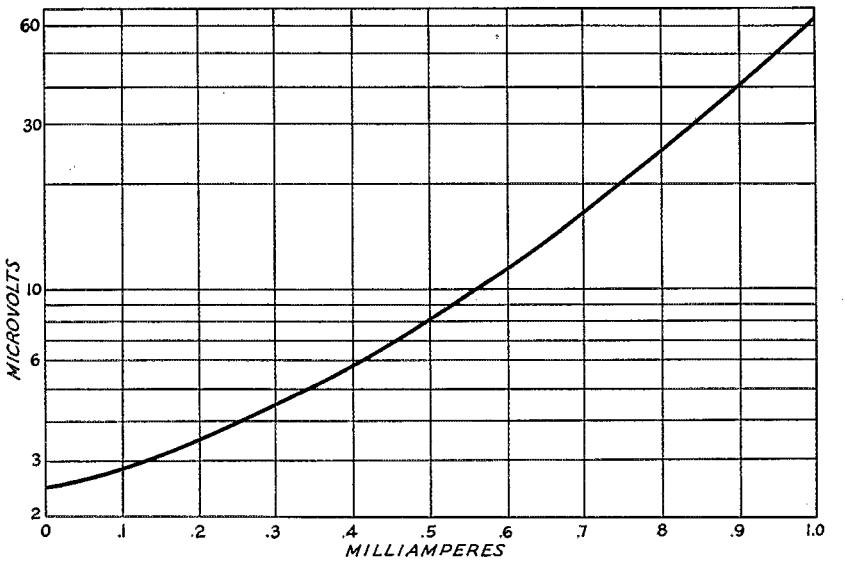
Some boys make a racket of posing as hams, usually from a long way off, and go around visiting amateurs. They usually pull a gag that they are out of money and want you to send a message through to their folks, usually out in California or some place. Then they hint that they'll stay around in the vicinity until they get their money, which of course never comes. I've had two such hitchhikers visit me, one posing as W6DDR (which isn't listed). He also posed as a commercial operator. Amateurs should be notified of these prowlers and if they can't produce their ticket then send them on their way pronto. . . .

Duke Bettelon, W8MFV



As a result of our recent announcement that all NC101X receivers are now being manufactured with S meters in place of the magic eyes formerly used, we have had a number of inquiries as to just how it is done. The circuit diagram is given herewith. The meter is a standard 0-1 milliammeter. If you have such an instrument on hand, you can easily enough make a special scale — either in "S Units" or "Microvolts." In this latter case the accompanying calibration curve will prove useful. On the other hand, if you do not want to make your own scale and want one of the special meters such as we use on our receivers, you will find them listed in the new No. 280 National catalog. The type number is SM80 and the net price is $6.00 including a sloping-panel mounting case which eliminates the need for removing the magic eye and chopping a meter-size hole in the front panel of the receiver. (Such an operation is relatively easy for some fellows but not so easy, we are told, for others!) One thing more — in adjusting the meter circuit, the 1000-ohm variable resistor is set at a value which will balance the bridge circuit (that is, cause meter to show no deflection, either positive or negative, when the r.f. gain control on the receiver is set just short of maximum, or at about 9 on the scale; the a.v.c. turned on; and the receiver not tuned to any signal).

James Millen



Scores A.R.L.L. Contest

(*Continued from page 40*)

Louisiana

W5WG	14976–144–52
W5KC	12954–127–51
W5DWW	6478– 79–41

Mississippi

W5GHF	2436– 42–29
W5GEA	308– 14–11
W5FIT	220– 11–10

Tennessee

W4CXY	6464–101–32
W4PL	5633– 64–44
W4DQG	2100– 42–25
W4EIS	1750– 35–25
W4DDJ	697– 21–17
W4RM	336– 14–12

HUDSON DIVISION

Eastern New York

W2DIJ	6160–110–28
W2EWD	5966– 79–38
W2FQG	2800– 50–28
W2ISQ	2784– 58–24
W2KFB	728– 26–14

Missouri

W9QBJ	9030–105–43
W9VLP	5928– 79–38
W9AUB	4176– 58–36
W9SBR	1600 –32–25
W9OUD	1178– 31–19

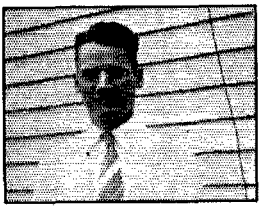
Nebraska

W9DMY	7452– 81–46
W9ZUM	2436– 43–29
W9EUT	972– 27–18
W9ZHJ	240– 12–10

NEW ENGLAND DIVISION

Connecticut

W1HYP	7566– 97–39
W1KFN	5454–101–27
W1BHM	5439– 74–37
W1CSC	3175– 64–25
W1GME	2310– 55–21
W1JHN	1748– 38–23
W1HYF	1734– 51–17
W1EAO	690– 23–15
W1CTI	580– 29–10



HERE'S THE MAN BEHIND THE BUG AT W8OFN, DR. HAROLD E. STRICKER

"Doc" was third highest scorer and Ohio winner.

N. Y. C.-L. I.

W2IBT	11316–138–41
W2HMJ	10664–124–43
W2IRV	9100–100–47
W2DBQ	9216–128–36
W2KKR	6142– 83–37
W2AHC	5016– 66–38
W2AOD	3306– 57–29
W2EIL	3078– 57–27
W2BGO	2806– 61–23
W2HUG	2231– 49–23
W2KIK	1596– 38–21
W2AJL	1520– 38–20
W2JHB	988– 26–19
W2KIX	928– 29–16
W2JCA	494– 19–13
W2KFW	468– 18–13
W2EC	324– 18– 9
W2AZM	280– 14–10
W2JDG	154– 11– 7
W2OQ*	126– 9– 7
W2HAK*	72– 6– 6
W2KTH*	2– 1– 1

No. New Jersey

W2JKH	8640–108–40
W2HZY	7344–108–34
W2JJE	6640– 84–40
W2JKG	5994– 81–37
W2KHA	3630– 61–30
W2GGW	3024– 54–28
W2ECO	2800– 50–28
W2JUC	2560– 64–20
W2CW	2548– 49–26
W2CFW	2400– 50–24
W2KMY	1824– 38–24
W2HNP	1260– 35–18
W2HRN	702– 27–13
W2EWM*	48– 6– 4
W2JQE	18– 3– 3

MIDWEST DIVISION

Iowa

W9LEZ	7644– 91–42
W9UOX	1820– 35–26
W9YXK	1100– 25–22
W9WWY	736– 23–16
W9BBB	540– 18–15
W9NVF	112– 8– 7

Kansas

W9CWW	10560–110–48
W9VBQ	9016– 98–46
W9WIN	1904– 35–28
W9ZSM	360– 20– 9
W9UEG	160– 10– 8
W9YRN	32– 4– 4

W1AW[2,4]	24034–197–61
W1UE[4]	9440–118–40
W1TS[4]	5402– 73–37
W1JPE[4]	5180– 74–35
W1BDI[4]	2808– 52–27
W1JBJ[4]	2070– 45–23
W1ES[4]	768– 24–16
W1JFN[4]	24– 4– 3

Maine

W1IZU	5994– 81–37
W1FBJ	2990– 66–23
W1IEB	260– 13–10
W1GKJ*	2– 1– 1

E. Massachusetts

W1EVJ	6751– 79–43
W1IQH	6567–100–33
W1EPE	4760– 70–34
W1IWC	4234– 73–29
W1JEA	3712– 64–29
W1IKU	840– 28–15
W1INO	602– 22–14
W1BSG	253– 12–11
W1BSM	60– 6– 5
W1ZR	50– 5– 5

W. Massachusetts

W1EOB	12446–127–49
W1JXN	2550– 51–25
W1AJ	2106– 39–27
W1DCH	2016– 48–21
W1BIV	1350– 45–15
W1KOM	1200– 30–20
W1FPP	810– 27–15
W1JAH	560– 20–14
W1BKG	220– 11–10
W1IJL	220– 11–10

New Hampshire

W1BFT	15184–146–52
W1AVJ	8774–107–41
W1HJM	7344–102–36
W1IP	6144– 96–32
W1AXL	1975– 47–21
W1KIN	160– 10– 8
W1HGV	80– 8– 5

Rhode Island

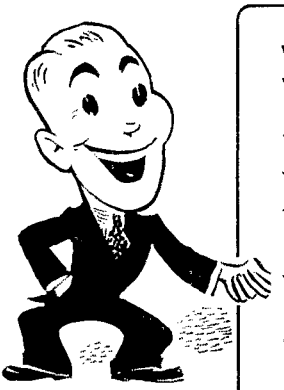
W1IQF	3528– 63–28
W1JUE	2484– 54–23
W1GTN	1764– 42–21

Vermont

W1EZ	22568–202–56
W1JXS	1496– 34–22
W1JVS	1176– 28–21
W1KJG	380– 14–10

(*Continued on page 80*)

RK SUPER TRIODES



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- ★ Easy to Drive
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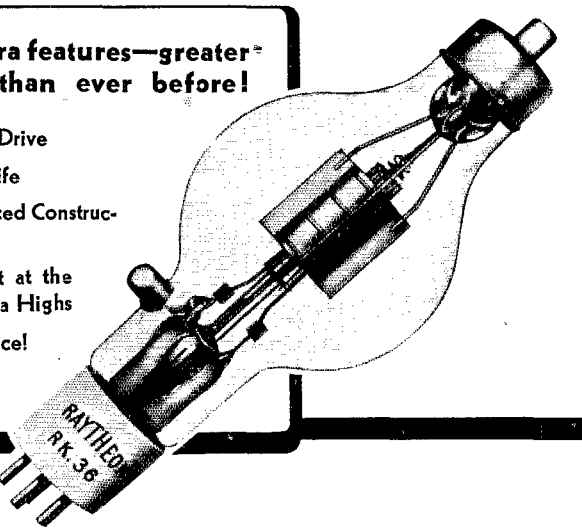

RK36 (mu of 14) RK38 (mu of 30). Two advanced triodes incorporating the latest engineering improvements. A pair of either type is capable of using the 1000 watts maximum input allowed by the F. C. C.! Both types conservatively rated at 100 watts plate dissipation and extremely easy to drive.

Self-supporting filament structure permits ultra high frequency operation without circulating R.F. between filament and other members. Tantalum plates and grids are all self-supported so as to decrease losses, eliminate electrolysis, reduce inter-electrode capacities and give maximum life. Extra heavy thoriated tungsten filaments (40 watts) assure a copious supply of electrons, and are able to withstand heavy momentary overloads.

RK35 (mu of 9) RK37 (mu of 30). Perfect mates to RK36 and RK38 offering the same advanced features — but with 50 watts plate dissipation. These small ultra high frequency triodes, with their extra heavy thoriated filaments (30 watts) tantalum plate and grid, hard glass envelope and isolantite base are amazing value. To assure maximum insulation, lowest capacities and efficient high frequency operation, all elements are also self-supporting.

Write your nearest Raytheon office for complete technical data.

Class C Operation

RK35	RK37	RK36	RK38
$8.00	$7.75	$14.50	$13.50

	One Tube		*Two Tubes*	
Filament Volts	7.5	7.5	5	5
Plate Voltage	1500	1500	3000	3000
Grid Bias	-250	-130	-540	-300
DC Grid Ma.	15	30	60	75
Power Output Watts	120	122	800	800

JUST OUT! "Handbook of Amateur Tube Uses." An encyclopedia of technical information, and containing the exclusive Raytheon Temperature Color Chart, the only one available for amateur use. 50c

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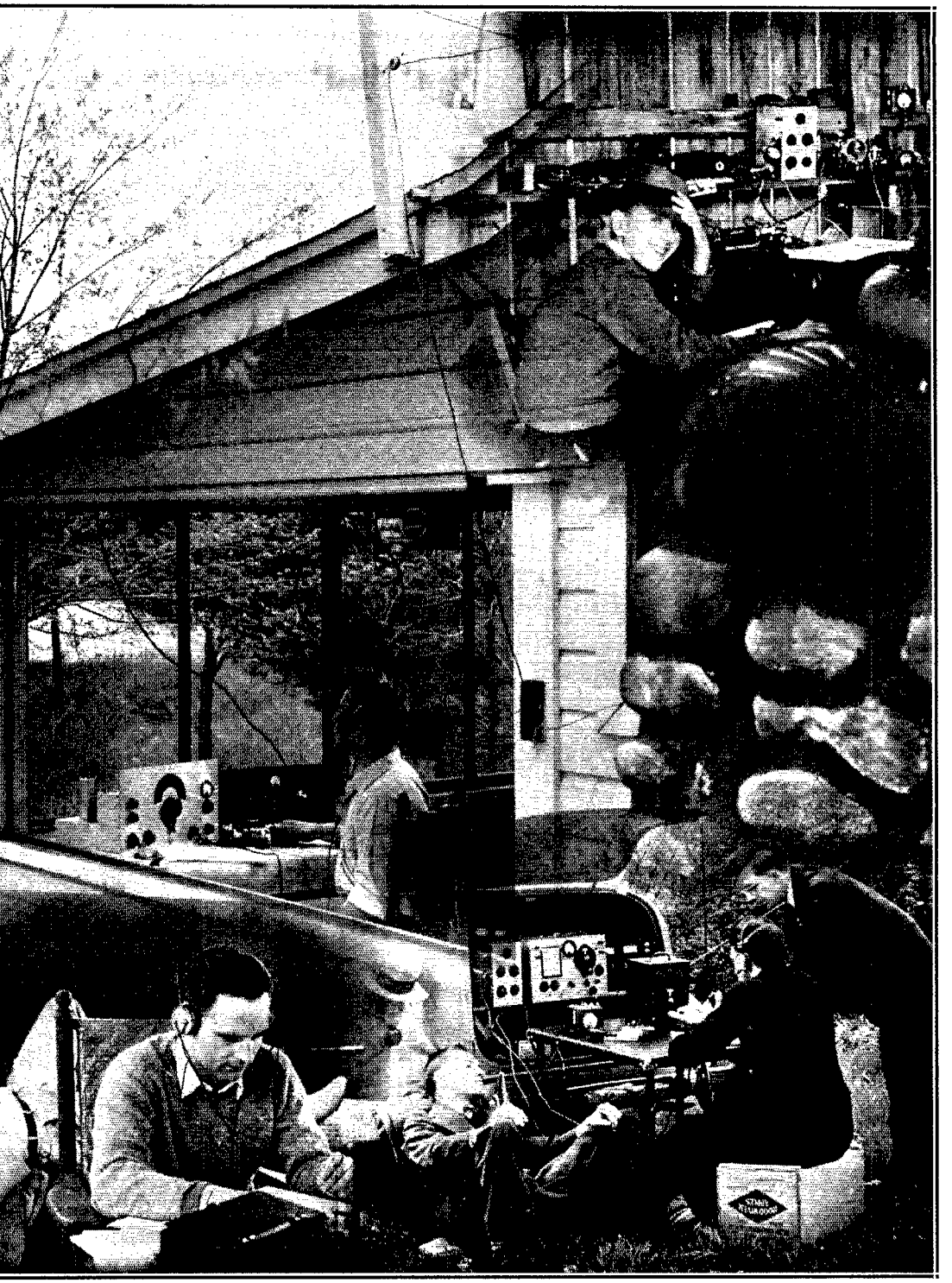

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A Three-Tube Super for Portable or Emergency Work

(*Continued from page 11*)

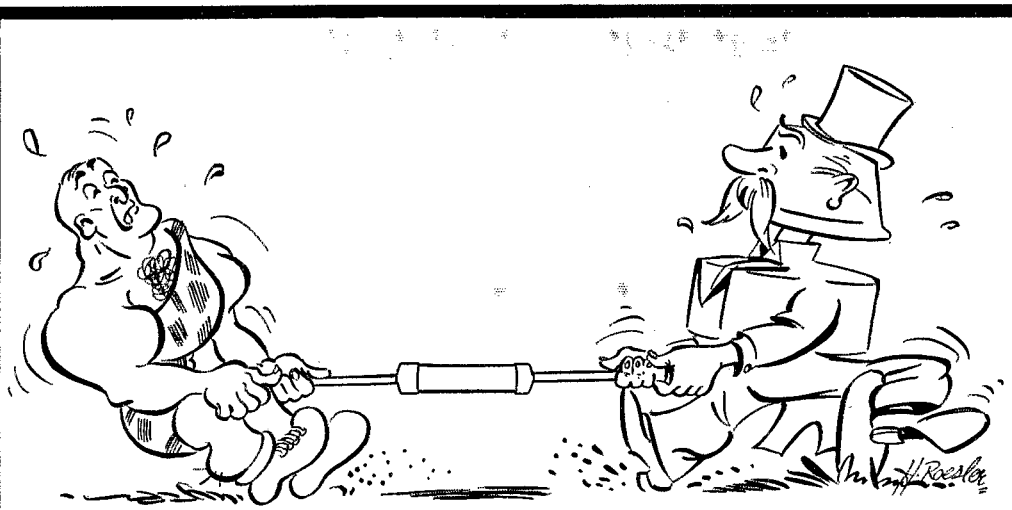
crystal filter, the crystal can be borrowed and set up in a low-power oscillator to do the trick, provided its frequency is in the vicinity of 455 or 460 kc. The exact frequency is not important so long as it is near 460, the frequency for which the transformers are adjusted.

With a regular test oscillator, connect its leads to the chassis and the grid of the 6K8 (no r.f. coil in the grid circuit of the tube). Using a modulated signal, adjust the i.f. screws for maximum signal strength. As adjustments are made, reduce the output of the oscillator until, on the final check, the audio output in the headphones is moderately weak. This will avoid overloading of the receiver and will make the effect of slight changes more readily observable. An unmodulated signal will serve almost equally well, the hiss being peaked instead of the audio tone. When the adjustment is satisfactory, the beat oscillator may be turned on and, with the oscillator signal frequency unchanged, the adjusting screw on the transformer turned until a beat note of about 1000 cycles is obtained. The test oscillator frequency may then be varied on either side of zero beat and if the i.f. is properly adjusted one side should be noticeably louder than the other. In other words, the selectivity should be such that a small, but definite, single-signal effect is observed.

