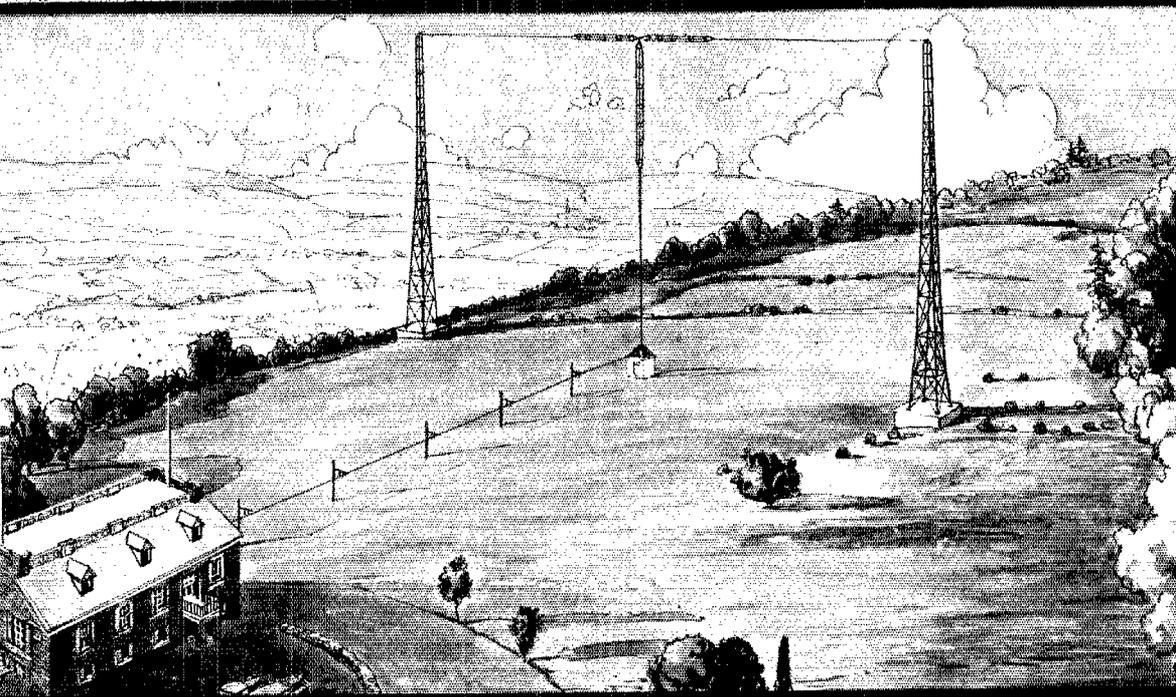


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In This Issue

OCTOBER, 1929

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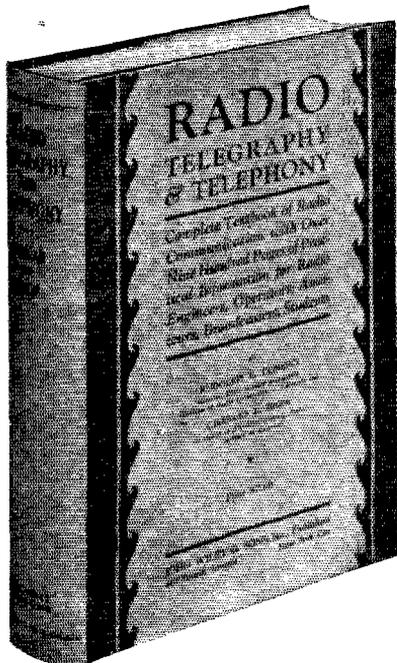
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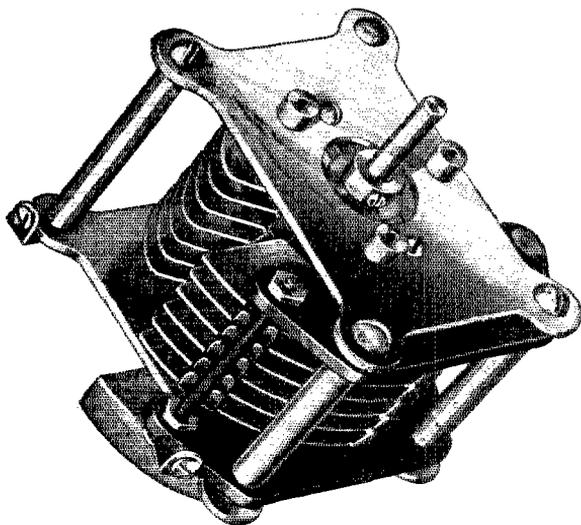
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QST



The Official Organ of the A.R.R.L.

VOLUME XIII

OCTOBER, 1929

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The American Radio Relay League

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

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

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

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

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EDITORIALS

AN editor is a funny fellow. He is likely to get to thinking of the successive issues of his magazine as installments of a continued story, as chapters in a chronicle in which there should be no duplication. Once a story is told it is part of the record, in black and white for all to see, he thinks, and it would be improper to tell it over. Sometimes he overlooks the fact that people forget about a thing, howsoever definitely recorded, and really need to hear about it again. Then he wakes up and tells the story again, for the folks who have forgotten or for those who never heard it straight.

It seems that some such repetition ought now to be given the story of the events at the International Radiotelegraph Conference two years ago and the resulting "Washington Convention of 1927." The facts are foggy, the details get twisted, the implication of things is not clear. The story needs reviewing.

Radio is an international matter because signals carry into other countries and there are conflicts between nations. International conferences are the only way to settle such things, and there have been several such conferences. Back in 1912 there was one in London which was the origin of all the old references to the "London Convention" which used to occur in our license exams. It was agreed that such conferences would be held every five years, but then came the war and its aftermath of uncertainties and confusion, so that it was the fall of 1927, fifteen years later, when finally the representatives of the different nations met, at Washington. There had been extensive preparation, formal proposals published in advance, much study. Several hundred delegates, representing about eighty governments and separate colonies, were in session for nearly eight weeks. It was the biggest international conference of governments ever held in the world's history, the longest, the most complex. In it amateur radio appeared on the official international horizon for the first time.

Internationally, amateurs as a class had no existence whatever prior to the Washington Convention. Internationally they had no rights. The London Convention was signed before it was dreamed that amateurs would ever work internationally or, for that matter, out of their back yards. Every nation was free to permit amateurs to work nationally if it wished, for the treaty dealt only with international matters.

High-frequency communication, we must remember, has been developed only since the war. The United States and some other countries had encouraged amateurs and had provided liberally for them in domestic regulations. But the United States was party to the principle that stations which could produce interference by being heard in another country should be subject to international treaties that regulated them. So here we were, in existence, wisely fostered by our own Government, but only a young mushroom that had come into the international picture since the last world-wide pow-wow, and, internationally speaking, with zero status, recognition and frequency assignments. That was why this conference was so all-fired important. If it had voted that there should be no amateurs at all, so far as concerns international communicating, our Government would have had to choose between chucking the whole treaty just on our account or of cutting off our heads whether it wanted to or not. Let it be said here that the preponderant sentiment in the conference was to do just that. The United States could work for us, and work for us it did, but we entered upon that conference without status, as a group who in this country were favorably regarded by a Government who wished for us an international recognition we had never had.

Radio is world-wide and this country alone no longer says what shall go on. There isn't an amateur outside of North America who isn't tickled pink with that 1927 conference. They got more than they had before. We, protégés of a benevolent government that had complete power to run us off the map any time we proved ourselves infernal nuisances, came out of the conference with half our shirt gone. That is, we had "lost," so far as getting international recognition for it was concerned, much that our Government had tentatively given us United States amateurs pending the holding of this international meeting. Had our frequency bands been only national in their effect, like our 1919 frequencies, we could have held them without doubt, for they would not have been an international concern. But short waves are international in effect and must be the subject of an international agreement. Unfortunately for our nice 1928 assignments, other nations had it in their power, by refusal to agree, to prevent us from continuing in the enjoyment of the same — and they did exactly

that, because they were not strong for amateurs. Radio is world-wide and so the United States was but one nation out of many. It did its best for us but it had to agree that the conference had the right to settle what classes of radio users could use what frequencies. Regardless of how strong our Government is for us do you think that, after eight weeks of man-killing work, with reasonable compromises finally effected, they were going to kick over the traces and abandon the whole show, with its hundreds of definite advantages to them, because they couldn't get other nations to agree to what they had done in the past for amateurs? Call us sacrificed if you want to — although no radio interest in all the history of that glorious art ever had such whole-hearted and persuasive backing as the United States delegates gave amateur radio at that conference. But that is how international conferences go — you fight like anything to convert folks to what you want but, when all is said and done and the vote is taken, you take your medicine like a man. Majority votes are what do the business at such affairs.

There isn't any question about who represented amateur radio at that conference. The spokesman for amateur radio was the Government of the United States and it said everything that could be said, said it well, said it persuasively. We were simply chock against the hard fact that this question was an international one and that if our Government wasn't to play a lone hand against the whole world in the great radio game, it had to abide by the international vote.

Is it worth nothing that after fifteen years of indeterminate status, during which no man could say whether anything would survive, we have today international rights and a status under which amateur radio is progressing? Is there anyone who wishes to deny *QST's* statement that the privileges accorded international amateur radio today are at least sufficient to give a reasonably happy existence?

We amateurs maintain an American Radio Relay League partly for the purpose of looking after our rights as amateurs. That League is constantly on the job doing just that, and doing the best job that is humanly possible in every case. No, we do not always publish in *QST* all the detailed decisions of our Board, of the very frequent meetings of our Executive Committee, of the constant negotiations of Headquarters. *QST* goes everywhere and it wouldn't be wise; frequently it would embarrass matters under way. The League regrets that sometimes misconceptions arise because members fall to wondering about something that is not fully explained in the current *QST*, but it sees no way to overcome that situation now. A very, very great deal of A.R.R.L. work never gets written up. For every change in amateur regulations that you hear about, there are hundreds of proposals considered

and talked to death, hundreds of defenses made against sudden dangers. How many of you know, for example, that in the past four months our secretary has been sent to Washington ten times to look after our business there? Or that our Board of Directors is sending him to Europe in September because there is an international technical conference then at which it seems we ought to be represented to protect our interests? Or that our vice-president devotes almost his entire time to keeping abreast of radio legislation and regulation on behalf of amateur radio? The membership never hears of these things. It has a right to expect that they will be taken care of automatically. That's why we have a League.

Our A.R.R.L. is spending about \$175,000 a year in maintaining, perfecting and advancing the position of amateur radio in this country. It has a staff of two dozen people at Hartford working exclusively in the interests of the members of A.R.R.L. Since the war this organization of which you, as a member, are part owner — *your* League — has expended nearly two million dollars in carrying on amateur activities and in doing the best job in protection of the rights of amateurs that can be devised by your own elected representatives — the Board of Directors. For an institution devoted to a hobby, A.R.R.L. is a huge one. "Of, by and for the amateur, it numbers within its ranks practically every worthwhile amateur in the country and has a history of glorious achievement as the standard-bearer in amateur affairs."

K. B. W.

A.R.R.L. Standard Frequency Transmissions

NOVEMBER

FOR the benefit of foreign A.R.R.L. members who receive *QST* late, the following tentative Standard Frequency Schedule for the month of November is given. The times of transmission and the frequencies for schedules specified will be found on page 38 of the September issue of *QST*.

Date	Schedule	Station
November 1, Friday,	A	W1XV-W1AXV
" 3, Sunday,	CD	W9XL-W9WI
" 8, Friday,	BB	W1XV-W1AXV
" 8, Friday,	AB	W9XL-W9WI
" 15, Friday,	B	W1XV-W1AXV
" 22, Friday,	AB	W9XL-W9WI
" 24, Sunday,	C	W1XV-W1AXV

Strays

W5IQ lives on Battery Street. He should get a nice 1929 d.c. note from his location.

— W9FO.

WTIC

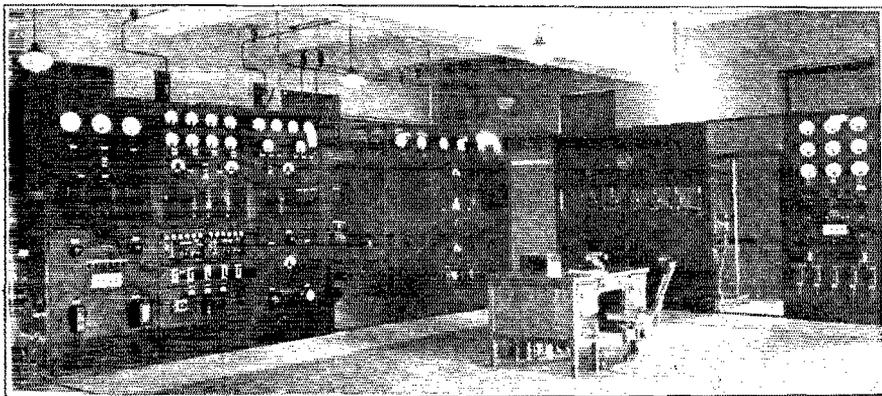
A Modern 50-kw. Broadcast Station

We acknowledge the friendly cooperation given by Mr. Walter G. Cowles of the Travelers Broadcasting Service and his technical staff in the preparation of this article. — EDITOR.

By James J. Lamb, Technical Editor

ALTHOUGH most of us are more or less familiar with the generalities of design of modern amateur and commercial radio transmitters, few of us realize that the amateur and commercial fields have so much in common and that the present trend in amateur technical development is paralleling closely the progress in commercial design and practice. Attainment of that frequency stability,

broadcast transmitter is rated in kilowatts while the amateur is restricted to watts, the modern high-power broadcast transmitter contains numerous features of design which can be applied profitably in amateur practice. *QST* presents WTIC's new 50-kw. transmitter, therefore, not only because it marks a milestone in modern radio development but also because it contains so many features whose application can be of



THE 50-KW. TRANSMITTER AT WTIC

Everything is within view of the operator. The transmitter proper comprises the panels forming the left side of the right-angle. The rectifier and power-control panel are on the right. The panel at the extreme left carries the UX-866 rectifier units for the crystal-oscillator-amplifier, buffer amplifier, modulated amplifier and modulator on the panel at its right. The 5-kw. amplifier is at the left of the open gate and the 50-kw. stage is at its right. The box on the operator's desk contains the push-button control for the entire transmitter.

maximum distortionless modulation, and reliable transmission considered desirable in amateur radio of today, becomes an absolute necessity in contemporaneous highly-competitive commercial broadcasting. It is not surprising, therefore, to find that the modern commercial transmitter not only contains those features which characterize modern amateur transmitter design but in addition utilizes them to a much greater degree in obtaining that type of performance which we amateurs are finding desirable and which broadcasters are finding necessary. Although the modern commercial designer considers frequency shift in terms of tens-of-cycles-per-second while the amateur thinks in hundreds, and the modern

inestimable value to the further development of amateur transmitter technique.

WTIC'S LOCATION

When one goes about choosing the site for a radio station representing the investment of some hundreds of thousands of dollars, he does not pick the first likely looking spot he comes upon and build his station there. Few indeed are the amateurs who have even the opportunity of choosing the location of their station, let alone determining whether or not it is the Will-o'-the-Wisp "good location" dreamed of. In the selection of the site for WTIC's transmitter lucky chance in choosing a location was not resorted to.

the arctic ice when I spotted an area to the right that was a little bluer than the rest and which might have been the ice of Smith's Bay, an arm of the Arctic Ocean. About ten minutes later we saw the plane ahead turn to the left and start down, so we guessed they must have seen something.



We followed. Soon two black spots appeared on the horizon, which, as we came closer, proved to be the two halves of the village of Barrow, situated as they are about a half mile apart on opposite sides of a lagoon. The plane ahead went right down and landed, but we circled the village once, real low, to let the people know we had arrived.

This was unnecessary. Eskimos swarmed out of igloos like ants out of hills. All came running; men, women, kids, dogs, even one old codger on crutches, to the place where the other plane had landed. We landed, taxied up alongside, and stopped. All crowded around excitedly jabbering Eskimo at us and all insisted on shaking hands. Eskimos are great at shaking hands, we afterwards learned. They shake hands with all strangers from the new-born babies to the corpses. The Eskimos all helped take our stuff up to the trading post where we made the acquaintance of Mr. Fred Hopson, the mayor, and the rest of the white populace, all very congenial people.

That night we rigged up the hand generator and the Barrow transmitter temporarily so we could let Hemrich know we had arrived OK. One wire up the flagpole and another to a shovel handle stuck in a snowbank constituted the antenna system. First thing heard was KFZH calling us and we immediately "clicked him", sent him some press, and gave him the dope.

Next came preparations for the long hop over the arctic ice. I was to stay at Barrow and listen for the signals from the plane, transmitted automatically every half hour during its flight over the arctic ice pack. The crystal controlled set on the plane was the one used last year, built by Mr. Hanson of NKF, and pictured in the June, 1926, QST. This time it was powered by a hand gen-

erator having a device geared to it to send two-letter signals automatically, when cranked. It was an ideal unit for our purpose.

There ensued at Barrow a period of beautiful weather—though cold of course. Test flights were made and preparations hurried so the long flight could be started while the weather was yet good.

One fine morning, (it was 42 below zero—I remember it!) Capt. Wilkins and Ben Eielson climbed into the DN-2 and after taxiing the length of the lagoon with the heavy load of gas for the long flight, took off and headed northward. They were soon lost to sight but the "OK" signal, cranked out on the hand generator, came through fine every half hour telling us that they were still going. That is, for the first two hours. Then signals became weaker. It gave me a rather sinking feeling, because I knew the old set was not kicking out like it should and that with them putting 100 miles between us every hour we would soon lose their signals altogether, which we did. It was only weeks afterwards that Wilkins told me why. Whenever he would crank the hand generator, the heat liberated from his body would cause hoarfrost to form on all metal work in the little cabin, including the radio set—it was that cold. As long as he would sit still there would be no frost. Rather an unusual excuse for a radio set not working, but true.

Along in the afternoon it clouded up quite suddenly and by evening there was a howl-



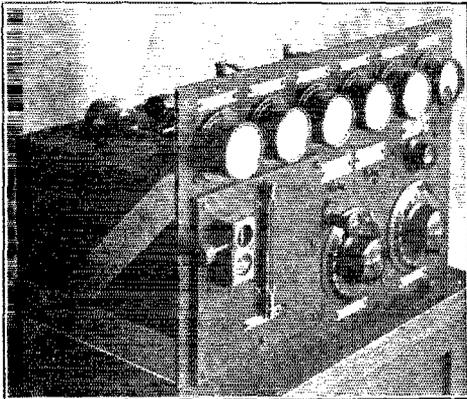
THE DN-2 NOSING AROUND A CORNER OF THE TRADING POST

ing gale and blizzard blowing. The worst storm of the season. We at Barrow hoped for the best, and hoped the DN-2 had completed its long flight and had at least reached the coast on its return before running into the storm. But with no radio signals after two days, and the storm continuing unabated, things looked serious. Schedules were forgotten and almost continuous listening instituted.

Then, the next afternoon, some dashes were heard right on the plane's wavelength which told us that they had weathered the

as of such a frequency at a given temperature but the calibration is for the unit as a whole, amplifier included. This in itself is an unusual feature and not in accordance with general practice. The practicability of the arrangement is obvious, however, since the units are in duplicate and in event of failure of one unit due to fracture of the crystal or anything else destroying the accuracy of calibration, the other can be immediately switched in its place and the defective unit shipped back to the laboratory for repair and recalibration. By this practice there is no chance of the frequency of a crystal as specified by the laboratory being affected by association with circuits or loads at variance with those for which it was calibrated. While such precautions as to frequency calibration and maintenance are by no means necessary in amateur radio, they are of prime importance in services requiring close adherence of assigned frequencies.

The crystal mounting also is unusual, although here again sheer practicality is evidenced. Extremely accurate temperature control has been found difficult in actual service, and methods of minimizing frequency shift with change in temperature have been found valuable as adjuncts to temperature control. The mounting of



THE CRYSTAL-OSCILLATOR-AMPLIFIER WITH ITS OUTER SHIELD REMOVED

Two of these units are used in the transmitter. The small panel projecting from the front has mounted on it the thermoregulator adjustment and thermometer for indicating the oven temperature. The oven is immediately behind this panel.

the crystal plays an important part in maintaining constant frequency with slight variations in temperature and the mounting used in this transmitter is such that a comparatively coarse control of temperature is accompanied by negligible frequency drift. The mounting is of the air-gap type, the gap being determined by quartz spacers between the upper and lower plates. The gap is maintained constant by virtue of the identical temperature co-efficient of expansion possessed

by both the oscillating crystal and the quartz spacers. The spacers are thicker than the crystal by the length of the air-gap. Fig. 2 illustrates the principle of the mounting used. In an actual test

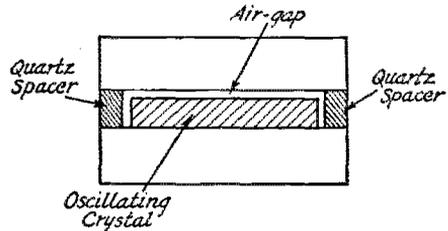


FIG. 2

extending over a considerable period, the frequency of the transmitter did not vary in excess of 20 cycles from the assigned frequency. The 20-cycle shift occurred during the first hour, after which zero beat was maintained for the remaining hours of the test. The temperature of the oven varied over a range of approximately 1.8° (C.) during the run.

The oven is of comparatively simple construction and comprises several outer walls of heat-insulating material with an inner compartment of aluminum. Within this compartment are mounted the crystal holder, the element of the thermoregulator whose adjustment is mounted on the front panel, the bulb of the thermometer, and the heater unit. The oven, in turn, is contained in the shield housing the oscillator and its associated amplifier.

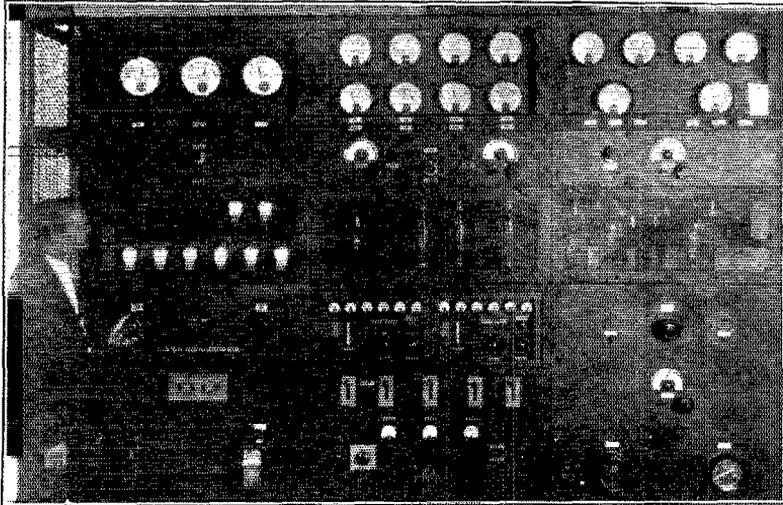
The oscillator tube is a UX-210 with 180 volts on its plate and employs grid-leak bias. The crystal is connected between the grid and filament and the plate tank is tuned to the frequency of the crystal, 1060 kc., by a variable condenser. The output of the crystal oscillator is capacitively coupled to the control grid of the first of the two succeeding stages of screen-grid amplification. These amplifiers each use one UX-865, $7\frac{1}{2}$ -watt screen-grid tube with 500 volts on its plate, and grid-leak bias. Screen-grid voltage is obtained from the plate supply through suitable resistors. The plate power for the whole unit is obtained from a UX-866 mercury-vapor rectifier and filter unit mounted on the panel at the left of that on which the crystal-oscillator-amplifier is mounted. The input to the second amplifier is capacitively coupled to the plate tank of the first amplifier; both plate tanks are tuned by means of variable condensers. The crystal-oscillator-amplifier unit is the only completely shielded section of the whole transmitter; a decidedly interesting feature. The ovens of both units are heated from the house-lighting circuit and are left running continuously to insure constancy of temperature. Immediately below the two units are the switches for throwing either into service.

BUFFER AMPLIFIER, MODULATED AMPLIFIER
AND MODULATOR

The output of the second screen-grid amplifier is capacitively coupled to the control-grid of the UX-860, 75-watt screen-grid buffer-amplifier which is mounted in the compartment above the crystal-oscillator-amplifier units. Excitation is sufficient to cause this tube to draw 250 watts from the plate supply at a plate voltage of 3000. It is nearly biased to cut-off, bias voltage being

realization of 100% modulation and has been described previously in *QST*. The Class-C amplifier is neutralized to prevent self-excited oscillation. Its plate tank is similar to that of the buffer-amplifier; a copper-strip inductance tuned by a Cardwell transmitting condenser.

Two UV-849 tubes in parallel are used in the modulator. At first consideration the use of two tubes may seem unnecessary, but their desirability becomes apparent when the ratings and characteristics of the UV-849 are consulted. The



THE UX-866 RECTIFIER, MODULATOR AND 5-KW. LINEAR AMPLIFIER UNITS

obtained from the station grid-bias generator. Screen-grid voltage of 750 volts is obtained from the plate supply through a suitable resistor. The plate supply for the buffer-amplifier, as well as for the UV-849 modulators and modulated amplifier, is obtained from the three-phase series rectifier using six UX-866 tubes mounted on the left end panel. The plate tank inductance is of copper ribbon wound on a hard-wood strip form and is tuned by a 7200-volt Cardwell transmitting condenser.

The buffer-amplifier must furnish a healthy kick to the grid circuit of the modulated Class-C amplifier to supply the grid losses and insure grid saturation. The UX-860, capacitively coupled to the grid circuit of the Class-C, UV-849 modulated amplifier, does this without difficulty. Plate input to the UV-849 is 300 watts at 2000 volts with the grid biased well beyond cut-off. Plate current is supplied to the modulated amplifier and two UV-849 modulator tubes through a common modulation choke; plate voltage on the modulator tubes is 3000 and this is dropped to 2000 for the modulated amplifier through a suitable resistor which is by-passed by a large fixed condenser. This arrangement is essential to the

load resistance of the modulator is the plate resistance of the modulated amplifier and the conditions for maximum output are satisfied when the load resistance is twice the plate resistance. The plate resistance of the two modulator tubes in parallel is practically half the plate resistance of the single amplifier. Maximum modulator output, therefore, should be obtainable. Moreover, the use of two tubes in the modulator makes possible complete modulation of the Class-C amplifier output without overloading the modulator tubes. The plate input to each modulator tube is 100 milliamperes at 3000 volts, a total input of 600 watts. Their grids are biased so that they operate on the linear portion of their characteristic. Sufficient grid-swing is possible to vary the modulated amplifier plate potential between zero and twice the operating voltage without noticeable distortion. Non-inductive resistors are connected in the modulator grid leads to prevent oscillation at ultra-high radio frequencies. Negative grid-bias voltage is obtained from the bias generator.

Grid input to the modulator is from a two-stage speech amplifier consisting of two resistance-coupled UV-203-A tubes. This amplifier is at the

bottom of the modulator panel. Its input comes from the station control-room amplifier which, in turn, is fed by the studio control amplifier at the Travelers' Grove Street building in Hartford. The speech amplifier and modulator system is, to say the least, effective. A "20-db.-down" (0.01-milliwatt) speech amplifier input signal is sufficient to give 100% modulation of the 50-kw. transmitter output.

THE 5-KW. LINEAR AMPLIFIER

The modulated output of the UV-849 excites the first linear amplifier which uses two UV-863, 10-kw. water-cooled tubes in push-pull. Plate power for these tubes is furnished by the 350-kw. 20,000-volt three-phase series mercury-vapor rectifier. The output voltage of the rectifier is dropped to 15,000 for this stage, by resistors. Plate current to both tubes is 1 ampere; total plate input is 15 kw. Filament power is supplied by direct-current generator; the filament voltage is 22 and the current to each tube is 52 amperes. Negative grid bias of 320 volts is supplied from

spun resistor. The circuit is the same as that shown in the description of the linear amplifier of the 'phone transmitter in the April, 1929, issue of QST. Grid excitation is controlled by varying the coupling to the modulated amplifier plate

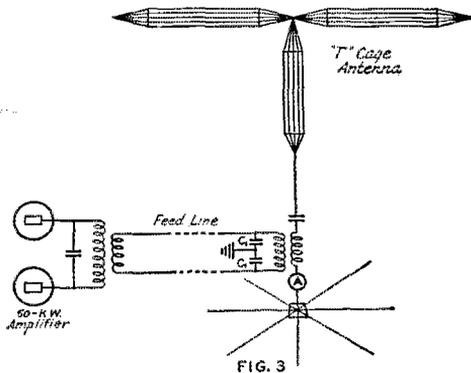
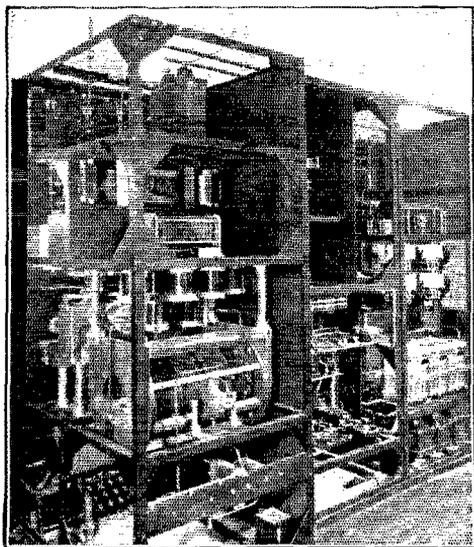


FIG. 3

coil and by regulating the resistance of the Ohm-spun unit.

The plate capacitance of the tubes is neutralized by a pair of high-voltage three-plate variable condensers "cross-connected" between grid and plate, plate and grid, of the respective tubes. In neutralizing the amplifier, a low-reading thermocouple ammeter is connected in the tank circuit and, with excitation reduced and plate voltage off, the neutralizing condensers are adjusted for minimum current in the plate tank. The plate inductance is similar in construction to the inductances of the lower stages. It consists of copper edgewise-wound ribbon on a wood-strip form. High-voltage fixed condensers connected across this inductance tune it approximately to resonance while fine tuning is accomplished by means of a rotatable aluminum ring mounted in the plane of the coil turns at the center of the inductance. This ring is referred to as the "flipper." It is rotated by an insulating shaft terminating in a knob on the panel front. With this adjustment, tuning over a range of approximately ten kilocycles is possible. This scheme for fine adjustment is used in all tuned circuits of the transmitter not equipped with variable condensers. It should have many applications in amateur transmitters and no doubt an adaptation of the idea would be applicable to receiver tuning as well. At amateur frequencies, the possible frequency variation would be considerably greater than at the lower broadcasting frequencies because the change in distributed capacity and inductance of the coil would be affected in greater proportion. Perhaps the amateur transmitters and receivers of the future may be visualized as aggregations of fixed condensers and coils tuned by a variety of aluminum rings or discs. While the idea may not be new, its practicality is given



A PEEK AT THE REAR OF THE 5-KW. STAGE

The plate inductance and the grid coupling coil for the 50-kw. stage input are on the second deck from the bottom. The toaster-like appearing rig on the third deck is the Ohm-spun grid-shunt resistor. One of the neutralizing condensers may be seen just in front of the plate inductance. Part of the rubber tubing coil for cooling water is visible below the first deck.

the bias generator and is fed to the grids from a center-tap on the grid tank inductance.

The grid circuit of this stage is inductively coupled to the plate circuit of the modulated amplifier. The grid coupling coil is connected by a short feed-line to a high-C tank circuit to which the grid leads are, in turn, connected. Across this grid tank and the grids, is connected an Ohm-

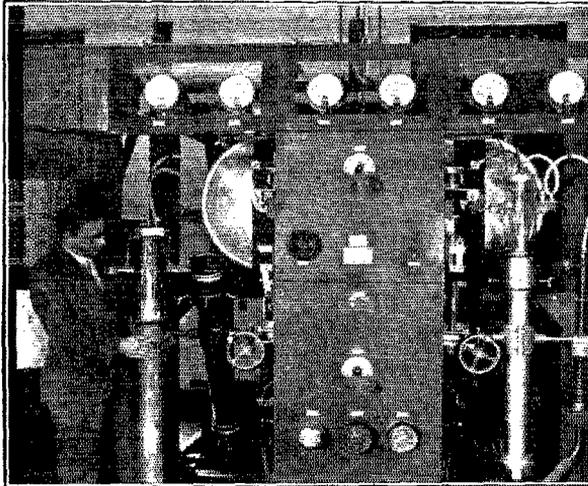
weight by the fact that it finds its way into the most modern equipment. The grid tank coil is similarly tuned by an aluminum disc.

Proper excitation of the 5-kw. linear amplifier is obtained by varying the coupling to the modu-

the two tubes; enough power to operate a goodly number of ham transmitters. The plate voltage is 18,000 and seems quite reasonable. But the plate current is around 5 amperes per tube; 10,000 milliamperes plate current for a single push-pull amplifier almost numbs the amateur imagination. Grid bias for Class B operation is 320 volts, a comparatively low value since the tubes have a high amplification factor. Two kilowatts of actual grid excitation are required for the full 50-kw. power output of the amplifier. When the mind has become accustomed to such values, the good old 75-watter seems to shrink to the proportions of a 199.

The heat generated by the filament and plate power consumed is considerable to say the least, and it is obvious that an effective means for rapid cooling of the tube elements must be provided. The heat dissipated by the filament alone would be sufficient to wreck a tube in short order if no means, other than air, were available for cooling. Such catastrophe is made remote by the effective water-cooling system incorporated as an auxiliary to the transmitter and will be described in detail later.

The circuit arrangement of the 50-kw. amplifier is the same as that of the preceding stage. Its tuning and excitation adjustments are identical with those of the 5-kw. amplifier. Its components differ considerably from those of the preceding stage,



THE 50-KW. LINEAR AMPLIFIER WITH THE FRONT-DOORS OPEN

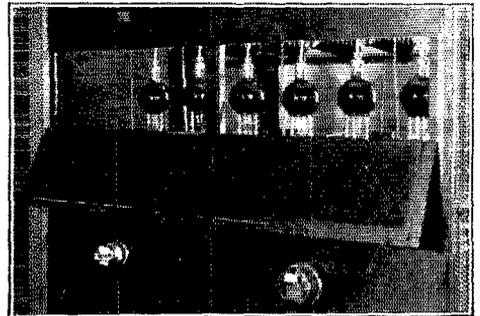
The 100-kw. tube is obviously "man-size." Note how the left-hand tube socket is tipped forward to facilitate insertion of the UV-862. The tubing running to the top of the tubes is for air-blast cooling of the glass grid and filament seats.

lated amplifier plate inductance and adjusting the grid-shunt resistor until the amplifier carrier output is 5-kw. With carrier power output of this value, a maximum undistorted power output of 20 kw. is possible on the modulation peaks. The excitation adjustment is both critical and important. Distortionless performance on the part of the linear amplifier is impossible unless it is correct. A detailed explanation of the method of adjusting the excitation of the linear amplifier of an amateur 'phone transmitter is given in the April, 1929, issue of QST.

THE 50-KW. OUTPUT LINEAR AMPLIFIER

A 50,000-watt radio frequency linear power amplifier is most decidedly an innovation in the art of radio telephony and has been made a practical actuality as a result of the perfection of the 100-kw. tube. The designation of the rating of the amplifier might well be 200 kw., for its power output on the modulation peaks has this value. Two UV-862, 100-kw. water-cooled tubes in a push-pull circuit do the work.

Of all the interesting features of this amplifier, the UV-862 is undoubtedly the most interesting. To one accustomed to lesser tubes its ratings are almost staggering. Filament current is 207 amperes at a filament voltage of 33. Almost 14 kw. of power is required for heating the filaments of



SIX MERCURY-VAPOR TYPE TUBES ARE USED IN THE 350-KW. RECTIFIER

This is the first rectifier of its type ever used in a commercial station.

however, and details of their construction may be of interest.

The plate inductance is made up of flat-wound copper strip on notched glass bars fastened to a form of wood ribs and is quite similar in construction to the edge-wise wound inductance of the preceding stage. Proponents of both flat and edge-

wise wound coils should be satisfied with the practice in this transmitter, for the two types are found in equal proportions. The plate tank condenser is mounted immediately above the inductance and is in two sections, one on each side.

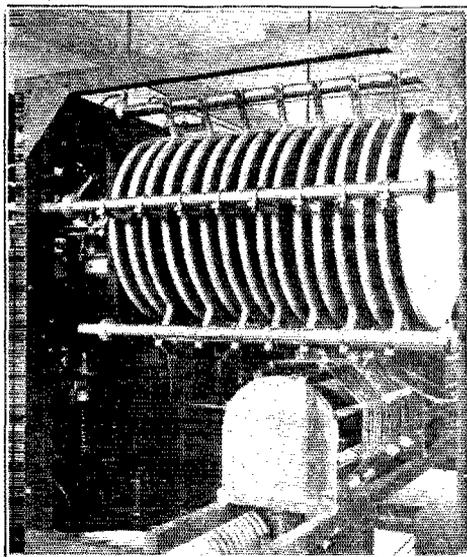
Each section consists of a series of slightly dished aluminum discs. The discs are about 30 inches in diameter and are each equipped with three projecting lugs spaced 120 degrees apart around the circumference for mounting. The plates are fixed on pipe supports which, in turn, are fastened to the frame of the transmitter by insulating pillars. The supports are spaced 60 degrees apart and alternate plates are mounted on and connected to each set of three pipes. The two sections of the condenser are in series across the plate inductance. Each pair of plates has a capacitance of approximately 75 $\mu\text{fd.}$, the total capacity of the condenser being 750 $\mu\text{fd.}$ The tank capacitance is varied by the addition or removal of plates and adjustment of the spacing between them. This type of air-dielectric condenser construction has practical application in amateur transmitters; the plates might be aluminum "pie-plates" or discs cut from sheet aluminum and the supports could be threaded rods. Sufficient capacity variation for tuning purposes could be obtained by mounting one end plate on a screw rotated by a knob or small crank. Fine tuning adjustment of the plate circuit is by means of an aluminum disc "flipper" inside the inductance, operated from the panel.

The neutralizing condensers for this stage are most unique. An aluminum disc supported by a large threaded screw and similar to those used in the tank condenser, but without mounting lugs, is capacitively coupled to the front end plate of each section of the tank condenser. The spacing between these plates and the end plates of the tank condenser is variable, the rotation of the screws moving the plates toward or away from the stationary plates. The movable plates are connected to the respective grids of the UV-862 tubes. The neutralizing circuit is identical with that of the 5-kw. stage.

As in the preceding stage, excitation is controlled by input coupling and adjustment of the grid-shunt resistor. Since the output of the preceding stage is 5 kw. and but 2 kw. are required for proper excitation, it is obvious that the grid-shunt resistor is called upon to dissipate a considerable amount of power. While the dissipation of 3 kw. in a resistor may seem to be a wanton waste of good power, it is essential to linear amplification. Good grid-regulation is absolutely necessary and it can be obtained only by making the input resistance of the grid circuit comparatively low and supplying sufficient power, in excess of that dissipated in the resistor, to insure "grid saturation."

THE ANTENNA SYSTEM

Although the construction of a directive antenna system has been considered, that in use at present is of the "T" type, operated against ground and fed by a two-wire transmission line. The schematic plan of the antenna and feed-line is shown in Fig. 3. The input to the transmission



BEHIND THE 100-KW. TUBES

One section of the massive plate-tank condenser dominates the picture. Below it is the plate inductance and feeder-input coupling coil. A coil of tubing for cooling water may be seen below the inductance.

line is inductively coupled to the plate coil of the 50-kw. amplifier. The output terminal equipment is such that the surge impedance of the line is matched to the antenna resistance. The antenna resistance is 65 ohms and the natural frequency is 1140 kc. (380 meters). The value of radio frequency current at the base of the antenna is 27.8 amperes at normal carrier power output.

The ground system consists of 200 feet lengths of heavy bare copper wire buried in shallow trenches radiating from a point immediately below the center of the antenna. All wires are connected to a large copper sheet beneath the tuning house. The line terminal equipment and antenna ammeter are in the tuning house.

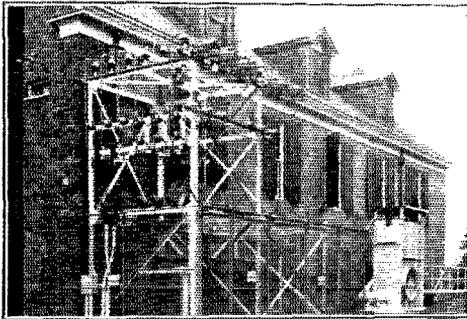
The possibility of even harmonic radiation is eliminated by the use of the antenna-and-ground combination and also by making the line terminal circuit high-C with a ground at the nodal point.

PLATE, FILAMENT AND GRID BIAS SUPPLY

Plate supply for the tubes preceding the UV-863 stage is obtained from rectifier units using the UX-866 type rectifier tubes and that for the UV-

863 and UV-862 tubes is supplied by the 350-kw. unit employing six UV-857 mercury-vapor type rectifiers in a three-phase "series" circuit. This rectifier is the first of its type to be used in a commercial installation. The UV-857 is the jumbo version of the familiar UX-866 and has a peak inverse voltage rating of 20,000 and a peak current rating of 20 amperes. The d.c. output voltage is normally 18,000 and is varied by means of a motor-operated voltage regulator in the 2300-volt primary circuit of the three single-phase plate supply transformers. The output voltage is dropped to 15,000 for the two UV-863 tubes in the 5-kw. stage; the full rectifier output voltage is applied to the plates of the UV-862 tubes in the 50-kw. stage. The rectifier output is filtered by a large reactor and bank of high-voltage condensers.

Filament current for the UV-863 and UV-862 tubes is supplied by a d.c. generator equipped



A VERITABLE SUB-STATION IS REQUIRED TO HANDLE THE STATION'S POWER DEMANDS

Primary power enters the attractive Colonial style station building from the equipment within the fence. The two-wire antenna lead line may be seen at the upper left. The water-cooling radiator with its motor-driven air circulating fan is down right.

with a filter rather than by step-down transformers. The use of filtered direct current for filament heating is essential for the prevention of hum in the output when heavy filament currents are employed. Several hundred amperes of alternating current flowing through a filament would create a fluctuating field of considerable intensity. Alternating current from step-down transformers is used for filament heating of the rectifier tubes as well as for the filaments of the transmitting tubes of the lower stages.

Negative grid bias voltage for all tubes following the crystal oscillator-amplifier is supplied by a d.c. generator. This method of obtaining bias insures good voltage regulation.

THE WATER-COOLING SYSTEM AND POWER CONTROL

The development of the water-cooled type tube has made necessary similar developments in the water system involved and this installation has

a water system which in itself is a considerable plant. Distilled water only is used and an important unit of the system is the perfectly legal still located in the basement of the station building. The pure water distilled by this unit is put in a storage tank from which it is pumped through the outdoor radiator and the tubes. When the transmitter is shut down and the pumps stop, the water automatically drains from the outside radiator to the storage tank in the basement. This eliminates the danger of a possible freeze-up in cold weather.

The use of distilled water has several advantages over the use of doubtfully pure "tap" water. Corrosion and "scaling" of the copper jackets of the tubes is minimized and the comparatively high resistance of the distilled water permits operation of the plates at high potential with respect to ground with a negligible power loss. The water flows through coils of rubber hose immediately prior to reaching the tube water-jackets and again immediately after leaving them. This increases the length of the water column and of the high-resistance path to ground.

When the transmitter is put into operation, the water pumps automatically start circulation some time before the filament and plate power comes on and the water is kept circulating for some fifteen minutes after the rest of the plant is shut down to insure proper gradual cooling of the tubes.

Power to the transmitter is controlled by an elaborate system of automatic switches which operate in proper sequence and with proper timing. The whole transmitter is controlled by a single push-button start-and-stop switch. Pilot lamps indicate current flow in all important circuits and assist greatly in locating the source of trouble in event of a forced shut-down. The transmitter can be easily controlled by a single operator, although the technical staff of WTIC is made up of three engineers and eight operators at the present time.

CONCLUSION

Obviously, it has been impossible to cover in complete detail every interesting feature of this modern 50-kw. transmitter. An attempt has been made, however, to dwell particularly on those features of greatest interest to the amateur and it is hoped that ingenious experimenters will find ways and means of applying some of the ideas to our game. It is more than probable that many applications will be discovered in addition to those suggested in these pages. Some may prove of great value to amateur radio; all will be worth trying.



Director Karl Weingarten "took the fatal leap" recently.

A Worthwhile Combination

By Dale Pollack*

A unit combining a monitor, frequency meter, and receiver for portable or station use, being satisfactory for either phone or c.w. operation. — EDITOR.

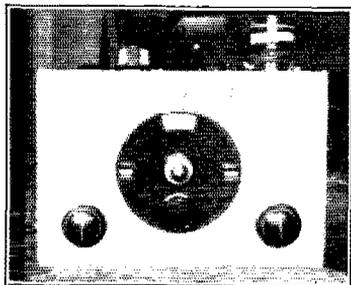
THE family pocketbook looked rather slim last month but the set looked worse, so we determined to make a decent one and at the same time keep our funds out of the negative quantities. There were really several units needed and the cheapest and simplest thing to do was to build one set that could be used for everything. The result is described in the following paragraphs.

REQUIREMENTS

A "1929" set to come under the above heading would have to embody the following features:

1. Small size and light weight for portability.
2. Shielded batteries for the monitor.
3. Small change in calibration with various antennas.
4. Full dial coverage for all bands.
5. Peaked audio amplifier with switching arrangement for phone reception.
6. Complete shielding.
7. Economy.

The cabinet in which the set is housed is one of the aluminum cans manufactured by the Aluminum Company of America. They are five



A VIEW OF THE SET

The coil is located at the top as is the knob controlling the auxiliary condenser. The main tuning dial is in the center and the two smaller knobs operate the regeneration and volume controls.

inches by six inches by nine inches and were designed to hold one stage of a broadcast receiver. To put each of the three tubes in a separate box would have made the set too bulky and would

have cost about six dollars more. The result was that the tubes were all jammed into one can.

In order to get full dial coverage for each band, the series condenser idea described in connection with the two-tube receiver appearing in the November, 1928, issue of *QST* was incorporated. The main tuning condenser is a 13-plate midget

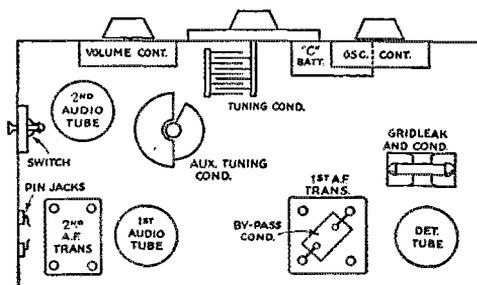


FIG. 1. — THE GENERAL ARRANGEMENTS OF THE PARTS IS SHOWN ABOVE

and the auxiliary condenser in series with it is a 23-plate affair. Midget types were employed for compactness. The knob of the auxiliary condenser is the one appearing on the top of the receiver.

Inductive rather than capacitive coupling to the antenna was used since our demand is also for a frequency meter, and changing the antenna would have had a considerable effect on the frequency calibration if capacitive coupling had been used. For the same reason, resistance control of regeneration was employed.

AUDIO AMPLIFIER

Rather than sacrifice the ability to properly receive phone signals, it was decided to forestall the use of a peaked audio amplifier and resort to some external means of securing audio frequency selectivity. The method used was to interpose a tuned filter between the output of the amplifier and the phones.

While the particular filter employed is not the ultimate in filters by any means, yet its usefulness cannot be underestimated. It consists simply of a choke and condenser shunted across the phones. It does not show in the photo of the set because it was placed in the battery box. A switch is mounted on the battery panel to allow

* W2AEC, 62 Liberty Place, Weehawken, N. J.

the filter to be disconnected when phone reception is desired. A single-pole single-throw switch will do nicely.

By using a variable choke and condenser, it is possible to move the resonant peak of the filter to any part of the audio spectrum desired. An adjustable choke can be made by modifying a cheap "B" substitute choke so that the air-gap in the core may be varied. This will change the inductance of the choke. However, in this case, only the capacity across the choke was made variable by employing several small fixed units so arranged as to be under the control of a fan switch. By this means it is possible to change in steps the amount of shunt capacity and hence,

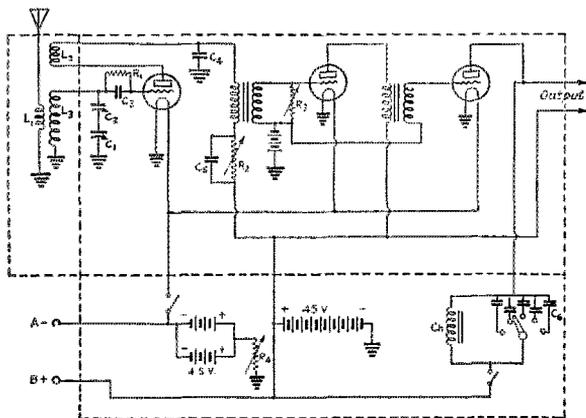


FIG. 2 — THE CIRCUIT DIAGRAM

The upper compartment contains the detector and audio amplifier while the lower box holds the batteries and the audio filter across the output circuit. The constants are as follows:

- C1 — 13-plate midjet.
- C2 — 23-plate midjet.
- C3 — 100-µfd. fixed condenser.
- C4 — 2,000-µfd. fixed condenser.
- C5 — 0.1-µfd. fixed condenser.
- C6 — 6,000-µfd. fixed condensers.
- R1 — 5 megs.
- R2 — 50,000-ohm variable.
- R3 — 100,000-ohm variable preferably provided with an "off" position.
- R4 — 15-ohm rheostat.
- Ch — Primary of old audio transformer.
- L1 — 2 turns of No. 20 d.c.c. wire wound around base of coil socket.

