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

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

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n 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, however 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, protectors 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 wise 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 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 wholehearted 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 shocked 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.”

E. B. W.

A.R.R.L. Standard Frequency
Transmissions

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.

<table>
<thead>
<tr>
<th>Date</th>
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<tr>
<td>November 1, Friday</td>
<td>A</td>
<td>WIXY-W1AXV</td>
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<td>3, Sunday</td>
<td>CD</td>
<td>W9XL-W9W1</td>
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<td>22, Friday</td>
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</tr>
<tr>
<td>24, Sunday</td>
<td>C</td>
<td>WIXY-W1AXV</td>
</tr>
</tbody>
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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

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 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 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-306 rectifier units for the crystal-oscillator-amplifier, buffer-amplifier, modulated amplifier and modulator on the panel at its right. The 50-kw. amplifier is at the left of the open gate and the 30-kw. stage at its right. The box on the operator's desk contains the push-button control for the entire transmitter.
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 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. Once 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 generator 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 Eidsen climbed into the DN-2 and after taxing 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 shaking 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 howling 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 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 coefficient 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 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 1.5° (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-805, 7½-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-806 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 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 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
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” input is fed by the studio control amplifier at, from the station control-room amplifier which, 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 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-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 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
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 modulated 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 reality 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-582, 100-kw. water-cooled tubes in a push-pull circuit do the work.

Of all the interesting features of this amplifier, the UV-582 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 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, 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-

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

The 100-kw. tube is almost "tall-sized." Note how the left-hand tube socket is tipped forward to facilitate insertion of the UV-582. The tubing running to the top of the tubes is for air-blast cooling of the glass grid and filament seals.

SIX MERCURY-VAPOR TYPE TUBES ARE USED IN THE 500-KW. RECTIFIER

This is the first rectifier of its type ever used in a commercial station.
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 µfd., the total capacity of the condenser being 750 µfd. 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 “ple-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 2 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 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 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.

Strays

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 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 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 capacitative 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 capacitative 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

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* 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, 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 Wouf-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.L., 336 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. Dellingher, 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 78)
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

SOMEONE 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 safe guard 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

A MATEURS 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 W1MK.

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. The certificate accompanying 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 harmonies of broadcasting stations in 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 flyers 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 navigational 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 N1XL at Mount Evans, Greenland, the next point along the proposed line of flight from Port Burwell. From MacMillan's Bowlain, 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 over-worked 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, W3CP, Hammond, Ind. — $150.
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 Childey), 143, 163 kc.
2V3S, Louisburg Radio (N. S.), 107, 115, 127 kc.
3 F. E. Handy, E. L. Battey, 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 station whenever 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 consideration,

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 Chestow 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 operation, 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

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-µfd. Braemer-Tully and is mounted behind the main panel (which, together with the front baseboard, is of 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 1/4″ wide by 1/16″ thick, spaced 1/8″ apart on oak separators which are bolted to bakelite rings 1/2″ wide and 2 1/2″ in diameter.

The output of this tank circuit is passed through a 500-µfd. condenser which consists of two aluminum plates 2″ square separated by a 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 µfd. with the key down, to less than 2 µfd. 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.

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 condensers 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 Ls511 with 400 volts on its plate and 6 volts negative grid bias. The four crystal holders will be
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-150 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

coil is of construction similar to the oscillator coils and consists of ten turns spaced 1\(\frac{3}{4}\)" apart.

The second frequency doubler is a DET1SW 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\(\frac{1}{4}\)" 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 \(\mu\)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 3/16" 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

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1 See Appendix, at the end of this article, for characteristics of the British tubes used at GB8Y.
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 variable of 150 µfd. 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-µfd. 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 stc. voltmete 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 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-µfd. condenser, 80-henry choke and another 6-µfd. condenser. The object in having a separate H.T. 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.

\* 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.e. note (only one 2-mfd, 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. 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") thick, 1' long and 1" wide. About 60 volts per cell is found to give best results. The surprising 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 September, 1928, and has proved itself entirely satisfactory for 1929 requirements. The great advantage 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 4" high. It 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 mfd. for tuning and the other 100 mfd. 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-

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3 The 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.
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

![Diagram of the monitor-frequency meter](image)

**FIG. 4.---THE MONITOR-FREQUENCY METER**

- $C = 1000$-pf. by-pass condenser.
- $C_1 = 15$-pf. tuning condenser.
- $C_2 = 100$-pf. variable-shunt condenser.
- $L_1 = 12$ turns on tube base for 7 mc. band.
- $L_2 = 10$ turns on tube base for 7 mc. band.
- RFC = 120 turns on 1/2" diameter.
- $S = $ Switch — open when external filament battery is used.

The combination 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 beat 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 faculty 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, 22.9, 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 band 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 9 1/4 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.
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 (Oram)
1. Use: Three element general purpose tube, suitable as final amplifier in receiving sets.

**FIG. 5.—THE FOUR-TUBE RECEIVER**

- **C** — 1-mfd. by-pass condenser.
- **C<sub>1</sub>** — 15-mfd. tuning condenser.
- **C<sub>2</sub>** — 60,000-mfd. fixed condenser.
- **C<sub>3</sub>** — 0.05-mfd. fixed condenser.
- **C<sub>4</sub>** — 0.01-mfd. fixed condenser.
- **C<sub>r</sub>** — 100-mfd. variable condenser.
- **R** — 10,000-ohm resistor.
- **R<sub>1</sub>** — 1234-ohm fixed filament resistor.
- **R<sub>2</sub>** — 742-ohm fixed filament resistor.
- **R<sub>3</sub>** — 8-megohm grid leak.

- **E<sub>t</sub>** — 5.25 volts. **R<sub>s</sub>** — 6,000 ohms. **E<sub>0</sub>** — 400 volts, max.
- **I<sub>1</sub>** — 0.8 amp. **μ** — 5

Approximately equivalent to Deforest DV7, but operates at higher plate voltages.

**DE5 (Marconi)**

- **R<sub>a</sub>** — 600,000-ohm fixed resistor.
- **R<sub>s</sub>** — 600,000-ohm fixed variable resistor.
- **R<sub>g</sub>** — 10,000-ohm resistor.
- **R<sub>3</sub>** — 10,000-ohm resistor. **L<sub>a</sub> and L<sub>b</sub>** — Tuning inductance and filter inductor in plug-in coil form.
- **R<sub>v</sub>** — Secondary of Field coil.
- **T** — Audio amplifying transformer.
- **V** — Farnley socket.

1. Use: Power amplifier in receiving sets.
2. **E<sub>t</sub>** — 5 to 6 volts. **R<sub>s</sub>** — 7,000 ohms. **E<sub>0</sub>** — 140 volts.
3. **I<sub>1</sub>** — 0.25 amp. **μ** — 7

Approximately equivalent to Radiotron UX-201A.

**DEH-610 (Marconi)**

- **R<sub>a</sub>** — 800 micro-mhos.
- **R<sub>4</sub>** — 820,000 ohms.
- **μ** — 800 micro-mhos.

Approximately equivalent to Radiotron UX-240.

**PM-14 (Mullard)**

- **R<sub>a</sub>** — 1,500,000 ohms.
- **R<sub>4</sub>** — 75 volts.
- **μ** — 800 micro-mhos.

Approximately equivalent to Radiotron UX-222.

**VO-150 (Mullard)**

- **R<sub>a</sub>** — 1,500,000 ohms.
- **R<sub>4</sub>** — 75 volts.
- **μ** — 800 micro-mhos.

Plate dissipation: 80 watts.

Approximately equivalent to no American made tube. The UX-892 is the nearest approach we have to the VO-150.

**U-5 (Marconi)**

- **E<sub>t</sub>** — 5.0 volts. **R<sub>r</sub>** — 300 ohms. **E<sub>s</sub>** — 400 volts per anode
- **I<sub>r</sub>** — 1.6 amps. **I<sub>s</sub>** — 60 ma. max.

Approximately equivalent to the Radiotron UX-213.

**DEISW**

No information on the DETISW tube is available but it is believed that this tube is very similar to the Marconi DETI tube, the operating characteristics of which are:

- **E<sub>t</sub>** — 6.0 volts. **R<sub>s</sub>** — 6,000 ohms. **E<sub>0</sub>** — 1,000 volts.
- **I<sub>r</sub>** — 1.9 amps. **μ** — 11

The DETI is a "dull emitter" tube having 40 watts plate dissipation.

Approximately equivalent to the W. E. 211-A tube.

—Editor

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-milliamperes, 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 $2.25 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.

VF4DK 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 audionyde 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 UX-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 UX-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 anything like such a matching in our high-frequency and audio-frequency circuits, there is a dual advantage in the employment of the UX-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 UX-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 audionyde amrna...
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 -109, -201-A or -112-A. The two-tube screen grid receiver brings in sixth district stations on this 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 — Error). 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 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, W1BIS, 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 piodymontron 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 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 22½ 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 µfd, with grid leaks up to 10 megs. The circuit could be made to go in or out of oscillation without fringe howl or thumps when using grid leaks up to 7 megs. A 10-me gambin 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-

(Continued on page 78)
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 book-end bound copy of the Radio Amateur’s Handbook, (2) six pads of A.R.E.L. message blanks, or (3) 500 A.R.E.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 the original announcement (March QST, page 82) 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 forefront of wireless-telegraphic communication, back in the days of amateur spark transmitters, crystal detectors, and other devices 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 assurance 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 best 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 chrips, thumps, and “tails” on the end of our dots and dashes, are inexusable 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 practice 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.
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 WD0QV and the writer (our stations are only a little over half a block apart) started up actively on the 3575 kc. 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 will 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 rear windows is 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 WD0QV and myself did the "quiet hours" for each other. This consisted in one station staying off from 9:00 p.m. to 3:00 a.m. and the other from 3:30 p.m. to 4:00, 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.f. was worse (in interfering power) than was raw r.f. Pure d.e., however, was almost immeasurable at a distance of a half block if a suitable long-tube 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 WD0QV 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 more tacit agreement, whereby the stations concerned confine their operations to times when the others cannot be on the air will frequently do much to create better feeling among the amateur living close to each other. After all, the main point to be emphasized is that cooperation is 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 motor-generator and is operating almost every night. Regular Monday night schedules are being kept with W2XL and other active AA stations in the Area. W2AVG (well known) is operating on the "214" call (signal) transmitted at 9:00 p.m. E.S.T. every Monday, and the regular routine goes on. W2PF, the alternate Corps Area N.C.S., is being rebuilt but will be in operation again soon.

Eastern New York State Net: W2BGR, the alternate N.C.S. of this net, has returned to AA affairs. W2AVM 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 widows with the 61st 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: W2AHK, the N.C.S. of the Western N.Y. district, W2XAE, W2CVU, W2AFG 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 A.A. ranks.

New Jersey State Net: W2A0M has kept his schedules as N.C.S. of the net throughout the summer.

THIRD CORPS AREA: W7AJR 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. W4AC1 is the N.C.S. of North Carolina with W4AEW as alternate. W4AX is Control Station of the Third Alabama Area.

W1MK

A.R.R.L. Headquarters' Station W1MK operates on frequencies of 3575 kc. and 7130 kc. Robert B. Parmeuter, "EP" is the chief operator; his list is familiar to most of the amateur fraternity. Occasionally other members of the Headquarters' staff operate at W1MK. 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 7130 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. The times 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 10-meter band.

3500 kc.
- 8:10 p.m. to 9:00 p.m. on Sun., Mon., Tues., 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 night (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 expeditiously to A.R.R.L. Headquarters. The frequency included within parentheses indicates the band in which each individual station keeps the schedule with W1MK:

- W1EZ, Pasadena, Vermont (3500): Mon. and Thurs.
- W1Y, Newton, Conn. (3500): Tues. and Fri.
- W3SN, Fr. Howard, Md. (3500): Tues. and Thurs.
- W2AKW, Lancaster, Calif. (7000): Mon. and Thurs.
- W6CIS, Sacramento, Calif. (7000): Mon. and Fri.
- W1AAL, Oil City, Pa. (3500): Sun.
- W5DHY, Detroit, Mich. (3500): Thurs. and Fri.
- W9AL, Torrance, Ont. (7000): Tues. and Fri.
- W4APY, Berea, Ill. (7000): Tues.
- W6DQZ, Chicago, Ill. (7000): Mon. and Fri.
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 practice and other information for your special 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-kc 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


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-five 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.
Traffic Summaries

**JULY-AUGUST**

Pacific led by Los Angeles .................................. 10,715
Central led by Michigan .................................... 3587
Atlantic led by Eastern Pennsylvania .................... 1392
Roanoke led by Virginia .................................... 1577
New England led by Connecticut .......................... 1488
Southeastern led by Georgia-South Carolina .............. 1470
Midwest led by Kansas ...................................... 1349
Hudson led by Eastern New York .......................... 1070
Rocky Mountain led by Tash-Wyoming .................... 436
West Gulf led by Northern Texas .......................... 367
Dakota led by North Dakota ................................ 312
Northwestern led by Oregon ................................ 167
Delta led by Mississippi .................................... 95
Quebec .......................................................... 61
Prairie led by Manitoba ..................................... 19
Vanalla led by British Columbia ............................ 5

48 stations orig. 6586; delivered 5588; relayed 11,307: total 24,401 (84.8%; delivered).