If an oscillator such as the crystal affair suggested above is used, the lining-up procedure will be much the same. In this case, however, it should suffice to set the oscillator somewhere near the set, without any direct coupling to the 6K8. A resistor of about 100,000 ohms should temporarily be connected between grid and ground, again with no r.f. coil in the socket. It may be necessary to put some shielding about the oscillator, or reduce its plate voltage, for the final i.f. tuning adjustments in order to get a weak enough signal.

In a pinch, the i.f. can be lined up without any auxiliary oscillator at all simply by plugging in the pair of coils covering the 7-Mc. band and tuning around for any steady signal. Usually the transformers as they come from the factory are adjusted closely enough to give fair response before regular alignment, and once a signal is heard the lining-up readily can be carried through. It will not be possible to depart greatly from the desired intermediate frequency since the tuning range is small. Of course the test oscillator method is to be preferred when it can possibly be used.

With the i.f. aligned, plug in the detector coil and set C_1 at about one-fourth capacity. Then, with C_3 at minimum, carefully tune C_2 from minimum until the high-frequency edge of the desired band is reached. This point should be found with C_2 at about half capacity on 1.75 Mc., at about $\frac{5}{8}$ capacity on 3.5 Mc., and very nearly at full capacity on 7 Mc. The band-spread may



The New End Lead (Center Lead) CENTRALAB Resistor is ★ T.P.

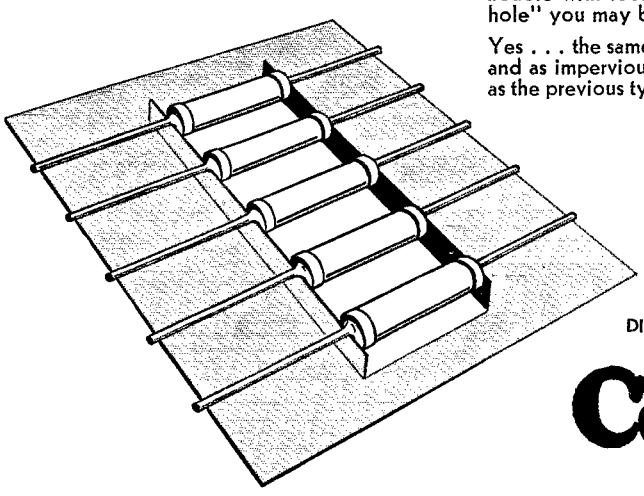
Now available . . . five to a card in one-half and one watt ratings . . . 100 ohms to 5 megohms.

★ **TUG-PROOF** a mighty important reason for changing to CENTRALAB'S new Center Lead Resistors. For these new Fixed Resistors have their ends so firmly attached that you will never experience any trouble with loose ends no matter into what "tight hole" you may be forced to solder.

Yes . . . the same strong ceramic — hard as stone — and as impervious to moisture, vibration and shock, as the previous types. End leads brought out through bakelite insulation.

Baptized with fire at 2500 degrees . . . they are still the best Resistor bet of all.

For original equipment or replacements . . . select Centralab's new Center Lead Resistors.



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CRL
RESISTORS

then be checked by tuning C_3 across its scale. If the band-spread is not as described in the previous section, it may be decreased by adding a turn or two to the oscillator grid coil in the case of the 1.75- and 3.5-Mc. coils, or increased by the reverse procedure. In either case a new setting must be found for C_2. On 7 Mc. the band-spread can be increased or decreased by moving the tap toward or away from ground. If care is used in following the coil specifications, however, no adjustments of this sort should be needed.

TUNING

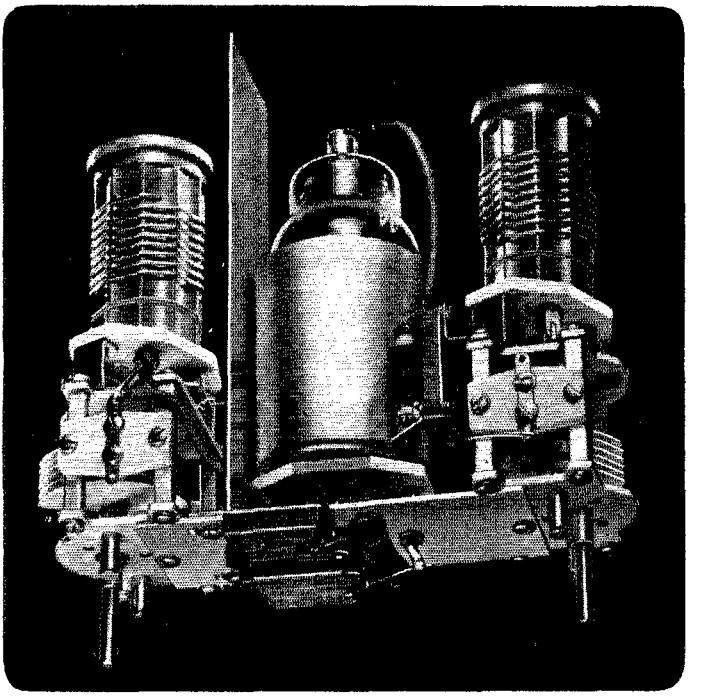
With the preliminaries out of the way, actual operation of the receiver is simple. With the band-setting condenser at the proper setting (the device previously described simplifies this adjustment), tuning is done with the main dial. For c.w. reception, snap the b.o. switch to the on position, tune in a signal, and adjust C_1 for maximum strength—or set the condenser at any point on the high-capacity side of resonance which gives the desired signal strength. The condenser gives adequate volume-control range, although it will not cut out a signal completely unless the signal itself is very weak. When using C_1 as a volume control, always set it on the high-capacity side of resonance so that image response will be reduced.

Resonance on C_1 is best detected by setting the main dial at a point where no signal is heard and then adjusting C_1 for maximum background noise. If two such settings can be found, use the one with the highest capacity; the other is in resonance at the image frequency. As C_1 is varied with a signal tuned in there will be a slight change in the beat-note frequency; this change will be gradual and always in the same direction until C_1 has passed through resonance and approaches the oscillator frequency. In the latter region the change will be considerably greater, so the detector tuning should be kept near actual resonance or on the low-frequency side of it. The tuning is not really critical but, because of the relatively large-capacity condenser, shows a quite definite peak.

In evening operation it is seldom necessary to approach resonance with C_1 since signals often have such strength that the receiver overloads. This cannot readily be avoided at the low-plate voltage used except through reducing the signal input by detuning C_1. It is quite easy to find one off-resonance setting of C_1 which gives good strength on practically all signals so that the tuning is purely single control. In the daytime, with poorer transmission conditions and fewer signals, it is often helpful to tune the detector circuit for maximum strength. One setting will hold over a considerable portion of a band.

At the frequencies for which this receiver is designed images should give relatively little trouble. Naturally there will be some, but usually they are quite effectively masked by the legitimate amateur signals. Image response is practically the only disadvantage of this type of receiver, but is certainly tolerable in view of the many points of superiority over the conventional

BUFFER · DRIVER · DOUBLER



IN ANSWER to hundreds of inquiries, Hammarlund is glad to announce the "BD-40" buffer-driver to be used with the now-famous "PA-300." These kits are so designed that they can be assembled by the most inexperienced person. Featuring the same type of construction as in the "PA-300", the "BD-40" can be put together in a few minutes using only a screw driver and soldering iron. No intricate chassis drilling is necessary. The "BD-40" can also be used as a low power output amplifier in a beginner's transmitter. Beginners can now build "Professional" rigs. The illustration shows the complete unit assembled and wired, ready for installation. It measures only 8¼" x 7½" x 3¼". The power output is approximately 40 watts when using either an 807 or RK-39 beam tube. See the "BD-40" and also the "PA-300" on display at your local ham store.

Write for complete data!

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PRECISION PRODUCTS FOR BETTER RADIO

HAMMARLUND

portable regenerative receiver. A particular image readily can be taken out by a simple wave-trap, tuned to the image frequency, in one of the antenna leads.

For 'phone reception, the tuning procedure is the same except that the beat oscillator is off. The selectivity is comparable to that of the ordinary superhet, a point which will be appreciated by those who have used regenerative receivers for 'phone.

In conclusion, this little set seems to offer marked advantages over the regenerator for portable emergency use, and work with it so far has failed to disclose any serious defects. It does not pretend to be the ultimate, but rather the first step in what we feel is the right direction. It is possible—indeed probable—that time and continued field use will point out ways in which improvements can be made without sacrificing the fundamental requirements of compactness, light weight, battery economy, and low cost.

A 250-Watt 56-Mc. Rig

(Continued from page 15)

Two complete power supplies are mounted on a heavy duty chassis measuring 17 by 13 by 3 inches.

The higher-voltage supply delivers 1000 and 1250 volts at 500 ma. The lower voltage system supplies 600 and 750 volts at 350 ma. This lower voltage supply has a variable auto-transformer in the primary of the power transformer so that the voltage can be varied smoothly from a low value to maximum of 750 volts. The rectifier and filter systems are conventional and need no detailed description.

MODULATOR

The modulator unit, shown schematically in Fig. 2, consists of two push-pull stages. Two 2A3's are the drivers for the ZB-120 Class-B modulators. The input transformer to the 2A3 drivers has a low-impedance primary winding with taps. This is advantageous in two respects; first, the microphone pre-amplifier can be mounted directly on the operating table with the gain control convenient to the operator, permitting the use of a short microphone cable; second, a low-impedance link between the pre-amplifier and modulator unit is not as susceptible to stray r.f. and magnetic fields as would be a high-impedance connection. This to some extent minimizes r.f. feedback and noise on the carrier.

The drivers are self-biased with an 800-ohm 10-watt resistor in the filament return. The ZB-120 grids are coupled to the drivers through a Varimatch transformer. The plates of the modulators are coupled to the r.f. unit through a Varimatch Class-B output transformer. This transformer carries the final r.f. amplifier plate current through its secondary winding. In the diagram it will be noticed that the ZB-120 grid returns are tied to ground, but normally they are connected through meters to ground at W2KPX.

The pre-amplifier should deliver enough voltage

WHY NOT A FIRE BRICK FOR THE ANODE?

It will stand excessive heat, is distortion proof, is a good heat radiator (high thermal emissivity) and is very inexpensive.

Illustration shows the specially processed tantalum elements in an Eimac 250T tube.

There are two very important reasons why fire clay is not suitable for anode construction: 1) It is not a good electrical conductor: 2) (most important) A heated fire brick *pays off gas.*

Every "ham" knows that gas released inside a transmitting tube destroys emission; more often causes complete failure. The ability of anode materials to withstand excessive heat is less important than that such material can be completely de-gassed. Eimac discovered this fact long ago . . . chose tantalum for tube elements and developed a new method for removing its relatively small original gas content. (1/10 that of Molybdenum and only 1/1000 that of the conventional carbon anode.)

Since that time, radio amateurs who use Eimac tubes have been favored with outstanding performance, plus complete freedom from failures caused by gas. BUT the use of tantalum alone is not wholly responsible for this fact.

Perhaps you have wondered why other tubes (even some having tantalum elements) cannot measure up to the Eimac standard? The answer is: Tantalum requires special handling, Eimac engineers developed an exclusive process which takes full advantage of the superior properties of tantalum, renders it completely de-gassed and eliminates the use of a chemical agent or "getter." Results speak for themselves. Eimac tubes will stand momentary overloads of 400% to 600%, without damage, where some tubes fail utterly.

Your dealer is ready to deliver an Eimac tube for your transmitter . . . from 35T to 1000UHF.

Eimac TUBES

EITEL-McCULLOUGH, INC., San Bruno, Calif.

NOTE: Amateurs who are interested in increasing the efficiency of the tank circuit in their transmitters will be wise to ask about the New Eimac Vacuum Tank Condenser. Get full information from your dealer.

to excite the 2A3's to full output, and should have sufficient gain for the type of microphone used. Any of the usual tube combinations may be used.

The normal power input to the transmitter is 300 to 400 watts, a limit set by the audio output available from the modulator. The power input to the Class-C amplifier has been run as high as 600 watts with perfectly safe operation on 56 Mc. Work also has been done on 2.5 meters.

The National A.R.R.L. Convention

(Continued from page 17)

many of the Headquarters staff. There will be talks on operating procedure, the future of the League, what your League means to you, and many other vital subjects. All Directors will be invited as well as the whole staff at West Hartford. An open forum is planned under the direction of the President of the League.

The equipment show will be the finest strictly-amateur display ever held. You will see all that is new in amateur radio—everything from complete stations to the smallest part. All of your favorite apparatus will be on display. Plenty of time has been reserved for visiting these displays and talking over your individual problems with the outstanding engineers in amateur radio. Over $100,000 in apparatus will be displayed.

A special program has been planned for the women which will assure them of a grand time under the guidance of a woman chairman. By all means bring your wife. There will be many parts of the program she will enjoy, especially the banquet and Saturday night party.

There will be contests galore, including code-speed contests for both men and women. All talks will be limited to 45 minutes and there will be frequent recess periods. Nothing dry and tiring.

Plan now on attending this, the finest of all and the first A.R.R.L. national convention in 14 years.

Delta Division Convention

New Orleans, La., September 3rd and 4th

THE New Orleans Radio Club is sponsoring the official Delta Division Convention to be held at the Hotel Jung, New Orleans, La., on September 3rd and 4th. It is a pleasure of the convention committee to extend a cordial invitation to A.R.R.L. members, radio amateurs and interested friends to attend this affair at New Orleans, "America's Most Interesting City."

Amateurs who have attended local hamfests and the Louisiana State Convention two years ago know that New Orleans can, and always does, arrange things for a good show and a good time.

Program will be complete with well known speakers, plenty of entertainment and prizes. The tentative fees have been set at $3.25 and $2.75 for the Y.L.'s. A very fine pre-registration prize has been set up.

If more information is desired, write Gene Treadaway, W5DKR, Secretary, New Orleans Radio Club, Hotel Jung, New Orleans, La.

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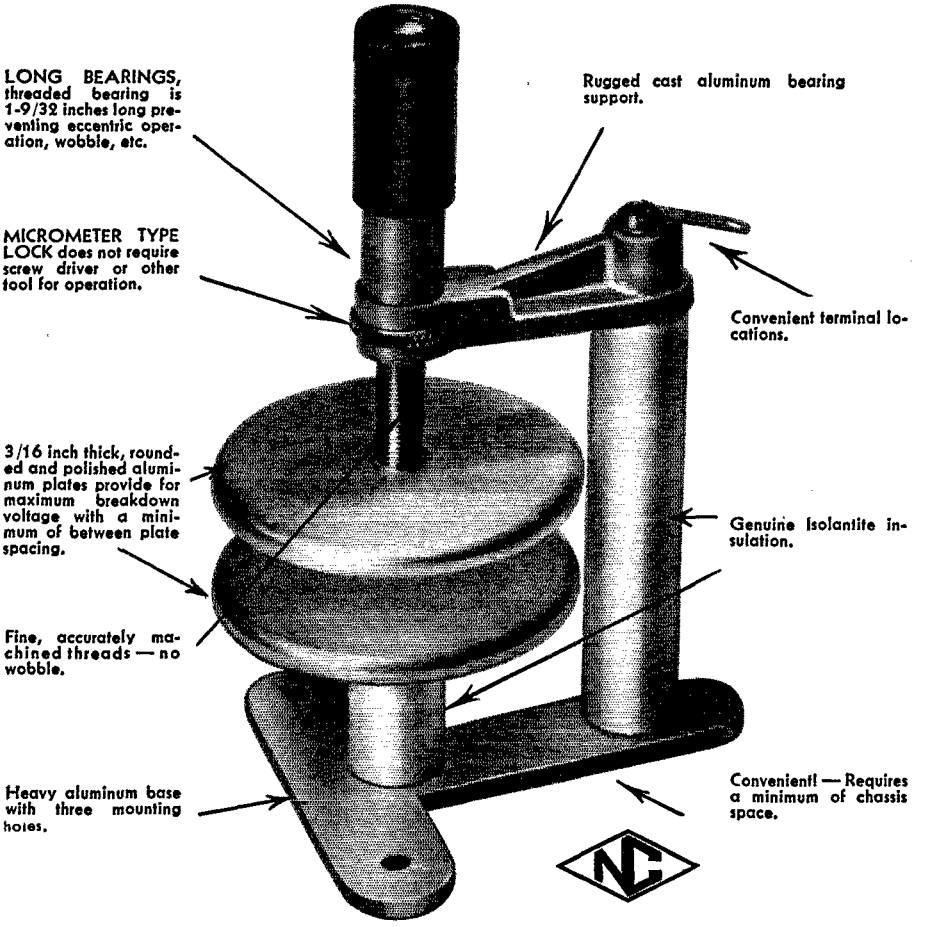

We not only are continually striving to develop and originate new and advanced products, but we are also continually trying to improve and better our older products. See the improved NC-800 at your dealer's today! — No increase in price!

NATIONAL COMPANY, INC., MALDEN, MASS.

Station Activities

ROANOKE DIVISION

NORTH CAROLINA—SCM, H. S. Carter, W4OG—Please don't forget your S.C.M. these hot summer months, for it is very hard to get up a report when no reports are received. ECH has had his call changed to DVV. AAU has W.A.C. and W.A.S., and is waiting for 28-Mc. to open again so he can use his pair of 100TH's. TJ is putting up a beam antenna. DLX is going to join N.C.R. FCB, EYF, BMR and CQ are members now. BIP has been rebuilding the rig and improving the shack. DGU is on 3.9 and 14-Mc. 'phone regularly. BBS is back on 3.9-Mc. 'phone with a new Lafayette 40-watt transmitter. DKF is working for Class A ticket. W4QI has an emergency transmitter. The Raleigh gang had a fine time on Field Day. BHR bought OC's "Signal Squirter" and swapped it off before he got home with it. ESO says all the gang there had a swell time in the Annual Field Day. FIY and FIZ are new Clinton hams. DGV is going strong on all bands with 75% of his time spent in good rag chews. DWB led the State again in traffic this month. 4NC had a swell time on Field Day; they had a 12-h.p. Austin motor running a 5-kw. a.c. generator; the entire outfit was built on a special trailer weighing about 1500 lbs. BOH, ABT and CFR have started building 56-Mc. rigs and plan to have a net going in the city soon. DCW is on regularly. AI returned from South Carolina. North Carolina has missed him for all these years. DZS is going to Fort Lauderdale, Fla., and may make it his permanent address. We hope not, but if so, best of luck, OM.