Band	Turns L2	Turns L3
1,750 kc.	44	8
3,500 "	30	7
7,000 "	14	6
14,000 "	5	5
28,000 "	3	4

L2 is wound with No. 30 d.c.c. wire and L3 with No. 26 d.c.c. wire.

the frequency to which the trap circuit is resonant. This filter circuit may be seen in the lower portion of Fig. 2.

CONSTRUCTIONAL DETAILS

The coil socket was mounted on top of the case for accessibility and in order to keep the leads to it short, the set was mounted on the "roof" of the can *à la* Silver-Marshall. A tube shield has been placed over the coil to eliminate

coupling to the transmitter when it is employed as a monitor.

At least one author in *QST* has discouraged the use of metal panels because of the trouble experienced in insulating various parts from it. With the possible exception of about a dozen or so such cases, no trouble was encountered from this source! However, this difficulty was finally eliminated by making all the holes requiring insulation larger than needed and then winding the shafts, bushings, screws, or what have you, with a few yards of thread. This proved much simpler than ordering special fibre or bakelite bushings at a great deal of trouble and expense. After each insulated part is mounted, it is advisable to make a test with a battery and 'phone to be sure that the insulation is really existent and not merely apparent. This will allow one to economize on tubes.

The use of such a small cabinet may not be approved by some amateurs due to the difficulties involved in the construction of the set. I can sympathize with these in advance but still believe it to be worth while. If, however, the general cramped appearance of things discourages you, use two cans, one for the detector and the other for the audio amplifier.

BATTERY CASE

Our requirements call for the use of the set as a monitor which would be impractical without the shielding of the battery circuits. Another case like that housing the set was procured and a rheostat, three binding posts, and a switch were mounted upon it. Two "C" batteries connected in parallel supply the filaments of the 199's and two small 22.5-volt "B" batteries furnish gravity for the plates. After the batteries have been placed inside and wired, the remaining space should be filled with crumpled newspaper to prevent the batteries from shorting against each other or the case. The two cases are screwed together and a connecting cable run through the two adjacent sides. By using this battery box, the set can be used as a monitor or employed as a portable.

CALIBRATION

The use of the set as a frequency meter does not presuppose an accuracy of within five or six cycles per second. However, its accuracy should be sufficient for most general amateur work in view of the obvious advantages of its being easily and readily checked against transmissions from standard frequency stations and commercials.

The dimensions given for the coils will be found to vary with individual sets and a little experimentation should be done to ascertain the exact number of turns. This adjustment is easily accomplished by making the number of secondary turns such that the top of the frequency band falls at 5 on the dial when the auxiliary condenser is at half-scale. Then adjust the auxiliary condenser until the bottom of the band is at 95 on the tuning scale. This procedure is repeated with all the coils. Calibration can be made with the aid of Standard Frequency Transmissions and O.F.S.

West Gulf Division Convention

November 22nd and 23rd at San Antonio, Texas

MALCOLM McCARTY, the Secretary and the Convention Committee of the San Antonio Radio Club are working hard to make the Third Annual West Gulf Division Convention a success and extend to all the amateurs in the Division a most cordial invitation to attend this year's convention.

A good program has been prepared and diversified enough to make your stay enjoyable.

A.R.R.L. Executive Committee has promised us one representative from Headquarters; it will be either Secretary Warner or Treasurer Hebert and we know that interesting information will be given the delegates. Bring your YLs and OWs, as there will be plenty of entertainment for them. At this writing the name of the hotel has not been decided, but a note to Malcolm McCarty, Secretary of the Club, 108 De Vilbiss St., San Antonio, Texas, making your registration will bring forth the information. The cost of convention tickets is \$4.00. Show what you can do for the old West Gulf!

Pacific Division Convention

November 29th and 30th at Los Angeles, Calif.

FELLOW members of the A.R.R.L. and radio amateurs within and outside of the Pacific Division: This is the official call for the tenth Annual Pacific Division Convention to be held at the Hotel Alexandria, Los Angeles, Calif., on November 29th and 30th. This year's affair is sponsored by the Amateur Radio Research Club, which cordially extends an invitation to all radio amateurs to attend.

Prominent speakers will be present and will address the meetings on subjects of vital interest to us all. The Committee is working hard to have Dr. A. Hoyt Taylor, President of the I.R.E. and also head of NKF, attend, and it is hoped to also secure the attendance of John L. Reinartz, whom all amateurs know so well but few have seen. We

are assured by A.R.R.L. Headquarters that one representative will be present from Hartford.

The Wouff-Hong Trophy will be awarded as has been done in past years.

Now let every one of the division boost this convention and let's put it over with a BANG!

Mr. Charles A. Hill, Secretary of the A.R.R.C., 936 So. Fedora St., Los Angeles, Calif., is hoping to receive a thousand requests for reservations. *Will you be one of them?*

Warner Goes to The Hague

AMATEURS will be interested in knowing that K. B. Warner, secretary of the American Radio Relay League, has been appointed by the Department of State as a technical adviser to the United States delegation which is attending the meeting of the International Consultative Committee on Radio Communications to be held at The Hague beginning in middle September. It will be his duty to advise the delegation on matters affecting amateur radio. His expenses are paid by A.R.R.L. under a special appropriation voted for that purpose by the Board of Directors.

The delegation is headed by Major General C. McK. Saltzman, of the Federal Radio Commission, former Chief Signal Officer of the Army. The other delegates are Major General George S. Gibbs, present Chief Signal Officer of the Army, and Captain S. C. Hooper, U.S.N., Director of Naval Communications, the officers heading the respective Army and Navy establishments with which amateur radio has its closest relations. In addition to Technical Adviser Warner there are four technical assistants, all from the Government Service: Dr. J. H. Dellinger, Chief of the Radio Laboratory, Bureau of Standards; Dr. C. B. Jolliffe, also of the Bureau of Standards; Commander T. A. M. Craven, U.S.N., chief teacupper at Washington in 1927; and Mr. Gerald C. Gross, W3GG of the Federal Radio Commission.

Our July editorial should be reviewed for information on The Hague affair. It is not another international treaty in the making. It is the first of a series of meetings, to be held about every two years under the Washington Convention, to deal with technical and administrative difficulties which arise in the execution of that convention. It will be a relatively small and relatively informal meeting of technical experts, whose recommendations will be passed to the governments and commercial operating companies via the Berne Bureau. Its decisions do not have the weight of regulations; they are recommendations.

The United States radio officials have held meetings at Washington for some months in preparation for the conference, and the views and suggestions of this country have been formulated

(Continued on page 76)



The President's Corner

A WORD FROM

HIRAM PERCY MAXIM

PRESIDENT OF THE AMERICAN RADIO RELAY LEAGUE AND
OF THE INTERNATIONAL AMATEUR RADIO UNION

Lifting the Bushel

SOMEBODY once said something about hiding one's light under a bushel. One of the big things which we radio amateurs can do is to lift the "bushel" off our light. If any group in this world has a good light to show the world it is we radio amateurs. I firmly believe that amateur radio has done more human good than any other amateur activity. The permanent help it has been to thousands of young men, the advancement it has given the art of radio communication, the assistance it has been in every great public emergency, the friendships and good will it has created, not only in our own country but all over the world, the amount of business it has created for manufacturers and dealers, all amount to a sum total that is really impressive. And yet the public at large appears to know very little about us. Our representatives in pleading a case for us always have to do a lot of explaining.

I wonder how many of you fellows realize that over twenty municipalities in the past have attempted to make laws that would have killed amateur radio in their localities. Headquarters has had actually to go to court several times to show these municipalities that, while they have police powers, they have not the authority to make laws governing radio communications. Even State legislatures, every now and again, attempt to make laws restricting amateur transmitting which would eliminate amateur radio in those States. We have had to show these legislatures that while a State has sovereign power within its borders, it cannot regulate interstate matters, and radio is, of course, very much interstate.

When it comes to our Federal Government, long years of work have built up a very complete and fine appreciation of the radio amateur among the departments at Washington which have to do with radio. On several occasions these departments have stood between us and proposed Congressional restrictions. To this extent, Headquarters has lifted the bushel off our light. But what we want is for this same thing to be done with the general public. Headquarters has maintained a news and publicity bureau for years, has seen to it that stories on amateur radio achievements got into the press of the nation, and has made use of the innumerable conventions we have held during the past fourteen years, but the country is too big and there are too many other interesting things in the newspapers and magazines. If you fellows, who are scattered by the thousands from the Atlantic to the Pacific, could be induced to take a personal interest in this matter, to talk up what amateur two-way radio communication has done in the past, what it is doing today for thousands of young and middle-aged men throughout the world, it would eventually make a whale of a difference when your representatives have to fight your battles. If we would make a point of doing this thing for our organization, we would unquestionably notice the difference in a very few years. I do not believe there is anything that we could do that would equally safeguard our own future and also that of those who are to be radio amateurs after we have gone.

KHEJ and the 'Untin' Bowler Awards

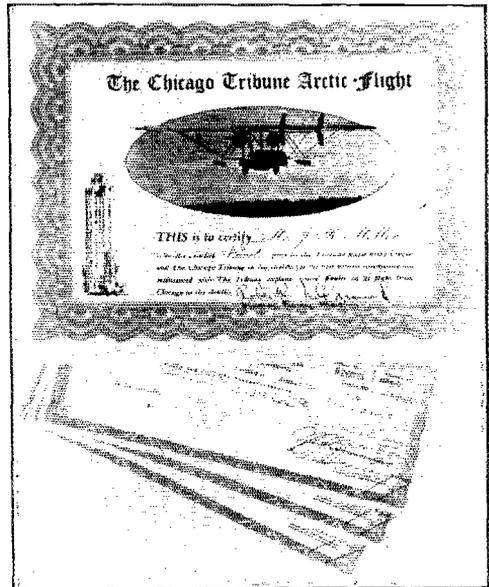
By F. E. Handy, A.R.R.L., Communications Manager

AMATEURS will recall the announcement of the 'Untin' Bowler's proposed flight across the Arctic regions to Europe during early July. The A.R.R.L. invited all amateurs and member-stations to participate in a communications competition to be held in connection with this flight. The *Chicago Tribune*, sponsor of the flight, asked our assistance in intercepting messages and dispatches to be sent from the plane, offering \$400 in cash prizes, for judges designated by the League to distribute to amateur wireless operators "in accordance with their relative skill, accuracy, and ingenuity displayed in receiving broadcasts from the plane, provided that dispatches be forwarded to the *Tribune* without disclosure of their contents." Full details of this competition were mailed to A.R.R.L. Communications Department appointees and sent to all amateurs with the latest flight developments from day to day by means of telegraphic broadcasts from WIMK.

The 'Untin' Bowler, twin-motored Sikorsky amphibian airplane, left Roosevelt Field, L. I., June 29 for Chicago, which was the official starting point of the flight to map a new commercial air route across the Arctic. The radio equipment as well as the plane itself was thoroughly tested on this preliminary flight, the signals being widely copied by radio amateurs while the plane was between Buffalo and Chicago. The plane carried a screen-grid high frequency receiver and a 50-watt T.G.T.P. transmitter licensed to operate on 6890 kc, with the call signal KHEJ. Power supplied from a 240-cycle alternator made identification of the plane's signal fairly easy.

Early on July 3d the plane left Chicago, the key being tied down at 8:48 a.m. just after leaving Grant Park. Hundreds of amateurs all over the country reported logging the signals at this time, also stating their determination to stick with the fliers throughout the entire flight. In the absence of an experienced radio operator for the trip, pilots Cramer and Gast were in charge of the radio equipment. The signals were readily followed, in spite of some intermittent fading, until the landing at Milwaukee and later at the Soo at 1:35 p.m. At four o'clock the 'Untin' Bowler again took the air, the signal being picked up at once by eager amateurs. The signal continued with the key locked down until 4:25 p.m. when, after a slight shift of frequency, a brief message was sent. The sending by one of the pilots was not of the best and did not permit perfect copy. Miller of W9CP seems to have been the only listener who successfully received and reported

this message to the *Tribune*. However, as soon as the key was held down again the rest of KHEJ's followers found the signal, nearly all holding it until the plane landed at Remi Lake, Ontario, at 6:44 p.m. Different logs examined show that interference was experienced from WCY at Cleveland and from harmonics of broadcasting stations in



THE CERTIFICATE WITH THE CHECK WHICH ACCOMPANIED EACH

Miller only received the top check! the others go to Schnell and Strauss.

some localities. The message heard at W9CP was as follows, "Just trying out — very bumpy — KHEJ."

A lot of radio amateurs were up bright and early on the morning of July 4th with more serious thoughts than celebration of the holiday in mind. Strauss (W9AAS) heard KHEJ between 3:48 and 4:09 a.m. (warming up the engine probably). Meyers of the *Tribune* picked up the weak signal at W9DN at 5:05 a.m. Schnell (W9UZ) and Miller (W9CP) were on the job at an early hour, too. KHEJ became louder when the plane took off from Remi Lake at 5:58 a.m. At 8:20 a.m. the fliers sent their call and the new location "Rupert House." The *Tribune's* station got this, and Miller (W9CP) copied and reported in although unable to get perfect copy this time. The plane

was forced to halt, due to poor visibility, just beyond Rupert House, not making the mouth of the Great Whale River until the following day.

The story of the flight from this point is a tale of great hardships, delays due to storms, heavy fogs and bad flying weather. We shall not repeat it in detail here, as it has all appeared as a matter of record in the press.

During the daily flights it was possible to follow KHEJ consistently, to tell when a flight was in progress and to judge the position and distance from a starting point by the length of time the signal was on the air. Due to navigation requirements, Cramer did not find it feasible to use the transmitter to send the detailed reports which amateurs had hoped to copy from KHEJ. In Ungava Bay the *Bowler* was marooned for two days in a precarious situation amid the floating ice, unable to fly the forty miles to the friendly settlement of Port Burwell through thick impenetrable fog. Finally making Burwell, the high tides and a storm of gale intensity succeeded in breaking up the harbor ice and snatching the amphibian from its moorings on the evening of July 13. In spite of the best efforts of her pilots, the *Bowler* could not be saved. Cramer and Gast were fortunate in not being carried to sea with the plane.

During the flight regular weather reports were secured by the *Tribune* from government observation posts. These were transmitted twice each day on schedule by Mr. Pinney of WICKP to NXNL at Mount Evans, Greenland, the next point along the proposed line of flight from Port Burwell. From MacMillan's *Bowdoin*, WDDE, a message to the *Tribune* via amateur station W9ETA offered the fliers whatever assistance possible for the expedition to give. While the fliers delayed at Burwell awaiting favorable weather which did not come, the most enthusiastic amateurs in addition to listening for the familiar continuous signal from KHEJ on 6890 kc. dusted off the long-wave equipment. With this, VCH and VAS¹ were copied direct in order to first intercept word of the fliers' departure for Greenland and to pick up any news filed at the Port Burwell radio station and speed it to the *Tribune*. From Burwell letter code signals were to be used to indicate the distance covered progressively during the ocean flights. The desirability of adding the weight of an operator to work KHEJ continuously and make possible two-way communication with amateurs, supplying an uninterrupted news story and relieving the overworked pilots of this responsibility was realized before the conclusion of the flight. In fact, definite ways of accomplishing this later in the flight were receiving consideration at the time of the loss of the *Bowler*. Such an addition to the crew of the airship would undoubtedly have added zest to

our competition in addition to the advantages at once accruing to the fliers themselves and to the *Tribune*.

THE AWARDS

Five prizes of \$150, \$100, \$75, \$50 and \$25 had been contemplated in our original announcements of the competition. The unexpected termination of the flight at Port Burwell and other factors limited the amount of practical assistance rendered the fliers by amateur radio, however. It was felt that few of the entrants would qualify for awards and that in view of this fact, conscientious participants would wish us in addition to keeping faith with amateurs, always our first duty, to be entirely fair in releasing the *Tribune* from obligation if possible.

On discussing the subject with the *Tribune*, having a single award or the equivalent in mind as fair to both the sponsor of the contest and all the amateur participants, the *Chicago Tribune* displayed a most generous and whole-hearted attitude, insisting on sharing with the League in awarding the first three prizes in the original amounts, and stating that it had received complete evidences of the interest of A.R.R.L. members in its flight.

A committee² of three judges had been appointed at the beginning of the competition to examine the claims of participating amateurs in every detail. When a reasonable time had elapsed after the conclusion of the flight, the numerous logs of KHEJ reception and reports of other cooperation received in connection with the flight were given most careful consideration. First of all, evidences of amateur cooperation with the flight plans, but having no connection with receipt of the *Bowler's* dispatches or work with KHEJ, were ruled out as having no weight, valuable though this work may have been. Logs were graded according to skill and accuracy. The practical results attained were important. The effort made to keep the *Tribune* informed of reception of signals and of the several brief messages transmitted counted considerably, and this is where most of the reporting stations in the East and South lost their chances of prize winning. On conclusion of its deliberations, the chairman of the award committee forwarded recommendations to the *Tribune*.

First Prize Winner — J. R. Miller, W9CP, Hammond, Ind. — \$150.

Second Prize Winner — F. H. Schnell, W9UZ, Chicago, Ill. — \$100.

Third Prize Winner — Irving Strauss, W9AAS, Chicago, Ill. — \$75.

In addition to the cash prizes, certificates in recognition of the achievement of these operators

(Continued on page 76)

¹ VCH, Port Burwell Radio (Cape Chidley), 143, 163 kc.
VAS, Louisburg Radio (N. S.), 107, 115, 127 kc.

² F. E. Handy, E. L. Batty, and D. E. Menk, all of the Communications Department staff constituted the award committee.

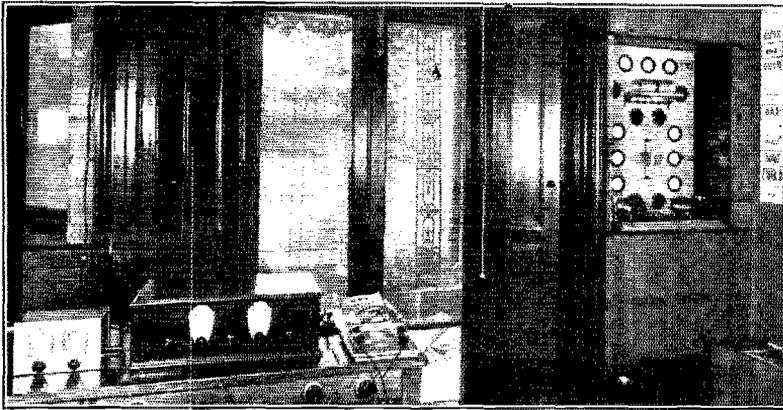
G5BY

This is the sixth published entry in the Station Description Contest detailed in the March issue of QST. G5BY is the first foreign station to be described in this Contest. Let us remind you that manuscripts for the Station Description Contest will not be received after October 10th. If you wish to be eligible for the 1929 Station Cup shown on page 89 of the May issue of QST, now is the time to let us have that description.

— EDITOR.

THE apparatus which is about to be described has been especially constructed to conform with 1929 requirements. The old transmitter, power supply and receiving set with which G5BY won the International Relay Contests of May, 1927, and February, 1928, for the most reliable station in the British Isles have been scrapped; although they had proved themselves admirably suited to the

tion whichever one was required. The crystals are arranged in pairs (two at the top and two at the bottom of the band) so that it is possible to change from one to the other of each pair without having to retune the various circuits. A full scale drawing of the transmitter was made. This was essential as a symmetrical layout was particularly desired and it is most important to keep all R.F. leads as short as possible. After much considera-



A GENERAL VIEW OF G5BY

The monitor and receiver may be seen on the operating table, while the transmitter is fitted into the French window. Through the screened doors may be seen what looks to us like a large estate admirably suited to experimental work on transmitting antennas.

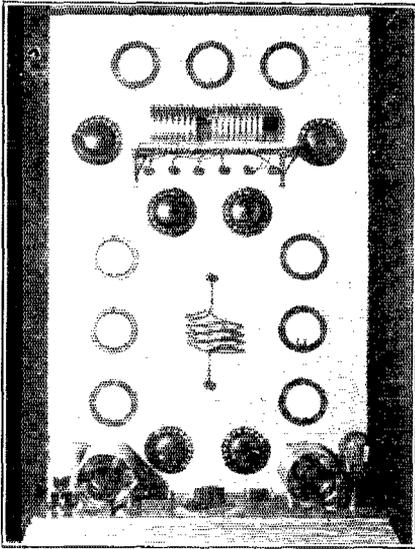
then existing conditions, it was felt that if the station was to maintain its reputation under the new régime, fresh gear was essential.

Accordingly, in the spring of 1928, plans for a new transmitter for H. L. O'Heffernan, G5BY, 2 Chepstow Road, Croydon, Surrey, England, were started. Approximately two weeks were spent in deciding what type to adopt, and back issues of *QST* were consulted freely. Fortunately expense was of secondary consideration, and it was finally decided to build a crystal-controlled transmitter suitable for work on the 7-mc. and 14-mc. bands. The chief objection to this type of transmitter is that one cannot shift the frequency by a slight amount, when interference necessitates, and to obviate this drawback it was decided to use four crystals with a rotary switch to bring into opera-

tion, a design was finally chosen which, while satisfactory from the point of view of symmetry, gave very short grid and plate leads to all tubes. It may be said in proof of this that when the final power amplifier tube is employed, it passes test for perfect neutralization although no shielding is used and, when neutralized, it is impossible to make it oscillate of its own accord. Comparative tests with a self-excited transmitter of the same input as that of the final power amplifier showed that the amplifier gave slightly better radio frequency output when both transmitters were on the same frequency and adjusted for maximum power output.

In the main photograph of the operating room, the monitor is shown on the table at the extreme left, with its dial illuminating and filament

switches just below. Immediately to the right is the four-tube receiver and alongside and further back is the key. The two switches below the log



A CLOSE-UP OF THE TRANSMITTER

The four crystals are mounted in the square boxes on the bottom shelf. The oscillator is the tube at the left; the tube at the right is the first frequency doubler. The tank and antenna inductances are conveniently mounted and ready for changing. The use of the various meters is described in the text.

book are for transmitter and receiver while close to the 'phone jack is the push-pull switch for the receiver-monitor connection of head 'phones. Binding posts for extra 'phones are also shown. On the right side of the French windows is the transmitter which is built into a triangular window thus keeping it free from dust. The wooden casing on the floor to the right of the transmitter contains the 350-volt bank of dry batteries used for grid bias with taps brought out to the bakelite panel in front, the filament supply transformer, and the high tension and filter unit for the crystal oscillator tube. The main high voltage transformer and chemical rectifier is contained in the room immediately below and the high tension leads go through the floor. All the leads for the transmitter with the exception of the Zeppelin feeders which come in through the top of the window are contained in the two hollow strips of ornamental beading which can be seen on both sides of the wall below the transmitter.

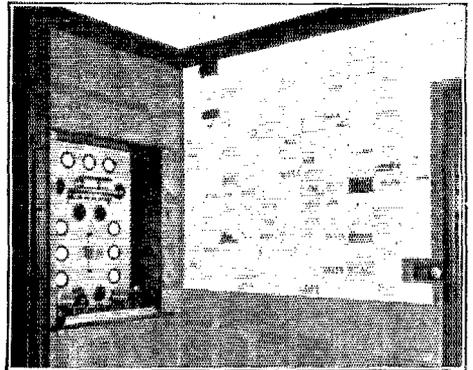
THE TRANSMITTER

A detailed description of the transmitter is given herewith.

The crystal oscillator is the tube shown in the left-hand bottom corner (see photograph) and is an LS5B1 with 400 volts on its plate and 6 volts negative grid bias. The four crystal holders will be

seen in pairs on either side of the dial in the center of the front baseboard. They are constructed of ebonite and are home-made. The selector switch used for bringing the desired crystal into operation is of the rotary type. It is mounted on the underside of the front baseboard and is controlled by the dial in the center. It is entirely homemade. The variable condenser used for tuning the tank circuit is a 250- μ fd. Bremer-Tully and is mounted behind the main panel (which, together with the front baseboard, is of $\frac{5}{8}$ " oak, French polished) its dial being the bottom left-hand one. Immediately above and to the left of this is a thermocouple meter, reading up to 5 amperes which is in series with the condenser tuning the tank circuit. The plate coil is mounted on the front baseboard below this meter and between the crystal oscillator tube and the crystal holders. Like all the other coils it is home-made and is highly polished and lacquered. It consists of 15 turns of copper strip $\frac{1}{4}$ " wide by $\frac{1}{16}$ " thick, spaced $\frac{1}{8}$ " apart on oak separators which are bolted to bakelite rings 1" wide and $2\frac{1}{2}$ " in diameter.

The output of this tank circuit is passed through a 500- μ fd. condenser which consists of two aluminum plates 2" square separated by a



A CORNER OF G5BY

The transmitter may be seen at the left. The power supply is housed in the box at the center of the photograph.

sheet of .002" mica. The top plate is mounted on an extended sounder arm and the capacity of this condenser is varied by means of the sounder relay from 500 μ fd. with the key down, to less than 2 μ fd. when the key is up. No originality is claimed for this home-made device as it was fully described in *QST*, July, 1927, under "Keying The Amplifier." Due to the gradual increase and decrease of radiation when the transmitter is keyed in this manner no key clicks whatever are caused and not the slightest trace of any back-wave can be heard when the key is up, so that a beautifully clean-cut signal is the result. This keying arrangement of sounder and condenser is mounted

on rubber in a wooden box on the back baseboard and is practically noiseless in operation.

The first frequency doubler is an LS5B tube with 700 volts on the plate and 300 volts negative grid bias and is shown on the right-hand side of the front baseboard. The tank tuning condenser is similar to that used in the oscillator and is the bottom right-hand dial. Above and to the right is its corresponding 0-5 ampere thermocouple meter while the plate coil is immediately below. The

meter and condenser, the use of clips being carefully avoided in the tank circuit. The plate current of the DET1SW is indicated by the 0-100 milliammeter mounted separately near the floor.

The output of this stage is applied to the grid of the final amplifier—a VO-150¹ type tube operating with 1200 volts on its plate and 120 volts negative grid bias. The tube is mounted behind the panel and near the top coils. The right hand coil is the plate coil for the amplifier and has

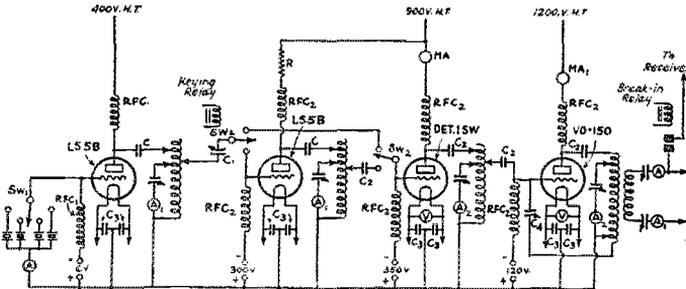


FIG. 1.—THE CRYSTAL-CONTROLLED TRANSMITTER AT 65BY

- SW₁ — Crystal selector switch.
- SW₂ — First frequency doubler cut-out switch.
- A — 0-150 M.A. thermo-couple meter.
- A₁ — 0-5 amp. thermo-couple meter.
- A₂ — 0-10 amp. thermo-couple meter.
- MA — 0-100 M.A., d.c. milliammeter — not mounted on panel.
- MA₁ — 0-500 M.A., d.c. milliammeter.
- V — 0-15 a.c. voltmeter.
- C — 1,000- μ fd. fixed condenser.

- C₁ — 500- μ fd., special variable condenser on relay — described in text.
- C₂ — 500- μ fd., 5000-volt fixed condenser.
- C₃ — 1000- μ fd. fixed condenser.
- R — 5000-ohm, 150 M.A. fixed resistor.
- RFC₁ — 200 turns No. 32 d.s.c. wire on 2 3/4" bakelite tube.
- RFC₂ — 150 turns No. 32 d.s.c. wire on 2 3/4" bakelite tube.

coil is of construction similar to the oscillator coils and consists of ten turns spaced 1/4" apart.

The second frequency doubler is a DET1SW¹ with plate voltage of 800 and 350 volts negative grid bias. It is mounted behind the panel to insure short grid and plate leads. Its plate coil is clamped vertically between two binding posts mounted on the front of the panel and is interchangeable for work on the 7-mc. and 14-mc. bands. For 14-mc. operation it consists of four turns of copper tubing 1/4" diameter as shown in the photograph while for 7-mc. work a coil similar to the one in the previous frequency doubler is used. When working in the 7-mc. band the previous stage of frequency doubling is dispensed with; the output of the keying condenser is switched to the grid of the DET1SW. The condenser tuning the tank circuit is the one above and to the left of the plate coil and is a double spaced Cyldon condenser of 450 μ fd. capacitance which was converted from an ordinary spaced double section receiving condenser. In series with it, as usual, is a thermocouple meter reading 0-10 amperes. This meter is the third one up on the left hand side. The binding posts used for holding the plate coil in position also serve to make the electrical connections between the coil and the thermocouple

12 turns for 7-mc. and 9 turns for 14-mc. operation. The antenna coil is at the left and both coils are of 5/16" copper tube highly polished and lacquered and rest on glass rods.

The method employed in making very neat yet extremely low-loss connections to these interchangeable coils may be of interest. Each coil has four connections; plate, tuning condenser, center tap and the other side of tuning condenser via thermocouple, and neutralizing condenser. The correct position for these taps is first ascertained by the use of clips after which holes were drilled through the tube and countersunk brass screws are inserted and bolted on the inside of the coil. Three-inch lengths of flexible insulated wire are then soldered to the heads of these screws, the other ends being terminated in a tag for insertion into the proper binding posts which are mounted on the panel directly underneath the coil. To change coils one has merely to loosen the four binding posts and lift off the coil complete with its three-inch leads. This operation takes about 15 seconds and one never has doubts as to whether the leads have been put back correctly when

¹ See Appendix, at the end of this article, for characteristics of the British tubes used at 65BY.

using this method. The tank circuit tuning condenser is on the extreme right of the plate coil and is similar to the double spaced one already described. Its associated thermocouple meter, reading 0-10 amperes, is the third meter up, on the right. The neutralizing condenser, shown below the plate coil, is a triple-spaced home-made

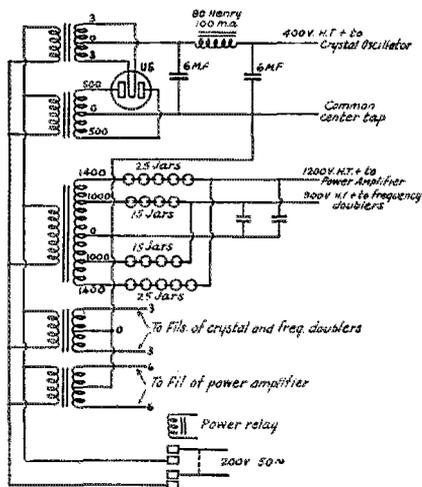


FIG. 2.—THE POWER SUPPLY CIRCUIT

variable of 150 μ fd. maximum capacitance. The antenna coil, which is coupled on the left-hand side of the plate coil, has 8 turns and is used for both 7-mc. and 14-mc. bands. To the left of this is one of the feeder condensers. The other is mounted on the side of the framework of the transmitter at the same level and is not visible in the photograph. Both are of construction similar to those already described and are of 450- μ fd. capacitance.

The three meters shown at the top of the transmitter are, left to right; 0-5 ampere thermocouple meter in Zeppelin feeder, similar instrument in other feeder, and 0-500 ma. d.c. meter in plate lead to VO-150 tube. The two remaining meters whose purpose has not yet been stated are the center ones of the two rows of three on either side of the DET1SW plate coil and are, center left, 0-150 ma. thermocouple meter in series with the crystals to indicate the load on them, and center right, 0-15 a.c. voltmeter with double-pole double-throw switch at side of transmitter to enable it to read the voltage across the filaments of either the DET1SW or the VO-150 tubes.

THE ANTENNA

The antenna which is now in use is a Zeppelin, full wave (65 feet long) on 14 mc. with 60-foot feeders. The latter are spaced eight inches apart with wooden separators boiled in paraffin wax. In order to dispense with a hand operated

change-over switch which breaks the transmitter antenna circuit the following arrangement was adopted.

The feeders were connected directly to the transmitter by the shortest possible path. A home-made relay from a sounder was then mounted close (about 6 inches) to the point where the feeders enter the triangular window in which the transmitter is housed. This relay, which has a gap of 3/16", is so arranged that it connects the receiver on to the feeder when up and when depressed, it causes the receiver to be disconnected from the transmitter antenna. The connections to the relay itself are such that by means of a switch it can be operated in two ways—either by the switch which starts up the transmitter, thus causing the receiver to be isolated from the antenna during the period when the transmitter is in operation or by means of the key. Every time the key is depressed the receiver is disconnected from the antenna thus permitting break-in operation when desired.

A NOVEL REMOTE CONTROL SYSTEM

As the transmitter is worked entirely by relays (the relay control for the power supply is also home-made from a sounder) remote control is a feature which has proved very useful. By means of a table at the operator's bedside and a separate receiving antenna, the transmitter may be operated from the bed! Separate "A" and "B" batteries are installed on the bedside table and as the receiver in the operating room is equipped with a Yaxley connecting plug and socket, it is the work of a moment to take it up to the bedroom and plug in batteries, after which the station is ready for operation.

POWER SUPPLY

The power supply is obtained from the 200-volt, 50-cycle mains by means of four transformers. The filaments of the crystal oscillator and frequency doublers are lighted by a 6-volt transformer and the 11-volt filament of the power amplifier tube is lighted by a separate one. Plate power for the crystal oscillator tube is obtained from a 500-volt home-made transformer with full-wave tube rectification and a filter consisting of a 6- μ fd. condenser, 80-henry choke and another 6- μ fd. condenser. The object in having a separate H.T.² supply for the crystal stage is to secure good regulation so the input to the oscillator tube will not be subject to variations caused by a difference in the load of the final power amplifier. The H.T. for the remaining three tubes comes from a 1400-900-0-900-1400-volt transformer and chemical rectifier. The correct voltage for the first frequency doubler is obtained from the 900-volt tap through a 5000-ohm resistance,

² The term "H. T." stands for high tension and is used in the same sense as American amateurs use the term plate voltage.

while the next stage has the output of the 900-volt tap on it. The 1400-volt tap is used for the power amplifier.

The use of a chemical rectifier may cause a little comment but it was adopted for the following reasons. As the transmitter is crystal-controlled with a separate H.T. supply for the crystal oscillator, very little smoothing is required to obtain a pure d.c. note (only one 2- μ fd. condenser is used across the 900-volt tap and another across the 1400-volt tap) and a chemical rectifier without any smoothing chokes proves suitable. Also, and this is the real point, in adjusting a crystal controlled transmitter very heavy overload currents will be drawn from the rectifier. Tube rectifiers are very expensive over here and even the best will not stand the overload they are bound to be subject to in this transmitter.³ The cells are two-pound jam jars, three quarters filled with a saturated solution of refined borax and distilled water. The aluminum electrode consists of a strip one millimeter (about .04". — Editor) thick, 4" long and 1" wide. About 60 volts per cell is found to give best results. The surprising

ber, 1928, and has proved itself entirely satisfactory for 1929 requirements. The great advantage

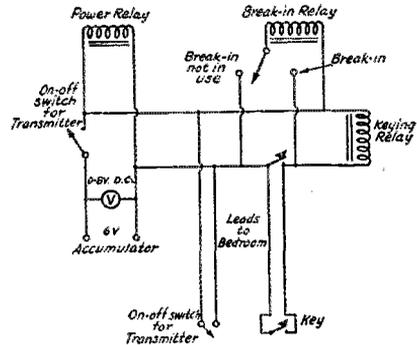
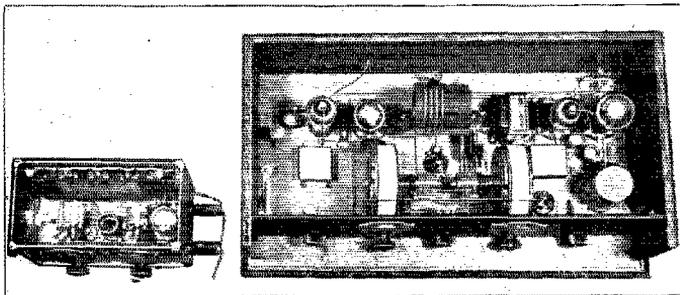


FIG. 3. — RELAY AND REMOTE CONTROL CONNECTIONS

of the pure crystal note has been particularly marked when working the west coast U. S. A. stations as they report that it stands out above the local noise level and cuts through the QRM caused by the east coast U. S. A. signals. During the spring of this year communication was obtained with more than 70 different W6's and W7's and the average of all these reports is QSA4 — over 30% giving QSA5.

THE RECEIVER AND MONITOR

The monitor is shown on the extreme left of the largest photograph while a close-up view of its interior construction is given in another photograph. It consists of the conventional oscillator housed in an aluminum box measuring 9" long and 5" wide and 6" high. It



THE MONITOR AND RECEIVER

The monitor, housed in an aluminum box, is self contained and may be carried about for making frequency measurements. It is accurately calibrated and may be used as a heterodyne frequency meter. The receiver is a copy of the four tube receiver described in QST last November. Note the numerous U. S. components used at G5BY.

success of this rectifier is attributed to the fact that the cells were formed four at a time, bridge connected, across the 200-volt a.c. mains. This method ensures that the cells are all formed, as any defective one can be easily detected when forming and another substituted. The complete rectifier, together with the H.T. transformer, is housed on a shelf in the cellar which is immediately below the operating room and the only attention paid to it is a periodical visit every six weeks to "top up" the cells. No creeping of the electrolytic has been noted and the rectifier has been in use now for nearly a year without the slightest trace of trouble.

The transmitter has been in use since Septem-

³The power supply equipment was built before the mercury vapor rectifier tubes were available. Even now it is very difficult or almost impossible to purchase these tubes in England.

can be used completely self-contained and may be carried around the room with the headphones on while listening to the transmitter. Because it is chiefly used as a frequency meter and as such extremely accurate calibration is required, an external "A" battery is provided and is plugged in by means of a jack. Two variable condensers with illuminated dials are used. One has a capacitance of 12 μ fd. for tuning and the other 100 μ fd. for shunt capacity. The tuning and reaction coils are wound on a tube base. This is shown in the center of the monitor with the tuning condenser and tube to the right of it. Two 16-volt dry batteries are connected in series for the H.T. supply and can be seen at the back, one on top of the other. The three jacks shown on the left side, front right side, and back right side are used respectively for plugging in external "A" battery, six-volt supply for illu-

mination of condenser dials, and headphones. Since the transmitter is crystal controlled, the monitor is not required to provide an accurate check on the note, so only one coil for the 7-mc. band is generally used, although a separate coil and calibration chart is available for the 14-mc. band if desired, thus simplifying calibration and ensuring a quick change to any band as the harmonic is used for 14-mc. and 28-mc. operation. Calibration is secured from the four crystals in the transmitter and is accurate to 1/10 of 1%, while the open curve of the graph permits reading to 1 kc. on the 7-mc. band. When the headphones, which are of 4000 ohms resistance, are connected to the receiver, a switch allows a resistance of 4000 ohms to be placed across the headphone connections of the monitor, ensuring the calibration when using it to heat with incoming signals on the receiver.

The four-tube receiver employs the circuit described in the November, 1928, issue of *QST*. The controls are, left to right, tickler control, illuminated dial for shunt capacity, volume control, illuminated dial for tuning, and variable selectivity control. The last mentioned control was being used when the photograph was taken, as a built-in absorption type frequency meter for fine tuning but this was subsequently taken out and a variable resistance for selectivity control substituted, the need for a fine tuning device having proved unnecessary. The tuning coils are home-made and are interchangeable, covering the 7-mc., 14-mc. and 28-mc. bands. The method of using a lumped variable capacitance in parallel with the main tuning condenser has been found most useful as it permits one to cover all frequencies between 6 mc. and 34 mc. with four coils. This facility was greatly appreciated during the daily schedule which this station kept with NKF over a period of six weeks as NKF required reports of tests on 17.5, 17.7, 20, 22.5, 23.9, 24.6, 26.3, 27.7, and 30 mc. These tests were all received by means of the 14 mc. and 28 mc. coils and variations in the lumped capacity. A Ford spark coil tuned to peak at 1000 cycles (shown mounted in the front right-hand side of the photograph) is used, together with a variable resistance in series with the shunt condenser across the coil to control the degree of selectivity. A Yaxley plug and socket enables the same receiver to be used in the bedroom (with a separate set of "A" and "B" batteries) when remote control of the transmitter is desired from there. No hand capacity of the slightest degree can be detected as the whole of the back of the bakelite panel and the under side of the baseboard is lined with 1/16" copper sheet. The dimensions of the panel are 21" by 7" and the baseboard is 9½ inches wide. The receiver is mounted sufficiently in the rear of the cabinet to permit a wooden front to be fixed into place by means of two pins at the bottom and one at the top of it when the receiver is not in use.

The time taken to change from 7-mc. to 14-mc. band or *vice-versa* is about ten seconds for the receiver and less than two minutes for the transmitter. A chart of the settings of the various controls of the transmitter for each crystal for both 7-mc. and 14-mc. bands is always kept handy and it is possible to hear a station, say on 7 mc. signing off after a CQ when the transmitter is on 14 mc. and be able to change to 7 mc. in time to

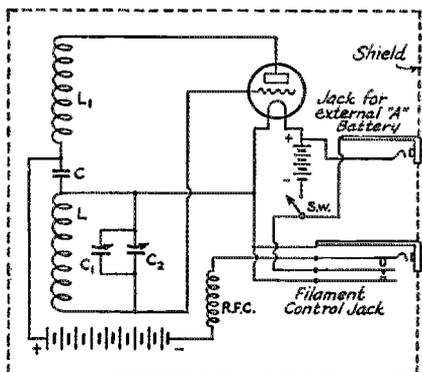


FIG. 4. — THE MONITOR-FREQUENCY METER

- C — 1000- μ fd. by-pass condenser.
- C₁ — 13- μ fd. tuning condenser.
- C₂ — 100- μ fd. variable shunt condenser.
- L — 12 turns on tube base for 7 mc. band.
- L₁ — 13 turns on tube base for 7 mc. band.
- R.F.C. — 150 turns on ½" dowel.
- S — Switch — open when external filament battery is used.

call and raise that station. This actually has occurred several times. To change the frequency within the band (from one crystal to another) takes 30 seconds. If an urgent shift is required and one is prepared to work with about 60% of normal output, QSY can be accomplished almost instantaneously by merely moving the crystal selector switch to the crystal nearest in frequency to the one in use.

In the general view of the station it will be noticed that the operator, when sitting in front of the receiver, has all the controls handy. Particular care was paid to this point when designing the layout, as much of the enjoyment of long spells of operating is spoiled if one has to be continually reaching to get at the various controls.

Since the monitor and receiver are on all the time one is operating the only controls required to change over (if one does not happen to be using break-in, when of course only the key is used) are the on-off switch for transmitter and the push-pull switch (shown directly beneath the second tumbler switch from the right) for the receiver monitor connection of headphones. This makes snappy operating and enables one to save a considerable amount of time during a QSO; while with break-in operation one can give short calls and thus prevent a lot of needless QRM — the aim of every 1929 station.

APPENDIX

For the benefit of those amateurs who are not familiar with British vacuum tubes we present operating characteristics of the tubes used at G5BY.

LS5B (Osram)

Use: Three element general purpose tube, suitable as final amplifier in receiving sets.

I_f — 1.6 amps. I_o — 60 ma. max.
Approximately equivalent to the Radiotron UX-213.

DET1SW.

No information on the DET1SW tube is available but it is believed that this tube is very similar to the Marconi DET1 tube, the operating characteristics of which are: —
 E_f — 6.0 volts. R_p — 6,000 ohms. E_b — 1,000 volts.

I_f — 1.9 amps. μ — 11
The DET1 is a "dull emitter" tube having 40 watts plate dissipation.
Approximately equivalent to the W. E. 211-A tube.

—Editor.

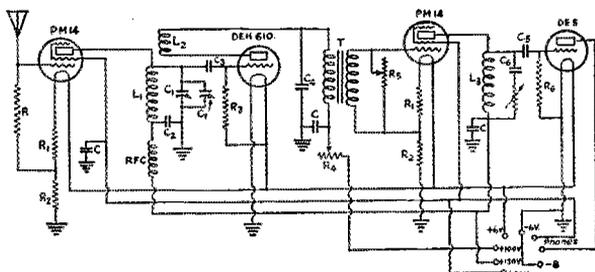


FIG. 5. — THE FOUR-TUBE RECEIVER

- C — 1- μ fd. by-pass condenser.
- C₁ — 12- μ fd. tuning condenser.
- C₂ — 4,000- μ fd. fixed condenser.
- C₃ — 1- μ fd. fixed condenser.
- C₄ — 2000- μ fd. fixed condenser.
- C₅ — 6000- μ fd. fixed condenser.
- C₆ — .01- μ fd. fixed condenser.
- C₇ — 100- μ fd. variable condenser.
- R — 10,000-ohm resistor.
- R₁ — 1 1/2-ohm fixed filament resistor.
- R₂ — 7 1/2-ohm fixed filament resistor.
- R₃ — 8-megohm grid leak.
- R₄ — 500,000-ohm Frost variable resistor.
- R₅ — 200,000-ohm Frost variable resistor.
- R₆ — 6-megohm grid leak.
- R₇ — 10,000-ohm Frost variable resistor for selectivity control.
- L₁ and L₂ — Tuning inductance and tickler wound on plug-in coil form.
- L₃ — Secondary of Ford coil.
- T — Audio amplifying transformer.
- Y — Yacley socket.
- RFC — 100 turns on 1/2" dowel.

E_f — 5.25 volts. R_p — 6,000 ohms E_b — 400 volts, max.
 I_f — 0.8 amp. μ — 5 μ_m — 800 micro-mhos.
Approximately equivalent to DeForest DV7, but operates at higher plate voltages.

DE5 (Marconi)

Use: Power amplifier in receiving sets.
 E_f — 5 to 6 volts. R_p — 7,000 ohms. E_b — 140 volts.
 I_f — 0.25 amps. μ — 7 μ_m — 1000 micro-mhos.
Approximately equivalent to Radiotron UX-201A.

DEH-610 (Marconi)

Use: Detector and radio frequency and resistance coupled amplifier.
 E_f — 6.0 volts. R_p — 60,000 ohms. E_b — 150 volts max.
 I_f — 0.1 amp. μ — 40 μ_m — 650 micro-mhos.
Approximately equivalent to Radiotron UX-240.

PM-14 (Mullard)

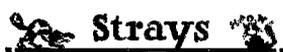
Use: Four element screen grid amplifier.
 E_f — 4.0 volts. R_p — 230,000 ohms. E_b — 100 volts.
 I_f — 0.075 amp. μ — 200 μ_m — 850 micro-mhos.
Approximately equivalent to Radiotron UX-222.

VO-150 (Mullard)

Use: Oscillator and power amplifier.
 E_f — 11.0 volts. R_p — 15,000 ohms. E_b — 1,500 to 2,500 volts.
 I_f — 6.0 amps. μ — 31
Plate dissipation: 80 watts.
Approximately equivalent to no American made tube. The UX-852 is the nearest approach we have to the VO-150.

U-5 (Marconi)

Use: Full-wave rectifier.
 E_f — 5.0 volts. R_p — 300 ohms. E_b — 400 volts per anode



W5MI gives us another suggestion for cheap QSL cards. Draw the sketch you wish for your station and send it to the nearest Eastman Kodak store with the request that they make a negative of this drawing. The negative can then be used in a printing frame in the same manner as any photographic negative. Another and cheaper method is to make the drawing with India ink on thin white writing or onion skin paper and from this make a negative on a film by placing the film behind the drawing in a printing frame and flashing an ordinary incandescent bulb on and off once as quickly as possible. The negative should be developed and from this as many cards as are desired may be printed. The sample cards submitted by W5MI were indeed mighty good looking.

W8ARO reminds us that an Electrad, type-C, 50-watt, 22-milliampere, 100,000-ohm resistor, when used in series with a model 506 0- to 200-volt Weston meter will permit the meter to read full scale deflections of 1000 volts instead of 200 volts. Of course the meter will indicate the lower voltage when the resistor is removed, so that this one meter may be used for two scales.