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 highest total of real messages. A traffic summary showing the standing of the various Divisions for the past month is printed below. Where place does yours take? What Section will carry the banner next month and help its 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 calendar 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 W1MK 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 reliable 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, OM, 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.
### OFFICIAL BROADCASTING STATIONS

**Local Standard Time**

<table>
<thead>
<tr>
<th>Call</th>
<th>Frequency</th>
<th>Schedules</th>
</tr>
</thead>
<tbody>
<tr>
<td>W1AJC</td>
<td>7110</td>
<td>Tues., Thurs., Sat., 6 p.m.</td>
</tr>
<tr>
<td>W1ANH</td>
<td>3960</td>
<td>Mon., Wed., Sat., 7:15 p.m.; Tues., Sun., 10 a.m.</td>
</tr>
<tr>
<td>W1AQL</td>
<td>3840</td>
<td>Mon., Wed., Fri., 7 p.m.</td>
</tr>
<tr>
<td>W1ATJ</td>
<td>3950</td>
<td>Mon., Wed., Fri., 6:30 p.m.</td>
</tr>
<tr>
<td>W1BEP</td>
<td>3500</td>
<td>Mon., Wed., Fri., 7:10 p.m. — also, at odd times during the week.</td>
</tr>
<tr>
<td>W1BGM</td>
<td>3725 (cc)</td>
<td>Mon., Tues., and Thurs., 10:30 p.m.</td>
</tr>
<tr>
<td>W1BL</td>
<td>7100</td>
<td>Tues., Fri., 5 p.m.</td>
</tr>
<tr>
<td>W1CDOX</td>
<td>3590</td>
<td>Tues., Thurs., Sat., 6:15 p.m.</td>
</tr>
<tr>
<td>W1KH</td>
<td>3850</td>
<td>Sun., 9:00 p.m.</td>
</tr>
<tr>
<td>W1KH</td>
<td>14,300</td>
<td>Sun., 8:00 p.m.</td>
</tr>
<tr>
<td>W1MK</td>
<td>3575 &amp; 7150</td>
<td>Sun., Mon., Tues., Thurs., Fri., 9:30 p.m. — (Midnight)</td>
</tr>
<tr>
<td>W1QP</td>
<td>3860</td>
<td>Mon., Wed., Fri., 7 p.m.</td>
</tr>
<tr>
<td>W2AEP</td>
<td>7240</td>
<td>Mon., 7:30 p.m.; Thurs., 11:00 p.m.</td>
</tr>
<tr>
<td>W2AXT</td>
<td>3540</td>
<td>Mon., Tues., Fri., 7 p.m.</td>
</tr>
<tr>
<td>W2AXT</td>
<td>7090</td>
<td>Mon., Wed., Fri., 6:30 a.m.</td>
</tr>
<tr>
<td>W2BBS</td>
<td>14,160</td>
<td>Sun., 10:30 a.m.</td>
</tr>
<tr>
<td>W2CHO</td>
<td>7000</td>
<td>Tues., Fri., 7 p.m.</td>
</tr>
<tr>
<td>W2CIT</td>
<td>7000</td>
<td>Tues., Sun., 7:30 p.m.; Sun., 10:30 p.m.</td>
</tr>
<tr>
<td>W2FF</td>
<td>7175</td>
<td>Mon., Sat., 10:30 p.m.</td>
</tr>
<tr>
<td>W2FFE</td>
<td>14,260</td>
<td>Sun., 8 a.m.</td>
</tr>
<tr>
<td>W3AXX</td>
<td>7310</td>
<td>Transmits broadcasts at various times during week.</td>
</tr>
<tr>
<td>W3ALE</td>
<td>7300</td>
<td>Mon., Tues., Thurs., 7 and 10:30 p.m.</td>
</tr>
<tr>
<td>W4AER</td>
<td>3965</td>
<td>Mon., Wed., Fri., 1:30 p.m. and 12:30 p.m.</td>
</tr>
<tr>
<td>W4AEE</td>
<td>1400</td>
<td>Mon., Wed., Fri., 4:30 p.m. and 7:30 p.m.</td>
</tr>
<tr>
<td>W4AEF</td>
<td>14,000</td>
<td>Tues., Sat., 6:00 p.m.</td>
</tr>
<tr>
<td>W4ARH</td>
<td>7190</td>
<td>Mon., Thurs., 9:00 a.m.; Sun., 8:00 p.m.</td>
</tr>
<tr>
<td>W4AH</td>
<td>7300</td>
<td>Mon., Thurs., 7:00 p.m.</td>
</tr>
<tr>
<td>W4AIH</td>
<td>14,100</td>
<td>Wed., 1:30 p.m.</td>
</tr>
<tr>
<td>W4H</td>
<td>3750</td>
<td>Mon., Wed., Fri., 11:00 a.m.</td>
</tr>
<tr>
<td>W4HR</td>
<td>7120</td>
<td>Sun., 6:30 a.m.; Fri., 7:30 p.m.</td>
</tr>
<tr>
<td>W4MS</td>
<td>14,000</td>
<td>Mon., Tues., Wed., Thurs., Fri., 3:30 p.m.</td>
</tr>
<tr>
<td>W4MS</td>
<td>7000</td>
<td>Mon., Wed., Fri., 12:30 a.m., also at intervals on Sundays on both frequencies.</td>
</tr>
<tr>
<td>W4RN</td>
<td>7250</td>
<td>Mon., Wed., Fri., 6 p.m.; Sat., 10:30 p.m. — also several times on Sunday on 14,000-kc. band.</td>
</tr>
<tr>
<td>W4TS</td>
<td>7125</td>
<td>Sun., 2:15 and 7:30 p.m.; Wed., Sat., 8:00 p.m.</td>
</tr>
<tr>
<td>W5AKP</td>
<td>7300</td>
<td>Tues., Thurs., 8:00 p.m.; Sun., 10 a.m.; Sat., 3 p.m.</td>
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<tr>
<td>W5ASQ</td>
<td>7140</td>
<td>Tues., Thurs., 9:40 and 9:00 p.m.</td>
</tr>
<tr>
<td>W5AZD</td>
<td>7300</td>
<td>Mon., Wed., Fri., 7:00 and 10:00 p.m.</td>
</tr>
<tr>
<td>W5BF</td>
<td>7150</td>
<td>Tues., Thurs., Sat., 12:30 p.m.</td>
</tr>
<tr>
<td>W5KX</td>
<td>3516</td>
<td>Mon., 5:30 and 11:00 p.m.</td>
</tr>
<tr>
<td>W5MM</td>
<td>7315</td>
<td>Mon., Wed., Fri., 6:30 p.m.</td>
</tr>
<tr>
<td>W6ADK</td>
<td>3510</td>
<td>Daily except Sat. and Sun., 7:30 p.m.</td>
</tr>
<tr>
<td>W6AKW</td>
<td>7100</td>
<td>Sun, 6:30 p.m.; Sat., 6:45 p.m.</td>
</tr>
<tr>
<td>W6ALG</td>
<td>3528</td>
<td>(cc phone)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Call</th>
<th>Frequency</th>
<th>Schedules</th>
</tr>
</thead>
<tbody>
<tr>
<td>W6ALZ- W6AHH</td>
<td>7300</td>
<td>Daily except Sat., and Sun., 6:00 p.m.</td>
</tr>
<tr>
<td>W6AHE</td>
<td>7080</td>
<td>Tues., Thurs., 8:00 p.m.; Wed., Fri., 11:30 p.m.; Mon., 9:00 p.m.; Tues. and Fri., 6:30 p.m.</td>
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<tr>
<td>W6BZ</td>
<td>7143</td>
<td>Tues., Sat., 7:00 p.m.</td>
</tr>
<tr>
<td>W6BZR</td>
<td>7190</td>
<td>Mon., 6 p.m.</td>
</tr>
<tr>
<td>W6BHR</td>
<td>14,250</td>
<td>Fri., 6 p.m.</td>
</tr>
<tr>
<td>W6DHM</td>
<td>3560</td>
<td>Tues., Thurs., 7:15 and 10:30 p.m.</td>
</tr>
<tr>
<td>W6DKY</td>
<td>7150</td>
<td>Sun., 9:00 p.m.</td>
</tr>
<tr>
<td>W6DU</td>
<td>3500</td>
<td>Wed., 5:00 p.m.</td>
</tr>
<tr>
<td>W6KJ</td>
<td>14,150</td>
<td>Wed., 5:00 p.m.</td>
</tr>
<tr>
<td>W6DD</td>
<td>7300</td>
<td>Tues., Wed., Thurs., Sat., 6:00 p.m.</td>
</tr>
<tr>
<td>W6DJ</td>
<td>3650</td>
<td>Mon., Wed., Fri., 8:00 p.m.</td>
</tr>
<tr>
<td>W6DZ</td>
<td>7190</td>
<td>Mon., Wed., Fri., 23:00 p.m.</td>
</tr>
<tr>
<td>W6TD</td>
<td>7190</td>
<td>Mon., Thurs., 8:00 and 10:00 p.m.</td>
</tr>
<tr>
<td>W6DD</td>
<td>3550</td>
<td>Mon., Thurs., 10:30 and 11:00 p.m.</td>
</tr>
<tr>
<td>W6DD</td>
<td>14,280</td>
<td>Mon., Thurs., Fri., 7:30 p.m.; Sat., 10:30 p.m.</td>
</tr>
<tr>
<td>W6BP</td>
<td>7190</td>
<td>Mon., Wed., Fri., 7:00 p.m.</td>
</tr>
<tr>
<td>W6COS</td>
<td>3725</td>
<td>Mon., Wed., Fri., 7:00 p.m.</td>
</tr>
<tr>
<td>W6DLG</td>
<td>7015</td>
<td>Sun., 12:30 p.m.</td>
</tr>
<tr>
<td>W6DME</td>
<td>7015 &amp; 5300</td>
<td>Mon., Wed., Fri., 10:30 p.m.</td>
</tr>
<tr>
<td>W6DJ</td>
<td>3940</td>
<td>Mon., 7 p.m.</td>
</tr>
<tr>
<td>W6DRI</td>
<td>7100</td>
<td>Wed., 7 p.m.</td>
</tr>
<tr>
<td>W6DRE</td>
<td>14,290</td>
<td>Sat., 7 p.m.</td>
</tr>
<tr>
<td>W6DQ</td>
<td>3500</td>
<td>Wed., Fri., 10:30 p.m.; Sat., 7:30 p.m.</td>
</tr>
<tr>
<td>W6DRJ</td>
<td>7142</td>
<td>Sat., Sun., 12 noon; Mon., Wed., Fri., 10:30 p.m.</td>
</tr>
<tr>
<td>W6HD</td>
<td>7145</td>
<td>Mon., 9:00 and 9:30 p.m.</td>
</tr>
<tr>
<td>W6SH</td>
<td>7145</td>
<td>Mon., 9:00 and 9:30 p.m.</td>
</tr>
<tr>
<td>W6SH</td>
<td>14,265</td>
<td>Mon., 7:00 p.m.</td>
</tr>
<tr>
<td>W8PL</td>
<td>7055 (cc)</td>
<td>Mon., Wed., Fri., 5:30 p.m.</td>
</tr>
<tr>
<td>W8BAN</td>
<td>7175</td>
<td>Mon., Wed., Fri., 11:30 p.m.</td>
</tr>
<tr>
<td>W8FUS</td>
<td>7160</td>
<td>Daily, 9:00 p.m.</td>
</tr>
<tr>
<td>W8FUE</td>
<td>14,280</td>
<td>Daily, 7:00 p.m.</td>
</tr>
<tr>
<td>W8BBA</td>
<td>3660</td>
<td>Sun., 7:30 p.m.; Mon., Wed., Sat., 8:00 p.m.</td>
</tr>
<tr>
<td>W8BBA</td>
<td>7140</td>
<td>Mon., Thurs., Sat., 8:30 p.m.</td>
</tr>
<tr>
<td>W8BBA</td>
<td>9890</td>
<td>Mon., Thurs., 6:00 p.m.</td>
</tr>
<tr>
<td>W8CBK</td>
<td>7040</td>
<td>Daily, 7:00 p.m.</td>
</tr>
<tr>
<td>W8DHO</td>
<td>3670</td>
<td>Sun., 10:30 p.m.</td>
</tr>
<tr>
<td>W8DQ</td>
<td>7100</td>
<td>Mon., Wed., Fri., 11:30 p.m.; also 8:30 a.m. when possible on same days.</td>
</tr>
<tr>
<td>W9DUD</td>
<td>14,000, 7600</td>
<td>Mon., Thurs., 7:00 p.m.; &amp; 1715</td>
</tr>
<tr>
<td>W9ERU</td>
<td>3850</td>
<td>Tues., Sat., Thurs., 7:30 p.m.</td>
</tr>
<tr>
<td>W9AHM</td>
<td>7190</td>
<td>Mon., Wed., Fri., 7:00 p.m. — sometimes on Sun. mornings.</td>
</tr>
<tr>
<td>W9ZD</td>
<td>7300</td>
<td>Tues., 7:30 p.m.; Fri., 10:30 p.m.</td>
</tr>
<tr>
<td>W9FFD</td>
<td>3850</td>
<td>Mon., Fri., 9:45 p.m.</td>
</tr>
<tr>
<td>W9FFD</td>
<td>7245</td>
<td>Wed., 9:45 p.m.</td>
</tr>
<tr>
<td>W9EGU</td>
<td>7094</td>
<td>Daily except Sun., 7:00 p.m.</td>
</tr>
<tr>
<td>W9EQA</td>
<td>7150</td>
<td>Thurs., 9:00 a.m.</td>
</tr>
<tr>
<td>W9PF</td>
<td>3876</td>
<td>Wed., 10:00 p.m.</td>
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<tr>
<td>W2SC</td>
<td>WTZ</td>
<td>7140</td>
</tr>
<tr>
<td>W9CN</td>
<td>7310</td>
<td>Mon., Wed., Fri., 8:00 p.m.</td>
</tr>
<tr>
<td>W9DBJ</td>
<td>7000</td>
<td>Mon., Wed., 7:00 p.m.</td>
</tr>
<tr>
<td>W9EDK</td>
<td>7070</td>
<td>Mon., Wed., Fri., Sat., 1:00 and 7:00 p.m. Wed., 10:00 p.m.</td>
</tr>
</tbody>
</table>
**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 new comers to the amateur ranks need code practice more than anything else, instruction in amateur operating practice, and two-way work with more experienced operators, as well 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 much 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 readily 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 use you some microwaved classes and help which will help you in putting this service over to those who copy your transmissions.

**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 W3ALU have been working WFA about once a week for the past two months and taking quite a few messages. WFA's signal in 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 an antenna (usually on about 7500 ke.) when the rapid fading does not prevent. W3ALU and W6CUI have successfully worked together both stations copying and checking when the signals are so poor that WFA-WLD schedules fail. WFA sometimes comes through as early as 10 p.m. E.S.T. WFAF has also been worked. Many of W6TM recently handled quite a bunch of traffic for WFA and reported "NIN" at the key. W7MP also contacted the Bird expedition in early August, his signals being reported fairly strong over a very sure QRM.

**PMZ**

Some anxiety was felt during early August for the safety of Professor Seebahn and radio operator Wells (W3ZD) 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 W3AKW. The portable Burgess-battery operated transmitter (7500 ke.) 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.

Reader 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 Medium 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 7200 ke.

**WDDE**

Schonert Bandonie, WDDE, (Mr. 217, August 30 by radio via W1AEB) — 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 Golf Zeppelin. Only a few stations worked as they don't seem to listen for me on 23.18 meters. W2AZW has been

<table>
<thead>
<tr>
<th>Station</th>
<th>Location</th>
<th>Frequency</th>
<th>Days</th>
<th>Hours (Local Time)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>W5RBT</td>
<td>Gouldsboro, Texas</td>
<td>1750 ke.</td>
<td>Fridays</td>
<td>9:30 p.m.</td>
<td>ICW and 'phone will be used.</td>
</tr>
<tr>
<td>W6RF</td>
<td>Independence, Calif.</td>
<td>1750 ke.</td>
<td>Fridays</td>
<td>8-10 p.m.</td>
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<tr>
<td>W6EQ</td>
<td>San Leandro, Calif.</td>
<td>1940 ke.</td>
<td>Sundays</td>
<td>8-9 a.m.</td>
<td></td>
</tr>
<tr>
<td>W3BSP</td>
<td>Olathe, Kansas</td>
<td>1750 ke.</td>
<td>Mondays</td>
<td>6:30-7 p.m.</td>
<td></td>
</tr>
<tr>
<td>W6BD</td>
<td>Menasha, Wis.</td>
<td>1750 ke.</td>
<td>Thurs.</td>
<td>10:30-11:15 p.m.</td>
<td>Ten-word speed for first twenty minutes, and about 20 WPM for last twenty. Five minutes devoted to explanation.</td>
</tr>
<tr>
<td>W6FLS</td>
<td>Ave. III.</td>
<td>1715 ke.</td>
<td>Tues.-Thurs.</td>
<td>12:30-1:30 p.m.</td>
<td></td>
</tr>
</tbody>
</table>

**W3RJ**

 Ft. Worth, Texas. Signified intention of sending code practice, but gave no definite schedules.

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**Brooks**

W3CVI, W1BQI, W1KX, VE1AR, and W2AJD have all been of assistance in handling traffic for the International Grenfell Association with its stations VOSAF, (St. Anthony, Newfoundland) and VOSWG (Northwest River, Labrador). VOSAE and VOSWB 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 185 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 Abacan burned to the water while anchored at Long Island.