Traffic: **W4**DWB 83 DLX 15 OG 5 ANU 4 DCW 3 DGU-ESO 2 DGV 1.

SOUTH CAROLINA—SCM, Ted Ferguson, W4BQE—BNN is working mostly 28-Mc. 'phone, but has QSL from VK2FU confirming 1.75-Mc. 'phone QSO. CQU is rebuilding rig and revamping antenna system. EXJ has new 28-Mc. rotating beam, also has 56-Mc. rig on the air. EGH is working 28-Mc. 'phone and 1.75-Mc. rag chewing. EDQ says 28-Mc. short skip FB. CZA is busy with preparations for hamfest. FFO is vacationing in Virginia and working portable there. CKW is active on 14 Mc. The S.C.M. expects more reports next month and expects all OFFICIAL STATIONS to report. Don't forget the Hamfest at Charleston, S. C., Sunday, July 31st. If you miss this one you will be sorry you did. See you there.

Traffic: **W4**CZA 38 BNN 15 CQU 7 EDQ 5.

VIRGINIA—SCM, Charles M. Waff, Jr., W3UVA—P.A.M.: 3AIJ—R.M.'s: 3DJC, GTS—GPC is leaving our Section to live in Maine. Sorry, OM. Come back to see us. AQPZ/2 has moved to Bristol; new call is 3HNP. Welcome. HBH will be in operation soon at C.C.C. Camp at Morrmans River. GTS still handles plenty of traffic. AIJ wants more stations in Virginia 'Phone Net Sundays. HDQ is experimenting with series modulation. FQO worked TF2AX and ST6AL, for new countries, and needs only Nevada for W.A.S. The Richmond Short Wave Club sponsored an outing and Field Day in conjunction with the A.R.R.L. Field Day. Thirty-two licensed hams and numerous YL's, etc., were present at Big Meadow, on the Skyline Drive, at one time or another from Richmond, Norfolk and Washington. Almost a dozen transmitters were in evidence operating on all bands from 56 to 1.75 Mc. HNV and HNZ are new Lynchburg hams. DZW now has Class A ticket.

Traffic: **W3**HDQ 88 GTS 78 (WLMG 76) GPC 23 AIJ 6 8QPZ/32.

WEST VIRGINIA—SCM, C. S. Hoffmann, Jr., W8HDNS—A poll has been taken of DX records; more to follow in future reports, as received. Following is a list of total countries worked by W. Va. hams: KKG 117, JRL 112, AZD 105, KWI 94, OXO 91, CDV 80, GBF 76, LCN 75, MZD 74, CWY 70, QBQ 65, NCD 57, PQQ 56, ASI 56, FAA 52, PAJ 48, MIP 40. Three groups reported participating in Field Day tests, one composed of ELJ, LGB, KHB and QQZ; the second LJX, PTJ and QIB; the third JKN and ASI. HHH visited Logan; he is using 950 watts on 1.75-Mc. 'phone! ELJ was appointed S.N.C.S. of A.A.R.S., 8OK resigning. OJI was appointed Official Observer, the first such appointment held in the Section for some years. KIU, with aid of RFP and DWZ, made a field survey of 56-Mc. sigs over Morgantown. KIU visited Hall, Ex-8TI, now W2KUM. MOP's O.P.S. was endorsed for another year. PHY reports KWU moving to Warren, O. KGT moved to Pittsburgh. RHS and RHM are in U.S.N.R., Wheeling. AWT is now a Medical Doctor. FB, OM! JM got married. Congrats! KWV has Junior operator. EHA and FEO have made their usual summer appearance after another winter's hibernation! BDP is working on television. BTV, DYB and QFN are rebuilding. KKG worked OY4C and VK9MD. BTV, KKG and the S.C.M. visited Washington, D. C., Convention. RFT and RZJ (a YL!) are new Nitro hams.

Traffic: **W8**PTJ 58 BTV 34 HD 26 PSR 24 PHY 7 KIU 4 OXO 2.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Frederick Ells, Jr., W1CTI—The New Haven Amateur Radio Association handled 1770 messages at its booth at the New Haven Progress Exposition. Three 250-watt transmitters operating on 56, 14-Mc. c.w., 3.9-Mc. 'phone and 3.5-Mc. c.w. were used. Those participating in the setting up of the exhibit, the operators and local relay stations were JHM, KFN, KQY, GDC, JZJ, JYE, HSX, DDP, HHJ, JQK, ATH, FMV, GRF, IYF, BYW, EUG and KUM. JYE had his hands full with Exposition traffic. KQY secured very good coöperation from IGN, LHE, 2KTR, 2HCO, 3EDC, 1JMY and JXP in handling Exposition traffic. LHE reported in person at C.B.A. Club meeting. JXP reports that A.A.R.S. drills shut down May 28th. BDI and AFB spent a quiet Field Day at UE's place in Granby, operating portable BDI. Portable EH at Niantic worked 64 stations; operators were EH, JFN and JPE. KFN handled over a thousand messages at GB during the Exposition, and only one at his own station. It's mutiny! CBA took part in the Field Day, June 12th, the gang setting up 7, 3.5 and 56-Mc. stations in a hay field near New Canaan. A gas-driven a.c. generator was used, but not many stations contacted, due to "hash" in the power delivered. The gang gained plenty of experience with emergency rigs, a little sunburn and a swell time. ES still maintains schedules with 3BWT and 8CMP.

Traffic: **W1**GB 1770 JYE 1703 KQY 1340 LHE 1105 JMY 376 JXP 177 ES 69 DMP 38 BDI 29 EH 27 DWP 3 KFN 1.

MAINE—SCM, Winfield A. Ramsdell, W1FBJ—GOJ has new exciter unit for the Collins 30FXC and is working some of the higher frequency bands as well as some 'phone rag-chewing. INW and LDC called on 5AUC, who has been honeymooning in Auburn. INW is building new rig with HF100 final. APR moved to Taylor Pond for the summer. KKZ has his eye on an HRO. LDC received a certificate of merit in the W/VE contest. JCP and IQM will be working portable from Millinocket this summer. JCP has new RK-12 pushing pair of 35T's. LHD and LHI are new hams in Millinocket. DHH is going to Northeast Harbor this summer to try some portable work. IIE handled some of the New Haven tercentenary traffic; Hal says that the last radio Rifle Match with Oneida, N. Y., through 8DSS was a real success. LHC, new ham in Damariscotta, has new Hallicrafter receiver. JUJ worked seven 56-Mc. DX stations on June 5th. LHA heard 3GMZ, 9CLH, 8JLT, 9FGN and several others. KAD worked 9NY. KOU received QSL from the eighth district as being heard. CRP was out on F.D. and worked two stations. AUC has 1.75-Mc. 'phone rig at camp this summer. KJJ completed W.A.S. on 'phone and also W.A.C. on 28-Mc. 'phone. Bill will have fine array of certificates, as he is getting O.P.S. appointment shortly. LDC is new O.R.S.

Traffic: **W1**IIE 12 LDC 8 CBU 6 GOJ 5 KOU 3 LHA 2 JCP-CRP 1 FBJ 4.

EASTERN MASSACHUSETTS—SCM, Sam Gross, W1IWC—AKS is still high traffic man. KZT and KH made B.P.L. on deliveries. KH worked Cincinnati, Chicago and Toledo on 56 Mc. HXE received five QSL's confirming QSO's with W8 and W9's on 56 Mc. KPW reports hearing W6, W7, W8 and W9 on 56 Mc. June 5th, all S8–9. LAZ sends in reports of N.B.A.R.A. members by message. WV has new speech equipment all finished and working. JJY is working hard trying to make 100-watt amplifier perk. The N.B.A.R.A. enjoyed a successful Field Day using a 6L6 crystal oscillator on 7 Mc. JKT worked two W9's on 56 Mc. with s.e. oscillator, 25 watts input. KVU worked K6PDQ with 6L6 oscillator on 7 Mc. GAG is moving upstairs and will have separate room for station. KKO is putting up a vertical "Zepp" for 14 Mc. KHV is getting his T125 ready for the fall. The S.S.A.R.C. ended the season's club activities with a turkey banquet, entertainment and dance, June 16th, at Quincy. An enjoyable time was had by all, and the committee in charge is to be congratulated. The Brockton Radio Club successfully defended their "duck pin"

title and are looking for more competition. Another radio rifle match was held May 29th. The Massachusetts Rifle Ass'n of Woburn and the Connecticut Rifle and Revolver League at Simsbury, Conn., were the teams competing. Communication between ranges was furnished by IHI and IWC operating portable at Woburn, Mass., and UE (at Granby, Conn.), who drove to the Simsbury range during the match to exchange scores. A return match is planned for the near future, as the contestants were much pleased with this type of match. IHI and IWC operated during the Field Day and learned plenty about emergency equipment. JSM will operate 61.6 portable 3.5-Mc. rig on the Cape during August. LGY handles traffic on 56 Mc. AGX keeps summer schedules with HWE.

Traffic: **W1**AKS 320 KZT 194 KH 188 HXE 186 AGX 85 EMG 77 LGG 60 HWE 54 KPW 48 JSM 34 LAZ 22 LEA 21 LGY 17 WV 10 LBY 7 FOI 1 JJY 18. (April–May: **W1**IHI 442 JCK 313 EMG 261 JSM 149 KCT 100 EPE 45 QW 26 (CC1I 57) AST 8 QE (CC1C 30).)

WESTERN MASSACHUSETTS—SCM, William J. Barrett, W1JAH—BKQ went to town on Field Day; ops were LBU, JOP, IOR, CFQ, DDK, IZW, KJY, JNA and FJC. EOB is now also WLGD; Vic reports the Field Day week-end slightly damp at HDQ's portable QTH. (Same here!) BVR was very much in evidence at N. E. Convention —doing his usual swell job. AJ reports a lil' DX and a lil' traffic—the main thing is that he reports—how about the rest of you guys?? BIV reports logging lots of W9's on 56 Mc., June 5th. New officers of Chair City Radio Club: Pres., AUN; V.-Pres., KIK; Activities Dir., ADE; Secy.-Treas., BYJ. FTS was active in the flood—I mean Field Day—ops included IJR, JAD, FFK, JAH, LFT, FZI and IKT. JAH put up new mast, aided and abetted by JAD.

Traffic: **W1**IOR 206 (WLGJ 28) EOB 149 (WLGD 61) BVR 24 (WLG 85) AJ 24 JAH 9 BIV 6.

NEW HAMPSHIRE—SCM, Carl B. Evans, W1BFT—The M.V.A.R.A. operated portable during A.R.R.L. Field Day at the NYA camp in Concord. All units were 100% battery-operated. Two complete stations were in operation on 3.5 and 7 Mc. and one station on 56 Mc., using the call 1BFT-1. AEF is now using 808's in P.P. with 250 watts input. LIN is a new ham in Concord. JKH joined the R.C.C. KBR acquired an SW-3 receiver. JEH and the gang at the State Sanatorium at Glencliff will be 56 Mc. this summer with a directive antenna headed south. HJI worked U9ML for W.A.C. on 14 Mc. 7KK is looking for a schedule with a N. H. station to complete W.A.S.; he operates on 14,380 kc. with 350 watts input. The Mike and Key Club of Nashua operated portable 1TA-1 on a hill outside of town on 56 and 3.5 Mc. during the annual June Field Day.

Traffic: **W1**BFT 5 AEF 2 JKH 1.

RHODE ISLAND—SCM, Clayton C. Gordon, W1HRC —From IZO we have the following: "Prov. N.C.R. did an FB job at State Airport where complete station was set up for communication with Hartford N.C.R. (N1QP) in N. E. Air Tourney held 5 June. Hams who participated included CAB, IZO, GVH, GTS, HEN, IPU, KXA, DDY, KWY, KUG. Official letter of commendation on station and communications received." Thanks, Del, for FB report. From JUC comes a report on the Newport gang. JUC advises that JSB was in town and had a long talk with his old classmate, KOE in Kingston, on 56 Mc. JFF worked a W9 in Chicago on 56 Mc. besides a W2 and W3 with his new crystal-controlled rig. JUC has new 56-Mc. receiver and is about complete on a new 56-Mc. M.O.P.A. All this 56-Mc. success has HPE scouting around to buy a new receiver. JNO was in town and paid most of the fellows a visit. KLR has been bitten by the traffic bug and says he likes it fine. ETD reversed the usual procedure and developed odd harmonics with crystal control which disappeared when using e.c. CPV in Pawtucket is also R.M. for that Section and is doing an FB job rounding up new O.R.S. and A.E.C. members. The Providence Radio Association held its Annual Test of Emergency Equipment on June 12th (The A.R.R.L. Field Day). The place selected was the residence of FAH in North Scituate. A 110-volt a.c. generator-driven by Maytag gas engine was available. A superhet receiver is almost a necessity on these parties to overcome the hash from the power plant (Hi). Everybody agrees that the only way to find out how good a set up we have is to get out and try to put it to work. Therefore, another Field Day for P.R.A. will be pulled off again this summer, with some of the technical defects which were observed on this one corrected. It is a thought that instead of an attempt to contact as many stations as possible on a Field Day, might it not be more practical and more in line with what would be met in an actual emergency if a test were run with one other point, or a small net of points, observing how long a time a continuous QSO could be held through interference, fading or any other obstacles? Does any other club or group of hams wish to coöperate with us in running a test of this nature? Address 1GTN, President P.R.A., 26 Charles St., Cranston, R. I.

Traffic: **W1**KLR 46 IZO 34 QR 14 KKE 1.

VERMONT—SCM, Alvin H. Battison, W1GNF—KWB is working in St. Albans. JXS plans to operate in Barnard during July and August. KJG has worked all New England with his 5-watt 1.9-Mc. 'phone. KOO has a new SW3. JVS needs Montana for W.A.S. The Green Mt. Radio Club was quite successful in the Field Day tests despite the inclement weather on the Mt. Individual operator contacts: FSV-31, GAZ-25, BNS-19, GAN-14, AAJ-13, GAE-6, KVY-2. KUV and 2AZX engineered the generator and transmitters. LEM is the station of Ted La Pier in St. Albans. KVB visited KUY, KJG and JRU. FPS attended the Hartford Convention. The Twin State Radio Club, IIV, will be open for the summer after July 1st. JVJ is operating portable at Ryegate Corners. LII is the call of Don Hoyt, Orleans. AEA, DPO, GGT and ILX qualified for A.E.C. this month. JRU and IQG are rebuilding to rack and panel at their new locations. KUY is rebuilding in order to make his whole station portable. KXL is using the low-power stages of his transmitter at present. IQG and 61JK visited at FSV. KOO visited at EJF. DPO is looking for O.P.S. recruits. BJP contacted Paraguay on 3.5 Mc. JZF has a new RME receiver and DB20 pre-selector. CUN in Barre operates some from EKU. GXP will be on 3.9 Mc. for the summer. BLC is building a 28-Mc. rotary beam. DQK is sporting a new 500 watt 1.9-Mc. 'phone. EZ and IZM visited Mt. Mansfield.

Traffic: **W1**FSV 21 GNF 12 AHN 2.

HUDSON DIVISION

EASTERN NEW YORK—SCM, Robert E. Haight, W2LU—LU spent two weeks in wilds of Maine. ISQ is on 14, 7 and 3.5 Mc. using 6L6 osc., 6L6 doubler and 35T final. KOI is rebuilding rig for 150 watts, all bands. GTW reports Delaware Valley R.P.A. was out for Annual Field Day operating under GTW's call. ITK schedules 8CTX Wed. nights. BLU is busy with a crack 'phone job and erecting new sky wire. BJX, our new Emergency Coördinator, changed address to 358 Church St. KFB finds 3.9-Mc. 'phone FB; he works 300 miles consistently with 20 watts input. KZS gets fine results on 3.5 Mc. using 33 crystal oscillator, 1 to 1.5 watts input. ALP is grinding crystals, fixing up controls and relays for quick change from receiver to transmitter and sports new antenna, center-fed. DVC reports S.A.R.A. Field Day results were very good. DHS and JZR managed to pull in a nice total of points. ACB and KUD are rebuilding for lots of power. JZR attended Hudson Division Convention. HYC heads Section in traffic.

Traffic: **W2**HYC 120 (WLNX 19) LU 45 ISQ 40 KOI 3 GTW 7 ITK BLU 7.