The "R. M. A. Better Radio Reception Manual" published by the Engineering Division of the Radio Manufacturer's Association tells in detail just how to locate and eradicate "man-made static." The manual gives detailed information as to the various types of electrical appliances which are liable to cause interference, how the cause of the noise can be located, and finally, how the noises can be eliminated through the installation of various types of filters. The manual may be obtained for \$.25 from the Radio Manufacturer's Association, 32 West Randolph St., Chicago, Ill.

Parting is such sad sweet sorrow,
I think we'll part again tomorrow.
— New York Evening Post.

VE4DK says this "pome" applies to defunct 210s.

Experimenters' Section

THE SCREEN GRID TUBE AS A DETECTOR

BOTH the directly and indirectly heated cathode types of screen grid tubes offer intriguing possibilities as detectors in high frequency autodyne receivers and reports citing excellent results are coming in from a number of experimenters. While most of the work, so far reported is in connection with the UX-222 type tube, the heater type UY-224 has characteristics which indicate that it will be found even more effective not only as a detector but also as a radio- and audio-frequency amplifier. The UY-224 has a higher amplification factor than the UX-222 (420 as compared to 300) with a considerably lower plate resistance (400,000 ohms as compared to 850,000 ohms). Since the maximum output is obtainable when the load resistance is equal to the plate resistance of the tube and as it is practically impossible to attain

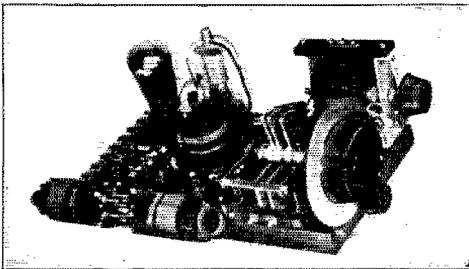


FIG. 1.—EXPERIMENTAL MODEL OF THE SCREEN GRID DETECTOR RECEIVER USED AT W1AQD

anything like such a matching in our high-frequency and audio-frequency circuits, there is a dual advantage in the employment of the UY-224 type tube. We have a higher amplification factor to start with and can approach attainment of a match between plate and load resistance in practical high-frequency circuits.

The principal objection to the UY-224 tube is its inconvenient heater demand, 1.75 amperes at 2.5 volts, but the attainment of greater output with fewer tubes minimizes this seemingly objectionable feature. Moreover, satisfactory emission is obtainable with a heater voltage of 2.0 and the possibility of operating three of these tubes, with their heaters in series, from a six-volt storage battery offers itself as an attractive possibility. The cathodes can be connected to the positive terminal of the heater battery and negative grid bias up to 6 volts obtained from that source. One practical combination of heater type tubes for the high-frequency autodyne ama-

teur receiver would be: a UY-224 as the untuned r.f. coupling stage; a UY-224 screen grid regenerative detector and a UY-227 audio amplifier, resistance or tuned-impedance coupled to the

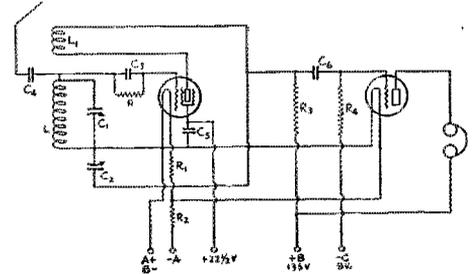


FIG. 2.—W1AQD'S SCREEN GRID DETECTOR CIRCUIT

- C_1 — 20- μ fd. tuning condenser.
- C_2 — 330- μ fd. regeneration control condenser.
- C_3 — 250- μ fd. grid condenser.
- C_4 — Antenna coupling condenser.
- C_5 — 6000- μ fd. by-pass condenser.
- C_6 — 6000- μ fd. audio coupling condenser.
- R_1 — 10-megohm grid-leak.
- R_2 — 15-ohm filament resistor.
- R_3 — 20-ohm rheostat.
- R_4 — 250,000-ohm fixed plate resistor (grid-leak type).
- R_5 — 2-megohm grid-leak.
- L — Grid coil, 8 turns No. 22 d.c.c. wire for 14,000-kc., 18 turns No. 22 d.c.c. for 7000-kc. and 38 turns No. 28 d.c.c. for 3500-kc.
- L_1 — 7 turns No. 28 d.c.c. for 14,000-kc., 10 turns for 7000-kc. and 12 turns for 3500-kc. All coils wound on Pilot forms.

detector output. Amateur receiver development is clearly following this trend and experimenters may be expected to bring forth concrete examples within the next few months.

A Receiver Using Screen Grid Detection

By Louis C. Brown *

WHEN properly employed, the screen grid tube has distinct advantages over other types of tubes as a detector. Due to its high amplification factor and low grid-filament capacity (which permits a higher L/C ratio in the tuned circuit, resulting in the application of a higher signal voltage on the grid of the tube) the tube is more sensitive and delivers a much greater output than three-element tubes. A single stage of resistance-coupled audio frequency amplification used in conjunction with a screen grid detector will give as loud a signal as

*15 Church St., Livermore Falls, Me.

a pair of 'phones can comfortably handle and will operate a loud speaker on a good amateur or short-wave broadcast signal. Due to the low grid-plate capacity, the regeneration control has small effect on tuning.

The screen grid detector has one disadvantage which, however, will not trouble many. The high plate-filament capacity, via the screen grid, prevents oscillation on frequencies higher than 20,000 kc., but if the leads are kept short (especially the plate lead) no difficulty will be had in obtaining oscillation on lower frequencies. In fact, it is in the 14,000-kc. band that the tube shows up to the greatest advantage over a -199, -201-A or -112-A. The two-tube screen grid receiver brings in sixth district stations on this

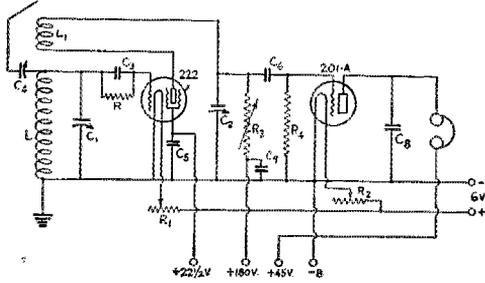


FIG. 3.—CONSTANTS SAME AS FIG. 2 WITH FOLLOWING EXCEPTIONS

- C_3 — 100- μ fd. grid condenser.
- C_5 — 0.5- μ fd. by-pass condenser.
- C_7 — 0.5- μ fd. by-pass condenser.
- C_8 — 3000- μ fd. by-pass condenser.
- R — 7-megohm grid-leak.
- R_1 — 50-ohm rheostat.
- R_2 — 10-ohm rheostat.
- R_3 — Clarostat variable resistor, 500,000-ohm.

frequency when the best a good factory made set can do is "nines." The latter set employed four tubes: one UX-222 in an untuned r.f. stage, detector and two audio. The photograph of Fig. 1 and the schematic diagram of Fig. 2 show the details of construction. Since the picture was taken the set has been built up into a panel model.

Each amateur has his own idea of what constitutes a good tuner so no detailed description of the tuning condenser or the inductances will be given. A few more turns than necessary with a 201-A will be required on both secondary and tickler to tune to the desired frequency. The resistance coupled audio is not a "funny" idea. It is a strict necessity due to the high plate impedance of the tube. In this circuit the plate resistance is in the neighborhood of two megohms (control grid bias zero, screen grid voltage 45 volts — EDIROR). Therefore, to get maximum output the plate circuit coupling resistance should be equal to that value but such a high resistance is impracticable because of the high voltage drop which would result. As a compromise a 250,000-ohm plate resistor and 135 volts of "B" battery are used.

Capacitive control of regeneration is used. If the parts are properly placed and wired and if care is used to make the plate leads short and clear of other wiring, adjustment of the regeneration condenser will have no more effect on the frequency setting than is had in a set using resistance control. If the regeneration control has a "hang over" (goes in and out of oscillation at different points on the scale) this may be remedied by changing the screen grid voltage. Because of the resistance already in the plate circuit, resistance control of regeneration in the detector plate supply lead is impracticable. A Frost potentiometer of 100,000 ohms resistance connected across the tickler has been tried with good results. A third possible means of regeneration control is the use of a "quiet" rheostat in the detector filament lead. If either of these two schemes is used, a fixed by-pass condenser is, of course, connected in place of the variable regeneration condenser.

Another stage of audio may be added if desired. A volume control could be included in the circuit, to protect your ears from the resulting signals and to prevent howling. A screen grid, peaked audio amplifier might be used with resistance coupling between the detector and the audio grid circuit. A screen grid r.f. stage may

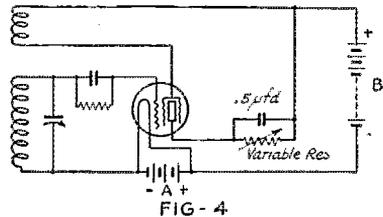


FIG. 4

also be added if desired. In this case the detector grid leak must be returned directly to the filament.

The screen grid tube has been tried as a space charge detector but the results do not approach those obtained with the screen grid circuit. Volume and selectivity are reduced; the regeneration control greatly affects tuning, due to the high grid-plate capacity, and less inductance can be used in the tuned circuit because of the increased grid-filament capacity.

FURTHER EXPERIMENTS WITH THE UX-222

John A. Baker, WIBIS, 120 Myrtle St., Claremont, N. H., reports additional interesting results of experiments with the UX-222 as an oscillating detector.

"The first circuit used the tube as a pliodynatron with a tuned plate circuit, 45 volts on the screen grid and variable plate voltage. As plate voltage was increased from nearly zero the plate current rose to about 4 milliamperes and then suddenly dropped to about 2 milliamperes, rising

again with increasing plate voltage. Oscillation at audio frequencies was obtained when the drop in plate current occurred. One-half microfarad condensers across the 'B' battery stopped the howl but no evidence of radio frequency oscillation was obtained.

"The second circuit was a standard tuned grid and tickler arrangement, the tube being used as

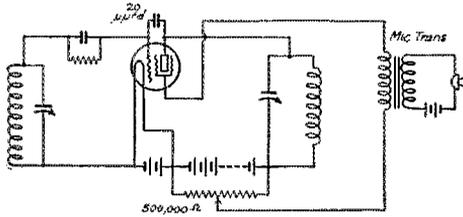


FIG. 5

a space charge detector. A stage of transformer coupled audio amplification followed. Signal strength was not much, if any, better than that obtained with a 201-A in the same circuit. Resistance coupling to the audio tube was also tried with no better results, a Clarostat being used as a combined coupling resistance and plate voltage control.

"The third circuit used the same tuner and resistance coupled audio amplifier but with the 222 as a screen grid detector. Screen grid voltage was $22\frac{1}{2}$ and plate voltage 180 through the variable coupling resistance. A very decided increase in signal strength was obtained, equivalent to an additional stage of audio amplification. Plate current and screen grid current were about one-fourth milliamperes each. The coupling resistance actually in circuit was about 200,000 ohms as determined by measuring the current flowing through the resistor when a known voltage was applied to its terminals. This would make the actual plate voltage something between 90 and 135 volts.

"A fourth circuit was tried. This used the same receiver circuit with the exception that the screen grid and plate of the 222 were connected together. Results with this arrangement were about the same as those obtained with circuit two; that is, not much better than a 201-A. Finally the tube was tried in the regular receiver circuit (screen grid) with 90 volts on the screen grid and plate voltages less than 90, to get the dynatron effect. The result was more audio howl.

"Circuit three showed such strong signals that further tests were tried with it. Increasing the screen grid voltage to 45 jumped the plate current to between 4 and 5 milliamperes with no noticeable increase in signal strength. Various sizes of grid condensers and grid leaks were tried; grid condensers as low as 100 μ fd. with grid leaks up to 10 megohms. The circuit could be made to go in or out of oscillation without fringe

howl or thumps when using grid leaks up to 7 megohms. A 10-megohm leak caused a weak fringe howl. The grid condenser was shorted and oscillations could be started or stopped with no thump or howl. This circuit required very low plate and screen grid currents while the others required from 2 to 5 milliamperes to start oscillation.

"I have no means of determining whether or not the use of the tube as a screen grid detector is more sensitive than that of three element tubes but it does give a very much louder signal. No exact measurements of sensitivity or audio strength were made. Output was judged by the signal strength as indicated by the 'phones. The experiments were conducted in the 7000-ke. and 14,000-ke. bands."

The schematic diagram and constants of Mr. Baker's "best" circuit are shown in Fig. 3. The circuit is essentially the same as that of Fig. 2.

SCREEN GRID TUBE AS A SELF-MODULATED OSCILLATOR

G. W. Ing, 1835 Leal St., San Antonio, Texas, suggests the circuit of Fig. 4 as applicable where it may be desirable to have a source of radio frequency energy modulated at audio frequency. The dynatron characteristic of the tube makes possible the audio frequency oscillation, the frequency being controllable by means of the vari-

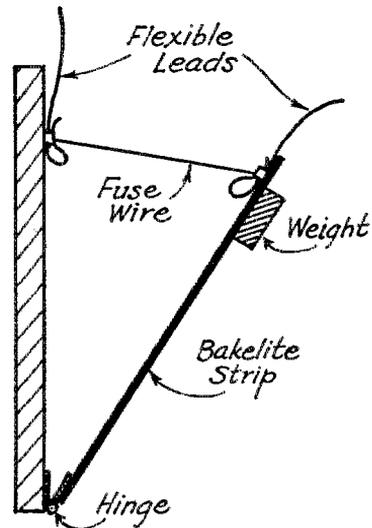


FIG. 6

able resistor in the plate supply lead. Such a modulated oscillator would be useful in checking the performance of non-regenerative receivers.

The same experimenter suggests the use of the screen grid type of tube as a combined modulator-oscillator in the circuit of Fig. 5. The tube

(Continued on page 78)

The Communications Department

F. E. Handy, Communications Manager
E. L. Bartey, Asst. to Coms. Mgr.
1711 Park St., Hartford, Conn.



Giving "It" to the Amateur Station

The Communications Manager invites contributions on every phase of amateur communication activity, offering a prize for the best article selected each month. The author whose article appears to have the greatest value each month has his choice of (1) a buckram-bound copy of the Radio Amateur's Handbook, (2) six pads of A.R.R.L. message blanks, or (3) 500 A.R.R.L. log sheets. The right is reserved to use other articles at any time with the usual credit to the author. A wide variety of subjects on which articles would be welcomed appeared with our original announcement (March QST, page 62) and the offer stands good for all articles received in 1929 marked for attention in connection with the contest. Why not sit down and send us your ideas today?

The prize-winning article by Mr. Turner calls attention to the need for high-class amateur station equipment, and also points out that with the best of transmitters, monitors, etc., operating technique must be improved. — EDITOR.

By Rufus P. Turner*

IN the forenoon of wireless-telegraphic communication, back in the days of amateur spark transmitters, crystal detectors, and other dinguses now relegated to the radio trash heap, receiving operators were not so dependent upon the call-letters of a station heard for identification. There were other means. Many present-day enthusiasts will recall identifying the old stations by certain individual characteristics of the signals, which, whether originated by amateur or commercial stations, possessed definite qualities whereby they might be distinguished, one station from the other. In most cases the distinguishing characteristic was the peculiar pitch of the note, the whine of "sync" and "non-sync" rotary gaps, or the unvarying tone of spark coil vibrators. Then, also, the operator's transmitting technique or "fist" served to give added assurances of station identity.

Once the operator of one of the old spark stations found a sharp note, pleasing to his ear and easily readable through static and other forms of interference, he allowed his interrupter to stay put and receiving operators came to know his station thereafter by the characteristic tone of the signals. Then came pure C.W. transmissions and oscillating receivers, introducing possibilities of varying the beat note at the receiving end. The advent of C.W. and tube transmission drove that highly prized quality of individuality out the transmitting station's rear exit.

A few stations retained their individuality by adopting I.C.W. sets, capable of emitting signals of the broken continuous wave type, producing in distant headphones a note of definite audio frequency. The majority of stations lost their identifying properties, with the exception of the distinction attainable by operating technique. I.C.W. and A.C.C.W. have quite rightly lost favor because of the need for increased frequency stability due to a scarcity of amateur channels. There is no room for the selfish operator who uses more than his share of our limited number of channels. Operating peculiarities, together with differences in note, or

keying characteristics dependent on circuit adjustments remain useful in making a speedy identification of operators and stations. But keying chirps and thumps, and "tails" on the end of our dots and dashes, are inexcusable and must be ironed out if our stations are to be regarded as perfect. The mode of operation, the good (or bad) procedure, and the "fist" developed by practise and attempted perfection offer the most convenient and practical means of imparting an air of distinction to a station today.

Two thirds of present-day active amateur stations have no distinguishing characteristics. The remaining third possess some little of the "it" that makes them stand out from the mass. What imparts the quality of individuality to these few stations? A characteristic tone, a certain smoothness and steadiness of our crystal clear signal, of course, is essential as a basis for building "it" around a given call signal. More than this alone is necessary, however. The writer feels that the more serious-minded station owners will agree that faithfulness to definite operating nights and frequencies is more desirable than sporadic operation. But first, last, and all the time *good operating technique* is essential to making our station stand out among the hundreds of mediocre stations on the air. Build your station well — then see that you operate it in a correct and business like way. *Good operating technique!* That's what will make your amateur reputation something of which to be proud.

Schedule-keeping is important, too, at this time when congested amateur frequency bands hamper consistent general operation. Now that the tone of the signals radiated cannot honorably be used to impart individuality to the station, and when the operator is building up his technique, he can find refuge in faithfulness to chosen times and wavelengths of operation. With certain nights and frequencies for operation, listeners-in know when and where to find a station and learn to recognize the operator's reliability and good characteristics.

Clear the way for individuality! Let the organized amateurs give some attention to giving their stations a little "IT" — a bit of signal appeal. Work for a good signal.

* W1AY, W9FZN, 5520 Jay St., N. E., Washington, D. C.

Build through schedules. Adopt standard practises. Use reliable operating technique!

Reducing QRM Between Local Stations

By Duane Magill*

IT is frequently a great help to have another amateur a block or two away, but if both stations are active in the same band, it often gives rise to an interference problem. When W9DQV and the writer (our stations are only a little over half a block apart) started up actively on the 7000-ke. band in the summer of 1927, the QRM we caused each other was terrific. While we have not entirely cured the situation, it is the purpose of this article to give a few methods which we hope may help others.

(1) The use of tube-base coils helps. The coils we used two years ago were four inches in diameter, and they had considerable pickup. The use of tube-base coils with smaller fields permits work in the 300 kc. of the present band with less QRM than when the band was 1000 kc. wide. (2) The use of short receiving antennas of bell wire strung in the room, results in further improvement. A single-pole double-throw switch may be used to switch on a longer outdoor antenna when the other station is off the air. (3) From here on cooperation is necessary. For months W9DQV and myself kept "quiet hours" for each other. These consisted in one station staying off from 2:30 p.m. to 3:30 p.m. and the other from 3:30 p.m. to 4:30, etc. Such a system is only necessary in extreme cases, and we have long since abandoned it. Naturally, if there are several stations all interfering with the rest, such a plan is impractical.

In our case at such short distances, smooth r.a.c. was worse (in interfering power) than was raw a.c. Pure d.c., however, was almost inaudible at a distance of a half block if a suitable keying filter was used. Without the filter, there would be a bad key click. The click covers a lot of frequency territory so on behalf of local BCL's, every amateur ought to use such a filter. Neither W9DQV nor myself tried complete shielding of the receiver, due to the expense and difficulty involved, and because in our case it did not seem necessary. This might help but the use of the simplest methods should be tried first. Even with stations close together, with key clicks, and high power, the situation can be improved tremendously. A mere tacit agreement, whereby the stations concerned confine their heaviest operating to times when the others cannot be on the air will frequently do much to create better feeling among the amateurs living close to each other. After all, the main point to be emphasized is that cooperation and a willingness to make some concessions for the general good will do wonders in improving any "local QRM" problem.

ARMY-AMATEUR NOTES

SECOND CORPS AREA: W2SC, the Corps Area N.C.S., has a new moto-generator and is operating almost every night. Regular Monday night schedules are being kept with W2CXL and other active AA stations in the Area. A "ZLV" (general call) is transmitted at 9:30 p.m. E.S.T. every Monday, and the regular routine goes on. W2PE, the alternate Corps Area N.C.S., is being rebuilt but will be in operation again soon.

Eastern New York State Net: W2BGB, the alternate N.C.S. of this net, has returned to AA affairs. W2ANV is obtaining new material for the Eastern New York district.

Southern New York State Net: W2BPQ, N.C.S. of the Southern N. Y. district had two weeks duty with the 101st Signal Battalion, N. Y. N. G. at Camp Dix, N. J.

Queens County District Net: W2BHY will be active again this fall.

Western New York State Net: W8AHK, the N.C.S. of the Western N. Y. district, W8DAE, W8CVJ, W8AFG and a number of other AA members attended the A.R.R.L. Con-

vention at Auburn on August 8th and 9th. A number of new recruits were obtained for the AA ranks.

New Jersey State Net: W2AOS has kept his schedules as N.C.S. of the net throughout the summer.

THIRD CORPS AREA: W3AJR is a new member in this Area. The call W8XE has been changed to W8YA.

FOURTH CORPS AREA: W4ACZ has been appointed the N.C.S. of Florida. W4ACI is the N.C.S. of North Carolina with W4AEW as alternate. W1AX is Control Station of the Third Alabama Area.

WIMK

A.R.R.L. Headquarters' Station WIMK operates on frequencies of 3575 kc. and 7150 kc. Robert B. Parmenter, "RP," is the chief operator; his list is familiar to most of the amateur fraternity. Occasionally other members of the Headquarters' staff operate at WIMK. Their personal signs may be found in the QRA Section of QST.

Throughout the following schedules Eastern Standard Time will be used.

OFFICIAL AND SPECIAL BROADCASTS are sent simultaneously on 3575 kc. and 7150 kc. at the following times:

8:00 p.m.: Sun., Mon., Tues., Thurs., and Fri.

10:00 p.m.: Mon. and Fri.

12:00 p.m. (midnight): Sun., Tues., and Thurs.

GENERAL OPERATION periods have been arranged to allow every one a chance to communicate with A.R.R.L. Headquarters. These general periods have been arranged so that they usually follow an official broadcast. They are listed under the two headings of 3500 kc. and 7000 kc. to indicate whether the watch is devoted to listening on the 30-meter band or to the 40-meter band.

3500 kc.

8:10 p.m. to 9:00 p.m. on Sun., Mon., Tues., Thurs., and Fri.

10:00 p.m. to 11:00 p.m. on Tues. and Thurs. (No OBC sent before these periods.)

12:00 p.m. to 1:00 a.m. (or later) on Sunday night (Monday morning).

7000 kc.

10:10 p.m. to 11:00 p.m. on Sun., Mon., and Fri.

12:00 p.m. to 1:00 a.m. on the following nights (actually on the morning of the day following): Mon., Tues., Thurs., and Fri. (Only on Tues. and Thurs. does the OBC precede these periods.)

SCHEDULES are kept with the following listed stations, through any of which traffic will travel expediently to A.R.R.L. Headquarters. The frequency included within parentheses indicates the band in which each individual station keeps the schedule with WIMK:

W1ACH, Brookline, Mass. (3500): Sun. and Thurs.

W1EZ, Pownal, Vermont (3500): Mon. and Thurs.

W1KY, Cambridge, Mass. (3500): Mon. and Fri.

W1VB, Newton, Conn. (3500): Tues. and Fri.

W2JF, Jersey City, N. J. (3500): Sun., Mon., Tues., Thurs., and Fri.

W3BWT, Washington, D. C. (3500): Sun., Mon., Tues., and Fri.

W3EC, Ft. Monroe, Va. (3500): Thurs.

W3SN, Ft. Howard, Md. (3500): Tues. and Thurs.

W3ZS, St. Davids, Pa. (3500): Mon. and Thurs.

W1AEF, Lakeland, Fla. (7000): Sun., Wed., and Fri.

W6AKW, Lancaster, Calif. (7000): Mon. and Thurs.

W6CIS, Sacramento, Calif. (7000): Mon. and Fri.

K6DTG, Wheeler Field, T. H. (7000): Mon. and Wed.

W6EEO, Williams, Calif. (7000): Sun. and Tues.

W8AAG, Oil City, Pa. (3500): Sun.

W8CUG, Pittsburgh, Pa. (3500): Sun.

W8DYH, Detroit, Mich. (3500): Thurs. and Fri.

W8SZ, Detroit, Mich. (3500): Sun. and Thurs.

VE9AL, Toronto, Ont. (3500): Tues. and Fri.

W9APY, Berwyn, Ill. (3500): Tues.

W9DGG, Chicago, Ill. (7000): Mon. and Fri.

W9ERU, Rockford, Ill. (7000): Sun. and Fri.

W9OX, Louisville, Ky. (3500): Sun. and Thurs.

* W9DQD-W9CLJ, 730 N. 6th St., Grand Junction, Colo.

BEGINNERS, ATTENTION!

In the Radio Amateurs Handbook you will find useful suggestions for memorizing and learning the code. Plans are afoot for printing in QST information designed to help you get your first license and to build simple equipment for receiving the transmissions which are being arranged for your benefit. Above is the first list of "volunteer stations" which will transmit code practise and other information for your especial benefit. We expect to publish additional stations' schedules in November QST. A printed sheet explaining how to make a simple receiver to cover the 1750- and 3500-ke. amateur bands will be sent free of charge, if you will drop a line to the Communications Department requesting this information. Be sure to ask for any other information you need, too, so that we may help you out.

1929 SIGNALS

3500-ke. band: W1ACH, W1AEF, W1ANS, W1A0I*, W1EZ, W1MK***, W1NH, W1NS, W2AKH, W2BEY, W2LU*, W2VG, W3ADM, W3BFL, W3FO, W3NF, W8ALP, W8AKN, W8ARX**, W8BSY, W8DAQ*, W8DNX, W8RD, W8WO, W8ZZ*, W9CQU, W9DAQ, W9DLD*, W9DLI*, W9DTK, W9DXZ, W9EAU, W9ESP, W9FHU, W9FUR, W9GHN, W9OX, W9YL, NAA.

7000-ke. band: W1AAT, W1ANZ, W1AOF, W1AXX, W1BDO, W1CNI, W1CQR, W1CRW, W1EK, W1MK***, W1XV, W2AFJ, W2AFM, W2ALO, W2AOF, W2AUP, W2BCM, W2BFF, W2FN, W2FY, W2JC*, W2KR, W2PX, W2UW, W3ADO*, W3ANH, W3AWS, W3KY, W4AEJ*, W4AGH, W4KV*, W4LM, W4OC, W4PF*, W4RZ, W4TO*, W4WS*. W5ACE, W5AFG, W5AFX*, W5AIN, W5AJL, W5QJ, W5QL, W5TD, W5MP*, W6ACL, W6AM, W6BL, W6CG, W6CGJ, W6CHW, W6CN, W6CUH, W6CWW, W6DLN, W6DNM, W6EDX, W6EEO, W6EPF, W7AO, W8ADU, W8AGI, W8BCK, W8BDR, W8BLH, W8BOX, W8CIK, W8CSN**, W8CJT*, W8DCE, W8DUA, W8EA, W8EB*, W8JL, W8LT, W8QU, W8SK, W8UK, W8VS, W8VX*, W8WO**, W8ZC*, W9ACM, W9AHQ, W9ARA**, W9AZY**, W9BEZ, W9BOA, W9BBP***, W9BQC, W9CDU, W9COS, W9CRX, W9CSC, W9CVN***, W9CWX, W9DBJ*, W9DGG, W9DWU*, W9EHO, W9EKK, W9EQP, W9ERU, W9FDJ, W9FEQ, W9GAC, W9GAR*, W9GFT, W9GHH, W9GHT, W9GHTV, W9LL, W9PU, W9RI, W4QL, VK3PP, OMITB, PXR.

14,000-ke. band: W1BUX, W1OM, W2AHU, W2AOG, W2A0J, W3ATS, W3BQU, W4AIM, W5AFI, W5BBH, W5BFP, W5QL*, W5TP, W5ZAV, W6AQJ, W6DLN, W6EPI, W8CPC, YE2BE, YE4FF.

Well-operated stations: W1A0I, W1MK***, W2ARY, W4AAV, W4TO, W4WS*, W6AKW, W6AM, W6DPJ, W8WO, W9AZY, W9ERU, K1HR, VE3VS, CE1AH, CT1BX, PY1AW.

NOTE.—The stars indicate the number of extra times stations were reported.

TRAFFIC BRIEFS

Someone recently told W1UE his signals were "among the best." We have heard other signals among the best. Hi.

W8AKC, LaFleur of Utica, N. Y., was one of the forty-nine fellows (one from each state and District of Columbia) who represented their respective states in the Edison Scholarship Contest. LaFleur is a real amateur, and we all owe him our hearty congratulations on his fine work!

'Phone men in the east are interested in having a transcontinental 'phone relay—messages to be handled by 'phone alone. The opinion of amateurs who would be interested in such a relay is hereby solicited. Address replies to the Communications Department.

The following is an account of a QRP test conducted while W4AAQ was working VK5GR on August 1: VK5GR was using 10 watts input when contact was made. Signal strength was then R7 at W4AAQ. Input reduced to 6 watts—strength was R6. When input was finally reduced to 2.7 watts (voltage—160, MA-17) signal strength dropped only to R4. This communication took place between 5:20 and 6:15 a.m. C.S.T. BF, OMs!

BRASS POUNDERS' LEAGUE

Call	Orig.	Del.	Rel.	Total
W6CHA	76	135	565	776
W6BRK	262	106	390	758
W6EEO	87	259	286	632
W3EC	422	78	106	606
K1HR	192	126	258	577
W6CBW	51	169	284	504
W6BP	68	94	340	502
W1MK	82	73	335	490
W2QU	265	137		402
W8DYH	38	92	233	363
W3BWT	53	71	235	359
W6ALX	26	151	144	321
W6CGM	25	110	180	315
W4TS	62	102	144	308
W6BIW	43	40	224	307
W6DTU	174	31	87	292
W2APV	175	168		285
W9BXB	145	43	92	280
W6AKW	5	9	260	274
W6ASH	43	41	176	260
W4AEF	48	10	200	258
W9FLG	96	96	65	257
W6KV	184	61	2	247
W9BVF	30	65	145	246
W8JD	20	37	186	246
W3ZF	43	67	123	233
W6DYW	36	17	179	232
W6DPJ	4	24	203	231
W9COE	110	105	10	225
W9GHI	110	32	78	220
W6BTZ	33	39	144	216
AC8RV	143	57	16	216
W6AVJ	162	18	34	214
W8NO	141	69		210
W8HO	69	141		210
W6SR	199	4	4	207
W6CUH	12	6	189	207
W6EIB	12	22	170	204
W6EPT	25	8	156	189
W6EPZ	24	60	78	162
W6EQF	46	85	26	157
W4QH	86	55	12	153
W6ETJ	19	64	56	139
W6DBD	28	56	47	131
W9CKZ	33	85	10	128
W6EGH	7	67	18	92
W6DLM	15	52	16	83
W2BIV	20	52	10	82
W6CNX	11	55	6	72

The several amateur stations responsible for the best traffic work—the ones that are "setting the pace" in worthwhile traffic handling—are listed right up near the top of our B.P.L., the figures giving the exact standing of each station accurately.

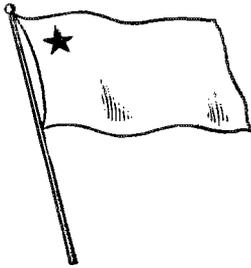
All these stations appearing in the Brass Pounders' League are noted for their consistent schedule-keeping and dependable message-handling work in amateur radio. Special credit should be given to the following stations (in the order listed) responsible for over one hundred deliveries in the message month: W6EEO, W6CBW, W2APV, W6ALX, W8HO, W2QU, W6CHA, K1HR, W6CGM, W6ERK, W9COE, W4TS.

Deliveries count! A total of 200 or more bona fide messages handled and counted in accordance with A.R.R.L. practice, or just 50 or more deliveries will put you in line for a place in the B.P.L. Why not make more schedules with the reliable stations you hear and take steps to handle the traffic that will qualify you for B.P.L. membership also!

Traffic Summaries

JULY-AUGUST

Pacific led by Los Angeles	10,715
Central led by Michigan	3587
Atlantic led by Eastern Pennsylvania	1592
Roanoke led by Virginia	1577
New England led by Connecticut	1488
Southeastern led by Georgia-South Carolina	1479
Midwest led by Kansas	1439
Hudson led by Eastern New York	1070
Rocky Mountain led by Utah-Wyoming	436
West Gulf led by Northern Texas	367
Dakota led by North Dakota	312
Northwestern led by Oregon	161
Delta led by Mississippi	95
Quebec	61
Prairie led by Manitoba	19
Vanalta led by British Columbia	3
498 stations orig. 6586; delivered 5588; relayed 11,307; total 24,401 (84.8% deliveries).	



The Los Angeles Section in the Pacific Division leads the country in traffic this month, and carries the *Traffic Banner*. This banner will go each month to the Section with the largest total of *real* messages. A traffic summary showing the standing of the various Divisions for the past month is printed below. What place does yours take? What Section will carry the banner next month and help their Division head the list?

Navy Day Competition

October 28

A NAVY DAY program of telegraphic broadcasts to amateurs has been arranged just as last year under the auspices of the Navy League of the United States. To prevent any possibility of overlapping transmissions from different stations, and to insure that everybody has a chance to get the messages, but two transmitting stations have been selected this year. Each of these stations will send the Navy Day broadcasts simultaneously on more than one frequency on the schedules which will be stated. Note that Navy Day will be Monday, October 28, 1929. It is suggested that you mark the date in the log or on the calen-

dar above the operating table, or wherever necessary to insure your ability to participate.

The telegraphic broadcasts will be sent to all amateurs including the nearly two thousand members of the Naval Communications Reserve. A Navy Day Honor Roll will appear in December *QST*. Everyone who listens and copies the broadcasts has an equal chance to "make" the Honor Roll. The more of the two messages you can copy and forward to A.R.R.L. Headquarters, the higher will your name stand in the list. There will undoubtedly be other messages sent from the District Commandants through some of the District U.S.N.R. stations and we shall be glad to have copies of these messages, but please bear in mind that only the two messages sent from NAA and WIMK count in the receiving competition. Just part of one message from these stations will put you in the list as a participating station. There is a good chance that you may be one of the few operators to receive special commendation from the Secretary of the Navy for having submitted the most perfect and complete copies of the two broadcast messages. If large numbers of perfect copies are submitted, legibility and neatness will determine the relative standing of the high operators. Allowance will be made to favor participants in the west and mid-west, due to the hour of sending these broadcasts, and depending somewhat on a comparison of the reports of conditions on the different frequencies in different localities.

A sensitive receiver and an accurately calibrated monitor or frequency meter will enable you to get all set for the contest before October 28. It will pay to spend a little time in preparation — in determining the receiver dial settings for the different frequencies which will be used. Listening in advance of the competition at the same time of day as these broadcasts will be sent will help to determine which of the several frequencies enumerated will give the most copiable signals in your location. Below is the schedule that will be followed.

It is requested that care be taken by other stations using these frequencies to avoid unnecessary interference with these transmissions. Please pass the word about the schedules around to other operators, too. It is hoped that as many amateurs as possible will participate in the Navy Day arrangements.

Many of us belong to the U.S.N.R., but this is an opportunity giving us all an opportunity to show interest and pride in our Navy, whether we happen to belong to the Communication Reserve or not. We can demonstrate our skill in copying and perhaps learn some new facts about the Navy and the Naval Reserve at the same time we have a good time twirling the dials. To a few this contest may look "too easy" but let us add that to make 100% perfect copy requires a sincere effort and considerable proficiency. So copy everything that you can, O.M., and be sure to mail it next morning to A.R.R.L. Headquarters, Attention of the Communications Department.

TRAFFIC BRIEFS

On the morning of May 17, Donald F. Wright, California short-wave reception enthusiast, heard what he believes to have been a German amateur rebroadcasting a program from a German BC station. He has confirmation of program reception from the BC station, but they do not use short waves. Mr. Wright requests the amateur to step forward as he has a report waiting for him.

Station	Freq. (kc)	W.L. (m)	Starting Time (E.S.T.)	Message from
NAA, Navy Dept., Washington, D. C. (Arlington)	4015 8030 12045	74.7 37.4 24.9	7.30 p.m. 1930	The Secretary of the Navy.
WIMK, A.R.R.L., Hartford, Conn.	3575 7150	83.9 41.9	8.30 p.m. 2030	Lt.-Comdr. Hiram Percy Maxim, U.S.N.R., Presi- dent of the A.R.R.L.

OFFICIAL BROADCASTING STATIONS
(Local Standard Time)

CALL	FREQUENCY	SCHEDULES	CALL	FREQUENCY	SCHEDULES
W1AJC	7110	Tues., Thurs., Sat., 6 p.m.	W6ALZ-	7300	Daily except Sat. and Sun.,
W1ANH	3990	Mon., Wed., Sat., 7:15 p.m.;	W6AGH		6:00 p.m.
		Tues., Sun., 10 p.m.	W6AXE	7080	Tues., Thurs., 8:00 p.m.; Wed.,
W1AQL	3846	Mon., Wed., Fri., 7 p.m.			Fri., 11:30 p.m.; Mon., 9:00
W1ATJ	3950	Mon., Wed., Fri., Sun., 6:30			p.m.; Tues. and Fri., 6:30
		p.m.			a.m.
W1BEP	3500	Mon., Wed., Fri., 7:30 and	W6BJX	7143	Tues., Sat., 7:00 p.m.
		10:30 p.m.—also, at odd	W6BZR	7190	Mon., 6 p.m.
		times during the week.	W6BZR	14,280	Fri., 6 p.m.
W1BGM	3725 (cc)	Mon., Tues., 7 and 10:30 p.m.;	W6DHM	3500	Tues., Thurs., 7:15 p.m.
		Wed., Thurs., Sun., 10:30	W6DKV	7150	Tues., Thurs., 7:00 and 10:30
		p.m.			p.m.
W1BIL	7100	Tues., Fri., 5 p.m.	W6DPU	3500	Sun., 9:00 p.m.
W1CDX	3500	Tues., Thurs., Sat., 6:15 p.m.	W6ZZI	14,150	Wed., 5:00 p.m.
W1KX	3850	Sun., 9:00 p.m.	W6EDD	7300	Tues., Wed., Thurs., Sat., 6:00
W1KH	14,300	Sun., 8:00 p.m.			p.m.
W1MK	3575 & 7150	Sun., Mon., Tues., Thurs.,	W6RJ	3650	Mon., Wed., Fri., 8:00 p.m.
		Fri., 8:00 p.m.	W7AAW	7180	Mon., Wed., Fri., 2:30 p.m.
		Mon., Fri., 10:00 p.m.	W7DD	7100	Mon., Thurs., 6:00 and 10:00
		Sun., Tues., Thurs., 12:00			p.m.
		p.m. (Midnight)	W7DD	3550	Mon., Thurs., 10:30 and 11:00
W1QP	3860	Mon., Wed., Fri., 7 p.m.			p.m.
W2APV	7240	Mon., 7:30 p.m.; Thurs., 11:00	W7DD	14,200	Sun., 1:00 and 4:00 p.m.
		p.m.	W8BWP	7150	Tues., Thurs., Fri., 7:30 p.m.;
W2AXT	3540	Mon., Tues., Fri., 7 p.m.			Sat., 10:30 p.m.
W2AXT	7080	Mon., Wed., Fri., 6:30 a.m.	W8CEO	3725	Mon., Wed., Fri., 7:00 p.m.
W2BBS	14,160	Sun., 10:30 a.m.	W8DLG	7015	Sun., 12:30 p.m.
W2CRO	7000	Tues., Fri., 7 p.m.	W8DLG	7000 & 3500	Mon., Wed., Fri., 10:30 p.m.
W2CTH	7000	Tues., Sun., 7 p.m.; Sun., 10:30	W8DME	3940	Mon., 7 p.m.
		p.m.	W8DME	7100	Wed., 7 p.m.
W2FF	7175	Mon., Sat., 10:30 p.m.	W8DME	14,280	Sat., 7 p.m.
W2FF	14,200	Sun., 8 a.m.	W8DQP	3500	Wed., Fri., 10:30 p.m.; Sat.,
W3AXX	7310	Transmits broadcasts at various			Sun., 7:30 p.m.
		times during week.	W8DRJ	7142	Sat., Sun., 12 noon; Mon.,
W3ALE	7300	Mon., Tues., Thurs., 7 and			Wed., Fri., 10:30 p.m.
	3665	10:30 p.m.	W8HD	3659	Mon., 8:00 and 9:00 p.m.
W4AEF	1700	Mon., Wed., Fri., 1:30 p.m.	W8HD	7143	Mon., 7:30 p.m.
		and 12:30 a.m.	W8HD	14,286	Mon., 7:00 p.m.
W4AEF	1400	Mon., Wed., Fri., 4:30 p.m.	W8PL	7055 (cc)	Mon., Wed., Fri., 5:30 p.m.
		and 7:30 p.m.	W9BAN	7175	Mon., Wed., Fri., 11:30 p.m.
W4AEF	14,000	Tues., Thurs., Sat., 6:00 p.m.	W9BEU	7160	Daily, 9:30 p.m.
W4AHR	7100	Mon., Thurs., 9:00 p.m.; Sun.,	W9BEU	14,320	Daily, 7:00 p.m.
		8:00 a.m.	W9BJA	3660	Sun., 7:30 p.m.; Mon., Wed.,
W4AH	7300 (cc)	Mon., Thurs., 7:00 p.m.			Sat., 8:00 p.m.
W4AI	14,100	Wed., 1:30 p.m.	W9BJA	7140	Mon., Thurs., Sat., 3:30 p.m.
W4HK	3750	Mon., Wed., Fri., 11:00 p.m.	W9BKJ	3930	Tues., Thurs., 7:00 p.m.
W4HK	7120	Mon., Wed., Fri., 7:00 p.m.	W9CBK	7040	Daily, midnight.
W4MS	14,000	Mon., Tues., Wed., Thurs.,	W9DAE	3670	Sat., 10:30 p.m.
		Fri., 5:30 p.m.	W9DQN	7100	Mon., Wed., Fri., 11:30 p.m.;
W4MS	7000	Mon., Wed., Fri., 12:30 a.m.,			also 8:30 a.m. when possible
		also at intervals on Sundays			same days.
		on both frequencies.	W9DUD	14,000, 7000	Mon., Thurs., 7:00 p.m.;
W4RN	7250	Mon., Wed., Fri., 6 p.m.; Sat.,		& 1715	Tues., 7:30 a.m.; Sun.,
		10:30 p.m.—also several			10:00 a.m.
		times on Sunday on 14,000-	W9ERU	3850	Tues., Sat., Thurs., 7:30 p.m.
		kc. band.	W6ASM	7190	Mon., Wed., Fri., 7:00 p.m.—
W4TS	7125	Sun., 2:15 and 7:30 p.m.;			sometimes Sun. mornings.
		Wed., Sat., 8:00 p.m.	W9ZD	7300	Tues., 7:30 p.m., Fri., 10:30
W5AKP	7300	Tues., Thurs., 8:00 p.m.; Sun.,			p.m.
		10 a.m.; Sat., 3 p.m.	W9FFD	3870	Mon., Fri., 9:45 p.m.
W5ASQ	7140	Tues., Thurs., 8:00 and 9:00	W9FFD	7245	Wed., 9:45 p.m.
		p.m.	W9EGU	7094	Daily except Sun., 7:00 p.m.
W5AZD	7300	Mon., Wed., Fri., 7:00 and	W8EQ	7150	Thurs., 9:00 p.m.
		10:00 p.m.	W2PF	3876	Wed., 10:00 p.m.
W5BBF	7150	Tues., Thurs., Sat., Sun., 12:30	(W28C)		
		p.m.	W7IZ	7140	Sun., Thurs., 9:00 p.m.; (28
W5KX	3516	Mon., 5:30 and 11:00 p.m.			mc.) Sun., 1:00 p.m.
W5MM	7315	Mon., Wed., Fri., 6:30 p.m.	W9CN	7310	Mon., Wed., Fri., 8:00 p.m.
W6ABK	3510	Daily except Sat. and Sun.,	W9DBJ	7000.4	Mon., Wed., 7:00 p.m.
		7:00 p.m.	W6EDK	7070	Mon., Wed., Fri., Sat., 1:00
W6AKW	7100	Sun., 6:30 a.m.			and 8:00 p.m.; Tues., Thurs.,
W6ALG	3528	Sat., Sun., 6:45 p.m.			1:00 and 7:00 p.m.

(cc phone)

WANTED, VOLUNTEERS

At the urgent request of numerous beginners, we are again devoting space in this Department to list the schedules of 1750-ke. amateur stations who will broadcast information and code instruction to beginning amateurs. The newcomers to the amateur ranks need code practise more than anything else, instruction in amateur operating practise, and two-way work with patient experienced operators as soon as they secure their licenses to increase their proficiency in using their stations. Thus it is, that we are listing below the few stations that have already volunteered. But we need many more volunteer transmitting stations in the 1715-2000-ke. (150-175 meter) band.

Both C. W. and radiophone stations can engage profitably in broadcasting and two-way work for beginning "hams." Radiophone volunteers are really preferred, however, as by using *both* microphone and key instruction can be given most efficiently to the listeners. Last season those who took part in this work had gratifying results and built up large audiences and many friends, who listened regularly as soon as the schedules were announced. So if you have a 1750-ke. radiophone or telegraph transmitter and can engage in this most worthwhile work, please drop us a line at once, giving data on your exact frequency, hours of schedules, etc., and prepare to follow your schedule as soon as it is in print. We shall be glad to send you some mimeographed ideas and helps which will help you in putting this service over to those who copy your transmissions.

1750-KC. VOLUNTEERS' SCHEDULES

Station	Location	Freq.	Days	Hours (Local Time)	Remarks
W5RDT	Gouldbusk, Texas	1760 kc.	Fridays	9:30 p.m. on.	ICW and 'phone will be used.
W6EAF	Independence, Calif.	1750 kc.	Fridays	8-10 p.m.	
W6EEQ	San Leandro, Calif.	1940 kc.	Sundays	8-9 a.m. 6:45-7 p.m.	
W9BSP	Olathe, Kans.	1780 kc.	Everyday	7:30-8 p.m.	Ten-word speed for first twenty minutes, and about 20 WPM for last twenty. Five minutes devoted to explanation.
W9EBD	Menasha, Wis.	1715 kc.	Sundays Mondays	12:30-1:30 p.m. 6:15-6:45 p.m.	
W9FLS	Ava, Ill.	1715 kc.	Tue.-Thurs.	10:30-11:15 p.m.	
W5RJ	Ft. Worth, Texas.	signified intention of sending code practise, but gave no definite schedules.			

Expedition Work

AMATEUR station-owners are requested to keep us informed of all their contacts with expeditions. Expeditions are invited to send information from month to month and as far in advance of their movements as possible. When no information is received of an expedition after a definite length of time it will be dropped from our tabulation which runs elsewhere in *QST*.

WFA

Knight and Link of W2ALU have been working WFA about once a week for the past two months and taking quite a few messages. WFA's signal is now so erratic that it is difficult to copy through the New York noise level. Using a stage of "224" amplification WFA can be copied solid without antenna (usually on about 7800 kc.) when the rapid fading does not prevent. W2ALU and W6CUI have successfully worked together both stations copying and checking when the signals are so poor that WFA-WHD schedules fail. WFA sometimes comes through as early as 10 p.m. E.S.T. WFAT has also been worked. Macy of W9UM recently handled quite a bunch of traffic for WFA and reported "MIN" at the key. W7MB also contacted with the Byrd expedition in early August, his signals being reported fair through very severe QRN.

PMZ

Some anxiety was felt during early August for the safety of Professor Seelman and radio operator Wells (exW3ZD) who were not heard from for several days while making their way inland to the headwaters of the Murung River,

a 35-day trip. After a hazardous trip into territory never before visited by a white man the party returned to its base, tagged by exposure and hardships but reassembling the base station and reporting its safety by messages to this country via K1CY and W6AKW. The portable Burgess-battery operated transmitter (7300 kc.) was used by the field party for direct contact with K1CY who reported the signals weaker and weaker until poor radio conditions and failure of a spare power supply unit made it impossible to keep schedules.

Kessler of W6EPZ contacted with PMZ on the morning of August 17 (P.S.T.) assisting in some radio tests. The 500-cycle base station equipment was being used. XIAM is located about 250 miles south of San Diego, California. This Mexican station keeps fine daily schedules with W6EPZ, but his operating hours are limited as he has to conserve the B-battery power for his portable transmitter. XIAM is reported to be working on about 7320 kc.