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**TRAFFIC BRIEFS**

Beginners who are looking for code practice 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 8, 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 is extended to all amateurs in that and neighboring sections. For full particulars write David S. Hutchinson, 111 Stackville St., London, Ontario.

Here's a good one! W6DLG sent in the following as a "sample message" on the back of his ORS application forms: "HR MSG FM HARTFORD CONN W1MK NR 200 AUG 5 OR 41 TO A MCCAULY 300 THIRD ST OAKMONT PA. -- CONSIDER YOUR CONNECTIONS WITH THIS ORGANIZATION SEVERED STOP REASON FOR DISMISAL YOUR REFUSE TO GRANT OFFICIAL RELAY STATION APPOINTMENT TO W6DLG STOP 99. -- SIG F E HANDY ARR L COMMUNICATIONS MGR." (After that one SCM McCauley thought it best to give W6DLG his ORS HI.)

Louie Huber, W6DOA, formerly of the Headquarters staff, is now Ensini, C-O-V8, in the U. S. N. R. F. O. U.!

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 nice to see the amateurs prepared! Good work, Miami!

W6QJ 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.

W6ZS is in daily communication with Australia. W6QJ can move traffic for Nicaragua on his daily schedule with NNNIC.

W6QPR has daily schedule with PY1AW in Brazil. W6ZC 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."

W6DBK says a government survey indicates that the only bug showing signs of lassitude last summer was the radio bug. Hi.

The first post-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 WSBN, W6JN and XYL-W8GNO, 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 WS8RS, if interested in joining.

NX3XL, the station of the University of Michigan Green- 

land Expedition, Mr. Evans, Greenland, has been closed for about two years after which time operation will probably be resumed. NX3XL has worked stations in all parts of the world and, a few months prior to closing 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, W6AZX, heard VK2ME, Sydney, Aus-

tralia, rebroadcasting KDXA's signals. KDXA was, in turn, re-

broadcasting 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. EST, on 60 meters, using 500-watt crystal controlled transmitter employing 4-250 watters as modulators and one 911 as ampli-

fier. Amateurs are requested to listen for them and report information on reception direct to W2XE.

W4TZ is radio operator on the American International Airway's blimp, 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 WRWB using 175 meters and 750 

watts, was engineered by one from the amateur ranks, W6C9X. He expects to find frequency "objectionable" 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 growing. 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 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 every-

One of the amateur in Australia, or the island of Bullanan for that matter, who is trying to QSO someone in the United States, only to have an inconsiderate ham come along Q5Xing 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. Meeder, O.R.S., W6ERK

W6AZD suggests that stations copying Official Broadcasts should call the ORS after he has shut down and ac-

knowledge receipt of the broadcast. ORS Official Broadcasts have little way of knowing that their ORS are being copied. Let's give them our thanks hereafter.

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

A hamfest, arranged entirely by phone, was held at W2MA's in Pelham Manor, N. Y., on Saturday, August 10. Those present were W1AUX, W1OGR, W1QY, W2ACD,
**DIVISIONAL REPORTS**

**ATLANTIC DIVISION**

EASTERN PENNSYLVANIA — SCM, Don L. Lusk, W3ZF - W8DHT is giving W3ZF a merry chase for traffic honors. 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 the months to come. W8DHT got back 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 the accurate traffic schedule. W3B1D has a beautiful 1925 signal on 2500 and put out two reports this month. Two more reports then you are eligible for ORS. Bert, W3CSDS reported no traffic for the second straight month.


SOUTHERN NEW JERSEY — SCM, M. J. Lowry, W3CGF — Activity slumped badly during the summer months. W3AMG, W3AJT and W3CGF are doing some work but the rest are painfully silent. W3CGF is still in New York City and only gets on the air on the weekend. W8KJ is going to try for a commercial ticket. This section is in need of active ORS so let's have more applications. We want some IML members this coming season.


MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Forrest Calhoun, W3BBW - Maryland: More fellows reported from this state than any of the rest but this state is still weak. W8CM, a new ORS, leads the state with a nice total. W3AEH is on again. We welcome two new ORS this month — W3NY who is on 14 mc. and W3DDG on 3000 kc. The SCM station, W3BBW, is sure lost in the woods but I hope to be with you soon. Dist. of Columbia: W8BWT leads the entire section again! He is our new Route Manager so let him hear from you, gents, in regards to skeds and traffic routes. W3ALF is going strong on both 7000 and 3500 kc. with d.e. Delaware: Only one station in this state reported again this month, W8ML, a new ORS, leads the state with a nice total. W3ALF is down in New York City and only gets on the air on the weekend. W8KJ is trying for a commercial ticket. This section is in need of active ORS so let's have more applications. We want some IML members this coming season.


**CENTRAL DIVISION**

WISCONSIN — SCM, C. N. Cropo, W9VD — W9BRF sends in a good report from his summer location at the U.S. Army of Wisconsin summer school. W9DRW has schedules with W9PX and W9AIA. W9DKA says he ruined two perfectly good tubes, but will have a new set on the air soon. W9DJK-W9CPU is operating on 7000 kc., and says one can't expect a large traffic total when working in that band. W9FHU reported via radio. W9DLK visited W9VFB during the past month. W9WS was not on very much the past month. W9OT just returned from a trip through Wisconsin, Minnesota and Canada, leaving visited stations W9CWL, W9MC, W9DKW, W9CFC, W9CRL, W9CRH, W9RI, W9DEK is on 14,000 kc. now, but will change to 3500 kc. about Sept. 30 for the winter season. W9DKT had a very enjoyable trip on the Lakes with the Fleet. W9D is on about once a week, usually Mondays, on 5579 kc. for Army traffic.

INDIANA — SCM, D. J. Angus, W9CQY — We regret very much to report the death of Mr. Ed Turner, W9KX, Richmond, Ind. The Naval Reserve at Indianapolis are getting bids on a complete crystal-controlled transmitter to be used at the section headquarters station at Indianapolis. This transmitter will be in operation in about two months. W9EEY is again on the air. W9PPF is discontinuing operations for the rest of the summer. W9D1H is again rebuilding. W9AIN has moved his junk pile to Indianapolis, where he is in business. W9AFJ is being built on a 30-Watt Crystal-controlled job. W9CFQ is on the lakes cruising with the Naval Reserve. W9CNC is putting in a 500-watt screen-grid transmitter. W9CSI wants supplies. Can you accommodate him? W9EIV is getting out with 200-watt plate supplies as well as higher powers on 7000 kc. band. W9DAQ, a new station, started with a bang, on 2000, and wants traffic. W9FZQ is a new one at Laporte. W9AXD is putting in a crystal. W9AJH rebuilt, and gets out FB now. W9CPX put in a new Zeppl 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 transmitter and receiver therein. W9ABE has put up a new Zeppl antenna and Installer's license is about to be granted to him. W9BBO has a new high C xmitter and is working the west coast quite consistently. W9WYJ has been too busy with orchestra work to be on air. W9CEN is in a firemen, and put out a fire second story. W9DIR is a new donor for traffic. He has joined the W9DIZ is back on the air after pounding brass as a commercial operator. W9DHM has joined the ranks of the Benedictics, but is still in the game. W9DFV is a new potato grower now, and says that isn't the half of it. W9BQM has a building that has burned down, but not much time for traffic. W9AAB is a new ham in Elkhart.


KENTUCKY — SCM, J. B. Wathen, HI, W9BAZ — This report is written from Covington, where I am being entertained by the gang. And how! W9FSS has received his pre-war trophy for traffic handling, and we all helped kill it. W9GGB and W9FWS have been appointed ORS. W9A6Y has been after DX with consequent drop in traffic. W9FZQ has everything ready for big opening on Sept. 1st. W9CCE has a good outfit pecking now, and is looking for traffic. W9ELL is expecting a junior operator. Bet it is a V. J. He saved himself the expense of a trip 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. W9FWS will be on again. W9HGW succeeded to W9IK and is handling a lot more. W9EYD is bothered with business and doesn't find time to pound much brass. W9HAN suffered $30 damage from lightning. Faze the junk man. W9BXK is looking over new houses. W9UAJ is with us once more, and promises to be the real thing this time. There will probably be another price offered for high traffic totals about October, so brush up your skids and get going.


MICHIGAN — SCM, Dallas Wise, W9CEP = W9GHI handled some traffic direct with ZL1T at Auckland, N. Z. W9BSR is kept busy with the affairs of the Chair Warrens Club, and reports a new station for Pontiac. W9KUW, W9BRO, W9CSU was a Detroit visitor, and says he wants all the traffic he can get. W9CFC is handling quite a bit of army traffic. W9CUI is still rebuilding. W9EFQ has a 50-watt going now, and keeps a daily schedule with K9F7Z, a yacht out of Detroit. W9LEI is using a W9KUI Lakeside transmitter. W9LHJ is getting a high from the Sea, N. J. W9UAX says the outfit has arrived and that he ought to be out in the air in a month or so. W9SA9H was radio op aboard the U.S.S. Dubuque during the summer cruise. W9CAP of Owosso is working with an ORS, U.S. received and wants more traffic. W9SAC has been silent due to summer weather and work. W9AAT has a first-class ticket now, and is also an ORS. W9MJD makes the BPI again, and has been handling a great amount of the Michigan Army traffic.

W9CIE has dropped all schedules. W9YDWH wins the nodelectric insulators for this month. W9PPF has been reported from Australia with his new outfit. W9CR1 has been at the CMTG at Camp Cluster. W9CIT is W9CSI, who is now at his summer home in Bay View, Mich. W9JL, W9M2, W9DX, W9JFZ, reported by him through W9JLF is doing well on the coast. W9FMT is on 2000 kc. with a low-power outfit, and would like reports on the signs. W9CEP has been off the air, due to installing a new transmitter. W9D1D has been heard from.


OHIO — SCM, H. C. Storek, W9BYN — 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 traffic reports should be picking up. Here's hoping. W9XAU leads Ohio this month. He and W9WZG, who comes second, get most of theirs through J-A work. W9CIG reports that a certain captain in the Nat'l Guard reported the SCM as having kicked the bucket. HI, W9DFJZ reports he gets a lot of traffic for the A-A work, but not much for the high powers. W9CWS has laid off. McMaster is going to be O.K. W9CIV is charging his QRA. His new call will be WS4AE. W9BML is going into the business of printing QSL cards. W9BMY is handling a few, and reports W9CIG. W9CIV is now on 7500. It is the W9CIV translates to St. W9CIV, and is the W9CIV IV, and is the SCM thinks that his sudden romance has budded into full bloom. HI, W9DDF is going to Purdue University and will have a 9 call there. W9QU reports the mosquito menace too general to work radio. HI, W9DR is near the part of the month at Camp Perry. W9SOQ again observes a silent period on his report, except for his total of 10, W9CSC now has pull-push TPTC circuit in his transmitter, and says it has the Hartley beaten a mile. W9AXS is handling a lot of traffic for W9AXS is handling a lot of traffic for Wi, W9AJD in reporting. W9CIV reports that most stations are afraid of traffic. W9BRR reports. Traffic: W9BRR is looking for traffic. W9PL got two messages. W9APB is DXing on 14,000 kc. W9SL has also on 14, and works 7 times also. W9BRR invites work for the SCM. W9AXS is going to rebuild. W9BXN visited the SCM. He is going back to Coxa. Tech. W9DBK has been vacationing in Georgia. W9CNOU has been listening to the Graf Zeppelin. W9CNE has not moved his outfit as yet. W9BQK has its new outfit going well. W9CIG is in the air again. The SCM is off the air, as the rope at the mast end broke. W9DDE is working the "talkies" in his home town. W9CNO is still off the air. W9DLE is going to Cleveland to work. Let's snap into it now, with lots of traffic, and put OH back on top.


ILLINOIS — SCM, F. J. Hinds, W9AYP — Activity is picking up now that summer is on the wane, W9AKX wants more Army-Amateur stations. Get in touch with him, gang. The W9QD brothers have been in Yellowstown for a few weeks. W9C8L has a new 3-cell Motorine. W9GJW was also in Yellowstown. He reports the Austin "Y" Club has a new 450-volt 8 M. power pack for DX this winter. W9D0X and W9DZXV were very busy this month operating W9GE on a Camp Grant, Fh. O.A. W9C7AF has been broken up, due to Illinois Pine Line Company losing its commercial stations through cancelled licenses. The ops, W9AGQ and W9ECA, will carry on individually. We would like to receive traffic reports from W9GQY, W9JFZ and through W9AAT is. For an 852. W9BXB had his hands full this month with Camp Grant traffic. W9EFP has a new S.G. tuned R.F. receiver. W9RI0 is a new man doing fine work in Rockford. W9BOL is putting in an ear for receiver. W9NH3 has been hit with some trouble; adjusting the new S.G. set. W9A2N has now worked ten countries. W9K8B has been visiting fans in Canada for three weeks. W9BZ0, W9CRZ and W9D1W handled much Camp Grant traffic. W9G1V has a new Zepp. W9CIEC is arranging for a
W H E W says a new mercury and two transmitters and receivers, so also, don't forget to report those 1929 signals.


D A K O T A D I V I S I O N

NORTH DAKOTA — SCM, B. S. Warner, W9DYY, Surface Engineer, has returned from University of Minnesota. W9DYA has been working QSO with the Army Amateur Corps Area station, but reports noluck. W9BFV has put up a new Zeppe antenna and reports very good success with it. DX is ten country and the Byrd Expedition. FB, OM, W9PCA paid the SCM a visit recently.

Traffic: W9BVF 216.

SOUTHERN MINNESOTA — SCM, J. C. Pehouslek, W9EUP, has arrived on the University of Minnesota. W9DYA has been working QSO with the Army Amateur Corps Area station, but reports no luck. W9BFV has put up a new Zeppe antenna and reports very good success with it. DX is ten country and the Byrd Expedition. FB, OM, W9PCA paid the SCM a visit recently.

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October, 1929

Announcement that he is ready to make the BP 2. W2BQ has returned to Philadelphia while in Camp Dix. Brooklyn: W2BIV leads his horde and makes the BP1 by keeping 15 foreign skeds weekly and, incidentally, make the BP1 in four nights, besides keeping the gang in the bands as on 09. W2BGR claims the record of sending in DX work on 14-cw 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, W2CQ has taken his transmitter to the医院 ready. Another DXer is hearing an outfit and could soon be heard. Long Island: W2ACE says W2AVP is still at sea. W2ATC can be heard at portable W2BF, and requests reports on W2AYM, the station of the Boy Scout troop in Richmond Hill.


Eastern NEW YORK — SOM, F. N., Holbrook. W2CNS — W2QI makes quadruple BPL score by handling traffic mostly with NNN1NIC, W2AHR has been home for the summer from Harvard. He will operate W1BZG this winter. W2AVS, who has just received license, was QSO on an airplane at Newburyport with R2 at both ends. W2ACY scores top messages in one night's operation on 3500 kc. W2U asks for ORS backed by traffic report for the most difficult summer month, W2OKN was QSO Columbus, S. A., and Hunanria, W2DP has applied for ORS.