NEW YORK CITY & LONG ISLAND—SCM, Ed. L. Baunach, W2AZV—New appointments: LR and EVA O.R.S., GUV O.P.S., KJY O.O. CHK's new QTH is 138 Rutland Ave., Rockville Centre. CFS joined the benedicts on June 18th. Congrats. LBI got his R.C.C. KYO hooked G2ZQ for his 1000th QSO in five months. CMI is located in Riverhead operating portable on 3.5-Mc. c.w. and 4-Mc. 'phone. DBQ worked SU1CH and found out that he had been waiting to have a QSO for two years; friend in Cairo had given him one of his QSL's. KYV is operating portable July 23rd to August 4th on 3.5 Mc. during a camping trip from Washington, D. C., to Vermont, and would like to QSO the gang. IHT schedules his brother, JBL, at his summer QTH. KCV did some nice operating with the N.Y.N.G. at camp. KTF is building low power rigs for 14 and 56 Mc. KXB is building the double regen super described by 1JPE in March *QST*. IXQ's antenna was cut down. ELK has been experimenting with '46 doubler stage. EVA needs Nevada, Utah and Wyoming for W.A.S. 1YR is now located at 159 Bainbridge St., Brooklyn. KVY is using crystal control on 56 Mc. using a 28-Mc. crystal, a pair of 48's in the final with 110 volts d.c. on the plates, about 30 watts input. New station LJC is located at 2108 Quentin Road, Brooklyn. 8QPS/2 would like to hear from any of the gang interested in playing checkers over the air; he operates on 7190 kc. PF reports a new op at SC/WLN from WLV. DVU read in the paper that L. I. is sinking one inch in one hundred

(*Continued on page 72*)

56 Mc. Goes on Annual Frolic

(*Continued from page 21*)

June 9th: W9ZGD reports that at about 8:05 P.M. CST, W5EHM called QST on 28 Mc. and reported that 56 Mc. was open to the 8th and 9th districts. W5AJG was heard in Ohio S8 at 9:21 P.M. CST.

June 10th was an active day. W5EEX, Houston, Texas, worked W8VO, W8JLQ, W9UJE, W9CLH, W9LLC and W9YYY, using about 70 watts to a pair of '10's. W9ZGD, Milwaukee, worked W5EHM for the third time at 7:58 P.M. CST. W9YTI, Milwaukee, heard three W5's, including W5EHM. W5AJG, Dallas, Texas, worked W9ANA at 7:44 P.M. CST, and heard W9CLH and W8CVQ; reports band open from 7:30 to 8:30. W8PK reports band open from 7:30 to 9:00 P.M. with W5EHM the best performer. W8PK heard EHM work W8JLQ, OWO, RYK and a W9 in Indiana. W8QDU, Michigan, heard W5EEX and W5ZS, both fading badly; worked W5EHM. W8QFV heard W5EHM, W5EEV (testing) and W5EXQ, about 7:30 P.M.

June 18th: W5AJG reports "five" open from 8:00 to 11:30 P.M. CST. He worked W8VO, 11:30, and W8CIR, 11:50; heard W3BLH, W8QXV and W8IEF. W3EZM, Langhorne, Pa., worked W5EHM at 11:30 P.M. CST. W8QFV, Ohio, heard W5EHM at 10:10 P.M.

June 19th: W3EZM worked W4EDD at 7:20 P.M. CST. Eugene Schraut of Sheboygan, Wis., reports the following heard between 4:30 and 7:00 P.M.: W1KIB, IXP, W2MO, DYR, HWX, W3DYE, BUU, EZM, BIO, NU, FBH, AYF and FVR. W8QFV heard W4EDD at 9:30 P.M. W1IJ writes, "June 19th W4EDD rang the bell again, putting an S5 to 9 signal up the coast. He was first heard here from 8:22 to 9:00 P.M. EST, at which time he faded out and the band returned to normal. At 9:23 we noticed the band was upset again and went back to EDD's frequency and there he was. At 9:28 P.M. we called him and made contact. The last we heard of him was about 9:40 when he seemed to have gone out of the picture."

June 27th: W9ARN, Bartonville, Ill., reports the band opened slightly for east coast at 7:00 P.M. CST. At 7:17 W2KLZ was worked; W8ABX was heard on i.c.w. at 7:26; band out at 7:45. W8CIR, Western Pennsylvania, worked W9UOG. W8NED worked W9ZJB, W9QDQ and several other nines. W9NY worked W1IZY, 6:03 P.M. CST, W2KLZ, 6:16 P.M.; heard W2KLZ again at 7:20 P.M.; worked W5EHM at 10:49 P.M. W9VKT, Omaha, Nebr., heard W2KLZ, 7:25 P.M. CST, W8QKT, 9:10 P.M., W8CIR, 9:20 P.M.

June 28th, W5BHO, Houston, Texas, reports hearing W9CLH for very short periods of time (about one-half minute) at 8:48, 9:05 and 9:25 P.M.

June 29th, W5AJG, Dallas, W9USH, South Dakota, 11:00 A.M., heard W9ANA, Wisconsin, from 10:00 to 11:30 A.M. CST.

And that's the story as this issue goes to press.

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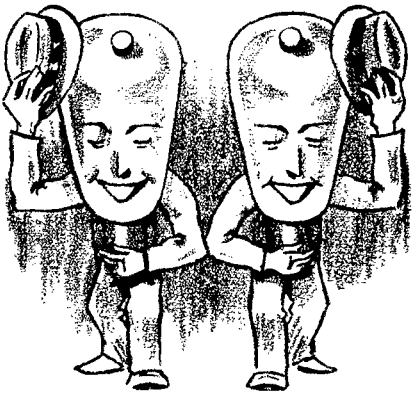
That's how the movie producers would tell you that radio amateurs everywhere are cheering those two new Taylor Champs, T-40 and TZ-40. Our natural modesty forces us to admit that these new tubes are gol-darn good—we know they represent greater values for Radio Amateurs. Many thousands of these Wonder Tubes, have been bought during the past few months. Reports indicate extremely efficient operation on all ham bands from 5 meters up to 160 meters. Such outstanding manufacturers as Bassett, Utah, Temco, Thordarson, Gross, etc., have developed fine transmitter circuits and kits which use these tubes. Reports from these manufacturers are equally enthusiastic as those received from amateurs themselves. Be fair to your Rig *and your pocketbook*, and remember — comparison sells Taylor Tubes.



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Fil.	7.5 Volts	2.5 amps.
Amp. Factor		25
Grid to Plate Cap		4.5 mmf.
Plate 1000 Volts		115 m.a.
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Price		$3.50

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Class B. Audio

Fil.	7.5 Volts	2.5 amps.
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(Continued from page 69)

years, so he is working on his emergency rig now. Unit 4 of Section 6 of the N.C.R. organized an expedition to Rock Hill, L. I., under the leadership of ADW and operated portable on 1.7, 3.5 and 7 Mc. on Field Day. IXY manages to keep the foreign schedules going FB. LAP reports regularly. AVS at Riverhead operates on the Airport Network every night at 5 P.M. EC reports A-P Net discontinued until fall. HGO keeps his once-a-week schedule with 8MCT. Heavy rains kept AZV's Field Day activity down. AOT and GGS are getting back after a long layoff. HMJ and eight of the S. I. gang operated in a tent in the wilds of S. I. during Field Day. JRF also operates in the Airport Net. KDK contemplates leaving S. I. for Army Air Corps at Mitchel Field. KMS operates on 7 Mc. with an RK49. CPY is trying to get on 7 Mc. with a P.P. 6L6 final. KMN operates 3.5 and 7 Mc. JRZ works DX on 14-Mc. 'phone and c.w. KVB keeps on 4-Mc. 'phone while COK operates 56 Mc. ELN sends the following news: CGD recently tripped to the altar. CSB also lost his bachelor freedom some time ago. The YL-2NI, who used to attend the F.T.C. (Flatbush Transmitting Club) meetings, got spliced, but not to the ex-boy friend 2CES, who got her started in ham radio. Hi! BTF will soon be back on with a corking new rack-job and a nifty super-het receiver. BLD completed a swell new rack-job. FEO moved to Richmond Hill, Jamaica, and expects to work his old friends on 1.75 Mc. better from the new QTH. ELN will very shortly be back on 3.5-Mc. c.w. with new rig using 6L6G and parallel tens and a Hallicrafter receiver.

Traffic: **W2**EEL 203 PF 76 AZV 70 IHT 31 DBQ 28 FF 14 EC 13 BGO 10 BYL 8 GRJ 7 AA-CIT 6 KJY 12 LR 6 JZX 11 8QPS/2 2KCV 7 IXY-CHK 6 FLD-DIR 5 GG-FIP-AZM 4 KYV-BDR 3 KXB 4 HJT 3 HYL-AJM-AHC 2 DYU 3 HGO-LBI-HMJ 2 LAP-AGH-AGC-DOG-HAK-JBL 1.

NORTHERN NEW JERSEY—SCM, Fred. C. Read, W2GMN—Some very good work was done by radio clubs and individuals in the June Field Day, despite the dampening effects of a couple of thunder showers. Communication on 56 Mc. was especially brisk. To the best of our knowledge the greatest number of contacts for this section was made by the Jersey Shore Amateur Radio Assn. from its station at Homing Hill. GVZ is still after DX and has worked 109 countries. TP is busy making a new 28-Mc. antenna. AOG has new 56-Mc. rig. Number of Jersey hams had fine time at the Hudson Division Convention on June 17th–18th. Committee deserves congratulations. IOZ made trip to Luray, Va., and Washington. KTR has an O.R.S. appointment after only 5 months on the air. FBI LEK is new station in Woodbridge. ISW is building portable transmitter-receiver. FDL moved to Middletown, Conn. ZB is back on 56 Mc. at new location in Hillside. GYY sends CQ with cut-out of his motor boat and works the gang ashore. FOI and JOC spent two weeks at National Guard camp at Indiantown Gap, Pa. Schedules were kept with IE at Cranford on 1.75-Mc. c.w. BZJ built new exiter for Field Day contest. IQM has been active on 3.5 Mc. KHA is spending summer at Derry, N. H. Any of the fellows who want to get in touch with him may do so through 1KIN; AUH is planning to use 56-Mc. 'phone. GME and HFN have been doing good DX work on 14 Mc. BMK has new preselector. Public Service Amateur Radio Club had dinner meeting, May 31st, their last meeting until fall. North Newark Amateur Radio Club discontinued meetings until fall after a very active season. DSV finds 14-Mc. conditions improving for DX.

Traffic: **W2**CGG 455 (April–May) KTR 360 HOZ 209 HCO 180 HCO 51 (April–May) GVZ 44 BZJ 14 KHA 25 KMI 23 ISW-CJX 6 IZV 4 HDJ 3 HQL 2 (WLNR 42) DSV 8.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Jack Morgan, W3QP; Asst. SCM in charge of E.C., Miss Frances V. Rice, W3AKB; R.M.'s: 3AKB, 3AQN, 8ASW. P.A.M.: 3EOZ. The Frankford and York Road Radio Clubs waged intensive war on each other during the annual Field Day outing. Both seemed able to work everything within hearing, despite thunderstorms, ear-splitting static and periodic equipment trouble. 3BRZ hooked XU8OL near 14.320 kc. 3DGC is bucking static on 1.75 Mc. for some summer vocalizing. 3DXC has tied in with 4PL for clearing K6 traffic; he also has crystal switching which speeds up dodging interference. 3EEW raised Detroit on 7 Mc. with .18 watts!! 3EFH built his regular rig into a case, so that it is both the home station and the portable with no changes but antenna and power supply. 3EML ran up his total in only two weeks: Here is the fast route to K5AA and the W6 area. 8NPQ has moved to Pottsville, and provides the only O.R.S. route into that point. Nearly all report reduction or discontinuance of schedules for the summer, but the main lines continue operating: 3EML to K5AA. 3EWJ to 8ASW, 3DGC, 3GDI, 3ADE and 8CDT; 3NF to WLM; 3QP to 6LUJ, 6CUU, OA4U and VK6MO.

Traffic: **W3**ADE 5 3AOC 15 3AQN 97 3BES 8 3CHH 16 3DDM 15 3DGC 229 3DXC 50 3EFH 2 3EML 356 3EWJ 113 3FXG 5 3GDI 14 3GYY 42 3HCT 1 3NF 101 3QP 322 3UA 14 8ASW 166 8CDT 7 8EKG 53 8NPQ 4 QLW 2 3GAG 122 3AKB 178 3ECA 34 3EDC 141 8EU 3.

MARYLAND, DELAWARE, DISTRICT OF COLUMBIA—Edgar L. Hudson, W3BAK, SCM—3CXL, 3CQS: R.M.'s. 3BWT: Chief R.M. Several of the Eastern Shore gang attended the Atlantic Division Convention at Washington, June 24th-25th. SN is installing new power supply in Collins and putting in tube keying. WU worked four new countries. GKZ returned from three weeks in New London, Conn.; he also visited Hartford and some of the HQ gang. BXC attended the New England Div. Convention in Hartford, May 22nd; he received his M.A. degree in chemistry from Wesleyan University and will go to MTI as teacher in the fall. 3EYX, together with GPK, GXI and HMX, had portable rig on the skyline drive on Field Day and had lots of fun. GXX has had his ticket a year and has worked all states and 50 countries with 100 watts. HBT is on 7 Mc. with a pair of 6L6's. EPV works 56 Mc. when DX is bad. AOO and BEN are going in for DX in a big way. CSX moved to the country. ATQ is on 7 Mc. with a 50-watter. FCX is getting built up with a new rig and new 81X receiver. BWT is rebuilding. DOG raised his power to 600 watts on 3.9-Mc. 'phone. AED rebuilt his kw. rig and is back on with FB signal. GLM, a junior at Yale, is home for summer QSO's. AXP is taking a trip to France on a French liner.

Traffic: **W3**CXL 227 (WLM 2808) SN 577 CIZ 562 FPQ 10 BAK 7 CDQ 6 WU 3 CDG 2.

SOUTHERN NEW JERSEY—SCM, W. Walter Filson, W3BEI—BYR is rebuilding. HEH is back on with a new c.c. rig using 35-T's in the final with 400 watts. Z1 still holds a few schedules. FBM secured new power supply for final and is getting better results. HLV is interested in traffic handling and is starting out with a '47 crystal and '45 final with about 40 watts. AEJ turned to rag chewing for the summer. ZX is getting going in a new location on Oak Drive, Medford Lakes. K4ENY dropped in on the gang unexpectedly, and says his two-year stay at the Virgin Islands will be terminated about October, after which he expects to be transferred to the Great Lakes. The D.V.R.A. will hold its annual outing and hamfest on Aug. 14th at Sullivan's Grove, Washington's Crossing Park, N. J. The D.V.R.A. operated from Mercer Airport on the Annual A.R.R.L. Field Day and worked 25 hours for 51 contacts. 1KTQ(3) enjoyed a shakedown cruise down along the Atlantic Coast and wound up in Cuba. The S.J.R.A. will hold its annual outing and Field Day in Aug. or Sept. Details later.

Traffic: **W3**ZI 88 BYR 60 (WLNV 9) FBM 40 BEI 9 HEH 8.

WESTERN NEW YORK—SCM, H. E. Preston, W8CSE—P.A.M.: 8CGU. R.M.'s: 8BJO, 8DSS, 8JTT. The big news of the month is the 56-Mc. DX worked by DSU. On June 5th the 56-Mc. band opened up during the evening and Fred worked 9AHZ and 9ZPJ; he heard 9ARN and 9NY. PK and AGU were also active on 56 Mc. and got in some good work. PK heard 5EHM. DSU puts in a couple of hours each Tuesday night on "five" with 100 watts input to the final. It would be greatly appreciated if anyone hearing his signal, regardless of distance, would report reception to him. NXQ moved about July first to Webster Ave., Syracuse; as soon as he settles at new QTH he will have about 100 watts on 56 Mc. JTT has been visiting in Springfield, Mass.; he has a new 65-foot stick at his Fredonia QTH. NNJ had an FB time operating MLM portable on the A.R.R.L. Field Day. The Finger Lakes Transmitting Society had an FB Field Day in conjunction with the A.R.R.L. Field Day; a self-powered rig with an RK-20 was used in a trailer at "Frozen Ocean," fifteen miles south of Auburn;

over 80 contacts were made, many of them on 3.9-Mc. 'phone; the call used was 8BDV/8. ACY worked ZD2H for his 89th country MIM. DHU is giving 14 Mc. a whirl. FUG changed QTH to 123 Holmes Road, about two miles west of the city of Rochester. JQE is working on his RK-20 rig. DSS gets on around 9 P.M. EST occasionally. Our low-power DX'er, ROI, went on 14 Mc. and the first station called, EI6G, came back and gave him 589X report MIM; he is forsaking Auburn for new QTH at Aurora. RKA has been registered as the local American Legion emergency communication unit. 4FCP/8QMR returned from Florida and is summering at Middleburg; he is very anxious to establish a schedule with Rochester. RNG shifted activity from 1.75-Mc. 'phone to 7-Mc. c.w.; one day he was QSO a VE3 and the wind blew his antenna down, pulling the transmitter right out of the window. Hi! NA worked 54 stations on 1.75-Mc. 'phone and one station on 1.75-Mc. c.w. GZP, OAM and CSE captured Class A tickets during the month. OAM joined Coast Guard as Radioman. GZP is burning up the 3.9-Mc. 'phone band. The Toothpickers, IY, CGU, FFN and GBV, still keep their noontime schedule on 3.9-Mc. 'phone. RTX in Caledonia applied for O.P.S.; he is on 1.75-Mc. 'phone. RNE in Syracuse is planning on a new transmitter; with all the advice he probably gets from PXA, NXQ, JUG, ETH and LYJ, it's a wonder the poor fellow doesn't go crazy. LYJ is president of Syracuse Radio Club and RNE is vice-president. RZX is a brand-new ham in Syracuse. KDY will show the boys how to really operate a 1.75-Mc. 'phone. REI and RKM are active in Cortland. QLT is on 28 and 14 Mc. RMR in Mt. Morris has a new SX11 Skyrider and is working plenty of DX on 7 Mc. QXS paid the S.C.M. a visit; he is on 1.75-Mc. 'phone and 3.5-Mc. c.w. JNU is working plenty of 14-Mc. 'phone. Don't forget to listen on 56 Mc. every Tuesday from 7:30 to 9 P.M.

Traffic: **W8**JQE 24 PLA 87 RKM 36 JTT 2 ACY 4 DHU 19 DSS 34 ROI 2 RKA 27 QMR 48 CGU 15 FCG 52 CSE 56 (WLNM 49) QXS 48.