WDDE

Schooner *Bowdoin*, WDDE, Nr. 217, August 30 (by radio via W1AFB) — Radio conditions have been very poor since my last report for *QST*. Weather up here terrible. Rain, snow and fog. In fact, it has been stormy most of the time with seas so rough you can see almost nothing. We are in a new place almost every night. Received complete news about the *Graf Zeppelin*. Only a few stations worked as they don't seem to listen for me on 23.18 meters. W2AW has been

mainstay, although have been getting wonderful support from W9ETA, W9EF, W1AFB, W8AXA, W2BUO and W1RW. Two of our men, a Frenchman and a half-breed Eskimo will stay at the base this winter but no radio transmitter will be installed as first planned, as Frank Henderson is returning to the States. We shall have to depend upon middle west stations for QSO after we pass the Straits of Belle Isle. Expect to arrive back in the U. S. A. September 15th. Until next report, 73.

— Brooks

W2CVJ, W1BCU, W1KH, VE1AR, and W3AJD have all been of assistance in handling traffic for the International Grenfell Association with its stations V08AE (St. Anthony, Newfoundland) and V08WG (Northwest River, Labrador). V08AE and V08WG both work near the 14,000 band. Additional stations in or near New York City are requested to attempt to arrange schedules with these stations to facilitate the handling of traffic to the Association whose offices are located at 156 Fifth Ave., New York City. Please don't forget to keep A.R.R.L. Headquarters fully informed of your contacts and schedules with these stations.

W3AIA reports that the Yacht *Abacost* burned to the water while anchored at Long Island.

TRAFFIC BRIEFS

Beginners who are looking for code practise of a somewhat advanced nature should try copying the Official Broadcasts sent from W1MK. These are sent at a speed of 10 to 12 words per minute.

TRAFFIC BRIEFS

Western Ontario Hamfest

A hamfest will be held at the Hotel London, London, Ontario, on October 9, under the auspices of the Western Ontario Amateur Radio Association. It is scheduled to start at 1 p.m. and continue throughout the afternoon and evening. An excellent program is planned and a cordial invitation extended to all amateurs in that and neighboring sections. For full particulars write David S. Hutchinson, 111 Sackville St., London, Ontario.

Here's a good one! W8DLG sent in the following as a "sample message" on the back of his ORS application forms: "HR MSG FM HARTFORD CONN WIMK NR 200 AUG 5 OK 41 TO A W MCAULY 309 THIRD ST OAKMONT PA-----CONSIDER YOUR CONNECTIONS WITH THIS ORGANIZATION SEVERED STOP REASON FOR DISMISSAL YOUR REFUSAL TO GRANT OFFICIAL RELAY STATION APPOINTMENT TO W8DLG STOP 99-----SIG F E HANDY ARRL COMMUNICATIONS MGR" (After that one SCM McAuly thought it best to give W8DLG his ORS Hi)

Louie Huber, W9DOA, formerly of the Headquarters staff, is now Ensign, C-V(S), in the U. S. N. R. FB OUI!

The Miami Amateur Radio Club and the American Legion Post of Miami, Fla., are cooperating to provide a reliable communication system in the event of another hurricane. A 50-watt station is being installed in the club rooms, and will operate under the call W4LA. At least one member will be prepared to handle traffic when the power goes off. W4AJD operates regularly from a dynamotor supplied from a Delco plant. It is understood that the Miami Naval Reserve will have a portable set on a truck in case of disaster in surrounding communities. We don't want to see another hurricane, but it is fine to see the amateurs prepared! Good work, Miami!

W2QU reminds us that there are numerous amateurs who maintain regular schedules with foreign countries, and suggests that we start a column to list these schedules. We shall be glad to consider it when sufficient material is received to make it practical. We must make certain specifications for such a list, however.

1. Schedules must be reliable and in effect at least one month after publication.
2. Operators of stations whose schedules are published must agree to get all messages off promptly.
3. Whenever messages cannot be delivered sender must be advised.
4. Headquarters must be notified at once of any change in schedules so the list may be corrected.

Would you like a column according to above? If you keep any foreign schedules and can comply with the rules, send us the dope.

W1SZ is in daily communication with Australia.

W2QU can move traffic for Nicaragua on his daily schedule with NN1NIC.

W8CFR has daily schedule with PYIAW in Brazil.

W8CXC invites traffic for Costa Rica for his schedule with T12HV on Monday nights.

Let's hear from the rest of you who have reliable "foreign contacts."

W8DBK says a government survey indicates that the only bug showing signs of laziness last summer was the radio bug. Hi.

The first get-together of the Chair Warmers Club was held in the form of a good old hamfest at W8ARJ, Curtice, Ohio, on July 28. In addition to a good number of members, several non-members were present, including W8BYN, W8CJN and XYL-W8CNO, who acted as official waffle passer. The purposes of the Chair Warmers Club, which was

formed for disabled and invalid amateurs, were announced in August QST. Write W8BRS, if interested in joining.

NX1XL, the station of the University of Michigan Greenland Expedition, Mr. Evans, Greenland, has been closed for about two years after which time operation will probably be resumed. NX1XL has worked stations in all parts of the world and, a few months prior to closing, was in communication with WFA, thus directly linking an expedition in the north with one in the far south for the first time.

A short time ago, F. W. Albertson of the University of Michigan's station, W8AXZ, heard VK2ME, Sydney, Australia, rebroadcasting KDKA's signals. KDKA was, in turn, rebroadcasting WFA! The total mileage travelled by WMA's signals before reaching Mr. Albertson is some 30,000. Zowie!

W2XE, which is the experimental call of BC station WABC, broadcasts daily from 7 a.m. to 11 a.m. E.S.T., on 50 meters, using 500-watt crystal controlled transmitter employing 4-250 watters as modulators and one 861 as amplifier. Amateurs are requested to listen for them and report information on reception direct to W2XE.

W4TZ is radio operator on the American International Airways' biplane, the *Southern Cross*, which left Tampa, Fla., a while ago, on a survey trip to Chile. We wish "Red" luck!

The Cleveland police broadcasting system, which is about to go on the air with call WRBH using 175 meters and 750 watts, was engineered by one from the amateur ranks, W8COX. He expects to function as "chief" when the system gets under way. Remember us, OM. Hi.

SHIFTING YOUR FREQUENCY

All amateurs know that QRM is bad, but we cannot help it any by growling. There is one way to lessen it, however. The present bands seem to be at their peak periods between six and ten at night. How often we have all heard fellows swishing up and down the band with a note like a buzz saw, even during that period. Maybe they can't afford a better note, but it doesn't cost money to change your frequency in a quiet manner. You may ask how. Just this: Pick a time when there are only a few stations on the air, then with a reliable frequency meter calibrate the dials of your transmitter so that you can shift frequency from one part of the band to another without having the power on.

You can readily see the advantage of this. You will cause no QRM to the other fellows, and you will be helping everyone. Think of the amateur in Australia, or the Island of Boohunk for that matter, who is trying to QSO someone in the United States, only to have an inconsiderate ham come along QSXing up and down the band spoiling the QSO for both parties. Is that right? No! And I for one am in favor of adjusting my transmitter so that I can change frequency with the power off. Let's make our operation more clean cut and a credit to amateur radio in general.

— George W. Mesher, O.R.S., W6ERK

W5AZD suggests that stations copying Official Broadcasts should call the OBS after he has shut down and acknowledge receipt of the broadcast. FBI Official Broadcast Stations have little way of knowing that their OBS are being copied. Let's give them our thanks hereafter.

Sea-going hams, attention!! W9EVA, now radio operator on shipboard, takes a short-wave receiver on his trips and keeps in touch with things by copying regular broadcasts from W9FZQ in his home town. No need to get homesick these days, Sparks!

A hamfest, arranged entirely by 'phone, was held at W2MA's in Pelham Manor, N. Y., on Saturday, August 10. Those present were W1AOZ, W1CGR, W1QV, W2ACD,

W2GJ, W2MA, W2QN, W2QU, W2SS, W2UV and W3CGB. An enjoyable time was had by all. FB!

Phone men will be interested in the following crystal frequencies, checked by reliable meters, furnished by W1AOZ as a help to them in keeping within the 3550 to 3500-ke. phone band: W1AOZ—3520 kc., W1CGR—3504 kc. Also, W1MK's regular frequency is 3575 kc., just 25 kc. outside the 3550 kc. limit.

A friend of W1AOZ recently mentioned his desire to get in touch with his brother in Schuylerville, N.Y. W1AOZ made a schedule with W8DBQ in that city, and the following

night both brothers were on hand at the respective stations. A very interesting and brotherly two-way phone conversation ensued. We amateurs have often experienced a well-known sense of satisfaction when putting two members of the general public in touch by radio telegraph contact—but think how much more satisfaction the brothers must have experienced in actually hearing each others voices and having a full opportunity to exchange greetings and news.

W3AIN, W3BA and W3VO at Philadelphia have handled quite a bunch of traffic to W1AOZ's folks, phone being used very effectively in handling the messages. W1AOZ thinks phone men should handle more traffic.

DIVISIONAL REPORTS

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Don L. Lusk, W3ZF—W8DHT is giving W3ZF a merry chase for traffic honors. Hi. We are in need of more men like W8DHT. The hot weather is almost past and I'm looking to some mighty fine traffic totals in this section. W8AWO just got back from six weeks of fun and is ready for the daily grind now. W3AFE is trying for traffic and an ORS. W3NF is still working on the Lehigh Valley Radio Club organization but manages to handle some traffic. W8VD has a beautiful 1929 signal on 3500 and pushed out traffic this month, two more reports than you are eligible for ORS. Bert, W3CDS reported no traffic for the second straight month. Am sorry, OM, we must have traffic or QTA of ORS. It's extremely easy to handle at least ten messages per month. W8DRG wants 7000 and 3500 kc. meter skeds badly. He is installing xtal and will be going by the time this is in print. W3AUR is trying to make WAC on 14,000 kc. and is also fooling high frequency tissue effects. W3MC sent his reports in early because of vacation. W3ZF leads the section again with traffic.

Traffic: W3ZF 233, W8DHT 114, W8VD 59, W3NF 39, W3AFE 37, W8AWO 10, W3AKB 10, W8DRG 6, W3AUR 3.

SOUTHERN NEW JERSEY—SCM, M. J. Lotysh, W3CFG—Activity slumped badly during the summer months. W3ASG, W3ATJ and W3CFG are doing some work but the rest are painfully silent. W3CFG is still in New York City and only gets on the air over week-ends. W3KJ is going to try for a commercial ticket. This section is badly in need of active ORS so let's have more applications. We want some BPL members this coming season.

Traffic: W3ASG 29, W3CFG 10, W3ATJ 8.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Forrest Calhoun, W3BBW—Maryland: More fellows reported from this state than any of the rest but traffic is still missing. W3AJR, a new ORS, leads the state with a nice total. W3MH is on again. We welcome two new ORS this month—W3NY who is on 14 mc. and W3DG on 3600 kc. The SCM station, W3BBW, is sure lost in the woods but I hope to be with you soon. Dist. of Columbia: W3BWT leads the entire section again! He is our new Route Manager so let him hear from you, gang, in regards to skeds and traffic routes. W3ALF is going strong on both 7000 and 3500 kc. with d.c. Delaware: Only one station in this state reported again this month so it looks as though Delaware is going on the rocks as far as hams are concerned. Hi, W3ALQ is the lone star and reports a new ham in Seaford, W3WI. Well, fellows, this is my first report since the election and I want to take this opportunity to thank you for the cooperation. Sorry to say I will have to do some more cancelling unless I get your reports. Let's have them. We led the division for the month of June to July. FB and keep it up.

Traffic: W3BWT 359, W3AJR 49, W3MH 21, W3ALF 16, W3ALQ 10, W3BBW 2, W3NY 1.

WESTERN NEW YORK—SCM, C. S. Taylor, W8PJ—Well, gang, this month starts things going again. W8AG has several schedules. W8AHC, W8CNIW, W8BGV and W8DME are handling traffic. W8BCM is rail-riding at present. W8BHK worked EAR on 14 mc. and also handled some traffic. W8BJ attended the Auburn Convention.

W8BLP worked France, Germany, Australia and handled many messages for west coast on 14 mc. W8BUP is in Boston at radio school, 2nd op. Mr. White is handling traffic at W8BUP. W8CDB is handling traffic and building a new transmitter. W8CEI is rebuilding his transmitter. While on his vacation W8ABQ visited W1ARG, W1WU and Headquarters. He sat in at W1MK with "RP" until 2 a.m. one night. Pretty late for you, OM. Hi, W8CSW will open up again soon from Cook Academy. W8CVJ is on again with traffic. W8DDL will open up soon with fone on 3530 kc. and expects to handle traffic, mostly by fone. W8DII has started out with a schedule. W8DQP is keeping schedules. From reports this month the Central New Yorkers had a fine time at the Convention at Auburn and many dignitaries attended.

Traffic: W8AGI 12, W8AHC 20, W8BGV 11, W8BAK 13, W8BLP 64, W8BUP 9, W8CDB 30, W8CNIW 10, W8CVJ 7, W8DDL 18, W8DII 27, W8DME 8, W8DQP 9, W8PJ 7.

WESTERN PENNSYLVANIA—SCM, A. W. McAuly, W8CEO—Less than one-third of the ORS in this section reported this month. Write to W8CFR, W8CZN and W8CUG and ask them how they keep track of it. Their reports come in like clockwork, all through the year. W8CUG again leads the pack with five skeds. W8CFR is handling Brazilian traffic on 14,000 kc. W8DLG, a new ORS, sends in a nice report. He says there may be another ham station in Brookville soon. W8CZN reports VK, ZL and K6 stations QSA5 on 7000 kc. band now between six and eight a.m. W8DKS sends in a good long letter. W8GI still keeps his sked with W3SN. W8DKQ reports the new station coming along slowly. W8DNO reports good results from his new location. W8GU will be in Denver for some time and will be glad to test with the east, especially Erie. The Erie Amateur Radio Club will hold their annual banquet on September 28 and several important amateur radio problems will be discussed. The Amateur Transmitters Association puts out a snappy news sheet once a month. The membership is well over a hundred now. Good radio weather just around the corner. Let's go!

Traffic: W8CUG 175, W8CFR 66, W8DLG 26, W8CZN 23, W8CEO 18, W8DKS 6, W8GI 4, W8DNO 5, W8WAY 13.

CENTRAL DIVISION

WISCONSIN—SCM, C. N. Crapo, W9VD—W9FVB sends in a good report from his summer location at the Univ. of Wisconsin summer school. W9BWZ has schedules with W9PX and W9ALA. W9DKA says he ruined two perfectly good tubes, but will have a new 852 on the air soon. W9DJK-W9CUF is operating on 7000 kc., and says one can't expect a large traffic total when working in that band. W9FHU reported via radio. W9DLD visited W9FVB during the past month. W9FSS was not on very much the past month. W9OT just returned from a trip through Wisconsin, Minnesota and Canada, having visited stations W9ANM, W9ZC, W9KV, W9CKI, W9CF and W9L. W9DEK is on 14,000 kc. now, but will change to 3500 kc. about Sept. 30 for the winter season. W9DTK had a very enjoyable trip on the Lakes with the Fleet. W9VD is on about once a week, usually Mondays, on 3579 kc. for Army traffic.

Traffic: W9FVB 33, W9BWZ 21, W9FHU 16, W9DJK 14,

W9DKA 10, W9DLD 10, W9FSS 10, W9OT 6, W9DEK 4, W9DTP 4, W9VD 8.

INDIANA — SCM. D. J. Angus, W9CYQ — We regret very much to report the death of Mr. Ed Turner, W9EKW, Richmond, Ind. The Naval Reserve at Indianapolis are getting bids on a complete crystal-controlled transmitter to be used as the section control station at Indianapolis. This transmitter will be in operation in about two months. W9EEY is again on the air. W9PF is discontinuing operations for the rest of the summer. W9DHI is again rebuilding. W9AIN has moved his junk pile to Indianapolis, where he is a permanent resident, and will soon be on with his 50-watt xtal-controlled. W9FCG is on the lakes cruising with the Naval Reserve. W9CNC is putting in a 500-watt screen-grid xtal-controlled job. W9GKI wants schedules. Can you accommodate him? W9EVB is getting out with 200-volt plate supplies as well as with higher powers on 7000-ke. band. W9DAQ, a new station, started with a bang, on 3500, and wants traffic. W9FZQ is a new one at Laporte. W9AKD is putting in a crystal. W9AJH rebuilt, and gets out FB now. W9FCX put in a new Zepp antenna. An amateur radio club is being organized at South Bend. W9FZQ is putting up higher antenna poles to help his DX. W9ABP plans to build a plane soon and install radio xmitter and receiver therein. W9AEB has put up a new Zepp antenna and installed a High C xmitter. W9AUX plans to be on again very soon. W9BQH has a new High C xmitter and is working the west coast quite consistently. W9BYI has been too busy with orchestra work to be on the air. W9CEM is a fireman, and put out a fire across from W9BQH. He has a new junior on now. W9DDZ is back on the air after pounding brass as a commercial operator. W9DHM has joined the ranks of the Benedicts, but is still in the game. W9DVE is a new potato grower now, and says that isn't the half of it. W9EPB is rebuilding his speed boat, so not much time for radio. W9ASB is a new ham in Elkhart.

Traffic: W9FYB 10, W9GKI 10, W9FCG 7, W9PF 7, W9EEY 9, W9DAQ 18, W9FZQ 2, W9RW 20, W9DSC 8, W9EVB 8, W9CYQ 15, W9EF 39.

KENTUCKY — SCM. J. B. Wathen, III, W9BAZ — This report is written from Covington, where I am being entertained by the gang. And how! W9FS received his prewar trophy for traffic handling, and we all helped kill it. W9GGB and W9FS have been appointed ORS. W9AZY has been after DX with consequent drop in traffic. W9FZY has everything ready for big opening on Sept. 1st. W9CEE has a good outfit perking now, and is looking for traffic. W9ELL is expecting a junior operator. Bet it's a YL. He never was lucky. Hi. W9FBV has vamoosed to Michigan and is taking out an 8 call. W9CMK finally reports to say that he has moved to Chicago. Sorry to lose you, OM. W9GBX will earn his WAC when he gets three more continents. W9FGS will be on as soon as he can screw up some cooler weather. W9ETD is bothered with business and doesn't find time to pound much brass. W9BAN suffered \$30 damage from lightning. Page the junk man. W9BXX is looking over new houses. W9AUH is with us once more, and promises to be the real thing this time. There will probably be another prize offered for high traffic totals about October, so brush up your skeeds and get going.

Traffic: W9BXX 50, W9FBV 19, W9BAN 16, W9CEE 13, W9FS 10, W9AZY 9, W9ETD 8, W9AUH 6, W9BAZ 4, W9ELL 4, W9FZY 1.

MICHIGAN — SCM. Dallas Wise, W8CEP — W8BGY handled some traffic direct with ZL1FT at Auckland, N. Z. W8BRS is kept busy with the affairs of the Chair Warmers Club, and reports a new station for Pontiac, W8RR. W8BRO was a Detroit visitor, and says he wants all the traffic he can get. W8CAT is handling quite a bit of army traffic. W8CU is still rebuilding. W9EGF has a 50-watt job going now, and keeps a daily schedule with KFZT, a yacht on the Great Lakes. W8CKZ is vacationing at Wildwood by the Sea, N. J. W8AX says the outfit has arrived and that he ought to be on the air in a month or so. W8AAH was radio op aboard the U.S.S. *Dubuque* during the summer cruise. W8CAP of Owosso is working 14,000 kc. W8DSE is back again and wants lots of traffic. W8ACB has been silent due to summer weather and work. W8AUT has a first-class ticket now, and is also an ORS. W8JD makes the BPL again, and has been handling a great amount of the Michigan Army traffic.

W9CE has dropped all schedules. W8DYH was the nickle-plated insulators for this month. W8PP has been reported from Australia with his new outfit. W8CRL has been at the CMTC at Camp Custer. W8CIK is W8CMP, who is now at his summer home in Bay View, Mich. W8HL, W8ZZ, W8DFS, reported by radio through W8DYH. W8AFK of Flint is on 7000 kc. with a low-power outfit, and would like reports on the sigs. W8CEP has been off the air, due to installing a new transmitter. W8DED has been heard from, Hi.

Traffic: W8DED 2, W8HL 46, W8DFS 5, W8CIK 9, W8ZZ 21, W8DYH 363, W8BGY 18, W8BRS 21, W8BRO 50, W8CAT 115, W9EGF 25, W8AAH 12, W8CAP 6, W8AUT 4, W8JD 216, W9CE 5, W8PP 26, W8CEP 31, W8NO 210, W8HO 210.

OHIO — SCM. H. C. Storck, W8BYN — This has been the worst summer for some time, as far as traffic is concerned. But by the time this sees print, all of us will be looking towards our sets again, if not working them, and the totals and reports should be picking up. Here's hoping. W8BAU leads Ohio this month. He and W8GZ, who comes second, get most of theirs through A-A work. W8GZ reports that a certain captain in the Nat'l Guard reported the SCM as having kicked the bucket. Hi. W8BKM reports he gets a lot of traffic for Cleveland, but not many hams active there. W8CSS lads 34 though he has been too busy to work the set much. W8CPQ is changing his QRA. His new call will be W8ANF. W8BML is going into the business of printing QSL cards. W8BAC is playing around with a short-wave super-het. W8CIY goes off the air for some time. The SCM thinks that his sudden romance has budded into full bloom. Hi. W8DDF is going to Purdue University and will have a 9 call there. W8QU reports the mosquito menace too bad to work radio. Hi. W8BOR spent part of the month at Camp Perry. W8OQ again observes a silent period on his report, except for his total of 10. W8CFL now has push-pull TPTG circuit in his transmitter, and says it has the Hartley beaten a mile. W8AYO says BCL trouble, work and vacation sort of shot traffic for him this month. W8IF reports that most stations are afraid of traffic. W8BBR reports. W8BBH is looking for traffic. W8PL got two messages. W8APB is DXing on 14,000 kc. W8LI has also been on 14 mc. and works 7 mc. also. W8CRL invites work for the RM. W8DMX is going to rebuild. W8BNA visited the SCM. He is going back to Mass. Tech. W8DBK has been vacationing in Georgia. W8CNU has been listening to the Graf Zeppelin. W8CXD has not moved his outfit as yet. W8BKQ has his new outfit going now. W8AQU is operating on the Lakes. The SCM is off the air, as the rope at the mast end broke. W8DDK is working with the "talkies" in his home town. W8CNO is still off the air. W8DVL is going to Cleveland to work. Let's snup into it now, with lots of traffic, and put OHIO back on the map.

Traffic: W8BAU 181, W8GZ 143, W8BYN 100, W8BKM 35, W8CSS 34, W8CPQ 30, W8BML 28, W8BAC 19, W8CIY 19, W8DDF 17, W8QU 15, W8BOR 14, W8OQ 10, W8CFL 10, W8AYO 9, W8IF 8, W8BBR 6, W8BBH 5, W8PL 2, W8APB 1, W8LI 1.

ILLINOIS — SCM. F. J. Hinds, W9APY — Activity is picking up now that summer is on the wane. W9AHK wants more Army-Amateur stations. Get in touch with him, gang. The W9QD brothers have been in Yellowstone for a few weeks. W9CSL has a new 3-coil Meissner. W9CJ was also in Yellowstone. He reports the Austin "Y" Club has a new 450-volt S. M. power pack for DX this winter. W9DOX and W9DXZ were very busy this month operating W9GKE at Camp Grant. F.R. OMs. W9CAF has been broken up, due to Illinois Pipe Line Company losing its commercial stations through cancelled licenses. The ops, W9AOG and W9ECA, will carry on individually. We would like to receive traffic reports from W9HHW and W9GFU. W9BEF is saving up for an 852. W9BXX had his hands full this month with Camp Grant traffic. W9ETP has a new S.G. tuned R.F. receiver. W9BNO is a new man doing fine work in Rockford. W9BOL is putting in an arc for rectifier. W9BRY is building a S.G. receiver. W9ERU is having some trouble; adjusting the new S.G. set. W9AFN has now worked ten countries. W9KB has been visiting hams in Canada for three weeks. W9BZO, W9CKZ and W9BN1 handled much Camp Grant traffic. W9GIV has a new Zepp. W9ECR is arranging for a

busy season. W9AYB is to teach school this fall. W9FO wants the QRA of SN1AA. Filter condenser blow-outs and hot attic have kept W9AFF off the air. W9CZL spent some time visiting stations in Missouri and Arkansas. W9GJJ wants an ORS. W9FCW worked his first "K" station this month. W9DJ has been appointed Army net control station to relieve W9US. W9DJ sends ball scores to W9CSS on WPBE on the lakes. W9CUH reports DX better this month on 14 mc. W9AD reports farm QRM. Hi. W9FDY had a fine time on reserve cruise on the lakes. W9BKL was a communication officer on the U.S.S. *Dubuque* during reserve cruise. His fifty skeds were suspended during that time. W9DGK worked CM5RY just before leaving for a cruise on the U.S.S.C. 433 (NIQL). W9FDJ will rebuild for the winter season.

Traffic: W9BXB 280, W9CKZ 128, W9GKE 96, W9AHK 78, W9DGK 69, W9GLV 66, W9ERU 58, W9BNI 53, W9AFN 36, W9BZO 36, W9CZL 29, W9FDJ 23, W9APY 20, W9GJ 18, W9AAW 17, W9BKL 12, W9CUH 9, W9CIA 6, W9ECR 5, W9CSL 4, W9KB 3, W9ALK 2, W9BNR 2, W9DJ 2, W9FCW 2, W9GJJ 2.

DAKOTA DIVISION

NORTH DAKOTA — SCM, B. S. Warner, W9DYV — W9DM just returned from the University of Minnesota. W9DYA has been trying to QSO with the Army Amateur Corps Area station, but reports no luck. W9BVF has put up a new Zepp antenna and reports very good success with it. His DX is ten countries and the Byrd Expedition. FB, OM. W9FCA paid the SCM a visit recently.

Traffic: W9BVF 246.

SOUTHERN MINNESOTA — SCM, J. C. Pehoushek, W9EFK — Vacations bothered the gang terribly this month, but every ORS is making great promises for bigger and better hears this fall. Many are under construction, and it looks as though there will be five or six stations on 3500 kc. with fine jobs. W9ELA managed to handle quite a few. W9COS ran a schedule with KFR6 this last month. W9AIR says the LeSeur and Northfield gangs had a dandy hamfest on the 4th. W9DHP is brass pounding on the Great Lakes. He says Tommy Edmonds is on the Ingalls, and W9DOE is on the Reiss. They say QSL via Marine Post Office, Soo, Mich. W9EYL, a new ORS, is rebuilding to 1930 Hartley. W9ELE is going on fone with the rest of the gang. W9DRG, a new ham at Owatonna, Minn., worked Colorado with a 201A. W9DBW worked 29 foreign stations in a row, and got R8-9 from OA48. W9DGE acquired a new UX852, and will be on with two 852's in self-rectified circuit this fall. W9DMA is too busy to do any brass pounding. W9DBC is still having heavy QRM from YLS and the old flyver.

Traffic: W9ELA 17, W9COS 4, W9AIR 2.

NORTHERN MINNESOTA — SCM, Carl L. Jabs, W9BVH — Only three stations reported this month. I think those moonlight nights have their effect on traffic. Hi. W9CIY relayed a message from Hawaii to Illinois in ten minutes. FB. W9EHI is back on 7 mc. W9CTW is putting up a new antenna. The SCM is making some changes in his transmitter and building a new monitor. Through some error he was reported as being sick. The only way I can account for this is that while I was on my vacation W9BMX made out the report and he knew I visited Tijuana, Mexico. Hi. W9GGQ and W9AV are new prospects for ORS. Send in your reports or the SCM will have to use the ax. Also, don't forget to report those 1929 signals.

Traffic: W9CIY 18, W9EHI 1.

SOUTH DAKOTA — SCM, D. W. Pasek, W9DGR — W9EJ says he is just plunging away on 7 mc. W9DB reports a new Shield Grid layout that perks fine. W9DIY has a new mercury arc and two transmitters and receiver, so he ought to make things pop this fall. W9DGR had pleasant visits with W9DB, W9DLY, and W9CIR (Mitchell). A portable was operated under the call W9DZY while yours truly was working near Mitchell. The results were nil. Please report your activity, gang, so that the rest of us may hear about it.

Traffic: W9DB 22, W9EJ 8.

DELTA DIVISION

ARKANSAS — SCM, H. E. Veltz, W5ABI — With the coming of cooler weather, many of the gang are back on the air after a quiet summer. We had the misfortune to lose one of our best stations, W5EP, who has gone to Fargo, South Dakota, from where he hopes to work the gang with a "9" call. W5AQX is rebuilding his transmitter into a xtal control, using a pair of 50-watters. W5JK is back on the air on 7000 kc. W5ARA will be among those who welcome cool weather, so that electric fans in his town will be stored away, and he will be able to operate his station in peace. Hi. W5ALY has a new receiver. He is on 14,000 kc. W5JK is a new station in Little Rock, using one 210 tube. He is building a fone set for this fall. W5RCZ is getting out well. W5ABI is on 7000 and 14,000 kc. W5ZAA has been spending the summer conducting interesting experiments on his farm 10 miles north of Conway, Ark. He has received several nice write-ups in the local papers concerning his experiments, which were the "wiring up" of sections of his peach and vegetable crop to stimulate production by magnetic force. Sure FB, old boy. Well, gang, where are all the traffic reports? We received only one traffic report this month. Let's all see if we can't do much better next month.

Traffic: W5JK 2.

MISSISSIPPI — SCM, J. W. Gullett, W5AKP — W5EQ reports that he is going to install two Rectobulbs and clear up that AC note of his. W5AAP has a new Silver-Marshall screen-grid receiver, and he says the foreign amateur stations all come in about QSA5. W5BEV has been visiting in Meridian looking over WCOC. W5AS is a new amateur in Columbus. (Welcome to our midst, OM.) W5ARO is also an active amateur station in Columbus. W5AJJ says his OW has gone away on a trip, so will make up for lost time, now, pounding brass. W5QJ has a new 50-watt layout, and he should have a real good note, as he has a motor-generator and will use two 50-watt tubes as rectifiers, when he doesn't want pure DC. W5GQ is constructing a portable transmitter and receiver for the 14,000-ke. band. He worked seven 6's in a row, the other night, using 7½-watts power. W5AYE has moved his station to Jackson. W5BDZ is encamped at Biloxi with the Mississippi National Guard. W5AED reports that he has no schedules at present, and is going off on a vacation. W5AWP is working in the 7000-ke. band in daytime and in 3500-ke. band in evening. W5BBX reports schedules with the following: W4OQ, W9GHG and W8BUA. He handled some official Army traffic from Ft. Riley, Kansas, to Washington. W5AKP is rebuilding his complete layout. He will have a pure DC note in the 7000-ke. band, and expects to work everything he hears. Hi.

Traffic: W5BEV 23, W5BBX 13, W5AWP 12, W5AED 9, W5FQ 6.

LOUISIANA — SCM, M. M. Hill, W5EB — The gang has been very active rebuilding for winter. W5BAY has put in a couple of 281's and a good filter, and will be in Baton Rouge for the winter. W5PG has rebuilt with the proceeds of a trip to sea. W5WF says QRM from work. W5BDJ is the proud possessor of a card from Austria. W5BDY is having QRM from the YLS and parties. W5AXS says xtal is too expensive and too hard to get going so he is using Hartley. W5LV visited W5BAY and W5EB. W5WG has a 210 on 14,000 kc., and works the world. He is now located at Ruston. W5EB is back at Oakdale and has a 203A on 7000-ke. c.e., and an 852 in Hartley on 3500 and 14,000 kc. W5ANA has a new rig on 7000 kc. If the traffic for the winter comes up to the building of the summer, we will lead the division by a large majority. Come on, fellows, let's have those reports.

Traffic: W5EB 15, W5WF 12, W5BDJ 3.

Hudson Division

NEW YORK CITY AND LONG ISLAND — Acting SCM, V. T. Kenney, W2BGO — Manhattan: W2BNI spends most of his time on the air in the afternoon. W2BDJ is still wasting a lot of time on the air because he can't find anyone to keep skeds with him. W2OV is now vacationing in the sixth district, and will have lots to tell us when he returns. Bronx: W2APV makes the BPL this month by keeping a nightly sked with NJ2 PA.

W2AET and W2ABS are rebuilding. W2AII has done his bit with the C.M.T.C. and is ready for traffic again. W2AET announces that he is ready to make the BPL. W2BPQ has returned and is again on the job after successfully defending Philadelphia while in Camp Dix, Brooklyn. W2BIV leads his borough and makes the BPL by keeping 15 foreign skeds weekly and, incidentally, make the BPL in four nights, besides keeping the gang in the bands as an 00. W2BCB claims the record per square inch in DX work on 14-mc. band, as his set measures 6 x 4 inches. W2SC is keeping Army skeds while W2PF is rebuilding. Staten Island: W2BEY reports his two 210's went west, so he is using a 250 in a self-excited circuit. W2CIS has taken his transmitter to Schenectady. Arthur Brown is building an outfit and should soon be heard. Long Island: W2AEC says W2AVP is still at sea. W2ATT can be heard at portable W2BFC, and requests reports on W2AYM, the station of the Boy Scout troop in Richmond Hill.

Traffic: Manhattan — W2BNL 8, W2BDJ 6, W2OV 4, Bronx — W2APB 285, W2AET 14, W2ABS 11, W2AII 10, W2AFT 6, W2CYX 6. Brooklyn — W2BIV 82, W2CRB 50, W2PF 2. Long Island — W2AVP 11, W2ATT 2.

EASTERN NEW YORK — SCM, F. M. Holbrook, W2CNS — W2QU makes quadruple BPL score by handling traffic mostly with NN1NIC. W2AGR has been home for the summer from Harvard. He will operate W1BZG this winter. W2AVS, who has just received license, was QSO an airplane at Newburyport with K6 at both ends. W2ACY scores ten messages in one night's operation on 3500 kc. W2LU asks for ORS backed by traffic report for the most difficult summer month. W2BKN was QSO Columbia, S. A., and Hungaria. W2UO has applied for ORS.

Traffic: W2QU 402, W2LU 61, W2AVS 17, W2AGR 17, W2ACY 10.

NORTHERN NEW JERSEY — SCM, A. G. Wester, W2WR — Now that summer is behind there should be no excuse for ORS not reporting and traffic taking a big jump. W2WR maintained a schedule with W4AGR during August. W2JX cannot raise stations but receives plenty of cards. W2BDD enjoyed his summer in Jersey using a low power transmitter and handling traffic. W2JF besides his nightly schedule with W1MK has one on Saturday with W8LL. W2JX says he hopes to do better with the cool weather setting in. W2BY has a new rebuilt transmitter and also boasts a new fivver. W2CTQ has installed a 250 which is stepping out. W2AOS had the honor to conduct W8AKC who was one of the 49 boys in the Edison Contest through the Edison plant at West Orange. W2DX will leave Detroit shortly and will pound brass again in Jersey.

Traffic: W2BDD 14, W2JF 40, W2CJX 6, W2CTQ 8, W2AOS 6.

MIDWEST DIVISION

IOWA — SCM, H. W. Kerr, W9DZW — Phone interest is growing, but for social rather than traffic purposes. W9BCA maintains his NN skeds. W9DXP reports his new UX-860 screen-grid PA going FB with R8 report from a New Zealander. W9DWU plays golf, but gets traffic, too. W9CZC is vacationing in Chicago. W9DEA is on U.S.N.R. cruise at Great Lakes. W9FFD gets an ORS and is OK'd as OBS for NW Iowa. W9EJQ, RM, is putting out a fine note for traffic — when you want skeds, write him. W9FDL challenges W9DVS to a traffic contest. W9FWG is a first reporter. FB! W9CSH using 201A with 300 volts B battery and W9DUU using a 210 are new hams, QRA Sioux City. W9GDR has his new transmitter going FB. W9FFS is in the Transmitting Dept. of WENR, and sends 73 to the gang. W9GKL is the chap who ranked top at the Ames exams. Let's hear from the traffic boys at once.

Traffic: W9BCA 49, W9DXP 21, W9DWU 21, W9DZW 21, W9FFD 14, W9EJQ 6, W9FDL 4, W9FWG 3, W9GDR 1. NEBRASKA — SCM, C. B. Diehl, W9BYG — W9QY is putting the final polish on harvest, and will be back on the air soon. W9EEW handled no traffic, but is excused on account of the amount of work being done at the office. W9JTH had the misfortune to lose his youngest child, and the entire section offers its sympathy. W9DFR is starting in again, and between Hicks at KOLL expects to lead the "pack." W9DVR has no traffic, but has sworn it will be different after this. W9FAM is just getting strung out, and

in a short time will be hitting the old pace again. W9DNC sends in his last report on account of going to Muskatsee, Iowa, as chief operator at KTNT. We regret his loss and hope he serves Iowa as well as he did Nebraska. W9DI is very busy with harvest and is getting ready for a big winter. W9BOQ is looking for schedules east and west on 3500 kc. He reports W9BUC, a new station at Marquette. W9BBS sends in his report from Sidney. He says he can't get home long enough to make his report, since he is *Conductor*. W9BQR has been away to Nat'l Guard camp with W9DTH. W9BYG reports.

Traffic: W9DFR 5, W9FAM 4, W9DNC 3, W9DI 3, W9BBS 5.

MISSOURI — SCM, L. B. Laizure, W9RR — W9FTA is on with MOPA 210-250 rig, and reports W9BKW and W9BYJ are new stations in his neighborhood. W9BYJ is the station of the Soldan High School. W9GHG and W9DZN led in St. Louis traffic. W9FUN is making a two weeks' visit in Chicago. W9DUD has a new outfit and is ready to handle any traffic. W9DFN led the state in traffic with 38 messages. He visited two weeks at W5BEE, and hopped to W1BPC, where he won a new 210 as prize for being from the greatest DX. Hi. W9EPX now staying with W9EPY in Chicago. W9CDU found time to get married this month, which is his first as an ORS. W9DKG had another of those famous visits from W9FBF and W9FSL. W9FVM has a portable, W9CON. W9DAE rebuilt the set for 14,000 kc. W9EUB is kept busy with his armature winding job, but found time to handle a few messages, and didn't forget the SCM on report day. W9CFL wants to hear from any U.S.N.R. stations or amateurs interested in U.S.N.R. work. W9DQN will also give out information on U.S.N.R. to all inquirers. W9ALC expects to return to the west coast shortly. W9BMA says he is going to be an ORS or bust. W9BSB is making a vacation trip through Minnesota, Dakota and other states in that section. W9CRM is again heard on the air, this season, on 7000-ke. band. W9BKK is operating at local air station.

Traffic: W9DHN 38, W9EPX 5, W9CDU 12, W9DKG 6, W9FVM 4, W9DQN 25, W9ALC 5, W9EUB 5, W9FTA 4, W9DUD 6, W9FUN 2, W9GHG 14, W9DZN 17.

KANSAS — SCM, J. H. Amis, W9CET — Traffic is holding its own in spite of extremely hot weather. W9FLG takes all traffic honors, and kept a daily sked with CX7, the station of the Kans. Nat'l Guard. W9GHI and W9COE are both hard after traffic. W9ESL has gone on his vacation, and intends to visit hams in several states. W9CJK is also on his vacation and reports from Hot Springs, Ark. W9BTG is after reliable skeds. W9GFO complains that traffic is N.G. W9SS finds 500 v. D.C. better than 1100 v. A.C. for consistent work. W9DEB claims he can't use a burnt-out 210 very well. Hi. W9FIG is installing a xtal, so it won't be long now. W9CET, the SCM, is Reg. Communication Officer for the 114th Cav. and has been at Ft. Riley the past month. W9CFN has just returned from the harvest fields. W9BHR rebuilt the transmitter for the Nat'l Guard. W9CKY has a new TP-TG rig going. W9FZU is having a hard time getting skeds. W9HTL has hay fever, and is sisking Ki Choo now. Hi. Fall is here, gang, so let's get ready for the largest traffic season in our history.

Traffic: W9FLG 257, W9COE 225, W9GHI 220, W9ESL 104, W9CJK 90, W9BTG 28, W9GFO 22, W9SS 22, W9DEB 19, W9FIG 18, W9CFN 15, W9BHR 11, W9CKY 10, W9FZU 9, W9HTL 5, W9CET 81.

NEW ENGLAND DIVISION

EASTERN MASSACHUSETTS — Acting SCM, Miles W. Weeks, W1WV — As WIACH has turned over the job to me, I am making my initial bow to the gang, and wish to express my appreciation of the fine cooperation you have already shown me. Summer vacations have had their effect on traffic but, in spite of a curtailed month on this account, W1LQ leads the way. W1RY reports DX FB on 14 mc., having worked eleven countries in the last two weeks. He is now a freshman at Tufts. W1WU's new QRA is 288 Summer St., New Bedford. W8ABQ, who is 64 years old, paid him a visit recently. Hi, who said we were all school boys? W1CMZ has also moved and is rebuilding. W1BLD now has his ORS appointment and has been sharing his key recently with W1NV. 866's will soon

be rectifying at WIACH. WIBVL finds time to hunt DX, and expects to have his new xmitter ready this fall. WIACA turns in a good total and says he is now at 121 Third St., Medford. W1WV visited WIBLD and W1CMZ and is very QRL his new job as acting SCM. Delinquents beware! W1AZE was QSO KFLF while the "Ripple" was in Chesapeake Bay. W1KH is now OBS for this section, and the gang are urged to listen for his OBS. Our RM, W1KY, is vacationing. She says too many stations are keeping too few skeds just now. W1AGS has graduated from Northeastern, and expects to be more active. W1BOB is preparing for skeds in every N. E. state. FB, OM. He has applied for ORS as has W1AGP. W1AGP now has new call, W1IG. W1BZQ wants skeds on 7 and 14 mc. after midnight. W1BZG, who is W2AGR also, holds a commercial ticket and wants an ORS here. W1LM is also resting his arm, vacationing. The Eastern Massachusetts Amateur Radio Association meetings begin again in October. W1KY, the Seey, will be glad to answer inquiries.

Traffic: W1LQ 45, W1ACA 43, WIACH 34, W1BZQ 30, W1BOB 30, W1WU 27, W1KY 23, W1KH 21, W1BLD 19, W1RY 17, W1AZE 16, W1WV 12, W1BZG 6, W1CAE 4, W1CMZ 2.

RHODE ISLAND --- SCM, C. N. KRAUS, W1BCR --- WIBLV is on 14,000 kc. with low power. W1MO is installing a mercury arc. W1BCR is on 14,000 kc., being operated by members of the Radio Club of R. I. as well as by Mr. Kraus. Official broadcasts are sent from W1BCR every Monday at 8:00 p.m., E.D.S.T. (14,000 kc.). W1CPH is on again. W1CBS, a new station, is working out well. W1BN has moved to Ohio, where he expects to have a real station soon. W1AMU has been put on the active ORS list again. He is using 50 watts on 40 m. and 80 m. Let's hear from you all, fellows.

Traffic: W1MO 8, WIBLV 8, W1BCR 6.

MAINE --- SCM, G. C. Brown, W1AQL --- When this report reaches the readers of QST, the Maine State Convention will be history, and it is the Queen City Club's fondest hope that those attending will remember it as one of the best ever put on in the Pine Tree State. Our recently elected Director leads the way this month. FB, Fred. W1ATO is next man with a good total. W1CDX reports much activity in the U.S.N.R. up in his part of the State. W1KQ says his best DX for this month is Poland and the Canal Zone. W1AQD reports that he has new 28 and 14-mc. transmitter, using push-pull tuned-plate tuned-grid with two 852's. W1TB says he won't be able to attend the convention this year. The Bangor gang report very little traffic this month, due to vacations and work on the Convention.

Traffic: W1BIG 78, W1ATO 67, W1CDX 55, W1KQ 28, W1AQD 27, W1TB 24, W1QH 11, W1AQL 11.

WESTERN MASSACHUSETTS --- SCM, Dr. J. A. Tessmer, W1UM --- W1BVS says they have new power mains installed à la fire underwriter's code. W1BSJ says his SW receiver is working FB. W1BVR's father died July 26th, so he hasn't felt like using set very much. W1NS says that W1AMF and W1ARP of Northampton visited his station. W1BZJ is getting better, but still is not well enough to pound brass. W1COS is getting over an auto accident. W1CTF is rebuilding. W1BNL has a fine total of messages, and says his shield grid receiver is perking up per May QST. W1UM will be on the air with a 50-watt, crystal-controlled using intermediate tank circuit. W1BIX is rebuilding and trying to keep his monitor oscillating. Regular Thursday evening meetings are being held at the Worcester Radio Club rooms, 274 Main St., Room 301. Come up and meet the gang.

Traffic: W1BVR 1, W1BNL 89, W1NS 32, W1CTF 10, W1BIX 2.

NEW HAMPSHIRE --- SCM, V. W. Hodge, W1ATJ --- The vacation season cut quite deeply into traffic this month. W1IP pounded out a bunch just to keep in practice and get his fist limbered up for the coming season. W1APK of Pembroke invites the gang to stop and seem him at the "Cutting Farm." W1AU's new Chevy is keeping him from the key. W1GDT is working on a new traffic tuner. W1BFT and W1AOV are still touring the state, and stopped in at the SCM's recently. W1MB is a state inspector on a cement road construction job. W1BIS is working on a new

receiver. W1AEF reported direct to Headquarters. Reports are needed from more of the gang, even tho no traffic is being handled.

Traffic: W1P 36, W1APK 11, W1AEF 4.

CONNECTICUT --- SCM, C. A. Weidenhammer, W1ZL --- W1TD is getting crystal-control reports on his new transmitter. W1AJB was accidentally skipped in last report. Sorry, OM. W1DDE is worked daily by W1AFB. W1OS reports contacts plentiful on 7000 kc. W1BWM, our proud papa, is listening to dadas of an eight and one-half pound brass pounder. W1BNS let his call expire. He is now on with new call, W1GY. W1BOD is working DX and handling traffic. He snared Egypt and Poland on 14 mc. W1RP visited the A.R.R.L. Hq. W1BGC is still with us on 7210 kc. W1AMC has a schedule with NN2ND. W1CTI worked portable WIATN, who is W1ADW. A 2500-volt condenser and an 866 were blown by W1AMG. W1ARL expects to move to Schenectady. W1ZL is supervising U. S. Department of Agriculture quarantine lines in southwestern Pennsylvania. W1MK makes the BPL as usual.

Traffic: W1ARL 5, W1AMG 5, W1CTI 9, W1AMC 22, W1BGC 4, W1RP 25, W1BOD 18, W1OS 2, W1AFB 35, W1AJB 29, W1MK 490, W1UE 5.

NORTHWESTERN DIVISION

OREGON --- SCM, W. S. Claypool, W7UN --- W7PE hits the ceiling this month with 54 total. W7MV is next in line with 26. Once more the Roseburg BCLs have W7JC scared off the air. W7EO reports by Special Delivery. Sorry to lose W7AIX, who is moving to Kennewick, Wash. W7PP, W7AP, W7SI, W7AKK, W7QR and the SCM are busy arranging the coming convention. W7PP gets QSA5 from all stations he works with his 500-watts input. W7FH reports working WFAT. W7AMQ is servicing BCL sets for local Stewart Warner sales. ORS take warning --- seven cancellations were made this month, and there are still a few who are eligible for a westward voyage. The Portland gang are all ready to show the world how to put on a convention. The prizes are valued over three hundred berries, and there is the possibility of a new 204A being raffled. Someone will be lucky.

Traffic: W7PE 54, W7ABH 19, W7MV 26, W7JC 10, W7EO 9, W7WL 11.

IDAHO --- Acting SCM, Harold R. McBirney, W7ABB --- W7AJQ is going to attend the N. W. division convention at Portland. W7ACD is the only station reporting traffic. W7UG is in Glencoe, Ill., interested in moviecine. W7GU is heading for California and may take the N. W. convention at Portland. W7IY rebuilt his transmitter this summer, and reports splendid results. W7HR hopes to be on the air soon. W7ALC is back from a tour in which he covered every state in the sixth and seventh districts except Montana. W7ALW has worked thirteen countries, four continents, on 14 mc. with a 210. W7ABB is going to attend the University of Idaho. He is the net control station of the Army Amateur Net for Idaho and is looking for someone to take the work over. W7GL has a temporary appointment as net control station of the fourth Idaho district, and anyone wishing an appointment should communicate with W7ABB.

ALASKA --- SCM, W. B. Wilson, W7DN --- Only one report received this month, and that direct to HQs by radio via W6AIM. K7AIF feels lonesome, fellows! Send in your reports.

Traffic: W7AIF 32.

WASHINGTON --- SCM, Otto Johnson, W7FD --- W7OI, a new station at Ft. George Wright, is looking for reliable schedules. He promises plenty of traffic from the Army post there.

PACIFIC DIVISION

HAWAII --- SCM, F. L. Fullaway, K6CFQ --- K6CJS handled the most traffic for this month. He is rebuilding, and will be on with 150-watts crystal-controlled in the near future. K6DQJ, over on Maui, handled a nice bunch of traffic. His brother is K6BJJ in Honolulu, and they keep the wires hot on inter-family traffic. K6EST, another Maui ham, handled a good bunch on his sked with K6AVL. He is going off the air this month to enter the Univ. of Hawaii. K6DWS has suspended all skeds while he rebuilds. K6CLJ leaves this month to enter M. I. T., where

he will take up radio engineering. We hope we can hear him behind the key of W1XV. K6ACW promises to be back on in several weeks, and ought to be able to put in good DC, as he has been working. K6CFQ likes commercial operating fine, seeing that he can play on the short waves. His ship, NEIN, has a 75-wattor on the ham waves with a 500-cycle note. The promised Army-Amateur affiliation fell through, due to lack of interest among the Hawaiian amateurs. Not a very nice thing to have to admit.