Northern NEW JERSEY — SOM, A. G. Wester, W2WR — Now that summer is behind there should be no excuse for not sending reports and traffic taking a big jump. W2WR maintained a schedule with W4AGH during August. W2IX cannot raise stations but receives plenty of cards. W2BDD enjoyed his summer in Jersey using a low power transmitter and handling traffic. W2BQF besides his nightly schedule with W1MK has one on Saturday with W2JL. W2XZ says he hopes to do better with the cool weather setting in. W2BY has a new rebuilt transmitter and also boosts a new flyer. W2CTQ has installed a 250 which is stepping out. W2AOS had the honor to conduct WSAKC who was one of the boys in the Edison Contests through the Edison plant at West Orange. W2DX will leave Detroit shortly and will pound brass again in Jersey.


MIDWEST DIVISION

IOWA — SOM, H. W. Kerr, W9DWH — Phone interest has been almost entirely rather than traffic purposes. W9IAC maintains his NN skeds. W9DXP reports his new UX-800 screen-grid PA going FB with R8 report from a New Zealander. W9DWU plays golf, but gets traffic, too. W9CZC is active in Chicago. W9DEA is on USN.S.R. cruise at Great Lakes. W9PFF gets an OHS and is OUS as OHS for NW Iowa. W9EQK, RM, is putting out a fine note for traffic — when you want skeds, write him. W9FDI challenges W9IVS to a traffic contest. W9FWG is a fine reporter and is putting on a schedule. W9HZJ gets B battery and W9DUU using a 210 are new hams, QRA Sioux City. W9GDR has his new transmitter going FB. W9FEF is in the Transmitting Dept. of W9NFR, and sends 73 to the gang. W9GLX is the chap who ranked top at the Ames exam. Let's hear from the traffic boys at once.


NEBRASKA — SOM, C. B. Diehl, W9IWC — W9QY is putting the final polish on harvest, and will be on the air after the harvest. He claims no excuse for not doing a full account of the work being done at the office. W9WDI had the misfortune to lose his youngest child, and the entire section offers its sympathy. W9DHR is starting in services in the Air Force, but is still at KCF.

W9DHR 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. W9DNQ sends in his last report on account of going to Muskateen, Iowa, as chief operator at KENT. W9AGT for his last 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 W9BDC, a new station at Maryquette. W9BQS sends his report from Sidney. He says he can't get home long enough to make his report, since he is Conductor.

W9NRQ has been away to Nat'l Guard camp with W9DTH, W9BYG reports.


MISSOURI — SOM, L. B. Laurre, W9RRT — W9TTA is on with MOPA 210-250 rig, and reports W9KKW and W9BXS are new stations in his neighborhood. W9W1X is the station of the Soldan High School. W9CHD 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. W9DHN led the state in traffic with 38 messages. He visited two weeks at W9REE, and lopped to W9BFQ, where he was on new 210's prior to coming from the greatest DX. H. W9EPX now staying with WSEPY 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 W9PFB and W9FPG. W9CWM has been able to handle traffic, but can give no reports over 14,000 kc. W9UEB is kept busy with his armament winding job, but found time to handle a few messages, and didn't forget the SCM on report day. W9CFI wants to hear from any U.S.N.R. stations or amateurs interested in U.S.N.R. work. W9DQK will also give out information on U.S.N.R., to all inquirers. W9CALC expects to return to the west coast, shortly. W9BRA says he is going to be an ORS or bust. W9BBB is making a vacation trip through Minnesota, Dakota and other states in that section. W9CRM is again heard on the band this season, on 7000-kec, band, W9KKK is operating at local air station.


KANSAS — SOM, J. H. Ams, W9CET — Traffic is holding its own in spite of extremely hot weather. W9FIL takes all traffic honors, and kept a daily sked with CXT, the station of the Kansas Nat'l Guard. W9WHI and W9COE are both hard after traffic, W9ELS has gone on his vacation, and intends to visit hams in several states. W9CJX is also on his vacation and reports from Hot Springs, Ark. W9BTG is after reliable skeds. W9FGU complains that traffic is N.G. W9FQI finds 850, D.C. better than 1000 v. 2 for transient work. W9DRL claims he can't use a burst-out 210 very well. H. W9FIG is installing a staul, 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. W9FN has just returned from the Dakotas and is rebuilding the transmitter for the Nat'l Guard. W9CKY has a new TP-TG rig going. W9FIZU is having a hard time getting skeds. W9HL has bad hay fever, and is signing Ki Choo now. Hi. Fall is here, gang, so let's get ready for the largest traffic season in our history.


NEW ENGLAND DIVISION

EASTERN MASSACHUSETTS — Acting SCM, Miles H. W. Weeks, W1WY — As W1ACHI 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 season, we have had on the air every day, and the traffic has been excellent. W9UW's DX on 14 mc., having worked eleven countries in the last two weeks, is now a freshman at Tufts. W1WU's new QHA is 288 Summer St., New Bedford. W9AIQ, who is 64 years old, paid him a visit recently. Hi, who said we were all school boys? We're still learning the business. W1BLL now has his ORS appointment and has been sharing his key recently with WINV. So60's will soon
be rectifying at W1ACH. W1BVZ finds time to hunt DX, and expects to have his new transmitter ready this fall. W1ACA turns in a good total and says he is now at 121 Third St., Medford. W1WV visited W1BDL and W1CMZ and is very QRQ, his new job as acting SCM. Delinquents beware! W1AZE was QSO KF7L while the "Ripple" was in Essex county. 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 W1OB08. W1OB08 is preparing for skeds in every N. E. state, Fl. OM. He has applied for OBS as has W1AGP. W1AGP now has new calls, W1HHG. W1HHZQ wants skeds on 7 and 14 mc. after midnight. W1H1ZG, who is W2AGR also, holds a commercial ticket and wants an OBS here. OWIL is also resting his arm, vacationing. The Eastern Massachusetts Amateur Radio Association meetings begin again in October. W1KY, the Seely, will be glad to answer inquiries.

Traffic: W1LQ 05, W1AC 34, W1ACH 34, W1BQZ 30, W1BOB 30, W1WI 27, W1KY 23, W1KH 21, W1BDL 19, W1VY 17, W1AZE 16, W1WY 12, W1BQZ 6, W1ACE 4, W1VWZ 2.

RHODE ISLAND -- SCM, C. N. KRAUS, W1BGR -- W1HLX is on 14,000 kc. with low power. W1MO is installing a mercury arc. W1ZC is on 14,000 kc., being operated by members of the Radio Club of R. I. as well as by Mr. Kraus. Official announcement is to be made next in line from W1ZC. Every Monday at 8:00 p.m., E.D.S.T. (14,000 kc.), W1CHP 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 OBS list again. He is using 30 watts on 40 m. and 80 m. Let's hear from you all, fellows.

Traffic: W1MO 08, W1BLV 8, W1BGR 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 from Portland that will have the largest attendance it has been 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. W1QN 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: W1BQZ 78, W1ATO 67, W1CDX 55, W1KQ 28, W1AQD 27, W1TH 24, W1QH 11, W1AQL 11.

WESTERN MASSACHUSETTS -- SCM, Dr. J. A. Tsementis, W1QHA, has mains installed in the fire underwriter's code W1BSJ says his SW receiver is working fine. W1BVV's father died July 26th, so he hasn't felt like using set very much. WINS says that W1AMF and W1ARP of Northampton visited his station. W1BHJZ is getting better, but still is not well enough to pound brass. W1OS is getting over an auto accident. W1CTP is rebuilding. W1HLN has a fine total of messages, and says his shield grid receiver is peaking up per May QST. W1UM will be on the air with a 50-watt, crystal-controlled using intermediate tank circuit. W1BFX 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: W1BVV 1, W1HLN 89, W1NS 32, W1CTF 10, W1BX 2.

NEW HAMPSHIRE -- SCM, V. W. Hodge, W1ATJ -- The vacation season cut quite deeply into traffic this month. W11P poured out a bunch just to keep in practice and get his list limbered up for the coming season. W1APK of Pembroke invites all to stop by the Pembroke Farm. W1ATJ's new Chevvy is keeping him from the key. W1CDT is working on a new traffic tuner. W1BFT and W1A0V still are touring the state, and stopped in at the SCM's recently. W1MJS is a state inspector on a cement road construction job. W1BIS is working on a new receiver. W1AEP reported direct to Headquarters. Reports are needed from more of the gang, even tho no traffic is being handled.


CONNECTICUT -- SCM, C. A. Weidenhammer, W1WON -- W1WTG is getting crystal-control reports on his new transmitter. W1AJB was accidentally skipped in last report. Sorry, OM. W1DDE is worked daily by W1AEP, W1OS reports contacts plentiful on 7000 kc. W1BWM, our proud papa, is listening to daddys of an eight and one-half pound brass pounder. W1BSN let him call expire. He is now on new calls W1TG, W1HOD is busy DX and handling traffic. He snared Egypt and Poland on 14 mc. W1RP visited the A.R.R.L. HQ, W1BG is still with us on 7210 kc. W1AMC has a schedule with NX2XD. W1CTT is working portable W1ATN, who is WA2D. A 2500 volt condenser and an 806 were blown by W1AMG. W1ARL expects to move to Scheneateady. W1ZL is supervising U. S. Department of Agriculture quarantine lines in southwestern Pennsylvania. W1MK makes the BPL as usual.

Traffic: W1ARL 8, W1AMG 3, W1CTT 9, W1AMC 22, W1BGC 4, W1RP 25, W1BOD 18, W1OS 2, W1AFB 35, W1AJB 28, W1MK 490, W1UE: 5.

NORTHWESTERN DIVISION

OREGON -- SCM, W. S. Chappell, W7TN -- W7PE hits the ceiling this month with 54 total. W7WM is W7CDM and W7LC have W7JC scared off the air. W7EO reports by Special Delivery. Sorry to lose W7AIK, who is moving to Kennewick, Wash. W7PP, W7AP, W7SI, W7AKS, W7QT and the SCM are busy arranging the coming convention. W7PP gets QSA from all stations he works with his 500-watts input. W7FH reports working W7AT, W7AXQ is servicing BCL sets for local Stewart Warner sales. OR8 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 20A4 being raffled. Someone will be lucky.


IDAHO -- Acting SCM, Harold R. McBirney, W7ABH -- W7AQJ 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 movietone. W7GO is heading for California and may take the N. W. convention at Portland. W7TV is working portable. W1DYY 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. W7AILW has worked thirteen countries, four continents, on 14 mc. with a 210. W7VY is new to 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 W7AAB.

Traffic: W7AAB 42.

WASHINGTON -- SCM, Otto Johnson, W7TD -- W701, 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, K6CQ -- K6CQ handled the most traffic for this month. He is rebuilding, and will be on with 150-watts crystal-controlled in the near future. K6DQX, over on Maui, handled a new bunch of cards this month. His brother is K6QXI in Honolulu, and they keep the wires hot on inter-family traffic. K6EST, another Main Hawaiian, handled a good bunch on his sked with K6AYL. He is going off the air this month to enter the Univ. of Hawaii. K6DNS has suspended all skeds while he rebuilds. K6CJU 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 his K6DQW. He looks as if he is working, K6CQK likes commercial operating line, seeing that he can play on the short waves. His ship, N7N, has a 75-watt on the ham waves with a 300-cycle noise. A 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 150, K6DQW 6, K6EST 48, K6DWS 20, S9CIA 2.

SAN FRANCISCO — SCM, C. Bane. W6WB — W6ERK makes the BPL both ways, and has the greatest total reported so far in the section. W6HP runs George a close second, and will be a good one 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, W6DD, 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 is in full operation and 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. W6CQZ has been hard at work fighting the Ultraudion, but took time off to push through some traffic. The great number of the boys are installing crystals and MO-PAs, and I expect to hear some beautiful “29” notes on very shortly, my W6—installs crystal, and his troubles are now beginning. W6WB is having MO-PAs. Our boys are anxious to get in touch with men willing to try some 25-mc. tests. Get in touch with the SCM if interested. W6DHY is attending this section hereafter. He is really settling down and promises good traffic. W6AMP is trying 25 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 765, W6HP 502, W6DWT 232, W6EFP 161, W6HBD 131, W6AYC 53, W6DHY 42, W6PW 37, W6HJ 21, W6DQZ 20, W6DXY 8, W6WB 8, W6AC 2, W6DZ 1.

EAST BAY — SCM, J. W. Frates. W6CZ — Traffic becomes 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 15th 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 W6AIIX, W6BRTZ, W6ASHL, and W6BBW. Then, under the direction of S. C. Houston and a group of section operators, as well as the Oakland Radio Club, portable W6SH was installed at the Joy Zephyr, now owned by the 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 opportunity to acquire them with amateur radio work. Among those who participated in the work were W6CZR, W6DDU, W6EY, W6SSB, W6BFW, W6DCZ, W6AWE, W6ASHL, W6ATT and a group of others. Messages were relayed to W0JUT, the Oakland Radio Club, for routing due to the electrical interference at the show grounds, and W6ALX, W6AWE, W6BJW and other stations. W6ALX comes on as high as 1000 watts in its efforts to keep W6CGM, in spite of the fact that he is a railroad fireman on the road two days out of three, run up the highest total through trans-Pacific work with KIPW, K1CE, K1MC, K1BC, ACSR, W6BO and W6BWT. W6CZG, it is true, had its difficulties, but Thiel, signalled his appointment as an ORS by becoming the third highest total. FB work! W6ASHL did also considerable traffic work as a new ORS. W6BRTZ is pumping much sap and much traffic into the air. W6ERB is holding schedules with W1KSY, W6AWE, W6FRM and W6WHC. W6GCS is taking it easy. W6IP was forced to shut down his station for a Naval Reserve cruise to Catalina on the U.S.S. Hazevoad. 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. W6U4 is keeping four live skeds, and says that the high C Hartley is the berries. He was host to W7N1L. recently. W6M3S has a new ultraudion operating under the portable call of W6AXN, 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 on W6TX. W6BO is good Scout work, teaching, instructing and demonstrating the great joys of amateur radio. W6DQJ, at Fairfield, reports that he is leaving soon for a Naval Reserve cruise on the U.S.S. Hazevoad, and promises good messages. Point Richmond are fairly quiet although he is using 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, W6BZM 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. W6BDR says he is off the air for a month. Several of the fellows have visited W6BS8 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.


LOS ANGELES — SCM, D. C. Wallace. W6AM — Seven stations make the BPL this month — W6AVJ, W6EQE, W6ETJ, W6GCH, W6U1H, W6DLN, W6AWK. W6AWK has been handling PMZ traffic and is acting U. A. base, since W6BRTZ is still shuffling around. E. C. Ramsey of Bromley’s Tokio flight, W6AVJ has his usual good total. W6UCH did plenty of QRM checking and helped over a dozen get inside the bands. W6FOP 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. W6GCH makes the BPL. W6DLN has built monitor, and worked W6COH’s skeds with K7AB and OMIB while he was sick. W6FSA installed Reccubitals for his 210 and worked China, Japan, Honolulu on 7000-kc band. W6ERK is operating at Presidio in Monterey using call W6ELZ. He reports there are quite a few ops there — W6ATS, W6EFM, W6DHY and himself, W6CIS sends in his report special delivery to be sure to be on time. W6EAC reports that W6AXK was in, also W6DWJ and W6BPF; W6BWF just finished rebuilding his transmitter. W6BPM is building a new screen grid four receiver.