WESTERN PENNSYLVANIA—SCM, Kendall Speer, Jr., W8OFO—R.M.'s: 8KUN, 8KWA, 8MOT, 8GBC. A.A.R.S. Liaison R.M.: 8UK. N.C.R. Liaison R.M.: 8KOB. Emergency Coördinators: McKeesport, 8DNF; Pittsburgh, 8QAN; Erie, 8AQJ; St. Marys, 8NDE; Butler, 8DDC; New Castle, 8NQO; Ohio River Region, 8BBV. New appointments: O.R.S., AVY; O.B.S., RBI. DON'T MISS THE SOUTH HILLS BRASS POUNDERS FIFTH BIG ANNUAL HAMFEST, Sunday August 7th at Clattys Driving Range, Mt. Lebanon, Pittsburgh. From noon 'til dark. Lots of eats, prizes and speakers. Tickets, $1.00. Attendance of 1000 expected. The Pittsburgh Area Radio Council has organized with five clubs already represented. QAN is President and AVY, Secretary. Western Pennsylvania, West Virginia and Eastern Ohio Radio Clubs are invited to join the Council. Write 8AVY for details. The Altoona Horseshoe Radio Club held its June meeting in the form of an outing and basket picnic at Ivyside Park. Over 125 attended. NRY, Chief Engineer at KQV and WJAS, and ONW of West Penn Power spoke at the June meeting of the McKeesport Mon Yough A.T.A. Pictures of the San Francisco Bay Bridge were shown at the meeting of the Amateur Transmitters Ass'n of Western Penna. in Pittsburgh. OLW, OC, FTY, ONW, AMP, OFO, CUG, UK, NDP, BSO and CFR will again handle 56 Mc. radio communication for the annual Boat Regattas September 2nd–3rd at North Park, this year being sponsored by Allegheny County during the Sequi-Centennial celebration with two complete regattas instead of one as in previous years. Ensign Hiner, FUW, and Lieut. Williams, ZAE, Commanders of Sections Two and Three of the N.C.R., are busy enlisting recruits. A card to either will bring you application blanks and details. The S.C.M. was visited by KXP, NCJ, his XYL and 3BO. DDC, DNX, BBW and RXO took part in Field Day doing nice work. CMP attended the Atlantic Division Convention. NDE is trying some 14 Mc. during the summer. UK operated portable for South Hills Brass Pounders on Field Day with PX, QAN, OKF, CKO, FCO and others assisting. CUG, CFR, BSO, NXD and Sam Nickhazy ran up a nice score during Field Day. MTK had his appendix removed. GUB completed his course at Dodge Institute and now has his First Class Telephone Ticket. AJV bought an HRO. NDP is back on the air. The XYL at NCJ made the R.C.C. and worked a YV for her first DX. POX and CUN are on 7 Mc. Over 125, including the R.I., Grinnell and XYL attended a picnic, June 12th, on BRC's farm. JSU worked 58 countries and went W.A.C. eight times since January. MJK is on 14 Mc. for summer; his new rig is 6L6-6L6-Pr. T40's with 200 watts. RUF is on 3.5 Mc. E1S works 7 Mc. IOH has a new Vibroplex. KWA in pulling down his old antenna brought the chimney along with it. CIR worked Florida and Texas on 56 Mc. OKS, LGD, OUA, LBO, QNJ, QVN, OIR, QEN, QNY and QBK completed two weeks' active duty at the Phila. Navy Yard. QFM is back from two months' cruise on the U.S.S. *Savannah*. HHM is now 3GXV at Norfolk and OCG is 4FDO at Rocky Mount, N. C. PFW is handling Western Penna. traffic in the A.A.R.S. State Net during the summer. RQA now has 25 countries. AVY is busy with Radio Council, P.R.R. Emergency and fishing! RAU and RAZ have been hearing W1–2–3–4–5–9's on 56 Mc. KCW uses a pair of '45's TNT on 3.5 Mc. Congrats to DGL, who just got married. LBW has just been rated Chief Radioman and LGD Radioman Second Class in the N.C.R. SBQ (ex 4BOU), "side kick" of 4IR, the Ole Dixie Squinch Owl, is joining the Third Corps A.A.R.S. NTJ, KYW and PMY took part in Field Day. RUE worked 5EHM on 56 Mc. FLASH—W8CMP was presented with the Marconi Memorial award at the Hudson Division Convention. Congrats. You are invited to become O.R.S. and O.P.S. during the summer period and be ready when the fall season opens. The traffic nets will be bigger and better. Don't forget, crystals are loaned gratis to active stations. A card to the S.C.M. will bring information and application blanks. Do you want a W. Pa. QSO Contest this fall with prizes? Your response and enthusiasm will determine if there will be one.

Traffic: **W8**FUW 162 OFO 81 DNX 69 CMP 53 DDC 35 QAN 25 NDE-UK 15 NCJ 3 JSU-MJK 2 IOH-RBI 1.

DELTA DIVISION

LOUISIANA—SCM, Eugene H. Treadaway, W5DKR—R.M.'s: 5BN, 5DWW. P.A.M.: 5BMM. E.C.: 5FPO. O.O.'s: 5DXK, 5FXX. EQG reports the Baton Rouge Amateur Radio Club very active. ACA is doing an FB job on 14 Mc. and is active O.R.S. FXC is on the job 100% as O.O. BYX has T55 in final, and is going strong after a lay-off of six years. BN has 250 watts into 242-A, working 7, 14 and 3.5 Mc. CEW enjoys working DX. BMM will build several new beam antennas soon. WG and BZR were active in Field Day tests on Black Lake, about 60 miles southwest of Ruston. GIA has pair of T40's working nicely. GMF with his low power is doing a great job on 14 and 28 Mc. GUX reports for FSI, GVW and 4WD of Camp Beauregard, and says they all will be active on 28 Mc. soon. FVD reports the Louisiana Tech. Radio Club successful in its private Field Day on Black Lake with the Monroe Amateur Radio Club. Congrats, gang! EPY, our good friend of Starkville, Miss., sends 73 to the Louisiana boys. AOZ is working away on that 28-Mc. 'phone rig. GUK is sure proud of his '45's P.P. FPO, the old 'phone station, is heard on c.w. these days. CXQ is a hog for DX. DXK is plenty QRL with convention plans. CJO has a complete new plug-in transmitter. EBB has a new 16-tube R.C.A. ham receiver, and it sure is the berries. JW, EDY, FSX, EVS and FHH are going strong on 28-Mc. 'phone. DKR has new ham shack, new antenna, and is working 14 Mc. FMO has keen new beam antenna. EVZ has 150T in final with 600 watts. GXQ is new active ham in Baton Rouge. BRR is big DX man. ACY has 300 watts on 3.9 Mc. FZQ has an FB rig. AKI, ML, DXB and EKU want activity on 56 Mc. Here's your chance to give it to 'em, gang. JN has new 14-Mc. antenna. FZY likes 28-Mc. 'phone. ZV is heard all day long on 28-Mc. 'phone. 9SNR quit the sea and will be heard from his station back home; while in New Orleans he was active over FPO. GLH is active 7-Mc. station. GRE is working hard for W.A.S. GMR and his 100TH are doing a nice job on 28-Mc. 'phone. BLQ has an FB new 28-Mc. 'phone rig. FWO says his new McMurdo Silver receiver perks FB. DRF does his bit of DXing. GCS likes his T55 job. FJW, EGK and DXL are active Monroe stations. BDJ gets out nicely with low power. DAQ has a swell transmitter. FSA is working away on new rig. GJO does some oping over FPO. AVO is back and active in New Orleans. Sure glad to have you back with us, OM. BSR keeps Lake Charles on the map. GIW, the L.S.U. station, is working some nice DX. ADJ comes crashing through the QRN on 1.75-Mc. 'phone. FUM is getting c.w.-minded. GAL sends some FB reports on the Baton Rouge gang. KC is active O.R.S. and O.B.S. of Plaquemine. GDU enjoys pounding brass. BQD reports active from Jonesboro. DU, our R.I. at New Orleans, is heard on 28-Mc. 'phone.

"Five" certainly gave the boys a work-out this year! During May and June W8CIR worked seven districts, lacking only W6 and W7! W3EZM has also worked all districts except W6 and W7, has worked 15 states and D.C. and received "heard" reports from 18 states. Who holds the records for number of states worked on "five"? Has anyone worked all districts?

56-Mc. will bear watching. Perhaps the band is open more often than we realize. The open periods this year apparently covered a wider span of time than in the past. With the advent of more stable signals and improved receivers DX may become more common, and extend more widely through other portions of the year. Experienced five-meter men believe that crystal control and more general use of good receivers will greatly improve 56-Mc. performance.

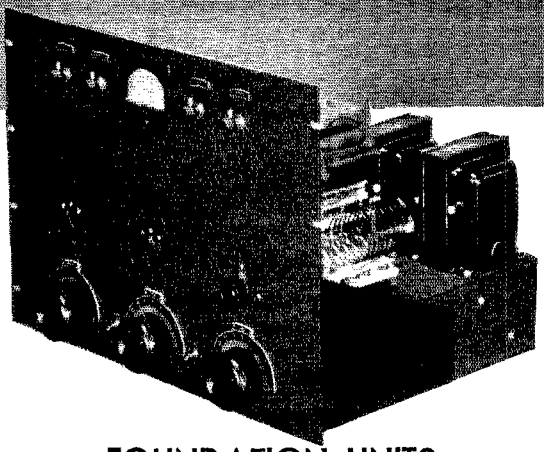
Many thanks again to those who submitted reports. To those who figured in the May–June activities—well done and keep plugging!

—*E. L. B.*

Heard and Worked * on 56 Mc. June 5th

In Massachusetts: W3GMZ W4DNW EDD W5DRN FO FOH W8ARQ BDG CIR CQK EGQ IUB IUD IVF JIN JKT JLQ* LDJ LHU LSS NKJ NKK NSL NSS OCG OAI OIA OJF OOD ORA OSS OTG PBP PNU PPU PQK QDU QXV RAC RDT RFC RFS RKE RMJ RSH RSM RSS RUD RUL RUT RVA RVD RVP* RVT* RYM VO YX W9AAV AEA AHZ ALE ARC ARF ARN BEA CGW CJW CLH CMN CX FEN FP* IUD KIC LLC LNV LVK LYI MKJ NY PQA PQH PTB QCY QEI QHR TMM UTS VHG WJW WLX YDD YGZ YSV* YX ZDG ZEO ZGD ZJB ZMG ZSS ZUX. **In Connecticut:** W5ZS W8EGQ ENV IUD JIN JLQ NOB OJF* OPG ORA* QAM RSF RSS* RVT YX W9ARN CAY CLH CX FEN* FP GGH* GKO HPP* IBX IV IVC* KEN KRX LDM LLC LLV LLX LYI* MXK* NY OXD PQH* TMM UTS ZSS. **In New Hampshire:** W8CJW EGQ JIN JLQ OJS OTG RMJ RSS RVT W9ARN CLH DQH FP PPV PQH PTB UGS ZGD ZSS. **In Maine:** W3GMZ W8EGQ OPO RSS W9CLH NY* PQH. **In N.Y.C. area and Eastern New York State:** W8CXK EGQ* JIN* JLQ MRK NIX NKJ* OIA* OTG QDU RAF REU RFC RSS RVA* RVQ RVT YX W9ALE ARN BEA CJW CLH FCH FEN FP HPP IVD JFM LLC LNV LCK* LYI MTN NY PMM PQH PQX QCY RBK TMM TMN USH UTS WJW WLX YMG* YSR YSV ZBD ZSS* ZTB. **In Eastern Pennsylvania and Southern New Jersey:** W5ML ZS W7EYN W8BEA CGU CLS EGQ JIM JIN JLQ* LL* MKJ NJJ NKJ OCV OIA* OKG OPG* OQG ORA OTG* PNU* POG PQK QDU QHR RK RKE RMJ RRH* RSM RSS RTS RVA RVT RXO YX W9AHZ ALE ARN BEA CLH* CX EYH FE FEN FGB FP GGH* GNW GPS GUX GYS HPP HTT IBC IVC JUE* LNV LVK* LYI MXK NMF NY* OLY* OVK* PNC PQH* QCY QHR* QHY QVB RGD TAT THR TQH USH UTF UTL UTS VSS WLX* YGS* YGU YGZ* YLD YMD YMG* YNG YSA YSB YSV ZBS ZGD* ZJG ZJD ZSS ZUL ZUX* W6DQH-9 W6EVO-9. **In Western New York:** W5EHM ZS* W8EGQ JIN PQJ RSS YX W9AHZ* ALE ARN CLH NY OLY PQH UIZ* ZJB* ZPJ*. **In Western Pennsylvania:** W1BJE* IJG IVA* IZY* JUN QV* W2GAH* IXY KLZ* W4EDD W5ETQ* ZS* W9AHQ* AHZ* FD GKO MOW OLY QFX* QVP UIZ* VIZ WTV* WWD* ZJB*. **In Ohio:** W1AGR* AJR APJ ASP AUN BJE* CCX CKV DOO ETD EYM* FKV FVD FZU GDJ GKJ GQV GYT HM HPE IAH* IAK IGH IJG IXO IXP IYK IZA IZY JFK JIS JLG JLI* JLO JMT JNT JUI JUN* JZC JZE* KEE KEK* KEM* KEX KH KHK KHO KIB KNG KNH KNM KNN* KNX KPM* KPV KSG KTF KUD* LAB* LBK LGH PM SI TA W2ANM* BKW COK DB DKJ DMM FGB HGB HYJ HZL* JCY JMC JVV KHK* KL KLO KLV KLX LAH LEY* W3CGF DOD EZM* FBC FBH FOP* GHI GHL GHO HJM HK MV W4EDD ETC W5AJG ML ZS W8ETD W9OLY USH. **In Illinois:** W1ASY AUN* BRL

A New THORDARSON Band Switch Transmitter Kit



Instantaneous Band-Switching From Front of Panel

Over any three pre-selected amateur bands

- 100 watts input on all bands.
- Single meter reads all plate currents as well as grid current of final stage.
- Power supply and R-F section on one chassis.
- Band-Switching feature optional, regular plug-in coils may be used.
- Tube lineup: 6L6G—6L6G—TZ-40.

PHONE OPERATION

- Plate modulation by a separate unit using a pair of 6L6's.

FOUNDATION UNITS

Completely punched chassis and panels supplied by Thordarson for both units. Full constructional details, photos, diagrams, etc. Standard parts used throughout. Fits standard relay racks or cabinets.

UNIVERSAL SPEECH AMPLIFIER

- Designed specifically for amateur transmitters.
- Sufficient driving power for any Class B modulator.
- Hum at absolute minimum.
- Output can be adapted to either Multi-Match driver transformer or 500 ohm line.
- Accommodates crystal microphone.
- Optional volume compression circuit.
- Tube lineup: 6F5—6C5—6C5—2A3's P-P.
- Foundation unit furnishing completely punched chassis, instructions, photos, etc.; suitable for standard relay rack or cabinet. Also screen cover and bottom plate available.

Foundation Units for all three items may be obtained from your parts distributor

Ask him or write to factory for free descriptive circular SD-378

THORDARSON ELECTRIC MFG. CO.

500 W. HURON ST., CHICAGO, ILL.

Demand "Power by Thordarson"

CPM EYM* GYT HM IGJ* IJ IJG* ISC IUI* IXP* IXT IYI IYK IZY JLI JMT JQA* JQO* JXM JXN* JZN* KCG* KEE* KGE KHO KIB* KID KJE KJY KNM KRB KUD* KXK* LBK MJ* MY SI **W2**DB DMM* FBI GAH* GHV* HGB HWX* IRY ISY IXY JCY* JMC JQY KBH KHR* KLO KLW KLZ* LEZ MO* **W3**BYF GEF* GIO HG. **In Kentucky:** W9RBK worked W1CMP*, W1KUD*, W1KXF*, heard **W1**JUN JUJ KJT IXO JFK **W2**COK LBK KLV KLU ISY ANM **W3**BUU FVR. **In South Dakota:** W9USH worked W2JCY*, W2KTC*, W2MO*, W2DB*, heard **W1**JMT KID **W2**JMC ISY HWX **W3**HKN EZM GLV **W8**AGU CIR. (During the week June 1st-6th, W9USH worked W2AMN, W1IXP, W5EHM, W5AJG.) **In Kansas:** W9UIZ worked W8GU*, AGU*, CIR*, VO*, heard **W1**ALW JQH KIB MY IY **W2**JMC HW ISY **W3**GLV FCR **W4**DEK **W8**NOU OSS QAI. **In Missouri:** W9ZJB worked **W2**HWX*, ISY* **W8**AGU* CIR* GU* DSU* MST* NED*, heard **W1**JQA KEE JXN JMT SI GDJ JNT **W2**JCY JMC MO HGB DYR KLV GJK **W3**FOP FVH EZM FBH FVR CUD VX HKM **W8**QDU. **In Iowa:** W9CCY worked W2JCY*, heard **W1**KEE SI **W2**MO JMC KLZ FKD HWX GLZ **W3**FKF **W5**ZS **W8**CIR CLS AGU QKI DK KBJ QDU NED MST **W9**KHC DND. **In Texas:** W5AJG worked W8VO* QKI* QDU* NF* JLQ* W9NY, heard **W8**CIR OPO GU. **In Michigan:** W8QDU worked **W2**JLY* DB* HYJ* LAH* **W3**AYF* FLL* **W5**AJG*, heard W9CCY. W8MSK heard **W1**SI JNT JLI JMT GQV **W2**KHR MO COK IQK AWV HWX FQM KMK JCY LAH LEY KTU LU FWX **W3**CUD FSI ERA BYS HKM AIR GYE HKX EZM FBH HAC GDO GKW HKN VX GHL GKJ **W4**EDD. **In Wisconsin:** On May 27, May 31, June 5, W9NY worked **W1**BJE* CSR* EYM* IZY* KAD* KTF* **W2**BVY* **W3**AIR* BYF* CXU* EVT* FVR* **W5**AJG* EHM* ZS* **W9**CLH, heard **W1**IXP KEX SI 5CSU-1 **W2**DYR FQM GAH HYJ IXY JCY KBG KFG KHR KTC KTU **W3**CUD DOD FAA FSI GHY GIO GKW GMZ HG HJX HKM VX **W5**ML (W9NY reports all stations heard by him were using crystal control.)