Traffic: K6CJS 159, K6DQ 6, K6EST 48, K6DWS 20, K6CLJ 2.

SANTA CLARA VALLEY—SCM, F. J. Quement, W6NX—Several of the heavy traffic handlers failed to report this month. W6JU handled a nice amount of traffic. W6ESW is using the 3500-ke. band for moving traffic, with good results. W6BMW reports a new 852 on 14,000 ke. soon. "Too hot here for radio," reports "RP" of W6AME. Because of its central location this station seems to be the mecca of visiting hams. W6BNH, due to a change of position, will not be on the air for a month. W6CTE has just returned from Alaska. W6BYY enlisted in the Naval Reserve as radioman first class this month. W6NX was away on vacation during the month. W6BAX is still working great DX on 14,000 ke.

Traffic: W6JU 53, W6ESW 12, W6BMW 12, W6AME 4, W6BNH 1, W6NX 4.

SAN FRANCISCO—SCM, C. Bane, W6WB—W6ERK makes the BPL both ways, and has the greatest total reported so far in the section. W6BIP runs George a close second, and says he will beat him yet. He has applied for an ORS, and certainly deserves it. I am very glad to have a new reporter with us this month in W6DYW. He makes the BPL first time up. W6EPT, the boy from up north, makes himself known in his customary manner. Our new RM, W6DBD, is now right on the job doing the things an RM should. Any desiring skeds are requested to get in touch with him. W6AYC finds time to hammer out some traffic when he isn't busy with his regular job. The Army-Amateur network in this section is progressing rapidly under the able guidance of W6DFR. W6PW reports good total this month, and is busily engaged on the Tri-Section Smoker to be held in the middle of September. W6HJ reports and is now taking a little pleasure jaunt to the Hawaiian Islands via the Matsonia. W6CZQ has been hard at work fighting the Ultraudion, but took time off to push through some traffic. A good number of the boys are installing crystals and MO-PA's, and I expect to hear some beautiful "29" notes on very shortly. W6W—installs crystal, and his troubles are now beginning. W6WB is having fine results with the MO-PA. Our boys are anxious to get in touch with men willing to try some 28-mc. tests. Get in touch with the SCM if interested. W6DYB is attending college this semester. Here's luck, Al. W6AC and W6DZZ are both rebuilding and promise good traffic. W6AMP is trying 28 mc. W6CIS reports and says he just returned from wonderful vacation in the Yosemite Valley. Seventeen stations report this time and our message total is the highest yet, being over 2000.

Traffic: W6ERK 758, W6BIP 502, W6DYW 232, W6EPT 189, W6DBD 131, W6AYC 53, W6DFR 42, W6PW 37, W6HJ 21, W6DZQ 20, W6DYB 8, W6WB 8, W6AC 2, W6DZZ 1.

EAST BAY—SCM, J. W. Frates, W6CZR—Traffic boomed during the past month due to several events which stimulated amateur messages. In the first place, Sgt. Del Armstrong and the operators of the headquarters company of the 150th Infantry, Calif. Nat'l Guard, operated W6KV at the San Luis Obispo camp, and kept a steady stream of messages coming into the section through W6ALX, W6BTZ, W6ASH, and W6BIW. Then, under the direction of S. C. Houston and a group of section operators, as well as the Oakland Radio Club, portable W6SR was installed at the Joy Zone of the American Legion in Oakland preparatory to the Legion delegate's departure to the National Convention in San Diego. The station was located in a booth in the main show tent, and all those who attended were given the privilege of filing messages to acquaint them with amateur radio work. Among those who participated in the work were W6CZR, W6BDU, W6EY, W6BSB, W6BJW, W6DCZ, W6AWF, W6ASH, W6ATT and a group of others. Messages were relayed to W6OT, the Oakland Radio Club,

for routing due to the electrical interference at the show grounds, and to W6ALX, W6AVE, W6BJW and other stations. W6ALX comes out as high traffic man this month. W6CGM, in spite of the fact that he is a railroad fireman on the road two days out of three, ran up the next highest total through trans-Pacific work with K1PW, K1CE, K1MC, K1HC, AC8RV, AC3MA, K1CY and K6NL. W6BIW, Thiel, signalled his appointment as an ORS by becoming the third highest man. FB work! W6ASH also did considerable traffic work as a new ORS. W6BTZ is pumping much sep and much traffic into the air. W6EIB is holding schedules with K6DTG and W6DHM. W6DWI ran up a sizeable total. W6IP was forced to shut down his station for a Naval Reserve cruise to Catalina on the U.S.S. *Hazelwood*. He returned home in the middle of the cruise to greet a newly arrived daughter. W6AWF covered a good deal of ground during the month, assisting the section traffic work, testing transmitters, and building new push pull jobs for beginners. W6RJ is keeping four live skeds, and says that the high C Hartley is the berries. He was host to W7NI, recently. W6BMS has a new ultraudion operating under the portable call of W6AYN. W6ASJ, in company with W6DUR, has taken up a temporary residence at Salinas. Both of them are operating the portable W6CRE, and have organized the Salinas Radio Club for a traffic competition with the Oakland Radio Club. W6CTX is still pounding away at his Scout work, teaching, instructing and demonstrating the great joys of amateur radio. W6DDQ, at Fairfield, reports that he is leaving soon for a Naval Reserve training cruise on the U.S.S. *Hazelwood*. W6EJA says things-out at Point Richmond are fairly quiet although is heating up the old UX-210 regularly. W6PG of Berkeley has been keeping a sked with W6CRE at Salinas and handling some of the station's traffic. W6ATT says school is creating quite a bit of radio QRM. W6BZU remembered the fact that he hadn't reported on the evening of the last day, and called up the SCM long distance from Concord to pony express the dope in. FB. W6EDR says he is off the air for a month. Several of the fellows have visited WSBS which is lying in the harbor. S. G. Culver, section secretary-treasurer, has just returned from a summer vacation and has assumed his work of attending to the membership.

Traffic: W6ALX 321, W6CGM 315, W6BIW 307, W6ASH 260, W6KY 247, W6BTZ 216, W6SR 207, W6EIB 204, W6DWI 120, W6IP 72, W6AWF 66, W6RJ 50, W6BMS 40, W6CRE 39, W6CTX 32, W6DDQ 20, W6ASJ 12, W6EJA 8, W6PG 8, W6ATT 7, W6BZU 5, W6EDR 2, W6BJW 50, W6SR 172.

LOS ANGELES—SCM, D. C. Wallace, W6AM—Seven stations make the BPL this month—W6AVJ, W6EQF, W6ETJ, W6EGH, W6CUH, W6DLN, W6AKW. W6AKW has been handling PMZ traffic and is acting U. S. A. base. He also handled weather from Japan for Lt. Bromley's Tokio flight. W6AVJ has his usual good total. W6CUH did plenty of QRG checking and helped over a dozen get inside the bands. W6EOF makes the BPL on deliveries. He is also doing fine promotion work for the Pacific Division Convention in Los Angeles on November 29th and 30th. W6ETJ reports DX surely FB there. W6EGH makes the BPL. W6DLN has built monitor, and worked W6CUH's skeds with K7AIB and OM1TB while he was sick. W6ESA installed Rectobulbs for his 210 and worked China, Japan, Honolulu on 7000-ke band. W6EKL is operating at Presidio in Monterey using call W6EIZ. He reports there are quite a few ops there—W6ATS, W6EFM, W6DYU and himself. W6EKC sends in his report special delivery to be sure to be on time. FB. W6EAU reports that W6AKK was in, also W6DJW and W6BPM; W6DJW just finished rebuilding his transmitter. W6BPM is building a new screen grid four receiver.

W6AM reports WSBS schedules, kept for the eight months, now ended. W6EKE worked VK4AR on the morning of the 15th and got it 5. W6QL had the pleasure of a visit with Mr. and Mrs. CEIAL of Chile, also Mr. and Mrs W6DGQ of Sacramento. W6HT wishes to thank hams who sent flowers at the time of his wife's death. W6BFI has a new transmitter. W6AKD is working in Los Angeles, so all skeds are broken at present. W6ALR plans on having his transmitter at the Fresno district fair. W6AXE was QSO with WSBS at 12:30 a.m. on July 12th. W6DLI is still

QRL with fishing. W6OF reports QRN very bad up there in the mountains. W6UJ is on his vacation. W6BJX reports W6BXA, YL, left for Berkeley. She is charter member of Short Wave Club and was made honorary member by vote of executive committee. W6CZT sends in a good report. W6EFA says he will be 99 strong next month with radio show traffic. W6EVA took trip to Canada with W6ETA (YL also) and stopped at 37 hams' places en route. W6COT is being troubled with a bad power leak. W6BZR has been working long hours, but manages to "buzz" once in a while. W6AEC is going to build a new receiver soon. W6MA and W6EPH send in good reports. W6HS is moving to Inglewood and will be operated jointly by Charters and Fassett. W6DKX will be moved to Phoenix in about thirty days. W6DZI has his new four-tube screen-grid receiver finished. W6EAF alternated for W6AKW, and made forth meter oscillate with four turns and 500 mfd fixt condenser. W6CGY is building a new shack. W6CAG reports as usual. W6ZZA kept schedules with W6MA. W6DZK was QSO WFAT, HAM and eleven different South American stations in one week. W6DHM is looking for some traffic and skeds on 3500 kc.

W6CRC has been on vacation. W6DLK will be on the air more now, because his YL gave him the air. Hi. W6FJ has been off the air a lot this summer, because he had lots of overtime at the studio. The A.R.R.L. banquet was held July 27th at the Chamber of Commerce Bldg., Los Angeles; 127 sat down to dinner, and more came in later. There was a talk by Klem. stunts by the Associated Radio Amateurs of Long Beach, stunt by Amateur Radio Research Club, excellent entertainment by the KFWB entertainers and stunt by the Pasadena Short Wave Club. Our director, Mr. Babcock, came down from San Francisco specially for the meeting. Director Babcock attended his first meeting of the Associated Radio Amateurs of Long Beach, on July 26th, and told of doings at Hartford. The Pasadena Short Wave Club held its regular meeting on August 2nd. An 0 to 100 milliammeter was given as prize. They also had technical talk and eats. W6DKX was married, August 8th, and is going to Arizona to be a manufacturer's representative. Congratulations! W6CKS would like early morning skeds. W6BTU is handling Naval Reserve messages. They count as regular A.R.R.L. messages in our totals. W6CWO had the Pasadena Short Wave Club meeting at his place, August 15. W6EOG had a nice reliable traffic total and wants more skeds. W6CHA is now working with Gillfillan Radio Co. W6CBW is our surprise with a big BPL total of 504, including the handling of news from PMZ of the *Chicago Tribune*. Aug. QST should have listed W6DKV in BPL instead of W6DKY. Louise Hooper, the able secretary of the SCM, is moving to Oakland. We are sorry to lose her, and wish her every success in her new location.

W6CBW spent 60 consecutive hours getting news of PMZ for the *Chicago Tribune*. W6CWO claims New Zealand and the Philippines as his DX. W6EOG sent in his first report. W6DKV's call was erroneously listed as W6DKY in the August BPL. W6BTU sends in a good report. W6CHW is QRL work. He sends in a report from W6CHA.

Traffic: W6AKW 274, W6AVJ 214, W6CUB 207, W6EQF 157, W6ETJ 139, W6EGH 92, W6DLN 83, W6ESA 51, W6EPH 44, W6EKE 40, W6EKC 35, W6EAU 30, W6AM 28, W6EKE 26, W6QL 25, W6HT 22, W6BFI 20, W6AKD 18, W6ALR 18, W6AXE 16, W6DLI 16, W6OF 15, W6UJ 10, W6BJX 9, W6CZT 9, W6EFA 8, W6EVA 7, W6COT 6, W6BZR 5, W6AEC 5, W6MA 4, W6HS 4, W6DZI 3, W6EAF 3, W6CCY 3, W6CAG 2, W6ZZA 2, W6DZK 2, W6DHM 1, W6CWO 10, W6EOG 41, W6CBW 504, W6CHW 30.

SAN DIEGO — SCM, H. A. Ambler, W6EOP — W6EPZ leads this section and also makes the BPL. FB, OM. W6ACJ has five skeds, and turned in a nice total. W6CXZ reports for the first time, and has a good total. W6EPF was on vacation, and is now getting more skeds lined up. W6DGW found time to handle a few. W6EOP was very QRL getting portable ready to take on vacation. W6DNS has rebuilt his transmitter and is getting FB reports. W6EOM says traffic scarce and DX good. W6BAM has a pair of 281's now, and is getting out very much better. W6EOS rebuilt transmitter and receiver and blew two

screen-grid tubes. W6AKZ reports he is installing new station. W6CNK has a new 1500-volt generator and will be on soon with increased power. W6BAS is getting ready for traffic. He has three complete transmitters, all with crystal control, and is arranging sked with Alaska. W6EOP now has tickets for the convention in Los Angeles, so get them while you have the cash.

Traffic: W6EPZ 162, W6ACJ 148, W6CXZ 74, W6EPF 54, W6DGW 42, W6EOP 41, W6DNS 21, W6EOM 10, W6BAM 5, W6EOS 4.

SACRAMENTO VALLEY — SCM, Everett Davies, W6DON — Our old standby, W6EEO, has again come to the top. With his eight schedules he is showing the world what amateur traffic is. W6AIM just got his ORS and came through with a fine report. W6AFU reports all skeds broken. W6DYB will soon have a new set that will work. Two new hams in Sacramento are W6CFV and W6CGX. W6CGX is W6BYB's brother. W6BDX is going to the P. Tel. and Tel. Co. school to learn Morse. W6DON is now operating and announcing at KFBK. The Sacramento Valley Amateur Radio Club is planning big things for the State Fair. Remember the reports!

Traffic: W6EEO 632, W6AIM 150, W6AFU 71, W6DON 35.

PHILIPPINES — SCM, M. I. Felizardo, KIAU — This report was sent in by KICY — KIAU is being rebuilding. KIAF is changing to DC. FB! KIAU says he still keeps sked with W6BYV. K1BJ is on his annual leave, but will be back soon. KICE, a new station of the 31st Infantry for handling Ft. Santiago traffic, is on with two fifties in T.G.T.P. circuit. K1CM is keeping regular skeds. KICY took over the Borneo Expedition sked while KIAF was off. K1DL is heard occasionally. K1EL, a beginner, has a 210 on the air. K1JR is on some. K1HC is on often in the early evening. K1HR is keeping his regular schedules. K1MC has finally learned how to neutralize the oscillator on the xtal. K1PW is our pioneer DC station. K4HW, in Camarines Sur, is our first P. I. fourth district station. Welcome! K7OE is waiting for a shipment containing his MG. K9PL is still batting away. KIAF and K1HR report direct to HQS by radio. KIAF, Junior, arrived during the month. Congrats. W6EEO sent in the following information on Chinese activities which he receives from ACSRV: AC5GO is on the air again, but is QRL with his business with the Chinese Government. ACSAG has a sked with K1HR. He is playing with radiophone. AC8JK, a new ham, is anxious to QSO W6. AC3MA at Chefoo is a doctor. The Shanghai bunch are forming an amateur club. ACSRV handles traffic for U. S. Marines on duty at Shanghai.

Traffic: KIAF 167, K1HR 577, ACSRV 216.

ARIZONA — Acting SCM, H. A. Ambler, W6EOP — W6DTU sends his report direct to HQ's. He is building a MOPA outfit for the 14 mc. band, and makes the BPL. Where are the rest of you Arizona boys?

Traffic: W6DTU 292.

ROANOKE DIVISION

VIRGINIA — SCM, J. F. Wohlford, W3CA — W3EC is on furlough, and the station will be looked after by other operators at the Post Radio Station. We hope that the other operators can maintain the schedules for "ED" while he is away. W3MT is having hard time getting rectifier tubes to hold his 1500 volts. W3MO is driving new car for the family and can't get back to radio. W3MU rebuilt set and is getting out FB. W3AJA is having trouble getting his transformer back after a blow-out. W3APT is using one 199 until he gets his transformer repaired and gets back with 210. W3ARU is having a big time traveling around the country trying to QSO hams from a plane. W3CKL is at Army camp. W3ALN is getting ready for DX this fall. W3BDZ is working on MOPA circuit and building monitor. W3BZ was caught in the act of tinkering with television by the SCM. All we saw was a lot of streaks. Hi.

Traffic: W3EC 606, W3MT 8, W3MU 1, W3ARU 8, W3AHQ 107, W3ALS 34.

WEST VIRGINIA — SCM, F. D. Reynolds, W8VZ — The SCM visited Headquarters during his vacation, and saw how things are handled there. He had an all night session at Brainard Field, the location of W1MK. By the time

you are reading this, the weather will be great for radio again, so let's see if we can't get things fixed up and go in for a big winter. WSDCM has a 50-watter working on 14,000 kc., and has been working about 75% of the DX heard. Arrick of WSDPO is also sticking to the 14,000-kc. band. He worked five European and six South American stations between Aug. 1st and 15th. W8OK spent the middle of Aug. encamped near Pt. Pleasant with the Nat'l Guards. W8SV intends to get a couple of 210's working by fall.

We expect it will probably be a quarter KW, as he has had a position all summer. W8ATC has the best of intentions of attending Carnegie Tech. again this year. W8ACZ is on a trip through the East. He has a portable receiver with which he copies broadcasts from his own station, which is being operated by W8JM. W8JM is operating a Belgium 50-watter on 14,000 kc., and has been doing both DX and traffic work. W8BCN finally found a 210 that would last him for more than one QSO. H. W8CLQ has been working for the B. & O. while one of the operators was away on his vacation. W8HD is keeping schedules and chewing the rag with his 210. Ex-8CFK is thinking about rigging up a portable outfit, as he is on the road most of the time. The SCM finally had W8VZ on the air, and hopes to find time to operate once in a while. W8BOK is a new station in Clarksburg. He will be on with combination phone and telegraph outfit, using two UX-852's. FBI Try and get those reports in on time, fellows.

Traffic: W8ACZ 24, W8JM 24, W8OK 27, W8BCN 8, W8DCM 47.

NORTH CAROLINA — SCM, Hal S. Justice, W4TS — Fellows, my first report as SCM is not all I had hoped it would be. Reports from non-ORS were good, but the ORS disappointed us. Please give us your support and help put things across. Several new ORS certificates are being issued, and all inactive ORS will be cancelled. W4AEW is trying to organize a State Army Net, and wants the gang to write him. He has several skeds on Monday nights. W4AGH has sold out and is going to the Univ. of North Carolina. W4TN is taking a portable transmitter with him to college. W4TS and W4QH handled messages for the 30th Signal Co., N.C.N.G., between camp and home, and made the BPL. W4UB is working some good DX, handling quite a bit of traffic, and is in line for an ORS appointment. Vacation, hot weather, and things in general are dull, says W4OC. W4AB mailed his report direct to Headquarters. W4EC has been inactive for some time.

Traffic: W4TS 308, W4QH 153, W4UB 77, W4AEW 28, W4AGH 15, W4TN 13, W4OC 3, W4AB 63, W4EC 23.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, C. R. Stedman, W9CAA — Traffic is a bit low this month, as most of the fellows have been on vacations. W9CAA took a trip over Western Colorado and visited some hams on the way. W9DQD put in remote control from the basement. W9DQV has been pounding out on 7000 kc. with good results. W9CSR has been busy vacationing. W9BQO decided to rebuild the outfit again. W9CVE continues to be the leader in traffic handling. W9EUR and W9DRV are going to the hills with a portable using B bats. W9CDE says he can't do much on account of QRN and QRM. W9EBF complains the report cards aren't big enough for his dope. The SCM wishes more of the gang had the same trouble. W9FDM installed a new power supply, and gets a classy note now. W9DNT and W9DTY are two new hams at Greeley. W9PZX at Estes Park expects to get on the air this fall. W9EAM is on 7000 kc. with nice d.c.

Traffic: W9CVE 70, W9EUR 2, W9CAA 9, W9DQD 5, W9DQV 17, W9EBF 3, W9CDE 2.

UTAH-WYOMING — SCM, Parley N. James, W6BAJ — Although traffic activity was very slight this month, we have one station that makes the BPL this month. W6CNX leads the section and makes the BPL on deliveries. He keeps several schedules and operates on 7000 and 14,000 kc. Am sorry to announce that the section is losing one of its new ORS as W6DXM is leaving the state this month, but we expect to hear him signing a nine call in Denver. W6BAJ found traffic nil on 7000 kc. W6DPJ reported direct to Headquarters.

Traffic: W6CNX 72, W6DXM 24, W6BAJ 1, W6DPJ 231.

SOUTHEASTERN DIVISION

GEORGIA-SOUTH CAROLINA-CUBA-ISLE OF PINES — SCM, J. G. Cobble, W4RM — Following appointment has been made: W4RS, Atlanta. Also a few cancellations. If no report from the following within five days after this report appears in QST, they will be cancelled: W4AAM, W4TU, W4OY, W4PD, W4AZ has been on active duty with Naval Reserve. W4RN is DXing on 14 mc. W4KU's new QRA is 800 Myrtle St., Atlanta, Ga. W4RM uses MOPA and Zepp, and wants skeds with Georgia A-A net stations. W4PX is back on with a UX-250. He worked F8AHM on 6810 kc. W4BO has xtal DC on 7090 kc. W4KL's antenna came down. W4RM had portable at camp with N. G. W4VD is QRL speed boats and YLS. W4AZ is moving. W4SI is back on with an 852. W4RZ is new call of old W4VL. W4AJH continues to report regularly. W4JL is temporarily off the air. W4ADN is back on with 50-watter. W4KV was appointed Radio Aide to Signal Officer in A-A Net. W4RN, W4SI and W4AHM handled Atlanta traffic for Ga. N. G. at camp. QRA of CMZJM is Box 299, Havana.

Traffic: W4KV 108, W4RN 130, W4AHM 88, W4SI 50, W4RM 240, W4AJH 22, W4RZ-W4VL 53, W4PM 10, W4PX 9, W4BO 9.

ALABAMA — SCM, S. J. Bayne, W4AAQ — W4IAM has been at CMTC, but is on the air again. W4AX has been appointed control station of the Third Alabama Area of the A-A Net. W4WS says the High C circuit can't be beat. Ex5FT is operating at W4WS part time. W4PH blew his 210, but is perking equally as well with a 171. W4AAH reports business QRM. W4IM has received Official Relay Station appointment. W4UY is receiving foreign cards daily. W4AHQ recently paid the Montgomery gang a visit. W4AKM still wonders what has happened to his note. W4ALG, Old-Timer, is back with us and has ordered a 204A. FB. W4TI has a schedule with KFR6 in Canal Zone. W4LT works 14 mc. with CW in daytime and 160 meter phone at night. W4EW sends in his first report, as does W4JQ. W4EW uses a 210 and a Majestic power unit. W4JQ and W4LT are big buddies. W4AJY is forced to resign as Route Manager and Official Relay Station on account of business pressure. W4ZI has wound a new plate transformer and is trying out MOPA. W4VY of Troy is also a new reporter. W4GN requests those having traffic for the west coast to route through him. W4AHR and W4AHP had a splendid trip and visited several hams en route. W4AJR and W4AEP have moved into swell shacks at their respective locations. W4HB has been bitten by the fone bug. W4MY advises that he will soon depart for Oklahoma, where he will make his home. We certainly hate to lose "Bink." W4AKB has also had a vacation. W4AAQ is hard at work, but pounds brass at odd intervals. W4AP, a ham of 1917, has recently received his license, and will be heard with a nice DC note.

Traffic: W4ALG 43, W4AIM 37, W4AAQ 30, W4IM 24, W4AHR 12, W4TI 11, W4UV 10, W4WS 10, W4LT 9, W4JQ 9, W4GN 7, W4EW 6, W4PH 4, W4AHP 1, W4ZI 1, W4VY 1, W4HB 1.

PORTO RICO-VIRGIN ISLANDS — SCM, E. W. Mayer, K4KD — K4AAN and K4AKV are both on 14 mc. K4AAN handles traffic, works good DX and applies for an ORS. FB. OM. K4AKV says traffic is slow, but offers reliable QSP to England. EX-K4JA is awaiting new license. K4KD handled traffic with SM, YK and G. works ZL and VK at will. Let's have more reports and ORS applications. OMs. Needed: volunteers for ORS and OO! Let's go, OMs!

Traffic: K4AAN 28, K4KD 10, W4AKV 1.

FLORIDA — SCM, Harvey Chafin, W4AII — W4MS is going to the U. of F. and will make things hum in Gainesville. W4AEE leads the gang this month with a traffic total of 258, and makes the BPL. Harwick of W4AEF is home on a vacation, and will be heard often. W4AKF, W4ACO and W4VR are back from the Naval Reserve cruise. W4HQ has a FB xtal note. W4ABJ is on the air once in a while. W4IG reports that the weather conditions make it impossible to work any DX. W4QI is back at Georgia Tech., and plans to have a transmitter going soon. W4JV now has a ninth district call, W9DZS, and has received his first-class amateur license. W4AKH is on 14 mc. and worked sixteen countries

in the last two months. FB. W4AKF has been to Havana, Cuba, on the U.S.S. *Mohan* for a period of three weeks. W4QV blew his 50-watter, so he installed a 210 and worked four continents in one day and nite. We are surely glad to have KDV5 with us. His transmitter is all fixed up now, and he would like a few reliable schedules. W4QL reports for the first time. W4TK has just returned from his vacation. W4HY, W4OB, W4AGY. W4SY also report. W4ACZ has been appointed Net Control Station of Florida for the Army Amateur Net work, and desires the assistance of all possible stations for handling traffic. Write to him if interested. His QRA is: A. Litschauer, 640 Harold Ave., Winter Park, Fla.

Traffic: W4AEF 258, KDV5 53, W4QV 15, W4HY 13, W4MS 12, W4QL 11, W4AKF 6, W4AKH 6, W4OB 6, W4AL 5, W4IG 4, W4SY 3, W4TK 3, W4ACZ 2.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, J. H. Robinson, W5BG — The weather had its effect on activity, but can't blame you fellows a bit as the heat around here melted the knob off the key. Old W5RJ lends this month. He says Ft. Worth is getting some active stations. W5EV reports two new stations opening up at Tyler, Texas. W5BAM is visiting out in West Texas and working stations that he visits. W5AAE says a 210 and a dynamotor have replaced the Ford coil. W5BAD reports new stations in Ennis, Texas, and is fixing up for fone this winter. W5OE is still QRL, but gets time for a little brass pushing. W5ATZ wants his ORS cancelled for the winter, as he is going to attend A. & M. College. The SCM is working service manager of a local radio store, so gets radioed 12 to 14 hours a day. Little time left for ham radio. W5FC is handling traffic in fine style.

Traffic: W5FC 60, W5RJ 46, W5EV 22, W5BAM 19, W5AAE 12, W5BAD 8, W5OE 6, W5ATZ 5.

OKLAHOMA — SCM, Wm. J. Gentry, W5GF — W5VH is moving to Enid. W5ASQ and W5AYF have been on a vacation. They had a portable and handled some traffic. W5BEF is high man this month. Congrats, OB, W5CB is Engineer for Sulphur Water Department. W5AXM sent in his first report. Reports from Enid and Oklahoma City are nil. What's wrong, gang? Oklahoma is open for skeds for fall business. Write the SCM for dope. W5ALP was second in the traffic list. Will hate to see you go to Pennsylvania to school, OM. W5GF has been busy making electric refrigerators refrigerator. Hi. W5JB has hopes of getting on the air soon. Here's hoping to hear from more of the gang next month — please report your traffic if you have only one. It all counts.

Traffic: W5BEE 51, W5ALP 23, W5CB 18, W5GF 11, W5AYF 11, W5ASQ 10, W5AXM 6.

SOUTHERN TEXAS — SCM, R. E. Franklin, W5QX — W5ASM is indefinitely out of amateur radio for unknown reasons. W5LP has a new commercial license. W5TD has a new 250 watt xtal controlled transmitter. W5AEA has an 852 going on 14 mc. W5AHH is keeping a sked with W5AJD. W5AJD has a new portable call, W5BIS, and W5AGI is second op. He has skeds with W5AHQ, W5BBH, W5AJL and W5FC.

Traffic: W5AHH 24, W5AJD 35.

CANADA

QUEBEC DIVISION

QUEBEC — SCM, Alex Reid, VE2BE — We hope next month to be able to report that one of our stations is displaying a WAC certificate. Conditions have improved a great deal on 14,000 kc., and the boys have been getting in some fine DX, especially VE2CA, VE2BB, VE2BE, VE2BD and VE2BG. VE2AP has returned from Europe. While in England he had the pleasure of meeting a number of the boys he had worked. He speaks of the very friendly feeling the gang have for Canadians. VE2AC, our old reliable RM, has been on holidays for three weeks. The gang had the pleasure of a visit from our old friend Q.L.C., ex-2CHK, now W6PN, on his way from Europe to San Francisco.

Traffic: VE2AC 10, VE2BE 13, VE2AL 8, VE2BG 9, VE2AP 7, VE2BB 14.

VANALTA DIVISION

BRITISH COLUMBIA — SCM, E. S. Brooks, VE5BJ — Situation in Vancouver looks very promising for this fall, as a bumper crop of new hams are fast getting on the air. We would surely welcome them at the B. C. A. R. A. Clubhouse. VE5BC does some key pounding when he isn't building new receivers. VE5CF has a new pole on his front lawn, and reports better results. VE5JN is still touring around England, and expects to be away until after Christmas. VE5AN has a yacht, but no transmitter — 'smatter pop? VE5AL managed to get on the air again from his new QRA with a low-power transmitter and indoor antenna. Two YLs from Calif., W6EVA and W6ETA, called on some of the gang and used their sets to get QSO with their folks at home. W6EBQ, a brass-pounding fireman from Pasadena, was also a visitor here. VE5DD says hot weather and business keep him off the key.

Traffic: VE5DD 3.

PRAIRIE DIVISION

MANTOBA — SCM, A. Y. Chase, VE4HR — The new SCM wishes to thank all concerned for the honor bestowed upon him, and assures you that he will do all in his power to uphold the good name of this section. Experimental work is being carried out by VE4GQ and VE4BQ on the 28-mc. band. We welcomed visits from W8DLD, W8NB, VE4BU and VE5HB. The first named presented us with some very interesting facts about the new UX866 tube at the club meeting held on August 13th. VE4ZZ has at last received his official call. VE4BQ, VE4HR is building himself a short-wave super-het, and is contemplating building a new xmitter.

Traffic: VE4GQ 13, VE4BQ 6.

TRAFFIC BRIEFS

Although our 7000-ke. band admittedly is at times congested, the following instance is one that indicates that things may not be quite so bad as they are reputed to be: At about 6:26 p.m., E. S. T. WISZ was endeavoring to QSO W8DUW, who apparently was listening on the wrong end of the band. W8AVD came to the rescue by informing W8DUW that WISZ was calling him. QSO was effected at 6:29 p.m., and WISZ was told by W8DUW that he (W8DUW) had a 6:30 p.m. schedule with K4AAN. It happened that WISZ also had a schedule for this time with K4AAN. Both WISZ and W8DUW then listened for K4AAN, who was found to be calling both of them. After a snappy QSO, WISZ signed off with both stations and began to listen. A QST from W8CYG was heard, directed at W8DUW. About this time K4AAN and W8DUW were heard by WISZ to finish their QSO. WISZ called W8DUW and informed him of the call from W8CYG, whereupon W8CYG and W8DUW became connected. All of this happened within thirteen minutes!

W7AOW, in searching for a suitable name for her transmitter, stabled upon "Heliogobous," which is derived from the Greek *helios* (the sun — in this case meaning that the signals from W7AOW are directed skyward), and the Latin *globus* (indicates, of course, the tubes in the transmitter). The receiver at W7AOW has been christened "Eureka," which means, in good Greek, "I have found it" (this, of course, meaning the signal that one is searching for).

While we are immersed in our philological investigations, let us suggest that the etymologist in the amateur ranks might make a suitable alteration of "*ad astra per aspera*," for use by those interested in piercing the Heavisdale layer.

For several weeks K1AF at Ft. Mills, P. I., maintained a nightly schedule with W8BS, the Yacht *Carnegie*, and supplied the ship with weather reports from the Manila Observatory. Operator Jones tells us that on one occasion, the *Carnegie* was able, thanks to these reports, to dodge the worst part of a real typhoon! FB K1AF!

W2EW of Brooklyn, N. Y., has been stationed in New Haven, Conn., for several months and has been informed of the home news by transmissions from W2BFN, all reception being with a portable receiver in New Haven.

Calls Heard



W1RY, R. F. Hathaway, 23 West Weir St., Taunton, Mass.

14,000-kilocycle band

w6aaw w6abg w6abv w6ac w6ags w6ajm w6akd w6alm
w6amw w6ann w6aov w6app w6apw w6aq w6acj w6aaq
w6asl w6avj w6awp w6awp w6ax w6azy w6bbm w6bam
w6bax w6bho w6bec w6bes w6bdi w6bdj w6bez w6bfe
w6bgh w6bhq w6blu w6hsm w6bto w6btv w6bvx w6byh
w6byy w6bzr w6bzs w6cei w6cfy w6chy w6cjm w6clz w6cot
w6cpu w6ery w6esw w6eub w6euc w6euh w6eni w6ewi
w6eww w6czk w6czm w6czz w6dev w6ddy w6dev w6dex
w6dgc w6di w6diy w6dix w6dkv w6dlm w6dnt w6dpa
w6dgc w6drb w6dsg w6dtd w6dtu w6dmj w6dwp w6dwp
w6dyj w6dz w6dzd w6dzk w6dcp w6dqz w6dzy
w6ebn w6ebv w6ec w6ees w6eem w6etg w6ehf w6ehi w6eif
w6ekk w6ekp w6ekw w6eop w6eot w6epr w6eqd w6eeq
w6eaj w6ere w6erm w6esh w6etj w6etu w6gn w6hs w6ht
w6jn w6jv w6kb w6pu w6qj w6ql w6qy w6tj w6ue w6uf
w6vz w6al w6zi w7acy w7aeu w7afo w7agb w7ajj w7alw
w7ao w7aof w7apf w7fa w7fh w7hn w7kq w7mo w7nm
w7pv w7rz w7si w7ui w7vk w7wl celah ce2ab ce3ac ce3bf
celay em2ay em2oe em2jt em8mh et1aa et1bd et1bx et1by
d4aar d4jl d4kg d4ns d4oa d4ual d4uj d4uo d4vp d4xn
d4yt ear1o ear3f ear96 f8ax f8aap f8acj f8aja f8btr f8cp
f8ct f8da f8dmi f8dct f8ef f8eo f8er f8faf f8fe f8fk f8gdb
f8hel f8he f8hm f8hr f8hz f8ix f8j f8ja f8jr f8klm f8kz
f8lb f8lbg f8mrz f8mst f8oa f8oap f8orm f8pns f8pro f8rbp
f8rby f8rkd f8rnf f8sm f8so f8swa f8toy f8tss f8wb f8wzk
f8xyo f8ypz f8zx fk5er fk4ms fm8rit fq8hpg iq8wb g2ax
g2ay g2ju g2nh g2oq g2vq g2xv g2xy g2yu g2zp g5bj g5by
g5bz g5jo g5lw g5ml g5qf g5qv g5rm g5us g5uv g5ux g5vl
g5wk g5wp g5vz g5vk g5vn g5vx g6bd g6br g6cj g6er g6dh
g6dp g6gc g6hp g6ko g6lk g6ll g6nt g6nx g6oh g6oo g6pa
g6qb g6qt g6rb g6ta g6un g6ut g6uz g6vp g6wg g6wn g6wo
g6wp g6wt g6wy g6xb g6xc g6xe g6xn g6xp g6yq g6yv
g6yy haf3an haf3ar haf8b i1gl i1to k4akv k4kd k4ni kfr5
lu2ca lu3dh lu4dq lu8en lu8fk nj2pa nlgren oa4h oa4j oa4o
oa4q oa4s oh2nm oh2nap ok1fm ok1rv on4ar on4bc on4di
on4dx on4ea on4fe on4ft on4fp on4fq on4g on4gm on4gn
on4gw on4hp on4ij on4ro on4rs on4uo on4us on4uu oz5a
oz7bl oz7h oz7ly oz7y papb7 pa0dm pa0dw pa0fp pa0gt
pa0gw pa0kv pa0vn pa0wim pa0wj pa0zf pk1jr pylaa pylah
py1aw py1br py1ca py1el py1em py1er py1ib py2ag py2aj
py2bc py2ih py2ii py3ah rx1aa sm5rp sm5tn sm6ua sm7us
sp3ar sp3pb sp3pyl u0ex vk2ac vk2aw vk2hm vk2je vk2kl
vk2lj vk2rc vk2rx vk2tw vk3ax vk3bw vk3cp vk3ex vk3ks
vk3lp vk3pa vk3pm vk3ra vk3xo vk3yn vk4bb vk4jh vk5bj
vk5bw vk5hg vk5jh vk5mb vk7eh vk7lj vo8ae vo8azw
vo8mc x9a xbx xoz7xu xpa0ja xw7eff xj yilmdz z1lf z1fw
z1ab z1ac z1be z1bz z1cgo z1bas z1bcm z14ao z14ax z14ha
z14hg zp7ab zs4a zs4m zs5d zs6p zt1j zt1r kflf wfa wfbt
wdele wx

VK2RX, H. C. St. John, Rockdale, N. S. W., Australia

14,000-kilocycle band

w1bux w1cq w1cqr w1ry w2bdr w2bw w2cix w2jn w3bjm
w3sh w4abw w4aef w4ya w5ahx w5awd w5rg w5yg w6aaz
w6agy w6ajm w6apw w6asl w6ham w6bax w6bto w6chy
w6cuc w6dgm w6dhs w6dlm w6dtt w6dxm w6dwi w6eoz
w6eug w6gm w6jt w6qy w6rv w6tj w7agb w7ajj w7kq w7nr

w8adg w8adm w8cew w8eed w8era w8ddf w8drs w8gz w8of
w9aas w9bue w9dly w9ef w9eta w9fbw w9giy aulkab celah
celui ce2ab ce3ac ce3bf et1aa d4abn d4uj earlo iq8bpg
f8axq f8btr f8cp f8fd f8fk f8gdb f8gy f8he f8ho f8jd f8jl f8pam
f8rcm f8rko f8rrr f8wb f8xh f8xu f8xz g2lz g2od g2xv g5by
g5bz g5qv g6bm g6ge g6vp g6wi k6clj k6eha oa4h oa4s
oh2nm okaas2 ok1ab ok2yd on4ar on4bu on4di on4fe on4fp
on4ft so1aa su8an su8rs uwog ve1br ve2bg ve4cu ve4ff
ve4he ve5aw

OZ7W, E. F. Pedersen, Horsholmsgade 18A, Copenhagen, Denmark

28,000-kilocycle band

wlaep yi2gq lu2az w2atf ve1br py1bl su8an su8ri wldma
wlaew wlaef z4tm w4rb wlda lu2fi w2bkg hu9dt wlgp
w2bai w2ago w3muv w2el wlil lu3pa lu2dh py1br py1ca lu2fi

W9BGA, E. J. Raible, 819 Sylvia St., Louisville, Kentucky

14,000-kilocycle band

celah celai ce2ab ce2bm ce3ac ce3cj em2jt et1aa et1bx
et1by ex3ah d4abg d4jl d4uj d4xn ear1 ear1o ear65 f8aap
f8acj f8aja f8axq f8btr f8cp f8dmf f8eo f8er f8fd f8fr f8gdb
f8ha f8hr f8hz f8j f8klm f8lx f8olu f8orm f8pam f8pro f8rbv
f8sm f8swa f8xh f8pjm fq8hpg fq8wb g2ax g2bm g2lz g2od
g2qv g2xv g5bd g5bj g5br g5by b5bz g5jo g5lw g5ml g6rm
g5uw g5ux g5vl g5yq g6bd g6hp g6ll g6mc g6nf g6nt g6oh
g6pa g6qb g6vp g6yq g6xb g6xc g6xn g6yv kfr5 k4akv k4ni
k6alm lu1ez lu2bx lu2ca lu2fi lu3dh lu6fe lu8ad lu9dt nj2pa
nr2ags oh2nap on4ar on4di on4ft on4fp on4hp on4ij on4us
on4uu pa0dm pa0fr pa0gw pa0wim pa0wj pa0zf pk1jr pylaa
py1aw py1br py1ca py1el py1em py1er py1ib py2ag py2aj
py2bc py2ih py2ii py3ah rx1aa sm5rp sm5tn sm6ua sm7us
sp3ar sp3pb sp3pyl u0ex vk2ac vk2aw vk2hm vk2je vk2kl
vk2lj vk2rc vk2rx vk2tw vk3ax vk3bw vk3cp vk3ex vk3ks
vk3lp vk3pa vk3pm vk3ra vk3xo vk3yn vk4bb vk4jh vk5bj
vk5bw vk5hg vk5jh vk5mb vk7eh vk7lj vo8ae vo8azw
vo8mc x9a xbx xoz7xu xpa0ja xw7eff xj yilmdz z1lf z1fw
z1ab z1ac z1be z1bz z1cgo z1bas z1bcm z14ao z14ax z14ha
z14hg zp7ab zs4a zs4m zs5d zs6p zt1j zt1r kflf wfa wfbt
wdele wx

W7UI, Conrad E. Dyar, 526 East 12th Ave., Spokane, Washington

celah em262 f8fp g2lz g2xv g5by k4ni k6aew k6ajl k6cjs
k6etf oa4o oa4q oa4p oa4s on4fp vk2ij vk2lj vk2ho vk2rx
vk3pa vk3zj vk3cp vk3pm vk3wx vk3dc vk4bb vk4bd
vk4g vk4hg vk4rb vk5hg vk5bj x9a z1ac z14ae

WSAEC, J. C. Heberger, 371 Augustine St., Rochester, N. Y.

7000-kilocycle band

w6byb w6btz w6ebn w6djw w6aww w6bvf w6ani w6dpo
w6brq w6cha w6cww w6erb w6dix w6bby w6dza w6awm
w6etn w6ebx w6egm w7ho w7ahe w7afo w7ao w5ww w6alp
w6gr w6axx w5bbx ve5hc ve2ab cm5fl vk3pp un1nic k6cjs
k6bd k6dtg k6dv k6avl

G6YL, Miss Barbara Dunn, Felton, Northumberland, England

wlaof w1awk w1bdo w1bs w1fe w1rv w2alu w2cxl w2jo
w3cjm w4akq w4zp oa4o 55x xoz7oo y12ad au7ao

(Continued on page 68)



Conducted by A. L. Budlong

BY the time this article emerges from the blue copy-paper on which it is being written to the more or less white pages of *QST*, something more than a month will have elapsed, and the Hague Technical Conference probably will be all over but the shouting.

As far as the United States amateur is concerned, we trust there will be no shouting, nor any need for it. The Hague Conference is not another Washington Conference. It can't change the frequency assignments of the Washington Conference. For a full description of the reason for this affair, as well as its scope and powers, readers are referred to the editorial appearing in the July issue.

Not only will the United States Government have a delegation present, but the A.R.R.L. Board has deemed it sufficiently important to authorize the attendance of Secretary Warner, who will watch out for the affairs of our gang here in the United States and will work for the I.A.R.U. in cooperation with the officials of amateur societies abroad.

There will be no discussion here of matters which we expect to be brought up at the Hague, or of our ideas with respect to them. It is not the place of the compiler of this department to discourse on such subjects even if he were in a position to do so — which he is not.

Suffice to say that the A.R.R.L. Board has followed the preparation for this conference extremely closely, and that Warner will see to it that our welfare is safeguarded. In his editorial this month, "KB" mentions that he has been in Washington ten times in the last few months. We might add that most of these visits have been on account of this Hague affair.

THOSE DX TIME-TABLES

When we published a squib, a few months ago, requesting data on "best times to work DX" we secretly anticipated that was the last we would hear about it. For, to be perfectly frank, it is like

pulling hen's teeth to get such data. The average amateur, alas, casually glances at such a request, idly murmurs, "Let John do it" and rereads "Calls Heard" in the hope that he may have overlooked an Asiatic report on the first reading.

It is our extreme pleasure to report that we guessed wrong.

"John did it" — "John" in this case being represented by five public-spirited hams whose calls are listed herewith: WSAXA, W3JM, W4WZ, W9DXP, and W7AFO.

In the table below, we have averaged WSAXA's and W3JM's data to get times for the Eastern States, and the data of W9DXP and W4WZ (Tenn.) for the Central States. Incidentally, each of the two Easterns and each of the two Centrals checked with each other most favorably. Since only one Pacific report was received, we couldn't very well check it with anybody else — but we have hopes for next month.

The times given are G.C.T. in each case, (0000 being midnight). For E.S.T., subtract 5 hours; for C.S.T., subtract 6 hours, and for P.S.T., subtract 8 hours.

TABLE I — 14,000-KC.

	<i>Eastern States</i>	<i>Central States</i>	<i>Pacific Coast</i>
Europe	2130-0000 (2200)	2300	0300-0700
South America	2200-0200 (0000)	0000-0400 (0300)	0200-0530
New Zealand	0400-0700 (0600)	0600	0500-0800
Australia	0500-0800 (0700)	0500	0500-0800
	1100-1330 (1200)	1000-1530 (1300)	
Japan			0630-0830
Asia	2300-0300	0730	1500-1700
South Africa	0600-0830 (0730)	0300-0400	0500-0700
			1330-1500

Time given in parenthesis () is most favorable single hour.

All right, there's a start. We hope it represents only the start, too. Check it up with your experiences; if it agrees, let us know it, and if it doesn't agree, tell us what times work best for you.

The table should work for the foreigners as well as our fellows in the States. That is, the above should tell an Aussie what times are most favorable for connecting with the East Coast,

Pacific Coast, etc. We'd like to have foreign stations check, too.

It will be noticed that this is a 14,000-kc. table. We had only two reports which included 7,000-kc. information, and really want a few more before putting anything into print. So, when you send us information, include both the 14,000- and 7,000-kc. bands.

We've got this thing started; it depends on you, dear reader, to keep it up.

QSL CARDS

The following remarks, while intended primarily for our foreign readers, will apply just as well to many U. S. hams. Please don't get the idea that "he can't possibly mean me." He can — and probably does.

A. R. R. L. Hq. receives an average of two thousand QSL cards a month for forwarding. The bulk of these are from foreign hams, destined for amateur stations in the States, but there is a fair percentage going the other way.

Now the point of this whole squib is this: A good 15% of those cards have the call-letters so poorly written that we have trouble guessing what the call is, and more than 5% of them are completely undecipherable and are destroyed.

Small, fine handwriting, "trick" writing, etc., may be all right for the rest of the card, but please avoid it when putting down the call letters. If you want your cards to get to their destinations, observe the following rules: *Print* the call letters, in large, plain, "undecorated" letters. Space them well. If you make a correction, don't try to write heavily over the bum call — often we can't tell which is which. Use a new card, or print the corrected call plainly above the old one, and entirely separate from it.

This careless and illegible handwriting matter is becoming an increasing factor in QSL-card forwarding. At the present time, about 100 to 150 cards go into the wastebasket each month. This can be avoided by following the procedure mentioned above.

BRITISH NOTES

By J. Claricoats (G6CL)

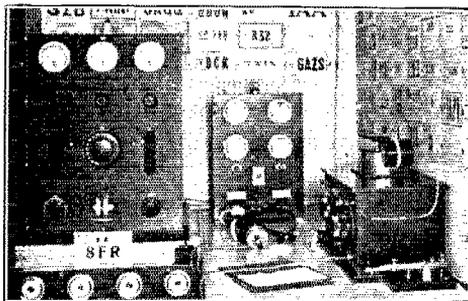
Generally, conditions were poor on all short waves during the early summer. This fact, coupled with the long days which tended to make the average amateur forsake the key for the open air, was responsible for the dearth of active work. Outstanding during the month was the successful reception by Mr. Somerset (BRS125) of the 56-mc. signals sent out by Mr. Noden (G6TW). This was the first recorded reception of amateur signals sent on this frequency. The distance is about 200 miles.

On the 28,000-kc. band very little DX was

accomplished, but Mr. Thomas (G6YK) succeeded in establishing the first G-D QSO when he worked D4UA.

Conditions on 14,000-kc. were very unreliable, certain periods proving good for DX, but on the whole no consistency was obtained.

The 7000-kc. band continues to be choked with unnecessary transmissions with enormous powers. Most of the 'phone heard from Europe is of poor quality, and many stations appear to be in ignorance of the Washington wavebands. The majority of British stations are now using pure d.c. or good r.a.c., but unless the Continentals will also make an effort to clear the air we can think that the band will soon be useless



STATION F8FR IS OWNED AND OPERATED BY ROBERT DUBS, one of the district managers of the French amateur society, the R. E. F. The outfit is located at Mulhouse, Alsace.