W6AM reports W6BS8 schedules, kept for the right month. W6BS8 now works K6CO. W6WJ and W6AT are now operating one-half day a week. W6AIU of the evenings of the 15th and got R6 W6QL had the pleasure of the visit with Mr. and Mrs. C. E. ABER of Chile, also Mr. and Mrs. W6BDQ of Sacramento. W6BDQ wishes to thank hams who sent flowers and cards. These were delivered by W6DAW, a new transmitter. W6AKD is working on the Los Angeles College, all skeds are broken at present. W6ALR plans on leaving his transmitter to the Fresno district fair, W6XNF is QST with W6BS8 at 12:30 a.m. on July 12th. W6DUI is still
W66CZ reports that 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. W6E0P claims he will be in vacation in Los Angeles, so get them while you have the cash.


SACRAMENTO VALLEY — SCM, Everett Davies, W8DEN — Our old standby, SCM, has again come to the top. With his eight schedules he is showing the world what amateur traffic is. SCM just got his ORS and came through with a fine report. SCMAF reports all skeds broken, W6DYB will soon have a new set that will work. Two new hams in Sacramento are W6EVY and W6GCG. W6QXS is presently W6BY's brother. W6IAX is going to the P. Tel, Tel. and Tel. Co. school to learn Morse. W6DEN is now operating and announcing at KFBK. The Sacramento Valley Amateur Radio Club is planning things for the State Fair. Remember the reports!


PHILIPPINES — SCM, M. I. Felizardo, K1A1 — This report was sent in by K1CY — K1AC has been rebuilding. K1AF is changing to DC. K1AF says he still keeps skeds with W6QZY. K1BY is on his annual leave, but will be back soon. K1OE, a new station of the 1st Infantry for bell testing, is on with two stations in T.G.T.P. circuit. K1CM is keeping regular skeds. K1CY took over the Borneo Expedition sked while K1AF was off. K1DL is heard occasionally. K1EL, a Begins, 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. K1HW, in Camarines Sur, is our first P. I. fourth district station. Welcome! K10E is waiting for a shipment containing his MG. K1PL is still batting away. K1AF and K1HR report direct to HQs by radio. K1AF, 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. AC8AG has a sked with K1HR. He is playing with radiophone. W6IAG, a new ham, is an acquaintance of W6W6, AC3MA at Chefoo is an amateur club. ACSRV handles traffic for U.S. Marines on duty at Shanghai.

Traffic: K1AF 167, K1HR 577, ACSRV 216.

ARIZONA — Acting SCM, H. A. Ambler, W6EOP — W6TUTU sends his report direct to HQ. He is building a MOPA outfit for the 14 mc. band, and makes the BPL. Where are the rest of you Arizona boys?

Traffic: W6TUTU 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 "BPL," while he is gone. W3FWM is having trouble getting the 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 FH. W3IJA is having trouble getting his transformer back after a blow-out. W3AIP is using one 199 until he gets his transformer repaired and gets back with 210. W3RU is having time traveling around the country trying to QSO hams from a plane. W3CLK is at Army camp. W3ALS is getting ready for DX this fall. W3BDS 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 static. W3M0 was QSO skeds around the country. The SCM is at the Headquarters during his vacation, and saw how things are handled there. He had an all night session at Brainard Field, the location of W1MD. 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 for a big winter. WSDCM has a 50-watt working on 14,000 kc, and has been working about 75% of the DX heard. Arrick of WSDPQ is also sticking to the 14,000-ko band. WSPQ has moved to and six South American stations during Aug. 1st and 15th. W80K spent the middle of Aug. swamped near Pt. Pleasant with the Nat'l Guards. W8SVT intends to get a couple of 210's working by fall. We expect it will probably be about a month before W8ATC has the best of intentions of attending Carnegie Tech. again this year. W8A2C 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 W6GM. W8JSM is operating a Belgium 50-watt on 14,000 kc, and has been doing both DX and traffic work. W8BWN finally found a 210 that would last him for more than one QSO. H8WCLQ has been working for the B & O, while one of the operators was away on his vacation. W80D is keeping schedules and chewing the rough with his 210. Ex-SCEH 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 more in a while. W5BOK is a new station in Charleston, W5RQH combines with him a mobile phone and telegraph outfit, using two UX-652's. F8B JY and get those reports in on time, fellows.


NORTH CAROLINA — SCM, Hal 8, Justice, W4TS — Fellows, our first report as SCM is not all I 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. W4AECF is working to organize a State Army Net, and wants the gang to write him. He has several skeds on Monday nights. W4AUG has sold out and is going to the Univ. of North Carolina. W4TTS and W4RQH handled messages for the 23rd Signal Co., N.C.N.G, between camp and home, and made the RPL. 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.


ROCKY MOUNTAIN DIVISION

COLORADO — SCM, C. R. Stedman, W5CQA — Traffic report. This month's traffic of the fellows has been on vacations. W5CQA took a trip over Western Colorado and visited some hams on the way. W6DQY put in remote control from the basement. W6DQY has been pounding out on 7000 kc, with good results. W6CNB has been busy questioning. W6QDO decided to rebuild the outfit again. W6QCV continues to be the leader in traffic handling. W4FEU and W4FRE are going to the hills with a portable using B Bats. W4CDE says he can't do much on account of QRN and QRN, W4EFB complaints report cards aren't big enough for his dope. The SCM wishes more of the gang had the same trouble. W6DFJ installed a new power supply, and gets a class A note now. W9QNT and W9DHY are two new hams at Greeley. W4FZS at Evans Park expects to get on the air this fall. W4FEM is on 7000 kc, with nice d.e.


UTAH-WYOMING — SCM, Parker N. James, W6RJAY — Although traffic activity was very slight this month, we have one station that makes the HPI. This month, W6CNX lends the section and makes the BPL on deliveries. He keeps several schedules and operates on 7000 and 14,000 kc. Am sure the gang in the section is losers one of its new ORS as W6TXM is leaving the state this month, but we expect to hear him signing a nine call in Denver. W6BRAJ found traffic nil on 7000 kc. W6DJO reported direct to Headquarters.


SOUTHEASTERN DIVISION

GEORGIA-SOUTHWEST CAROLINA-CUBA-ISLE OF PINES — SCM, J. G. Cobble, W4AM — This month's traffic has been made: W4H8, Atlanta. Also a few cancellations. If no report from the following within five days after this report appears in QT, they will be cancelled: W4AAM, W4TU, W4OY, W4PD. W4AZ has been on active duty with Naval Reserve. W8RN is DXing on 14.000 kc. W4KU's new QRA is 800 Myrtle St., Atlanta. Ga. W4RM uses MOPA and Zepn, and wants skeds with Georgia A-A net stations. W4PX is back on with a UX-250. He worked F8AHM on 8X10 kc. W8BH has xtal DC on 7000 kc. W8RMK is supporting current and has a big new outfit at home. W4GDU, W4QD, and W8EY are ham radio operators and live in suburban Atlanta. W8A4Z is moving. W4NS is back on with an s82, W4ZR is now call of old W4FL. W4AJH continues to report regularly. W4JL is temporarily off the air. W4ADN is back on with 30-watter. W4KY was appointed Radio Aide to Signal Officer in A-A Net. W4RN, W4SI, and W4HAN handled Atlanta traffic for N. G. A. camp, QRA of CMZJM is Box 299, Havana.


ALABAMA — SCM, S. J. Bayne, W4AAQ — W4A1M has been at CMTC, but is on the air again. W4AX has been assisted control station of the Traffic Bureau in Montgomery. W8DN says the High C circuit can't be beat. Ex-S51F is operating at W4WS part time. W4PF blew his 210, but is keeping equally as well with a 171. W4AAH reports business QRN. W4JH has received Official Relay Station appointment. W4VU is receiving foreign calls daily. W4AAQ recently paid the Montgomery gang a visit. W4A1M still wonders what has happened to his note. W4ALG, Old-Timer, is back with us and has ordered a 28X. FB, W4TI has a schedule with K8KQ in Gonda. W4OVA made a splendid trip and visited several 100 meter phone at night. W4EF sends in his first report, as does W4JQ, W4EW uses a 210 and a Majestic power unit. W4JQ and W4LT are big buddies. W4JF is forced to resign as Route Manager and Official Relay Station on account of business pressure. W4Z1 has 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. W4AH and W4AP had a splendid trip and visited severalbetween route. W4JR and W4AP have moved into swell shacks at their respective locations. W4HH has been bitten by the fone bug. W4MY advises that he will soon depart for Oklahoma, where he will no longer have to hate the "Bink." W4XAKB has also had a vacation. W4AAQ is hard at work, but bonds boss at odd intervals. W4AP, a ham of 1917, has recently received his license, and will be heard with a nice DC note.


PORTO RICO-VIRGIN ISLANDS — SCM, E. W. Mayer, K4RD — K4AA and K4A1K are both on 14 mc. K4AAN handles traffic, works good DX and applies for an ORS. FB, OM. K4AAK says traffic is slow, but offers reliable QSP to England. EX-K4A is awaiting new license. W4K1D handled traffic with W8I, W8Y and G, W1EZL and VK at well. Let's have more reports and ORS applications. OMs Needed: volunteer for ORS and OOO! Let's go, OMs!

in the last two months, FR, W4AKF has been to Havana, Cuba, on the U.S.S. Mohan for a period of three weeks. W4QV blew his Shocker, so he installed a 210 and worked four continents in one day. We are sure glad to have him on the air. His transmitter is all fixed up now, and he would like a few reliable schedules. W4OLP reports for the first time. W4TK has just returned from his vacation. W3HY, W4OB, W4AGY, W4SY1 also report. W4AC has been appointed Net Control Station for Florida for the Army Amateur Network, and desires the assistance of all possible stations for handling traffic. Write to him if interested. His QRA is: A. Latchecker, 660 Harold Ave., Winter Park, Fl.


WEST GULF DIVISION

NORTHERN TEXAS — SCM, J. H. Robinson, W5ING—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 W5JR 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. W5A1K says a 210 and a dynamotor have been installed. W5CHD is QST's new station in Ennis, Texas, and is fixing up for some winter. W3OE is still QRL, but gets time for a little brush pushing. W4ATZ wants his ORS cancelled for the winter, as he hopes 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, W5GK 66, W5EV 22, W5AM 19, W5AA 12, W5BAM 12, W5CHD 11, W5VE 6, W4ATZ 5.

OKLAHOMA — SCM, Wm. J. Gentry, W5FQ—W5UH is moving to Enid. W5ASQ and W5AFY have been on a vacation. They had a portable and handled some traffic. W5BHE is high man this month. Congrats, OR. 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 full 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 any. It all counts.


SOUTHERN TEXAS — SCM, R. E. Franklin, W5UXO—W5UXO is out of service due to unknown reasons. W5LP has a new commercial license. W5TD has a new 250 watt, stat controlled transmitter, W5AHA has an 850 going on 14 mc. W5AHE is keeping a sked with W5AJD. W5ADJ has a new portable call. W5BIL, and W5AGI is second up. He has skeds with W5AHE, W5DH8, W5AL and W5FC.

Traffic: W5AHE 21, 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 R.M. has been on holidays for three weeks. The gang had the pleasure of getting out from our old friend Q.L.C., ex-2CHK, now W6PN, on his way from Europe to San Francisco.

Traffic: VE2AC 10, VE2BE 18, VE2AL 8, VE2BG 9, VE2AP 7, VE2BB 14.

VANALTA DIVISION

BRITISH COLUMBIA — SCM, E. S. Brooks, VE8BJ—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 on the air. B. C. A. R. A. Clubhouse, VE5DC does some key pounding when he isn't building new receivers. VE7CF has a new pole on his front lawn, and reports better results. VE5MN is still touring around England, and expects to be away until after Christmas. VE5AN has a yacht, but no transmitter—single pop? VE5AI managed to get on the air again from his new QRA with a low-power transmitter and indoor antenna. Two V's from Calif, W6RNA and W6ETA, called on someone on the ground and used their sets to get QSO with their folks at home. W6EQ, a brave-pounding fireman from Pasadena, was also a visitor here. VE5DD says but weather and business keep him off the key.

Traffic: VE5DD 3.

PRAIRIE DIVISION

MONTROBA—SCM, A. V. Chase, VE4HR—The new SCM wishes to thank all concerned for the honor bestowed upon him, and states that he will do all in his power to uphold the good name of this section. Experimental work is being carried out by VE4QG and VE4BQ on the 28 mc. band. We welcomed visits from W5QD, W5NB, VE4BU and VE4BH. The first mentioned presented us with some paper on the band. We also heard the new UX666 tube at the club meeting held on August 13th. VE4ZJ has at last received his official call. VE4QR. VE4HR is building himself a short-wave superhet, and is contemplating building a new transmitter.


TRAFFIC BRIEFS

Although our 2000-ke. band admittedly is at times congested, the following instance is one that indicates that things may have been quite different a few months ago: About 6:29 p.m., E. S. T. W1SZ was endeavoring to QSO W8DOIW, who apparently was listening on the wrong end of the band. W1ATD came to the rescue by informing W1DIW that W1SZ was calling him. W1HZ was on W8DIW that he (W8DIW) had a 6:30 p.m. schedule with K4AN. It happened that W1SZ also had a schedule for this time with K4AN. Both W1SZ and W8DIW then listened for K4AN, who was found to be calling QSO, but not with the snappy QSO. W1SZ signed off with both stations and began to listen. A QST from W8CYG was heard, directed at W8DIW. About this time K4AN and W8DIW were heard by W1SZ to finish their QSO, and W1SZ called W8DIW and informed them of the QSO from W8CYG, and that W8CYG and W8DIW became connected. All of this happened within thirteen minutes!

W7AOW, in searching for a suitable name for her transmitter, stumbled upon "Heliophobous," which is derived from the Greek helios (the sun — in this case meaning that the signals from W7AOW are directed skyward), and the Latin phobos (indicates, of course, the fear 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 eymologist in the amateur ranks might make a suitable alteration of "od aestra per aspiris," for use by those interested in piercing the Heaviside layer.

For several weeks K1AF at Ft. Mills, P. I., maintained a nightly schedule with W5N, a Yorkton, and supplied the ship with weather reports from the Manila Observatory. Operator Jones tells us that on one occasion, the Cornwallie 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 W2BEN, all reception being with a portable receiver in New Haven.
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 discuss on such subjects even if he were in a position to do so — which he is not.

Suffice it 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.

THESE 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: W8AXA, W3JM, W4WZ, W9DXP, and W7AFO.

In the table below, we have averaged W8AXA'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.

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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-ke. table. We had only two reports which included 7,000-ke. 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-ke. 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 the 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 indecipherable and are destroyed.

Small, fin 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-ke. 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-ke. were very unreliable, certain periods proving good for DX, but on the whole no consistency was obtained.

The 7000-ke. 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.e. 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 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.
—Jessie 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-mfd. 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
The Amateur’s Goal—
More Miles Per Watt

With aeroplanes the goal is more miles per hour, more miles without re-fueling, more hours in the air, altitude, etc., but with a radio amateur it is how many watts you are radiating and how many miles per watt.

Some of the problems which the radio amateur encounters and must answer are: The maintenance of resonance at all times; the protection of costly tubes; tuning the transmitter to within a few cycles according to the 1929 band requirements; and obtaining a true indication of the extremely valuable radio frequency current generated by the transmitter.

The Western Model 425 Thermo-Galvanometer used in connection with a wave meter will enable you to tune your transmitter to come within the requirements, while the Thermo-Ammeter of the same model number in the oscillating (tank) circuit, gives you a reading which is the true indication of the R. F. current generated by the transmitter.