With the Affiliated Clubs

(Continued from page 27)

W9UNL	Iowa Illinois Amateur Radio Club
W9WKR	Lane Tech Radio Club
W9YL	University of Colorado Radio Club
W9YMA	Mound City Radio Amateurs
W9YWG	The Tractor City Radio Club
W9YWX	Sheboygan Radio Amateurs Club
W9ZBX	Lake Michigan Amateur Radio Reserve
W9ZVZ	South Eastern Nebraska Radio Club

OPERATING DEMONSTRATIONS AT CLUBS

At a meeting of the Amateur Transmitters Association of Western Pennsylvania (Pittsburgh), something new in the way of a program was tried with much success. Instead of having a speaker, Ken Speer, W8OFO, S.C.M., and "Shorty" Grossarth, W8CUG, gave a demonstration of "How Traffic Is Handled." This suggests several ways in which interesting programs may be worked up. Net operation is an exceedingly interesting form of amateur activity. A demonstration of net operating procedure, bringing several of the net operators to the club and conducting a net session before the club group should interest all operators. It would not necessarily have to be a traffic net. There are tricks to the smooth operation of any form of net, which would be enlightening to many amateurs. If the size of the club group is not unwieldy, it might be possible for the club to sit in at a net station during actual operation.

Demonstrations of correct operating practices in every day amateur communication (aside

from nets) would also provide worthwhile material for club meetings. Examples of correct calling, working, signing practice—proper use of CQ, QRZ (and other Q signals)—could be put across very nicely by the use of a loud speaker and two operators with keys and audio oscillator. In the case of a demonstration of voice operating, a couple of mikes would be all that was needed, unless the size of the gathering warranted a P.A. system.

Another interesting stunt for club meetings is to set up a receiver with loud speaker and tune through the bands, observing the operation of various stations, pointing out the errors, calling attention to the good operators, etc. The club group can be asked to comment on the operators logged—to tell what was wrong with the procedure used, what it should be. Newcomers and old-timers alike will profit by these various forms of operating demonstrations.

FILM AVAILABLE

By advance request two different selections of 16 mm. movie film may be made available to any affiliated club for meeting showings. One of these films shows the functioning of the A.R.R.L. Headquarters offices. Another shows amateur station participation in the Cleveland Air Races of some years ago. Mr. A. A. Hebert, A.R.R.L. Treasurer, is custodian of the films. Requests should be addressed to him.

GET ACQUAINTED!

Clubs are excellent places to get acquainted with radio amateurs and to participate in interesting discussion on our hobby. At A.R.R.L. headquarters there are recorded the addresses of several hundred amateur radio clubs affiliated with the League, their places and times of meetings. Why not drop in at your local club and "meet the gang"? Address the Communications Manager (enclosing 3¢ stamp, please) for data on affiliated clubs in your vicinity.

TO MAINTAIN INTEREST

The Chester Radio Club (Chester, Pa.) has devised a workable scheme to assist in keeping up interest in club meetings. At each meeting one member is selected to make up some forty questions for the following meeting. These questions deal with the various phases of amateur radio. Teams are chosen by the president and vice-president and the questions placed in a box, each contestant in turn drawing his question and answering, if possible. Scores are tabulated and totalled at the end of the "question bee" to select the winning team. Questions run anywhere from "How many prongs has a 6L6?" to "What States are in the Seventh District?" And do the boys get stuck!

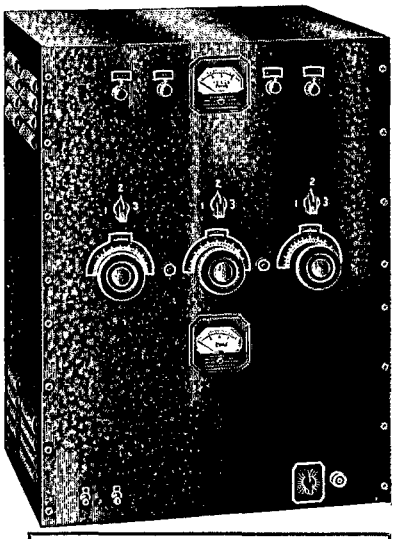
CLUB AWARD TO BE MADE

The Federation of Radio Clubs of the Southwest, A.R.R.L., is composed of affiliated member clubs of the Southwestern Division of the League. This progressive association publishes a monthly

(Continued on page 82)

BIG NEWS-GOOD NEWS for HAMS

THORDARSON 100 WATT Multi-Band TRANSMITTER



Get Yours Now on Newark's EASY TERMS

PAY ONLY $10 DOWN then a small amount on delivery, and the balance in 6, 9 or 12 months.

LOOK AT THESE BIG FEATURES

- 100 watts input on all bands.
- Power supply and R.F. section on one chassis.
- Single meter reads all plate currents as well as grid current of the final stage.
- Modulator and power supply on one chassis.
- Bands switched from front of panel.
- R.F. lineup 6L6G-6L6G TZ-40.
- Modulator lineup — 6J7, 6F5, 6F6, 2-6L6's.
- Crystal for each band.
- Band-switching feature optional, regular plug-in coils may be used.

This self-contained 100 watt Multi-Band transmitter is available in "Foundation Unit" form with complete instructions for assembly and operation. Chassis, panels and chassis brackets are supplied completely punched for easy assembly. The entire transmitter requiring but 26¼" of panel space may be mounted in any of the standard cabinets or racks available on the market. Only standard parts of nationally known manufacture and highest quality are used throughout. Both the R.F. and the modulator units are supplied complete with their own power supplies. Complete band-switching is accomplished from the front of panel. Approximate Price Complete Including Cabinet but Less Tubes and Crystals..... **$136.90**

Write for Complete Circular and Time Payment Details

Your CALL LETTERS IN GOLD . . . 10¢

Hams look at this! Your Call Letters in impressive *three dimensional style*. Big decalcomania letters nearly TWO INCHES high. Put them on your HAM SHACK door, auto window, etc. *Send dime for yours today.* Be sure to give your call letters.

FREE *Get This Big New* HAM Bargain Bulletin!

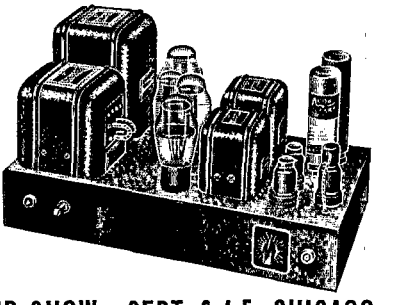
Illustrations, prices and full details on nearly 600 separate items, sets, tubes, parts and supplies! MAKE UP A $60 ORDER and Buy All the supplies you need at present low prices AND PAY ON EASY TERMS. Write for this Special Bulletin Today.

Thordarson Universal SPEECH AMPLIFIER

Total approximate price $25.58

less tubes and metal cover with regular type transformers and 500 Ohm output. Prices on C. H. T. Transformers on Request.

Designed to eliminate transmitter building troubles for the Ham. The 2A3 Output stage provides ample driving power. Chassis adaptable to rack-and-panel mounting or to conventional chassis type with metal screen cover and bottom. Supplied less panel, but with panel drawing and full instructions included. Easy terms when included in an order of $60.00 or more.



COME TO THE AMATEUR SHOW—SEPT. 3-4-5, CHICAGO

Visit our Booth and don't miss seeing Newark's HAM BARGAINS on display at our Beautiful New Store, only a few blocks from the Show!

NEWARK Electric Company

323 W. MADISON ST.
Dept. Q CHICAGO, ILL.

Scores A.R.R.L. Contest

(*Continued from page 56*)

W1FSV 192- 12- 8
W1KVB 176- 11- 8

NORTHWESTERN DIVISION

Idaho
W7FFQ 4556- 67-34
W7AYD 2214- 41-27

Oregon
W7CYU 180- 10- 9

Washington
W7GLH 9300- 93-50
W7LD 6900- 75-46
W7AKP 6512- 74-44
W7CMB 2400- 40-30
W7FZB 672- 21-16
W7WY* 108- 9- 6
W7CWN 50- 5- 5
W7APR* 2- 1- 1

PACIFIC DIVISION

Hawaii
K6CGK 855- 23-19

Santa Clara Valley
W6NCO 6390- 71-45
W6MUR 5184- 72-36
W6PBV 2378- 42-29
W6OTY 450- 15-15

East Bay
W6OCQ 784- 27-14
W6DHS 32- 4- 4
W6EJA 2- 1- 1

San Francisco
W6CIS 7304- 83-44
W6GPB 4525- 63-37
W6IPH 2580- 43-30
W6NEN 1292- 34-19
W6PFR 532- 19-14

Sacramento Valley
W6MDI 2240- 40-28
W6HIR 1728- 36-24
W6IZE 540- 18-15

San Joaquin Valley
W6EXH 240- 12-10
W6IWU 180- 10- 9

Nevada
W6UO 1518- 33-23

ROANOKE DIVISION

North Carolina
W4DWB 11880-135-44
W4ESO 384- 16-12
W4MR 300- 13-12

South Carolina
W4CZA 3720- 62-30
W4EPJ 1584- 36-22

Virginia
W3BWA 6864- 88-39
W3CFL 1276- 29-22
W3GWQ 442- 17-13

West Virginia
W8LCN 12576-131-48
W8JJA 8342- 97-43

ROCKY MOUNTAIN DIVISION

Colorado
W9TSQ 8326- 91-46
W9SBB 5265- 68-39
W9EHI 972- 27-18
W9URH 828- 23-18
W9RRS 630- 21-15
W9EHC 300- 15-10

Utah-Wyoming
W6FYR 40- 5- 4

SOUTHEASTERN DIVISION

Alabama
W4CYC 14976-144-52
W4APU 13158-130-51
W4DS 608- 19-16
W4EQC* 24- 4- 3

Eastern Florida
W4EFM 9292-101-46
W4EBP 672- 24-14

Western Florida
W4BSJ 13536-144-47
W4AXP 432- 18-12

Georgia-Cuba-etc.
W4AGI 9976-116-43
W4VX 6520- 83-40
W4ECZ 4410- 64-35

SOUTHWESTERN DIVISION

Arizona
W6KFC 19942-169-59
W6MNH 1768- 34-22
W6GBN 1134- 27-66
W6OUU 96- 8- 1

Los Angeles
W6OXQ 2668- 46-29
W6JD 160- 10- 8
W6IOX* 8- 2- 2

San Diego
W6NMZ 7216- 82-44
W6GTM 6642- 81-41
W6FQU 1152- 32-18

WEST GULF DIVISION

Northern Texas
W5FBQ 6232- 76-41
W5DXA 702- 20-18

Oklahoma
W5EGP 7600- 95-40
W5BOR 5360- 67-40
W5GVP 84- 7- 6

Southern Texas
W5FZD 8648- 97-47
W5GHI 510- 17-15

New Mexico
W5CJP 4340- 64-35

CANADA

Maritime
VE1EP 748- 22-17
VE1KY 504- 18-14
VE1JK 480- 20-12
VE1EX 300- 13-12
VE1ME 40- 5- 4

Ontario
VE3GT 13248-145-46
VE3AFW 11408-124-46
VE3ES 10890-121-45
VE3ZE 5076- 71-36
VE3AND 2394- 58-21
VE3DU 1050- 25-21
VE3SS 720- 24-15
VE3SG 552- 23-12
VE3DC 506- 23-11

Quebec
VE2DR 5880- 84-35
VE2HI 448- 16-14

Alberta
VE4GE 1044- 29-18

British Columbia
VE5QP 8096- 89-46
VE5SW 3776- 59-32
VE5UK 396- 18-11

Manitoba
VE4AHE 18- 3- 3

Saskatchewan
VE4QZ 1656- 35-24
VE4MB 1475- 30-25

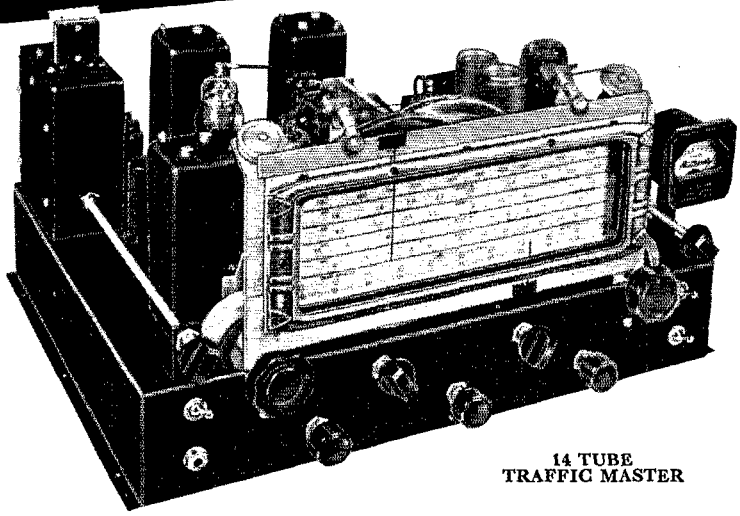
GREAT BRITAIN
G6QX 144- 9- 9

Complete Kit!
14 Tubes . . . 5 Bands

TRAFFIC MASTER

COMMUNICATIONS RECEIVER

What a radio! A 14 Tube, 5 Band Communications Receiver with electrical band spread. Major circuit improvements. Excellent sensitivity, selectivity and signal-to-noise ratio on the amateur bands.

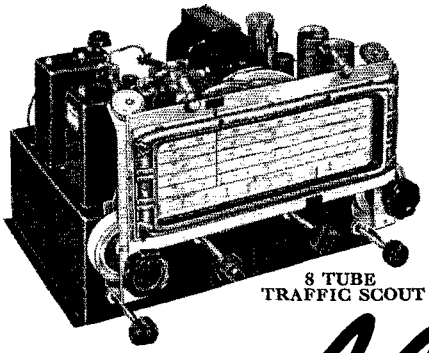


14 TUBE
TRAFFIC MASTER

The Traffic Master comes to you in complete kit form — everything included except tubes and speaker — even the solder. You will have the thrill of a lifetime building this receiver — a real TRAFFIC MASTER. Ask your PARTS JOBBER.

8 TUBE "TRAFFIC SCOUT" COMMUNICATIONS SUPER COMPLETE KIT

Meissner's great 8 tube, 5 band Communications Super with electrical band spread. The Traffic Scout has eleven desirable amateur features in addition to clarity and good performance. — A receiver kit that really delivers! You will enjoy building this one! Ask your PARTS JOBBER.



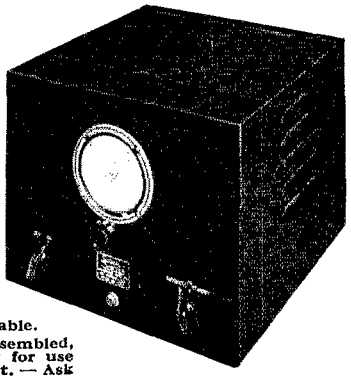
8 TUBE
TRAFFIC SCOUT

MEISSNER
SIGNAL SHIFTER

A Variable Frequency Exciter Unit for Remote Operation

Offers convenience and utility for the amateur. An electron-coupled exciter unit that has excellent frequency stability. It's variable — you can cover any amateur band right from your operating position. For remote control operation — there's plenty of excitation available.

The Signal Shifter is completely assembled, wired and adjusted. It is ready for use (except for tubes) when you buy it. — Ask your PARTS JOBBER.



Meissner

FREE! **Meissner 1938 catalog. 44 pages filled with things you need. Complete Kits! Push Button Tuners! A Complete line of parts. Get this big FREE BOOK now, while the supply lasts. See your PARTS JOBBER, or write to us — Meissner Manufacturing Co., Mt. Carmel, Illinois.**

"A FAMOUS NAME FOR TWO DECADES"

With the Affiliated Clubs

(Continued from page 78)

organ known as "73." We quote an item from the September, 1937 issue of this publication.

"The federation will award a beautiful cup which any club would be mighty proud to own. Here's a chance for any club to own this cup, it makes no difference whether your club is small or large, you have an equal chance of winning.

"This cup is offered to the club complying and securing the most points during the year 1938. It will be awarded at the 1938 Convention.

"You will find that the rules are very easy for any active club, all that is needed is a little cooperation from your club members. The rules for this contest appear below, and may the best club win! Good luck.

"(1) Club must be affiliated with A.R.R.L. (2) Club making the most progress. (3) Per cent gain in membership. (4) Outstanding activity. (5) Per cent gain in average meeting attendance. (6) Per cent A.R.R.L. membership. (7) Public relations as applied to community. (8) Operating activity of members. (9) Coöperative activities.

"To qualify for this contest complete report *must* be forwarded to the editor of '73' at once. This report must contain the following: (1) Is club affiliated with A.R.R.L.? (2) What is membership enrollment at present? (3) How many belong to A.R.R.L.? (4) What is average attendance at present?

"We might add here that this cup is a permanent award. If won by a certain club, it remains in their custody as long as the club exists. The following year another cup will be awarded."

MARCHING ALONG TOGETHER

(An editorial quoted from the *SARA News*, club paper of the Schenectady Amateur Radio Association.)

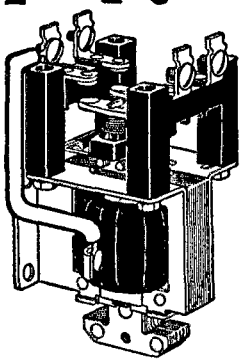
"The idea of hams forming an organization is certainly nothing new. There are dozens of hobby clubs in Schenectady that contribute greatly to making life in the community more pleasant. Incidentally, they furnish a means of interchanging skill, experience and information. Whether most hobby clubs exist or not, the hobbies can go on. But if there were no ham organizations, there would be no ham radio in a few years. It is largely through the efforts of organized hams that we have such unusual freedom of the airways in this country. Every ham, whether in the organization or not, shares in the benefits; every ham should share the responsibilities. To go forward in ham radio, we must all go forward together. . . .