The transmitter at the left is a Mesny push-will using two French 60-watt tubes, operating on the eleventh harmonic for the 14,000-kc. band, and the fifth harmonic against ground for the 7000-kc. band. A 500-watt m.y. delivers 1500 volts for plate supply. The receiver is an O-V-2 (detector and two-step) Schnell.

F8FR has worked all U. S. districts and is also a WAC, the certificate being plainly visible in the middle of the wall.

for experimental purposes. It would seem that the days are now past when we can enjoy a 100% "rag-chew" with a friend on the Continent.

The Radio Society of Great Britain is holding its Fourth Annual Convention on September 27-28th in London, and amateurs from all countries will be very welcome. Our society hopes to increase its membership to 2000 before the end of 1929. Foreign and Colonial amateurs are invited to apply for membership.

AUSTRALIAN NOTES

By the Wireless Institute of Australia

The outstanding item recently was the work of amateur stations in maintaining contact between the mainland and Tasmania during a disastrous flood which wrecked the power house at Launceston, Tas., completely severing communications between the north and south of the island and

(Continued on page 60)

Correspondence

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



A Good Note to Get DX

Baton Rouge, La.

Editor, QST:

Read an article in the June QST stating that several ham clubs would not answer anyone using an a.c. or fluttering d.c. note.

I have been using 1000 volts of raw a.c. on one UX-250 and was putting a nice punch into my bent Hertz antenna, but what a note! Not being able to stand the extra expense of getting high voltage rectifiers and condensers and chokes, I sold my 300-watt plate transformer, which delivers 1000 and 1500 volts on each side of the center tap, and bought an eight-microfarad filter condenser and one 213-B full-wave rectifier.

I will use 275 volts of pure d.c. on one 210, and there will be one less a.c. note cluttering up our narrow bands. I might not be able to get much DX with this low power outfit, but I will at least have a real ham station.

— Jesse N. Roberts, Jr., W5ANA and W5BDH

Dummies for the Amateur

Anoka, Minn.

Editor, QST:

Mr. Atkin's article on reduced QRM while tuning has been read and re-read and I think he should be highly complimented on his work in this field.

The above-mentioned article has brought to mind the adaptability of some of the practices in general use at commercial and broadcast stations to the needs of the amateur, and that with the application of the Atkin's "Pediplex," the strain on apparatus, the patience of both transmitting and receiving operators and the limited territory now available to amateurs would be greatly lessened if not entirely eliminated.

The animal under discussion is the "dummy antenna," which essentially consists of a tuned circuit with a resistance, the same as that of the antenna, and capable of dissipating the current that would normally be fed into the antenna, placed in the circuit to reduce the current flowing therein, and also to give the same characteristics to the dummy as are in the antenna. The dummy, for amateur work, need not be so accurate as that used on commercial installations, as all that is necessary is some way of placing a load on the transmitter so the actions of the various circuits

can be noted under load, and still not have an undesirable amount of bad noise going out on the air. This may be accomplished in two ways. The way used at W9CWI is called the combination frequency check and dummy antenna.

The equipment is very simple and is in most any ham's junk box. A coil of 8 turns of No. 12 antenna wire wound on a three-inch tube and a .00025- μ f. Cardwell variable condenser that has been double-spaced are the only requirements. The condenser is shunted across the coil and calibrated to a reasonable degree of accuracy from the receiver. The antenna coil is either very loosely coupled to the closed circuit, or removed from the transmitter entirely, and the coil on the frequency meter dummy placed in inductive relation to the closed circuit inductance and tuned to resonance with the closed circuit which will be indicated by maximum plate current. The position of the dial on the dummy can be noted and the curve of the meter referred to, thus giving a fairly accurate check on the frequency as well as placing a load on the transmitter. This method of using the dummy is not recommended for powers of more than 50 watts, as the current in the dummy circuit is very high and fireworks are likely to result if too much power is dissipated in it. Higher power transmitters should use the dummy in the following manner.

First remove both antenna and counterpoise leads from the transmitter and place a resistance of four or five ohms, with a carrying capacity of five or six amperes across the two terminals. It is assumed that the antenna feed condensers are included in the tank circuit thus formed. In case the antenna current meters must remain in the circuit they should be shunted with a heavy wire or they will die an untimely death. This temporary dummy can now be tuned to resonance by the use of the antenna feed condensers and the frequency checked by use of a separate frequency meter either by use of the plate current dip, or by the use of an indicating device on the frequency meter.

Dummies are employed in the greater part of broadcasting stations when warming up before going on the air. The dummy is a part of the transmitter and the transfer to the radiating antenna is accomplished by a switch in the antenna lead. QRM on the air is entirely eliminated and while it is only possible to tune the closed circuit with the dummy, the standard practice of the

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amateur is to resonate the antenna to the closed circuit, which is a very simple job at worst.

— George Collier, W9CWI-W9XL-W9WI-WCCO

More on Low-Power DX

Editor, *QST*:

Having read Smith's letter concerning his low power DX record on page 72 of the August *QST*, I feel inclined to write of my experiences with low power. Those who may doubt the claims made in regard to the following DX need only look at the many QSL cards from twenty-six different foreign countries and be convinced.

During the months of March and April, the DX made by W4UV was all continents, twenty-nine countries, all U. S. possessions except the Philippines, all Canadian districts and forty-six states. Several DX ships were also worked. Among those were XW7EFF in the Indian Ocean and RWX entering the port at Bombay, India. Weekly schedules were kept with ZL1FB for several weeks. The above DX was done on 14,350 kc. in the short period of only sixty days. The DX since 1927 is thirty-seven countries. There wasn't much DX here until the transmitter was shifted to the 14-mc. band.

The transmitter is a Hartley circuit consisting of two UX-201-A tubes with varied voltage from 135 to 225 volts of "B" batteries applied to the plates. The antenna system is a "high" harmonic operated antenna 140 feet long with a 100 foot counterpoise. I have tried different types of antenna systems, but none has proved superior to the one in use at the present time. The antenna is completely surrounded by a metal roof.

Consistent results have always been obtained, and excellent reports from both the U. S. A. and foreign countries are usually received. I can go as far as to say that I communicated with eleven countries in one day during fourteen operating hours. The outfit described is very economical to operate and if built and tuned right will emit an almost crystal note which undoubtedly accounts for some of its DX abilities on low power.

— Julius C. Vessels, W4UV

Ham Cordiality

211 5th Ave. East, Prince Rupert, B. C., Canada
Editor, *QST*:

I have just returned from my vacation, which took me to Vancouver and Victoria, which are both in my own province, as well as Seattle and Tacoma and other points in the state of Washington.

Returning, I have brought with me one of the finest impressions of the amateur fraternity that a person could possibly have wished for. VE5BM and I made the trip. There was not one city we visited but that we were very agreeably surprised by the exceptionally well-developed spirit of hospitality and friendliness. In fact, we simply had to put our foot down on one or two occasions

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July 15, 1929

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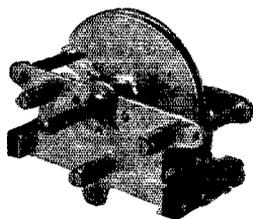
The 'Ship, revolutionary in design, will also carry the first fog penetration, "radio" compass, as well as a new type "high-above-ground" indicator.

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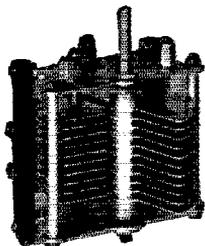
Thanking you for any assistance you may give, I am,

Yours respectfully,

R. V. Howard, Engineer
Radio Division, Slate
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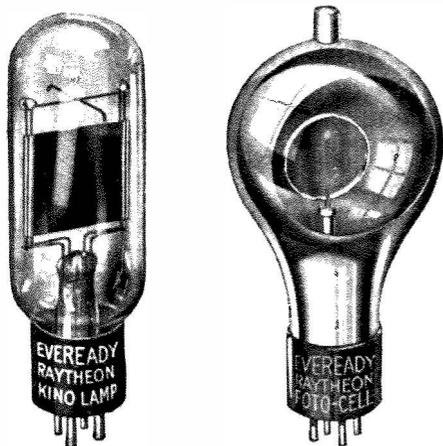
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to prevent good nature from causing too much trouble for our hosts. To say that we were treated royally would be putting it mildly. We were simply rushed off our feet.

Nowhere have I met anyone so obliging and so generous as the ham brotherhood was to us. It seemed to be inborn, this propensity for courtesy and goodwill, and it made time pass very pleasantly. It makes a fellow feel that, after all, the old A.R.R.L. is *some* organization and that we certainly have a whole lot to be proud of and to live for.

If ever I have the opportunity to reciprocate, can well say that the most I can do is very little in comparison to what was done for us on the visit.

— Felix E. Ball, VE5GT-VE5GU

Standard Frequency Transmissions

Brooklyn, N. Y.

Editor, *QST*:

I would like to say a few words about standard frequency transmissions. It is a great thing for calibrating a meter, but there is one bad feature, however, for which you are not to be blamed, and that is the attitude of most amateurs.

I've tried no less than six times to get a complete curve, only to have everything spoiled by some ham coming in with plenty of kick, right on top of W9XL. It wouldn't be so bad if it were a message, although I think it would be a good idea for all hams to be off during transmission, but it's these dad-burned guys that put the family Bible on the key and go out to get lunch.

— Harold deMyer, W2DW

One Way Out of the Difficulty

Executive Office, W9JL

Editor, *QST*:

The undersigned hereby offers the following article as a solution to this strife between 'phone and c.w. men.

Let the 'phone men get together and elect a delegate (their strongest he man). Put him in training and have him in Hartford by January 27, 1930. Let the c.w. men do the same. Let these two fight it out with gloves, pistols, or swords. Wouff-hongs will not be permitted in this aristocratic fight.

— Fred, of W9JL

Even for a Beginner

43 Water St.,
Oakland, Maine

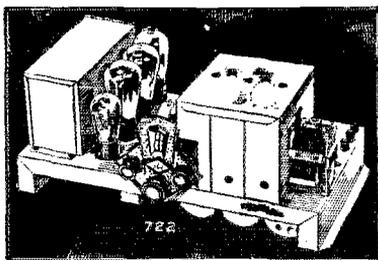
Editor, *QST*:

For the past three years I have been a constant reader of *QST*. I have not missed a copy since I first started taking it in January, 1926, and I guess if it keeps on coming as good as it has, I will not miss them as long as I am interested in radio. They are so easy to understand even for a

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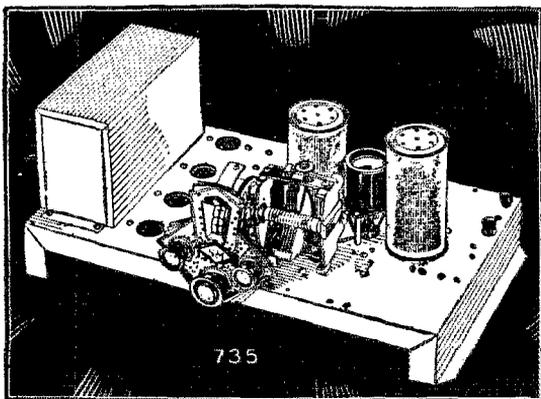
You know the Sargent-Raymont Seven—universally found to be the most sensitive broadcast receiver ever developed. Here, in the new 712 Tuner, is every feature of the 710—the five tuned circuits, the ultra-perfect shielding—the ultra-fine r. f. coils—all built into an all-electric strictly single-dial tuner, with band-selector tuning and power detection. Tubes required: 1—'27, 3—'24. Completely wired in satin-finish metal shielding cabinet, less tubes, \$64.90 net. Works into any audio amplifier.

Component parts, including shielding cabinet, total \$40.90. Fits beautifully (with controls central) in any cabinet with space 18 1/2 by 9 1/2 by 7 3/8-inch high.

An ideal audio amplifier for the 712 is the new S-M 677. Fully equipped with the famous Clough-System (in push-pull) the 677 takes radio or phonograph input; supplies all ABC power required for the 712 (2 1/2 volts a. c., 180 volts B). Tubes required: 1—'27, 1—'45, 1—'80. Completely wired less tubes, \$58.50 net (or for 25 cycles \$72.50). Component parts total \$43.40.

Over 3000 Authorized S-M Service Stations are being operated; many are proving highly successful and profitable. The nearest one is ready to serve you if you want a custom-built set; write us for address if you do not know it. If you build professionally and do not have the S-M Service Station franchise—write us.

Complete circuit diagrams of the 722 and 735 were first published in the **RADIOBUILDER** for August. Valuable suggestions on building and servicing are to be found in every issue. Use the coupon.



Short-wave reception has become the thrill-producer of modern radio—in spite of batteries and ungainly receivers with difficult control. Now, with the new S-M 735 Round-the-World Six bringing every marvel of the low-wave bands within the perfect convenience and unsurpassed neatness of installation suggested in the illustration—no one who really enjoys distance reception should be without the all-electric 735. A 224 a. c. screen-grid tube, so connected as to produce 2 1/2 times greater amplification than the '22, and a two-stage S-M audio amplifier (245 push-pull)—free from hum, even in distance reception. Four plug-in coils cover from 16.6 to 200 meters. Two extra coils (cost \$1.65) cover the broadcast band, with an altered connection built into the coil so as to greatly increase selectivity.

Yet the 735 is low-priced—\$64.90 net, wired complete with built-in power unit; the component parts total \$44.90 net. Tubes required are: 1—'24, 2—'27, 2—'45, and 1—'80.

735DC, for battery use only, \$44.80 net less tubes and cabinet. Tubes required: 1—'22, and 4—'12A. Component parts total \$26.80 net.

Either set fits perfectly in any of the cabinets referred to below.

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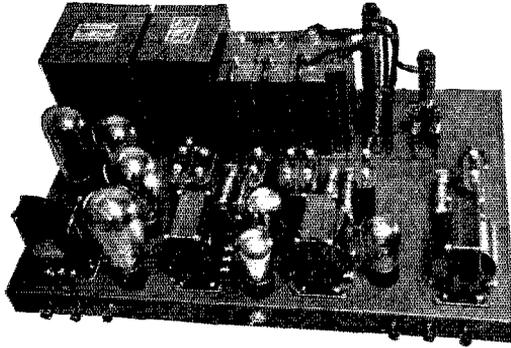
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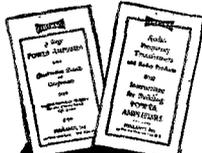
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beginner. Keep up the good work. I do not own or operate a station but am studying radio and find *QST* very helpful at all times.

— A. C. Faulkner

In Appreciation

56 North Broadway,
 Yonkers, N. Y.

Editor, *QST*:

Am sending herewith a letter from Mr. J. O. LaGorce of the National Geographic Society.

This letter shows what some of the "higher ups" of our country think of amateur radio. It also proves that it is deliveries that count!

— Harold W. Fowlkes, W2BFF

Washington, D. C.

Mr. H. W. Fowlkes,
 56 North Broadway,
 Yonkers, N. Y.

I hasten to thank you for your courteous interest in forwarding the radio message you picked up from Commander Byrd on June 4. It was very kind of you to take the trouble to do this and is just another instance of the splendid work which you and your colleagues of the American Radio Relay League are doing all the time.

With the idea that one of our world maps might be of interest to you for your personal station I am giving myself the pleasure of sending it under separate cover with my compliments.

— John Oliver LaGorce,
 National Geographic Magazine

More on Dress

135 E. Third St.,
 Springfield, Ohio

Editor, *QST*:

I wish to call your attention to the article headed "Dressing Up" in the April issue of *QST*. The idea is very fine but if wired up in conduit, as one of the pictures shows, it is apt to cause some trouble with the electrical inspectors. Most cities now use as the basis of their electric code the National Electrical Code of Underwriters book, and this book specifically states that "a.c. and d.c. shall not be run in the same conduit." One picture in *QST* shows it wired this way and creates quite a fire hazard. If it is wired in one conduit one is likely to run into trouble with the electrical inspectors and the insurance companies also. I would also suggest that, even when the wires are "cabled", as shown in another picture, they be in separate forms no matter how heavy the wire is. It is much better to be very much safe than a little bit sorry.

— D. G. Ream, W8OG

A Worthwhile Message

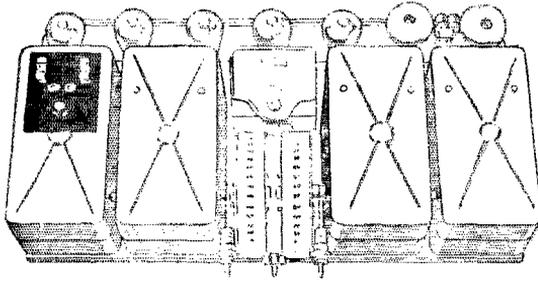
Frankville, Pa.

Editor, *QST*:

Recently a message was given me for transmittal to a soldier in Hawaii informing him of his mother's death.

ALUMINUM

for finer reception



BBETTER tone timbre, greater selectivity, closer tuning, are highly desirable qualities that Aluminum shields bring to radio reception.

Aluminum shielding reduces interference. It eliminates electrostatic and electromagnetic interaction.

It makes possible more compact design and adds less

weight to the set than any other metal. It is very workable and presents few limitations of sizes and shapes.

Inquiry is solicited for Aluminum shielding, condenser blades, and foil; and for Aluminum die castings in the form of loud speaker frames and bases, condensers and condenser frames, drum dials, chassis and cabinets.

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2439 Oliver Building, Pittsburgh, Pa.
Offices in 19 Principal American Cities



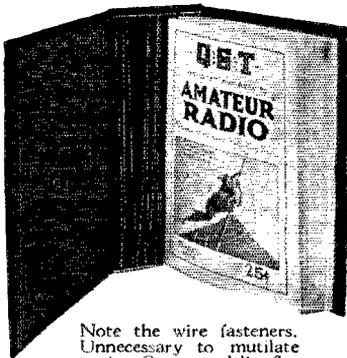
No! Wrong Again

Perhaps it was the September issue for 1927 or maybe the one that WIOFF borrowed the other day. It seems to me that there was a picture of an antenna on the cover — if we could only find that index, we'd be all right. — And thus do amateurs look up past articles in their back file of *QST*s.

All of this might have been saved if they had taken proper care of these back issues. The simplest answer, of course, is to invest in a sufficient number of standard *QST* binders at \$1.50 each to take care of the stack."

—July *QST*.

QST Binder



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

\$1.50 each
postpaid

A binder will keep your *QST*s always together and protect them for future use. And it's a good-looking binder, too.

QST

1711 Park St. Hartford, Conn.

I gave the message to W2ALO, W2CZC and 3AJV and asked them to try and get it to W2SC, W2CXL or W3SN. I also *QST*'d it with the same instructions. I heard W8WJ give it to W2CXL, he (W8WJ) having heard me *QST* it.

I would like to thank all stations who handled this message in any way, and would appreciate hearing from any station who made a delivery of it.

The sender of the message also sincerely thanks all who had anything to do with the forwarding of the message.

The work I had with that message gave me enough thrills to last a year.

— *Beri Felsberg, W8VD*

I. A. R. U. News

(Continued from page 51)

with the mainland of Australia, and causing damage estimated in millions of pounds.

Loss of the power station put Launceston amateurs temporarily out of action but before long the active stations there, VK7BQ (L. J. Crooks) and VK7CS (A. C. Scott) were operating with "B" battery supply in between assisting in the urgent relief work.

Loss of communication with the mainland was caused by road and bridge washouts, severing the overland part of the cable between the capital, Hobart and Melbourne on the mainland. W.I.A. stations were immediately offered. From the maze of detail it is difficult to pick out any outstanding performance, but the stations actively engaged were VK7CW, VK7HL, VK7DX and VK7LJ at Hobart working with VK3YX, VK3KS, VK3RJ and VK3LS and traffic was handled with due speed and considerable loss of sleep until normal communication was reestablished.

The incident has done more than anything else to bring the value of organized amateur radio to public notice, and the Chief Officer of Telegraphs has been pleased to publicly acknowledge the assistance rendered.

A number of serious air accidents to planes engaged on exploration flights have occurred lately in Australia, during which inefficient or no radio equipment has been carried, and although the W.I.A. has enough stations available to insure constant communication while a flight is in progress, no request for assistance has been made, probably due to the fact that other interests were being considered. Public opinion, however, is now asking why, and it is probable that on future flights suitable measures will be adopted.

The civil and defense aviation authorities are cognizant of the value of the Air Force Communications Reserve which we have organized, and pilots under their control are being supplied with charts on which amateur station locations are marked.

The first tactical exercise of the Reserve took place about two weeks ago, and was entirely

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SEND IN YOUR QSL
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INFORMATION



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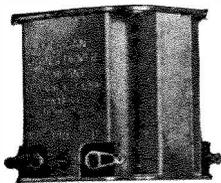
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Perform that "Operation" on Your set!

IT'S really not as serious as it sounds—
just take out those inferior transformers
and put in their place the true-tone
audio transformers—AmerTran De Luxe.

No matter how old or out-of-date your
set may be, this simple replacement will
bring you exact reproduction of all broad-
cast programs.



AmerTran De Luxe — 1st
stage turn ratio, 3. 2nd stage
turn ratio, 4.

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purpose of achieving real-
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done cheaply, or hap-
hazardly. AmerTran's 30
odd radio products all play
their definite part in pro-
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known to Radio.

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ation" today? See your dealer
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NEWARK, N. J.

successful, the stations engaged managing to get a lot of fun out of it, and eagerly looking forward to the next.

Ross Hull was suitably welcomed back at a General Meeting of the Victorian Division, the gang turning out "en masse" — including our one and only lady amateur, VK3HM (Mrs. L. Hutchings).

GERMAN NOTES

By W. Rach, Sec'y, D.A.S.D.,
and Dr. Curt Lamm

The most important event lately was our yearly meeting in Frankfurt. During the two-day session amateurs gathered from all parts of the country, as well as representatives of amateur organizations in Austria, Czechoslovakia and Switzerland.

Of the interesting discussions, two stand out as being especially worthy of note. The first was that of Dr. Plisch (OK3SK) of Brunn, Czechoslovakia, who gave a most interesting talk on new theories regarding antennas, as well as practical examples. For the second, we were fortunate to have Dr. Hundt, of the Bureau of Standards, Washington, D. C., who spoke on quartz crystals. He gave us some very interesting particulars on experiments in crystal control which were being undertaken at the Bureau of Standards. The detailed discussion which followed the talk, as well as the QSA5 applause, were the best proof of the audience's keen appreciation.

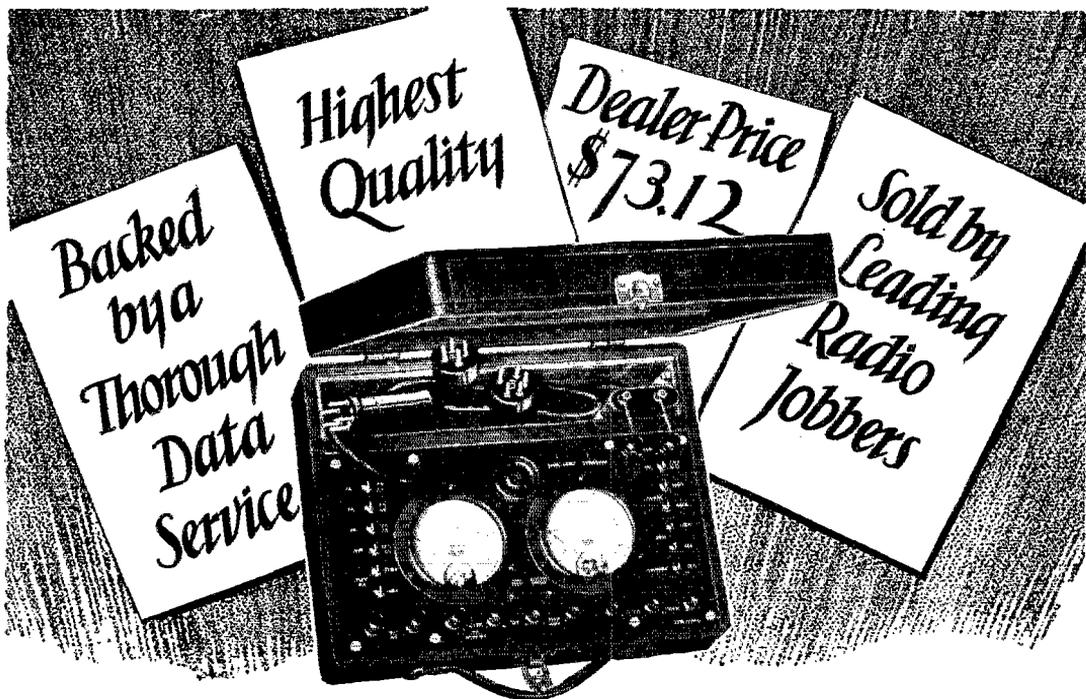
At this meeting, the following new officers of the D.A.S.D. were elected:

Col. D. Otto Fulda	President
Dr. W. Titius	Editor of "CQ"
F. Kron, Eng.	Technical Editor
W. Rach	Secretary

We regret that our former secretary, E. Reiffen (D4KU) finds himself so tied down by his studies that he was forced to resign. OM Rach will take over his labors as foreign correspondent. All German amateurs at this time wish to express their appreciation of the excellent work of OM Reiffen, and wish to pass on the same confidence to OM Rach. Our desire will be to retain and deepen our amicable relations with our foreign friends.

During the early summer there was little to report. The promised licenses were again refused, and will remain under consideration. For a time, therefore, most of the German hams must remain as listeners, the only legal activity in which we can indulge.

The results on 14,000 kc. are not up to standard, although some good work has been done. D4XN has QSO'd all continents, and D4BY, with only 8 watts input, was in communication with Japan. A most interesting circumstance in connection with this work is the fact that the set was on board a small catboat cruising on one of Berlin's nearby lakes.



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Pattern 199's are built to the most exacting standards. The large 3 3/4 inch Jewell Instruments have been proved on thousands of exacting industrial applications. The bakelite panel and silver contact switches indicate the high quality of construction throughout.

In addition, the Pattern 199 is backed by the most complete and thorough radio data service available, including complete test data on sets of leading radio manufacturers. Jewell Analysis Charts make it easy to record test data systematically for convenient comparison and analysis.

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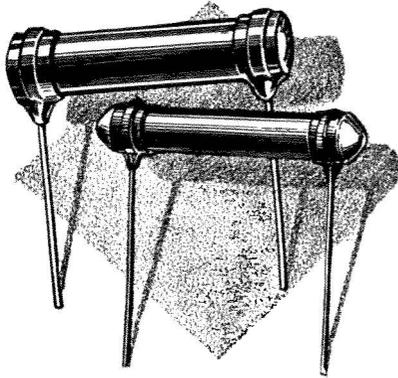


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Oscillogram showing noiseless performance of Bradleyunit Resistors.



Oscillogram showing noisy performance of other types of resistors.

Furnished in ratings from 500 ohms to 10 megohms, with or without leads. Color coded for quick identification.

Write today, giving specifications

ALLEN-BRADLEY CO.
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Allen-Bradley
PERFECT RADIO **AB** RESISTORS.

On 28 mc., the best work has been done by D4UAH and D4UE, in Munich, D4AW, D4CO and D4AC in Berlin. D4AW and D4CO, with only 8 watts input, have had several QSO's. Recently they received their first reports from England.

We have the extreme good fortune to announce that the Austrian amateurs have unanimously agreed to enter the D.A.S.D., and we will therefore guide their policies as well as our own in matters pertaining to the I.A.R.U.

In connection with the Convention at Frankfurt, the editor wishes to express his appreciation and thanks for a letter written to *QST* expressing the good wishes of the Convention delegates, and signed by all those present. It was a very graceful act, OM's.

AUSTRIA

As noted in the German report, the Austrian amateurs have decided to affiliate themselves with the D.A.S.D., in Germany, for amateur organization. We understood some months ago that this action was "in the works" and are very pleased to see that it has been culminated. We would like very much to have some notes from some Austrian amateur on Austrian conditions. How many of you are there, OM's?

JAPAN

By K. Kasahara, J3DD

There is not very much to report. A few new transmitting licenses have been issued, among them being J3CJ, Mr. N. Tokudaiji, who is licensed to operate on 7100 and 14,200-ke. He is a member of the J.A.R.L.

J3DD has received permission to operate on higher bands, and his QRH's are now 7100, 14,200 and 28,400 ke. He will be chiefly on the air on the two higher bands, and hopes to keep a sked with U. S. or European amateurs on 28,000 ke. particularly.

J3CB is also licensed for these higher bands.

QSL cards for Japanese amateurs may be forwarded through the A.R.R.L.

SWITZERLAND

As most amateurs know, the Swiss amateurs have had a tough time of it for many years. In fact, only one Swiss was ever licensed, to our knowledge, and government regulation was so strict that not many others ever dared to operate under cover.

A Swiss section of the I.A.R.U. was organized at the time of the Union's first Paris conference, but we regret to say that it rapidly became totally inactive.

It was a great pleasure, therefore, to receive in the mail a few days ago a letter from Mr. H.

REL ANNOUNCES 1930 TRANSMITTERS



DURING the past year developments in Radio telephone and telegraph transmitters have brought about new engineering principles. The transmitters for 1930 must employ all the new improvements so as to comply with the latest rulings of the Federal Radio Commission. Exhaustive experiments at the Radio Engineering Laboratories have produced radically new types of transmitters which embody all the modern features.

100% SYSTEM OF MODULATION

Prior to 1930 the amateur phone set was mostly a "hay wire" proposition. The 1930 amateur telephone transmitter rivals the modern broadcast stations. Efficiency demands 100% system of modulation. 100% Modulation means that your phone signals will be reported with the same signal strength as your straight CW signals of equivalent output power. The new system is not unnecessarily complicated. The selection of tested equipment allows the average amateur to construct transmitters and obtain efficient results without the usual experimentation.

ABSOLUTE FREQUENCY STABILITY

1929 has taught the amateur the importance of frequency stability. In plain language the transmitter must emit a clean note which remains absolutely steady without shifting or swinging. The narrow bands mean congestion making frequency stability an absolute necessity. The 1930 telephone or telegraph transmitter is of the multi-stage type employing either a crystal or a master oscillator control circuit. Frequency stability is even more important when using the new 100% system of modulation. The slightest swinging of the carrier wave will greatly increase the percentage of distortion.

READY FOR IMMEDIATE DELIVERY

Two new transmitting kits are available. The low power type employs either AC or DC type tubes. It has a CW telegraph output of $7\frac{1}{2}$ watts and an undistorted peaked modulation output of 30 watts. This transmitting kit is a basic unit for the modern 1930 transmitter. In addition to the equipment supplied by REL you will require only the power supply and the tubes. The second new developed transmitter uses the same low power basic unit and in addition a 75 watt lenier amplifier stage giving an output CW carrier of 18 watts and a peaked modulation of 75 watts.

REL HAS PLACED THIS EQUIPMENT WITHIN THE RANGE OF THE POCKET-BOOK OF EVERY AMATEUR

Full information on these new transmitters and also complete data on tuning, adjusting and operating multi-stage transmitters employing 100% system of modulation will be gladly supplied upon request.

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14 years

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New York Chicago San Francisco
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Degler stating that a move has been made to organize a Swiss amateur organization. Mr. Degler thought it could be done, and on the strength of this conviction sent out a "call" for replies. He hoped to get a dozen or so. Consider his surprise and pleasure at getting no less than fifty enthusiastic responses, all eager to see a real Swiss "ham" society organized, and all willing to help in accomplishing this end.

He immediately laid plans for a convention to be held at Zurich in the latter part of August, and all those who replied to the first letter were invited to be present. The editor is glad to report that, just as this material goes to press, a radiogram has been received from Mr. Degler stating that the convention was held, and that as a result, the S.A.S.U. (Swiss Amateur Transmitters' Union) is now an accomplished fact.

Congratulations, OM'S!

We hope to have details on the convention and the new society for presentation in the next *QST*.

Don't you get a real kick in reading about these new young societies being formed in countries where everything possible is done to discourage amateur radio? You simply can't keep a good ham down, whether he lives in Podunk, U. S. A., or some out of the way place in Java.

We've always wondered whether anybody reads this I.A.R.U. "colyum" right down to the bitter end, so this particular note is being stuck in last. If we get any replies to the request, we'll rest forever happy in the knowledge that some of you do read this far!

The point is that you may have noticed the long time intervening between the writing of the various foreign reports and their printing in *QST*. A June report will come out in the September issue, and an account of a convention in May doesn't appear until August.

We hate to admit that this is so, but it is, and what is worse, it is inevitable under present methods. You see, it takes a long time for the mails to move, and then when we add that to the usual time interval of *QST*, the result is horrible to contemplate.

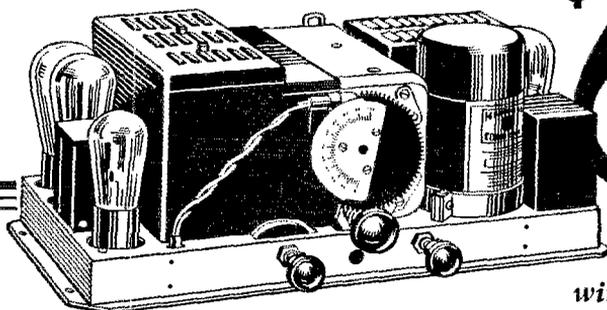
Now, if we could only speed up the transmission of these reports some way — Ah! We perceive that you are ahead of us!

Yes — we want to see if we can't get those reports sent by *radio*. How about it, foreign hams? And how about some good schedules with them on the part of the U. S. gang?

Now, please don't just write in and say you'd be glad to do this if we will fix it up with some foreigner to keep a schedule. Your humble compiler has lots of other work to do here at Headquarters in addition to pounding out this department, and while he will try to find time to fix up schedules between interested parties, it would make him a lot happier to see a letter come in that said: "This is to inform you that I have a schedule with XYZI every month to

MORE big news in radio

\$62



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Shown here
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Note, too, that the Monotrad utilizes: Two 224 Screen Grid

tubes in R. F. stages; one 227 tube as power detector; one 227 first audio tube, resistance coupled; two 245 power output tubes, connected push-pull; one 280 rectifier tube — seven in all. The Monotrad also has the Neutrodyne circuit.

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get the Andulian monthly I.A.R.U. report, the first of which is sent herewith." (Reports should reach Hq. by the 12th of each month.)

Honest, gang, it would be like manna from heaven!

Australia, South Africa, England, and Germany report regularly by mail, and perhaps some way could be arranged. . . .

Well, anyway, we leave it to you.

Calls Heard

(Continued from page 49)

W1CPH, T. L. Siglin, Jr., 23 Norwich Ave., Providence, R. I.

7000- and 14,000-kilocycle bands

w7ajj w6dna w7dp w7fl ce2ab ce3bm ce3me d4aan d4jl d4kd eargu f8ef f8cab f8xyz f8jf f8aja f8gdb f8mst g2xy g2yu g5bd f8oa g6nd g6mf g6xm g6xo g5lw g6uh g6rb g5bj haf8b k4ni k4lf lu3pa n12pa on4ww on5hp oz7t paky paqf py1br py1el py1aa py2ag py2ik py3ca ep3kx ve1dm ve1xk ve1cc ve3vs ve3ur ve4hc vo8ae vo8me om2jt cma2

K4KD, E. W. Mayer, Box 103, Ensenada, Pinaro Rico

w1apq w1avj w1aze w1sz w2acg w2adp w2aer w2ajb w2aob w2aoj w2apn w2aqj w2atz w2aw w2azk w2bbp w2bqj w2bjg w2bon w2osx w2zxl w2zi w2fn w3arx w3apn w3aws w4ajk w4ar w4ct w4gy w4is w4oa w5bfp w6adp w6cww w6dbx w6don w6bg w6eeg w6eog w7ae w7an w7bb w7dc w7uk w8cuh w8dlld w8dfu w8duq w8dpo w8dgt w8dre w8heb w8esq w9dbw w9dfw w9fge ce2ab cm2jt ct2ac d4uak ea2i f8axq f8jf f8rko f8rmf f8wb g2bm g3lw g5pl g6uw g6cl g6hd g6lb g6mf g6rb g6wl g6wn g6wo g6xa haf8b k4ni k6ctg k6dy k6eaf k6bj k6bg kfr5 lu3dr ok2yd on4fp on4ft on4hp on4ro on4fm on4uu paqf pafr paka sm6ua ve1cc ve2eh ve3bk vk2ac vk3pp vk7lj vo8ae z1lat z1lfl z1lfr

I. V. Miller, 13 Bedford Crescent, Dulwich Hill, Sydney, Australia

7000- and 14,000-kilocycle bands

w1adw w1aff w1aje w1anz w1ape w1apf w1aqf w1arx w1asu w1awe w1awf w1axx w1axk w1bnn w1bnu w1bux w1bxm w1edr w1eek w1emp w1emx w1eod w1eic w1dnc w1fl w1gg w1gw w1om w1mp w1mr w1zz w2abe w2aek w2aj w2afu w2alu w2alr w2ann w2amr w2apj w2aqh w2aql w2arb w2ase w2asj w2az w2baz w2bev w2beq w2beh w2bjg w2bhp w2bvq w2eav w2ee w2eh w2eqn w2eou w2eyf w2eyj w2eru w2ezr w2gp w2gt w2gy w2hb w2hj w2hq w2hp w2hma w2hn w2jn w2ju w2mb w2md w2qu w2r w2rs w2vtw w2za w3adp w3aqj w3bnf w3bwt w3ekl w3evi w3db w3ga w3gp w3io w3nz w3uj w4ac w4ae w4afk w4ahl w4aq w4ar w4aq w4ib w4kh w4ly w4sh w4sp w4tk w4ut w4we w4ct w4ace w4af w4at w4aq w4aot w4wb w4bc w4ba w4ra w4au w4awd w4aws w4ayf w4ayh w4ayy w5ba w5bbe w5bek w5bfp w5bx w5chx w5dje w5dst w5eez w5ix w5jc w5p w5mx w5pi w5ql w5rg w5uf w6aax w6afe w6ags w6ahs w6akk w6akw w6am w6app w6aoc w6aov w6aq w6ary w6ase w6ase w6avj w6avq w6awn w6awp w6axc w6ayh w6ayl w6abx w6ben w6bge w6bgk w6bgl w6bjj w6blu w6bnh w6bnu w6boa w6box w6boy w6bpc w6bpm w6bqk w6brj w6bep w6btm w6btu w6btw w6bvj w6bvx w6bvy w6bhw w6bxw w6by w6byy w6car w6cgm w6cgg w6cgr w6cha w6chy w6cj w6coj w6cxn w6cxc w6ery w6cui w6cuk w6cut w6czk w6czl w6czm w6czq w6dam w6dav w6dbb w6dbd w6dfr w6dgv w6dgh w6dhs w6dki w6dli w6dll w6dnc w6dns w6dck w6dow w6doz w6dpa w6dgo w6dqq w6dqv w6drb w6dtb w6dtd w6dur w6dwp w6dzo w6dyz w6duz w6dzy w6dzg w6ebn w6edo w6edx w6eec w6eeo w6elc w6elw w6egj w6ejc w6ehi w6ehf w6eib w6eic w6eii w6eek w6ekz w6emt w6emx w6eot w6efj w6eru w6esn w6eta w6etu w6euz w6fk w6g w6kw w6ln w6nx w6nz w6pw w6qk w6sf w6tz w6trz w6vz w6wb w6wn w6xbb w6xh w7abg w7abh w7ac w7aer w7alo w7ago w7ao w7ajj w7bb

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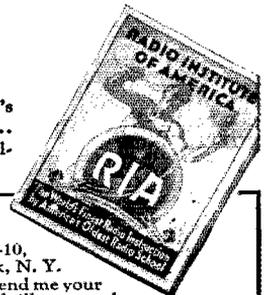
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w7bly w7dd w7do w7dw w7ew w7fl w7fs w7kt w7li w7lk
w7lp w7lz w7nl w7nr w7nh w7nr w7pc w7tx w7wh w7wi
w7wy w7zf w8adm w8aky w8apb w8asc w8aun w8avb
w8awv w8axz w8bau w8bfa w8bgv w8bns w8scw w8scr
w8suj w8sks w8smp w8sncz w8sny w8scpm w8sra w8sbe
w8scm w8dff w8dkh w8dhi w8dlld w8dva w8jq w8pu w8ypz
w8wv w8zz w9aas w9aid w9aok w9aol w9adk w9auih w9avh
w9awn w9bey w9beu w9bec w9bld w9bnd w9bpd w9bq
w9bqe w9bsd w9bpb w9btw w9bxj w9bxh w9bcq w9bck
w9cmv w9cp w9erd w9ewv w9evn w9cex w9ezc w9def w9dgs
w9dit w9dfy w9dfz w9dkh w9dlv w9dvq w9dr w9dws w9dyr
w9ebo w9ecz w9ef w9ef w9eft w9efk w9efu w9ejj w9ejo
w9enw w9ftz w9fx w9gka w9gsq w9gv w9lk w9mn w9nm
w9qw w9uuh ti2hv oa4q f8ssy f8gj g5by ve4af ve5dd ve5aw
z4te xc5l ae7xot ac5gm ac5gw ac8ag ac8aw ac8in ac8rv
ac7qo xw7eff xv7av k9pl jidx k9dr ktr5 kfr6 kfr8 kdv5
omltb oolrj k7lg pk3bm pk4jr on4gg on4pw on4bt d4yt
d4ban d4uj f8aap f8acj f8axq f8btd f8btr f8et f8eo f8hu
f8mb f8rbv f8rko f8sm f8xo f8xh f8xz f8gk f8wb f8ir f8dgb
f8ix g2bu g2es g2lz g2xv g5hv g5uv g5wk g5qv g5vl g5vx
g6bz g6gc g6hp g6ll g6xc g6vp g6xn g6xq llet jlap jlaw
jltx j2bc j1bk j1aa j2bv k1em k4ni k6bav k6alm k6elj
k6eba k7lg x9a kfr5 on4ar on4bt on4di on4fp on4fw on4gg
on4pj on4pw on4au on4wk on4ro oz7bl paljf xpa0ja xpa0yy
ear96 pk1jr pk4jr lu4dq oobam spebl oh2nm on2nap z4te
z5zj z54m ct1aa ct1ae ct1by fk4ms ve1ar ve2ca ve4af ve4fk
ve5aw ve5ef ve5cp celah ce2ab ce2bl ce3ag ce3bf subrs
solaa oa4o oa4h oa4s eplaa okaa2 oklfm uogx pylaa pylcm
pylib py2ak py5af ai2kt vt5kx vs1ab vk6he vk6sa

*WECR, S. S. Agwistar, W. H. Bauer, Opr. Ber-
muda to Montevideo, Uruguay*

7000-kilocycle band

w1aal w1aat w1ad w1ade w1afb w1aks w1ame w1ami w1aoi
w1arg w1arp w1atm w1aue w1axv w1axx w1bal w1bbi
w1bdi w1bjd w1bks w1bmc w1bnk w1bs w1bns w1cdp
w1cdx w1cfr w1cqp w1dl w1ek w1fc w1ia w1lv w1ni w1nx
w1vi w1vn w1wu w1xm w1yb w2abg w2adg w2aer w2afr
w2aif w2age w2agz w2akv w2alu w2anm w2aoj w2apn
w2aps w2asg w2ass w2atr w2atz w2auk w2avp w2aap
w2bay w2bg w2hgm w2bhv w2bme w2bpa w2bph w2bpi
w2byr w2cjq w2cxl w2cy w2lx w2ma w2ne w2nt w2pf w2pp
w2re w2sg w2wt w2wi w2wy w3ado w3ahj w3aip w3aitw
w3aih w3ajo w3amh w3anh w3apf w3apt w3ard w3aru
w3ato w3avo w3awn w3aws w3bdq w3bnu w3bq w3cju
w3dk w3ec w3ek w3kr w3ky w3ny w3uj w3ur w3vb w4ab
w4acc w4acy w4afe w4afm w4agy w4aib w4aig w4aiv w4aka
w4akq w4akt w4alb w4ald w4ao w4ar w4aw w4bu w4bu
w4ct w4ea w4ei w4ec w4gn w4kj w4ll w4nh w4oc w4oz
w4pm w4qh w4qv w4uy w4zp w5aap w5adv w5ana w5ane
w5awq w5ayq w5ayz w5beb w5bdy w5bg w5bqx w5ex w5df
w5gf w5gr w5je w5l w5ul w5uk w5za w5am w5ane w5arv
w5avj w5bek w5bgm w5bih w5bin w5bp w5bpy w5bqc
w5bvy w5bz w5chw w5ciu w5cuv w5ezz w5dkv w5dqy
w5dld w5dz w5eaa w5eao w5ebg w5ebn w5egy w5ehi w5eii
w5eiv w5eiv w5eup w5euv w5eav w5eva w5hy w5inx w5na
w5zbb w7aeg w7afo w7ao w7ua w8aa w8abc w8abq w8ac
w8aeg w8ads w8agk w8agv w8ahm w8ahq w8ake w8ann
w8apm w8ate w8axz w8ayo w8bna w8bdo w8bfd w8bqx w8bly
w8bno w8br w8bth w8bti w8cau w8cem w8cfr w8chy
w8cib w8ciw w8civ w8ckl w8csc w8cug w8dat w8dds w8dpo
w8duw w8dvt w8f w8iq w8jb w8mb w8np w8qm w8sx w8tj
w8uk w8vp w9ads w9afb w9aja w9alw w9aly w9apm w9ara
w9awn w9azq w9bca w9bnj w9bkr w9bly w9bul w9bvf
w9cku w9cmf w9erd w9est w9evn w9ewx w9dbj w9dli
w9dog w9dqh w9dva w9dvp w9eaw w9ecs w9efe w9efd
w9ek w9ema w9eph w9evu w9fdj w9fzi w9fzv w9fzv w9fhy
w9fs w9ftz w9gbj w9gfc w9git w9sk w9zd kdv5 kfr6 k4aan
k6dtq k6est ct1ec ct1cp ct1sf ct1am cm2jt cm5dl dol ear149
ear53 ear62 ear94 eu2bv eu4ka eu5pl f8cco f8cla f8jc f8jk
f8zj illaw g2ej g5hr g5bz g6qa helg ilcoz ifg illi oh2nas
on4gm on4pj pa0gt pa0qq pylc su7wu sp3ar sp3mb tg2elo
ve3co ve3cz vk2jq z1lr z1ft z1sas z1lj

KFJG, Tug Wanderer, Irving Mutschler, Opr.

w1rw w2ai w2bjg w2bkv w2bmm w2ch w2cxl w2fn w2fp
w4kh w5ql w6aaz w6aba w6abg w6afu w6ahp w6aie w6aim
w6apd w6auh w6avj w6awf w6awp w6brv w6bxk w6bck
w6bpf w6bqk w6cii w6ctx w6dgc w6dln w6dni w6dvi w6dyf
w6eay w6ehi w6ehw w6enx w6eou w6eox w6cft w6ctg w6ju
w6mx w6ny w6qo w7aay w7acd w7agn w7ahb w7dd w7ir
w8axz w8bwc w8cft w8chp w8cpl w8cpr w8su w8wh w8bas

It's the Same Story Everywhere!

Extract from ZL3CE's gossip section of the "Canterbury Radio Journal," published in Christchurch, New Zealand:

"The Posts & Telegraphs recommend these books for those studying for their (amateur) ticket: —; —, by —; and *The Radio Amateur's Handbook*, by Handy & Hull, and published by the A. R. R. L. The first contains altogether too much theory, of little use to the practical ham; the second is a little better but . . . very much out of date; the third, [*The Radio Amateur's Handbook*] if you will only study it thoroughly, contains almost all the information necessary to make you a good amateur."

And Furthermore:

"The Radio Inspector confided to 3CE that 'If I had my way about it I would make every ham and prospective ham buy a copy of the *Handbook*.' FB! Three cheers for our R. I.

"Read through every chapter, no matter what the heading, and by the time you have finished you will know more about the game and have more useful information at your finger-tips than many an amateur on the air to-day."

[[Thanks, ZL3CE—You've written
our Handbook ad for us this
month]]

HAVE YOU got YOUR copy of this remarkable book? Everything that can be thought of about amateur radio is in it, from how to start breaking into the game right up to the most complicated operating procedures for the most advanced modern stations. Revised 5th edition, with new material on power supplies, keying, etc. 200 reading pages, the size and type-style of *QST*; nearly 200 illustrations; a \$5 book if published in the usual textbook style.