The above illustration shows a typical transmitter with these instruments installed. They are of the popular 3\(\frac{3}{4}\)" diameter type for flush panel mounting and in every way represent the highest Weston quality — accurate, dependable, and possessing unusual electrical characteristics for instruments of this size.

Weston instruments are on sale by all dealers. If you cannot conveniently obtain the required models and ranges write to the factory direct.

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Weston Electrical Instrument Corporation
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Newark, New Jersey
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 W7EFF 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-me. 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 8th 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. VESBM 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
ENGIN EER SKNOW!

Slate Aircraft Corporation
Grandview and Flower Sts.
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July 15, 1929

The Allen D. Cardwell Manufacturing Corp.,
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Attention Manager

Dear Sir:

For many years I have used Cardwell Condensers, where it
was necessary to use a condenser that would STAND up; where
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holding up—Cardwell's have always held up.

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receivers for the new Slate all-metal dirigible we wish to use
Cardwells. All the way through!

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penetration, "radio" compass, as well as a new type "high-
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That we may better choose the correct condensers, will you
be so kind as to forward your catalog, pamphlets, or bulletins?

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

R. V. Howard, Engineer
Radio Division, Slate
Aircraft Corporation

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IF YOUR DEALER DOES NOT STOCK ++ ORDER DIRECT

RECEIVING Condensers in all standard
capacities. Transmitting Condensers for
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transmitting condensers. One for every tube
and purpose, and each one an engineering
masterpiece.

We have prepared literature which we would
like you to have. Requests will be promptly
filled. Now, more than ever—Cardwell Con-
densers are "The Standard of Comparison."
EVEREADY Raytheon Tubes for Talking Pictures and Television

Are definite contributions to this new science

Eveready Raytheon is at the front in television ... with both transmitting and receiving tubes of proved dependability and performance.

The Eveready Raytheon Foto-Cell is a long-life transmitting tube for talking pictures, made in several types. Also used in television. Foto-Cells to special order will be made reasonably.

The Eveready Raytheon Kino-Lamp for television reception is the first tube developed commercially which will work with all systems. Its glow is uniform over the entire plate. Its reproductive qualities are perfect, without the need of mirrors or ground glass. The performance of each tube is carefully tested in our laboratories.

Correspondence invited from all interested in television and talking movies.

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Opening Now the All-Electric Era in Short-Wave Reception

Two-Hundred-Dollar Results—$74.75

As trim and stylish-looking a one-dial set as was ever built to "sell on looks"—yet embodying such extreme performance as only Silver-Marshall can build into a set with three screen-grid tubes, band-selector tuning, and even screen-grid power detection—five times as efficient as '27 power detection.

Four tuned circuits—highly shielded—an audio amplifier combining resistance coupling and 245 push-pull—complete built-in ABC power unit—chassis only 18 3/4 by 9 1/2—all at the price of $74.75 net, less tubes and cabinet, in the S-M 722 Band-Selector Seven. Tubes required: 1—'24, 1—'27, 2—'45, and 1—'80. Component parts total $32.90 net. For use with any 90-120 volt d. c. electro-dynamic speaker.

Ideal for mounting in any of the cabinets mentioned below.

S-M 712 Tuner—The Only Receiver Ever Built Which Surpasses the Famous S-M 710 Sargent-Rayment Seven

You know the Sargent-Rayment 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 ultrafine s. t. 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 3/4 by 9 1/2 by 7 3/4 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 (2.5 volts a. c., 180 volts B). Tubes required: 1—'27, 1—'45, 1—'80. Completely wired less tubes, $56.80 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. Please use the coupon.

Silver-Marshall Inc., 6409 West 65th St., Chicago, U. S. A.

...Send your new fall catalog, with sample copy of the Radiobuilder. For enclosed 10c, send five new S-M Data Sheets, including those on 722, 712, 735, and 677.

Name..............................
Address............................

Say You Saw It in QST — It Identifies You and Helps QST
Here's a Real
Power Amplifier

Designed and Sponsored by FERRANTI, Inc.

It is a new 3 stage job wonderfully fitted for particular and strenuous Power Amplifier uses.

Just See What It Does:

Affords a gain of about 84 decibel with a frequency response of 25 to 8000 cycles. Less than 4 decibel variation from average with total absence of peaks at any point in the response curve. Delivers an undistorted output of 15 watts, with correct speaker load. Layout permits of adaptation to bread board, rack and panel or every Power Amplifier form. Where highest quality reproduction and abundant power are required this Power Amplifier is outstandingly superior.

FERRANTI Tells You How to Build It

Get FERRANTI'S great New Book with instructions and components for building 10 different Power Amplifiers. Everyone interested in Power Amplification needs it. Enclose 15c in coin to partly cover cost and mailing. And if you have any Power Amplifier problems the FERRANTI Engineering Dept. will help you to solve them correctly. This service is FREE to constructors, installation men and engineers. But send the coupon N-O-W, while you think of it.

FERRANTI, INC. Desk 810
130 West 42nd St., New York, N. Y.

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 3. 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 conduct, 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, W80G

A Worthwhile Message

Frankville, Pa.

Editor, QST:

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

ALUMINUM COMPANY OF AMERICA
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 W10FF 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.

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 QSTs 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 3AJW and asked them to try and get it to W2NC, W2CXL or W3HN. I also QST'd it with the same instructions. I heard W3WN 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.

— Bert Felsberg, W8YD

I. A. R. U. News

(Continued from page 21)

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

Loss of the power station put Launceston amatures 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 stations actively engaged were VK7CW, VK7HL, VK7DX and VK7LJ at Hobart working with VK3YX, VK3K8, 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 cognisant 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
COME ON FELLERS,
SEND IN YOUR QSL
CARDS FOR OUR
NEW HAM LOG BOOK
CONTAINING VALUABLE
INFORMATION
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—AmerTrans DeLuxe.

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

AmerTran products are built exclusively for the purpose of achieving realism in tone. It cannot be done cheaply, or haphazardly. AmerTran’s 30 odd radio products all play their definite part in producing the finest tone known to Radio.

Why not perform that “operation” today? See your dealer or write to us. Ask for Bulletin No. 1084.

AmerTran DeLuxe — 1st stage turn ratio, 3. 2nd stage turn ratio, 4.
Price each $10.00.

AmerTran
TRADemark REG. U.S. PAT OFF.
AMERICAN TRANSFORMER COMPANY
Builder of Transformers for more than 29 years
40 EMMET ST.
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. Reifen (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 Reifen, 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.
Unequalled Value in the Jewel Pattern 199

EVERY test necessary for effective radio servicing, including screen grid receivers, is met perfectly by the Jewel Pattern 199, the lowest priced, high quality set analyzer on the market.

Pattern 199's are built to the most exacting standards. The large 3\frac{3}{4} inch Jewel 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. Jewel Analysis Charts make it easy to record test data systematically for convenient comparison and analysis.

Thousands of dealers are converting service liabilities into profits through use of the Pattern 199. Order one from your jobber today.

List price, $97.50   Dealers’ net price, $73.12

29 YEARS MAKING GOOD INSTRUMENTS

JEWELL

199 Set Analyzer

Write for catalog sheet which describes the Jewel Pattern 409, a four-instrument set analyzer for expert servicemen, the the Jewel Pattern 210 Tube Checker, and complete line of Jewel Radio Instruments.
Bradleyunit
Fixed Resistors
are noiseless in operation

That's why they are the choice of leading set manufacturers for grid leak and plate coupling resistors. The oscillograms of units picked at random clearly illustrate the superior quietness of the Bradley unit. Constant resistance and permanent quietness, regardless of age and climate are reasons why you, too, should investigate Bradleyunit Solid-Moulded Resistors.

Oscillogram showing noiseless performance of Bradleyunit Resistors.

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

Oscillogram showing noisy performance of other types of resistors.

Write today, giving specifications.

Allen-Bradley Co.
277 Greenfield Avenue
Milwaukee, Wis.

On 28 mc., the best work has been done by D4UHA 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 J3CI, Mr. N. Tokudaiz, 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 QTH's are now 7100, 14,200 and 28,400 kc. 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 kc. 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 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.

Radio Engineering Laboratories
100 Wilbur Ave., Long Island City, New York
E. T. CUNNINGHAM, INC.
New York  Chicago  San Francisco
Dallas  Atlanta
More big news in radio

$62

Crosley Monotrad
— a 7-tube Screen Grid Receiving Unit

All the wonderful qualities of Screen Grid — yours, now, in this newest Crosley model 30-S, the Monotrad. And at the lowest prevailing price in Screen Grid sets. Only $62 without tubes.

In addition, the Monotrad has an exclusive new feature, the Triple Range Control. This ingenious device adjusts the full power of the set to local, nearby, and distant stations. It makes possible a flexibility of control never before achieved.

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.

Get in touch with the nearest Crosley distributor — see the Monotrad today! Or write us direct.

The Crosley Radio Corporation
Powel Crosley, Jr., Pres.
Cincinnati, Ohio
Home of WLW

You're there with a

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NEW England Mills offers everything in radio at wholesale prices that spell real savings! That's what you will find in this great catalog just off the press, featuring Radio's newest creations in sets, kits, parts and supplies. Everything in our catalog is backed by the guarantee of this old, stable concern and its vast resources, accumulated through 17 years of faithful service to its customers.

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We are one of the largest outlets by mail to the trade. We buy from many of America's leading factories on our own terms. Our cash resources enables us to command lowest prices from manufacturers. This is reflected in the net wholesale prices we show in our catalog. We give our customers the benefit of our vast purchasing power.

Radio Dealers Save Money

On complete radio sets of every description, dynamic and magnetic speakers, A. C. and all other types of tubes, eliminators, batteries, radio cabinets—in fact, everything required by dealers for resale or servicing. Buy right, sell right and make money.

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Earn big money by rebuilding and modernizing old sets. Catalog contains everything required for this work; also the best nationally renowned I'd kits—knocked down or completely assembled chassis ready to install in table or console cabinets, all at wholesale prices.

A. C. Electric Radios

Large selection of the finest A. C. Electric, 6, 7, 8 and 9 tube chassis and complete sets obtainable at the amazingly low prices we quote. Every modern radio improvement is embodied in these marvelous electric radios. All are sold by us with the guarantee of satisfaction backed by this 17 year old institution.

Battery Sets for Unwired Homes

Rural communities with homes not wired for electric radios offer a good market for battery sets, repairs and replacements. We have a large stock of batteries, eliminators, speakers, tubes, transformers, coils, and all kinds of accessories for battery sets. Best known nationally advertised goods, such as Cunningham, Sonatron and Arcturus tubes, Burgess batteries, Jewel instruments, Belden Products, Utah, Temple, Farrand and other popular dynamic and magnetic speakers.

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Get in on the ground floor of this big-money industry. Broadcasting stations and manufacturers are eagerly seeking capable graduates.

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Makes It Easy To Learn At Home
By means of this marvelous, simplified home-training course, sponsored by the Radio Corporation of America... you can now prepare for success in every phase of Radio. The remarkable outlay of apparatus given to you with this course ... enables you to learn by actual practice how to solve every problem in Radio work.

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As a student, you will receive an agreement signed by the president of this school assuring you of complete satisfaction upon completion of your training—or your money will be instantly refunded.

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Same faculty for seven years


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Write for an information sheet on our new short Wave Wavemeter. Price $12.50

Any type of Short and Long Wave Transmitting and Receiving Equipment; Also, Laboratory equipment calibrated built to order.

We will announce each month another of a series of laboratory instruments which we will manufacture.

These instruments will be of the highest caliber and will sell at reasonable prices. Watch for them.

Wireless Egert Engineering, Inc.
179 Greenwich St., N. Y. City
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.”

如果说，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.

You positively cannot get along without

The Radio Amateur’s Handbook

(Fifth Edition—in its 56th thousand)

By F. E. HANDY and ROSS A. HULL

of the A. R. R. L. Headquarters Staff

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You'll be referring to these copies for years to come — and they are fast disappearing.

The August, 1928, to April, 1929, inclusive, issues (except December) of QST completely cover the findings of the League's Technical Development Program—a program of investigation and development of amateur transmitters and receivers.

ARTICLE HEADINGS:
Overhauling the Transmitter for 1929
The Oscillator-Amplifier Transmitter
The Frequency Measurement Problem
High-Frequency Receivers
The Status of 28,000-ke. Communication
Requirements of Transmitter Keying
Improving Short-Wave Phone Reception
Modern Practice in High-Frequency Radiotelephony

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Literature on request.

GULF RADIO SCHOOL
844 Howard Ave. New Orleans, La.
Here they are...

New Audion 410

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

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filament Voltage</td>
<td>7.5 Volts</td>
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<tr>
<td>Filament Current</td>
<td>1.25 Amps</td>
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<tr>
<td>Normal Plate Voltage</td>
<td>425 Volts</td>
</tr>
<tr>
<td>Normal Plate Current</td>
<td>80 M.A.</td>
</tr>
</tbody>
</table>

Audion 422

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

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Filament Voltage</td>
<td>3.3 Volts</td>
</tr>
<tr>
<td>Filament Current</td>
<td>132 Amps</td>
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<tr>
<td>Plate Voltage</td>
<td>135 Volts</td>
</tr>
<tr>
<td>Control Grid Voltage</td>
<td>-1.5 Volts</td>
</tr>
<tr>
<td>Screen Grid Voltage</td>
<td>+45 Volts</td>
</tr>
</tbody>
</table>

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

DE FOREST AUDIONS

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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
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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 pam-
phlet that is yours for the asking.

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20 Keeso Ave., Milwaukee, Wis.

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

All products made to Recognized Com-
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Radio Manufacturers Assn.
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For 25 years manufacturers and suppliers
to the largest and most discriminating users.

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NEW HAVEN, CONN.