"The summer will fly by quickly, but when the September meeting is called to order, let's all join again in the activities to the tune 'Marching Along Together.'"

GENERAL CLUB ACTIVITIES

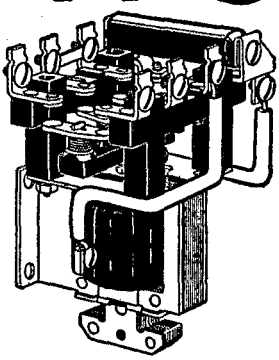
The Atlantic Radio Club (Pleasantville, N. J.) held a DX Contest for its members from November 15 to December 15, 1937; the first prize was an Eimac 35T. . . . The first issue of *HARC News*, publication of the Houston Amateur Radio

A.C. RELAYS



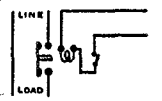
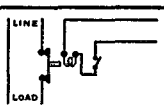
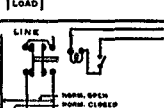
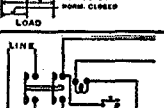
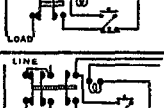
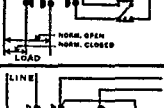
Made by

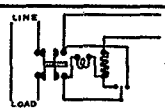
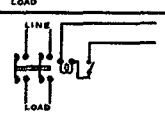
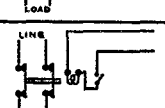
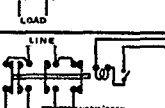
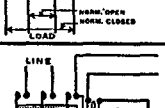
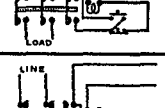
Allen-Bradley



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.

The maximum contact rating is 10 amp. at 220 v. or 3 amp. at 550 v. The relay coils are wound for 115 volts 60 cycle alternating current. Relays for other voltages can be supplied on special order. Use coupon below.

Type No.	Poles	Normally	Action	Circuit Diagram	Price Open	Price In Cab.
A107	1	Open	SP ST		$3.50	$4.50
A117	1	Closed	SP ST		4.50	5.50
A127	1	Open and Closed	SP DT		5.00	6.00
A137	1	Open	SP ST		4.00	5.00
A147	1	Closed	SP ST		5.00	6.00
A157	1	Open and Closed	SP DT		5.50	6.50
A167	1	Open	SP ST		6.50	7.50

Type No.	Poles	Normally	Action	Circuit Diagram	Price Open	Price In Cab.
A177	1	Closed	SP ST		$7.50	$8.50
A207	2	Open	DP ST		4.00	5.00
A217	2	Closed	DP ST		6.00	7.00
A227	2	Open and Closed	DP DT		7.00	8.00
A237	2	Open	DP ST		4.50	5.50
A247	2	Closed	DP ST		6.50	7.50

Radiostat—A stepless graphite compression rheostat for primary of 550 watt filament or plate supply transformer. Range 4 to 150 ohms. **Price $6.50**

ORDER BLANK—MAIL WITH REMITTANCE TO

Allen-Bradley Co., 108 W. Greenfield Ave., Milwaukee, Wis.

Enclosed find money order for $.....for which please send me, shipping charges prepaid, the following items:

.....for.....Volts.....Cycles

Name.....

Address.....

Club, indicates that this club is on its toes and going places. FB. . . . As a result of the efficient work of its program and publicity committees, the membership of the Dayton Amateur Radio Association has grown by leaps and bounds. Any society wishing a copy of the *DARA Bulletin* should get in touch with the editor, Clem E. Wolford, W8ENH, 3228 McCall St., Dayton, Ohio. . . . The Palomar Radio Club of Northern San Diego County held its Second Annual Birthday Party at La Jolla, Calif., in February. . . . The Iowa Illinois Amateur Radio Club (W9UNL) is interested in working with other clubs to encourage more 1.75-Mc. c.w. activity. To this end, the I.I.A.R.C. would consider offering several prizes in coöperation with other societies. . . . The Marietta Amateur Radio Society transmitted the progress of the Marietta-Bethany football game through its station W8KYC, in coöperation with the Bethany College Radio Club. . . . The Richmond Short Wave Club alternates meeting activities between social affairs and technical sessions. . . . The Fort Wayne Radio Club devotes one meeting per month to social activities, including interesting speakers, free prizes, free luncheon and a good old-fashioned get-together for all hams. . . . The 1937 award in the annual contest for the Burrows Cup, a contest for local amateurs under the auspices of the Victoria Short Wave Club, was made to VE5EC. Other operating activities participated in by V.S.W.C. members included operation of the club's station, VE5EZ, at the Y.M.C.A. Hobbies Fair, collaboration in a chess contest between players in Vancouver and Victoria, and operation of a station at the Y.M.C.A. annual camp. . . . One of the outstanding demonstrations at the Queen Anne High School Open House (Seattle, Wash.) was the operation of W7BPY, station of the school's Radio Club. . . . In connection with the Tercentenary Celebration of the City of New Haven, the New Haven Amateur Radio Association through its station W1GB transmitted several hundreds of invitations from the Mayor to officials in all parts of the United States and Canada. W1GB was also in operation at the exposition handling messages for the visitors. . . . The Westlake Amateur Radio Association held a very successful hamfest during February at Cleveland, Ohio. Among the guests of honor were Central Division Director Mathews, W9ZN, and E. H. Gibbs, W8AQ, Ohio S.C.M. . . . Close to 3000 hams, hamesses and friends attended the annual hamfest of the Union County Amateur Radio Association at Newark, N. J. A full program of entertainment met with much enthusiasm. . . . The South Shore Amateur Radio Club of Quincy, Mass., installed and operated a complete amateur radio station at the four-day Leisure Show held in that city during April. The station of the club's vice-president, Ed Myrbeck, W1AKY, was operated on 1.75, 3.5 and 14 Mc., 'phone and c.w. The exhibit was received most enthusiastically. . . . Over 85 members and friends of the Merrimac Valley Amateur Radio Club (Lawrence, Mass.) were guests on January 26th of the management of broadcast station WLAW. A special program dedicated to the club was broadcast at 1 A.M. on the 27th. . . . The Fourth Annual Banquet of the Nashville Amateur Radio Club, held in January, was attended by nearly 100 members and visitors. The principal speaker of the evening was Director E. Ray Arledge, W5SI, Delta Division. . . .

—*E. L. B.*

Honorable Mention Solution

(*Continued from page 38*)

nections. I then mounted the two coils side-by-side on a 6" by 11" baseboard, leaving a space between them for the condensers. Two binding posts were placed at each end for the power line and load, and one near the center for the ground wire. The unit was then mounted near the rig. The power leads from the rig were brought to the end of the filter opposite the condensers and connected. The power line from the switch was then connected to the remaining end of the filter at the condenser end.

This filter eliminated all interference except in one case in which an old receiver had to be

treated a bit differently. A low-pass filter similar to the one described in Fig. G was constructed and inserted in the antenna circuit of the receiver affected. This took care of the obstinate receiver.

My advice to those using the circuit of Fig. F is to be sure to by-pass the primaries of all power transformers with 0.01-μfd. condensers of at least 600-volt rating. The condensers should be placed close to the transformer terminals. If this is not done, r.f. from the transmitter may cause damage to the primaries.

A.R.R.L. QSL Bureau

FOR the convenience of its members, the League maintains a QSL-card forwarding system which operates through volunteer "District QSL Managers" in each of the nine United States and five Canadian districts. In order to secure such foreign cards as may be received for you, send your district manager a standard No. 10 *stamped* envelope. If you have reason to expect a considerable number of cards, put on an extra stamp so that it has a total of six-cents postage. Your own name and address go in the customary place on the face, and *your station call should be printed prominently in the upper left-hand corner.*

W1—J. T. Steiger, W1BGY, 35 Call Street, Willimansett, Mass.
W2—H. W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.
W3—R. E. Macomber, W3CZE, 418 10th St., N. W., Washington, D. C.
W4—G. W. Hoke, W4DYB, 328 Mell Ave., N. E., Atlanta, Ga.
W5—E. H. Treadaway, W5DKR, 2749 Myrtle St., New Orleans, La.
W6—Horace Greer, W6TI, 414 Fairmount Ave., Oakland, Calif.
W7—Frank E. Pratt, W7DXZ, 5023 So. Ferry St., Tacoma, Wash.
W8—F. W. Allen, W8GER, 324 Richmond Ave., Dayton, Ohio.
W9—Roy W. McCarty, W9KA, 11 South Michigan Ave., Villa Park, Ill.
VE1—J. E. Roue, VE1FB, 84 Spring Garden Rd., Halifax, N. S.
VE2—C. W. Skarstedt, VE2DR, 236 Elm Ave., Westmount, P. Q.
VE3—Bert Knowles, VE3QB, Lanark, Ont.
VE4—George Behrends, VE4RO, 186 Oakdean Blvd., St. James, Winnipeg, Manitoba.
VE5—H. R. Hough, VE5HR, 1785 First St., Victoria, B. C.
K4—F. McCown, K4RJ, Family Court 7, Santurce, Puerto Rico.
K5—Norman F. Miller, K5AF, 15th Air Base Squadron, Albrook Field, Canal Zone.
K6—James F. Pa, K6LBH, 1416D Lunalilo St., Honolulu, T. H.
K7—Dean Williams, K7ELM, Box 2373, Juneau, Alaska.
KA—George L. Rickard, KA1GR, P. O. Box 849, Manila, P. I.

Standard Frequency Transmissions

Date	Schedule	Station	Date	Schedule	Station
Aug. 5	A	W9XAN	Sept. 2	B	W6XK
	B	W6XK	Sept. 9	A	W9XAN
Aug. 12	A	W9XAN		A	W6XK
	A	W6XK	Sept. 16	BB	W6XK
Aug. 19	BB	W6XK		A	W9XAN
	A	W9XAN	Sept. 17	BX	W6XK
Aug. 20	BX	W6XK	Sept. 18	C	W6XK
Aug. 21	C	W6XK	Sept. 23	A	W6XK
Aug. 26	A	W6XK	Sept. 30	A	W9XAN
Sept. 2	A	W9XAN		B	W6XK

STANDARD FREQUENCY SCHEDULES

Time (p.m.)	Sched. and Freq. (kc.) A	B	Time (p.m.)	Sched. and Freq. (kc.) BB	C
8:00	3500	7100	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. and 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.* W9XAN uses 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 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.

W9XAN: Elgin Observatory, Elgin National Watch Company, Elgin, Ill., Frank D. Urie in charge.

W6XK: Don Lee Broadcasting System, Los Angeles, Calif., Frank M. Kennedy in charge.

WWV Schedules

EACH Tuesday, Wednesday and Friday (except legal holidays), the National Bureau of Standards station, WWV, transmits with a power of 20 kw. on three carrier frequencies as follows: 10:00 to 11:30 A.M., E.S.T., on 5000 kc.; noon to 1:30 P.M., E.S.T., on 10,000 kc.; 2:00 to 3:30 P.M., E.S.T., on 20,000 kc. The Tuesday and Friday transmissions are unmodulated c.w. except for 1-second standard-time intervals consisting of short pulses with 1000-cycle modulation. On the Wednesday transmissions, the carrier is modulated 30% with a standard audio frequency of 1000 c.p.s. The standard musical pitch A = 440

Where to buy it

A directory of suppliers who carry in stock the products of these dependable manufacturers.

ALBANY, N. Y. Uncle Dave's Radio Shack 356 Broadway

BOSTON, MASS. Radio Shack 46 Brattle Street

BOSTON, MASS. 110 Federal Street
Wholesale Radio Service Company, Inc.

BRONX, N. Y. 542 East Fordham Rd.
Wholesale Radio Service Company, Inc.

HARTFORD, CONNECTICUT 227 Asylum Street
Radio Inspection Service Company

JAMAICA, L. I. 90-08 166th Street
Wholesale Radio Service Company, Inc.

NEWARK, N. J. 219 Central Ave.
Wholesale Radio Service Co., Inc.

NEW YORK, N. Y. Gross Radio, Inc. 51 Vesey St.

NEW YORK, N. Y. Harrison Radio Co. 12 West Broadway

NEW YORK, N. Y. 100 Sixth Ave.
Wholesale Radio Service Co., Inc.

NEW YORK, N. Y. Terminal Radio Corp. 80 Cortlandt Street

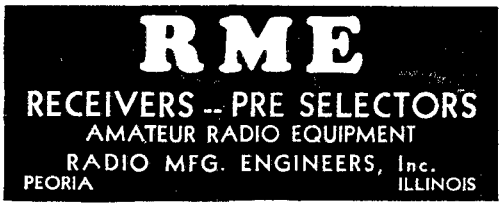
POTTSVILLE, PENN. E. Norwegian & George Sts.
Jones Radio Company

READING, PENN. 404 Walnut St.
George D. Barbey Company

READING, PENN. 104 North Ninth Street
Jones Radio Company

SPRINGFIELD, MASS. T. F. Cushing 349 Worthington St.

WASHINGTON, D. C. 938 F Street, N. W.
Sun Radio & Service Supply Co.



ALBANY, NEW YORK 356 Broadway
Uncle Dave's Radio Shack

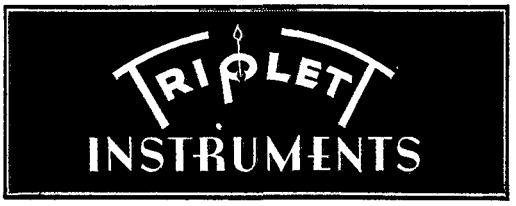
BINGHAMTON, NEW YORK 25-27 Sturges Street
Radio Testing Station

CONCORD, NEW HAMPSHIRE Rear, 80 N. State Street
Evans Radio

HARTFORD, CONNECTICUT 210 Chapel Street
Stern Wholesale Parts Company

NEW YORK, N. Y. Harrison Radio Co. 12 West Broadway

NEW YORK, N. Y. Terminal Radio Corp. 80 Cortlandt Street



ALBANY, N. Y. Uncle Dave's Radio Shack 356 Broadway

BOSTON, MASS. Radio Shack 46 Brattle Street

BOSTON, MASS. 110 Federal Street
Wholesale Radio Service Company, Inc.

BRONX, N. Y. 542 East Fordham Rd.
Wholesale Radio Service Company, Inc.

JAMAICA, L. I. 90-08 166th Street
Wholesale Radio Service Company, Inc.

MONTREAL, CANADA 285 Craig Street, West
Canadian Electrical Supply Co., Ltd.

NEWARK, N. J. 219 Central Ave.
Wholesale Radio Service Company

NEW YORK, N. Y. 100 Sixth Avenue
Wholesale Radio Service Company

NEW YORK, N. Y. Leeds Radio 45 Vesey St.

POTTSVILLE, PENN. E. Norwegian & George Sts.
Jones Radio Company

READING, PENN. George D. Barbey Co. 404 Walnut Street

READING, PENN. 104 North Ninth St.
Jones Radio Company

WASHINGTON, D. C. 938 F Street, N. W.
Sun Radio & Service Supply Co.

c.p.s. is also transmitted from 4:00 P.M. to 2:00 A.M., E.S.T., daily except Saturdays and Sundays, on a carrier frequency of 5000 kc., power 1 kw., 100% modulation. The accuracy of the frequencies of the WWV transmissions is better than 1 part in 5,000,000.

New World Globe

AMATEURS in general, and DX men in particular, will be interested to know that Rand McNally of New York, Chicago and San Francisco is now producing a world globe which may be quickly adjusted to supply all of the vital information as to great-circle bearing, distance, difference in time and conditions of daylight and darkness between any points upon the surface of the earth.

It has been designed with the requirements of radio and aviation particularly in mind. Instead of the usual arrangement in which the globe rotates on a fixed axis through the poles, this globe rests upon a cup-shaped base so that it may be set in any desired position. The globe is equipped with a fixed vertical ring and a second ring which may be rotated at right angles to the first. This second ring is divided in half and each half may be adjusted independently of the other. Both vertical and adjustable rings are calibrated in degrees while the adjustable ring also has a scale of miles and a time scale.

By centering the home location and lining it up with one of the poles and adjusting the movable ring, the great-circle bearing and distance for any other point on the globe may be determined quickly. The twelve-inch diameter globe is of good quality. The base and metal rings are finished in an attractive bronze finish.

—*D. H. M.*

New Hampshire State Convention

(New England Division)

Where: At Manchester, N. H.
When: Saturday, September 17th.
At Hotel Carpenter.

More information may be obtained from Carl B. Evans, SCM, 80 North State Street, Concord, N. H.

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.
(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.
(3) The Ham-Ad rate is 15c per word, except as noted in paragraph (6) below.
(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.
(5) Closing date for Ham-Ads is the 25th of the second month preceding publication date.
(6) A special rate of 7c per word will apply to advertising which, in our judgment, is obviously non-commercial in nature and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League takes the 7c rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 15c rate. Provisions of paragraphs (1), (2), (4) and (5) apply to all advertising in this column regardless of which rate may apply.

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.

QUARTZ—direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 719 World Bldg., New York City.

RADIO engineering, broadcasting, aviation and police radio, servicing, marine and Morse telegraphy taught thoroughly. All expenses low. Catalog free. Dodge's Institute, Byrd St., Valparaiso, Ind.

QSL'S, W2SN, Helmetta, N. J.

USED receivers. Bargains. Cash only. No trades. Price list 3¢. W3DQ, Wilmington, Del.

QSL'S, all colors, cartoons, snappy service. Write for free samples today. W1BEF, 16 Stockbridge Ave., Lowell, Mass.

CALLBOOKS—Summer edition now on sale containing complete up-to-date list of radio hams throughout entire world. Also world prefix map, press schedules and new time conversion chart. Single copies $1.25. Canada and foreign $1.35. Radio Amateur Call Book, 610 S. Dearborn, Chicago.