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- Overhauling the Transmitter for 1929 (Aug. 1928)
- The Oscillator-Amplifier Transmitter (Sept. 1928)
- The Frequency Measurement Problem (Oct. 1928)
- High-Frequency Receivers (Nov. 1928)
- The Status of 28,000-cc. Communication (Jan. 1929)
- Requirements of Transmitter Keying (Feb. 1929)
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w9beu w9bhh w9bwt w9ce w9cou w9cye w9dkg w9dtx
w9emr w9enr w9eph w9fcw w9fua w9gbx g9nt k1cy k6cyo
k3go ve4dg ve4gm ve4gq ve5dm vk2lj vk2rx z12ab om1tb
at1g

W60J-W6ZZK, Clyde DeVinna, Northern
Uganda, British East Africa

7000-kilocycle band

w1apf w1dl w1mk w1si w2cxl w3avd w3anh w3tr w4oc
w4wm w5afu w5je w5ql w8axz w8ces w9cyn w9ads w9ftx
klaf k1hr k6dtg kfr5

14,000-kilocycle band

w1bux w3pf w5aew w5lp w9bqe w9dfy x9a

W9UM-W9BOH, M. W. Macy, Lake Wawasee,
Syracuse, Indiana

w6aa1 w6aa6 w6afp w6afu w6aga w6ah w6ame w6ami
w6arn w6ash w6auk w6axm w6axn w6bab w6ba1 w6bek
w6bew w6bf w6bfc w6bfg w6bjf w6bjl w6bjr w6bjy w6blk
w6bng w6bnr w6buv w6bvs w6bwi w6bvx w6byb w6byy
w6cbk w6cbp w6cbe w6cix w6cpw w6cpm w6cui w6cuz w6czo
w6dda w6dec w6dey w6dfm w6dio w6dki w6dlc w6dli
w6dnc w6dpl w6dss w6ddt w6dte w6dto w6dui w6duq
w6dvd w6dvy w6dwi w6dwy w6dyj w6dyl w6dzm w6dzz
w6ea w6ebx w6ee w6edd w6edt w6eej w6efj w6efo w6efr
w6egk w6egr w6egy w6ehe w6ehi w6ehw w6ehx w6eib
w6eii w6eje w6elc w6elz w6emg w6emk w6emq w6emr
w6eog w6eop w6ept w6epu w6epz w6eqc w6eqs w6eru
w6etb w6etf w6etx w6eu w6eul w6ft w6flm w6ju w6pi
w6pv w6re w6ri w6sc w6tj w6tw w7aa0 w7aat w7ack
w7aif w7af0 w7aho w7ait w7akp w7akv w7am w7ans
w7bb w7bw w7ex w7dc w7ed w7ek w7fb w7fh w7ge w7kk
w7kw w7hn w7ih w7kj w7lp w7ls w7na w7nr w7pv w7rr
w7sr w7t w7ts w7u w7wn w7wp w7yg k1ff w1a w1bt w1t
vk2hm vk2br vk3ax vk3pj vk3pm vk3pp w1fe ve4af
ve4em ve4ek ve4hg ve4gk ve4go ve4hd ve4hp ve4hy ve4zz
ve5az ve5bl ve5hc ve5av ti2hv nr2wd nr2hc em2ay em2cf
em2co em2ce em2ay em2by em2fc em2fl em2ni hel1g
hel1r hel1m nj2pa x1f x9a x9b x1ab x1bj x1ft x1fw
z12ab z12aw z12go z12gp z13as z13cm z14ae z14ax n1fx n1xx
n17nic n1cnc n1nic n1nic n1nic n1nic n1nic o4t o4o
o4tq z2b ear98 kfr5 kfr6 kd5v k6avi k6ch k6cjs k6dju
k6dpp k6ene k6eqm k6eti k6dv

W8AEC, John C. Heberger, 371 Augustine St.
Rochester, N. Y.

7000-kilocycle band

ys1ab k4aan ve4dj k6avi em7ah em7sh ve4gm ve4af k1ff
k6eqm xae k6acw em2ay w1a n17nic nj2pa k7fy k6aiy
k6dv k6bhl kfr5 ti2hv ce2ab hel1g em5ic em2co vk3pp
z1ft z14av

W3FJ, T. P. Matthewson, 24 N. Boulevard,
Richmond, Va.

vk2no vk2rx vk2jy vk2lm vk2lw vk3cp vk3jy vk3pa
vk3ex vk3pm vk3rj vk3go vk3lp vk3bl vk4at vk4bb vk4bd
vk5aw vk5mb vk5hg vk5bb ce3bm ce3bf celah ce3ac
ce2hs ce2ab ce3ac py1aa py1aw py1bl py1cl f8ab f8cp f8ct
f8fr f8he f8ix f8em f8im f8hr f8eo f8hx f8klm f8orm f8pam
f8rbv f8wzk f8awa f8xhv g2bm g2ll g2nm g2sw g2od g5by
g5bj g5mq g6qb g6yq g6vp g6xb ct1aa ct1by ct1bx ct1ae
ct3am on4di on4ft on4fp on4j on4ku ok1ry ok1fm d4al
pa0tp pa0dw sin6ua ear98 xpa0zz o4l o4s o4o lulex
lu2bx zi2be z14ba k6acw k6alm kw5ar kfr5 kd5v fpm
rwx wsq em262 vo8mc

W. Clyde Townsend, Wireless Office, S.S. Dromore
Castle, Union Castle Mail S.S. Co., Mossel Bay,
Africa

(QSL to 3 Belmont Rd., Southampton, England)

(Heard during voyage from London to Capetown)

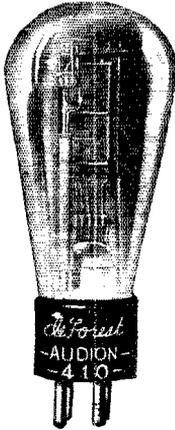
2000 miles south of England

w1abd w1aeh w1ajc w1are w1asp w1bkm w1bqs w1bn
w1cb w1lf w1lw w1rp w1rv w1rx w1yb w2acg w2apz
w2asz w2bfi w2bhr w2br w2ks w3er w3rmb w3ard
w3awm w3aws w3dx w3ep w3pf w4aef w4eaw w4gy w8bcu
w8cor w8duw w8ly w8vx w9dbj w9ejo w9fs ct1bd ct1ce

Here they are . . .

New Audion 410

Audion 422



Type 410 Audion is designed to use as an oscillator or as a radio-frequency power amplifier.

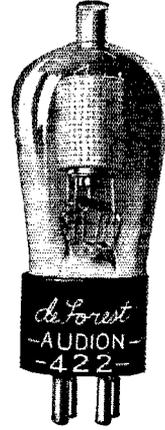
"Crolite" plate supports and mica spacers at the top of the tube afford protection from voltage breakdowns common to many -10 type tubes.

The use of oxide coated filament results in greatly increased life as operating temperatures are less than one-third that of thoriated tungsten.

"Creeping" is entirely overcome. It is practically impossible to heat the carbonized plate owing to an area nearly twice that generally used in ordinary -10 type tubes. The 410 Audion is capable of dissipating as high as twenty-five watts of energy.

CHARACTERISTICS 410 AUDION

Filament Voltage	-	-	-	7.5 Volts
Filament Current	-	-	-	1.25 Amps
Normal Plate Voltage	-	-	-	425 Volts
Normal Plate Current	-	-	-	80 M. A.



Type 422 Audion is a battery operated, screen grid tube for use as a radio frequency amplifier.

An oxide coated filament also gives this Audion much longer life and greater emission than in the ordinary -22 type tube. The filament is three times the diameter of the ordinary thoriated tungsten filament generally used, assuring freedom from microphonic noises.

CHARACTERISTICS 422 AUDION

Filament Voltage	-	-	-	3.3 Volts
Filament Current	-	-	-	.132 Amps
Plate Voltage	-	-	-	135 Volts
Control Grid Voltage	-	-	-	-1.5 Volts
Screen Grid Voltage	-	-	-	+45 Volts

Watch for our announcement of the new De Forest "50 watt" Audion soon to be placed on the market.

1906 DE FOREST RADIO COMPANY, JERSEY CITY, N. J. 1929

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Like a SHIP without a RUDDER

the "control" is gone . . . not powerless . . . but rudderless . . . no longer does she respond to the helmsman.

Your radio without good resistance device like the CENTRALAB resistance, doesn't respond to the slightest touch of the "helmsman."

You steer your way through the ether by fits and starts . . . augmenting the "static storms" by internal "self-inflicted" noises.

Better be sure that radio is "Centralab" equipped.

"Volume Control, Voltage Controls and Their Uses"

is the title of an interesting pamphlet that is yours for the asking.

Central Radio Laboratories
20 Keeffe Ave. Milwaukee, Wis.

ear16 ear69 ear75 ear105 eb4hp eu5kah eu5kau f8bu f8bwm fm8ev fm8fya freare frear75 on4bd on4ea

2000 miles south of England
7000-ke. band

wlneh w1aju w1arg w1asp w1blf w1bor w1cib w1gh w1rp w1sz w1yb w2afe w2age w2aga w2ayg w2avw w2ba1 w2bhr w2bif w2bix w2bmm w2orb w3add w3asg w3awa w3bvg w3ckl w3pl w4arw w4ea w4ei w4it w4kv w4vs w5and w8ayc w8bbj w8bek w8ciw w8ckl w8cyc w8ddk w8dwy w8ft w8pg w9ema w9ggg cm5fl ct1bd ear21 ear62 ear88 ear105 eu2dx fal g6wl ilef letj nkf on4bd rxfr5 ze15b

14,000-ke. band

wlaem wladw w1bfa w1bkr w1erw w1jr w1yb w2adh w2arm w2aog w2atx w2ba1 w2big w2bjr w2bud w2bj w2bg 1jn 2kr w3adm w3aby w8ays w8awf w8ayo w8cer w8dij w8lt w8uk k4ni ce3ac ct1bx f8ct f8fe f8hr g2dv g5ub pa3vn pylca ve2aa ve2bg ve3es

3000-4000 miles south of England

7000-ke. band

wlasp w1if w1rp w2aeb w2agn w2amm w2big w2box w2kj w2ku w2ra w3ard w3avd w3ack w4agr w4ft w4ie w9afm w8bau w8acu w8ohg w8dhe w8dx1 w9bad w9cig w9gvn w9ej1 auber eu3kac fm7sy paoss pxfr5 sp3dm

14,000-ke. band

wladw w1abl w1yb w2bgj w2evj w2el w2nj w2rr w3adm w4akg w4to w5aaf w5awd w8adm w8avd w8bf w8cib w8cfr w8uk w9dku w9vu k4aky ce3ac ct1aa f8hr f4pm g2aw g5yx g6zb g6vp lu2ca nj2pa oz5a pa0gw pylaa ve2bg

4000-5000 miles south of England

7000-ke. band

w1aol w1yb w2awg w3adz 3lzo w8cag w8dlg w8jm w9cew ear106 on4ea

14,000-ke. band

wladw w1ach w1atk w1atx w1bdx w1bdx w1dwo w1cek w1efi w1emx w1eir w1di w1rp w1yb w2adp w2aoo w2ad w2atk w2agp w2jn w3ais w3aur w3pf w6il w8adm w8avs w8ayl w8ayo w8bys w8cfr w8cnu w8dij 38dl1 w8doa w8dps w8gz w8hx w8liw w9anz w9bie w9cki w9dkf w9emr w9evy w9ex w9fks w9fxr k4aky ce2ac ct1aa ct1tt d4abg ear65 f2nm f8ep f8dgb f8rko f8swa f8ypz f8ypz f49hpg f4pm g2zp g5bz g5rm g5wk g6vp g6za on4yu oz7h oz7z pa1gw py2ak py2bg sm6ua sm8an ve2bg xpa0zz

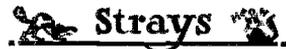
5000 miles south of England

14,000-ke. band

w1arg w1cmp w1rp w2a1z w2bif w2bky w2cif w2rz w3afj w3hp w4ai w4ea w4eaw w4oc w4pf w8hdk f8aja fo5ra on4hp

14,000-ke. band

w1dq w2bjg w2elw ct1aa f1pm g6vp py1bl



According to a dispatch from Berlin which was recently printed in the *New York Times*, "A successful test was made this morning between 7 and 8 o'clock by the Nauen station over a short wavelength of 21.5 meters with an energy of six kilometers." We are informed that this feat was accomplished by the use of high C binding posts.

Sometimes it is rather difficult to find a finish that will add a professional touch to some piece of equipment built by the home mechanic. Crystal-line lacquer provides a good finish but is not always available. This kind of lacquer may be made by adding naphthalene crystals, which can be purchased from any drug store, to any ordinary brushing lacquer. The quantity of the crystals to be used may be determined by experiment. The more of these crystals are used, the more pronounced and better the crystalline effect.

— From *Popular Mechanics*, via W2BKC.

ACME WIRE PRODUCTS

Coils — Magnet Wire Wound
Magnet Wire All Insulations
Varnished Insulations
Parvolt Filter and By Pass Condensers

All products made to Recognized Commercial Standards including those of:

National Electric Mfrs. Assn.
Radio Manufacturers Assn.
American Society for Testing Materials

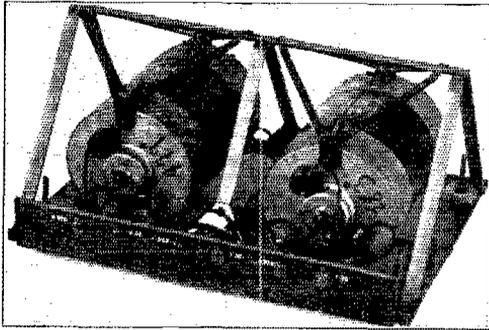
For 25 years manufacturers and suppliers to the largest and most discriminating users.

THE ACME WIRE CO.
NEW HAVEN, CONN.

Branch Offices:

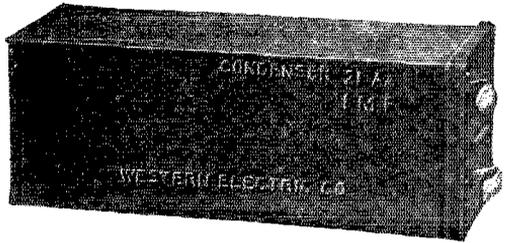
New York Cleveland
52 Vanderbilt Ave. Guardian Bldg.
Chicago
842 N. Michigan Ave.

BARGAINS ARMY AND NAVY RADIO SURPLUS

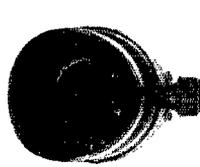


Western Electric Dynamotor System No. C.W. 927. Two 27/350 volt dynamotors in shock-proof hanger. May be used in parallel to give 100 mils at 350 volts, or in series, giving 80 mils at 700 volts. Can be used to operate transmitters up to 50 watts power from 32 volt D.C. mains. Ideal for Delco systems. Two dynamotors in hanger. \$25.00
Single dynamotor without hanger. 15.00

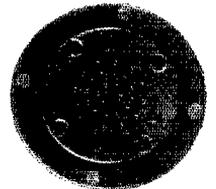
Western Electric Switchboard C.W. 928. Control board for Dynamotor System C.W. 927. Consists of starting switches, fuses, 0-50-500 volt voltmeter with switches for testing main lines and output. Also contains complete filter system. Very special. 8.00
Voltmeter, Westinghouse, No. 492419 cabinet portable, 2 scale 0-5-150, List \$6.50. 2.50
Amp. hour meter, Sangamo, bat. charge and discharge, type MS 2 sizes, 0-300 and 0-500, List \$50.00. 10.00
Voltmeter, Westinghouse, A.C. 3" dia. with external res. 0-175. 12.50
Dynamotor, Sperry Gyro Co., 6/400 volt, 200 watt, cast shaft. 15.00
Motor Generator, Crocker Wheeler, 110 D.C., 200 A.C., 500 watt, 500 cycle. Ball bearing. 50.00
Motors, Edison, universal, 50 watt, double shaft, 110 volt
Motors, Edison, D.C., 10 watt, double shaft (List \$10.50) 110 volt, 5000 R.P.M. 2.00
Motors, Underwood, D.C., 75 watt, double shaft, 1200 R.P.M., 110 volt. 3.00
Dynamotor armatures, Gen. Elec. triple commutators, two sizes, D.C. 12/750 volt and 24/1500 volt, complete with ball bearings (build field and save \$10). 10.00 and 12.50
Transformers, Peerless, 120 input, 5-10-15 volt output, 1/4 K.W., 60 cycle. 7.50
Transformers, G.R. current type, 125 to 2500, with center tap, 60 cycle, 300 watt. 7.50
Transformers, Amer. Tran., 220 to 8000, closed core, 1 K.W., 500 cycle. 15.00
Transformers, Simon, 220 to 11500 closed core, 1/2 K.W. 500 cycle. 5.00
Transformers, Amer. Tran., 220 to 12500 closed core, 2 K.W., 500 cycle. 25.00
Gasoline Engine, 1 cylinder 2 cycle Smith 2 horsepower, complete. 25.00
Gasoline Engine, 2 cylinder 2 cycle Sterling 5 horsepower, complete. 50.00
Air compressor, Kellogg, Model T, 1 1/2 cu. ft. per min., weight 6 lbs., 600 R.P.M., 125-lb. pressure. 3.00
Milliammeter, Westinghouse, type C.A., 0-250, zero adjustment, flush mounting. 5.00
Ammeter, Westinghouse, type C.A., 0-1, zero adjustment, flush mounting. 5.00
Voltmeter, Westinghouse, type C.A., 0-35, zero adjustment, flush mounting. 5.00
All above type C.A. meters operate on either A.C. or D.C. Regular price. 10.00
D.C. Ammeter, Westinghouse type PX2, 0-5, regular price, \$10.00. 5.00
Dynamotor, GE Navy Airplanes 24/750 volts. Aluminum frame, unusually good for airplane test work. Specially priced. 25.00



Western Electric Fixed Condenser 21AA, 1 microfarad, 1,000 volt A.C. test. Ideal filter condenser for low power transmitters. Fully guaranteed. Excellent value. \$1.00



Holtzer Cabot, Utah type, carbon granular transmitter. Special. \$.95



Western Electric Radio-phonograph transmitter unit, 320W. Special. \$1.50

Condensers, Century, 500 volt, 4 mfd. 1.25
Condensers, Dubilier, mica, working volts 12,000, cap. .0004. 10.00
Condensers, Dubilier, mica, working volts 3,600, cap. .32. 10.00
Condensers, Century, volts 500 A.C., cap. 4 mfd. 1.25
Condensers, Wireless Specialty, copper leyden glass jar, 10000 working voltage .002 mfd. 2.00
Condensers, Dubilier, mica, transmitting, 8500 working voltage .004 mfd. 10.00
Condensers, Dubilier, mica, transmitting, 12500 working voltage .004 mfd. Prices on request.
Condensers, Wireless Specialty, transmitting, 12500 volt .004 mfd. Prices on request.
Keys, transmitting, Army practice. 1.00
Keys, transmitting, Airplane flameproof, silver 1/4" contacts. 1.50
Keys, transmitting, Airplane flameproof silver, 3/8" contacts, with blinker light mounted on bakelite base. List \$7.50 — Special. 2.00
Keys, transmitting, Navy 1/4 K.W., "Mescro" silver. 2.00
Headphone, Army, with strap, 120 ohm.75
Headphone, Navy Radio School type, leather headband, 75 ohm. 1.50
Transmitter, telephone, U. S. N., 30 ohm (used).75
Magnets, Army mine and ringer type, has 4 large fixed magnets, good value. 1.00
Variometers, Gen. Radio No. 107D and 107E, with series and parallel connections. 5.00
Telegraph and buzzer portable sets, mahogany case, 2 tone platinum contact high freq. buzzer, 2 telephone toggle switches, potentiometer, sending key, 3 mfd. condensers, transformer and 2 choke coils, receiver, \$30 value. 5.00
Heterodyne, Signal Corps, type B.C. 104, for use with SCR 97, 1000 to 3000 meters, with detector. 15.00
Receivers, Signal Corp type, B.C. 14A, 200-600 meters, with cry. det. and Century buzzer in portable case. 7.50
Receivers, Navy, C.N. 113, 300-2500 meters. 7.50
Receivers, Marconi, 300-2500 meters, type 106, commercial ship type. 35.00
Receivers, Navy, C.N. 240, 1000-10000 meters. 50.00
Receivers, S.E. 143 and L.P. 500. Prices on request.
Insulators, Electro, strain 7"-15, 12"-35, 18".35
Switch, Telephone, toggle, 2-4-6-8 point.50
Western Electric Loudspeaker, Unit 193 W. Ideal for monitoring your transmitter. Without cord. 3.00
Coils, Retardation, West. Elec. Co. 57C, 83 ohm, 2 windings. 1.00
Buzzers, Century high freq., 2 coils. 1.50
Buzzers, West. Elec. extra quality high freq. 1.50
Holtzer Cabot, U. S. Navy Headphones, New, Utah type with rubber cushions. Special, per pair.75

WANTED

RECEIVERS — IP-501, SE-1420, SE-143, CGR-1, SR-1220, CN-294.
TRANSMITTING TUBES.

Sufficient postage and deposit of 20% required on C.O.D. orders. NO C.O.D. ON CANADIAN ORDERS.

MANHATTAN ELECTRIC BARGAIN HOUSE, Dept. Q, 105-7 Fulton St., New York City

Something
NEW



An Accurate Resistor

5 ohms to 5,000,000 ohms

The Super Akra-Ohm Resistor, wire wound, has been designed with the primary thought of commercial acceptability. In order to insure an accuracy of 1% and permanency of calibration, it is manufactured by a special process (patent pending).

Bulletin No. 62

which fully describes the use of the Super Akra-Ohm Resistor as a Voltage Multiplier, also contains the first complete chart for the employment of accurate resistors with microammeters and milliammeters. The Super Akra-Ohm Resistor is also especially recommended for use as Laboratory Standards, High Voltage Regulators, Telephone Equipment and Television Amplifiers, and Grid and Plate Resistors, etc.

Send Now for your copy of this useful Bulletin



Shalleross Mfg. Company
ELECTRICAL SPECIALTIES
200 PARKER AVENUE
Collingdale, Pa.



Warner Goes to The Hague

(Continued from page 19)

and distributed to the other nations. A.R.R.L. has represented the amateur at these conferences, the amateur committee of which was headed by Mr. W. E. Downey of the Radio Division with our secretary as vice-chairman. There have been no differences of opinion in this country concerning the regulation of amateur radio. Many matters affecting the technical performance of amateur stations and the administration of amateur radio are expected to arise at The Hague, but no difficulty is expected in looking after the rights of American amateurs, now covered by a satisfactory North American regional agreement.

KHEJ and the 'Untin' Bowler Awards

(Continued from page 22)

were awarded, making a permanent record suitable for a prominent place in the radio shack along with other trophies. These certificates each bear the signature of Colonel Robert R. McCormick, President of the Tribune Company and Editor-in-Chief of the *Chicago Tribune*; and of the President of the A.R.R.L., Mr. Hiram Percy Maxim. A photograph showing the details of one of these fine certificates together with the more substantial rewards presented to the winners as a result of their efforts appears elsewhere in this account.

Congratulations to the winners, and a hearty thank you to our good friends at the *Chicago Tribune*.

Experimenters' Section

(Continued from page 32)

is connected to use the control grid and plate in a regular oscillatory circuit for the production of continuous waves. The output is modulated by impressing voice frequencies between the filament and usual screen grid. With such a system the maximum obtainable percentage of modulation would be quite low, probably not exceeding 20%.

ARCLESS HIGH-VOLTAGE CIRCUIT BREAKER

It often happens that the arc which follows the blowing of a fuse in the plate supply lead is as objectionable as the overload causing the fuse to blow. To eliminate the arcing feature of fuse-blowing in high-voltage circuits, H. T. Hayden of the Ward-Leonard Co. suggests the arrangement shown in Fig. 6. When an overload causes the fuse-wire to melt, the two segments are immediately drawn apart by the dropping of the weighted hinged bakelite strip. The quick break prevents the formation of a sustained arc. Suitable fuse wire for use in plate supply circuits may be obtained in sizes of from .25 ampere up at stores dealing in electrical supplies.

!! STOP !!

Use Potter Replacement Blocks and By-Pass Units for Service Work

INFORMATION UPON REQUEST

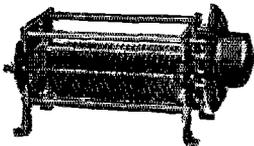
Potter Filter Blocks

T-2900	Condenser Block for the single 250 type tube amplifier	\$20.00
T-2950	Condenser for the push-pull 250 type tube amplifier	\$22.50
T-2098	Condenser Block for single 210 type tube amplifier	\$20.00
RR-245	Condenser for R-245 Compact for single and push-pull 245 type tube amplifier	\$19.75
105-05	Interference Eliminator for oil burner and ice machine motors of 110 volt 60 cycle operation	\$3.75

THE POTTER CO.

North Chicago, Illinois

A National Organization at Your Service



National Transmitting Condenser

We carry a complete line of parts made by "NATIONAL."

LEEDS

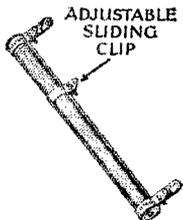
The Home of RADIO
45 VESEY STREET
NEW YORK



General Radio Transmitting Condenser

Type 334-P — .00025 cap. 3000 volts R. M. S. (3500 v. peak) **\$5.50**

New York's Headquarters for Transmitting Apparatus
When in Town Visit Our Store



ELECTRAD Truvolt Wire
Fixed Resistances from 1 ohm to 100,000 ohms—can be tapped at any resistance.

We carry a complete line of Electrad products.

Make your own transmitting and receiving coils. Copper tubing transmitting inductance.

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

Prices per turn

Ham Green, double silk covered, No. 16 receiving inductance.

2" diameter 30c per inch
3" diameter 35c per inch

Aluminum Shield cans and panels of every description to order.

Everything in **Cardwell**
Acme Thordarson Jewell
Flechheim Signal Bradley
Tobe Pyrex Fleron
General Radio
IN STOCK

NATIONAL RECTOBULB

An unusually reliable and efficient rectifier tube. Price each **\$10**

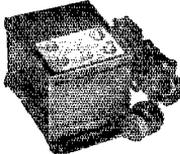
*Prices subject to change without notice.



NEON GLOW LAMPS

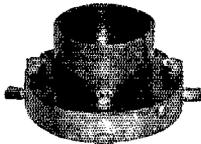
Made by General Electric Co., type G-10, standard base, 101 mcs., as illustrated in QST May issue page 17. Price only.....65c

\$7. THORDARSON R-195 TRANSFORMER



for B-Eliminator using the Raytheon B-H tube. Will carry the maximum current consumption without overheating. Low 235 volts either side of centre tap—high 285 volts either side of centre. Just 50 left, after that no more at any price.

\$2.25

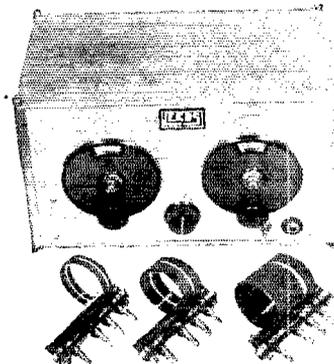


By Insistent Demand

LEEDS 50-watt socket, positive contact; heavy phosphor bronze springs, heavy brass shell; will hold your tube in one position. Special..... **\$2.50**

FEATURING

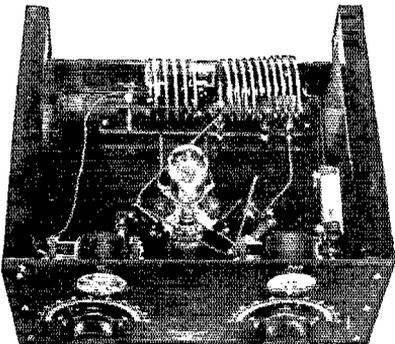
3 new items — Leeds Radio Lab. — others to follow in future issues. This department under the supervision of the Short Wave Specialist Jerome Gross. We design, construct and advise on any material for the "Ham" Broadcasting station or laboratory. Write Jerry Gross for advice on any of your problems.



List price \$60.
Special Offer, net **\$37.50***

New LEEDS all aluminum plug in Short Wave Receiver. Coils not exposed, thereby insuring 100% shielded job. Short Wave — 3-tube Receiver — detector — 2 audio, using three 201-A tubes. Universal type, continuous range 15 to 100 meters; amateur type covers Ham bands 20-40-80 meters with generous spread on the dial.

New LEEDS 7 1/2-watt Hartley 1929 type Transmitter. Ideal for the beginner or anyone desiring a transmitter extremely simple to adjust and operate. Will operate with a 201-A tube, with 90 volts on the plate, up to a 1UX-210, with 30 watts input; has plug in transmitting coils. List price — kit \$55. Completely constructed \$70. Special Offer, completely constructed..... **\$57.50***



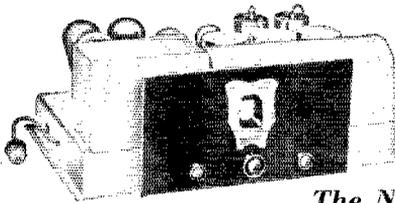
PLEASE PRINT YOUR NAME AND ADDRESS PLAINLY to AVOID DELAY

WRITE FOR SPECIAL PRICE LIST

MAIL ORDERS FILLED SAME DAY
10% Must Accompany All Orders

Unsurpassed Performance!

BUY DIRECT FROM THE FACTORY



The New ELECTRA Screen Grid Receiver

A RUGGED, perfectly designed set with all the features that are popular today. Totally shielded circuit. Licensed under patents of the Radio Corp. of America, A. T. & T. and General Electric Company. Simple foot-prot design which gives remarkable distance qualities with knife-edged selectivity. Uses seven tubes; 2 type 234, 2 type 227, 2 type 245 in push-pull and 1 type 280 rectifier tube. Built-in socket for voltage regulation. Over-sized power pack. Ball-bearing tuning condensers.

MONEY BACK GUARANTEE

Walnut high-boy console with sliding doors. Electro dynamic speaker.

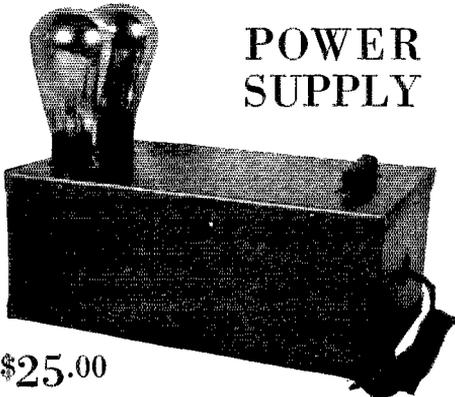
Price to QST readers, \$77.50

NATIONAL RADIO CORPORATION

680 Beacon Street

Boston, Mass.

POWER SUPPLY



\$25.00

Complete self-contained unit of heavy duty construction using two 281 tubes. Mounted in heavy metal case size 5 x 7 x 12 inches. Wt., 22 lbs. Delivers up to 150 mls at 500 volts filtered D.C. plate supply, also extra 7½ V. center tapped filament winding for supplying up to four 210 tubes.

We also manufacture wave meters, power amplifiers, transmitting condensers and power supply devices up five kilo-watt.

Write for Prices

GENERAL ENGINEERING CORP.
CHARLOTTE MICHIGAN

The Atlantic Division Convention

WITH more YL's and OW's in attendance than ever before, the Central and Western New York Section convention, held under the auspices of the Finger Lakes Transmitting Society, August 9th and 10th, at Auburn, N. Y., was a success from the very beginning.

Although the fellows were a little slow to register the first day it did not stop the committee from going right ahead with the program and giving those present a good time. Saturday was the big day, and bright and early there were contests of all kinds — QRM, Q signals, code speed and the usual liar's contest which again showed that the "ham" has a greater imagination than any other type of person. A good talk was given by Prof. B. S. Cushman on "Infra-red Ray" for signaling, and with apparatus demonstrated the working of such a system. Who knows but some ham may take this up and a few years hence we may be changing our present system of QSO. Charley Heiser, W8DME, talked on grinding your own crystal, and we know now why he has such a fine note and incidentally we learned where to get "blanks." R. B. Bourne, W1ANA from Hartford, and an old-time Auburn boy, delighted the crowd with demonstrations of a five-meter antenna, — the bulbs played a good game of "Now you see it, now you don't." Director Woodruff was present both in his official capacity and as technical lecturer, and in the latter position showed his latest experimental sets, besides giving a lot of information. The Stromberg-Carlson Co. again showed its friendliness by sending one of its engineers, Mr. V. M. Graham, who talked on the "Shielding of Radio Receivers," making use of numerous lantern slides. Unit Commander W. Harvey Bowman, who was also chairman of the convention, spoke interestingly on the Naval Reserve. But the surprise of the whole convention was the banquet at the Lake Side Inn, Owasco Lake. The food was most delicious, the YL's and OW's attractive and the "hams" themselves on their good behavior, so that the dinner was enjoyed by all and when Ed Manley, formerly operator of VOQ, the S.S. *Morrissey*, got up to tell us of his experiences in the Arctic, we all wished we could have been there ourselves. Fieldman Hebert, representing A.R.R.L. Headquarters, spoke on the "Policies of the A.R.R.L." and also informed the gang that Secretary Warner was going to attend the Hague Conference in September.

With the distribution of the many worth-while prizes, contributed by so many friendly radio manufacturers, the convention officially came to a close with a unanimous vote of thanks to the committee; but there was some "hamfesting" till the wee hours of the morning at a number of the stations.

A. A. H.

**Long distance radio communication
demands **PYREX**
RADIO INSULATORS**

Akron, Ohio Monrovia, Liberia

4500 Miles

THE United States-Liberia Radio Corporation utilizes PYREX Insulators for improving signal transmission between its far separated stations as shown above.

Insulators which are considered essential in such difficult work afford the best means of protecting the radio currents in any transmitting or receiving set.

PYREX Insulators are in a class by themselves as to mechanical and electrical strength, resistance to destructive influences and ability to maintain their insulating qualities in the presence of moisture, sun, heat, soot, industrial fumes, etc.

At least one suitable type and size for every radio need is shown in the PYREX Radio Insulator booklet. Get a copy for your file, and get PYREX Insulators from your dealer or from us.



PYREX
A TRADE MARK OF CORNING GLASS WORKS
RADIO INSULATORS

CORNING GLASS WORKS, Dept. 64
Industrial and Laboratory Division
CORNING, N. Y.

SPECIAL TO AMATEURS

FREE RADIO GUIDE

SEND FOR IT!

Shows the latest wrinkles, newest developments in radio at startlingly low prices. Get the set you want here and save up to 50%. The best in parts, kits, complete factory-built sets and supplies. Orders filled same day received. Write for free 264-page copy NOW. Wholesale prices to set builders, dealers, agents.

BARAWIK CO. 119 Canal Sta., CHICAGO, U. S. A.

LATEST BOOK-UPS & RADIO CATALOG

MARVELOUS NEW PATENTED SCREW-HOLDING SCREW DRIVER

Non-magnetic. Holds screws tight! Removes them INSTANTLY from inaccessible places. Factories, radio, electricians, machinists, etc., buy on sight! Indispensable. Price \$1.50 only. (Sent postpaid receipt money order.) **DISTRIBUTORS:** Genuine opportunity, earn big money exclusive territory. Write for details.

JIFFY-TITE MFG. CO. 1251 Water St. Boston, Mass.

Radio Operators Wanted

Radio operators are officers aboard ships. Well paid, pleasant work, travel. You can qualify in a short time in our well-equipped school under expert instructors.

Write now for free booklet on "Opportunities in Radio."



WEST SIDE YMCA RADIO INSTITUTE
111 West 64th Street, New York *Established 1910*

Wholesale Prices

for Dealers, Agents and Set Builders—prompt deliveries



OUR huge Wholesale Radio catalog No. 19 (2ND EDITION) is a valuable encyclopedia—a liberal Radio education. Mailed immediately on request—

FREE CATALOG

FROM many years in the Radio Mail Order Business, we have learned how an organization must be efficiently run to gain and retain the good will of our customers. Radio Specialty Co. ships orders promptly!—offers you 100% quality merchandise on a strict money-back basis if not thoroughly satisfied—and sells at rock bottom net prices.

Our catalog contains the largest assortment of completely assembled all-electric AC Receivers at amazingly low prices, and other Radio Merchandise including such lines as Pilot-Silver-Marshall—Carter-Aero—Yaxley—Tobe—Hammarlund—Amer Tran—Cunningham—Dongan—Thordarson—Muter, etc., etc. The latest improvements in Radio are listed and thoroughly described in this great catalog: AC All Electric Sets with self-contained ABC power supply—Public Address Amplifier systems—A.C. Set Converters—A and B eliminators—Dynamic Speakers and Units—Magnetic Speaker Chasses—245 and 250 Tube Amplifiers—Airplane Cloth Speakers—Push-Pull Power Amplifiers—Electric Phonograph Turn-Tables—Combination Radio and Electric Phonograph Consoles—Speaker Tables—Short Wave Sets and Adapters—Shield Grid Tube Kits—Television Parts—Electric Household Appliances, Tools, Workshops—CAMERAS—etc.

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New 1930
**RADIO
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Sent FREE
to Set Builders

NOW ready — Chi-Rad's latest money-saving catalog. All the latest parts, accessories, kits and sets such as: — New Super-Waft Shield-grid Short Wave Receiver, kit \$29.40 or completely constructed \$42.50; New National Shield-grid Short Wave Receiver, kit \$33.00 or completely constructed \$39.00; 3000 volt New type R3 Rectobulbs \$10.00.

Send today for your free copy

Chicago Radio Apparatus Co.
Dept. Q
415 S. Dearborn St., Chicago, Ill.

**It's EASY to Get a
HANDBOOK**

DIRECTIONS:

Realizing that Handbook must be had, proceed as follows:

- (1) Fill out below, tear off.
- (2) Reach in pocket, produce U. S. A. \$1 bill, old or new size (we don't care).
- (3) Clip together, mail us.

Handbook Factory,
1711 Park, Hartford.

SEND IT AT ONCE.

(Name)

(Street or P. O. Box)

(City and State)

Last Call for Descriptions!

OCTOBER 10th is the closing date at this office for manuscript to be used in the A.R.R.L. Station Description contest which has been running in *QST* for the past few months. This contest is being sponsored in an endeavor to find out which amateur has the station which appears to us to be the most nearly ideal station for 1929 conditions. This contest is world-wide; open to any amateur in any part of the world.

We have received various descriptions from month to month and have used the best one on hand each month. However, we have not been snowed under with descriptions. What is the reason for this? Nightly we hear signals which are just beautiful. They appear to us to be just as nearly ideal as one might ask for. Why don't these fellows send in the dope on their stations? Their signals bespeak their stations.

Say, OM, sit down right now and write up that station of yours. You owe it to yourself as well as to other amateurs around the world who will compare their ingenious ideas with yours. We want this contest to end in one grand finale. So far we have published some very nice descriptions but we know there are others just as good or better which we have never seen. It's up to you to send your station write-up in to us if you want that cup for your shack. We wish we might enter our own stations but we are ineligible. In other words, we crave competition. We want to be proud of the station which receives this cup. The owner will be known throughout the world as having the best amateur station in the world during 1929. Wouldn't you want to be the possessor of this cup? Of course you would.

Descriptions received on and before October 10th will be published in *QST* throughout the remainder of the year. This is the last notice we can publish before the contest closes.

Doings at Headquarters

ANOTHER month rolls around. The weather is getting cooler and along with this come amateur signals that have a wallop we have not heard for some time. Seems great really to be able to have decent contacts on our lower-frequency bands without being so hampered by fading and atmospherics.

This past month we had quite a few visitors. Among them we recall the sage "on the rock-bound coast," W1AOZ; and the same day VE2AP came in for another visit, having just arrived from Europe. Several men from the General Electric Company made their appearance. W2FJ and W2EZ are among the hams who paid us a visit and are connected with G.E. W9BKJ was on from Indiana. We met W2CFT, W2ANG, W8VZ and W1BBU. The last of the month W2CUF breezed in with the Mrs. and W2AYZ was with them.

The office this past month has been somewhat

QST Oscillating Crystals

AMATEUR BANDS:

(New prices effective October 1st 1929)

Winter is coming and no doubt you are going over your transmitter removing those weak links so as to get the most possible efficiency from your set.

One item of great importance is the *frequency stability* of your set. Does it *stay on one frequency*? If not, our *power crystals* will solve that problem. SCIENTIFIC RADIO SERVICE crystals are *known* to be the best obtainable, having ONE single frequency and highest output. With each crystal is furnished an accurate calibration guaranteed to *better than a tenth of 1%*. *New prices for grinding power crystals in the amateur bands* are as follows:

1715 to 2000 Kc band.....\$18.00 (unmounted)
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BROADCAST BAND:

Power crystals ground in the 550-1500 Kc band accurate to plus or minus 500 cycles of your specified frequency fully mounted for \$55.00. In ordering please specify type tube, plate voltage and operating

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We can supply heater units guaranteed to keep the temperature of the crystals constant to *better* than a tenth of 1 degree centigrade for \$400.00. Two matched crystals, ground to your assigned frequency in the 550-1500 Kc band with the heater unit complete \$500.00. More detailed description of this unit sent upon request.

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TRANSFORMERS

Guaranteed — Mounted — Complete

2 K. W. 2000 — 2500 each side.....\$40.00
700 watt 1000 — 1500 each side..... 14.50

250 watt 500 — 750 — 1000 each side
unmounted \$9.75; mounted \$11.50

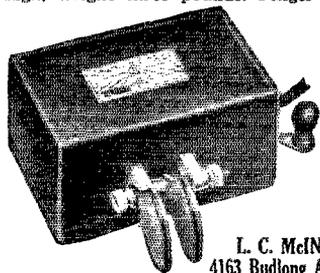
Auto-Transformers, Chokes, Polyphase and 25-cycle
Transformers, Add \$2.00 for fil. winding

9CES FRANK GREBEN

1927 So. Peoria Street, Pilsen Sta. Chicago, Ill.

The Ultimate Transmitter

It will get you through like hand sending. Under cover that locks in place only need be removed to adjust speed or clean points. Beautiful black frosted enamel finish, 2 1/2 x 3 3/4 x 2 1/2" high, weight three pounds. Finger paddles are adjustable and have milled surface. Prevents sticking to fingers. Four vacuum feet. 1/8" contacts welded in place.



\$12.50

Remit by money order or registered mail.

Do not strain your nerves with an old worn out bug. See July issue QST.

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4163 Budlong Ave. Los Angeles, Cal.

DODGE RADIO SHORTKUT

*Masters Code—Kills Hesitation
Increases Speed—Produces Results*

500 USERS CONFIRM STATEMENT

W5QN Several years old way copied 3 per. As many months with DRS and now copy 25 per. Did not see "How" of DRS at first — wasted many more months before tried it. Wonderful method — FB

DODGE HIGH SPEED

QUICK BOOSTER IF KNOW CODE

ex1BHJ High Speed boosted me from 27 to 42 in 8 hours — 15 minutes each eve. C G Short. Not a DRS user
ex8DRI High Speed boosted me from 25 to 35 in 2 evenings. Had used DRS, Robert Hale
exKUF High Speed boosted me from 25 to 35 in few days. Had used DRS, Rob Roy Phillips
W5AHM High Speed boosted me from 27 to 39 in 75 minutes — 15 each evening. Had used DRS
W8BFA High Speed boosted me from 25 to 35 in few days spare time. Also KDZC — had used DRS
W8CJK High Speed boosted me from 25 to 35 in few days spare time. Also KDIW — had used DRS
W8CPQ High Speed boosted me from 15 to 35 in 3 weeks spare time. Had not used DRS
W2BXY High Speed boosted me from 20 to 35 in few days spare time. Had used DRS
W9DGD High Speed boosted me from 20 to 35 in few days. Had used DRS
W9DLJ High Speed tried as requested — in few days copied 30 instead of 15 per — had used DRS

EASIEST WAY TO MASTER code is with DRS

WANTED — REPORTS from users of DHS and DRS

Radio Shortkut \$3.50. High Speed \$2.50. Money Order. Foreign Add 50 Cents. C.O.D. if send One Dollar.

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—Because QUALITY-BUILT**



Superior performance — because it is built to quality standards — not to meet any special price level.

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In Any Dynamic**

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A complete catalog of all Aerovox condensers and resistors will be sent free on request.

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PRODUCTS THAT ENDURE

barren with the young women who grace our corridors away on vacations.

Mr. Hebert has departed to a western climate on his annual round-up of conventions, hamfests and general amateur get-togethers. He will make stops in the middle west, going through Pennsylvania, Ohio, Indiana, Illinois, Nebraska and then out to Colorado, California and Oregon. We do not expect to see A.A.H. again until the last of September.

While exploiting trips we might say that our Secretary-Editor of *QST*, K. B. Warner, is leaving for The Hague just as this issue of *QST* goes to press. Particulars appear elsewhere.

Don Meserve spent his vacation with his reserve cavalry unit in camp at Ft. Ethan Allen, Vermont.

We welcome to these Headquarters Mr. George Grammer, W3AII, who has joined this outfit to take over the Technical Information Service duties. Mr. Grammar is a well-known amateur and you will probably hear another "W1" from Hartford before long.

Ev Battey has become acclimated to the work here and now has a station set up signing his old call, W1UE.

Dave Houghton is in the throes of moving. This veteran golfer's game is all "shot" now.

Jim Lamb has been seen so often on a mountain 7 miles from town, that people who did not know Jim was getting the low-down on WTIC thought he was up there chasing some Will o' the Wisp. Jim tells us that according to "Modgey" (see Aug. *QST*, page 8) WTIC has quite a high percentage of modulation.

"No births, no deaths, no one moved into town," is about what we should close this sketch with, as everything this past month has been cut-and-dried hard work for those of us not on vacation.

— C. C. R.

ELECTION NOTICES

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

1. You are hereby notified that an election for an A.R.R.L. Director, for the term 1930-1931, is about to be held in each of the above Divisions, in accordance with the Constitution. Your attention is invited to Sec. 1 of Article IV of the Constitution, providing for the government of A.R.R.L. affairs by a Board of Directors; Sec. 2 of Article IV, defining their eligibility; and By-Laws 9 to 18 providing for their nomination and election. Copy of the Constitution and By-Laws will be mailed any member upon request.

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Station 2 A M J

(President Bronx Radio Club)

If you want to get the real line-up on the service Wholesale Radio gives to amateurs, just signal the well-known 2AMJ (Frank Lester himself). Frank is the active head of our Amateur Dept. He knows your requirements. He fills your orders PERSONALLY. And, if you want additional proof, just call EX2BON. Johnny Wilcox will inform you that Wholesale Radio Service is "right on the job." He ought to know because he himself helps to make that slogan truthful.

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1 in. Tested blanks, 200-400, 400-600 meters.....	5.00
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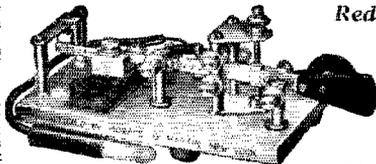
RESISTORS

The NEW Easy-Working VIBROPLEX No. 6

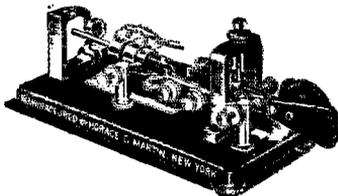
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2. The election will take place during the month of November, 1929, on ballots which will be mailed from Headquarters in the first week of that month. The ballots for each Division will list the names of all eligible candidates nominated for the position by A.R.R.L. members residing in that Division.

3. Nominating petitions are hereby solicited. Ten or more A.R.R.L. members residing in any one Division have the privilege of nominating any member of the League in that Division as a candidate for Director therefrom. The following form for nomination is suggested:

(Place and date)

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

Gentlemen:

We, the undersigned members of the A.R.R.L. residing in the Division, hereby nominate of as a candidate for Director from this Division for the 1930-1931 term.

(Signatures and addresses)

The signers must be League members in good standing. The nominee must be a League member in good standing and must be without commercial radio connections. His complete name and address should be given. All such petitions must be filed at the headquarters office of the League in Hartford, Conn., by noon of the first day of November, 1929. There is no limit on the number of petitions that may be filed, but no member shall append his signature to more than one such petition.

4. Present Directors from these Divisions are as follows: Atlantic, Prof. Eugene C. Woodruff, State College, Pa.; Dakota, Prof. C. M. Jansky, Jr., Minneapolis; Delta, Mr. Benj. F. Painter, Chattanooga; Midwest, Mr. Porter H. Quinby, St. Louis; Pacific, Mr. Allen H. Babcock, San Francisco; Southeastern, Mr. Harry F. Dobbs, Atlanta. Members of the Southeastern Division are informed that no nominations were filed from that Division in the elections of 1927, in default of which Mr. Dobbs has remained in office.

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

For the Board of Directors:

K. B. WARNER, Secretary.

Hartford, Conn., 1 August 1929.

To all A.R.R.L. Members residing in the Dominion of Canada, Newfoundland, and Labrador:

1. You are hereby notified that an election for an A.R.R.L. Canadian General Manager, for the term 1930-1931, is about to be held, in accordance with the Constitution. Your attention is invited

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TRIAD—a trouble-free tube, manufactured by men who are recognized leaders of the industry—a tube accompanied by a printed certificate guaranteeing a minimum of six months' perfect service or a proper adjustment. Unlimited power without distortion—truer tone—longer service—features that bring a new era of reception to the radio world. Buy them—install them—forget them.