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early ear69 ear75 ear105 ear4hp ear8kac ear9kw 88bw
80wms fm1dev fm9lyf ferc ear75 onid onka

2000 miles south of England

7000-ke. band
whamb wjaj wjw wjw ap wjw bjr wjw bjr wjw bjr wjw
wajw wajw bjr wjw bjr wjw wajw bjr wjw wajw
wajw bjr wjw bjr wjw wajw bjr wjw wajw

14,000-ke. band
whamb wjw bjr wjw bjr wjw bjr wjw wjw bjr
wajw bjr wjw wajw bjr wjw wajw bjr wjw
wajw bjr wjw bjr wjw wajw bjr wjw wajw

3000-4000 miles south of England

7000-ke. band
wajw bjr wjw bjr wjw wjw wjw wjw wjw wjw
wajw bjr wjw bjr wjw wajw bjr wjw wajw
wajw bjr wjw bjr wjw wajw bjr wjw wajw

4000-5000 miles south of England

7000-ke. band
wajw wjw bjr wjw bjr wjw wjw wjw wjw wjw
wajw bjr wjw bjr wjw wajw bjr wjw wajw
wajw bjr wjw bjr wjw wajw bjr wjw wajw

Say You Saw It in QST — It Identifies You and Helps QST
Western Electric Dynamotor System No. C.W. 927. Two 27/400 volt dynamotors shock-proof construction. May be used in parallel to give 100 miles at 350 volts, or in series, giving 90 miles at 600 volts. Can be used to operate transmitters up to 50 watts power from 32 volt D.C. mains. Ideal for D-c systems. Two dynamotors in box...........................................$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, 0-30-60 volt voltmeter with switches for testing main line and output. Also contains complete filter system. Very special.………..8.00
Voltemeter, Westinghouse, No. 494149 cabinet portable, 2 scale 0-5-150, List $4.50.…..2.50
Amp. hour meter, Sangamo, hat, charge and discharge, type 566, 2 sizes, 0-300 and 0-600, List $6.00…………..10.00
Voltemeter, Westinghouse, A.C. 8 in. with external res. 0-175 volts.......................12.50
Dynamotor, Sprony Gyro Co., 6/400 volt, 200 watt, ext. shunt ......................15.00
Motor Generator, Crocker Wheeler, 110 D.C., 200 A.C., 300 volt, 500 cycle. Ball bearing.………..50.00
Motors, Edison, universal, 50 watt, double shaft, 110 volt 5.50
Motors, Edison, D.C., 10 watt, double shaft (List $10.50) 110 volt, 500 K.P.M.…………2.00
Motors, Underwood, D.C., 75 watt, double shaft, 1200 R.P.M., 110 volt……………………3.00
Dynamotor, Eimontt, Gener, Kelle, triple-cam double size, D.C. 12-75 volt and 24-1500 volt. complete with fuses and shafts, builtahl and save $30………………10.00 and 12.50
Transmitters, Peerless, 120 input, 5-10-15 volt output, 1/4 K.W., 60 cycle……………………7.50
Transmitters, G.M. current type, 125 to 2500, with center tap, 60 cycle, 200 watts.…………7.50
Transmitters, Amer. Trans., 250 to 8000, closed end, 1/4 K.W., 60 cycle……………………15.00
Transformers, Simon, 220 to 11500 closed end, 1/4 K.W. 500 cycle………………5.00
Transmitters, Amer. Trans., 220 to 12000 closed end, 1/2 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 compressors, Kellogg, Model T 11/4 cu. ft. per min., weight 6 lbs, 600 R.P.M., 125-lb. pressure…………3.00
Millimeter, Westinghouse, type C.A., 0-240, zero adjustment, 1/4 K.W. 60 cycle…………5.00
Ammeter, Westinghouse, type C.A., 0-1, zero adjustment, 1/4 K.W. 60 cycle…………5.00
Voltmeter, Westinghouse, type C.A., 0-35, zero adjustment, 1/4 K.W. 60 cycle…………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 F22, 0-5, regular price $10.00………………5.00
Dynamotor and Navy Airplanes 24/750 volts. Aluminum frame, unusually good for airplane test work. Special price……………………25.00

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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
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 micrometers 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 Resistor, etc.

Send Now for your copy of this useful Bulletin

Shallcross Mfg. Company
ELECTRICAL SPECIALTIES
Collinwood, 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 so 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 amperes up at stores dealing in electrical supplies.
National Transmitting Condenser

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

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

**Size of tubing**

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Prices per turn

Ham Green, double silk covered, No. 10 receiving inductance.

- 3/16" diameter .......... 30c per inch
- 1/4" diameter .......... 35c per inch

*Prices subject to change without notice.

Aluminum Shield cans and panels of every description to order.

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**Everything in Cardwell**

- Acme
- Thordarson
- Flechtheim
- Jewell
- Signal
- Bradley
- Tobe
- Pyrex
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**General Radio**

IN STOCK

**NATIONAL RECTO-BULB**

An unusually reliable and efficient rectifier tube.

Price each ............ $10

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**New LEEDS**

All aluminum plug in Short Wave Receiver. Coils not exposed, thereby insuring 100% shielded job. Short Wave Detector — 2 tubes. Universal type, continuous range 15 to 100 meters; amateur type covers Ham bands 20-40-80 meters with generous spread on the dial.

List price $40. Special Offer, net .................. $37.50*

---

**New LEEDS**

7½-watt Hartley 1920 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 12X-210, with 30 watts input; has plug in transmitting coils. List price —kit $55. Completely constructed $70. Special Offer, completely constructed ................... $57.50*

---

**F E A T U R I N G**

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.
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.


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.

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 committe 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, WSDME, 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, WIANA 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 Wooduff 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.
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.

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

SPECIAL TO AMATEURS
Barawik's new short wave set has everything that amateurs desire. The Barawik Radio Kit gives full details. Send for it.

FREE RADIO GUIDE
SEND FOR IT!
Shows the latest wrinkles, newest developments in radio at startlingly low prices. Get the book 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 information today.

MARVELOUS NEW PATENTED SCREW-HELDING SCREW DRIVER
Non-magnetic. Holds screws tight! Removes them INSTANTLY from inaccessible places. Forstons, radio, electricians, machinists, etc. Send $1.50 for each recept. Exchanges. Price $1.00 each.

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FROM many years in the Radio Field 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.

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FREE CATALOG

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

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 Ke band: $18.00 (unmounted)
- 3500 to 4000 Ke band: $25.00 (unmounted)
- 7000 to 13000 Ke band: $45.00 (unmounted)

BROADCAST BAND:

Power crystals ground in the 550-1500 Ke band accurate to plus or minus 500 cycle of your specified frequency fully mounted for $55.00. In ordering please specify type tube, plate voltage and operating temperature. All crystals absolutely guaranteed regards to output and frequency and delivery can be made within two days after receipt of your order.

CONSTANT TEMPERATURE HEATERUNITS:

We can supply heater units guaranteed to keep the temperature of the crystals constant to better than a tenth of a degree centigrade for $400.00. Two matched crystals, ground to your assigned frequency in the 550-1500 Ke band with the heater unit complete $800.00. More detailed description of this unit sent upon request.

ATTENTION AIRCRAFT AND COMMERCIAL RADIO CORPORATIONS:

We invite your inquiries regards your crystal needs for Radio use. We will be glad to quote special prices for POWER crystals in quantity lots. We have been grinding power crystals for over few years, being pioneer in this specialized field. We feel we can be of real service to you. We can grind power crystals to your specified frequency accurate to plus or minus 0.3%. All crystals guaranteed and prompt deliveries can be made. A trial will convince you.

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DODGE RADIO SHORTCUT

Masters Code—Kills Hesitation
Increases Speed—Produces Results

500 USERS CONFIRM STATEMENT

W5ON Several years old way copied 1 per. As many months with DRS and now copy 25 per. Did not see "How" of DRS at first—wasted many months before I tried it. Wonderful method—FB

DODGE HIGH SPEED

QUICK BOOSTER IF KNOW CODE

e1K1HJ High Speed boosted me from 27 to 42 in 8 exKUNQ hours—15 minutes each eve. C G Short. Not a DRS user

e281DR High Speed boosted me from 28 to 35 in 2 exKFJW high. Had used DRS, Robert Hale

e281FW High Speed boosted me from 28 to 35 in few exKFW days. Had used DRS. Rob Roy Phillips

W5AHD High Speed boosted me from 27 to 30 in 75 W5AHI minutes—15 each evening. Had used DRS

W5BFA High Speed boosted me from 25 to 35 in few W5BFA days. Also K6GQW—had used DRS

W5CJG High Speed boosted me from 25 to 35 in few W5CJG days. Had used DRS

W5CPO High Speed boosted me from 15 to 35 in 3 weeks W5CPO space time. Had not used DRS

W5BXY High Speed boosted me from 20 to 35 in few W5BXY days space time. Had used DRS

W5GCD High Speed boosted me from 20 to 35 in few W5GCD days. Had used DRS

W9DLJ High Speed tried as requested—in few W9DLJ days copied 38 instead of 15 per—had used DRS

EASIEST WAY TO MASTER code is with DRS

WANTED — REPORTS from users of DRS and DRS


C. K. DODGE

Box 100
Mamaroneck, New York

Say You Saw It in QST — It Identifies You and Helps QST
The BETTER Wire-Wound Transmitter Grid Leak
—Because QUALITY-BUILT

Superior performance — because it is built to quality standards — not to meet any special price level.
Unique construction allows for winding more wire of a larger diameter in a small space. Liberal insulation. Soldering lugs and contact bands of Monel metal — providing equal expansion and positive connections. Covered with moisture-proof enamel. Guaranteed not to develop noise or open circuits. Three sizes (100, 40, 15 watts) and ten resistance values, tapped for all usual needs. $1.50 to $5.50.

Write Dept. O10 for complete details

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BUILT BETTER
CONDENSERS AND RESISTORS

Takes Out the Hum
In Any Dynamic

In spite of the many methods utilized to eliminate the hum in A. C. dynamic speakers, many of the best dynamics still have a hum which is sufficiently pronounced to be objectionable.
You will be surprised at the completeness with which an Aerovox 1500 mfd. "A" condenser, connected across the field coil or across the rectifier output will eliminate the hum and increase the sensitivity of the speaker.
Complete details and comparative data showing the results of using an "A" condenser to eliminate hum will be furnished on request.
A complete catalog of all Aerovox condensers and resistors will be sent free on request.

AERVOX WIRELESS CORP
78½ Washington St., Bklyn., N. Y.
PRODUCTS THAT ENDURE

harren 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, W3AIH, who has joined this outfit to take over the Technical Information Service duties. Mr. Grammer 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, MID-WEST, 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 AMJ
(President Bronx Radio Club)

If you want to get the real
line-up on the service Whole-
sale Radio gives to amateurs, just ask the well-known
2AMJ (Frank Lester him-
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knows your requirements. He
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ALLY, and your additional proof, just call
EX'Z'BON. Johnny Wilcox
will inform you that
Whole-
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on the job." He ought to
know because he himself
helps to make that slogan
true.

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to Amateurs!

Remember this: When you
deal with Wholesale Radio you receive careful attention from people WHO KNOW YOUR PROBLEMS! In this
unique service we are the only
organization of its kind in the world! See for yourself this big
catalog explaining this.

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for big catalog. Sent ABSO-
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bargains beautifully reproduced
in color. Shows all Short Wave
and Transmitting Apparatus.
Get your copy today! Simply write name and address in
coupon.

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Scientifically Prepared for Maximum Power and Unconditionally Guaranteed
1 in. square sections of your own size, specified frequency, supplied at the following prices:
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50-100 meters 10.00
100-199 meters 12.50
200-399 meters 15.00
400-699 meters 20.00
All 1 in. Octed Blanks, 200-400, 400-600 meters, $5.00
400-699 meters, $7.50
All 1 in. Octed Blanks, 600-999 meters, $10.00
All 1 in. Octed Blanks, 1000-1999 meters, $12.50

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Shows the latest wrinkles, new-
est developments in radio at startling
low prices. Get the set you want here
and save. The best in parts,
leads, complete factory-built sets and
supplies. Orders filled same day you
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out of reach in other books." Measure, don't guess. Coming
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type of merchandise! Many nationally
advertised brands are offered at NEW
LOW PRICES. You may buy Short
Wave Receivers, Short Wave Kits, Coils
for Transmitters and Receivers, and a
host of other merchandise necessary
to the successful amateur. Nowhere will you
be able to duplicate Wholesale
Radio sales or prices!

All our merchandise is FULLY GUAR-
ANTEED. You are protected in every
way. QST Readers receive personal
attention as described at the left.

Two well-known amateurs head the de-
partment with which you deal. BUY
IN CONFIDENCE FROM WHOLE-
SALE RADIO!

Other Parts and Supplies
Our stock includes a great selection of
use-to-the-minute merchandise of all kinds.
There is scarcely a radio part or supply
which we do not carry. This stock is accu-
rate in description in our big 1930 catalog
just out!

Send for Latest 1930 Catalog!

Mail to:
WHOLESALE RADIO SERVICE COMPANY
Dept. A-14
36 Vesey Street, New York City.

Name ____________________________
Street ____________________________
Town ____________________________
State ____________________________

Send for Catalog
THE NEW
YAXLEY Catalog

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

YAXLEY MFG. CO.
Dept. S, 1528 W. Adams Street, Chicago, Ill.

A Radio Parts Guide
A NEW RUSH SERVICE

THE new addition to the Hardwick-Hindle Plant guarantees speed. In 72 hours it can begin turning out exactly the resistor you want.

The most modern equipment known—a huge new electrical furnace—an efficient, experienced personnel—all work together to provide the manufacturer with the resistor he wants quickly.

Our new catalog showing a complete range of resistors, mountings and brackets is yours for the asking. Send for it on your business letterhead.

HARDWICK, HINDLE, Inc.

The NEW Easy-Working VIBROPLEX No. 6
Reg. Trade Marks: Vibroplex; VIBROPLEX "Nee"

In Attractive Colors
Blue Green Red

Hundreds of operators have traded in old models for this NEW Vibroplex, because it is EASIER to handle. Your old Vibroplex accepted as part payment.

Famous Improved VIBROPLEX
Used by tens of thousands of operators because of its ease and perfection of sending. Colors: Blue, Green, Red or Black...$17 Nickel-Plated...$19

Special Radio Model Extra Large, Specially Constructed Contact Points for direct use without relay. Colors: Blue, Green, Red or Black...

Specify color when ordering

Remit by Money Order or registered mail

THE VIBROPLEX COMPANY, Inc.
825 Broadway, New York City
Cable Address: "VIBROPLEX" New York

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.

1. 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...
TRİAD—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.

Tune in on the Triadors every Friday evening, from 8 to 8:30 (Eastern Standard Time) over WJZ and associated NBC Stations.

TRİAD MFG. CO., Pawtucket, R. I.

TRİAD INSURED RADIO TUBES

THE RADIO BOOK

that has been endorsed and is in constant use by United States Gov't and over 300 Universities, Schools and Technical Colleges in this and foreign countries.

"Radio Theory and Operating"

By Mary Texanna Loomis

President, Loomis Radio College
Member Institute of Radio Engineers

Fourth Edition revised and enlarged to 992 pages, 800 illustrations and right up to date. Flexible Kraft Leather binding.

Price $3.50 — Postage Paid

For sale by bookdealers throughout U.S. and many foreign countries, or may be purchased direct from the publishers. Send check or money order to

LOOMIS PUBLISHING COMPANY
Dept. 5 Washington, D. C.

Oscillating Quartz Crystals

Guaranteed—easy oscillators, carefully selected for maximum output, and ground to your approximate frequency which is stated accurately to within one-tenth of one percent.

1715-2000 Kilocycle band .................. $12.50
3500-4000 Kilocycle band .................. 17.50
One-inch oscillating blanks ................. 5.00
We also supply "POWERTYPE" crystals to broadcast and commercial stations.

Write for literature

American Piezo Supply Company
1101 Huron Building Kansas City, Kansas
Specialists in frequency precision
National Products
Rectobulb

A RELIABLE and efficient rectifier tube — low resistance due to mercury vapor — long life due to low-temperature elements, and oxide-coated cathode of large area — of sturdy design which defies the rough handling incident to shipping them.

Normal Rating: .......................... 250 Mills
Normal Plate Volts: ....................... 3000
Filament Volts: .......................... 1.7
Filament Volts: .......................... 10

The accepted standard for Ham Work — of increasing appeal to the Engineer in small Phone Transmitters as used in Patrol Work and Air Service — ideal for small broadcasters.