QSL'S. Cuts. Cartoons. Free samples. Theodore Porcher, 7708 Navahoe, Philadelphia, Penn.

1000's Y-cut crystals, 75¢. Networks spot frequencies, $1. Free catalog. Faberadio, Batavia, Ill.

QSL—SWL bargains. Fritz, 455 Mason, Joliet, Ill.

ANTENNAS. 102 pages antenna dope. Practical, understandable. Many arrays, directives, multibands. Complete tables eliminate calculations. Radio Antenna Handbook, continental U. S. A., 75¢; elsewhere, 85¢. Radio, 7460 Beverly, Los Angeles.

QSL'S. Free samples. Printer, Corwith, Iowa.

CRYSTALS, mounted, 80–160 $1.25, V-cut 40 $2.25. R9 Crystals, 338 Murray Ave., Arnold, Pa.

QSL'S—highest quality—lowest prices. Radio Headquarters, Ft. Wayne, Ind.

CRYSTALS: X-cut, 80–160 ± five kilocycles, $1.50; spot frequency, $2.50. Special prices to Army, Navy, Red Cross and other round table nets. Three small, 80 meter blanks, including carborundum, $1.20. Holders, $1. William Threm, W8FN, 3071 Moosewood St., Cincinnati, Ohio.

QSL'S, SWL's. 100—3 color—75¢. Lapco, 344 W. 39th, Indianapolis, Ind.

AMATEUR radio licenses, home study course in code and theory—reasonable, efficient, and thorough. Results guaranteed. American Radio Institute, 1430 N. Dearborn Parkway, Chicago, Ill.

1000 watt G.E. transformers 1100–2200–4400 volts each side c.t. Guaranteed. $13.50. Dawson, 5740 Woodrow, Detroit, Mich.

SELL: Pair of RK-36, slightly used, perfect, 5 volt 20 amp. filament transformer. Best cash offer takes them. William Dean, Columbia, Tenn.

BLILEY crystals. W8DED.

QSL'S, world's finest. Samples (stamp). W8DED, Holland, Mich.

TRADE radio course for transceiver. Want Rider's Manuals, modern servicing instruments. Virgil Coleman, Gid, Ark.

DOUGLAS modulation transformers. Match all tubes. More audio per dollar, 50 watts, $4.95 pair; 100 watts, $7.75 pair. Postpaid in U. S. Guaranteed. For details write W9IXR, Rice Lake, Wis.

WANTED: good used DB20. W3FHY.

SELLING out. Send for list. W9IFZ.

GROSS c.w. 25 transmitter, Gross power supply, 40–80 meter coils, xtal, tubes, $22.50. W5DMA, Trent, Texas.

MODERN QSL's, samples. W8BZK, Newark, Ohio.

NEW surplus government radio equipment. Real bargains—price list 3¢. Minch & Lyons, 2711 Virginia Court, Ft. Worth, Texas.

86 consecutive *QST's* to date, $12.50 c.o.d. Wencil Kopecky, 1502 K St., Cedar Rapids, Iowa.

TRADE National 100-X or 81-X receiver for miniature camera, enlarger. Frank Ridgway, Peru, Ind.

FBXA—complete with speaker, $35. Turchin, 742 E. 176 St., N. Y. C.

SELL: pair RK20As, slightly used, guaranteed perfect, $18. W4CRO, Box 339, N. Miami, Fla.

FEATURING Meissner signal shifters. Write—Loughnane & Co., Decatur, Ill.

TELEPLEXES, instructographs, omnigraphs, vibroplexes bought, sold. Ryan's, Monroe City, Mo.

QSL'S. Finest at lowest prices. Samples. Maleco, 1805 St. Johns Place, Brooklyn, N. Y.

ANALYZER, tube tester—Supreme 385 automatic, Hickok OS-10 radio-audio oscillator, 5 meter portable fone transmitter, receiver, All Star, senior receiver, complete parts for 150 watt, 20–160 fone transmitter. All perfect—send for list. W2IBK.

NEW. Cartoon and individually designed QSL's drawn to your specifications at an unbelievable price: $1. per hundred. Our samples will convince you. W8HTH, 216 Superior Bldg., Cleveland, Ohio.

NATIONAL NC80X, practically new, guaranteed perfect condition, with S meter; first $60. takes it. Holton Harris, 1026 Erie St., Shreveport, La.

STAMP for list. Detroit hams look it over. W8GWA.

SELL: 6L6G, T20s, 100TH rig, 400 watts, $65. New 7 metal tube receiver, $35. W2IUW.

DEFINITELY controlled angle of radiation. Tilting head rotary feeds thru bearing, worm gear motor driven. W8ML.

QSL'S, SWL's: one color 45¢, two color 60¢ hundred, postpaid. Samples. W1FTM, 268 Piedmont, Waterbury, Conn.

SELL or trade. Best offer takes Gen-E-Motor, 32 volts d.c. to 110 a.c. W9GKH, Milledgeville, Ill.

SKY Challenger II crystal, speaker, Brush headphones. Must sacrifice at $70. H. Peterson, 3526 S. 52 Ave., Cicero, Ill.

HIGH power factory-built plate transformer, 3½ k.v.a. 3300–2400–1750 each side, 110–220 primary. Trade for service manuals or 25 bucks. W9DEX, 404 N. Pinet, Jefferson, Iowa.

SACRIFICE half kilowatt d.c. motor—500 cycle generator set. 4 kw. transformer 2000 to 4000 each side center. Variable. W2BOX.

TUBE, condenser tester. Ohmmeter. Dependable 305C. Tests latest tubes. Cost $22. Offer? W2HTZ.

FILAMENT and plate transformers up to 1½ kw. built to order. All work absolutely guaranteed. R. Laurenson, 812 Coal, Wilkinsburg, Penn.

SELL National 81X receiver complete with cabinet, speaker, $70. Perfect condition. Owner in hospital. c/o W3CGU.

CRYSTALS: there is no substitute for dependable crystal control, Eidson T9 crystals give you this dependability with economy. Fully guaranteed, high activity type X-cut: 40 and 80 meter bands, $1.60; T9 ceramic holders, $1.10. Prices postpaid, c.o.d.'s accepted. Commercial crystal users inquire prices. Sold by: Frank Anzalone, 1540 Broadway, Room 1502, N. Y. C.; Henry Radio Shop, Butler, Mo.; The Hargis Co., Austin, Texas; Van Radio, 464 E. 117th, No. 7, Cleveland, Ohio; Southwest Radio Supply, Dallas, Texas; Pembleton Labs., Ft. Wayne, Ind.; Casa Edison, Havana, Cuba; Radio Atlas, Tampico, Mexico; or Eidson's, Temple, Texas.

SELL: transmitter complete—commercially designed and built, fully described in March *QST*, operating at present in the 20 meter band. Sacrifice for $1,750. W9AXH.

SELL: Comet Pro, xtal AVC model, tubes, speaker, 8 to 550 meters. Excellent condition. First $50. takes it. W9ARH, Box 487, Milan, Mo.

LISTEN for W9XA, high frequency broadcast station, Kansas City, Mo.

FREE air mail service. Guaranteed crystals 160–80M AT and 40M X, $1.95; 40M AT, $2.75; loloss mounting, $1. State frequency desired. Commercial crystals quoted. C.O.D.'s accepted. C-W Mfg. Co., 1170 Esperanza St., Los Angeles.

FOR sale: new National 81-X receiver complete, $80. W4AGH.

SELL: 3000/4000 c.t. 1 k.v.a. Thordarson, $12.; 500 v. .2 amp. Westinghouse MG set, $12.; Johnson 350DD70, $7., 100D90, $4.50, 50C130, $4. condensers; 2 Johnson 636 plug-in inductors, $4.; 204-A (50 hrs.), $25.; new PA-111 UTC transformer, $7.50; new Eimac RX-21, $6. W9AXH.

BARGAINS: reconditioned guaranteed receivers shipped on ten day trial. Practically all models at big savings. List free. Write Bob Henry, W9ARA, Butler, Mo.

BRAND new in factory sealed cartons: Sky Chiefs, $29; Ultra-Skyriders, $69.; Mac-Bugs, $5.95, ACT-20 transmitter at big discount. W9ARA.

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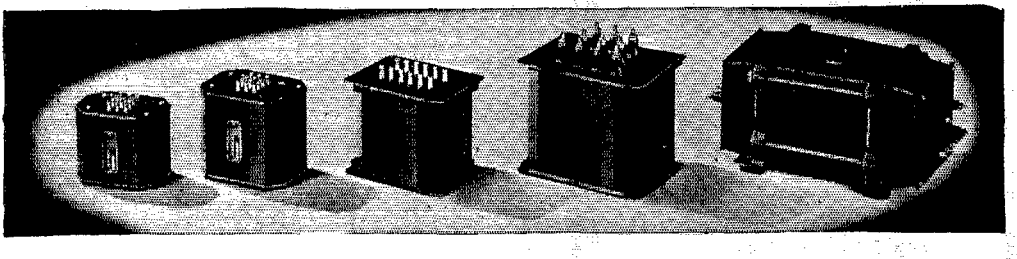

THE VARIMATCH TRANSFORMER NEVER BECOMES OBSOLETE

ALL UTC transformers are designed for maximum flexibility. The Varimatch series are noteworthy in that they will match any audio tubes to any RF tubes within their output rating, eliminating the possibility of obsolescence as new tubes are announced. All you have to decide is the DC input to your RF stage. Then just pick the VARIMATCH output transformer that will handle the maximum audio power required. These transformers will also match the line impedance output of PA or similar amplifiers direct to the Class C tubes. ALL VARIMATCH outputs matching RF stages will carry DC in the secondary.

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UTC VARIMATCH Modulation Transformers Will Match ANY Modulator Tubes to ANY RF Load . . .

VM-0 Maximum audio output 20 watts..... **$3.00**
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VM-2 Maximum audio output 60 watts..... **$7.50**
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Varimatch Input Transformers will take care of practically every driver requirement.

PA-50AX Single 89, 53, 56, 6C5, etc. to class B 53, 6A6, 89, etc..... **$3.30**

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PA-52AX Push Pull 45, 59, 2A3, etc. to class B 46, 49, 841, etc..... **$3.90**

PA-53AX Push Pull 45, 59, 2A3, 6L6, etc. to class B 210, 801, 800, 35T, RK-18, 203A, ZB-120, etc..... **$4.50**

PA-59AX 500 ohms line to 805, 838, 203A, 210, 800, ZB-120, etc..... **$4.50**

PA-238AX Push Pull Parallel 45, 2A3, 6L6, etc. to push pull parallel 838, 203A, ZB-120, or to class B 204A, HF-300, 849, etc., **$10.50**

PA-512 500 ohms line to class B, 150T, HF-300, 204A, etc. **$12.00**

VARITRAN

VOLTAGE CONTROL UNITS

REG. U. S. PATENT OFFICE

The UTC VARITRAN makes possible continuously variable output voltage, using a sliding contact riding over the turns of an auto-transformer.

Standard units are designed for 115 volts input, 0–130 volts continuously variable output.

FEATURES	APPLICATIONS
★ Smooth control	★ Motor control
★ High efficiency	★ Heat control
★ Excellent regulation	★ Rectifier control
★ Low cost	★ Light control
	★ Line voltage control

Model V-1. 570 Watts — 5 amp. maximum rating, complete with cord, plug and switch, net..... **$10.00**

Model V-2. Same as V-1, but uncased, with terminal strip for rack or panel mounting, net..... **$9.00**

Model V-3. 850 watts maximum rating, 7.5 amps., uncased, with terminal board and provisions for mounting, net..... **$14.00**

Model V-4. 1250 watts — 11 amps. maximum rating, uncased, net..... **$20.00**

Model V-5. 2000 watts maximum rating, 17.5 amps., uncased, net..... **$32.00**

Other sizes

Automatic VARITRANS are available to maintain line voltage constant. Details and prices on request.

Licensed under U. S. Patent No. 2009013

ALL PRICES SHOWN ARE NET TO AMATEURS

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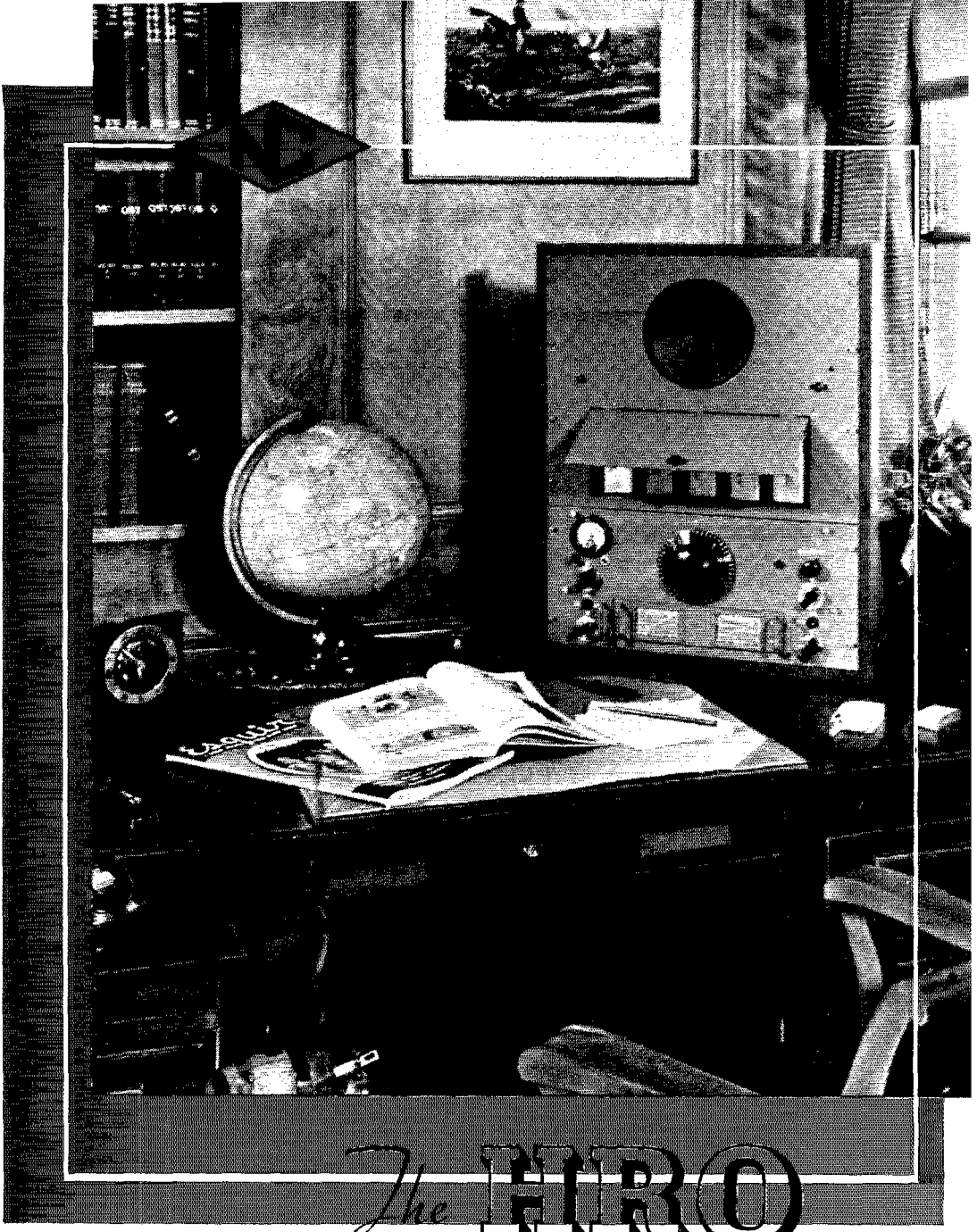
RUMFORD CONCORD



The HRO

THIS pleasing HRO combination comes in two choices of finishes, either rich grey (as shown) or black leatherette. Net amateur prices are: HRO receiver, relay rack type, with coils covering 1.7 to 30 megacycles — $192.00; combination panel containing matched speaker, spare coil cabinet and power supply, type SPC — $54; table-model relay rack type MRR — $13.50.

NATIONAL COMPANY

New RCA Beam Power Tube Provides 130 WATTS OUTPUT* with 1.5 Watts Driving Power

$17

Note these money saving features

1. **YOU SAVE** because beam power construction for high power sensitivity makes possible use of low-priced tubes in the exciter.
2. **YOU SAVE** because neutralization is not required with well-shielded circuits—thus eliminating expensive neutralizing condenser.
3. **YOU SAVE** in terms of antenna watts per dollar because of high power output with high efficiency.
4. **YOU SAVE** because rugged RCA construction provides long, trouble-free life.
5. **YOU GAIN** flexibility for band-switching transmitters because of full power input to 30 megacycles.

Since the announcement of the RCA 814 several months ago, hundreds of amateurs and experimenters who require moderately high power have reported that this tube provides the utmost in circuit efficiency. The RCA 814, shown in actual size on this page, is a husky tetrode using electron beam principle and is designed for use as an r-f amplifier, frequency multiplier, oscillator, and plate-modulated amplifier. Low interelectrode capacitances and excellent insulation are assured because plate connection is made through a separate seal at the top of the bulb and is thoroughly isolated by the screen and shield structure. (*For Class "C" telegraphy conditions)

RCA presents the Magic Key every Sunday, 2 to 3 P. M., E.D.S.T. on the NBC Blue Network

Ask your distributor for your copy of RCA TT-100 Bulletin just published, for complete list of features that will appeal to the discriminating amateur.

Max. Ratings— Class "C" Telegraphy

DC Plate Voltage, 1250 volts
DC Screen Volts, 300 volts
DC Grid Voltage, minus 300 volts
DC Plate Current, 150 MA.
Plate Input, 180 watts
Plate Dissipation, 50 watts
Filament Voltage, 10 volts
Filament Current, 3.25 amperes

RCA Radio Tubes

FIRST IN METAL
FOREMOST IN GLASS
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