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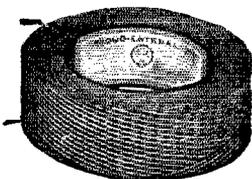


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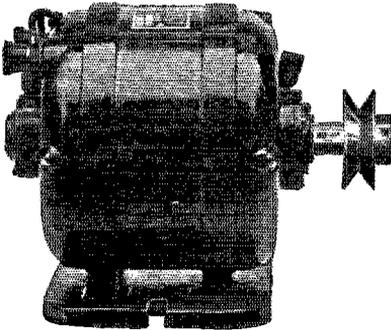
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Synchronous motors, small, compact, reliable self starting are now offered for *Television* equipment. They require no direct current for excitation, are quiet running and fully guaranteed.

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Write us about your requirements.

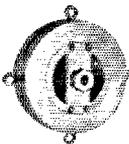
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Finest broadcast microphone made. Double button. Stretched diaphragm type. Covers entire frequency range. Write for circular.

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100 sheets	50c
250 "	\$1.00
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Now . . . It is **FREE**

If you really want to be a **First Class operator — you can.** Nature plays no favorites. She has given you the tools — **The Candler System shows you how to use them.** Overcomes every handicap. **DOUBLES** speed of slow operators. Makes fast operators **FASTER.** Puts you in **BIG PAY** class in few weeks. McElroy, world's champion radio operator endorses no other system. Satisfactory results or no pay. Folder tells all about it. Send name and address now!



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Build Your New Amplifier with These Parts

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We are prepared to furnish complete parts for construction of amplifiers for theaters, dance halls or public address systems.

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

page 10, should be connected to the negative terminal of the plate supply voltage, the negative side of the screen grid voltage, and the positive side of the amplifier grid bias. This change can be easily made by substituting a dot for the hook in the cathode circuit of the buffer amplifier.

Excellent washers for the mounting of rheostats or regeneration control resistors in metal panels can be made by sawing off slices of $\frac{1}{4}$ " inside diameter ($\frac{1}{2}$ " outside diameter) bakelite tubing. End washers to insulate the frame of the resistor from the panel can well be made from $\frac{1}{16}$ " thick bakelite. Bakelite of this thickness can be trimmed without difficulty by a pair of ordinary tin shears. It is essential, however, to drill the hole for the shaft before the trimming process is attempted.

Under some conditions or adjustments in the receiver or transmitter it is necessary to short one or more of the variable condensers. Probably the simplest method of providing for this is to bend over the tip of one of the outer movable plates. Then, when the condenser rotor is turned to the position where maximum capacity usually is obtained the bent rotor plate will make contact with its neighboring stator plate.

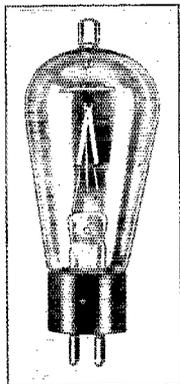
No, Clarice, a stable oscillator has nothing whatever to do with horses.

W51Q has a neat gadget to solve the problem of providing a small capacity in series with the tuning condenser of the short-wave receiver to give open scales on all bands. In his receiver the series condensers (see Fig. 4, page 15, *QST* for Nov., 1928) are made up in the manner of the small two plate mica dielectric type used for neutralizing in broadcast receivers. They are fitted with GR pins and plug into a pair of GR plugs in a piece of hard rubber mounted alongside the tuning condenser. Three condensers, each adjusted to provide full scale coverage, are used for the three higher frequency bands while a shorting strap gives the full capacity range of the tuning condenser for 3500-ke. operation.

It should be noted that when a potentiometer arrangement is used for regeneration control, as in the receiver described in the article "A '1929' Receiver" in the February, 1929, *QST* the filament switch should be a double-pole affair. Otherwise there will be a slight discharge of about one half milliamp from the detector section of the "B" battery whether or not the filaments are lighted.

W6NW reminds us that it is not necessary to be tantalized continually by the bug sliding across the table when it is operated. If the rubber feet on the bug are moistened and if the instrument is pushed down firmly on the table it will then stick, as W6NW says, "like a bum to a chicken sandwich." Sometimes it is as well to roughen the rubber feet with sandpaper.

Type 866 Rectifier Tubes



CHARACTERISTICS

Mercury Vapor	
Voltage Drop	15
Fil. Volts	2.5
Fil. Amps.	5.0
Peak Inverse Volts	5000
Peak Plate Amps.	0.6
Total Height	6 1/2"
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Large enough for 250 watters.

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16-page Parts Catalog

We want every reader of **QST** who has not yet received a copy of our big 16-page Parts Catalog to use the coupon for requesting his copy today. This catalog contains a vast amount of useful information, in addition to illustrating and describing the complete line of Frost-Radio parts

and accessories. It describes our big special offer to radio set builders. It calls about special hook-ups, short cuts, "how to do things better." Get your copy of this book right away. Remember, it's **FREE** for the asking. So just mail the coupon now and get your copy by return mail.

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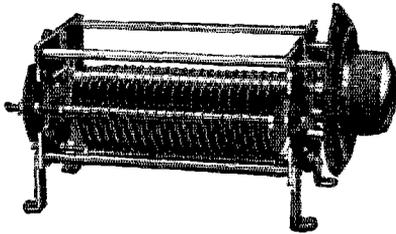
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For a Steady Signal—



National Transmitting Condensers are designed in accordance with latest practice for securing steady transmitted frequencies.

Furnished in capacities ranging up to .00023 mfd.—6000 volts; and .00045 mfd.—3000 volts.

Condensers can now be furnished with either hard rubber or crolite insulation.

Send for Bulletin 121-Q

NATIONAL

TRANSMITTING CONDENSERS

National Co., Inc. W. A. Ready, Pres. Malden, Mass.

Silent Keys

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

- John M. Griffin, Tampa, Fla., W4KY.
 Walter Heline, Linsborg, Kans., W9ERK.
 Leonard Randall, Orono, Me., W1AXU.
 Delmont Parsons, Portland, Me., W1KAY.
 Max Colvin, Kansas City, Mo., W9WV.
 B. A. Watson, Texarkana, Ark., W5AYP.
 Paisley G. Isenhour, Asheville, N. C., W4MI.
 T. C. Lockrem, Lisbon, N. D., W9BJV.
 Joseph M. Boon, Cushing, Okla., W5ASK.
 John T. Dalton, New York City, N. Y., W8BOW.
 P. Spencer-Nolan, Sydney, Aus., VK2YL.

Strays

Amateurs who follow major league baseball no doubt will be interested in knowing that G. Willis Hudlin, star pitcher of the Cleveland Indians is W8BGS.

John T. Dalton, W8BOW, who recently passed on was well known as a music composer. He wrote "No Yes, Yes No" and "Land of Dreams," the latter song of which was widely sung and had several presentations over New York radio stations.

Edward M. Glaser, W2BRB, departed from this life of single blessedness on the 7th of July, when he married Miss Rose Vakshall. They will live in Michigan. Our heartiest congratulations to the Glasers.

Porter Quinby recently introduced "with pardonable pride" a prospective League member and brass-pounder. Harold Eugene Quinby was born July 19th and is a mighty husky youngster.

Mr. N. Kagawa corrects an error which appeared in the "X-Section" in the June QST. The sixth line, page 47, should have referred to "Nagaoka's formula instead of "Nagokoa's formula."

Copper strip taken from the field coil of a Ford magnet often comes in handy around the radio room. It may be used for connecting wire or for inductance coils.

The Tech. Info. Service occasionally gets some good letters. One fellow asks, "Will you kindly advise where I can buy Lecher wire, and find out something about its use—also its probable cost?" Another fellow wants to know the current consumption of a 0-15 milliammeter.

Power Transformers and CHOKES

At Less Than Manufacturer's Cost

This is the bankrupt stock of the Scanlan Transformer Co.

- No. 1003 Sec. 600 V. 7½ V. C. T. to first choke, 7½ V. C. T., 2.5 V. C. T. to case 1¼ V. 3 chokes. For one 281, one 250, one 227, four 226. \$5.00
 No. 1002 Sec. 450 V. 7½ V. C. T. to first choke, 7½ V. C. T., 2½ V. C. T. to case 1¼ V. 3 chokes. For one 281, one 250, one 227, four 226. \$4.75
 No. 1001 Sec. 220-220, 5 V. Rect. C. T. to first choke, 5 V. C. T., 2½ C. T. to case 1¼ V. 3 chokes. For 280, two 171 A, 227 and 226 tubes. \$4.25
 No. 400 Sec. 350-350, 5 V. Rect. 5 V. C. T., 2½ V. C. T. to shield, 120 V. tri. chokes. \$4.50
 No. 220 Sec. 250-250, 5 V.—C. T. 5 V. C. T., 2½ C. T., 1½ C. T., 2 chokes high and low pri.—For 280-171-227 and 226 tubes. \$4.00
 No. 875 Secondary 375 volts—375 volts, 5, 5, 2½, 1½ and 1½. High and low primary and 2 chokes for 280, two 171A, five 226 and one 227. \$4.25
 No. 413 Filament Transformers for six 226, one 227, and two 171A tubes. \$1.95
 No. 644 Scott double chokes, 130 mils. \$2.50
 No. 641 Scott Audio input transformer. \$1.90
 No. 642 Scott Audio output transformer. \$1.90
 No. 640 Scott Audio copper shielded. \$1.90
 No. 30 Henry Chokes, unmounted. .90
 No. 102 2½ Amp. Dry Charger, less Raytheon cartridge. \$1.50
 Vitreous Power Pack Resistances 180 volt, 16000 ohms, tapped at 1800, 2800, 15100 and 10600. .95
 Used 5 tube radio sets in table model cabinets. Require minor adjustment. \$6.90

Write for list

Chas. Hoodwin Co.

4240 Lincoln Ave. Dept. 927, Chicago, Ill.
 BANKRUPT RADIO STORES

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.

(3) The Ham-Ad rate is 15c per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 25th of the second month preceding publication date.

(6) A special rate of 7c per word will apply to advertising which, in our judgment, is obviously non-commercial in nature and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League takes the 7c rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and takes the 15c rate. Provisions of paragraphs (1), (2), (4) and (5) apply to all advertising in this column regardless of which rate may apply.

PLATE power for your set, the very heart of its performance. For quietness, lowest ultimate cost, no other plate source even approaches the achievement of an Edison steel-alkaline storage B battery. Built painstakingly, every joint pure nickel, upset electrically welded. Genuine Edison Electrolyte. Our list describes complete batteries, construction parts, enameled aerial wire, silicon steel. Available immediately, filament and plate transformers for the new 866 rectifier, complete plate power units. Rectifier Engineering Service, radio W8ML, 4837 Rockwood Road, Cleveland, Ohio.

THE most complete line of modern short wave receivers for every particular service. Four to nine tube designs. Radiophone-CW transmitters, of any power or type. We make a complete line of apparatus including speech amplifiers, filter coils, transformers, rectifiers, variable condensers, inductances, etc. Any special apparatus, designs, made to order using your parts if desired. Prices on request. New bulletin lists complete line of apparatus. Write for copy, Ensell Radio Laboratory, 1208 Grandview Ave., Warren, Ohio.

SPECIALLY made rectifier aluminum with small percentage copper, stand more amperage, last longer, square foot \$1.25. Lead \$1.00. Elements, holes punched with bolts and nuts, new kind 1" x 4" 15c. 1" x 6" 17c, pair prepaid. Best Silicon steel .014" cut to order 25-35c lb. Postage extra. Geo. Schulz, Calumet, Mich.

AMATEURS — experimenters, builders. We serve over 4000 I.R.E., A.R.R.L., etc. experimenters and "nuts." Full discounts, \$50.00 stock approved parts — no sets. Over four pounds catalog, circuits, data, prepaid, 50c. Weekly bulletins (new items, results of experiments, etc.) 20 weeks, \$1. Sample experimenters "Over the Soldering Iron" magazine, 25c. Transmitting data, price list, etc., 25c. Kladag Radio Laboratories, established 1920, Kent, Ohio.

LET us build or bid on your station, broadcasting, amateur phone, or CW. Satisfaction guaranteed. Prices the lowest in the country. Try us, Uncle Dave L. Marks, 117 North Pearl Street, Albany, N. Y.

TRANSMITTING tubes. Wanted any size. We buy any size station. What have you? Uncle Dave L. Marks, 117 North Pearl St., Albany, N. Y.

SPECIAL: Amertran 1200 volt each side of center 2-7½ volt center tapped filament windings at \$8.00 each, 3/16 inch Signal Corp. silver contact keys 95¢ each, 30 Henry 150 mill. chokes \$1.90 each, Signal high frequency buzzers 95¢ each, Two microfarad 1000 volt unmounted condensers 85¢ each, Westinghouse Aeroplane generators \$4.50, Microphone cases \$2.25, Mershon condensers \$2.00 each, Flechtheim 1500 volt pig-tail leads one microfarad condenser \$2.75, with two microfarads \$1.50, with four microfarads \$6.50, Freshman 375 volt and two 7½ center tapped windings \$2.75, Thoradson 220 and 285 volts center tapped transformer \$1.95. All sizes of variable condensers 75¢ to \$1.00. Thousands of other buys. Send for monthly ham sheet, Uncle Dave, 117 North Pearl St., Albany, N. Y.

NAVY Dynamotors General Electric 24/1500 volt, \$37.50; 24/750 volt, \$27.50; 12/350 volt, \$18. Crocker-Wheeler 24/1500 volt, 450 watt, \$45. Holtzer-Cabot 12/500 volt, \$20. Westinghouse 6-15 volt, 500 watt, \$15; 10/350 volt, \$18; 27.5/350, \$15. Twins for 700 volts, \$28. 900 cycle, \$22.50; 1/2 kw, 500 cycle, \$15. Complete list, Henry Kienzie, 501 East 84th St., New York.

TRANSFORMERS — 100 watt, 110 volt, 60 cycle, 750 volts each side center tap, one 7½ volt filament winding, \$7.25. Same as above, but two filament windings, \$8. Above will operate two 210 tubes. Same as above, but 150 watts for operating two 250 tubes, \$9.25. Same as above, but 250 watts for operating two to four 210 or 250 tubes, \$11.50. Heavy construction, no heating, all mounted. Heavy duty transformers and chokes for amateur or broadcast stations supplied to specifications. Scott Coil & Transformer Co., New Albany, Miss.

PANEL engraving — finest workmanship on radio laboratory apparatus. Request price list. A. L. Woody, 19 S. Wells St., Chicago.

G. E. transformers 1100-2200-4400 each side center tap, used by Michigan, Cornell and Naval Research, \$12 f.o.b. Detroit. F. G. Dawson, 5740 Woodrow Ave., Detroit, Mich.

AMAZING screw-holding screw driver! Factories, garages, workers buy on sight! Profit 75¢ each. Exclusive territory. Free trial offer. Jifty, 1184 Winthrop Bldg., Boston.

WANTED — Navy standard receivers, SE143, SE1220, SE1420, IP500, IP501 — also spark gap units. State price and condition. Paul Trautwein, 38 Park Place, New York City.

QSL cards. 'Nuff sed. W8CUX, Millington, Mich.

WANTED: Your radio wants. Parts for that receiver, transmitter or power supply. Special apparatus. Pontiac Engineering Co., 1100 Ave. I, Brooklyn, N. Y.

SELL short wave receiver, Cardwell condensers, Aero coils, perfect condition, \$25. W8ARF, 307 West Central Ave., Delaware, Ohio.

TRANSFORMERS, filament, 110-12 volts, 150 watts, \$6.50; 110-8 volts, 75 watts, \$5.75. All above transformers are factory made, new, mounted, and designed for 60 cycles. Send for Ham List. Robert Annis, Electrical Apparatus, 524 N. Oriental, Indianapolis, Ind.

WANTED: Old style marble base key, 6-400 dynamotor, send list surplus parts not needed to W9BEU, 9032 Windom, St. Louis, Mo.

QSL cards, \$1 per hundred, W9BEU, 9032 Windom, St. Louis, Mo.

NTALS, guaranteed to oscillate 3500-kc. band, \$12. 1750-kc., \$4. W2BOA, 805 Corlies Ave., Allenhurst, N. J.

SELL — complete list of parts. Write for list. William Harmon, WICDT, Main St., Meredith, N. H.

WANTED: mate for my 4000-1 "S" tube. What have you? W9CAS.

A.R.R.L. sweater emblems should be worn by all League members. They are yellow and black 5" x 8" diamond, felt letters and embroidered symbol. Only \$1.00. Money order or currency only accepted. Eric Robinson, 135 Jefferson Road, Webster Groves, Mo.

WANT November and December, 1915, QST, also any 1916 copies. Quote price. Still adding to tube collection. Send list odd or large type. W9APM, Des Moines, Iowa.

TELEGRAPHY. Learn Morse and wireless telegraphy. Big salaries. Tremendous demand. Expenses low, can earn part. Catalog free. Dodge's Institute, Wood St., Valparaiso, Ind.

KENNEDY 150-3000 meters intermediate wave receiver with two-stage amplifier, \$15. Sherwood, W5BH.

RADIO amateur selling out. Receiver parts, half price. List for stamp. George M. Eshelman, Jr., Hartsville, Ohio.

ROUTE your traffic for European countries via W2API for direct transmission and speedy delivery.

W2API — 1000-watt and auxiliary transmitter especially for handling traffic to European countries. Route your messages via W2API for speedy and direct transmission to France, England, Germany, Switzerland, Belgium and Italy on regular schedule. Address W2API, Little Silver, N. J.

JEWELL 74 0-1000V a.c., \$11. Jewell 54-voltmeter with resistor 0-2000V, \$14. 0-1000V, \$13. Audion coils, 30¢. Edison 150AH battery, \$15. Edison 6-volt "A" with charger for A and B in mahogany case, \$40. 30H, 60 M.A. chokes, \$1.25. 30H 500 M.A. choke 60-16, \$25. Relays, \$2.50. Hilet transformers and chokes in stock. Write for details. Leitch, Park Drive, West Orange, N. J.

SELL—new 203A with socket, \$20 Trade—Jewell 0-5 thermocouple R.F. ammeter for 0-3, \$20. Jewell 0-500 M.A. ammeter for 0-300, \$20 Both nearly new. W8AJZ.

\$85 Esco 500-volt 100-watt motor generator, \$30, f.o.b. Chicago. Like new. R. W. Myers, 5003 Wilson Ave., Chicago, Ill.

TRADE: Grebe CR13, WE 7A amplifier, watt-hour meter, phonograph pick-up, d.c. B eliminator and battery charger. High power rifle. Want good SW receivers and transmitting tubes, Box 21, Seaford, N. Y.

CRYSTALS—Better ones at lower prices. Power type, 1750-1825 kilocycles, 3650-4000 kilocycles, \$10.50. 3500-3650 kilocycles, \$12.50. Oscillating blanks, \$5.00. Frequency as close as possible to that requested. Calibration to 1/10%. Ground to insure your frequency add \$6.50. Post-paid and insured. Immediate deliveries. Crystal Grinding Laboratories of W6BCX, 215 West Cook, Santa Maria, Calif.

TRADE crystals for what have you? W6ERV.

SPERRY dynamotor 6/400-volt perfect condition, \$15. W6UC.

5 WATT tubes, new, guaranteed, similar to UX210 with standard bases, \$1.00 each. Renno Tube Co., Atlantic, Mass.

OUR offer, of genuine VT14 navy five-watters, at one buck each, was evidently just what the fellows were waiting for, as nearly a thousand lucky men took this opportunity to stock up on these inexpensive transmitting tubes. Their voltage ratings are the same as the UX210, and we are mailing them pp. or c.o.d. for one buck each. Postage additional. G. L. Lang, 1128 Springfield Ave., Irvington, N. J.

SELL—station and extras. W8BJO, Dundee, N. Y.

QSL cards, stationery, wall cards, etc. Seldens, Cranesville, Pa.

CRYSTALS—see our display on page 85, American Piezo Supply Co.

FREQUENCY precision is the most urgent need of modern radio. Let us calibrate your new frequency meter from Piezo standards. American Piezo Supply Co., Dept. C, 1101 Huron Bldg., Kansas City, Kans.

QSLs, 100 two-color, \$1.00. Samples, W9CKA, Corwith, Iowa.

CRYSTALS—each plate tested on the air and fully guaranteed. 3500-kc., \$14; 1750-kc., \$9; blanks, \$4. W9DRD, Herbert Hollister, Edwardsville, Kans.

3000V, 4000W, 7½-hp, 3-phase drive double commutator motor-generator, complete, \$530. 2500V, 500W, double commutator, single-phase drive complete, \$225. 500-cycle 1-kw, ball-bearing motor-generator, 110V, d.c. drive, \$175. 250-cycle 1½-kw, ball-bearing motor-generator, 110V, d.c. drive, \$165. 2-3-kw, Rotary spark gap, 110V, d.c. drive, \$35. 1000W, 300W, Esco 1-phase drive, \$75. 300W G.E., \$95. 750V, 250W, new General Electric motor-generators, \$52.50. 200W, \$42.50. 32V, drive motor-generators, 750V, 150W, \$37.50; 300W, \$42.50. 300W, \$65. 400V, 100W, generators, \$8.50; ¼-hp, 3450 speed motors, \$10.50; ½-hp., \$16.50. ¼-hp, 110V, a.c. synchronous 1800 speed motors, \$20. 8V, 5-ampere generators, \$6.50. Queen City Electric, 1734 Grand Ave., Chicago.

SELL—7½-watt 40-meter airplane portable mopa transmitter, receiver, m.g., 15-dial omnigraph, extra dials. Best offer, W9PXA.

OMNIGRAPHS, Teleplexes, transmitter, receivers, Vibroplexes, 50-watters, "S" tubes, bought, sold, traded, Ryan Radio Company, Hannibal, Mo.

TRANSFORMERS, 500-0-500, 7½, \$4.50. 550-0-550, 8, \$5. 0-600, 7½, \$5. 10V, 75-watt, \$2.75. 350-0-350, 5, 2½, \$1.50. 300-0-300, 5, 5, 2½, 1½, \$4. 30H 85 M.A. double choke, \$1.75. 50H 125 M.A. double choke, \$2.50. Condenser blocks, working voltage 450, 2-4-4-1-1 mf., \$2.75. Unfused 2 mf., 45v, 4 mf., \$8c. Send for catalog, Electrone Laboratories, 834 N. Randolph St., Philadelphia, Pa.

POTTER Condensers: 1-mfd. 2000-test voltage, \$2.50; 1-mfd. 2500-test, \$3.25; 2-mfd. 1000-test, \$2.50; 2-mfd. 2000-test, \$4.00. Thordarson 650-volt power-filament transformers for 7½-watters, \$6.90. Aluminum square-foot, 85c; lead, 85c. "Ham List," #4, Circuit Sales, 1109 Eighth Ave., Fort Worth, Texas.

COMMERCIAL circuits—The Spark, Arc, Broadband, Converted Spark, mopa and mopa with lone attachment diagrams now accepted as correct for the new Commercial Exams. Six blue prints, \$1.00 postpaid. Federal Radio & Railway Institute, 517 Wells St., Milwaukee, Wis.

BARGAIN—Model 8A Kolster broadcast receiver, New, in original carton. This table model d.c. set in satin finished mahogany cabinet contains four stages of tuned r.f., detector, and three special audio stages. Single illuminated control. Selectivity or sensitivity adjustable. Requires seven 201A's and will take power tube in last stage. Height 12½", width 27½", depth 14½". A fine set, and only \$40 cash takes it. Miles W. Weeks, 40 Norfolk Rd., Brookline, Mass.

WILL sell any part of my 15-watt transmitter. Write for list. A sample Jewell filament or plate meter, \$2.50. Grant Jones, Avoca, N. Y.

REDUCED prices: Highest quality merchandise. 1000-volt d.c. working filter condensers: Dufilier 2½ mfd. metal-cased, \$2.25. Splittord, unmounted, 1 mfd., 40v. Four for \$1.50. Eight for \$2.60. 2 mfd., 75v. Four for \$2.60. Eight for \$4.80. Twelve for \$6.80. 19 mfd. tapped blocks, metal-cased, \$3.60. AmerTran 250-watt power transformers, 1200, 7½, 7½, center-tapped secondaries, \$7.25. Mounted power chokes (with airgap) 30 H, 100 M.A., \$1.60. 30H, 150 M.A., \$2.10. W.E. microphones, 96F. Pure rectifier elements: 1 x 4.9v, 1 x 5.10½v, 1 x 6, 12v. Send for list of "specials." William Harrison, 35 Ft. Washington Ave., New York City.

QSL cards, two colors, \$1.00 per hundred. Free samples. W8DTY, 257 Parker Ave., Buffalo, N. Y.

250 watters, oscillators, amplifiers, practically new. Make offer. W5ASQ-W5BEE.

GUARANTEED crystals—ground to any specified part of band. 1750-3500-kc., \$9-\$11. Power crystals, \$4 more. W8DWM.

SURPLUS equipment for sale or trade. Send for list. Want public address equipment and UV204A. W9FUE, Hiawatha, Kans.

EMERSON motor generator, 1150 volts, 400 watts, 110 v.a.c. drive—first \$50 takes it. B. Shields, United Fruit Co., New Orleans, La.

RECTOBULBS, ordinary and power crystals, all types of transmitting tubes or any item of new transmitting apparatus made; W9ARA has it at maximum discount with immediate service. Write, R. E. Henry, W9ARA, Butler, Mo.

WANT: Mercury are outfit. Sell or trade: Dynamotor, WE212D, WE211D, 203-A, 304-A, new Leach relay, 85 and 170 meter crystals, 550 V, transformer, Super-Wasp receiver. Other apparatus. What do you need? W9ARA, Butler, Mo.

SCREEN grid—in stock No. 39 d.s.c. advance resistance wire, suitable for primary windings of interstage r.f. screen-grid transformers, 100 ft. Plenty for three primaries, \$1.00 postpaid. Construction details of screen-grid coils, 25c. Clark Wells, 392½ Northampton St., Kingston, Pa.

FOR sale: xtal transmitter and parts. Write for list W9DCK, 413 Maple Ave., Lawrenceville, Ill.

MOTOR Generator Bargains, 750-volt, 250-watt direct connected to 110-volt, 60-cycle, alternating motors with field resistance, \$49.50. Also 150-watt, same as above, \$40. ½-horse, 110-volt, General Electric and Westinghouse alternating motors with pulleys, \$8.75. We are also offering many other bargains in motor generators voltage to 3000. Also separate generators, motors, etc. Write us for quotations on any machines you are interested in. Electrical Surplus Co., Radio Dept., 1911 Chicago Ave., Chicago.

FREE—four Cunningham tubes with each Pilot super-wasp at \$29.50, total value \$37.25. Order now. Big discounts on Tobe, Electrad, Yaxley, Frost, Thordarson, Sanguino, Weston, Signal, Elkon, National, Pilot, Hammarlund, and others. Send for price list. Hatry & Young, Hartford, Conn.

ONE Benwood synchronous rotary quenched gap, \$30. 1½-hp, synchronous motor, \$20. 1 UP1654 50 henry 300 mil choke, \$15. 4 Faradon UC490 1750-volt, 1 mfd. condensers, each \$2. 1 UV203 Radiotron 50-watter, \$10. 1 300 AH 5-cell Edison battery, \$40. 3 Murdock sections of condensers, each \$2. 1-kw. Thordarson 110-20,000-volt spark transformer, \$10. 1 0-500 mill Weston milliammeter type 301, \$7.50. 1 Jewell 0-4 amps r.f. meter t.c. type, pattern 84, \$10. 1 Jewell 0-15 volts A.C. voltmeter, pattern 74, \$7.50. Charles S. Chapman, 705 Plummer Ave., San Jose, Calif.

SHIELD grid transformers, new Tyrman Company bankrupt. Set of 4 matched, \$5.45; unmatched 50 each as is, Chicago Radio Service, 2650 Burling, Chicago.

FOR sale: Nearly new UV203A with socket, \$20. 2 Q15 De-ford 250-watter, \$18. Short-wave receiver, \$25. Vibroplex, \$9. Webster 2-stage 210 push-pull amplifier, \$30. Jewell 0-10 t.c., \$8. Jewell 0-500 M.A., \$5. Jewell 0-15V a.c., \$5. W9AFU, 909 Hayes Ave., Racine, Wis.

Q R A SECTION

50c straight with copy in following address form only:

W2BCH — A. S. Harrison, 6941 62nd St., Glendale, L. I.

W2BQJ — Geo. Ruckstuhl, 57 Cambridge St., East Orange, N. J.

W2JB — John B. Lewis, Asher, Okla.

W8BOK — L. E. Bates, 103 North 24th St., Clarksburg, W. Va

WIMK

A.R.R.L. Headquarters

R. B. Parmenter, Chief Op. "rp."

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

W1BDI-W1XL F. E. Handy "fh."

W1AL B. Dudley "bd."

W1EH K. B. Warner "kb."

W1BUD A. L. Budlong "bud."

W1CEI J. J. Lamb "jm."

W1ES A. A. Hebert "ah."

W1FI-W2JR G. Donald Meserve, "dm."

W1PX C. G. Keneffick "ck."

W1SZ-W1BIZ C. C. Rodimon "rod."

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Do you know that the 1929 Handy and Hull Handbook is available in bound form — \$2.00 per copy, postpaid?

When ordering a copy of this new fifth edition, look at your present copy and determine if you want the 1929 copy in more permanent form.

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Send for ROYAL-EASTERN'S
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Every worth while radio, electrical and sporting goods item is featured at lowest wholesale prices. Being the largest Radio and Electrical Mail Order House in the East, we can serve you best. We buy no seconds. We have no job lots. Only fresh and clean products in original factory cartons.

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Send for Catalogue Today. It's free

Royal-Eastern Electrical Supply Co.
12A West 22nd Street New York, N. Y.

YOUR A.R.R.L. EMBLEM



The League Emblem comes in four different forms. Its use by Members is endorsed and encouraged by the League. Every Member should be proud to display the insignia of his organization in every possible way.

THE PERSONAL EMBLEM. A handsome creation in extra-heavy rolled gold and black enamel, $\frac{1}{2}$ " high, supplied in lapel button or pin-back style. The personal emblem has come to be known as the sign of a good amateur. It identifies you — in the radio store, at the radio club, on the street, traveling — you can spot an amateur by it. Wear your emblem, OM, and take your proper place in the radio fraternity. Either style emblem, \$1.00, postpaid.

THE AUTOMOBILE EMBLEM. $5 \times 2\frac{1}{2}$ ", heavily enameled in yellow and black on sheet metal, holes top and bottom, 50c each, postpaid.

THE EMBLEM CUT. A mounted printing electrotype, the same size as the personal emblem, for use by Members on amateur printed matter, letterheads, cards, etc. \$1.00 each, postpaid.

THE "JUMBO" EMBLEM. How about the shack wall or that 100-footer? Think of the attention this big yellow-and-black enamel metal emblem will get! $19 \times 8\frac{1}{4}$ ", same style as Automobile Emblem. \$1.25 each, postpaid.

The American Radio Relay League, Hartford, Conn.

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

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

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

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

I hereby apply for membership in the American Radio Relay League, and enclose \$2.50 (\$3 in foreign countries) in payment of one year's dues, \$1.25 of which is for a subscription to *QST* for the same period. Please begin my subscription with the issue. Mail my Certificate of Membership and send *QST* to the following name and address.

.....
.....

Do you know a friend who is also interested in Amateur Radio, whose name you might give us so we may send him a sample copy of *QST*?

.....

Thanks

For Your Convenience

QST'S

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REMARKABLE RADIO VALUES

K O L S T E R Electro Dynamic Reproducer

Combined with 210 Power Amplifier and "B" Supply Unit



This famous genuine Kolster K-5 AC Electro-Dynamic Reproducer is complete with a 210 Power Amplifier and "B" Supply Unit all self-contained on a steel frame. This real fine matched rugged Unit weighs 45 lbs. without the Cabinet. The Cabinet itself is Pencil-Striped Walnut, beautifully designed with Cathedral grille.

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This Electro-Dynamic Reproducer can be used with any battery or AC set, replacing the last audio stage, or be used with all tubes of the set. Wherever used it will bring out every shading and range of tone; every note is reproduced with utmost faithfulness, pure and undistorted. It will modernize any radio receiver.

Uses 1 — UX-210, 2 — UX-281 and 1 — UX-874 tubes.

A 20-ft. cable is included with each instrument. Operates direct from 50-60 cycle, 110-120 volt AC current.

BRAND NEW IN ORIGINAL FACTORY CASES AND GUARANTEED

Every Reproducer is serial-numbered and has factory guarantee tag enclosed

List Price \$175.00

(without tubes)

Never ~~\$175.00~~
Before **\$49.50**



SIZE 6" x 5" x 3 1/2"

AEROVOX OR Dubilier HIGH VOLTAGE FILTER CONDENSER BLOCKS

Finest non-inductive High Voltage Filter Block ever made. Designed for use with UX-250 Power Tubes but can be used safely in filter circuits of transmitters or high power Amplifiers in any combination of capacities desired.

Each Unit is equipped with long, heavy, flexible leads, convenient for easy wiring, and also has mounting brackets.

The insulation resistance of these Condenser Blocks is in excess of R.M.A. and N.E.M.A. standard requirements.

Due to the request of manufacturers of these Condenser Blocks we cannot divulge the high list price of same.

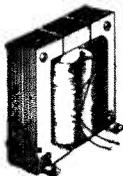
All brand new, never been used, latest design.

SPECIAL

\$3.25

PER BLOCK

CAPACITY	RATED D. C. WORKING VOLTAGE
2.0 MFD.	1000 V
1.0 " "	800 V
3.0 " "	400 V



50 HENRIES

FILTER CHOKES

85 MILLS

These are very efficient Chokes for use in Filter Circuits for your Transmitter, A and B. Eliminators or Power Packs.

The Choke Coils are very well constructed and are made with air gaps to prevent magnetic saturation from direct current.

SPECIAL

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	SPECIAL
R.C.A. Uni-Rectron Power Amplifiers — Model A. P. 935 List \$88.50 ea.	\$19.75 ea.
E210 BRADLEYSTATS, list \$4.00, fine for A.C. Line Voltage Control	1.60 "
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Kolster 135 Volt "B" Eliminators, List \$39.50 (without UX213 or 280 tube)	10.50 "

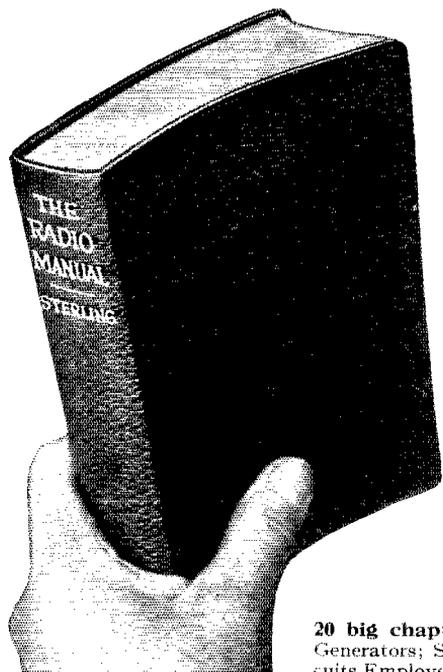
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for
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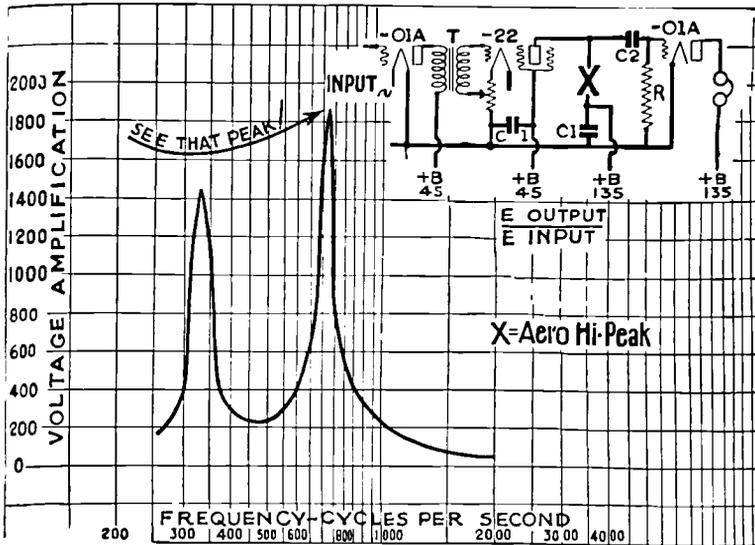
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Send me the Revised Edition of **THE RADIO MANUAL** for examination. Within ten days after receipt I will either return the volume or send you \$6.00. — The price in full.

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AERO HI-PEAK



See That Peak!

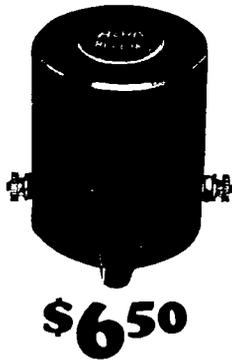
THAT is the Aero Hi-Peak of amplification and selectivity, the peak of amplification which is many times greater than you get with just ordinary transformer amplification, and which brings signals through QRM.

In these days of modern amateur radio and heavy QRM, you need more than amplification alone — you need selectivity more than ever before. The Aero Hi-Peak is a properly designed audio choke, tuned to a frequency which gives greatest signal response with the average headphones. As shown in the diagram, the Aero Hi-Peak is used as the second audio stage of amplification, connected in the plate lead of the screened-grid type (— 22) tube. The first audio stage of amplification may be any good audio transformer, but for a Hi-Peak like the one shown, the AE-300 audio transformer is recommended for best results. The Aero Hi-Peak is connected as shown by X. Not recommended for program music or voice reception.

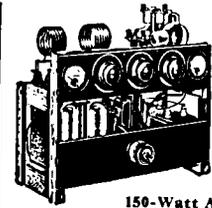
Ordinarily, amateur short wave receivers have been sensitive enough to satisfy the user, but they have been lacking in selectivity — that extreme selectivity so desirable for successful operation. Hundreds and hundreds of amateur radio stations are operating within the very narrow limits of the amateur bands, and there is bound to be some QRM. The Aero Hi-Peak makes it a real pleasure to operate your station without the usual "SORRI OM QRM VY BAD ON UR WV."

Mounted in heavy bakelite case, 2 5/8 inches high and 2 1/4 inches across mounting supports. Shipping weight about one pound.

If your dealer cannot supply you, write to us direct.



\$6.50



Aero High-Power Xmitter and

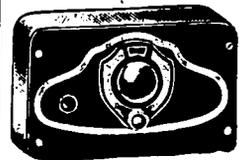
150-Watt Amplifier

For operation on 20-40-80 Bands.

The first high-power amplifier to use the UX-860 screen grid tubes, 1929 in every detail. 150 Watts of pure D.C. signals with a stability which has caused favorable remarks everywhere. Flexibility that fills every Ham need.

Kit No. 52 — Including the power supply, but not including tubes. List Price, \$259.00

Kit No. 53 — Less power supply and tubes. List Price, \$125.00

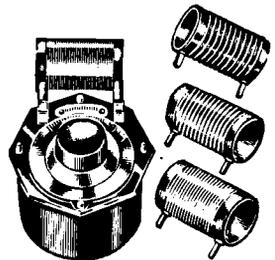


Only \$15

Aero Listening Monitor

Enables any amateur transmitter to check his own note, to know whether it is pure D.C. or not. It is a safe, sure and accurate way of knowing your station without depending upon the reports of others. Watching the ammeter won't help you — you need the Aero Monitor to be absolutely positive.

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Using the principle of the "series gap," condensers, and having a definite fixed minimum capacity, the amateur wavelength bands are spread over a great many dial divisions. The velvet vernier dial has 100 divisions, each of which may be read to one-tenth of a division. Each wavemeter is individually hand calibrated. Standard coils shown are 20, 40 and 80 meters, included in price. 5- and 10-meter coils extra. List Price, each, \$24.00

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Inside Information!

Inner seal cementing cells into a solid block

Moisture-proof insulating cell partitions.

Moisture-proof inner container

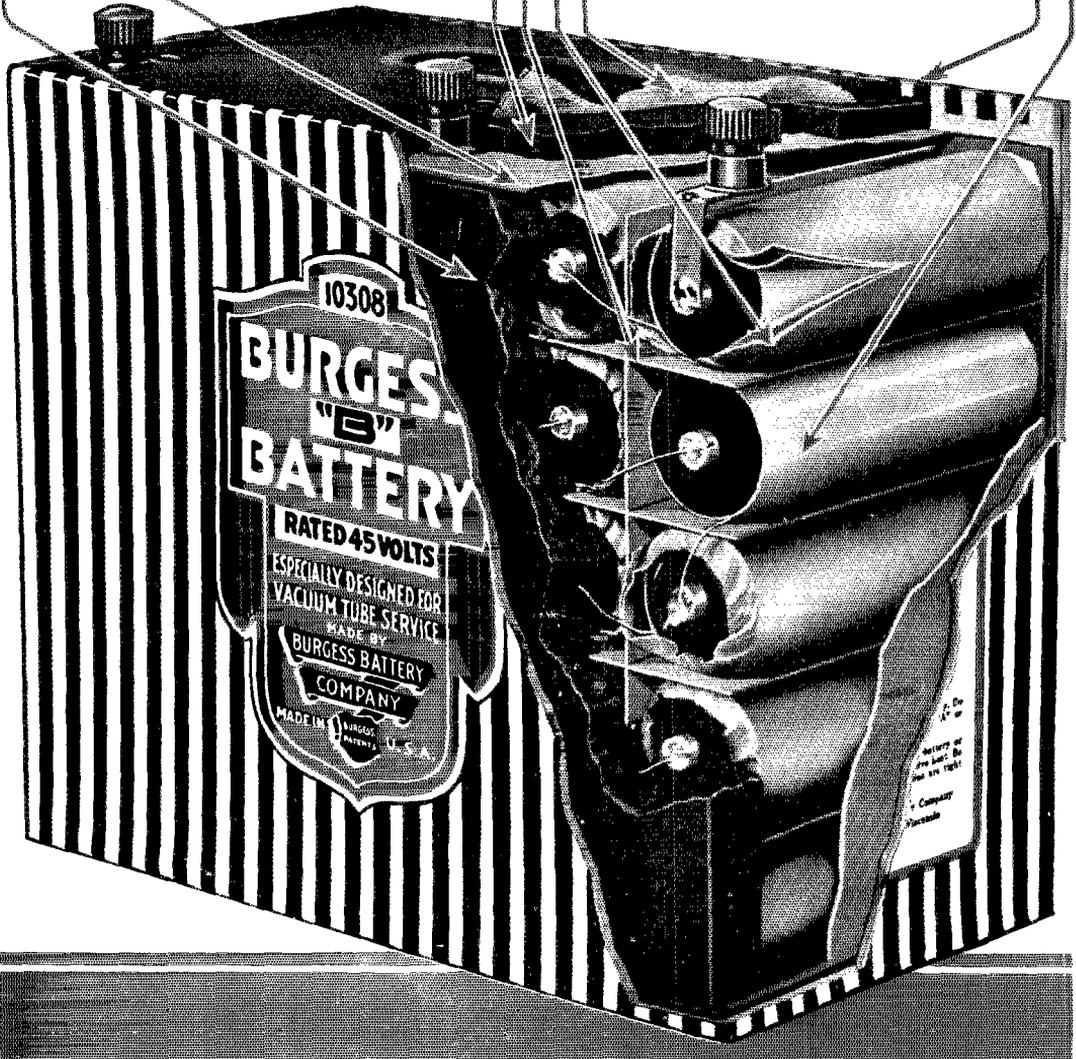
Double top seal

One piece, drawn, seamless zinc can

Moisture-proof cell wrapper

Black and white striped water-proof container

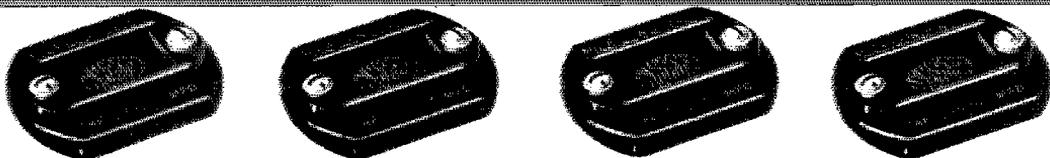
Re-inforcing strip in top seal



BYRD EXPEDITION



Pa. A-Photo



Transmitters and Receivers employ Sangamo Condensers

Away down among the ice barriers of the Antarctic . . . only the dependable operation of short wave transmitters and receivers keeps the Byrd Expedition in touch with the civilized world. Only the snappy kick of short wave equipment affords a plane in trouble the protection of the mother ship.

Not unusual then, the choice of Sangamo 5000-volt Fixed Condensers for the radio equipment. Tested at 5000

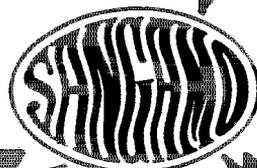
volts d.c. and 3500 a.c. and built to the world radio-known Sangamo standard, amateurs, commercial men and manufacturers have come to rely on Sangamo High Voltage Condensers.

Accurately rated, more than adequately tested and enclosed in an impervious Bakelite molding—these condensers offer the maximum protection in high voltage, high frequency circuits.

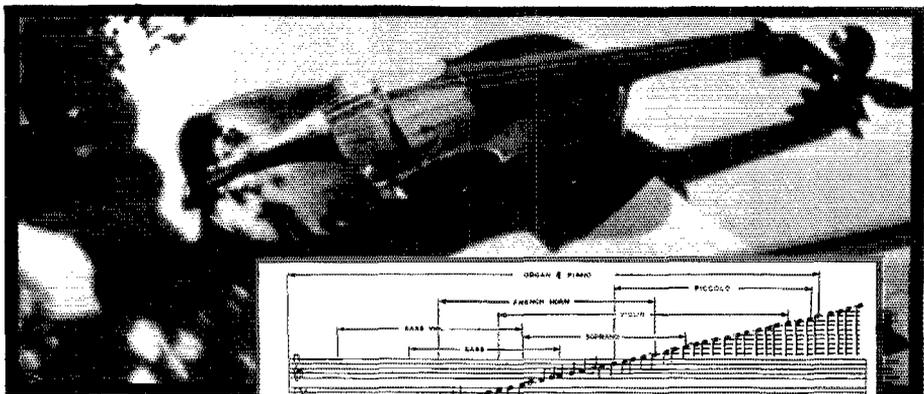
SANGAMO ELECTRIC CO.

SPRINGFIELD, ILLINOIS, U. S. A.

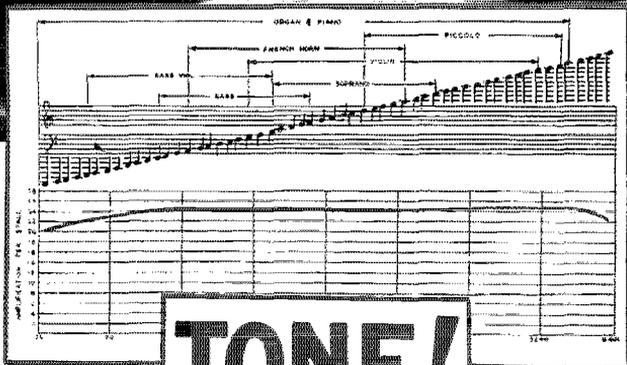
Manufacturers of Precision Electrical Apparatus for 30 Years



See reverse
side

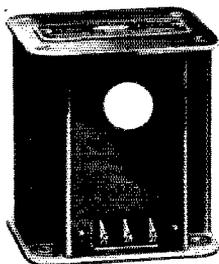


Curve of Sangamo Type "A" Transformer. Note the uniformity of amplification at all audible frequencies.



TONE!

According to *musical standards*



- Type A straight audio amplification.....list price, \$10.00
- Type B Push-pull Input Transformer for all tubes.....
-list price, \$12.00
- Type C-171 Push-pull Output, for 171 or 250 type power tubes with cone speaker.....\$12.00
- Type D-210, same as C except for 210 and 112 power tubes, \$12.00
- Type H-171, Push-pull Output for 171 or 250 power tubes for Dynamic Speaker.....
-list price, \$12.00
- Type G-210, same as type H except for 210 and 112 tubes.....
-\$12.00
- Type F Plate Impedance for use as a choke to prevent oscillation and for impedance coupled amplifiers.....list price, \$5.00

It may be true that the search for straight line audio-amplification is an out-of-proportion effort to accomplish a small objective. It may be true that few average listeners can really tell the difference between just "good" transformers and the best transformers!

But we do know, however, that the true beauty of music arises in seemingly small perfections—many of them known by name to only the trained musician. And we know that the *average* ear also responds, perhaps unconsciously, and derives greater pleasure from music "as it should be."

Therefore, in designing and building Sangamo "A" Transformers even the smallest improvement was important. No possible betterment was disregarded. Cost was disregarded, for this transformer is built for the man who wants the best and knows that it costs more. The core metal alone costs as much as the total manufacturing cost of many transformers, but it permits a dense, compact field without saturation and is worth the money because it increases amplification in the lower registers.

So Sangamo has built this master transformer to *musical standards* for those who demand the best. For the set builder to add to his pride of craftsmanship and achievement, for the manufacturer who wants a "tone" advantage against competition.

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