Sent postpaid if cash with order — Safe delivery anywhere in U. S. A. GUARANTEED

Price, $10 each
Announcing repair of UX852. $16.50
We repair 283A tubes .................. $19.00
284A tubes .......................... $75.00
WE 211 tubes .................. $16.50
WE 212 tubes .................. $40.00

ALL REPAIRS FULLY GUARANTEED

Chicago Radio Apparatus Co., North Central Agents
National Radio Tube Co.
3420 18th Street
San Francisco, Calif.

to By-Law 28, defining the policy of the League in Canada; Sec. 1 of Article IV of the Constitution, providing for the government of A.R.R.L. affairs by a Board of Directors, of which the Canadian General Manager is a member; Sec. 2 of Article IV, defining the eligibility of Directors; By-Laws 25 and 26, specifying the duties and authority of the Canadian General Manager; and By-Laws 22, 23, and 24, providing for his nomination and election. Copy of the Constitution and By-Laws will be mailed any member upon request.

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 ballot will list the names of all eligible candidates nominated for the position by League members residing in Canada, Newfoundland, and Labrador.

3. Nominating petitions are hereby solicited. Ten or more A.R.R.L. members residing in the Dominion of Canada, Newfoundland, or Labrador have the privilege of nominating any Canadian member of the League as a candidate for Canadian General Manager. The following form for nomination is suggested:

(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 Dominion of Canada, Newfoundland, or Labrador, hereby nominate .................., as a candidate for A.R.R.L. Canadian General Manager for the 1930-1931 term.

(Signatures and addresses)

The signers must be League members in good standing. The nominee must be a Canadian member of the League in good standing, and must be without commercial radio connections. His complete name and address should be given. All such petitions must be filed at the headquarters office of the League in 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. Mr. A. H. Keith Russell, of Toronto, Ont., is the present Canadian General Manager.

5. This election is the constitutional opportunity for members to put the man of their choice in office as the Canadian member of the A.R.R.L. Board of Directors. Members are urged to take the initiative and file nominating petitions immediately.

For the Board of Directors:

K. B. Warner, Secretary.

Hartford, Conn., 1 August 1929.

Strays

We have discovered that the phone transmitter described in the September QST is afflicted with a case of “floating cathodes.” The cathodes of the UV-224 tubes in the buffer amplifier of Fig. 1,
Synchronous Motors for Television

In addition to building reliable and satisfactory motor generators, "Esco" has had many years of experience in building electric motors for a great variety of applications.

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.

Other types of motors suitable for Television may also be supplied.

Write us about your requirements.

ELECTRIC SPECIALTY CO.
25 South St. Trade "ESCO" Mark Stamford, Conn.

BROADCAST MICROPHONE

Finest broadcast microphone made. Double button, stretched diaphragm type. Covers entire frequency range. Write for circular.

Broadcasters Service Bureau
San Jose California

HILET POWER

TRANSFORMERS AND CHOKEES

Mounted 700 watts, 1000-1500 volts each side, $14.50, un-mounted 250 watts, $8.50, each side, $7.75, mounted $14.50, 50 watt, 35 volts each side, two 7 kV windings, $4.90, 100 watt filament, any voltage $1.50. Chokes with adjustable core 250 MA $1.50, 160 MA $1.00, 500 MA $2.50. Specials to order. Write for drawings and specifications. One day delivery.

HILET ENG. CO.
ORANGE, N. J.

Resistance

from Alpha to Omega

No matter what your resistance problem may be, there is one universal solution —

CLAROSTAT

Variable and fixed resistors, volume controls, automatic line voltage ballast, socket antennas, etc.

Write for literature to

CLAROSTAT MFG. CO., INC.
263 North 6th St., Brooklyn, N. Y.

Members' Correspondence Stationery

One color (black) heading now being used at greatly reduced cost to members

Write your radio letters on League stationery — it identifies you.

Lithographed on 8½ x 11 heavy bond paper.

100 sheets .......................... 50c
250 " .................................. $1.00
500 " ................................. $1.75

(Postage Included)

A.R.R.L.
1711 Park St., Hartford Conn., U. S. A.

Radio Operators

Send for this Folder FREE

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. McKelvey, world's champion radio operator endorses no other system. Satisfaction results or no pay. Folder tells all about it. Send name and address now!

THE CANDLER SYSTEM CO.
6343 So. Kedzie Ave., Dept. RL, Chicago, Ill.

Say You Saw It in QST — It Identifies You and Helps QST
We are prepared to furnish complete parts for construction of amplifiers for theaters, dance halls or public address systems.

Dongan Electric Manufacturing Co.
2998-3001 Franklin St., Detroit, Mich.

Build Your New Amplifier with These Parts

No. 994 — Power Amplifier Transformer $12.00
No. 2189 — Push Pull Transformer $1.00
No. 2142 — Push Pull Input Transformer $4.50
No. 3107 — Straight Output Transformer $12.00
No. 2155 — Audio Transformer $4.50
D-946 — Standard Condenser Unit $22.50
No. 5554 — Double Choke (use in Filter Circuit) $11.00
No. 2124 — Transformer (for Push Pull Radio and Phonograph Amplification) $6.00

Get complete information on the new and approved types of Power Amplifiers using UX 245 and UX 250 Tubes and Dongan Approved Parts. For immediate delivery of any of these parts send check or money order.

Excellent washers for the mounting of rheostats or regeneration control resistors in metal panels can be made by sawing off slices of 1/2” inside diameter (1/2” outside diameter) bakelite tubing. End washers to insulate the frame of the resistor from the panel can well be made from 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-kc. operation.

It should be noted that when a potentiometer arrangement is used for regeneration control, as in the receiver described in the article “A ’29’ 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 milliamper 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 tautized 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
Fill. Volts 2.5
Fill. Amps. 5.0
Peak Inverse Volts 5000
Peak Plate Amps. 0.6
Total Height 63/4"
Diameter 23/8"

LIFE GUARANTEED
$3.00 Money Order
EDWIN C. EWING, JR.
Room 930, 29 S. LaSalle St.
Chicago, Illinois

Do you know that the 1929 Handy and Hall Handbook is available in bond 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.

PIEZO ELECTRIC QUARTZ CRYSTALS
"Announcement"

We are prepared to furnish to the wholesale and retail trade, accurately cut quartz crystals to your approximate specifications. Each crystal guaranteed to be free from twinning, cracks, flaws or any intergrowths and tested for oscillation before delivery. Crystals from 50 to 500 meters $4.50 each. Special quotations on lots of ten or more. Crystals on hand for most any frequency.

Bethesda Crystal Laboratory
P. O. Box 43, Dept. A
Bethesda, Maryland

TRANSMITTING GRIDLEAKS
5000 OHMS
These genuine General Electric wire-wound Gridleaks have a rating of 55 watts continuous duty.
Large enough for 250 watts.

SPECIAL 65c Ea.
AMERICAN SALES CO., 19-21 Warren St., N. Y. C.

HALLMARK OF EXCELLENCE
for FILTER CONDENSERS, BY-PASS CONDENSERS, RADIO INTER- FERENCE FILTERS AND POWER FACTOR CORRECTION BANKS
Write for complete catalog of Cornell Products, including our new "Cub" Condenser.
CORNELL ELECTRIC MFG. CO.
Long Island City New York

Say You Saw It in QST — It Identifies You and Helps QST
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 .00024 mfd. — 6000 volts; and .00045 mfd. — 3000 volts. Condensers can now be furnished with either hard rubber or crotile insulation.

Send for Bulletin 121-Q

NATIONAL TRANSMITTING CONDENSERS

Power Transformers and CHOSES
At Less Than Manufacturer’s Cost

This is the bankrupt stock of the Scanlan Transformer Co.

No. 1085 Sec. 600 V. 7½ V. C. T. to first choke. 7½ V. C. T. to case 1¼ V. 3 chokes. For one 281, and 250... $5.90

No. 1062 Sec. 280 V. 1½ V. C. T. to first choke. 1½ V. C. T. to case 1¼ V. 3 chokes. For one 281, one 250... $5.90

No. 1601 Sec. 220-220, 5 V. Rect. C. T. to first choke, 5 V. C. T. to case 1¼ V. 3 chokes. For 280, two 171 A, 227 and 250 tubes... $4.25

No. 400 Sec. 350-350, 3 V. Rect. 3 V. C. T. 1¼ V. 1½ C. T. to shield, 120 V. per 2 chokes... $4.50

No. 220 Sec. 250-250, 5 V. C. T. 1½ V. C. T. 1½ C. T. 2 choke high and low per... For 280-171-227 and 250 tubes... $4.00

No. 878 Secondary 350 volts... 115 volts... 55 volt... 1½ volt... 1¼ volt... High and low primary and 2 chokes for 280, two 171 A, one 227... $4.25

No. 413 Filament Transformers for six 227, one 227, and two 171A tubes... $1.45

No. 644 Scott double chokes. 1½ miles... $2.50

No. 641 Scott Audio input transformer... $1.00

No. 642 Scott Auto output transformer... $1.00

No. 648 Scott Audio carrier... $1.00

No. 10 Horn chokes... $1.00

No. 19 1½ A. Amp. Dry Charged, less Thay at... $1.50

Doherty Power Pack, 150 volt, 10000 volts. Toppe... $25

Doherty 5 tube radio sets in table model cabinet, require minor adjustment... $66.00

Write for list

Chas. Hoodwin Co.
4240 Lincoln Ave. Dept. 927, Chicago, Ill.

BANKRUPT RADIO STOCKS

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 Parsont, Portland, Me., W1KAY.
Max Colvin, Kansas City, Mo., W9WW.
B. A. Watson, Texarkana, Ark., W5AYP.
Paisley G. Isenhour, Asheville, N. C., W4MI.
T. C. Loekrem, Lisbon, N. D., W9BJV.
Joseph M. Boon, Cushing, Okla., W5ASK.
John T. Dalton, New York City, N. Y., W8BOW.
P. Spencer-Nolan, Sydney, Aus. VK2YI.

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 brash-pounder. Harold Eugene Quinby was born July 10th 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 "Nagoka'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.
HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature proper for radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor are submitted, such as, for example, such as, any big, bold or excessive capital letters used which would tend to make the advertisement stand out from the others.

(3) The Ham-Ad rate is 15¢ per word, except as noted in paragraphs (4) or (5) below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) A copy is due no later than the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature and which, in the opinion of the Committee on Ad Policy of the American Radio Relay League, is of the highest value to the amateur radio public. Such an advertisement shall be placed in the column where such matters are normally handled, regardless of which column of the price list may apply.

PLATE Power for your set, the very heart of its performance. For quietness DX utility, life-long permanence, absolute dependability, nothing else but PLATE will do, for no other plate source can approach the achievement of an Edison steel-alkaline storage B battery. Built painstakingly; every joint pure nickel, upset electrolytically. Genuine Edison Electrolyte. Our list describes complete batteries, construction parts, enamelled wire, silicon steel. Available immediately, filmplate and filament transformer, complete rectifier with recifier plate power units. Rectifier Engineering Service. radio WSMU, 4557 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. Ensmall Radio Laboratory, 1308 Grandview Ave., Warren, Ohio.

SPECIALY made rectifier aluminum with small percentage copper, stand more ammonia, last longer, square foot $1.25. Load $1.00. Fewer balls punched with beds and nuts, new kind 1½ x 4" 15¢, 1½ x 6" 17¢, pair prepaid. Best Silicon steel $0.12¢ each to order 25¢-50¢ lb. Postage extra. Geo. Scholz, Calumet, Mich.

AMATEURS — experimenters, builders. We serve over 4000 L. H. S. A. Members and Countless others. Send 25¢ for our catalog containing 25¢-50¢-50¢ and $1.00. $5.00 stock approved parts — no sets. Over four pounds catalog, circuits, data, prepaid, 50¢. Weekly bulletins and news. Our catalog, sent free, is our best week's work. Try our experimenters "Over the Soldering Iron" magazine. 25¢. Transmitting data, price list, etc., 25¢. Kladig Radio Laboratories, established 1930, 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: Ameron 1200 volt each side of center 2-7½ volt center tapped filament windings at $8.00 each, 2½ inch Signal Corps, each $8.00. Henry St. chromium plated maroon condensors $1.90 each, signal high frequency buzzers 95¢ each. Two microfarad 1000 volt unmounted condensers 85¢ each. Westinghouse, manganese coated condensers of same size, same condition. Price, 33¢ each. Mershon condensers $2.00 each. Fleetham 1500 volt pig-tail leads one microfarad manganese $2.75, two microfarads $5.75. Freeman 675 volt and 2000 volt manganese coated condensers $4.25 each. Price, $2.00 each. Hubbell 1500 volt pig-tail leads one microfarad manganese $2.75, two microfarads $5.50. Freeman 675 volt and 2000 volt manganese coated condensers $4.25 each. Hubbell 1500 volt pig-tail leads one microfarad manganese $2.75, two microfarads $5.50. Freeman 675 volt and 2000 volt manganese coated condensers $4.25 each.

NAVY Dynamotor General Electric 24,1500 volt, $37.50; 24,750 volt, $75.00; 27,500 volt, $112.50; and 44,000 volt, $180.00. Crooker-Wheeler 24,1500 volt, 450 watt, $155. Holter-Cab 12,1500 volt, $20. Westinghouse 6-15 volt, 500 watt, $15; 10,350 volt, $18; 27,500 volt, $30. Twins for 7½ volt, $9.50; 250 volt, $125.00; 500 volt, $200. Complete list. Henry Kienale, 501 East 8th 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, $12.50. 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.


WANTED: Your radio wants. Parts for that receiver, transmitter or power supply, special apparatus. Fonstone Engineering Co., 1100 Ave. I, Brooklyn, N. Y.

SELL short wave receiver, Cardwell condensers, 500 cycle, perfect condition, $25. W8AF, 307 West Central Ave., Delaware, Ohio.

TRANSFORMERS, filament, 110-12 volts, 150 watts, $6.50; 110-8 volts, 75 watts, $3.50. All above transformers are factory made, new, mounted, and designed for 60 cycles. Send for Ham Line. Robert Lewis, Electrical Apparatus, 524 N. Orient, Indianapolis, Ind.

WANTED: Old style marble base key, 6-400 dynamotor, send last surplus parts not needed to W9NEU, 9025 Windsor, St. Louis, Mo.

QSL cards, $1 per hundred, W9NEU, 9025 Windsor, St. Louis, Mo.

XTALs, guaranteed to oscillate 3500-ke. band, $12. 17,500-ke., $9. W2BOA, 605 Corliss Ave., Allenhurst, N. J.

SELL — complete list of parts. Write for list. William Harmon, W9CTD, Main St., Meredith, N. H.

WANTED: mate for my 4000-1 "S" tube. What have you? WUCAS.

A.R.L. sweater emblems should be worn by all League members. They are yellow and black 5½ x 8½ diamond, felt letters and embroidered symbol. Only $1.00. Money order or currency only accepted. Eric Robinson, 155 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. Cataling free. Dodge's Institute, Wood St., Valparaiso, Ind.

KENNEDY 150-3000 meters intermediate wave receiver with two-stage amplifier, $18, Sherwood, W9H.


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.

BARGAIN — Model 8A Kolster broadcast receiver. New, in original carton. This table model c. a. c. set in satin finished mahogany cabinet contains four stages of tuned r.f., detector, and three special audio stages. Single illuminated control sensitivity or sensitivity adjustable. Requires 110-v. a. c. and will take power tube in last stage. Height 121/4", width 271/4", depth 14 1/2". A line set, and only $40 cash takes it. Miles W. Weeks, 40 Nortons 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, Arcos, N. Y.

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